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VOLUME V OF 12 VOLUMES

RECORD OF PROCEEDINGS

of a

COURT OF INQUIRY

convened at

U. S. Naval Submarine Base New London
Groton, Connecticut

and

Portsmouth Naval Shipyard
Portsmouth, New Hampshire

by order of

Commander in Chief
U. S. ATLANTIC FLEET

To inquire into the circumstances
of the loss at sea of

USS THRESHER (SS(N)593)

which occurred on

10 April 1963

Ordered on 10 April 1963

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TWENTY-SECOND DAY

Portsmouth Naval Shipyard
Portsmouth, New Hampshire
Wednesday, 8 May 1963.

The court met in executive session at 0830.

Present: All members of the court and the counsel for the court.

The court opened at 0945 hours and announced that this session would be held with closed doors.

All persons connected with the inquiry who were present when the court adjourned were again present in court, with the exception of (b) (6), who was relieved as reporter by (b) (6). RADM Palmer, a party, and LCDR Hecker, a party, and his counsel waived their right to be present at this session of the court. Counsel for RADM Palmer was present.

George W. Guther was called as a witness for the court, was informed of the subject matter of the inquiry, was advised of his rights against self-incrimination, was duly sworn, and examined as follows:

COUNSEL FOR THE COURT: This is a closed session of the court, Mr. Guther, and classified information can be divulged here.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, address and occupation.
A. My name is George W. Guther; I reside at (b) (6) (b) (6) I'm a Supervisor Marine Engineer, Code 648D, the Piping and Machinery arrangements.

Q. That is in the Bureau of Ships?
A. In the Bureau of Ships.

Q. How do you spell your last name?
A. G-U-T-H-E-R.

Q. Briefly describe the nature of the duties which you perform in BUSHIPS.
A. Briefly, after the ship has been -- after the contract plans and the guidance plans have been signed, and the ship officially turned over to the technical code, the type desk, in this case, we normally receive what we call the working diagrams, which are being prepared in accordance with the specifications, and the guidance plan. The guidance plan, it must be understood -- is for guidance only. We approve these diagrams which are being submitted by the shipbuilder through the type desk in accordance with the specification and guidance plan, and any other changes that we would like to do with it. We also take care of ships in service, changes, new installations, and we take care of POLARIS patrol reports; we take action on those. As a secondary cognizance, we work with 1500 on their primary systems, up to a certain degree, the arrangements and the reactor box, the

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black box, as they call it. Some of the diagrams we receive from the contractors, I believe there are twelve, will have to go through 1500 for their comments.

Q. You are referring to Code 1500 of the Bureau of Ships?
A. Yes, Code 1500, Navy reactor branch, for their concurrence. That also applies to machinery arrangement plans.

Q. Mr. Guther, please briefly state your educational and professional background and experience in your present field of endeavor?
A. I graduated from a technical college in Germany. I had a degree in mechanical engineering, specializing in structural steel construction. I attended courses here at Columbia for one semester, in construction of steel. Before 1939 I had various experiences with private industry. Starting in '39 I worked for the Portsmouth Naval Shipyard for seven years, and transferred to the Bureau of Ships in 1946.

Q. Is that the Norfolk Naval Shipyard?
A. I'm sorry, I meant the Norfolk Naval Shipyard in Portsmouth, Virginia.

Q. You were at the Norfolk Naval Shipyard from 1939 to 1946, and thereafter you have been in the Bureau of Ships?
A. Yes.

Q. Turning directly to the U.S.S. THRESHER; what were your responsibilities at the Bureau of Ships with respect to the design of THRESHER's sea water system?
A. As I mentioned before, we received the diagrams from the Portsmouth Naval Shipyard for action, approval action, and the process, as I mentioned before also, was comparing them to the specifications and with the guidance plans. In addition to that we were depending on this main sea water system, which is a very simple system, and our larger systems, such as our auxiliary sea water systems --

Q. My question related to main sea water system first; what significant changes were made in THRESHER's sea water system between the contract plans and the working diagrams, and what were the reasons for the changes?
A. On the main sea water cooling system, the contract plan called for hull and backup valves; that is, suction and discharge valves had hydraulic operations. We inspected a mockup here at Portsmouth, and noticed that the backup valves were provided with a small hand wheel, and I told the representative of the Portsmouth Naval Shipyard, at that time, what happened to the hydraulic operation. The answer was, "We are not going to put one in". I told him that the specifications and the contract plan calls for it. I was told "Well, if you insist on it, we will not be able to do it unless we delay the ship". I asked him to put in flexible shafting, or at least a Reach Rod system terminating at the upper level, whichever is more convenient, as a temporary installation and it was approved on that basis, but it is only temporary and the ship will have to be back-fitted in the future. Two weeks later I went out to Mare Island and inspected their mockup and of course they had the very same hand wheel on the lower level. In the beginning they did not even attempt to have an operating gear from the upper level; they wanted to operate from the lower level. When I told them about the specification and the contract plan, they wouldn't touch it unless the design yard would provide them with the necessary plans. However, we did go out now and told them to install, at their own cost, the hydraulic operation from the upper level on the same control panel, hydraulic control panel for the other valves. Now in connection with that, the control panel was relocated close to the maneuvering area, so in

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case of damage, somebody from the maneuvering area can push levers; they don't have buttons, they have old-fashioned levers.

Q. So the change was accomplished as you requested?

A. A change has not been accomplished; I don't believe it has been accomplished on the THRESHER, nor on the other ships at sea. The letter only went out a short while ago. I think I have a copy of this letter on 8 March of 1963. We were amazed when we found out that the operation of that hand operated backup valve took eighty-three to eighty-seven turns, which was contrary to what our understanding was when we were up here at Portsmouth about, I would say, three or four years ago.

Q. Do you have a copy of that letter?

A. Yes, sir. There is a story behind it that I might mention. The Portsmouth Naval Shipyard wanted some money for the installation, and we called their attention to it, that in accordance with the specification and the contract plans, I have a copy here, it indicates hydraulic operation for the backup valves must be provided, and there was no deviation from it. All our previous ships had the same installation; I'm talking of nuclear ships now, at least the newer ones, from the 585 on.

A letter from the Chief, Bureau of Ships, serial 648-D2-18 of 8 March 1963, subject "SS(N)593 class hydraulic operated backup valves in main sea water systems; comments on", was offered in evidence, and their being no objection it was so received as Exhibit 164. Counsel for RADM Palmer waived the reading of the exhibit at this time.

Q. Mr. Guther, you have answered my question with reference to the main sea water coolant system. I shall now ask you --

A. May I interrupt you? There is one more thing that happened a little bit later on. This was a cross connection from the ASW system, for cold water operations so b(3) 10 USC 130 but that happened later, not on the first approval when we received the first working diagram from Portsmouth; I don't know whether it has any bearing on it.

Q. What significant changes were made in THRESHER's auxiliary sea water system between the contract plans and the working diagrams, and what was the basis for each change?

A. Well in general, we have a b(3) 10 USC 13 on the THRESHER, which is different from our missile boats, b(3) 10 USC 130 to supply various heat exchangers necessary. This consisted of b(3) 10 USC 130 the suction (pump discharge) side only. However, the guidance plan indicated that the discharge overboard system had only more or less b(3) 10 USC 130 In addition to that, none of the sea nor backup valves were provided with hydraulic operators on the guidance plan, and they were not mentioned in the specification. Spec could actually over-ride the guidance plan.

Q. Do you have a diagram showing changes made to include hydraulic sea and backup valves in those areas?

A. Yes, sir, I have.

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Q. Would you produce it, please?

A. However, I have to mention here there are some other changes which we recently -- actually starting about last December -- tried to provide for damage control purposes, and they are marked on this print in red. We added that because the BARBEL wanted one particular valve. We looked it over, but before the letter came we wanted to add some more valves for damage control purposes, and they are indicated in here in red. For instance, this will indicate a hydraulic indicator in the pump discharge cross valves, so you can split one side from the other. We do the same thing in the engine room; we do the same thing in the discharge overboard.

BY THE PRESIDENT: May I ask, Mr. Guther, whether or not these valves marked in red on this diagram were incorporated in THRESHER or not?

A. No, sir, it's still in the Bureau.

PRESIDENT: On the diagram, does the letter "H" mean a hydraulically operated valve?

A. This is correct; and if I may mention it, the two valves in the suction line located on the forward bulkhead in the engine room, they can be operated from the upper level of the engine room, and also from the auxiliary machinery space, because it didn't make sense, damage control wise, if you couldn't do it the whole way.

RADM Daspit: Mr. Guther, you indicated that work on this line began in December '62?

A. That was my thought in the office where I work.

RADM Daspit: Had it gone beyond just thinking in your office?

A. No. The whole writeup -- I have the whole thing here -- is in the type desk. However, we not only made changes to the THRESHER, we also were trying to improve other ships from the very same standpoint, for damage control purposes, and that was a package deal. That has to go before the board, and it has not gone before the board.

RADM Daspit: Thank you. Mr. Guther, you have some valves ringed with a dotted red circle; could you tell us what that means?

A. I think they are the overboard discharges and suction, aren't they? May I come back to the contract plans; I stopped with the contract plans when I had to produce this little sketch. Now this little sketch indicates what actually the THRESHER had, except the ones marked in red. You will notice some of them are hydraulic operated, some are check valves for a particular purpose in order to prevent back flow in case we cannot close the valve for the heat exchangers. Some others are new valves. Some others are just hydraulic actuators for an existing valve, but the difference between the contract plan, as originally approved by us, was that it provided hydraulic actuator operaters for hull valves and remote operaters for other valves from the upper level, but I understand that they did not provide the remote operators for the backup valves. Whereas the contract plan did not show any hydraulic operators for any of the sea valves.

The diagram for the auxiliary salt water system was offered in evidence and there being no objection it was so received and marked Exhibit 165. Counsel for RADM Palmer waived the reading of the exhibit at this time.

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Q. Please describe Exhibit 165.

A. The supply lines, the suction, is marked in green. Here are two sea chests, with a cross-over, in case one gets clogged up you can use the other to supply water to the pumps. Bump discharge goes into a loop which extends through the bulkhead into the auxiliary machinery space. Now talking about the other suction, the other end of it, in the auxiliary machinery space we have b(3) pumps. Here again we have two sea chests, two valves, hull and backup valves in this case, are both hydraulically operated. One of the reasons was that some of them are very hard to get to, and in some cases when they could not put in any flexible shafting, they reverted to actuators, which were simpler to do. Now this supplies the reactor fresh and salt water heat exchangers. We also have b(3) pumps in the auxiliary machinery space. The suction is also indicated in green. The discharge from the pumps ties into the same loop which comes from the engine room. The discharge is marked in yellow, and we have hydraulic operated overboard discharge and backup valve here, plus a check valve, which in case we can't close a valve we at least have a check feature in there, and as we all know, a check valve, a swing check valve, is not a positive closure, but it will help to a certain extent.

We also have another discharge on the starboard side, hull valve is also provided with hydraulic operator. The constant vent systems are combined. The main condenser ties into a line which picks up all the other auxiliary heat exchangers and has a separate overboard discharge provided with a hydraulically operated valve from the other level again. All these valve operators are in the maneuvering area on the upper level. They were relocated, except the one for -- I forget which they were, I can give you which ones. They are still located between the two turbines, and we have also written a memorandum to 525 for the relocation of this hydraulic control panel to be located adjacent to the main panel. The main panel takes care of certain auxiliaries, plus the main hull and backup valves, and there was a small one, (panel) consisting of, I think, six valves, a little farther aft. We put them together so that the whole control can be operated from one station right adjacent to the maneuvering area. Now these additional valves which are marked in red, were provided primarily for damage control purposes. Incase you have trouble, say, in this compartment, you at least can run, for instance the fresh and salt water heat exchangers, which are very vital, by closing this valve. You might have trouble on one side, and you still can operate this side by closing this valve hydraulically. The intent of these additional hydraulically operated valves is to be also operated from the same spot as all the rest, so that you have a control station for damage control, if you want to call it, all at one spot. You might have a little bit of trouble space-wise, but this is the intent.

Q. Now these recommendations of yours were incorporated in a memorandum dated 14 February 1963; is that correct?

A. Yes.

Q. I show you this memorandum; is this the one to which you referred?

A. Yes.

A memorandum from Code 648D to Code 525H, subject: "Ships in service, Additional remote sea water valve, acuators and valves; Provision for", dated 14 February 1963, was offered in evidence, and there being no objection, it was so received as Exhibit 166. Counsel for RADM Palmer waived the reading of the exhibit at this time.

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Q. That is an internal BUSHIPS memorandum; is it not?
A. Yes.

Q. Can you describe current proposals being considered within the Bureau of Ships with regard to THRESHER type ships constant vent systems?
A. At the present time all our heat exchangers, except the ones which are self vending, are provided from the water box with constant vent system. The forward and aft water box, they are all combined into a header, which is going overboard, and which I showed you right here. It is a two inch overboard and it ties in -- to this main passing overboard. This is not always the case, but the THRESHER happened to be that case. In some other cases we tried to use high points in an overboard discharge, making use of an existing overboard discharge, so we wouldn't have another bulkhead penetration, but this cannot always be done, however. By the way, for instance, EB is using a header and has a connection overboard located for and aft.

Q. That's the Electric Boat Division?
A. That's the Electric Boat. They have this for the purpose if you go up and down you can vent this way and going up you can vent the other way going down. We run tests last year and went out to the fleet, requesting information in setting up a test as to the necessity of the elimination, or proposed elimination, of constant vents. The reports comming back -- there was only one on the THRESHER, which is the only one where they had a slight air bubble in there, which they got rid of after a short period of time. All the other ships reported it satisfactory when they operated, I think some of them, for thirty days, so based on that the Naval Reactor Branch went out with a separate letter to take care of the pumps in the auxiliary machinery space and the fresh water sea water heat exchangers, and they insisted on retaining the constant vents overboard, and also on the pumps. We investigated our end of it and with other appropriate codes we found out that the pump people insisted on having constant vents. We thought perhaps we could save some more constant vents, so the outcome of it was, we went out with a letter telling them to eliminate all vents, with the exception -- constant vents, that is -- with the exception of the main condenser, the air ejector, the fresh water sea water heat exchangers, which I just mentioned, and all sea water pumps; that is the main and all the auxiliaries. I think there are some ships, one or two, the 571, I believe, and 575, which have a separated SST condenser and a separate air ejector that will also have to be provided with constant vents. Now constant vents, of course, means discharging overboard, but in addition to that we also have an inboard vent which they use for a startup, and those heat exchangers which had constant vents overboard, and where we eliminated them, are still provided with inboard vents in case we had trouble with them to get the air out, they are capable of doing so by cracking open the vent and running it down into the bilge.

Q. What is the date of the letter to which you refer?
A. We have two; this is the one that goes before the board, because it takes quite a bit of money to take them out of the ships. This is a letter to SUBLANT and SUBPAC telling them what we are going to do. Here it tells you where we will have constant vents; the others not mentioned will have inboard vents.

Q. You are showing me a change order justification memorandum prepared April 12, 1963.
A. Yes.

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Q. And a letter from the Chief of the Bureau of Ships to Deputy Commander, Submarine Force, Atlantic Fleet and Commander Submarine Force, Pacific Fleet, prepared April 11, 1963. To your knowledge, has either of these been sent?
A. This was sent out-- the change order memorandum was sent out.

Q. The change order memorandum was sent to 525.
A. This one I don't know whether it got out. I believe it has been signed out very recently.

Q. But you don't know?
A. I could check up on it very easily.

The cited change order dated 12 April 1963 was offered in evidence and there being no objection it was received as Exhibit 167. Counsel for RADM Palmer waived the reading of this exhibit at this time.

Q. Would you describe the development and coordination of THRESHER's Ship's Information Book as it applies to the main salt water circulating and auxiliary systems, as far as the responsibilities of your office are concerned?
A. Our responsibility is to review the Ship's Information Book as to the format, the type of information, the diagrams, because normally they make different diagrams, and they make quite a few mistakes on these, and what little there is on operating instructions. Now, if I may, I should like to make a short, brief remark in regard to instruction books, or information books. These were changed from the old type of information books where we had a sheet which gives you certain operation instructions, like lube oil transfer from such and such a tank to such and such a tank by symbols, by use of a full circle or a color or something like that, indicating you open this valve, you close that one, you have the whole thing lined up and then you start your pump and you transfer your oil. That is not the case any more. The original instruction book on the S5W was actually the Naval Reactor Branch's responsibility, and of course since all these ships use S5W we receive them from the shipbuilders and there are certain chapters in there which the Naval Reactor Plant is primarily interested in, and they review it and send their comments to us, we take care of our end of it, and comments from other codes. Like on pumps which are installed, we have to check with other codes in the Bureau and then we take the action and prepare a combined letter to the builder. Now in this particular case, on the 593, in reference to the main sea water and the auxiliary sea water cooling systems and other systems, they come in volumes. Right now we have, I think, about seven or eight volumes. In the future we are going to have sixteen volumes. There is a difference in the recent concept of Ship's Information Books by adding all the electrical equipment; this is in connection with the systems, such as pumps, motors and switches, into the very same chapter with main cooling systems or auxiliary cooling system, but going back to this particular book, this was submitted about two years ago. Portsmouth, as I understood it, was unable to do the job and they farmed it out to a Boston firm, with the understanding that they could follow the SS(N)588 as a guide. We received that book and it was in such bad shape, they copied most of the 588 and forgot that the turbines b(1) no steam loops, no nothing, so to make a long story short in this particular phase, we had to refuse the approval of the book. We had to return it. We still had to write about sixty to eighty pages of comments just to give them the major points that we wanted as to function, a brief description of what the system was supposed to do, some of the detailed

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instructions, not too detailed, on various components, and very little on operating instructions. These are the books; there was very little on operating instructions; but that was not done by us; it was higher authority that did that. So this book was approved by us, Volume I, part 1; we still have Volume II, part 2 . On the 15th of March, we approved the Ship's Information Book, Volume II, part 1, and we still have Volume II, part 2. This part 1 takes care of steam systems and sea water systems.

Q. And what year is that 15th of March?

A. I beg your pardon, 1963. However, the ship was provided with a preliminary book. The ship's crew comments were included, according to submittal letter which we received from Portsmouth when they submitted this book for our approval. I believe that was one of the reasons it took so long. However, as I said, the ship is supposed to have the same books that I have in front of me, but not with our comments.

RADM Daspit: Let us see the book.

PRESIDENT: Is this a preliminary book?

WITNESS: Yes, it is still preliminary.

RADM Daspit: But is this as was approved by you on 15 March 1963?

WITNESS: No, sir. I have the letter here. Our letter was written in March, 1963. This was what I was told by the Portsmouth people. I didn't have time to compare our comments with this book, but I was told that this wasn't done because they had to change the plates and everything else. However, I could verify that again by contacting the right people here in Portsmouth, because this is a Portsmouth copy.

Q. I note that the comments of the Chief of the Bureau of Ships made on 15 March 1963 were addressed to Commander, Portsmouth Naval Shipyard, with no indication of a copy to the Commanding Officer of THRESHER; do you know whether a copy was provided for THRESHER?

A. No, sir, we normally don't do that, because, the reason for that, if I may answer that question, is that Portsmouth might object to certain comments for reasons of their own. Then we would have to go back, and we would have to go back to the THRESHER and tell them that we are wrong or that this has to be changed, so that is one of the reasons.

Q. Why were specific operating instructions not included in THRESHER's Ship Information Book?

A. Well, as I said before, the book, the Bible, more or less, that we go by, is the first book on the 585, being the first ship of the S5W class, and that book was under the cognizance of the Naval Reactor Branch. I remember vaguely that one of the reasons was that the crews we have on these nuclear ships are much more properly indoctrinated than a crew on a surface ship. They have a certain background; they go through various courses, and they know a lot more than a crew on a surface ship. Now this is what I remember; that this follows the 585 concept, and all the way through, 588,598 and all these ships follow the same concept.

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Q. Mr. Guther, I note that in your work in the Bureau of Ships, in checking the contract guidance plans through working diagrams, that you consider the damage control features of the systems on which you were working; was that especially true in your work on THRESHER, or is that the normal approach of the persons in your code, to their work?

A. It's the normal approach. Contract guidance plans, as I said, are just for guidance only. You cannot show all the features in it, so what we are trying to do is to simulate some casualties and see what we could do to prevent that, by just adding a check feature in one case, and an additional cut-out valve in another case. However, there are limitations. If the basic design is a single line we have to consider that from that angle, as something you can't do, but not too much. Where you have the possibility, as in this case here, to isolate b(3) 10 U and still have power --

Q. In the normal performance of this duty, is it necessary for you to deal from time to time, with the people who draw the contract guidance plans?

A. Yes. If there's any necessity to contact any other code in the Bureau we must do it and we always do it. We don't cut out anyone, because it is their responsibility, the criteria of the ship itself, the hull, we go to the right people in the Bureau before we even write a letter.

Q. What has been your experience in dealing with those who draw the contract guidance plans in this area of our questioning now, as to the amount of attention which they devote to this area of damage control features?

A. Well, as I said before, the contract guidance plan is for guidance only. The contract guidance plans shows not even all the valves. It doesn't show any pipe sizes, no velocities or any of that sort of thing, which will of course, be shown on the working diagram, which we check to the greatest possible extent as to velocities, capacities, etc., but all this information is not on the guidance plan, nor, as I mentioned, is instrumentation: there is very little instrumentation on it.

Q. The working diagram is actually the one that you have to go over?

A. We could, perhaps, when we reviewed the contract plans -- we do that too, by the way -- we can suggest certain things, but that certainly doesn't mean that it is followed. It has happened for many reasons; we propose changes to the specification, which never got into the specification.

Q. You do review the contract guidance plans; is that correct?

A. Yes. That is before they go out and before they are signed by the Chief of the Bureau. We also review the specifications; we comment on that, so if it is accepted or not, that is a matter for higher level.

EXAMINATION BY THE COURT

Questions by a member, CAPT Nash:

Q. Mr. Guther, do you know what action was taken in connection with the contractor as a result of his apparently improper execution of the Ship's Information Book contract?

A. All I know is that they farmed it out to a Boston firm; we told them they could use, -- I don't even know the name of the firm, they could use the 588 as a guide, but the 588 is an entirely different ship. The test depth is different.

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b(1) There are many changes in the 593 that the 588 did not have. There are some other systems, yes, I'll admit that, that are almost exactly alike. What additional information this particular company received from Portsmouth I would not be able to answer that question.

Q. Would you please tell us what you mean by the "588"?
A. That is SS(N)588 class of ships.

Q. Do I understand correctly that this was a shipyard responsibility?
A. The preparation of the Information Book, yes, sir. Every shipyard is supposed to do that, and there's something in the specification to that effect. Normally the Information Books are large in volume and the time available is normally thirty days, and it's impossible, with the work that we have, to get rid of it in that time and it's just not us alone; there are other codes involved too, the electrical code, they get some of the books like this, so the time element is thirty days and if they cannot get it out in thirty days it is a must that the ship be provided with -- I don't know how many copies -- of what they call the preliminary information books which have not been approved by the Bureau of Ships.

Questions by a member, CAPT Hushing:

Q. Mr. Guther, have you analyzed the THRESHER's ASW system and compared it with the ASW system in say the 588?
A. No.

Q. Do you have a feel for which is better from a damage control standpoint?
A. I don't exactly know what the 588 has, the 588 class. I have an opinion of what I think would be the best thing. We are trying to work out what we call an automatic rupture sensing system, which is being tested, by the way, in California, on next Monday on the prototype, simulating the main sea system on the 593, and using this system, and assuming that it is operable, in my opinion, I would say a loop system is the best type of system we could use in conjunction with this automatic rupture sensing system, because you could b(3) 10 USC 130 if you had a leak, b(3) 10 USC and still have power b(3) 10 USC 130

Q. Well, what I was trying to get at, is the loop system better for damage control than the single header system?
A. In my opinion, I would say yes, because if you use the rupture system I would say it might be very complicated with a single line; we don't know too much about it yet. The rupture system is supposed to be based on a thousand gallons per minute rupture, or it could be less, but this was the first start. We didn't have anything to go by. This is the first prototype.

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(b) (6) relieved (b) (6) at this point as reporter.

Questions by a court member, CAPT Osborn:

Q. Mr. Guther, we have heard considerable testimony with respect to what is, what would like to be, a lot of specifics and non-specifics with respect to what actually existed in the THRESHER. I want to devote my questions only to the THRESHER. Was there an ASW cross-connection between the main "circ" system and the ASW system in THRESHER?
A. Yes, sir.

Q. There was?
A. Yes, sir.

Q. What was the normal line-up of that particular valve?
A. It was supposed to be used at very slow operation in cool water.

Q. This is from the detail valve print, which indicates that this valve was to be closed?
A. I don't believe-- Well, under normal operation, you wouldn't do it. I would agree it should be normally closed. I believe this is correct.

Q. I don't want any thinking about this; let me have what the print actually says.
A. Let me check on that. (The witness examined a blueprint in his possession.) Normally closed.

Q. Now, take a look at the cross-connections b(3) 10 USC 130 and see what the normal valve line-up says on that particular system.
A. Normally open.

Q. So then the normal concept, from a standpoint of valve line-up, is not to operate the system in a loop system, is that right?
A. Correct. Now, let me see the forward one. (The witness again examined the blueprint.) Yes, the same thing. Normally open.

Q. So the normal valve line-up on the detail specifications print was for cross-connection b(3) 10 USC 130 normally open?
A. That's correct, sir. That is based on a b(1) for full power.

Q. I am perfectly familiar with why it was done, Mr. Guther. I am also interested in the constant vent for the main condenser with respect to its size and what system it hooks into?
A. Size three-quarters. We had one fore and aft, and this is the vent system plan we never got, but I can show you where it hooks into. It hooks into right here (indicating on Exhibit 165). The main condenser is three-quarters, and it ties into a one and a half inch line. These are all constant vent lines.

Q. It hooks into the common vent?
A. The common line overboard has a 2-inch line.

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Q. It is possible, then, for the constant vent line on the main condenser and the main circulating water system to be cross-connected to the auxiliary "circ" water system only through a check valve failure?

A. Correct. You know there's a check valve installed there.

Q. Now, when the original THRESHER system was built, the check valves in the constant vent system did not exist and were put into operation during this post shakedown availability?

A. I assume you are correct. I do not know when it was put in. It was put in on a trial basis. That was a special check valve with a spring in it.

Q. Now, on the basis of your analysis at the Bureau of Ships, were you primarily concerned with flexibility involved or rapid isolation?

A. Flexibility in connection with what?

Q. Flexibility with respect to installation of valves with respect to maintaining cooling water over a long period of time.

A. I think, in a sense, they both should go together. We want flexibility, and we also would like to have reliability. In other words, you still have a capability of having some power available in case of a casualty.

Q. Are maximum flexibility and maximum rapidity of isolation mutually consistent?

A. Rapid isolation? I would say, without these additions, you will not have - you definitely will not have rapid isolation. You would not have it, because the valves don't have operators in the upper level which we will get at, and it takes much longer to close a valve by hand than hydraulically.

Q. Have you ever considered in your studies shutting all the salt water down on the ASW system and investigated the consequences?

A. Not in our studies, sir, no, because that would go into Design more or less.

Q. That would go into Design? What is your primary job in this particular system?

A. Well, Design usually investigates these phases of the work, or similar ones. We do not do this particular design work. This is not our responsibility. If you do anything like making calculations on this and looking it over from a point of view of a simulated casualty, we could improve on this, considering the instances we had on the Polaris Patrol Report and try to improve on it. We would try to simulate casualties, but you would not simulate all of them, but you can think of the worst one.

Q. I am very familiar with the Polaris Patrol Report, and to a great extent most of them are convenience items.

A. I agree.

Q. And they don't have a very real appreciation of a real bad casualty or a real catastrophic casualty, because, obviously, the fellow who wrote the report was still around. What I am really interested in is this: You, as a designer of an ASW system operating on a new type ship, what your real philosophy was with respect to, say, a fairly large leak, perhaps a b(1) hole: what would you do under those conditions?

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A. Well, first of all, we would provide them with hydraulic operators. Assuming that you have a rupture in the line of b(1) or b(1) hole, there would be approximately b(1) gallons a minute going into the ship, and our trim and drain pumps would not be able to take care of that; so the only other way out would be material-wise, and we would look over the system from a standpoint from what could be done assuming you had a casualty, and what would happen to the rest of the system. Number 1: isolate the source, and if necessary provide instrumentation, or things like that, or additional valves, if it is possible. You cannot do it in a suction line. A check valve, for instance, wouldn't help you. You might put another valve in there to operate from the upper level. For instance, all our drain system valves are down in the bilge. It has a galvanized pipe with a bell mouth and strainer. If you have a lot of water in there, you wouldn't be able to get down there; so we came out with a letter making it a requirement, and all the new ships are going to get it, to have, at least where the largest bilge pocket is in the 4-inch drain line, one valve operated from the upper level.

Q. Don't get me wrong on this, Mr. Guther, I think you are one of the few people that have even thought anything about damage control. The only point I am concerned about is the most basic interval there is in the world, that interval with respect to time and the rate of getting into trouble. Did you ever take a look at the rate of trouble and what you would do?

A. The only thing we did was try to get rapid operating valves, sea and back-up valves, and the best we could do right now is three to five seconds. But I am talking strictly now about auxiliary and main sea water system. Trim and drain system is a little different.

Q. I don't want to talk about anything but auxiliary sea water systems.

A. Yes. I have no cognizance of the valves. I am interested in whether or not the valve operates fast. We will give the dope to a particular branch in our Code, and they are the experts on the valve design and the details of the valves. I know these valves operate between three and five seconds, open or closed.

Q. The THRESHER probably had the most advanced ASW system installed on any of our ships. I think this, and most people think this way. We had hydraulic actuators, both sea and back-up, on THRESHER on the auxiliary sea water system--

A. I beg your pardon. Only in the auxiliary machinery room, and a small system forward, but not on the auxiliary sea water system on the THRESHER, not on the back-up valves.

Q. We did have some back-up valves in the system; not complete, but part of them.

A. You are correct.

Q. Now, there is one other design feature that I want to discuss, and that is, the reason why it is possible to envision two control stations, one in the maneuvering room for the maneuvering room suction and discharge, or the engine room suction and discharge, and one in the AMS, which is for the AMS suction and discharge, both of which had to be isolated in case of a casualty.

A. There is another letter out, or a memorandum, to have a switch in the maneuvering area to control the station in the auxiliary machinery space, adjacent or just forward of the engine room. Does that answer your question? As I told

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you before, it is still stationed on the upper level on the starboard side of the engine room, which covers a few, perhaps five or six auxiliary sea water valves, and that is supposed to be located adjacent to the present valve operating station on Frame 78 to the starboard side close to the maneuvering area. So you have the means. This did not go in the THRESHER. We did have a complete control station in a sense. By "complete" I mean at least in regard to the engine room and the machinery space. You could close these valves from one spot.

Q. Do you think it is a good idea to incorporate an electro-hydraulic system with respect to control of a flooding casualty?

A. Yes, definitely. I think we have to think about it and pretty fast. We have two means of operation.

Q. If you had your choice, would you prefer a complete hydraulic system?

A. Well, actually, we have a back-up right now with a hand pump.

Q. This would involve pumping the valve shut in terms of a rapid response system. But if you had the choice, would you use an electric button solenoid control rather than a complete hydraulic system?

A. I would rather see the valves operated from two different sources independently. If you lose electric power, you are in the same fix as you would on losing your hydraulic oil, or perhaps a self-contained air tank.

Q. I hate to belabor this point completely, Mr. Guther, but if you lose main hydraulic plant power, you have a hope of shutting the valves and you can only shut them manually, but if you incorporate a solenoid, that could fail and you would have no control; so I think you would be far better off to have a complete hydraulic actuator.

A. We have done that already with one of the Newport News boats. We have done that. Somehow I would like to have a button there which would deliver.

Questions by a court member, RADM Daspit:

Q. Mr. Guther, in regard to the simplification of the constant vent system, did I understand you to say that the pump maneuver requires a constant vent system for the auxiliary sea water pumps?

A. Let me phrase it this way: The pumps are not our cognizance; they are under the cognizance of Code 649. We requested information from Code 649 in regards to the elimination of as many constant vent lines as possible, and the air pump is one of them. If we could eliminate them and cut down the number of sea water piping and vents, it would be better. I imagine they must have contacted the manufacturers, but I am unable to comment on that. Nevertheless, they came back definitely no, they want constant vents.

Q. Regardless of whether everybody else was willing to eliminate the constant vents, unless Code 649 changed their minds, you had to have a constant vent system?

A. I am afraid we would have to follow their advice. They are the experts.

Q. To go back to the contract guidance plans, as I understand, they are prepared and reviewed by you before they leave the Bureau?

A. Yes, sir.

Unclassified

Q. How much of a review on damage control features did you conduct at this stage; do you conduct a more complete review later when you get the piping plans back, or do you do a thorough review on the contract guidance plans?
A. We do more on the working diagrams, since the guidance plan is for guidance only.

Q. Then don't you sometimes find yourself limited by a guidance plan that you have already approved?
A. No, sir, because the guidance plan is for guidance only. We can add or eliminate. The guidance plan is not supposed to be changed.

Q. Well, let's shift to the same line of questioning with regard to the specifications.
A. The specifications over-ride the guidance plan.

Q. But do you sometimes find, when you get the detail plans back from the Shipyard that the specifications had limited you on damage control features that you would prefer to have installed?
A. We did change the specifications.

Q. You do change them without too much trouble?
A. Yes, sir.

Q. What is your GS rating, Mr. Guther?
A. 14.

Questions by a court member, CAPT Osborn:

Q. The S5W reactor plant manual that you referred to only had to do with the reactor plant itself and associated machinery, is that correct?
A. I don't believe I mentioned the reactor plant manual.

Q. I thought you mentioned the S5W plant manual.
A. That was in connection with the information book, but there is a reactor plant manual which is entirely different from that. We also take a look at that one, but, as you know, this is strictly under the cognizance of N. R. B.

Questions by the president, VADM Austin:

Q. Mr. Guther. I believe you said that the Ship's Information Book for the 588 was a responsibility mainly of the Nuclear Reactor Division, Code 1500, is that right?
A. Not the 588. The 585 was the first.

Q. The 585?
A. This was the first ship which used the S5W reactor, but the 588 was used as a guide for the development of the 593, because that was actually later than the 585, and certain changes have been made.

Q. Now, the Ship's Information Book for the 585 did include the normal information that such a book should contain, did it not?
A. Information in what respect?

Unclassified

Q. Well, a normal Ship's Information Book would address itself to the safe operation of the plant, to the proper line-up of the various systems, for various conditions of operation of the ship, including, of course, instructions regarding damage control under various circumstances, is that correct?
A. Yes, but it was not done in these later boats.

Q. Was it done in the 585?
A. I don't believe so. The 588 followed the 585.

Q. And the information in the 588 book was given to the contractor to whom the Portsmouth Naval Shipyard let out the job to prepare the instruction book for the THRESHER, using the 588 book as a guide, the instruction book for the THRESHER as submitted by this outside contractor did not contain instructions on damage control?
A. No, sir.

Q. But limited itself mainly to the safe operation of the plant?
A. That is correct - just in general terms. There were just a few things. The funny thing is that they tell you how to blow a sea chest system, which is among the simplest of things, but on the more complicated things, it just isn't in there. There is a new format out in connection with the inclusion of all this information, including all the electrical stuff, and so forth, and it is even shorter than that, and still we are going to have about sixteen volumes.

Q. Mr. Guther, the preliminary Ship's Information Book which THRESHER did get, in view of the unsatisfactory condition of the contractor's submitted booklet, also limits itself to a description of the various systems and their operation for safe operation of the plant, rather than dealing with damage control, does it not?
A. That is correct, except that the safe operation for plant is too general.

Q. It is too general?
A. Yes, sir. I mean, referring to all the instruction books in the past, they went into much more detail than we do now, and we will in the future. There is even less in there.

Q. This automatic rupture sensing system that is to be tested on the west coast next week, where is that test to be conducted?
A. At Bendix in North Hollywood, California. We invited Newport News and E.B. to send somebody out to witness the test since we are seriously considering it even maybe for back-fitting, especially for the newer boats. We do not have a loop, however. We just have a single line.

Questions by a court member, CAPT Hushing:

Q. Mr. Guther, are you intimately knowledgeable of the specifications regarding the ship's instruction book?
A. Just in general terms.

Q. Do the specifications require that the instruction book contain a description of the system?
A. Yes, they do have a general description.

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Q. Do they require certain kinds of plans and diagrams?
A. Correct.

Q. Do they require the normal modes of operation of the system?
A. That is correct, because any diagram, they are supposed to include the normal mode of operation. That is why we mentioned before that these valves were normally open.

Q. Do the specifications require that the ship's instruction book contain all the combinations of operating procedures and sequences?
A. No. It is very general.

Q. Were the instruction books for the 585 approved by the Bureau of Ships?
A. Yes.

Q. Were the instruction books for the 589 approved by the Bureau of Ships?
A. Correct.

Q. Do I understand then that the situation which you have described relative to the instruction books not containing specific information is only your personal opinion rather than the official position of the Bureau of Ships?
A. Would you mind rephrasing your question?

Q. Do I understand, then, that your testimony relative to the Ship's Information Books' not containing sufficient detailed information as to the many modes of operation of the ship's systems is your personal opinion rather than the official position of the Bureau of Ships?
A. Yes. I prefer to see a little more on the operation.

Q. You prefer; but you have not been able to have that view prevail?
A. That's right.

PRESIDENT: Mr. Guther, the court notes with pleasure that you have addressed yourself and have informed yourself to a degree which is reassuring to the court of the matters on which you advise and work.

Neither counsel for the court, the court, nor counsel for RADM Palmer, a party, desired further to examine this witness.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement:

THE WITNESS: Of course, we only covered the main and "circ" system. I understood this was the only thing which the court wanted me to discuss. We do have some other auxiliary sea systems forward, which are of a minor nature. We also have a diesel forward. I don't know whether you want me to talk about those.

PRESIDENT: Well, the court would ask questions, Mr. Guther, if they wanted a detailed description of any other systems from you, because we do have different witnesses for different things, but you are free to tell the court in your own words, whether you have been asked questions in that area or not, anything that you think may have been associated with the events that caused the loss of the THRESHER.

The witness stated that he had nothing further to say.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

The court recessed at 1120, 8 May 1963.

The court opened at 1135, 8 May 1963, behind closed doors.

All persons connected with the inquiry who were present when the court recessed were again present in court.

No witnesses not otherwise connected with the inquiry were present.

(b) (6) , Commander, U. S. Navy, was called as a witness for the court, was informed of the subject matter of the inquiry, was warned of his rights under Article 31, Uniform Code of Military Justice, was duly sworn, and examined as follows:

COUNSEL FOR THE COURT: Commander (b) (6), this is a closed session of the court, and for that reason classified information can be given here.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, grade, organization, and present duty station.
A. Commander (b) (6) , USN, Bureau of Ships, Branch Head, Code 648, Piping, Valves, and Machinery Arrangements.

Q. Describe briefly the nature of your official duties.
A. Code 648 has technical responsibility for piping systems and the majority of the components that go into them, such as valves, filters, fittings. In addition, we have responsibility in the area of machinery arrangements, primarily the putting together of the systems. We accept these responsibilities after the contract plans have been signed and let and the type desk has taken cognizance of them.

Q. Briefly outline your naval and professional background and experience.
A. I graduated as an electrical engineer from the University of California; was educated with a Master's Degree in mechanical engineering at the post graduate school in Monterey. I have served overseas in repair bases. I have been assigned to two shipyards, working primarily with surface ships, in the capacities of Planning Officer and Ship Superintendent. I have served two tours in the Bureau of Ships, one in the area of mine sweeping equipment, and in my current tour. I have had one tour in the Engineering Experimental Station in the areas of research development and management, and in the area of metallurgy.

Q. When did you report to your present duty station?
A. I reported to my present duty station about 1 August 1961.

Q. Have you done extensive traveling in connection with your present duties as you have described them?

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A. Yes, sir. One of the functions for which I was responsible upon relieving was the area of sil-brazing of piping on ships. In order to familiarize myself with this problem, which at that time was just beginning to emerge as a full-blown crisis in the Bureau of Ships based on the BARBEL incident, I traveled for one year approximately 50 to 60,000 miles, primarily to shipyards involved: Mare Island, Pearl Harbor, and up and down the coast here with Supervisors, and at Portsmouth Naval Shipyard.

Q. How many miles in all would you say you traveled since you reported to your duty station in August of 1961?

A. I would say approximately 70--better than 50 to 60,000 miles.

Q. Will you discuss the Bureau of Ship's design philosophy as embodied in THRESHER's piping systems with respect to the welding and silver brazing of joints? First, would you take up the sea water systems?

A. Yes, sir. The contract plans and detail specifications for THRESHER were completed prior to my arriving in the Bureau. The ship was virtually completed before I took over my present job. However, we recognized very quickly that in this silver braze crisis there was a tremendous element of risk because of the depth involved. We were taking into the ship water at approximately b(1) PSI. The silver braze crisis, or problem, as it was presented to me, was based on a series of incidents, the most well known of which is the BARBEL. We immediately took to analyzing what caused the sil-braze problem. Was it a good method of joining pipe? Was it a good method of joining pipe for these depths? The history of silver braze is that it has been used for a long time. It was used on the 700-foot boats. It was used, of course, extensively throughout the earlier boats. In about November of 1961, for other reasons, Mare Island Shipyard looked at SCULPIN. At that time there was a great deal of concern generated by what we saw on SCULPIN. I think it is important to talk a little bit here about what a sil-braze joint is. I know you have seen the joint. I know you are familiar with its construction, but in going back and analyzing the failures that had taken place, we were able to come up with a reasonable pattern for it because of failures. For instance, in the case with the BARBEL the failure was because of a piece of wrong material. You go on to the SKATE, where we had some figures on shock test, and you find out the failure was due to some poorly designed bosses where it was possible for the sil-brazer to loosen up some of his own work in the process. So we had to attack the problem based on experiences that we had. We had at this time no destructive test. We had no means of determining the percent of bond that existed in the joint, so that we started examining this phase. We started immediately to investigate non-destructive tests. We set up a program to work in everything we could think of: electro-magnetic tests, pulser hammer tests, ultrasonics. When we were faced with SCULPIN, we were faced with the realization that, although we had not had a great many failures attributed to sil-braze as against improper material, we had to face up to the fact that there was incipient in the fleet a crisis, so that at this point we sat down at Mare Island with the best talent that we could get ahold of: Admiral Moore, from the Bureau of Ships; myself; and Commander Keays from the Bureau of Ships; Captain Harry Jackson, then from Portsmouth; and the entire group at Mare Island, plus the ships available at Mare Island; and we tried to establish, on the basis of technical knowledge then available, what could we do to assure ourselves that we were not hazarding the ships. We came out of that with two things: a feeling that more had to be done, but that something had to be got out to the fleet almost immediately based on the experience we were able to gain from this examination.

In discussing this earlier, it was pointed out that it might be of interest to see how the SCULPIN was presented to us and what we had to go on as a result of these investigations. (The witness then produced three photographs of silver brazed joints taken from the U.S.S. SCULPIN at the Mare Island Naval Shipyard in November of 1961.) May I talk to these just a bit?

Q. Are these photographs of what was found in SCULPIN when you were at Mare Island in November of 1961?
A. That's right, and they are so identified.

Q. Are these of three different joints?
A. Yes, illustrating three different things.

The said photographs were submitted to the court and to counsel for RADM Palmer, a party, and offered in evidence by counsel for the court.

There being no objection, they were so received and marked "Exhibit 168," "169" and "Exhibit 170."

Unclassified

(b) (6) relieved (b) (6) as reporter at this point.

Q. The exhibits have been numbered Exhibits 168, 169 and 170. Would you care to put them up here?

(Exhibits 168 and 169 were posted on a bulletin board for demonstration purposes.)

A. I picked out these particularly because they bear on some of the things which happened before and subsequent. In about March of '61, when we had the full realization of the BARBEL incident, we were almost tool-less as to how to hit this thing. When we got to this it appeared that certain direction was necessary, and I'll talk about this just a little bit when I get to the introduction of what we did step by step. But when we got to this, this confirmed many of the things that we had done to date. We had first gone after workmanship. Why? (Pointing to Exhibt 168.) Here is a man who didn't have a pre-insert ring. He tried to invent one. As best we can determine, this was a piece of face fed silver solder material he had in his pocket. Another thing which concerned us at this time, not having a way of measuring bond, was some way of insuring that we had bonding. This tool has been with us for years and years and years. There are Master Pipefitters who were brought up on it and will swear by it. So we dug out this type of thing to show that even had this guy done a good job here or here (pointing to Exhibit 168), he still would have less than fifty percent of the bond. It was physically impossible to do anything different. The other thing I point out here and here.

Q. Would you refer to that as Exhibit 169, sir?

A. I'm sorry, Exhibit 169 -- is that it is possible to make a good joint because this joint here is perfect. At this point then I felt myself that I had a grasp now of what the problem was. We went back and examined everything that had been done from BARBEL forward to see whether it made sense, had we done everything we could, because the failures primarily were lack of bond or this type of thing where we do not have bottoming, or to poor material. In existence at this time were instructions in the form of NAVSHIPS 637-2, which was written and published in about July of '61, which set up criteria, eliminated the use of the face fed fitting; we required it-up; we required identification of the joints to the brazer. Everything we saw in SCULPIN would have been eliminated had these things beeninvoked at the time SCULPIN was built -- not only invoked, but enforced. So that our position at this time was this. We had eliminated a face fed fitting. Now what did this do? In a joint which is properly made, using the pre-insert, if you see this fillet up here you have good reason to believe that this joint is satisfactory. If, at the same time, you have assured yourself that it is bottomed, everything that we have seen, everything that history tells us in going back into this thing, is that we have a bond across this. Now I'm not talking to how good a bond. I'm not saying that this would automatically give you a sixty percent bond, an eighty percent bond -- it would give you a joint.

Now at the time of SCULPIN we had just begun our ultrasonicwork. It was in its early experimental stages. There was lots to be worked out. But we did start to use it in checking out some of the SCULPIN joints in addition to the other things, routine inspection of joints for misalignment and other things like this, which were the best things we could give at the time. Another thing that had been done up to this time was the realization that we had to certify the material. So with this background we pushed as hard as we could on ultrasonics. I will now lead into THRESHER -- this was what the question was.

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The THRESHER had completed a considerable amount of operation and, with the exception of some joints on the trials, we had had no report that she had any silver braze problems. She went through a pre-shock hardening period where the Bureau of Ships issued a letter which contains the statement that: "Correction of deficiencies in sil-brazed joints in piping systems. Sea water systems in THRESHER have welded joints from hull flange of hull valves through the inboard flange of back-up valves. There are no known deficiencies to sil-brazed joints."

Q. Will you identify that letter for us, please?
A. Serial 525-076 of 9 March 1962.

Q. From the Chief, Bureau of Ships, to the Deputy Commander Sub Force Atlantic Fleet; Assistant Industrial Manager, Groton; Commander, Portsmouth Naval Shipyard. Subject: USS THRESHER shock tests, recommendations for pre-test shock hardening?
A. And what I read from was Enclosure (1).

The above cited document was submitted to the party and to the court, and was offered in evidence by counsel for the court. There being no objection, it was received in evidence as Exhibit 171.

Counsel for RADM Palmer waived reading the Exhibit.

Q. Proceed with your testimony on this point, Commander (b) (6) ?
A. Despite this, prior to the shock trials we did request the Electric Boat Company to do ultrasonic inspections on the external hydraulics system of the THRESHER. This was done and the report showed that a high percentage of the joints that they inspected were satisfactory. The complete report is at Portsmouth and, I believe, will be submitted in evidence by the Yard.

Q. That was on the external hydraulics system?
A. External hydraulics system. In May of '62 the Bureau received a letter from Portsmouth which stated, in effect, that the Shipyard considered that no additional pipe joint inspection was required on THRESHER during PSA other than that which resulted from damage incurred during shock testing.

Q. Would you look at Exhibit 156 and state whether that is the letter from the Shipyard to which you referred?
A. Yes, that's the letter. At this time, upon receipt of the report from the Bureau Coordinator for the Shock Trials on a number of small sil-brazed failures on the THRESHER, I came up to Portsmouth and examined these failures myself.

Q. Was that a written report of failures?
A. I'm sure it is written; I do not have it.

Q. What time would that have been, please; what date, roughly?
A. Prior to 28 August; it would be in that vicinity. The majority of the failures that occurred during shock trials in sil-braze were in small lines. We had no failures in any of the larger lines on the ship. These were, for the most part, traceable to bad design practice -- such things as hanging a fairly heavy valve on a small line with a sil-brazed joint; the poor support of some of the gauge boards which were tied into the lines which were silver-brazed. And the type of failure which occurred would have occurred under shock in your quick displacement of the shell. We then went back -- or I went back to the Bureau and consulted with the Type Desk and we wrote a letter on the 28th of August which outlines what we felt as a minimum must be done on THRESHER.

Unclassified

Q. Would you look at Exhibit 115 and state whether that is the letter to which you refer?

A. It is. Behind this letter were two things. The first was a recognition that we did, in fact, want more inspection on the THRESHER, recognizing, however, that the ship had been operational, had gone through shock tests without any failures, we still felt that we should do more. Secondly, involved in this is the philosophy of the deep diving ship. What can we do? What can we recommend to the Fleet for examinations to these ships? So it is in this context that this letter is written. It asks that the Yard continue testing ultrasonically the THRESHER systems, that they report to the Bureau upon completion what they had found. They were given a request to put a team on there and keep them on continuously so that we could get the maximum amount of test coverage. Our logical sequence of thinking here was that we had to come up with what we could do with other ships that were out which were totally sil-brazed. Our worry at this time was the 598 Class because we were talking, or beginning to talk about not bringing the ships in for overhaul. Our worry was the subsequent deep divers, some of which were also going to fall into this category.

Q. You were referring to the underlying reasons behind the writing of Exhibit 115?

A. Yes, sir.

Q. Exhibit 115 explains itself. In paragraph 6 it says: "The significance of gross failures of sil-braze joints in the vital submarine system is such that the Bureau considers it a matter of urgency, that an inspection program be developed for these systems that will ultimately permit the certification of all piping joints in submarines as meeting minimum Bureau acceptance standards." Do you find anything in Exhibit 115 which would exemplify the underlying reasons which you say prompted its composition?

A. I'm not sure I understand what your question is.

Q. Exhibit 115 states that there is a matter of urgency in conducting an inspection program. I find nothing in Exhibit 115 to indicate the reasons which you say were the reasons for its issuance. Can you --

A. Oh, I see.

Q. Nothing to inform the Portsmouth Naval Shipyard of the reasons which you now assign for sending the letter.

A. We had, as a result of the SCULPIN conference, come up with suggestions to the Fleet as to what we felt they should do to these ships based on the technology that was available at that time. I, and we, were never happy that this was the ultimate answer to this. This was the best that we had available to us then. We had and have now developed an ultrasonic tool to where we were ready to broaden the use of this tool. The results from THRESHER, from other ships that we were checking, would have been put back into a revision of this letter that I'm talking about to give the added guidance to the fleet, or assurance to the fleet. Prior to THRESHER, we had set up at Mare Island for this month a meeting with Force Commanders and the Shipyard, at which we were going to thrash out completely all of the instructions which are now out. We had prepared test blocks and other equipment to give to the fleet so that they could start and get their tenders and their advance bases ready to undertake this type of an examination of the sil-braze systems. At this meeting everything that we had was to be thoroughly gone over with the Fleet there so we could tie right back in with them the latest knowledge that we had on the sil-braze problem as it affected their ships. This was one of the underlying reasons behind this (Exhibit 115), so that we could have some information we could tell them.

Unclassified

Q. You have explained the reason for desiring to institute a program of silver-brazed joints surveillance. Will you now explain how and when, if at all, you conveyed to the Portsmouth Naval Shipyard management your concern for the safety of silver-brazed joints in THRESHER's vital systems, and your desire that they be surveyed to the maximum extent possible within the framework of the inspections which you requested?

A. Well, paragraph 6 of this letter (Exhibit 115) with the priority list assigned thereto, and a request that this be done, and a statement that we wanted the maximum number examined, is the only physical evidence that I've got of this.

Q. Do you have any other evidence besides physical evidence?

A. Directly connected with the THRESHER, no, sir.

Q. Proceed.

A. In working in the context that we were now working in, we started to do many things to alleviate the problem in the piping systems. I think it's important to recognize that so long as you have the b(1) pound water in the ship, I don't care what kind of a joint, or if we give you solid tubing, we have a problem. We have ground back into new construction everything that we could find out on silver brazing to give us adequate sil-brazed joints. We had started to cut back on the amount of silver brazing that we allowed. We allowed in the 598 Class, for instance, up to twelve inch. We started to cut back just as soon as we could. There was one class of submarines, the Fiscal Year '62 buy of 593's, that went out originally as all welded. But we began to recognize at this point that the problem wasn't just silver brazing. It was the piping system. We had two occasions, the SARGO and SWORDFISH, where we completely re-did the ASW system. During this evolution, at both Mare Island and Pearl Harbor Naval Shipyards, we immediately began to cut back on the number of joints that we made. We developed procedures, began developing procedures to do our, for instance, our reducing in pipes, by using mandrels. We began to look at planned piping systems. Historically the pipefitter has gone aboard ship and he's been king. He runs his stuff to suit; in fact, he's given these kind of instructions. Very quickly in the silver braze thing -- and not only silver braze, but this applies as to welding or any other kind of joint -- we recognized that no longer could we do this. We had to get control of this guy. We had to somehow or other give him guidance that the reason he was making bad joints was because he was making them up in the corner, down in the bilges. So we started a very extensive program. At this time we held two meetings with the Pipemasters, one on the West Coast and one on the East Coast, at which we went into this.

Q. What time was that to which you refer?

A. This was in the period about March of '62 -- subject to correction. So this program is part of an integrated program. Now this program is designed to insure that on ships currently building that we can get our hands on that we eliminate the possibility of failure in the piping system for any cause. It is designed to give us a capacity for going back into the ships as the need arises and doing the job there that has to be done in joint elimination and in making it easier for these people to make the joints. An extension of this was -- what do you do if you go all welded; is all welding the answer. And this was studied extensively. It can be done. And in order to do it, and to weld in the small sizes, we needed more technical knowledge. Coincidentally with this, at about the same time frame, we began to have some difficulties with our welding procedures, steam and copper nickel. These problems were primarily those of welding to meet standards at a rate which would allow us to deliver ships to the

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fleet. We set up at this time, under the general guidance of Portsmouth, what we called the Portsmouth Welding Project, to look into all facets of shipboard welding. We looked at it from the material, the fabrication procedure, inspection procedure, quality control procedures, through all of the installation procedures, right through the whole gamut. The output of this project will give us a capability of welding -- well, data, with a commensurate saving in both time and money. Now I think it's important to recognize that in going to all welding we do one other thing. We impose a burden on the Yard which is considerable. I believe it's a true statement that the current requirements are pushing to a limit the welders and radiographic facilities available to do the job.

Q. Are you referring to the requirements for those sections of submarine piping which do not include the reactor compartment?
A. Yes.

Q. Is it true that there is a higher standard imposed for welding within the reactor compartment than in the rest of the ship?
A. Yes. I hesitate only because you used the word "higher." There is a different welding standard in the Reactor Department.

Q. Would you characterize that difference for us, please?
A. It is generally more stringent, yes.

Q. Then it is your testimony that even the ones not more stringent are pushing the capacity of the individual welder?
A. This is right. This has been the result of the intense study that we have given in this area, right.

Q. Have you been able to compile any statistics on the precentage of failures in welded joints as compared with comparable silver brazed joints?
A. No, sir. We have very good documentation on the silver brazed failures. We have nothing to indicate that we get a similar failure in our welded joints. But we have had cases where we have had serious erosion or corrosion problems resulting from restrictions in lines.

Q. In the case of welded joints?
A. In the case of welded joints. I don't know what people have told you before, but in some of the welded joints we use what we call a backing ring, which is a protrudance into the stream. We have had very few, in surface ship cases, where we have been able to trace failures in piping systems to some downstream corrosion. Very few. None that I know of in submarines. I think what you're asking here is -- is welded better than silver brazed; and I'll give the answer as best I know based on all of the study that I have done. A good silver brazed joint is adequate for the job and will do the same job that the welding does. A bad silver brazed joint, in the context that I'm talking about -- poor material, poor workmanship, will fail before a bad welded joint will fail.

Q. But you get a higher percentage of good welded joints under present procedures than you do of good silver brazed joints?
A. Yes.

Q. Can you compare the order of magnitude for us, to the best of your ability?
A. Well, let me take a crack at this one. In the past year and a half we have had no silver brazed failures, with one exception, and that was a failure traceable to a bad design out at Mare Island. This has been fully documented. During the same period of time, to my knowledge, we have had no failures in welding.

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I had run through for me for the board, or for my own knowledge, a patrol report of the 598 and 608 Class. This source of information is the best that we've got on active ships. The 598 through the 602, reporting from three to six patrols, have reported none. The 608 on their fifth patrol reported one. The 609 on her second patrol reported two. So these are the best statistics that I've got available to me.

Q. Your testimony relates to the present state of the art, does it?
A. You mean this last? These ships that I've reported on were basically completed before we started any of the silver braze updating procedures.

Q. Can you tell us the specific document which imposed the specifications for silver brazing when THRESHER was constructed, and what changes have been made in that document since her construction?
A. I must defer one part of the question. I do not know the answer to what was invoked in the original specifications for the THRESHER. There has been in existence since July of 1959 a document, No. 250-637-2 --

Q. That is preceded by the word "NAVSHIPS", is it not?
A. That is right. This gave the procedures for sil-brazing and there is an earlier edition of this which was included in the THRESHER specs. At the time, in approximately July '61, this document was revised for the first time to include all of the knowledge which had been made available to the Bureau at that time. The primary things that were required by this document were material identification, joints fit-up, and the use of the pre-insert fitting. During the period from July '61 to July of '62, this document was under continual review as we learned more and more about the fitting and about the ultrasonic tool. In July '62 this document was re-issued, including the new information that we had and the use of the ultrasonic device.

Q. Would you clarify for us what criteria applied during THRESHER's post shakedown availability as to mandatory ultrasonic testing of sil-brazed joints? I mean by that question to have you specify precisely what size joints have to be tested by ultrasonic methods.
A. I need one more clarification. You mean on THRESHER?

Q. On THRESHER.
A. The joints which were examined ultrasonically on THRESHER were to be examined to the bond criteria that the average bond would be forty percent with no less than twenty-five percent on either of the lands, the lands being the upper and lower lap.

Q. My question related to the size of joints -- minimum size which was required to be ultrasonically tested. Was it two inches and over, or over two inches?
A. 637-2, in existence at that time, required over two inches for joints fabricated in the field.

Q. "In the field," means on board ship?
A. On board ship.

Q. Over two inches?
A. Yes, sir.

Q. Does it make any requirement with respect to joints fabricated in the shop?
A. For ultrasonic testing?

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Q. Yes.
A. No, sir.

Q. Commander (b)(6), in describing the so-called silver braze problem to us, which existed and was learned of by you shortly after your assumption of your present duties in the Bureau of Ships, you referred to it variously in the following ways: "the silver-braze crisis," "the tremendous element of risk involved," "the great deal of concern generated by what we saw in SCULPIN." You said, with reference specifically to THRESHER that: "We felt that we should do more despite the fact that we recognized that she had been operational." Should we conclude from this that what you did that was "more" was to require, when she did go into her post shakedown availability, that as much of her silver brazed joints as could be surveyed on a "not to delay vessel" basis, should be surveyed by ultrasonic methods, so that you could get enough information to promulgate an instruction which would cover surveillance of other submarine systems?
A. Well this is a long question. In the period in which we did not know, or had not enough information to know what the condition of our ships were, we did all of the investigation that we could. All of the investigation that we did, all of the tests that were run, demonstrated that if this joint were made properly it was a good joint. At this point we took the series of steps that I have gone through.

Q. I want this to be with reference to what was done about THRESHER.
A. As I testified, in the context of the letters which we have put in front of you, the statement from Portsmouth, the unchallenged statement to the Bureau of Ships that the sil-brazing was all right, the results from the tests at Groton which showed that the silver brazing done on those systems at least was good; based on the fact that THRESHER was built in the shadow of BARBEL and we were assured that Portsmouth Shipyard had jacked itself up by its bootstraps that this was good work, we felt that this letter (Exhibit 115) represented a very strong statement on the part of the Bureau on our desire to have THRESHER checked.

Q. Commander (b)(6), did THRESHER put to sea at the conclusion of her post shakedown availability without your asking Portsmouth Naval Shipyard for a report of what they'd found with reference to silver brazed joints in THRESHER?
A. Yes, with the exception of the reports required by this letter (Exhibit 115).

Q. Did she put to sea before you received a report in response to your request?
A. Yes, sir.

Q. Did you initiate one before she put to sea after the original one?
A. Sir?

Q. Before she put to sea, but after your original directive that she be ultrasonically tested, did you initiate any other requests for reports?
A. No, sir.

Q. Would that evidence a lack of concern on your part for the quality of the silver brazing in her vital systems?
A. No, sir. I have never stopped being concerned about this for any ship. Your question is a tough one. In the context of all I said and the general feeling that this ship was well-built, that she as built better than ships which had operated many years without any problems, I say again that in that context of

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thinking, in the Bureau of Ships and in Portsmouth, that this letter was a serious request and that it evidences a serious concern on our part that it even exists.

Q. You are referring, are you not, to the letter which we have tagged Exhibit 115?
A. Yes, sir.

Q. Your serious concern, however, did not extend to demanding a report before she put to sea?
A. No, sir.

Q. You have stated that you relied in part on the fact that the deficiencies reflected in the BARBEL investigation were corrected in THRESHER; is that what you have told us?
A. Yes, sir.

Q. On what did you base that conclusion?
A. In the course of acquainting myself with the problem and the background which existed, I spent a lot of time in this Yard, in the shop with the Master, on board ships. I recognized at this point these people had the knowledge and were doing a good job of silver brazing in accordance with the instructions that existed. Considering that this was sometime after THRESHER but that everything that I could find out in talking to people indicated that this had occurred as a result of BARBEL, and seeing the evidence with my own eyes, I felt no reason to question the statements by the competent who built the ship that she was, in fact a major step above anything that went into BARBEL.

Q. At what percentage of completion of construction was in THRESHER at the time of the BARBEL incident?
A. This I'll have to defer. I don't know.

Q. If you didn't know that, how could you satisfy yourself that the work that went into her reflected the lessons learned by BARBEL?
A. Only by talking to the people involved, by reading everything I could get ahold of on BARBEL, which I did -- well, this is the normal way I think you'd assimilate that type of information.

Q. Will you briefly describe design criteria and reliability of flexible hoses used in vital systems of submarines?
A. Well here again, this is a broad question. The flexible hoses are used for two reasons: one, to take up shock excursion; and the other, b(1) The fleet boats, the 400 foot boats, have maximum size, four inches. The 700 foot ships have maximum size, two inches. You said discuss the history?

Q. No, No. The design criteria and the degree of reliability of the hoses is what I seek to establish.
A. These are designed to a pulse loading of better than two and a half times test depth. This is an impact type loading and the pure failure of these -- that is, the failure under pure hydrostatic pressure -- is better than b(1) psi. They are thoroughly tested, both the fitting and the hose and the specifications. We have never had any difficulty with the hose under test. We have had no bad runs. In the history, as I've been able to reconstruct it, of the flexible hoses, we've had no failure because of what you might call pull-out, which would indicate bad design.

(b) (6) relieved (b) (6) as reporter at this point.

Q. How sensitive are they to improper installation?

A. They are sensitive, very sensitive--I am sorry; they are sensitive to improper installation, but this is primarily in the larger sizes and this is a matter of alignment, plus insuring that in the handling of them, there is no cut on the inner hose fabric which protects the braid--which is the strength of the hose--from sea water. The problem in alignment is primarily one of not imposing a strain on these early--that is pre-set--before they start their vibration. And in our past investigations we have established these parameters and all the ships that are currently using the hose are built--the hose is installed--in accordance with our current directives, which are specific to alignment preparation for installation; we do not allow kinking of hoses, and that this is now all built into the ship.

Q. When such hoses were installed in THRESHER, to what sort of abuses could they have been subjected which would have lessened their reliability factor?

A. The worst abuse that you could give a hose would be one which would somehow or other pierce the inner layer. It would almost have to be intentional. The THRESHER had the two inch hoses; the maximum size that she had on board. There is very little else that you could do to these hoses in the installation, if the end fittings were put on properly, which would cause them to fail.

Q. What about the effect of a person crawling or walking across the piping system while making an inspection or doing work?

A. On a one-time basis, I don't believe this would bother the hose. What I mean by one-time, if it became a stepping stone, this is something else, but a one-time basis, I don't believe it would.

EXAMINATION BY THE COURT

Questions by a court member, Captain Osborn:

Q. On your letter of 28 August signed by Robert L. Moore, were there any revisions on this particular letter?--Was this the way it was written--as you wrote it?

A. Let me correct one thing very quickly. This letter was written by Commander Keays in the Type Desk with my technical assistance.

Q. Was there any revision to getting this out?

A. I believe there was, yes, sir.

Q. Will you describe them to me please?

A. No, sir. All I know is that it was a hard letter to get out of the Bureau. I would prefer that the guy who packed it up and down the hall, give the answer, if he hasn't already.

Q. Why do you think it was hard?

A. Well, there was a general feeling in the Bureau and in some of the yards, that any ship that had operated for a long period of time with no problems, was essentially in good shape, that there were no problems; in other words having had no failures, that there was no further need for concern.

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Q. Was the author of this letter with you at Mare Island when you discussed the SCULPIN problem?
A. Yes, sir.

Q. Did you actually look at more failures than this at that time?
A. We looked at more bad joints. There were no failures on SCULPIN.

Q. More bad joints?
A. Yes, sir.

Q. Was the author also in a position to know, better than anyone else in existence, the conditions under which the THRESHER was built?
A. Now the author of this was Commander Keays, and the answer to that is no.

Q. I'll say the signer of this?
A. The signer of this was in the best possible position that I know of, inasmuch as he was at the Shipyard while she was built.

Q. Was there any reluctance to face up, that this condition--conditions of bad silver brazed joints--was an across-the-board problem in practically every ship we had at sea, and to make a decision involving testing of sil-brazed joints would be one that almost put us out of commission?
A. This problem we have faced in silver brazing; we have faced it in welding; we have faced it in flex hoses. When these things are presented to you, they are always presented to you in the context of what is it going to do to the fleet, what is it going to do to the ships as far as delay in operational committments are concerned. This is a factor in these decisions, and it is unquestionably a factor. In the case where you have a ship which is ostensibly, to the best of everybody's knowledge, built to the best standards which existed at the time, and for which you can find no failures, there is a strong tendency to accept the NDV type of decision. I don't care whether you are talking silver braze, welding, flex hoses, air bottles--I faced them all in the past 20 months. In the context of what happened to THRESHER, nothing that we've done is right. In the context in which the decisions were made, I believe we took firm, technical stands that were modified by people, who, in their best judgment, did what they had to do. Does this answer your question?

Q. Yes.
A. I say this, that Friday and Saturday, I will face the problem, which is imposed by the message which DEPCOMSUBLANT put out, a message in which I, one hundred per cent, concur. The Bureau's answer--which I don't know whether you've seen or not--is one hundred per cent concurrence. So long as we have the b(1) pound water in these ships, so long as we are concerned with pipe sizes down to b(1) inch, b(1) inch: so long as we do not have control down to these sizes, we have got to face this problem. So long as we do not know the effects in the auxiliary machinery space of a spray of hydraulic line oil from a small leak on switchboards that are close by, we have got a problem. Friday and Saturday of this week we will face the sil-braze problem. Maybe--I am not defending myself or the Bureau of Ships--I am making an effort to give you a philosophy, if you will, that we will make the decisions that have to be made now. That these decisions were modified in the past from what you may have wanted or I may have wanted; they were modified by men

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whose position was such that they should make these modifications. What are we going to do over the weekend?--I don't know. I know we're going to ask a tremendous lot of the operating forces. I know that we are not going to lift the restrictions, or be a party to it, until we have satisfied the operating forces. Nothing that we have done has been done without the knowledge of the operating forces. So that I say this, to try to answer your question, which is fundamental, you see. Why do you make decisions?--Why did this letter not say that the THRESHER should be one hundred per cent ultrasonically checked? Am I in line?

Q. Yes.

A. If you look at S91, you will find in S91 a statement that all piping systems, less than two and a half inches in size, which do not see a working pressure of b(1) do not require radiography. If you look at THRESHER, you will find for some reason or other, in the opinion of the Bureau of Ships and Portsmouth Naval Shipyard, no hoses were to be allowed over two inches. If you look at the mass of instructions that we have put out in the Bureau--and I haven't covered all of them--we have imposed quality control on silver braze, we have imposed material identification on all piping systems. In every case, there is a size limitation of some type or other. We have now been faced with a new situation in piping. Now I am speaking for me. We are faced with the statement in the SUBLANT dispatch, which I agree with, that we want unequivocable--I think that is his word--confidence in the sea water systems. I may be misquoting him but I think this is close. In this context we have got to do a lot of changes in our thinking, and we are prepared to do it. May I take just a few seconds on this subject?

PRESIDENT: Yes, Commander, go right ahead.

WITNESS: Involved in, and connected with, all of our piping problems has been a philosophy that all it is, is piping. I sat in very recently and heard some shipbuilders--surface shipbuilders in this case--say that all of their piping diagrams were run to suit. They had no control over this piping. I think Captain Hushing understands, more than anybody, what I am trying to say. So in this context, the only thing I see is to stop wherever we are and examine everything we've done and even then, we have to go further to insure that a casual failure of a pipe won't do damage. We have to go to the switchboards. We have to go to our remote controls for our valves, if it is possible, even our remote controls could be flooded out by a pin-sized leak.

So we have underway, as a result of the studies in the sil-braze many things along this line. We have, fortunately, the automatic sensing system for main injection. We feel that we can put on these ships a system which measuring in-flow and out-flow on your main "circ" system, will give you a signal that says something has happened to this system. If we can work it out with Admiral Rickover's group and our group, we will work this so that you will close those systems automatically. And I am starting immediately to try to adapt this to the ASW system.

Can we do it? I'm sure we can do it. A year ago, I was at SUBPAC. They didn't like the idea. LANTFLT has always wanted it. We have a problem of operator input. But this is the type of thing which generated from the concern of sil-braze, from the concern of flex hoses, and this is the

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thing for which fortunately we have the weapons now. We can do this. We have quality control in these shipyards. We have control over our piping joints; we have the ultrasonic; we are developing our x-ray technology. I have under development out at Mare Island, automatic procedures in copper-nickel welding aboard ship. With all of this ammunition, we are now prepared to go forward in whatever direction is indicated, based on the results of this indoctrination and our own. Now this is a long answer to your question, but I think it is cogent.

COUNSEL FOR THE COURT: To clarify it in the record, would you state to what SUBLANT message you are referring?

WITNESS: Oh, I am sorry. This may take a little time. (Witness looks in brief case) It was a message from DEPCOMSUBLANT of 4 May 041341Z to the Bureau of Ships, classified Confidential. Subject: Sil-brazed fittings. Primary action was to ask the Bureau to set up a conference to look into restrictions.

Q. Commander (b) (6), you are perhaps better qualified than anybody else in the Navy with respect to looking into the silver brazed joints. What kind of cooperation did you meet with in the Bureau of Ships with respect to trying to get this problem under control?
A. Functioning as I was, cooperation was good.

Q. Functioning how you were--

PRESIDENT: May I interpose one question. Are you not an important part of the Bureau of Ships yourself?

WITNESS: Yes, sir.

Q. Describe "functioning as you were." Could it have been better?
A. I had no difficulties, no, sir.

Q. Was this problem primarily emphasized on completion of new ships and establishing of standards for new construction, or with respect to retro-fitting?
A This question, I can answer. It was primarily working into the new construction program.

Q. How much effort was devoted on retro-fitting on THRESHER? Was this ever discussed--complete ultrasonic of every sea water system?
A. To my knowledge, no.

Q. From a standpoint of judgment, do you think a small pipe under shock test is more apt to fail than a large pipe?
A. You've opened a large question here. There are too many parameters to answer the question. The ship, as I looked at her when I came up to look at the sil-braze on the THRESHER, on the small piping--as I said and as was stated in this letter--the problem was primarily due to a bad installation and this is pointed out, but to try to say that a large or small sil-brazed fitting is more liable to fail under shock, is taking this thing completely out of the ship context because a lot depends on where it is in the ship. If your large sil-brazed fitting is in a relatively

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contained position, for instance, it will react one way. If it happens to be right next to a bulkhead, where the bulkhead is going to move with the shell, you're going to get an entirely different action. The same is generally true of the small fittings.

Q. You think the spectrum of the conditions is so big you can't make a general statement?
A. That is right. I don't see how you could make this. Other people in the Bureau are more knowledgeable on this than I am but I have forced myself to become knowledgeable, and that is my answer.

Q. Do you think a ship that has successfully undergone shock test, has anything to do with its ability, or the quality of its sil-brazed joints?
A. Yes, sir.

Q. Do you think you can make a fairly good generalization that once a ship has undergone shock test, it is better than one that hasn't?
A. That is right, and I say this again; keep in mind my initial statement that the worst thing that can happen is the wrong material. We have many, many, many tests which show that a silver brazed fitting with only a fillet will hold up under all kinds of conditions, so that my feeling is that a ship which has undergone shock test of the severity of THRESHER and not had any failures, this is certainly added assurance that the ship was well constructed. You can't ignore it because--let me say this a different way. Take my hypothetical case where the fitting was next to the bulkhead and this fitting were of the wrong material, it would fail--I'm sure.

Q. Did you know that the THRESHER never proceeded to test depth after she was shock tested?
A. No, sir, I wouldn't.

Q. Would this have had any effect on your decision with respect to sil-brazed testing?
A. I do not believe so. This is opinion hindsight of the worst type but I must honestly say I don't think that factor would infer--

Q. Did you automatically assume this?
A. That it went to test depth?

Q. Yes.
A. No, sir--no, sir.

Q. In basis of all the pressure that you were putting on, to get the ultrasonic program on the road with respect to sil-brazing, was there any pressure from the operators with respect to asking you whether you should limit the depth of ships or not?
A. No, sir, not that I know of.

Q. Was there any recommendation on your part?
A. To limit the depth?

Q. Yes.
A. No, sir. After BARBEL--now this is history for me--but after BARBEL, I went back and dug out as much as I could on BARBEL to this effect. Now maybe there was--I could not find it.

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Q. Do you think a lot of the stamina of the BARBEL investigation was lost because of the fact that a wrong material was involved in the silver-brazed joint that failed?

A. Now you are going to get opinion.

Q. That is what I want.

PRESIDENT: Will the member of the court please confine himself to questions which lend themselves to an answer by the witness within his area of competence. Answer the question as best you can.

WITNESS: This is strictly a matter of opinion. In order to get myself ready for the job, I did some investigations into BARBEL. There were many things which happened on BARBEL, the worst of which was this fitting. I do not feel, however, that the emphasis on quality control, which came out of BARBEL, was lost because they were able to reasonably establish the cause of this failure and if you want to know why, look at the letters having to do with bite-type fittings, the hydraulic system, O-rings--back through the whole gamut.

Q. Was this emphasized more in your investigation on the SCULPIN--that the process was more in question than materials, or control of the process?

A. Control of the process is the thing which we got ahold of first, and again I say that with the process under control, this is a fairly good joint. I am not saying one of these damned things didn't fail. I am saying this is a good joint. You have, I believe, in evidence, Mr. Sayre's report, so I don't have to refer to that.

PRESIDENT: We have Mr. Sayre's report.

Q. Have you had any evidence, in your experience, with respect to ball valves failing to operate at deep depths?

A. No, sir. The primary difficulty we have had with ball valves, having to do with a coating of them, does not stop them from operating at any depth.

Q. What I am trying to refer to is, if you had a history of testing these things on the surface and not testing them as you go down, what do you think your probability is of having a ball valve not operate?

A. Very slight.

Q. You don't think they're too suspect with respect to THRESHER?

A. No, sir.

Q. Your arrangement with respect to the ASW system have a lot--were you familiar with respect to the system, that you had multiple-station isolation involving silver brazed joints?

A. Was I familiar with the THRESHER system?

Q. For isolation of the ASW system involving many silver brazed joints?

A. Generally, yes. I know the system; I studied it--but this is a very general thing. You have heard Mr. Guther who was my expert on this.

PRESIDENT: The court will recess at this point.

The witness was duly cautioned not to discuss his testimony outside the courtroom.

The court then recessed at 1301 hours, Wednesday, 8 May 1963.

The court opened at 1400 hours, Wednesday, 8 May 1963.

All persons connected with the inquiry who were present when the court recessed were again present.

No person not otherwise connected with the inquiry was present.

The witness was reminded that his previous oath was still binding.

EXAMINATION BY THE COURT (Cont.)

Questions by a court member, Captain Hushing:

Q. Commander (b)(6), I show you a copy of a BUSHIPS letter, Serial 648X-160 of 13 February 1963. (Hands document to witness) Will you peruse it for a moment please?
A. Yes, sir.

Q. Does that letter convey information on silver-brazed problems and proposed solutions thereto?
A. Yes, sir.

Q. To COMSUBPAC and to DEPCOMSUBLANT?
A. Yes, sir.

Q. What is the gist of the first paragraph of that letter?
A. It refers to a serious condition which existed in the fleet in the salt water piping system on submarines, and to a dispatch which expressed DEPCOMSUBLANT concern for this.

Q. Is that a DEPCOMSUBLANT message of September 1961?
A. Yes, sir.

Q. Does that letter, to your knowledge, constitute at least a partial answer to that dispatch?
A. Yes, sir.

Q. Does that letter propose a program for improving the quality of sil-brazed joints?
A. Yes, sir.

Q. Will you turn to Enclosure (2) of that letter.
A. Yes, sir.

Q. Enclosure (2) lists, I believe, a number of ships to be inspected for sil-brazed joint quality, does it not?
A. Yes, sir.

Q. What are the first group of ships by category?
A. "Inspections in process or completed as of 1 February 1962."

Q. What is the second category?
A. "To be performed during PSA."

Q. Is the 593 listed under that category?
A. Yes, sir.

Q. Would you say that this indicates the Bureau of Shops intent to have the salt water systems of the 593 inspected during the PSA?
A. Yes, sir.

Q. Now, was the letter, to which you referred in your testimony this morning relative to THRESHER discussing the examination, partially instigated by the letter you now hold in your hand, the letter of 13 February 1962?
A. Yes, sir.

Q. Now let us turn to another subject.
A. Yes, sir.

Q. Are the so-called fleet boats of World War II operating with silver brazed systems installed?
A. Yes, sir.

Q. Are all of the nonnuclear submarines built since World War II operating with silver brazed systems installed.
A. Yes, sir.

Q. Has there been reasonably good experience or poor experience or unsatisfactory experience with those boats with silver brazed systems?
A. Based on all of the evidence I've been able to find, they've had good experience.

Q. Would you say this then, that up until 1960 or '61, the Bureau of Ships' experience with sil-braze has been reasonably good?
A. Again, based on what I've been able to discover, the answer is yes.

Q. In 1961, I remember by your testimony, there were strong indications of difficulty, is that true?
A. Yes, sir--yes, sir.

Q. At this time, 1961, was there a full line of approved weldable pipe fittings for use in all welded systems?
A. No, sir.

Q. What was your answer?
A. No, sir.

Q. Does such a line of weldable fittings, a complete line, exist today?
A. I say yes to this. There may be specific types of fittings--unique fittings--for which there are none, but in general, the answer is yes; we do have them.

Q. So there has been a development program so that it would now be possible, if ordered, to have a completely weldable system?
A. Yes, sir.

Unclassified

Q. Replacing the silver brazed joints by welded joints?
A. Yes, sir.

Q. In the absence of such joints, as existed perhaps in 1961, how could an all-welded system be constructed?
A. It could only have been constructed if the urgency were such that you could parallel this with the development program, which we have now completed in the last two years, to the point where you could have stayed ahead of production. It could only have been done under such an emergency that you would have gone ahead, started your welding system at the same time, with a crash research program in these other areas.

Q. You mean then that you would have had to concurrently developed a fitting and simultaneously installed them into the ship, taking a chance on approval?
A. This is a hypothetical case; my answer is yes.

Q. Now, let's go to another aspect of this subject. Is the relative cost of a sil-brazed fitting and a weldable type fitting, approximately the same?
A. The answer is no. The magnitude--I don't know the magnitude but the answer to your question as such, is no.

Q. Which one is the more expensive?
A. The weldable.

Q. Is the piping involved in welded systems and silver brazed systems the same piping?
A. Yes, sir.

Q. Does P-1 welded piping require radiography of joints?
A. P-1?--yes, sir.

Q. In a two-inch joint, for example, how much of the periphery of the joint is required to be radiographed in a P-1 system?
A. If the working pressure of the system were less than b(1) pounds, the answer would be none.

Q. But if it is above b(1) pounds?
A. 60 degress of circumference.

Q. What would you say the relative cost of welded joints versus sil-brazed joints might be across the entire spectrum of ships such as THRESHER?
A. For the '62 buy of 593 class, which I mentioned earlier, we had alternate bids. The alternate bid was an all-welded system, one inch and above.

Q. One inch and above?
A. One inch and above. The bid, the cost of the option in the case of one contractor was better than $250,000. The number being something in this range. It is better than that, $254,000 or something along this line.

Q. But this gives us an idea of the relative magnitude of the difference, is that right?
A. Yes, sir.

Unclassified

Questions by a court member, RADM Daspit:

Q. On this same subject, to clarify the record, could you tell us how the fittings were obtained to do the welding in the reactor compartment, because this was done almost immediately?

A. I am knowledgeable of what was done in the reactor compartment. I assume that you mean the replacement of the brazed fittings in the through piping.

Q. By welded joints.

A. By welded joints. I do not know where they bought them, but the point in time that this was done was such that the development process that we were talking about was fairly well completed, and I believe they could have been bought from the Electric Boat Company, for instance, at that point and time.

Q. All right. Now referring back to the three joints which you found on SCULPIN and which you had a conference in November 1961.

A. Yes, sir.

Q. I am trying to get a feel for how joints on other ships in the fleet might be, whether this was unique with one shipbuilder or not. Did the specifications at that time permit the bad procedures which resulted in this joint--specifically, were the joints required to have an insert in them, and were the joints required to be fitted up with square ends?

A. The SCULPIN--my hesitation is I am trying to get a point in time as to when the SCULPIN was built. This is my best guess on the basis of what I know, that face feeding was allowed, and that there were probably in the specs at that time some very general words on fit up.

Q. So that this was more the result of loose specs than of poor inspection at the time?

A. This is my opinion, yes, sir.

Q. Now I think you also said that suggestions to the fleet were made as a result of that SCULPIN conference?

A. Yes, sir.

Q. Were there any suggestions other than the letter of 28 February 1962, which we have just talked about?

A. Written and formalized, no, sir, nothing comes to mind. I spent time at both DEPCOMSUBLANT headquarters and PACFLT headquarters in the process of talking about this and getting what it was that we were talking about to the fleet. But this was the best document that we had issued.

Questions by a court member, Captain Osborn:

Q. I have a couple little detail questions. When you wrote the letter regarding the use of an ultrasonic inspection team, what did you think would be a reasonable production on joints per day by that team?

A. In the discussions which led to this, with Keays, we were hoping from four to eight a day for the team.

Q. Then you think that an examination of say less than two hundred in a nine-month period would be less than your expectations by a considerable factor?

A. This is right, yes, sir.

Q. This kind of performance wouldn't be indicative of an urgent problem solution would it?
A. It's disappointing to me, right, yes, sir.

Q. We've had testimony by one of our witnesses that within the last month, thirty-six sil-brazed joints were tested in SCULPIN that had been previously ultrasonically tested, and seven of them failed. Are you familiar with these?
A. No, sir, and I'm almost in daily contact with Mare Island. The answer is no, I did not know of this.

PRESIDENT: Counsel is directed to send a message to Mare Island to ascertain the truth or untruth of this report.

COUNSEL: Aye, aye, sir.

Questions by the court president:

Q. Commander (b)(6), I am reading from a dispatch sent by COMSUBPAC to BUSHIPS at 072326 Zulu. In that dispatch COMSUBPAC asks the question "NAVSHIPS 329-0029 issued as the technical manual for ultrasonic testing. Mare Island Naval Shipyard does not use the test techniques and BUSHIPS has issued separate correspondence which permits the acceptance of joints of lesser indicated bond than that required by this publication or NAVSHIPS 250-648-8. (For newly fabricated joints). Request clarification of status of issued standards." Can you explain this to us?
A. Well, may I ask, sir, is this a fairly recent message?

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Q. The seventh.

A. All right, sir. In our 13 February letter we established an acceptance bond criteria for completed ships--ships delivered--of a 40 per cent average bond, 25 per cent in each land. This is a lesser standard than we require for our new construction ships which is a 60 per cent bond criteria; and it is these two, I believe, that he is referring to, and this, I'm sure, is his question--why? And the answer is that at the time we started to look, based on a lot of test data, we said that a joint meeting this criteria is a minimal acceptable criteria, but we do not want this for new construction; we wanted better than this. This, I believe, answers your question.

Q. But what about the statement: "Mare Island Naval Shipyard does not use the test techniques" et cetera, et cetera? Does that ring a bell with you, or not?

A. No, sir. This is the first one I am going to have to punt on. I don't know; I don't know what he is saying. We'll have to answer his message. We'll look into it and it will be something which Friday we can get the answer to very quickly.

Q. But BuShips has not authorized Mare Island Shipyard to test by some means other than ultrasonic testing, has it?

A. No, sir.

Q. Sil-brazed joints?

A. No, sir.

Q. Now, referring to this letter, which is Exhibit 115 and which was written to the Shipyard, Portsmouth Naval Shipyard, I find in paragraph 6b the following: "The inspection team(s) should examine accessible sil-brazed joints in the following order of priority:--" I invite your attention to the word, "accessible." Can you tell the court whether or not the word, "accessible" was meant to apply to only unlagged portions of piping, or did it include lagged portions that were accessible?

A. As written the word, "accessible," would have meant that we expected them to remove lagging.

Q. You expected them to remove lagging?

A. Yes, sir.

Q. And so the "inaccessible" really meant joints that would require major break-out of equipment to get at, and not just that which would require removal of lagging?

A. Yes, sir, and I back this up by our enclosure (1) to the 13 February letter which says in paragraph c: "Check by non-destructive test all silver-braze joints between and including hull valve and back up valve which can be done without major removals of machinery, piping, foundations or hull structure, to same criteria as above."

Q. Now, at one point in your testimony this morning, you said that reports showed a high percentage of satisfactory joints when the Electric Boat Company inspected the external hydraulic system. Could you be more specific, more specific than a "high percentage of satisfactory joints"?

A. I can--and this should be brought out by the yard because they have the records. They can give you specific numbers. I am now speaking from memory, of something approximating a hundred and sixteen joints with something less

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than five of these being substandard. This report is in the yard and should be made a matter of record, I believe. These numbers are from the time we wrote the letter.

Q. That is something less than five per cent.
A. Yes, sir.

Q. If the THRESHER inspection which was directed by BUSHIPS had indicated as high as 14 per cent failures, would that have been considered an acceptable number of failures by the standards which were to be used?
A. No, sir. We would have required something more. I speak now from the background of making the decisions in the area of welded piping. We--our first reaction is what type of failure and where? And if it turned out sour, based on the circumstances, then we would have required more. I can't give you a precise answer, but I can give you a "for instance." Had they all been four inch, all in the main ASW system, we would have said, "That's enough;" we would have torn it out, or we would have thought seriously about tearing it out. Again, to back it up, this is generally what we did on SARGO and SWORDFISH.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. With reference to Bureau specifications for pipe welding and non-destructive tests of pipe welding, in the area of pipe welding during your travels that you have described to us, did you find that shipyards are meeting the existing BUSHIPS specification requirements?
A. No.

Q. Would you amplify that answer, please?
A. Yes, sir.

Q. By telling us what you did find.
A. Again, I am briefing a lot of stuff. Approximately a year ago, for reasons having to do with an increased awareness of what it is we are dealing with when we are sending ships down to b(1) and in an increased atmosphere of quality control, a serious examination of the welding procedures was made in the submarine shipbuilding yards. It was found that there was serious non-compliance with the standards in the yards examined. The initial investigation was triggered by Code 1500 in his concern for the piping systems under his cognizance. It was immediately recognized that there was no reason that this should stop at a particular bulkhead because this bulkhead happened to be the difference between the reactor compartment and the non-reactor compartment. We immediately started to investigate the rest of the piping systems aboard our submarines. We found that the condition which had been discovered in the reactor compartment was fairly general throughout the rest of the ship. Our initial reaction was that we have yards building ships that have never built steam ships before, or have not built them for a long time, so that we felt all we had to do was call on our surface yards and say, "Come on down here and show these people how to weld." This was not the fact. The surface ship welding was not any better than we were getting in the submarine yards. It was the awareness of this which started the Portsmouth project, that I mentioned earlier, which is leading to a greatly improved welding ability on the part of our yards. As soon as we recognized that we did not have a problem simply of training welders, we then started to look at the

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whole process. This is going on now. But, again, this was non-compliance with a standard which had been set, generally speaking, arbitrarily. The ASME, who is the expert--the American Society of Mechanical Engineers--in this field, have a standard which is considerably less than the Navy standard. There are some things in there which we would not allow aboard ship. I say this only to put in context what "non-compliance" really means. We did two things quickly. We readjudged our standard and we said, "Meet it."

Q. Was Portsmouth any better or any worse than the general run of shipyards in this connection?
A. This is hearsay evidence. They were worse.

Q. What period of time are you talking about?
A. Approximately a year ago. I believe, March a year ago.

Q. On what do you base your characterization of this as hearsay evidence?
A. The only people that I know who rated the yard were the Code 1500 people who made the first investigation that they made.

Q. Well, I ought to make my question to you clear, then. I asked you what you found out as a result of your travels. You have told us that you traveled throughout the world to the different shipyards.
A. All right; you lost context with me here.

Q. Yes.
A. All right. Of the four major yards that are building submarines today, where I spent the most of my time, the situation is the same. This would have rated fourth.

Q. What are those yards, please?
A. Mare Island, Electric Boat Company, Newport News, and Portsmouth.

Q. Have you found the existing attitude toward present pipe welding specifications is such that they are treated as a requirement to be met, or a goal toward which to strive?
A. We found, in the beginning, that they were, generally speaking, treated as goals and that waivers were being granted at the local levels to a considerable extent. Since this shakeup,--and it has been considerable,--we are getting compliance. Does that answer your question?

Q. Yes. Did you find it a general attitude, that the quality of welding and inspection required by the specifications was unnecessarily stringent?
A. Yes, sir.

Q. In your travels, have you found a significant number of instances of defective weld and poor inspection practices in the typical shipyard you visited?
A. May I ask you to say that again?

Q. In your travels, did you find a significant number of instances of defective welds and poor inspection practices which was typical of the yards you visited?

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A. The word, "typical," throws me. The answer is we found in all yards examples of both poor welding and poor quality control of welding. For the record, and for the Shipyard people, we found this same thing in industry.

Q. Is this a significant proportion large enough to cause you great concern?

A. Yes, sir.

Q. What proportion would you assess it to be?

A. What proportion of what?--What proportion of the yards that I visited?

Q. No, You have already said that the proportion of bad welds caused you concern. I will now ask you what proportion caused you concern. What did you mean?

A. When we checked the yards,--and now I have to say "we" because there were a lot of people besides me at this point inspecting the yards--we found that, as I said, a substantial number of them were welding substandard and that their inspection was loose. We ran some check tests to get some feel for what percentage of the welds were non-compliant in the surface shipyards, and looking at the radiographs, in the light of our present and then concern, we found as high as 85 per cent of the radiographs we looked at were rejectable. Now, you are in a big area. What I just said is a big mouthful. I've got to say this now, that when you sit in the Bureau or sit in the yard and look at a radiograph, and say that this radiograph is rejectable, you have many factors other than the condition of the weld which cause you to reject a radiograph. Now, I say this; it's no different than your camera. You take the picture and you develop it. If your developer is hot, cold or indifferent, if it is dirty, if you have been out of focus a little bit--when you look at your final picture, you are going to throw it in the waste-paper basket. You say, "This is a lousy picture." It doesn't mean that your wife is any different looking. You see my simile. So, remembering this, this is where the numbers I am talking about come from, that we got over a fairly wide check, I mean, a rather large number of radiographs. We got a high number of rejections of the radiographs we looked at.

Q. How do you wish to leave it with us, Commander (b) (6) --we have now heard that silver-brazed joints, the efficacy of brazing silver-brazed joints left much to be desired, and the validity of welded joints left much to be desired. Can you compare those two in the order of magnitude?

A. Yes, sir. I think I spent the last nine months of my life in this question. A welded joint which would be rejected today would not, in my opinion, and this is my engineering opinion, fail. The silver-brazed joint made with any of the things which I have said were wrong with silver brazing originally, which is, the wrong material, poor workmanship, or poor quality control, would fail.

Q. I don't wish to compare "now" with "then." At the time of THRESHER's construction, would you answer the question, please, comparing the relative reliability of the welded joints with silver-brazed ones.

A. I don't see a great deal of difference in my answer.

Q. You said that a welded joint rejected now would not--

A. All right. I am sorry. The hesitation is I have got to go back through a tremendous number of things to come up with these answers. I'm sorry. There were looks taken at THRESHER's steam joints. Off the top of

my head, I can't remember the numbers, but there were only a few of them that any concern was shown over. In other words, a look was taken at THRESHER. The fact that this doesn't ring a flag to me means that the welding at that time was better than the silver braze that I have discussed. In other words, it is a hard way to answer your question.

RE-EXAMINATION BY THE COURT

Questions by a court member, CAPT OSBORN:

Q. If I were to tell you that the complete sea water system and associated piping were completed in an operable condition and all tests were complete on 15th of March, 1961, which was the date we think THRESHER completed her power range testing and all systems were complete; can you give us an index of the quality of silver-brazed joints you would expect to find in the sea water system? Really, what I am driving at is all the things you have discovered, all the particular detailed correction procedures that you have tried to initiate and have initiated. Would there be a reasonable chance that, in those systems, any of those corrections would have been adopted at that time?

A. 1 March '61?

Q. About 15 March '61.

A. Well, my answer to that has to be yes. It has to be that, because I assumed my present post in August. Enough work had been done preceding me by other people in my job and in jobs in the Bureau where the July '61 addition of this NAVSHIPS 230-2 was on the street; and just looking into the amount of research that took--I would say that some of this must have come from this Yard and would have been effective on THRESHER. This is the best answer I can give.

Q. That seems to be the toughest problem we have in this particular area --is to decide when and where certain advances and inspections and processing really took effect. Really, as a matter of opinion, do you think we'll ever get a handle on this until we've tested them all?

A. My answer is that we will have to have a handle on it now.

Neither the counsel for the court, the court, nor the counsel for RADM Palmer, a party, desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated he had nothing further to say.

The witness was warned concerning his testimony and withdrew from the courtroom.

The court then closed at 1450 hours, Wednesday, 8 May 1963.

The court opened at 1500 hours, 8 May 1963.

All persons connected with the inquiry who were present when the court closed are again present, with the exception of (b) (6), who was relieved as reporter by (b) (6).

Captain David H. Jackson, U.S. Navy, was called as a witness for the court, was informed of the subject matter of the inquiry, was warned under Article 31 of the Uniform Code of Military Justice, was duly sworn, and examined as follows:

COUNSEL FOR THE COURT: Captain Jackson, this is a closed session of the court and classified information can be divulged here.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, grade, organization and present duty station.
A. David Henry Jackson, Captain, U.S. Navy, Director of Machinery Division, Bureau of Ships.

Q. Would you state briefly the nature of your duties in your current billet?
A. In my current billet, I am the head of the Machinery Division, consisting of eight branches, which have to do with the main propulsion, auxiliary, electrical, fire control, and navigational equipment of ships.

Q. Including submarines?
A. Correct.

Q. Briefly describe your naval and professional background and experience.
A. I became the Director of the Machinery Division in October of 1961. Prior to this time, I was the Director, the head of the Planning and Production Control Branch and the Head of the Computer System and Application Branch of BUSHIPS, for a period of two years. Just prior to that, two years prior to that, I was the Design Superintendent of the New York Naval Shipyard for a period of one year and a half, and the Industrial Engineering Officer in the shipyard for a period of six months. I attended the War College at Newport, Rhode Island in 1956 and 1957. Prior to that, I was in the Norfolk Naval Shipyard as Industrial Relations Officer; and prior to that, four years at the Engineering Experimental Station as the Laboratory Officer for the Metallurgical, the welding, the electrical laboratories; and just prior to that four years, as a Project Officer in the Machinery Design Division in the Bureau of Ships, in which I was the Project Officer for the design of the machinery plants for destroyers and destroyer escorts, and Assistant Project Officer for aircraft carriers.

Q. Are you familiar with the history of the condenser water boxes used in THRESHER, and the considerations as to their reliability which obtained during her history?
A. Yes, sir, I am.

Q. Would you relate this to us?
A. Yes, sir. I have a chronology here which I would like to go through from the beginning.

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Q. Can you keep it brief for us?

A. I will do my best. The contract for the water boxes and the condensers for the THRESHER was let on 24 February 1958. This was a contract with the General Electric Company for the entire propulsion equipment for the SS(N)593. This included the condensers, which were furnished by C. H. Wheeler. At that time, there were no requirements in the contract for a cyclic endurance of the condenser water boxes or heads; no requirement at all. By Change Order No. 2, dated 12 June 1958, the Bureau required the design of these water boxes to withstand . b(1)

. On 26 June of 1958, the Bureau sent to C. H. Wheeler a copy of a design memorandum. The original specifications for the THRESHER invoked Section 8 of the ASME pressure vessel code, which was at that time in our main condenser specifications, also. On 26 June of '58, we--the Bureau forwarded to C. H. Wheeler a copy of a paper entitled, "Tentative structural design basis for reactor pressure vessels and directly associated components," dated 1 April 1958. The reason for this is because our specifications require that the condenser water boxes be designed at the minimum for Section 8 of the ASME Code, and this was the work that was done in relation to designing the pressure vessels for the reactors, and all of the data that was developed with the pressure vessel reactor committee and by Mr. James Machon from the Bureau of Ships, and a doctor--I don't have his name on the tip of my tongue--from Venice, and one from Sapho. These people developed this particular design vessel, and this has been used for the design of the THRESHER's water boxes. On 28 June of 1959, the Bureau of Ships approved the plan for the C. H. Wheeler condensers, which included a statement saying: "It is considered that the water boxes will be satisfactory for the intended service." This meant that C. H. Wheeler had gone through the calculations, and that these calculations had been checked by the Bureau of Ships to see that they would withstand b(1) This gave a water box with a thickness of 7/16 of an inch. On 27 March 1959, the Bureau of Ships asked C. H. Wheeler to use 7/8 inch material on all of the condensers, except the first two on this contract. The first two of these were going on the 593 and the 603. The 7/8 inch condensers water boxes would therefore be used for all those after this. There was nothing at the time in the b(1)

. There was no question about--in going to this thicker water box--concerning the ability or the life of those for the 593 and the 603. The main reason we went to this was because in the design of the 7/16 inch water boxes we had to put a reinforcing ring in here, requiring two welds in this particular location; so that, in going to the 7/8 material, we were able to eliminate this reinforcing ring at this particular point and go to a smooth section which is shown on this particular picture right here. The other reason for this was that we found that we were being quite restricted in the forces on moments which we were requiring to be applied to the inlet and outlet nozzles on these water boxes, and that this was placing a rather strict and rigid requirement on the design and the designer of the piping coming into the condenser; so, therefore, we went to the 7/8 inch water boxes, which could withstand a much higher loading when an overturning moment is concerned. In fact, the overturning moment on the 593 is 65,200 inch pounds as compared on the 608 to 431,000 inch pounds. That was with the 7/16 inch box for the 65,200 inch pounds, as compared to the 7/8 inch water box with the 431,000 inch pounds. Then, in April of 1961, the whole subject of the THRESHER water boxes was reviewed, because of some tests that were conducted on the SCORPION,

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which showed that the estimates of overturning moments and the estimates of forces could sometimes be in error by large percentages. The whole design of the THRESHER water boxes reviewed at that particular time and the position and confidence was restated that the THRESHER was ready to proceed on trials and that there was nothing to indicate that the THRESHER's water boxes would not withstand b(1)

Then, in June of 1961--shall I keep going on this?

Q. I was going to ask you whether the THRESHER's condenser water boxes were instrumented for stress during the successful deep dive to test depth.

A. Yes, it was. The THRESHER condenser was instrumented for these tests, and the instrumentation consisted of twelve rosettes around the inlet piping in this particular location. We had three of the strain gauges that did not read properly, or were sporadic in the data they gave; and the other nine were satisfactory, and the calculations that were made based on this particular set of data equaled a fatigue life b(1)

This was placing a factor upon these readings which we could use that were proper with applying a factor to them because we didn't think we had reached the maximum stress, the peak stress: we felt that we had not reached the peak stress of these strain gauges, by applying a factor to these we were able to come up with a b(1) for these particular water boxes. If we had reached anything near the correct reading, the water boxes would have been good for at least b(1)

The next time we instrumented the THRESHER, we put thirty-six rosettes around the well, one at the toe of the well, one at the middle of the well, and one at the back of the well; one ring of them, a ring of twelve, and each one of these circles, the data from these were no good. We could not make any analysis of these data at all on this particular dive, and so we had to throw these particular results out.

Q. To your knowledge, have any other parts of the condenser salt water system been examined as possible weak points in THRESHER?

A. Yes, sir, we have examined the tube sheets in the THRESHER and have reached the conclusion that the tube sheets are adequate for the b(1)

Q. Are other condenser water boxes similar to those installed in THRESHER currently in use?

A. Yes, sir, there's the one on the 603, which is now being built at the New York Shipbuilding Corporation at Camden, New Jersey.

Q. But none in use?

A. None in use.

Q. Are additional reviews of such designs of water boxes for deep diving submarines being made in the Bureau of Ships?

A. Yes, sir. We have a contract with Southwest Research Institute at San Antonio, Texas, at which we are running a cyclic fatigue test on this particular condenser, based on the test results we obtained on the 608. We have, also, in addition, hand tested the 593; we tested the 608, the 594, and the 609. Based on the test results from the 608, which were very good, excellent results so far as the strain gauges were concerned, we are going to use those test results to cycle this condenser with the hull inter-reactions and the submergence pressure inside, cycle this condenser to destruction, with the pressures that we have developed through the strain gauges on the 608 deep dive test.

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Q. Would you briefly describe the military personnel situation now existing in your division of the Bureau of Ships.

A. When I took over Code 640, I had ten officers, including myself, in this division. I now have eight. This division at one time had a total of twenty-three officers in this division, some four years ago. Speaking from memory, I don't have anything in front of me here on this, I have had for the past nine months one of my technical branches uncovered from an officer head; this is my Code 660, the electrical branch has been running without an officer head.

Q. Has there been a compensatory increase in the number of civilian assistants?

A. In the last two years in this division, there has been a reduction of approximately forty-five civilian personnel.

Q. I would direct my question to the civilian personnel of engineering capabilities?

A. This is what I am speaking of.

Neither the counsel for the court, the court, nor the counsel for RADM Palmer, a party, wished to examine this witness further.

The president informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement:

I would like to make one other statement. I didn't finish one question asked me there. We do intend to run--we have had this in the Change Order form right now--we do intend to run tests on all of the different configurations of water boxes on all of our submarines. This includes the water box, the support, the connecting piping and anything that might be different in them, because this is such a complex structure that it requires this kind of treatment review.

The witness was warned concerning his testimony and withdrew from the courtroom.

CDR John Woolston, U.S. Navy, a former witness, was recalled as a witness for the court, warned that his previous oath was still binding, and examined as follows:

DIRECT EXAMINATION

Questions by counsel for the court:

Q. Commander Woolston, Deputy Commander Submarine Force, Atlantic Fleet Message 131410Z, of September 1961, has been introduced in evidence as Exhibit 162. It was addressed to Bureau of Ships. Do you have in your possession a copy of the Bureau of Ships reply to that message?

A. I do, sir.

Q. Produce it.

Unclassified

Unclassified

A message from the Chief, Bureau of Ships 152242Z September 1961 was offered in evidence and, there being no objection, it was so received as Exhibit 172. Counsel for RADM PALMER waived the reading of the Exhibit at this time.

Q. Exhibit 172 refers to the specifications for building submarines. Would you discuss the statements appearing therein relating to the problem of sea water and electrical switchboards?

A. Yes, sir, the particular excerpt from DEPCOMSUBLANT Message 131410Z of September '61 with reference to the proximity of switchboards to salt water systems. The particular subparagraph in this message that I would like to invite the court's attention to is paragraph 2(e). I have an excerpt from the self-contained specification for building submarines SS(N)593, page 583, lines 51 through 87, which I have checked and would like to submit into evidence.

Q. This relates to the protection of electrical switchboards from salt water?

A. Yes, sir.

The cited excerpt was submitted in evidence and, there being no objection, it was so received as Exhibit 173. The counsel for RADM Palmer waived the reading of the exhibit at this time.

Q. What was the effective date of Exhibit 173?

A. That was the date of the original signing of the specifications. This had been unchanged since the very beginning of THRESHER. I can't recall the specific date at the moment. It was in July of 1958.

Q. From your own direct knowledge, can you state whether these specifications were carried out in the case of the electrical equipment installed in THRESHER?

A. I do not know, of my own personal knowledge, that they were; but I suspect that particularly in the auxiliary machinery space they were not entirely met. I introduced these in evidence to complete the record of the previous message and to indicate that at least on the Bureau level there was a knowledge that this problem should be handled and consideration that the design yards had a piece of paper around which to work. Within the original design shipyards, I suspect that there are many areas wherein there is a straight shot salt water line to the switchboards.

Q. In your capacity while serving at the Portsmouth Naval Shipyard as the THRESHER design project officer, did you conduct casualty studies with reference to THRESHER class submarines?

A. Yes, sir, both in the contract design phase and in the detail design phase.

Q. Will you describe these studies and the results you obtained in them?

A. In general, there were two kinds of casualty studies which were held, and perhaps this also explains some of the differences in approach which have been expressed by different representatives of the Bureau of Ships. One type of casualty study is a system casualty study wherein you go over each and every component and piece of pipe in the system, to see what would happen if it were damaged in any way. The second is a ship casualty study wherein you look for the ramifications of what could happen after any particular casualty to any particular system. With each salt water system there might have been

Unclassified

hundreds of hypotheses that we went over and looked at each and every item. Then, we went from there, say, to the engineering approach, rather than the system approach, the ship approach. We looked at what would happen to the stream of water, what would go out afterwards, what would shut-downs be. At this time, one casualty was a serious salt water leak. The assumption of action at that point went in two ways; b(3) 10 USC 130 you would shut the proper valve, b(3) 10 USC 130 and proceed on propulsion b(3) 10 USC 130 until you had isolated the particular leak. The other b(3) 10 USC 130 and isolate or shut down all. We did not go, at that point, far enough into the flow rate consideration; we did not go at all into the flow rate consideration to see whether or not the ship could surface after these. This was a lack of knowledge.

Q. In describing these studies, you used the word, "we." Will you please explain what you meant?

A. I was speaking of myself and the various people responsible, responsible people in the codes in the Portsmouth Naval Shipyard at this period of time.

Q. Did the personnel of the THRESHER participate in these studies?

A. Not in the early studies in the game, because the personnel had not arrived yet. After people did come, we went back over these studies with individual people, also the training lectures talked to the problems of casualties in the system. Although the casualty studies were not written down in the instruction books, they were known to individual codes in the Shipyard, to myself, and were described to the crew as a part of each system study and as a part of the whole engineering plant study.

Q. Did ship's company benefit from any casualty study concerning a casualty to the auxiliary sea water system in THRESHER?

A. I couldn't say, to the best of my knowledge, whether they benefitted or not; I would assume they should have.

Q. I will rephrase my question. Was there such a study conducted by your people in Design?

A. Yes.

Q. Was it communicated to the crew?

A. Yes.

Q. Do you recall the extent of that study and the names of the ship's personnel who learned it?

A. The serious flooding casualties were items that were discussed in the lectures on the sea water system and, in general, most of the people in the crew were there. We individually spoke to people, I would say, literally hundreds of times about serious casualties, in particularly hydraulic systems, sea water systems and air systems. I couldn't tell who at any particular meeting.

Q. My question related to the extent of the instructions of a casualty to the sea water system, the auxiliary sea water system.

A. Well, I reiterate that the effects of sea water systems and the valves that had to be closed, the results of the study were passed during the lectures.

Q. Do you recall whether there was one addressed to casualties in the auxiliary sea water system?

A. This is what I thought I was saying, sir.

Q. Are you aware of any action being taken in the Bureau of Ships to increase the safety of THRESHER class submarines?

A. Yes, sir. The Bureau presentations, there have been many items discussed of the mechanical nature, and there are some others that have been mentioned that are being done. Relative to the matter of instructions, we are instituting a damage control book which we have not had heretofore as part of the ship's information book series. These books will include the results of studies that are being made now relative to the ship, the damage control features of the system, pointing out in particular the things that you people have pointed out. We have not told them in writing; now they will be in writing. We are studying further, particularly in the light of the tests that you gentlemen had made here, better protection; not words in the specification, but something that we can do better to isolate our electrical plant from the effects of salt water. Continuing vent system improvement or major elimination of the vents. Changes to the ASW system which would include not only additional valves, automatic sensing system, automatic closure system, b(3) 10 USC 130 and the ability at any time, in any space, to isolate that space from the effects of sea water, from any other space. An emergency blow system is well on the way. Remote operation of valves as a part of the over-all studies of the ASW system will also include further work on other sea water systems in the ship. Automatic securing devices and reductions of openings have been mentioned.

Further work is being done on plane recovery, both from the standpoint of mechanical limitations as one possibility, or other methods preventing stern plane dive jam or recovering therefrom. Increased air capacity for all ships is under consideration for immediate implementation. A Change Order came out yesterday explaining the ultrasonic inspection of sil-brazed joints throughout the submarine Navy, effective 1 May, with a report of all joints that haven't been inspected prior to that time for Bureau decision as to on what schedule they will be corrected. We are looking at another item which involves the over-all design, the design of the submarine, not just the details, but the deviations that follow yards may make from this design. This is a project, particularly since the beginning of the studies for the fiscal year '63 submarines, in trying to insure ourselves that follow yards do not deviate. We have allowed them in the past, and we are restudying the areas wherein we must say, "Thou shalt not deviate." Another area from a standpoint of increasing recovery capability is to insure the integrity of the hydraulic system further by putting the critical valves which are depending on hydraulics all accumulated to insure one closure of the critical valves even with the complete loss of the hydraulic system. Many of these items have been studied over the past many years. At this point, they are being brought up as some of the items for consideration by the Change Review Board in a matter of weeks, instead of a matter of years. How many will go, I cannot say, but these are some of the directions that will go.

Q. With reference to the design and construction of THRESHER, from your position in the Bureau of Ships, how would you evaluate the condition of responsibility of the Design Division, technical codes, and the submarine type desk?

A. The Preliminary Design Division in the Bureau of Ships is responsible for the first go-around on the over-all ship. There they maintain a responsibility, namely, in the hydrodynamic field throughout the life of the ship. The contact design code, that's Code 440, picks up and mainly holds the responsibility through the life of the ship for structure, theoretically and practically. That is a study of what kind of phones you should have and model studies to test them. They hold some hydrodynamic responsibility; these they never lose. Code 430 is responsible for the engineering plant. Individual codes to individual systems, but 430 for the plant. Again, through the life of the ship, Code 525 picks up from the Design Division the current responsibility for changes and design at the time the contract design is finished.

Throughout the rest of the life of the ship, Code 525, as the leader of the team, accepts the recommendations from others, but adjudicates, unless overruled by higher authority. Individual technical codes are again mainly responsible for individual systems. This relates back to the damage control studies wherein there is a difference in approach between the man who is responsible for a PUFF, a man who is responsible for a system, and a man who is responsible for the ship. Some technical codes have items, some have systems, and a few, the type desk and the 435 progress people, have ships.

Unclassified

EXAMINATION BY THE COURT

Questions by a member, CAPT Osborn:

Q. One question. With respect to the instructions which you gave on the auxiliary sea water system, as I understand it, with the design of the constant vent system as they existed in the initial phase of construction of THRESHER, is it impossible to operate a plant b(3) 10 USC 130

A. The loss of the constant vents were open before the check valves came in we always had the possibility of an interflow, and actually, considering the size of the line, a major break b(3) 10 USC 130 the system, if you shut the big valves on that size of the system, the force flow would not effect the venters, but should have been isolated and that was why we developed the check. The reason why the checks were not in originally was because that particular item had never been heard of before, apparently, and it took them halfway through the detailed design of THRESHER's PSA to have those things developed and thoroughly tested.

Questions by the president:

Q. Commander Woolston, you said that casualty studies which you had conducted here at Portsmouth during the building of THRESHER, were not written down in the Instruction Book on THRESHER; why?

A. The Instruction Books followed early ones in content. Originally this was just descriptions, which included some studies on casualty control. The casualties in these were nothing like as serious as the one we had during most of the changes of the system rules where we would start to play it out with the people around and have a head-knocking session over it. These were the kind of studies that resulted in the systems that we have. The intent of most of the studies was not so much what you would do in case, as what we would have the system do that will limit the damage that will result from these things, that will maximize the inherent capability of the system to continue itself continuously.

Q. Now you have said that one of the things which is currently being done by the Bureau of Ships to increase the safe operation of modern submarines is the institution of the damage control book.

A. Yes, sir.

Q. Who will have the responsibility for preparing that damage control book?

A. The damage control book would have to be prepared by the individual yard. Normally, what we would do, the lead yard, design yard would prepare this, and modifications would be made by the following yard. The requirements for what goes into the boats will be laid down in detail by the Bureau of Ships.

Q. Do you recall when you had the casualty studies made during building THRESHER, whether or not the philosophy that pervaded those studies was one of quick closure of the main sea valves in the event of a rupture in the ASW or other high pressure systems, or was it to look for and isolate the cause of the leak?

Unclassified

A. I never considered that it would be possible to wait and find out where a big leak was coming from.

Q. It was apparent to you and those associated with you in these studies that at that depth, and with the pressure obtaining at that depth, a leak would not permit a sufficient span of time to go looking for the cause?

A. With the exception of the hull line, the continuous vent, the answer is yes; that is correct.

Q. You fully realized that if you shut down your system by closing the sea valves, that you were depriving the ship of coolant water for its many heat exchanges?

A. Yes, sir.

Unclassified

Q. Did you, at that time, realize that there would be a significant difference in the length of time that the main propulsion plant could be continued in operation if the pumps were running at slow, rather than at fast?

A. Yes. I do not remember whether we did or did not have pumps in mind at deep depth in the early sea trials; I do not remember.

Questions by a member, CAPT Osborn:

Q. If you remember this so well, you relate some details factually on how long you can run at fast or slow, right now.

A. At high speed, b(3) 10 USC 130 We had some original calculations on the main condenser from the standpoint of your plant. It was recognized that the main plant, if you shut your sea water system down, it's out, we figured b(3) 10 USC 130

Q. At what power?

A. At full power b(3) 10 USC 130 and at small power it might last b(3) 10 USC 130 I do not feel that once you shut the sea valves that you can get significant power from the main propulsion plant for any appreciable length of time.

Q. The question wasn't related to the shutting of main sea valves; the question was shutting the auxiliary sea water lines; I mean the main valves in the auxiliary sea water system. I don't question your calculations with respect to the main condenser; I do seriously question whether the calculations were made on the auxiliary sea water system.

A. Calculations were not. We did not run, and I don't think they've ever been run since, on main air ejecter after condenser. Once the main ejector after condenser loses its water you've got two problems, the loss of vacuum is only one of them. The other is your dumping of steam.

Q. I think Admiral Austin's question on this was the importance and the transit involved of shutting auxiliary sea water valves instantaneously with respect to the effect on b(3) 10 USC 130 other insulary equipment, such as coolers, etc. If you do have that detailed information and you have made those calculations yourself, then you are one of the few.

A. No, these are not calculations, Captain, these are studies of what would happen qualitatively. We did not go into it quantatively, and I could not at that time have given you any more than "Yes, we ought to keep power if we can" with the hope that you would only lose b(3) 10 USC 13(the system, at worst, that you would get a leak that would be significant, that you would shut b(3) 10 US the ASW system down.

Q. What was the current thinking operating with respect to this casualty?

A. Of what should be done?

Q. Yes. Not in retrospect; I'm talking about the THRESHER prior to 8 April.

A. Basically, on how you set your system up, the approach was, we can shut it up this way and this is what can happen, or you can shut it up your alternate way and this is what you buy yourself, or what it costs you. With the ASW system.

Unclassified

the first re-do of the system after contract plans, put in this longitudinal threat in the system and looked at the fact that we would anticipate if a sea water leak occurred on the ASW system we would b(3) 10 USC 130 and everything we had, in order to be in the best position. For this you would have to acknowledge before you started, before you went into any evolution where you might get this casualty, "Do I want to be stiff before I go in, I want to try to isolate it if I go in."

Q. Now, that's the question I want to know, was it a complete isolate, completely isolate, no delay, or look and see?

A. If you are shallow this is a possibility. If you are shallow, then leaving b(3) 10 USC 130 gives you your best chance of maintaining a flow in the event of a leak, because then you can take it. As you go deeper you want to be harder in your systems. You want to have less loss due to flooding. You can afford less flexibility and water continuance. That is the b(3) 10 USC 130 b(3) 10 USC 130 main sea water system as a case in point. b(3) 10 USC 130 to be sure that you keep those condensers on the line, but the safest thing to do if you are shallow is b(3) 10 USC 130 you will immediately get a little sea water b(3) 10 USC 130 On the other hand, if you go down deep you have a better chance of keeping your whole plant on the line if there is a capability of b(3) 10 USC 130 The situation changes just as the situation changes is how I would prefer. This is all opinion, how I would prefer that the air banks stock failed.

Q. From your discussion of the multiplicity of actions, I would interpret that you would investigate the flexibility involved and made a decision rather than make an automatic.

A. It is always hoped that you make every decision before you are faced with the necessity of doing so. One of the items that goes into it is where you are and the decision as to how your plans should be set up is a function of your depth, I think. This would be my approach and this kind of thing was presented to the operators. "If -- here is what could happen: here are your choices" and the damage control book again, at least currently, unless doctrine would indicate that you have set specific depths to designate your rigging for near surface, you would have two setups, or maybe more than two setups. The same situation on the hydraulic system, with the multiplicity of options that you had there, as to what you gained and lost, and pressure demand versus constant pressure.

Neither counsel for the court, the court nor counsel for RADM Palmer, a party, desired further to examine this witness.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was warned concerning his testimony and withdrew from the courtroom.

The court recessed at 1600, 8 May 1963.

The court opened at 1615, 8 May 1963, behind closed doors.

All persons connected with the inquiry who were present when the court recessed were again present in court, with the exception of (b) (6), who was relieved as reporter by (b) (6).

No witnesses not otherwise connected with the inquiry were present.

William H. Eckhart, a civilian, was called as a witness for the court, was informed of the subject matter of the inquiry, was advised of his rights against self-incrimination, was duly sworn, and examined as follows:

COUNSEL FOR THE COURT: Mr. Eckhart, this is a closed session of the court. Classified information can be given here.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, address, and present occupation.
A. William H. Eckhart, (b) (6) Chief Design Engineer in the Portsmouth Naval Shipyard.

Q. How do you spell your last name?
A. E-C-K-H-A-R-T.

Q. When did you become the Chief Design Engineer of this Shipyard?
A. On the 1st of April 1958.

Q. Would you briefly describe your professional and educational background and experience?
A. I was graduated from Rhode Island State College in Kingston, Rhode Island, with a degree of Bachelor of Science in Mechanical Engineering in June of 1938. I came to work at the Portsmouth Naval Shipyard on the 3rd of January 1939 as a Junior Marine Engineer. I worked in the mechanical or marine engineering field until May of 1947, at which time I became supervisor of the Ordnance Section, and held that post until June of 1954. In June of 1954 I became supervisor of the Mechanical Branch and held that post until January of 1956. I had a little over one year in value engineering as a general engineer from January, 1956, to April of 1957. I was Deputy Chief Design Engineer from April of 1957 to April of 1958, at which time I became the Chief Design Engineer.

Q. My questions now will relate to that period during the construction of THRESHER after the contract design work was completed.
A. Yes, sir.

Q. Will you describe the organization of the Design Division during the project design period of THRESHER's construction?
A. At this time we had, of course, a Design Superintendent, who was a naval officer, and Assistant Design Superintendents, who served as Project Officers for specific tasks. Then in the civilian organization, I was the Chief Design Engineer. My principal assistant was Ralph Means as Deputy Chief Design Engineer. I had three major technical assistants, Mr. Dunham in the Structural area; Mr. Cerilli

in the Marine-Mechanical area; and Mr. Spear in the Electrical-Electronics area.

Q. Describe and discuss your responsibilities as Chief Engineer, Design Division, so far as THRESHER was concerned.

A. I was principally concerned with the administration of the division, the application of manpower, other various problems which arose, the development of procedures for handling work. The technical decisions were handled primarily through the Project Officer, the Assistant Design Superintendent.

Q. Chiefly, then, your duties were those of personnel management and administration of the Design Division?

A. Yes, sir.

Q. Do you recall participating in any technical decisions involving design work done in THRESHER?

A. I participated in discussions leading to technical decisions, supplying information and background knowledge which I might have had from earlier work.

Q. How were the technical decisions to which you have alluded consummated?

A. In general, after such discussions, the technical codes would prepare correspondence which was routed through the chain of command and eventually signed out, if the matter required Bureau decision, or if it involved a change in specifications. If it were within local control, these decisions were finally consummated through the Project Officer, who directed or guided the technical course of action.

Q. Was there a formal committee established to assist in making technical decisions in the design area?

A. Particularly in connection with the PSA, yes, we had a Design Review Board. If you go back to the early stages of the project development, we did not have a formal group such as the Design Review Board.

Q. Apart from that difference, did the functions performed by you and the responsibilities laid on you change any from the time to which my original questions were directed through the period of the post shakedown availability of THRESHER?

A. No, sir, not significantly.

EXAMINATION BY THE COURT

Questions by a court member, CAPT Osborn:

Q. How many times have you ridden the THRESHER?

A. I did not ride that ship.

Q. How many submarines have you ever ridden?

A. Oh, I would guess somewhere between half a dozen or a dozen.

Q. The design work undoubtedly which you've been subjected to, the technical discussions of the subject, either had no technical feasibility and practically was impossible actually to translate it into cold hardware. How do you think you can do your job unless you actually ride a ship?

A. Although I have not ridden THRESHER, I have ridden -- The most recent ship which I rode was the BARBEL. With that information, and with my responsibilities in the area of administration and application of manpower, and with my technical code people working through the Project Manager, who, in this case, was an Assistant Design Sup, I feel that the technical aspects were adequately covered.

Q. It would be your opinion that the Chief Design Engineer would be a personnel man, is that correct?

A. Personnel man, no. An administrator of the division, yes. There are many things strictly beyond personnel involved: general procedures for accomplishing work. One of the major fields in which I have devoted effort was also the alignment of the content and format of our documents to best serve the needs of the Production people, who must work with them. There comes to be between the technical and the administrative work a sufficient volume that it must be divided on some basis. In our case, the technical work was handled through the Project Officer, and the administration through me.

Q. One of the toughest examination questions recently given to high school seniors with respect to entering the leading prep schools in the United States was, "What was Herman Wouk's primary objective in the Caine Mutiny?" Could you give me a one sentence dissertation on what you think was the objective of that book?

A. No, sir.

Questions by the president, VADM Austin:

Q. Mr. Eckhart, the THRESHER design was a new design, relatively speaking, was it not?

A. I would say it was new primarily in the degree of refinement which allowed it to go deep and to run quietly.

Q. Well, in those two areas it forged new frontiers, as it were, did it not?

A. Yes, sir.

Q. It made necessary the advancement of the state of the art in welding, for example, which had not been faced up to before, did it not?

A. Yes, sir.

Q. And also in the area of silencing machinery which has a tendency to be noisy and which required lots of mountings that are not normal on older submarines, is that correct?

A. It required many new mountings, but these developments were evolved from known and proven hardware.

Q. What about the b(1) in pipe lines; were those an evolution from older ships?

A. They were an evolution and a development which was tested under our Project Pressure and put through very rigorous tests before they were allowed to be installed aboard the ship.

Q. In your association with the design of THRESHER, did you consider it a sound design?

A. Yes, sir.

Q. You did not feel that it was taking too much of a quantum jump in any area?

A. No, sir.

Neither counsel for the court, the court, nor counsel for RADM Palmer, a party, desired further to examine this witness.

The president of the court informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

The court was cleared at 1635, 8 May 1963, for deliberative session.

The court adjourned at 1805, 8 May 1963.

Unclassified

TWENTY-THIRD DAY

Portsmouth Naval Shipyard
Portsmouth, New Hampshire
Thursday, 9 May 1963

The court met at 0834 hours with closed doors.

All persons connected with the inquiry who were present when the court adjourned were again present in court, with the exception of (b) (6) who was relieved as reporter by (b) (6) . RADM Palmer, a party, and LCDR Hecker, a party, and his counsel waived their right to be present at this session of the court. Counsel for RADM Palmer was present.

No witnesses not otherwise connected with the inquiry were present.

Samuel R. Heller, Jr., Captain, U.S. Navy, a former witness for the court, was recalled as a witness for the court, was reminded that the oath previously taken by him was still binding, and was examined as follows:

COUNSEL FOR THE COURT: Captain Heller, this is a closed session of the court and classified information may be divulged here.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. Have you prepared additional presentations with regard to the effect of certain postulated flooding conditions in THRESHER?
A. Yes, sir, I have. I have a series that were requested by various members of the court. Do you have any desire as to order of presentation, sir?

Q. I think whatever order you have arranged would be satisfactory.
A. At one of the earlier sessions there was some skepticism regarding the conditions used by this Shipyard and the Electric Boat Division in conducting certain studies. The Bureau of Ships got the two activities together, squared away the assumptions, so that both activities are now using the same input information, and we used the two studies previously presented by me as the check problems to insure that the differences between the analogue computer used by Portsmouth and the digital computer used by Electric Boat were, in fact, producing the same answers; and I am happy to report that this check has been made and the two computer systems are producing the same answers.

The chart that I have here (referring to a chart numbered "1") represents the variation of flooding times with hole size for two conditions of blow. Now, in both of these studies all main ballast tanks are blown. There is a delay in starting the blow of fifteen seconds from the time of starting of flooding. The discharge co-efficient of the casualty is assumed to be eight-tenths. As before, the expansion of the air is assumed to be adiabatic. The banks are charged to b(1) pounds per square inch. This indicates that for the use of the so-called Captain's Air Bank, that's Air Bank Number One, ninety-six and a half cubic feet of continuous flooding of a hole two-thirds of an inch in diameter can be sustained indefinitely by blow; and for the entire four air banks, 405 cubic feet, that a hole slightly larger than one and three-eighths inches

Unclassified

can be sustained continuously, with the hyperbolic variation as the time, as the function of the hole size.

Questions by a member, CAPT OSBORN:

Q. One question. Where is the flooding in this case?
A. The engine room, sir. The hole size and the flooding time is really independent of location, but because of the studies that have been performed by both activities, for the purposes of this chart the computers were left along and the flooding went in the engine room.

Q. The only thing I'm really interested in, in all your studies, Captain Heller--the trim effect of the position of flooding is included in the problem?
A. Yes, sir. I understand this.

Q. All the charts will be with engine room flooding?
A. Yes, sir. The second check problem was the variation of flooding times with hole size with the initial ship's speed being eight knots, and with the ordered hard rise on the stern planes, fifteen seconds after flooding starts, and with a constant reduction in speed due to plane angle of one-eighth, which was then maintained thereafter. The main ballast tanks were not blown. The flooding discharge co-efficient was again taken as eight-tenths. (The witness posted and referred to a chart marked "2".) This indicates that the maximum size hole for continuous flooding that can be sustained with this speed condition is slightly less than one and a quarter inches, 1.19; and, again, a hyperbolic variation of flooding time at hole size.

Questions by a member, VADM DASPIT:

Q. What was the maximum angle you permitted the ship to take?
A. We did not restrict the angle on the ship, Admiral.

Q. I thought with your earlier curves you pretty soon reached the point of stall where speed didn't help any at all?
A. That's correct, sir.

Question by a member, CAPT HUSHING:

Q. That's ground into these curves, I assume.
A. Yes, sir, but we did not restrict the angle.

Questions by a member, CAPT OSBORN:

Q. Let me get this straight in my mind. Did you leave the stern planes on hard rise all the time?
A. Yes, sir.

Q. Well, really, what you do is after a guy passes something like fifteen or twenty degrees, he'd probably go back down, dive--right?
A. That's right. A word of amplification. There must be an infinite number of varieties of combinations of effects and the computer can only handle a certain number of them at any one time.

Q. If we want to correct these particular curves for a co-efficient of discharge, a variation of this particular thing, say, between five-tenths and eight-tenths, roughly, how do they vary?

Unclassified

A. You do it by changing the linear scale of the abscissa, this point one inch diameter, with a discharge co-efficient of eight-tenths, corresponds to the velocity through a hole that is slightly less than two-thirds of a square inch. So, all you have to do to change the discharge co-efficient is buggar the abscissa accordingly.

One of the ground rules agreed to at this meeting between the Bureau of Ships, Electric Boat Division, and the Portsmouth Naval Shipyard was that for future work in casualty recovery that we standardize on a linear scale one inch in the abscissa to be one inch hole size and a discharge co-efficient of one, so that the transformation would be even easier. As indicated before, the first chart, and this one were the check problems. These were precisely the same conditions previously furnished to you by me and by the Electric Boat Division separately. We are now using the same assumptions, same ground rules, and we have the same results.

(The witness posted and referred to chart numbered "3".) The court requested a set of studies approximately two weeks ago to attempt to match times furnished by other testimony. The ground rules given at that time were to assume a flooding discharge co-efficient of b(1) to consider the water to be iso-thermal, forty degrees Fahrenheit; to include the hull compressibility and compressibility of water; the air banks to be charged to b(1) psi, all air banks available; initial ship speed of eight knots. You then requested to study the effects of two, three and four inch holes with the casualty starting at clock time 9:11; and at this time of 9:11 a series of things were ordered: that the ship was to take a twenty degree angle to level off at 120 feet; that shortly thereafter the reactor was to SCRAM; and that, when the ship had slowed down enough, the line shaft propulsion motor, the so-called emergency propulsion motor, was to be cut in at the earliest possible time; and answer bells at thirty-nine rpm; and then at 9:14 the blow of all main ballast tanks was to commence; that at 9:17 there was a UQC transmission that said, "blank-blank test depth;" and that at 9:18.1 the first implosion was heard. We were asked to study continuous flooding and flooding at various times to determine as best we could what would match the time scale. Now, for the two inch hole, the ship would initially tend to rise due to the speed effect and the ordering of the angles on the planes, goes over the hump and comes back down. Now, if the flooding is continuous, at the end of six minutes, these curves diverge. Continuous flooding carries it out and eventually below collapse depth at seven hundred and, oh, about twenty seconds after the start of the problem, twelve minutes. But if the flooding is secured at six minutes, which would be 9:17, under the conditions given, the ship would then be saved and return to the surface. So, at this point, we stopped studies of the two inch hole.

(The witness posted and referred to chart numbered "4".) The three inch hole was next studied under the same ground rules; and, here, a larger number of curves are plotted with the divergence points coming at the time that the flooding is secured. The lowest one for continuous flooding crosses the collapse depth point at two hundred and eighty seconds about, which is four and two-thirds minutes. This is short of the 9:18.1 by a considerable amount. The case of securing the flooding at four minutes extends the time but slightly to collapse. The three minutes time for securing flooding projects it a bit further. And for two minutes, the ship can survive.

(The witness posted and referred to chart numbered "5".) A four inch hole was also studies and the same typical pattern is produced. In the case of

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continuous flooding, collapse is reached at two hundred and ten seconds, or three minutes of flooding, at about nine--I beg your pardon--at about two hundred and twenty seconds. For the two minutes of flooding, at about nine-fifteen, corresponding to a flooding time of about two hundred and sixty seconds. And if the flooding were secured in one minute, the ship could survive.

Questions by a member, RADM DASPIT:

Q. On your blowing assumption, I assume this is presuming you blew all you had?
A. Yes, sir.

Q. Have you any idea what the rate of blow was?
A. Yes, sir. The assumed rate of blowing initially was seventeen pounds per second. This has been confirmed by a series of blow tests made at several activities since the problem was started. However, as I'm sure the court is aware, the basis of these studies was what we would call a normal blow. an adiabatic expansion starting with the initial blow rate of seventeen pounds per second. and there is some experimental indication in one case that, with certain obstruction in the line, this would not be realized.

Admiral Daspit asked a question that we consider how much water would be taken aboard the ship if it started at b(1) feet and was to reach b(1) feet in seven minutes of time. The flooding discharge co-efficient was taken at b(1) to be consistent with the rest of our studies. No initial negative buoyancy was considered; no hull compressibility or water compression; the water was considered to be iso-thermal; ship had an initial trim by the stern of five degrees.

Q. That means down by the stern?
A. Yes, sir. (The witness posted and referred to chart numbered "6".) Now, for the condition for no blow and no speed, just the hole open to the sea, for a b(1) diameter hole--we had to work the problem by surrounding it--seventeen tons of water were taken aboard and it took a bit more than nine minutes to get to the b(1) foot mark. For a b(1) diameter hole it took a bit more than six minutes to get to the mark and forty-one and a half tons of water were taken aboard. And by interpolating between the two, we came up with a hole b(1) inches in diameter, corresponding to twenty-four and six-tenths tons of water that would meet the problem.

Q. This is continual flooding?
A. Yes, sir, this is continuous flooding. Now, the corollary to this, the companion study, was what would be the condition if there were no speed but there was an immediate blow of all main ballast tanks; and, as before, in order to match the time scale, we assumed two different holes and then interpolated between them. (The witness posted and referred to chart numbered "7".) A b(1) inch diameter hole corresponding to flooding of 110 tons took us out to five hundred and seventy seconds, nine and a half minutes. A b(1) inch diameter hole with a corresponding flooding of one hundred and fifty-eight tons at about the 5.2 minute mark; and, by interpolation, the b(1) diameter with 117 tons coming aboard matches the time scale desired. Now, this is continual flooding, Admiral Daspit, and not quite the answer to the question that you asked. We have found since then a way of answering your question in a little different fashion, which is to give you the immediate gulp of all the water at one time and then securing; and, with your permission, I'd like to present that.

(The witness posted and referred to chart numbered "8".) This came about as a result of the studies requested by Captain Osborn. His question was, "What was the additional negative buoyancy required to fit the time scale assuming no flooding, just the ship being heavy, and the heaviness being due to the temperature rise in the water, hull compressibility, the pressure of water, and some additional negative buoyancy at the start of the dive?" And he took away my speed, expect for the EPM. So, this is essentially the same conditions of the initial study requested by the board except that flooding is not now considered. This is a case of just being heavy. If the ship is 5,000 pounds heavy, it can survive. If it is 13,000 pounds heavy, it will continue waiting for a perturbation to kick it up or down, a thermal layer that would change the effect of the heaviness, or eventually unwatering the boat in a small amount through the drain system. These two figures appeared significant to us and they were included, although not requested. To match the 9:18.1, which is very nearly, Admiral Daspit, the question that you asked, the ship would be 45,000 pounds heavy under these conditions and match the time scale. The 50,000 pounds heavy would take it to the b(1) foot mark, which is the answer to the question raised by you, sir (addressing Admiral Daspit). The 35,000 pound heavy mark is merely added here to give you a feel for the spread of the additional negative buoyancy.

Questions by a member, CAPT HUSHING:

Q. I notice at the top there is the normal scale and information that you've used on all the other charts. At 9:14, for instance, commence blowing all main ballast tanks. Do I understand blowing was started at that point?
A. On one bank, Captain Hushing, Captain's Air.

Q. You have one bank?
A. That's all.

Q. And how much water does one bank displace in, say, two minutes to three minutes?
A. I don't know how to answer that question as yet as a result of the blow tests that have been conducted recently. It's not the same as we had initially believed.

The eight charts referred to by the witness in his testimony, together with two charts entitled, "ASSUMPTIONS," were submitted to the party and to the court, and were offered in evidence by counsel for the court with the request that permission be granted to substitute photographs therefor at the conclusion of the court. There being no objection, they were received in evidence as Exhibit 174 and permission was granted for the substitution of photographs therefor.

Questions by counsel for the court:

Q. Captain Heller, do you have in your possession copies of the results of the main ballast tank blows conducted during THRESHER's initial building trials?
A. Yes, sir, I do; here they are. This is a Verifax copy of the completed shipboard Test Memorandum entitled, "BLOWING MAIN BALLAST TANKS." This covers a blow with high-pressure air at sixty foot depth and a low-pressure blow at essentially the same depth.

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Q. On what date did the blows occur?
A. May 31, 1961.

Verifax copies of the results of the Main Ballast Tank Blows, conducted during THRESHER's initial building trials on 31 May 1961, were submitted to the party and to the court and were offered in evidence by counsel for the court. There being no objection, they were received in evidence as Exhibit 175.

Q. Would you briefly describe the tests exemplified by Exhibit 175 and the significant data obtained?
A. The method of conducting the test was to start with the ship at the sixty foot depth, essentially stationary in the water, and to blow selected main ballast tanks, in this case, all dry, by using the high-pressure air system feeding the ballast blow. Banks Number 2 and 3 were on line, with Bank 2 at b(1) psi, Bank 3 at b(1) psi. The blowing time was thirty-four seconds. The ship surfaced at the rate of one-half a foot a second and took a small five degree up angle in the process of surfacing. The bank pressures after the blow were b(1) as read at the ballast control panel. This was not a particularly significant test; it was routine.

Q. Are the high-pressure air and main blow systems in TINOSA similar to those in THRESHER?
A. Yes, they are.

Q. Have tests of TINOSA's high-pressure air and main ballast blow systems been conducted?
A. Yes, sir.

Q. Was the purpose to determine time versus pressure relationships?
A. Yes, sir.

Q. And any indications of difficulties that might have been experienced by THRESHER in operational use of her systems?
A. It is my understanding that the initial reason for conducting the blow was to determine the pressure-time relationship to serve as a starting point for additional computer studies on casualty recovery methods.

Q. Would you then describe the tests conducted?
A. Yes, sir. The banks were charged to as high a pressure as was conveniently possible, which was b(1) psi; rated storage pressure is b(1) All banks were put on the b(1) pound header, thermocouples were put on selected valves to record temperature as a function of time; and two very accurate IC air gauges were cut into the line, one on the b(1) pound header, and the other on the b(1) pound header, so that they could be mounted in the same location and photographed with a very high speed motion picture camera along with a timing clock. The timing clock was triggered by actuation of one of the blow valves. In the initial run on TINOSA, this was Main Ballast Tank No. 1 blow valve.

The sequence of operations was for the operator at the ballast control panel to flick the blow valve actuators coming from right to left--this is Main Ballast Tank No. 1 forward group, aft group, just as rapidly as his hand could come across these three switches. As the Main Ballast Tank No. 1 blow valve was opened, the clock and the camera were started, and away we went.

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The initial run conducted on Friday last continued for a period of some eight minutes. The drop initially at the b(1) pound header in fifteen seconds was, roughly speaking, a b(1) psi; and thereafter it trailed off very slowly about b(1) psi in the next six-odd minutes. A corresponding reading on the b(1) pound header was that in the first fifteen seconds it dropped about b(1) psi and continued very rapidly down that same relationship to about four and a half minute mark, when it began to level off close to b(1) psi. This indicated, on the surface, that something was blocking the b(1) pound reducer and, not being sure of what this was, we reran the same test under the same conditions on the evening of 6 May--I beg your pardon, at noon on 6 May, and we essentially repeated the results.

We decided that we had best find what the obstruction in the line was and opened up the two b(1) pound reducing valves and found that a small strainer element in each valve at the inlet port, the b(1) pound side, had been buckled, crushed, and effectively blocked about two-thirds of the port area. These were removed and later that same evening, 6 May, we ran the test again. The system then performed essentially as expected and in good agreement with predictions. The drop on the b(1) pound header in fifteen seconds was approximately b(1) psi; it continued down at a hyperbolic fraction reaching the b(1) psi mark at six minutes. The b(1) pound header followed it essentially parallel at b(1) psi after the minute and a half mark, and this was almost exactly what had been forecast.

At the request of the court, a similar blow was conducted last evening where the actuation of Main Ballast Tank No. 1 blow valve was not involved. The forward and aft group blow valves only were used. There was essential duplication.

Q. Do you have records of these tests?
A. I have these on a plot, sir, and can produce as many additional ones as you want. I have indicated how they went by time. Tabulated data can be made available if you prefer.

Two graphs depicting the results of tests performed on USS TINOSA's high-pressure air and main ballast blow systems were submitted to the party and to the court and offered in evidence by counsel for the court.

Questions by a member, CAPT OSBORN:

Q. I have one question on this particular deal. I understood that the half life on these particular banks was eighty seconds, Captain Heller. The half life on here is over 300 seconds. What's the discrepancy on that?
A. The difference here is the difference in ground rules that became evident in earlier testimony. The figure you quote for the half life was based on the initial Portsmouth assumption of flow rate. These curves presented today indicate the initial rate actually achieved across the board in several actual flow rates and is expanded theoretically from that initial rate; and therein lies the difference between what was presented earlier and what is presented now.

There being no objection, the above-cited graphs were received in evidence as Exhibit 176.

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Questions by counsel for the court:

Q. Of what material was the strainer which you discovered in the high pressure line?
A. This was a non-corrosive, non-ferrous metal of the copper-nickel family, very fine mesh.

Q. Could you describe its size and exact location?
A. In words, this may become difficult; I will try. The basic strainer element was a small cone, perhaps an inch and a quarter, inch and a half altitude. The diameter of the cone at its mounting place was approximately three-quarters of an inch with a clear orifice in the mounting plate of about five-eighths of an inch. It was located in the inlet port of the reducer valves with the conical end pointing upstream, towards the flow.

Q. To the best of your knowledge, are there any instructions which require the removal of inlet strainers from the b(1) pounds per square inch high-pressure air reducer installations?
A. There are no instructions that I know of that require it. There has been a recommendation by this Shipyard to the Bureau of Ships and to the two Force Commanders that these be removed from the several reducers, seven to be exact, in the THRESHER class ship.

Q. When was that recommendation made?
A. Tuesday evening, I believe.

Q. Are you able to describe the underlying reasons for retention of the inlet strainer assembly in the original installation?
A. I can only give you opinion, not fact. It is my opinion that because of the difficulty experienced with the scoring of the seats of these reducers, which was attributed by the operators, the builders and the valve manufacturers, to be the effect of dirt carried into the valve, that these were inserted as a late modification to protect the seats of the valves.

Q. Do you have any reason to believe that a similar strainer was installed in a similar place in THRESHER's system?
A. Again, I can only give you opinion. I do not know for a fact what existed, but my guess is that they were there.

COUNSEL FOR THE COURT: Mr. President, counsel is prepared to offer evidence on this point.

PRESIDENT: Very well.

EXAMINATION BY THE COURT

Questions by the president, VADM AUSTIN:

Q. Captain Heller, as I understand your testimony, the conical strainers of approximately three-quarter inch diameter which were installed on the high-pressure side of the b(1) reducer were provided for in the specifications for that valve?
A. No, sir.

Q. Will you clarify this point?
A. They were provided by the valve manufacturer in addition to, as something over and above the specifications.

Q. Was the change to the specifications of this "over and above" provision by the contractor tested for feasibility, safety and practicality?
A. In the shop, sir.

Q. In the shop. In which shop?
A. In the manufacturer's shop for the qualification testing of the valve, and on numerous occasions within the Shipyard to insure the tightness of the valve, that the proper reducing action was done, and that the built-in relief feature of the valve did, in fact, relieve at the proper pressure, incident to a sequence of rework when seats were scored on any number of ships. All ships currently building at this yard, with the exception of DOLPHIN, have the same type of reducers.

Q. With the same strainers upstream?
A. To the best of my knowledge, yes, sir.

Q. And on none of these tests which you have just described did such a clogging of the reducer as was experienced in TINOSA found?
A. To the best of my knowledge, none were so found, sir.

Q. From what source are these strainers obtained?
A. These were furnished by the valve manufacturer, the Marotta Corporation, Boonton, New Jersey.

Q. Are we certain that the strainers in TINOSA and in THRESHER when she was lost were, in fact, strainers furnished by Marotta Corporation?
A. Again, I cannot speak from personal knowledge, Admiral. I can only speak from intuition that the answer to your question is yes. To the best of my knowledge, there have been no strainers manufactured locally or provided by other manufacturers that would fit these particular units.

Q. Captain Heller, do you have any opinion which might explain the known failure of this kind of strainer in the case of the TINOSA test and the possible failure of these strainers in the THRESHER?
A. May I answer that as one question, rather than two which you have stated, sir?

Q. What is the need for changing the question?
A. I prefer to answer one question at a time, Admiral. May I answer first regarding the TINOSA, sir?

Q. Yes.
A. It is my opinion that with the long, sustained blow, with the speed of airflow and the consequent reduction in temperature, that there was a gradual frosting or icing on the mesh of the strainer element until it became essentially a thin membrane, at which point it performed as every other shell would when subjected to high pressure; it would tend to snap through, to buckle.

Q. Now, would you answer my question regarding the possible failure to a similar conical strainer in the case of the THRESHER?
A. This is even more difficult to answer because I am not aware of the situation that existed on the THRESHER that would correspond in any way to the blow test that was conducted on TINOSA. I can only hazard a guess.

Q. That is what the court asks, Captain Heller. If we all knew what happened on the THRESHER, this court of inquiry would not be sitting and going through the laborious task of seeking information such as I now seek from you.

A. I realize the reason for the question, Admiral, but I am not privy to any particular information which indicates that a blow was conducted or attempted on THRESHER with the exception of the guidance furnished by this court in providing guidelines for the conduct of casualty studies.

Now, if such a blow were attempted and if it had extended for a period of a minute and a half or more and the same general moisture were present in the air system on THRESHER as apparently existed on TINOSA, then a similar incident could have happened, in my opinion.

Questions by a member, RADM DASPIT:

Q. In regard to your estimate of the cause of failure of the strainer on TINOSA, and your earlier testimony that this strainer had been tested by the manufacturer and at numerous times in the shop, I would conclude, then, that either none of the manufacturer's tests or the shop tests had been of long duration or the air had absolutely no moisture in it at all. Could you comment on that at all?

A. Yes, sir. I would think that the duration was the compelling difference here, sir. Under normal circumstances, the valves are tested hydrostatically for tightness, dried, and then subjected to a very short period of pneumatic operation merely to show that they would open and close, relieve, and secure at the proper times.

Q. Has the Portsmouth Yard instituted any changes in their testing procedures in the shop as a result of this experience on TINOSA?

A. This is under way but cannot be done until a sufficient capacity of air is made available. We have scrounged around to find all available air flasks and have now acquired, by hook and by crook, enough to give us b(1) which corresponds to a typical air bank on an attack class nuclear submarine.

Questions by a member, CAPT OSBORN:

Q. I think that in this test the volume is extremely important and I want to ask you a technical question in this vein. Do you think that if you had, say, as dry air as we could get, say, saturated air at fifty degrees temperature, and you expanded it with respect to a blow, that even under those conditions it would be highly possible that you would frost up this strainer?

A. I would like a clarification, please. What is your meaning of the words, "saturated at fifty degrees"?

Q. I mean that the temperature, the vapor pressure of water is at fifty degrees and as much water as can go in the air at fifty degrees is present in the air. The attendant physical problem is that it is cool in the bank, naturally becomes available, probably be carried out by the velocity involved to the strainer and clog up the strainer.

A. I would agree with that.

Q. So, with our present techniques, we've got a good possibility, even under optimum conditions, of having a frosting on a strainer?

A. Possibly, yes. There are ways to avoid this within the existing technology. May I indicate at least one of them? In the conduct of the test

program on TINOAS this past week, we monitored temperatures on filters ahead of the reducer valves. These are separate from the valves and are provided basically to pick up any foreign matter that would be in the system; and they were located upstream of the reducer valves deliberately to protect these valves. The temperature dropped markedly as the flow continued, and frost was apparent on the outside surface of the filter body. And at one point in the blow, the flag popped up indicating that the internal bypass on the filter had been actuated, that there had been something that clogged on the filter cartridge to prevent normal flow, so that the pressure drop was above that specified for the item of equipment. Now, with this internal bypass, the blow continued right on. So, it is possible to solve these problems with existing technology.

Q. Where you have this particular problem, though, and you are going through the filter and you bypass the filter, obviously the filter, one would assume, frosted, and then bypassed; then your air that can go through goes right straight to the filter. Is that correct?

A. No, sir. Then the air that could go through bypasses the filter and goes to the downstream portion of the system.

Q. But it still goes through the reducer?

A. Yes, sir.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. I show you a letter, which is Exhibit 156 before this court, a letter from Commander, Portsmouth Naval Shipyard, dated May 9th, addressed to the Chief of the Bureau of Ships. Subject is: "Pipe joint inspection USS THRESHER." It has a very short text. It says: "It is considered by this Shipyard that no additional pipe joint inspection is required for USS THRESHER during PSA other than that which results from damage incurred during shock testing. All piping systems have been thoroughly inspected previously and further inspection would be redundant.

"2. Bureau concurrence is requested."

Did you sign this letter?

A. Yes, sir, I did.

Q. Would you please give us your reasoning and motivation which prompted you to write the letter?

A. There's a difference between signing a letter and writing a letter, sir. I approved it when I signed it. I did not prepare it. Now, the reasoning that underlies its preparation, and this must be taken in the time scale of the letter, was that following the first and second sea trials of THRESHER when there had been difficulties with the constant vent and the trim and drain systems, the Shipyard had conducted a very severe test of impulsing the trim and drain system, which led to a modification of speed and valve operation and a modification of the sequence of valve operation and pretty definitely indicated that the trim and drain system was sound. The constant vent line had been thoroughly inspected for material identification and for the tightness of its joints. The ship had then been operating in the late summer and early

fall of '61, had returned to the yard over the December '61 - January '62 period, and had undergone additional inspections and tests. It had been at this time at the Electric Boat Division for the shock hardening availability prior to the tests to be conducted at Key West. As a matter of fact, the ship was still at the Electric Boat Division when this letter was prepared, and we were aware of the tests and inspections that they were going to make and the results of the initial portion of it. We were further aware that the ship would be subjected to a very severe environment during the shock tests and its weaknesses, if any, would be unearthed at that time. Now, there was just enough doubt in all our minds that the Bureau concurrence was requested. We did not at that time have a firm handle on the post shakedown availability, and this was a way of getting one of the customers to circumscribe the work to be performed. And I would interpret the letter both as a releaser and the procurer of many similar, and the receiver of an equal number, that this was a "Poppa, get off and make a decision" type thing.

Q. In December, 1961, you said, there were additional inspections and tests performed in THRESHER. Were there additional inspections and ultrasonic tests to her vital sea water systems at that time?

A. I do not know. At that particular period in time, my duty at the Shipyard involved the ALBACORE and DOLPHIN and I was physically present, but technically aloof.

At this point, (b) (6) relieved (b) (6) as reporter.

Q. Yet you gave the fact of additional inspections and tests at that time as one of the underlying reasons for your confidence in the lack of a need for further inspection.

A. This was part of the backup information furnished by the man who prepared this correspondence. This the sequence of events.

Q. Who was that man?

A. To the best of my knowledge that was Lieutenant Commander J. H. Billings.

Q. Were you aware that the tests which were going to be made at Electric Boat Division were on the hydraulic system only?

A. No, sir, I was not, and I am not aware of that now.

Q. Yet you based some of your reasoning as to the lack of need for further tests, on the work to be done at Electric Boat?

A. That is part of the package. Part of the requirement for the Electric Boat Division's accomplishment during the pre-shock test availability, was to conduct ultrasonic inspections of silver brazed joints.

Q. You testified, in explaining the purpose of the letter, that there was just enough doubt in "all of our minds about this." What did you mean by in "all of our minds"?--Who were the "our"?

A. The people in the chain of command concerned with that letter--the Planning and Estimating Division, the Design Division and the Planning Officer. That letter was signed by me as the Acting Planning Officer during the absence of the regularly assigned planning officer.

Q. Could you mention those people by name who had doubt in their minds about this?

A. Yes. I would say that this was the Type Desk at that time, Lieutenant Commander Billings; his civilian assistant; his immediate superior Commander Madden, the Planning and Estimating Superintendent; Lieutenant Commander Allen who was the Assistant Design Superintendent for THRESHER; Captain Jackson who was the design superintendent; Captain Strauss, who was the Planning Officer at that time; and certainly in my own.

RE-EXAMINATION BY THE COURT

Questions by a court member, RADM Daspit:

Q. Yet, Captain Heller, you mentioned at one stage of the construction of the THRESHER and after her first builder's trial, you used impulse testing on the trim and drain.

A. Yes, sir.

Q. Hasn't this type of testing discarded after a certain period of time as an ineffective method of testing sil-brazed piping?

A. You are asking two questions at one time too, Admiral.

Q. Well hasn't impulse testing been discarded as a method of testing because it is ineffective on sil-brazed piping?

A. I can't answer that; I am not competent in that area, sir. The test was not continued past the trim and drain system on THRESHER because the other salt water systems are essentially open at all times and not subject to the water hammer with a sudden opening of a valve.

Questions by court president:

Q. Captain Heller, when was the THRESHER built?
A. That's a very strange question, sir, and I don't know how to interpret it. I can give you the sequence in time as to approximate keel laying, launching, sea trials and commissioning.

Q. Captain, all I wish to establish is the time frame for construction of THRESHER.
A. Yes, sir. The keel laying was in the spring of '58 as I recall. The ship was launched in July of '60. The initial sea trials were two years ago, May of '61. The ship was commissioned--and I know this date precisely--3 August 1961, because it was my wedding anniversary.

Q. When did the BARBEL incident occur?
A. I am groping, sir--I was not involved at the time with that. It must have been in the fall or winter of 1960 or the spring of '61.

Q. I believe your first impression was correct; it was nearer the end of November 1960. Did the BARBEL incident raise questions regarding the reliability of silver-brazed joints?
A. Yes, sir.

Q. Was that concern known to you?
A. Yes, sir.

Q. Was anything done to increase the reliability of sil-brazed joints after the report of the board which investigated the casualty on the BARBEL in 1960?
A. Yes, sir.

Q. I note that the date of your letter, signed as Acting Planning Officer, was May 8th, 1962. And in that letter you say all piping systems have been thoroughly inspected previously and further inspection would be redundant. Now in the light of what happened in BARBEL, in the light of the fact that ultrasonic testing had been developed subsequent to the BARBEL casualty, the court finds it a little difficult to understand your categorization as just a "needle" to the Bureau of Ships to make a decision regarding further testing. It finds it difficult, because the Bureau of Ships should be able to rely, to a degree, on the advice that it gets from those in the field. Could you clarify this please?
A. The Bureau does indeed rely to a great extent on the advice it gets from the field. But the Bureau does not always rely on any one activity or any one field, and there is a sensation that I have, having been associated with the organization for a fairly long period of time, that they must be prodded in certain areas on a continuous basis.

CROSS-EXAMINATION

Questions by counsel for RADM Palmer, party:

Q. Captain Heller, I would like to refer your attention to a question asked you earlier by Captain Osborn with regard to--as I remember--whether you might expect icing in the strainer element, under normal operating conditions. Do you recall the question I am referring to?
A. Not in that form.

Q. Do you recall the question?
A. I recall the question, yes, sir.

Q. Just one clarification. Is there not a requirement or a standard operating procedure, that all air banks be drained of condensed moisture periodically after the banks have been charged?
A. Yes, sir.

RE-EXAMINATION BY THE COURT

Questions by a court member, Captain Osborn:

Q. Do you know where the drains to the air banks are located in THRESHER?
A. Yes, sir. They come off the flasks. There's a little knob-shaped affair with a manual valve.

Q. In the main ballast tank?
A. Yes, sir.

Neither counsel for the court, the court, nor counsel for RADM Palmer, a party, desired further to examine this witness.

The president informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement:

WITNESS: I will defer such a statement until a later appearance.

PRESIDENT: We do not have you scheduled for a later appearance, Captain Heller.

COUNSEL FOR THE COURT: Is it correct to say that you have no statement to make, Captain?

WITNESS: I have no statement to make at this time.

COUNSEL FOR THE COURT: And it is understood that neither counsel for the court nor the court desires to call you further at this time?

WITNESS: Understood, sir.

The witness was duly warned concerning his testimony and withdrew from the courtroom.

The court then closed at 1000 hours, Thursday, 9 May 1963.

The court opened at 1025 hours, Thursday, 9 May 1963.

All persons connected with the inquiry who were present when the court closed were again present.

No person not otherwise connected with the inquiry was present.

The court then recessed at 1026 hours, Thursday, 9 May 1963.

The court opened with open doors at 1130 hours, Thursday, 9 May 1963.

All persons to the inquiry who were present when the court recessed were again present.

William A. Brockett, RADM, U. S. Navy, was called as a witness for the court, was advised of the subject matter of the inquiry, was advised of his rights under Article 31 of the Uniform Code of Military Justice, was duly sworn and was examined as follows:

COUNSEL FOR THE COURT: This is an open session of the court, Admiral, and there are members of the public present. For that reason, classified information may not be divulged here. Is that understood?

WITNESS: Understood.

COUNSEL FOR THE COURT: If a question put to you by any member of the court or counsel would, in your judgment, require the inclusion of classified information to make the answer complete, you will not answer the question but will so indicate instead.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, grade, organization and present duty station.
A. William Alden Brockett, Rear Admiral, U. S. Navy, Chief of the Bureau of Ships.

Q. Briefly outline your responsibilities as Chief of the Bureau of Ships.
A. I have the ultimate responsibility for the design, conversion, repair and maintenance of all ships in the U. S. fleet including, of course, submarines.

Q. Would you give us a resume of your naval and professional background and experience?
A. I graduated from the Naval Academy in 1934. I spent two years in the NEW MEXICO as the junior division officer; a year as the boiler division officer. I spent a year in the CALIFORNIA as the communicator for Commander, Battle Force. I spent the next year in the AUGUSTA on the China Station as Ship Secretary, signal officer and Admiral Yarnell's communicator. Then I spent the next year on the WAHOO a river gunboat, as gunnery officer. The following year I spent as chief engineer in the LUZON, another gunboat. I came back to the States in 1940, went to post-graduate school at Annapolis for two years. The third year was spent at MIT where I received my degree as Master of Science in Marine Engineering. Thereafter, I went back to sea as chief engineer of the NEW ORLEANS, and served in her until the spring of '45, at which time I was designated for engineering duty and thereafter went to the New York Naval Shipyard. At New York Naval Shipyard I was electrical design superintendent for a year. I was the assistant Planning and Estimating Superintendent for Machinery, Electrical, Electronics and Ordnance.

We were short-handed. And in 1947 I went to the Naval Academy where I spent four years teaching fluid mechanics and thermodynamics in the Marine Engineering Department. Thereafter I went to the staff of COMBATCRULANT as Material Officer with additional duty as the representative of COMBATCRULANT in Norfolk handling all administrative matters including matters of supply as well as materiel. In 1954 I went to the David Taylor Model Basin where I served two years as the Industrial Officer. In 1957 I served for approximately nine months on the so-called Cordiner committee and thereafter I spent approximately 18 months in the Bureau of Ships as the Director of the Machinery Division.

In 1958 I became Production Officer for Long Beach Naval Shipyard, and in 1960, in September, I became the commanding officer of the Boston Naval Shipyard. In 1962, on the 5th of July, I assumed duties in the Bureau of Ships as the assistant Chief of the Bureau for Shipbuilding Design and Fleet Maintenance. That remained my assignment until the 29th of April just past, at which time I assumed the duties of Chief of the Bureau of Ships.

Q. What actions were taken by the Bureau of Ships as a result of THRESHER's loss and while you were serving as Assistant Chief of the Bureau?

A. The actions taken were essentially a continuation of, and acceleration of, the continuing review of design features that has always been going on on ships, and submarines in particular. The approach that I think we took was that there were some obvious lessons to be learned. Exactly what they were, we still do not know. We have weighed on this court to help us in this area, but we have addressed ourselves to certain possible things that might have happened. We have undertaken re-examination--and I might say, that where your question is addressed to that time when I was still the Assistant Chief, that there is no dividing line on this, that it was a continuous process; that which was going on after 10 April is merely the continuation into the present date--the re-examination of design features.

We also, as you undoubtedly know, in hopes to implement the efforts of this court, established a special technical review board which is not addressed to the THRESHER but rather to the question of submarine design. This group is headed by Rear Admiral McKee and contains on it a group of people we think are some of our most expert people in submarine design. This board is in session. They had their first session on the 29th. They are working hard at a general review of the design of submarines in the current atmosphere.

We've had an examination of casualty control techniques together with the fleet, and I might add here at this point that there is of course considerable fleet input. There have been meetings with representatives of COMSUBPAC, COMSUBLANT, and with the people concerned in Chief of Naval Operations. We are using those facilities which we have within the submarine design from external departments which include our laboratories, those civilian organizations such as EB Div--

Q. You mean Electric Boat Division?

A. Electric Boat Division of General Dynamics, who are competent in the area of submarine design, as well as our own in-house capabilities. So it's a continuing review and naturally, there has been impetus to expedite some things which were in process but probably could stand some speeding up.

Q. Based on that continuing review and your own knowledge, do you have an opinion of the overall soundness of THRESHER's design?

A. I do, and I will make it an opinion, that basically it is a sound design. Naturally, the occurrence was cause of great concern and shock, both on a personal basis and a professional basis. I might say that I have had some early conditioning in this area. Being raised in New London, I remember the S-4 and S-51--and in both cases there were people I knew aboard. But, fundamentally, we think that the United States has got the finest submarines in the world. They can do things that no other submarines, to our knowledge, can do. We have got a basically sound design and we must pursue those soft spots, if they exist, which would make the full utilization of these submarines doubtful in anybody's mind.

Q. Have you formed an opinion as to the cause of the loss of THRESHER?

A. No, I have not. It's too early to make a judgment. I again hope that what arises from this Board, this court's deliberations, will possibly steer us in the right direction for things that need a hard look. At this point I think speculation as to the cause would be improper, but I'm sure that all of us would have a series of things that required a completely conservative approach, re-evaluation, re-judgment--and I could express again some opinions as to some of the things which I am sure this court has well developed. But to do this, I would be infringing into a classified area, I feel, and I would suggest that it wouldn't be proper for open court.

Neither counsel for the court, the court, nor counsel for RADM Palmer, a party, desired further to examine this witness in open court.

The president informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of record in connection therewith, which had not been fully brought out by the previous questioning and which could be given in open court.

The witness made the following statement:

WITNESS: Mr. President, I have no prepared statement to make and I would really prefer to answer whatever questions the court may pose.

At this point all persons not otherwise connected with the inquiry withdrew from the courtroom and the court met with closed doors.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. Admiral Brockett, this is a closed session of the court and classified information can be divulged here. At the conclusion of your testimony I shall ask you what classification you would accord to your closed court testimony taken as a whole. Would you continue with your answer to the question which I believe was, "Have you formed an opinion as to the cause of loss of THRESHER?"

A. The answer to this is specifically the same as I gave in open session. But what I wanted to bring out are some of the things which we have done in the sense of, I say, trying to improve our surety as to the integrity of systems.

(b)(1)

We have also put out a change order for all ships under construction--submarines under construction--requiring that all sil-brazed joints made after the 1st of May be inspected using ultrasonic techniques. Insofar as those ships which are in commission are concerned, this is still under review on the basis of the size of the problem, the magnitude of the problem, and that is to be done we think on an individual ship basis, but it is being expedited because, of course, this becomes a loose end.

We are proceeding, and had been proceeding before the unfortunate incident, to modify the blow rates with particular reference to BN's and this is being developed for the SSN's as well. So I think you can see some of the things that have worried me most, as they worried you; i.e., pipe joints, electrical failures, the question of the blow rate, and then an included one of course, which has much greater magnitude, would be the question of additional air bottles for the 593 class. This is under review but there are some things we can do and do rapidly, and this is what we are trying to accomplish.

At the same time I might say that we've tried not to panic. The first reaction is to fly in several directions. You have got to move; you have got to do something, but it's got to be something constructive and something that is, let's say, reasonably well thought out. For instance, as I mentioned, the question of the blow rate was under consideration but it's been dragging along. It's been a matter of something better than routine business but not enough impetus. Many of those things which we have done are keyed into the published reports of what this board has been inquiring into. For instance, the question of spray on electrical equipment. This is being pursued. It is a nasty problem but we are looking at that. We are re-evaluating the question of sil-braze versus weld and this appears to be a very, very difficult design problem. So these are some of the areas in which we have been looking.

PRESIDENT: Admiral Brockett, the court has also been mindful of the danger of panicking and going to far in any direction. It is hoped the information which you have gotten from this court both in open hearings and from the closed hearings--in which we have been happy to have had a representative from your Bureau present--have been helpful and productive, because we have been quite mindful of the fact that the loss in this case is so great and so regrettable and so tragic, that there was great danger of just that--panicking--and going too far in the direction of getting perhaps more air bottles into ships than you had any possible need for, and that sort of thing. So that I hope we have been successful in avoiding any over-zealousness from a practical point of view.

Q. Admiral, would you go into just a little greater detail with reference to your re-evaluation of sil-brazed versus welded joints, with particular reference, first to the reliability factors of each, and second, to the impact on ship design and construction if welded joints were used in greater numbers?

A. Let me address myself to the latter question first.

Q. Fine.

A. In order to make welded joints, all of us know, I believe, that this takes increased space around that joint and additionally it takes increased space when you come to take your radiographs, which you obviously have to do, and the impact we don't have in detail except we know it simply means a bigger boat; and

insofar as the two are concerned, one versus the other, it's my personal opinion--and I have not talked this over with my best advisors yet--but it appears to me that with the ultrasonic test, which is coming to fruition after some years, but it seems to be at about the point we would like it to be now, that this is going to give us very, very good assurance as to the integrity of these joints. I would say within the realm of possibility and the good God's desires, that those joints made after 1 May have just as good a chance to be good ones in sil-braze, in the appropriate sizes, as those which are welded.

Q. Could the fleet develop a capacity for making such tests?
A. Yes.

Q. Could you give us your views as Chief of the Bureau on the use of HY-80 steel in the hull of deep diving submarines?
A. Well the simple answer to that is it is the only material we have that has any chance of doing the job, and I think that it's a first rate material. We had to learn a lot about it, and we now know a lot about it. But if you will remember, we didn't speak of HY-80 in ALBACORE. We spoke of low carbon STS, I think. I was on the fringes of this at David Taylor because I had the welding group out there. It's a very tough material. As I'm sure you have been told, all of the work done at NRL in the explosion bulge test indicates that although we know it is a cracker, it is not a crack propagator, being a dense material. It has excellent explosion resistance and we think we have an excellent material here but like all other good things it takes tender-loving care and this is what I think we are giving it.

Q. What is your evaluation of the adequacy of military staffing at the Bureau of Ships level--first as a whole, and secondly with respect to those military personnel working on submarines?
A. Well this is one of several problems that I face in my new job; and I didn't come here to cry I might add, but we, as you well know, Mr. President, we do have a problem here because we have discussed this in connection with some other activities of ours performed jointly. We, right now, and speaking now to the whole group, are approximately two hundred officers shy of the designated billets. We have approximately 1050 billets to fill. We are trying to do this with approximately 940 officers. These are round numbers and I speak of "now" as of 1 July. Yesterday, the Secretary came in and said "Here are some letters that you are going to have to write to people that are retiring the first of July." And, "Which ones do you know by first names?" So I worked this list over and I just thought yesterday there must be 30 odd Captains and Commanders on the list. I know these people; I know they are competent. When I gave the numbers to you, one thing that I did not include is approximately one hundred Ensigns and JG's who have the 1400-1405 designator and I think I am quite right in not including them because they are not qualified yet to do those things which an ED is supposed to do in the business.

Q. Your numbers do reflect all of the engineering duty officers?
A. Yes, this is the head count. I have got them exactly if you want them. I didn't bring them here for the purpose of this court; I have been carrying them around as part of my campaign to see if I can get some help.

PRESIDENT: The court would like to have them.

WITNESS: I will give you juat a gross idea of what has happened to the Lieutenant--through Rear Admiral situation since 1959. We have 1046 billets. And the first of July '59, we had 1057 on board. Again I am leaving out the Lieutenant (jg) and Ensigns. On 1 July '60, we had 1002. On 1 July 1961, we had 947. On 1 July '62, 911. Projected to 1 July '63--and this is a good number--841. Also in just the last couple days' experience, I have had two requests put to me for ED's for billets that don't exist. One with the OP-76 group Astronautic. Of course, with the Satellite business, there is a lot of ship interest in this and that is where I would like to put an officer because it is good to have them in these positions. Additionally, I have had a request from the Air Force to provide an ED for them down at Canaveral so they can keep their feet out of the molasses in connection with conversion of range ships. We have had a captain down there, one of our better ones, and he is in an aircraft carrier area of expertness and I want to get him back. I thought I was going to get him without relief but we got a letter that he be relieved by a competent commander for a ship that they might build or convert. So there are great demands on us from many outside agencies. When I say "outside" I exclude from outside the fleet staffs, type commander staffs, the shipyards, the repair facilities, and laboratories and the Bureau itself. But we've got one man in the Defense supply agency in the technical area. We've got several in DCA. And there's a great scattering of talent and it is tough to keep it concentrated insofar as the submarine group is concerned, in particular I don't have any numbers but I can tick off some good competent people I know personally, and have over a number of years, who have left during the past year. CAPT James Bethea, CAPT K. Taylor, CAPT Ralph Kissinger, CAPT Chester Smith--these just come off the top of my head and I am sure there are more. Now what do we do about it? I think you know my ideas on this. We need some good competent help from the 1100's. We need to get a pay-back from those who go to post graduate school. If somebody takes the marine engineering course or a naval architecture associated, which we do have this group, electronics, then they should, I think, pay back the Navy--if you want to call it that--and also improve their own competence and capacity, by two short tours or thereabouts associated with their specialty, and the advantage of the 1100's in the Bureau of Ships is tremendous, such beyond this business of giving us some help. It's the fleet input, and I might add that the submarine group in general has been particularly good about this, that we have had 1100 submarine officers in the Bureau and still do today, but we could use more in all areas. Now, what happens, let's say we get the submarine group staffed up; we still have other problems to face, and there is a tendency to pull somebody off who is actually qualified in the submarine sense, to handling another job that is important. I've got two boys right now that I would like very much to see in their area of specialty, but they are also doing jobs that have to be done. CAPT William Cross who is Comptroller and CAPT J. J. Nolan who I put in the personnel area to pursue just what we have been talking about. So, I didn't come to cry; I didn't expect to make this speech, but it is a problem.

PRESIDENT: Admiral, I do know a good bit about your views on this subject and as you know, having sat in the Bureau with you, surveying not only your problems but the Navy's and our problems--the planning management and development and criteria for selection of thosebest suited to carry on this most responsible job.

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(b) (6) was relieved as reporter by (b) (6) at this point.

RE-EXAMINATION BY THE COURT

Questions by court president:

Q. I would just like, though, to ask you a few questions about your own Bureau. What percentage of the total shipbuilding load is in the area of submarine construction?

A. Well, as you well know, at the present time it represents a large proportion of the total. It is the highest individual grouping of ships that there is.

Q. Would it be more than fifty percent?

A. Well, it depends a lot on whether we speak in dollars and cents. I think we should probably address ourselves to dollars, because dollars indicate complexity and complexity indicates engineering talent. I'm trying to do some mental arithmetic. I can do it in just a second (the witness made some computations on a paper in front of him). I would like to make the statement subject to correction in the record. For this fiscal year I will say that the program, dollar value, is about half submarines, with 8 SS(N)'s and six SS(B)'s.

Q. Now as I understand, your Bureau is divided into technical lines and ship type lines. In other words, you have certain people who are responsible for one technical area.

A. That is correct.

Q. Then you have other people who are responsible for a ship type area. How many ship type areas do you have?

A. In the so-called type desks, I count seven.

Q. One of which is submarines?

A. One of which is submarines.

Q. Are those type desks roughly manned with the same number of people in each?

A. No, sir, the largest one is the submarine type desk.

Q. How many officers do you have in that type desk?

A. [redacted].

Q. Roughly how many officers do you have in the other type desks combined?

A. I would have to check that, Admiral; I could give you an example, on our auxiliary desk we have two, the destroyer desk -- I give you an approximate -- we have about five; the carrier desk has about four, and I can correct these all for the record; it's in this order. The 529 type desk has two naval officers and a marine.

Q. Admiral Brockett, realizing that your submarine type desk is numerically stronger than your other type desks, in view of the fact that at least fifty percent of the shipbuilding effort is in submarines, do you think that your submarine type desk is adequately manned?

A. I would say no to that question, although I must say for the record, that on an individual and workload basis, and recognizing the attention that is being paid to this particular area at the moment, that they are facing the same type of a workload that all of the type desks are. I might add, though, that one of the areas which has not been mentioned, and which is also important, is the design area. At the present writing, I have in the whole Design setup, one qualified

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submarine officer. We have, incidentally, some good civilians in the Design area, but it has been a matter of the man we had in the so-called preliminary design, Commander Aroner, his resignation is effective the 1st of May. We have left in the hull design area Commander Leroy Jackson, and he is -- I hope to do something about it -- due to leave in the Summer months, but we are gasping at the moment and we are faced with some rather difficult designs, one of them being the new reactor, the SS(N)671, S5G. Additionally, we are still in the process of cleanup on the 188A for the SS(N)'s, and we are right smack in the middle of the A-3 retro-fit for the 598 class.

Q. Now you have stated that you have only one submarine officer in the whole Design part of your Bureau. This is one out of roughly how many?

A. This is one out of approximately fifteen.

Q. Now let us consider the level of responsibility and authority in your Bureau. At what level, in your Bureau, is the senior submarine qualified officer?

A. At the present time I would say actively engaged in submarine work, the senior one is Captain Kern, the head of the Submarine Type Desk.

Q. And he is subordinate to how many levels of authority?
A. He is three notches below the Chief of the Bureau, but I might say we have a short-circuit, so far as submarine matters go.

Q. Do you have any Assistant Chief who is qualified in submarines?
A. No, sir, we do not. I would like to address myself to this line of questioning, Mr. President. I'm a believer in the lowest level of responsibility taking charge, and I have no fears along this line of questioning, as long as I have Don Kern and some of his contemporaries available.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. You have commented on the Navy side of the staffing. Do you have any comments to make about civilian staffing; first, at the Bureau level?
A. Well, I would like to address this in a broad sense. There is a community of submarine design concept in this country; there is some of it in the Bureau of Ships; there is some of it at the EB Div., and there is some of it here at Portsmouth. To a lesser degree, there is some at Mare Island. Now Mare Island hasn't been as active in recent years as they have in the past, and additionally there is a possibility of the development of competence in this area, and at least there is interest developing in it at Newport News. So, in the whole community of submarine design, it is my estimate that there are probably thirty to forty people in this country who are really qualified, all-around submarine designers. In the sense of a broad picture, there are specialists in some areas, some who are broad people, other specialties within that broad understanding.

Q. From your experience as a shipyard commander at the Boston Naval Shipyard, what comments would you make with regards to the ability to get the work done with what is available, what personnel are available in a shipyard?
A. I think the opportunity to get work done is there. We have a problem, and I might add that this is not peculiar to a public shipyard; it also exists in private yards. The ability to hire and fire is often mentioned with particular reference to the workmen on the job. My viewpoint on this might be somewhat different from others, but I feel that if you have a situation which requires firing of a workman, that you want to bull it through, you can do it, and I have done it. The NCPI, so-called, is in my mind, as a very large union contract; very complicated, and the large shipyards are generally faced with the same thing insofar as labor itself is concerned; the people with tools in their hands. They have labor contracts as well, and the firing is not as easy at this level in the private yards as people tend to think it is, because you have the same type of grievance procedures; you've got the same problems of seniority, the same general difficulties, if you want to call tham that, which you face in operating any industrial activity, be it public or private. One difference though, that the same protection provided to your workmen in private yards, or private industry generally, is also afforded your middle and I might even say your top civilian management. This is a pecularity of the Federal Government, and it is the Pendleton Act in a nutshell, which was badly needed at the time it was passed, and possibly it still is. Nevertheless,

this is the law of the land, and I don't think we are going to change it here.

RE-EXAMINATION BY THE COURT

Questions by a member, CAPT Osborn:

Q. I noticed a great pride of your civilian people, particularly from the Bureau of Ships, when they are discussing their responsibilities with respect to completing a design, but I see very little pride in their responsibilities for the design after it has left their hands. Can you explain this?

A. I have not observed the phenomena; no, I cannot. Tell me more.

Q. Well, I noticed that a big effort on the part of your personnel, for instance, in the circulating water system, for example, or meeting some of the rather remote elements of design, such as extremely high ejection, for instance, and high temperatures say b(3) 1(and the associated requirements with respect to pump requirements in that area, while a complete lack of appreciation, on the other hand, in operating a system in that manner with respect to damage control at deep depths. I feel this is a familiar area problem with respect to the high performance we place on submarines going to deep depth.

A. I'm with you, Captain; I know what you're talking about and I agree. I think that my plea for people such as yourself to work in the Bureau of Ships, as reasonably senior officers, has a lot to do with just what you're talking about. Now let me pursue this one more point; would you come to the Bureau of Ships, and the answer is "No, not right now, because it's looked on as the kiss of death." What I want are good officers who are going to get promoted who will come there and get promoted so the place doesn't look like the end of the line.

Q. There is no officer in this room, including any ED in this room, that has had the stigma of specialist placed on them as much as I have, having been over fifteen years in the missile business, and from the standpoint of an operator itself the worst thing I could do, from a standpoint of promotion in this system is to go to the Bureau of Ships and help you out at this time.

A. Yes, I understood; this is something that has to be overcome.

Q. Now I would like to suggest a high performance ship, and I would say submarines in this case, with respect to the logistical problems associated with their maintenance and retro-fit, and the degree of confidence in that work, as compared with just the construction and new design preparation. Would you please discuss this area for me?

A. I think that this probably cannot be answered categorically. I think it has to be answered on the basis of individual cases, individual people concerned, individual yards, individual ships, if you will, but let me say this; I think I know what you are driving at. This problem, as you pointed out earlier, regarding overhauls, alterations, is going to be a difficult one, and it is going to have to get a great deal of attention. For instance, the BN's are out of the new construction business very shortly, but we're walking right into a 41 ship problem and it's a lulu. It has been complicated by things which are, unfortunately, I'm afraid, again outside of the Navy's control, and logistics, right off the bat, worries me as much as it worries anybody in this room. I mean, different components from ship to ship; this is something that I've been aware of for ten years and I've been unsuccessful in doing anything with it, but having been with the Fleet for a while, I know what the problem is when you have the right spare part for the wrong motor, and the ability of ships to interchange parts, in other words, to have a common bin, in effect, goes down the drain in this process. The thing we seldom have, unfortunately, are sister ships.

Q. Having been in the strategic business for some time, I've discussed this problem with my aviator friends a lot, and their philosophy is when you get the shipbuilding program over, then, with respect to SSBM's, then we'll go back to diverting our assets to something else. With the experience that you've had to date with the SSBM's on station, and even SS(N)'s and particularly SS(N)'s in overhaul, do you think that this is an illusion?

A. I know very well it is.

Questions by a member, RADM Daspit:

Q. Admiral, you spoke about the need for 1100 officers in the Bureau of Ships. You also said that in the submarine field you are better off than in any other area. One peculiar thing about nuclear submarines; they not only have the nuclear plant, but they are the only submarines that we have that can run at high speeds for a long period of time, and which are deep diving. Do you have available to you, outside of the Reactor Branch, any submarine officer who has ever had operating experience in high speed, deep diving submarines?

A. I'm not sure, Admiral Daspit of the pedigree of the people I have. I assume, having asked the question, that you know the answer; I guess it's no.

Questions by the President:

Q. Admiral Brockett, you just said that the thing we seldom have, or rather a member of the court asked you a question in which he used the expression that the Navy seldom has sister ships. The statement is rather significant because it seems to denote to me a rapidity of development, a rapidity of advancement

of the state of the art, which mitigates against sister ships; is this correct?
A. This is correct, Admiral.

Q. Is there an answer in forward planning, advanced planning, longer range of shipbuilding programs, or something of that sort?
A. This is a matter of fundamental philosophy that we've all talked to along the line. I used to have a little speech I made "A step-up function on ships" instead of always proceeding up the sloping line, so that no other ship on it was different, so that you come up on it like this after you got something developed and build like this for a while and then go this way. I'm not convinced of the validity of my own argument on this, because I have to take the judgment of the Ships Characteristics Board and the bosses thereof in the Pentagon; I think they may know more about this than I do. Now there was a long discussion back in 1959, which I happened to read yesterday, regarding THRESHER, and should there be more THRESHERS or should there be a continuation of the SKIPJACK, and the decision was made at the time by people I believe competent to make this decision, that we would build THRESHERS, but again there are things that come along that are add-ons. The only thing that I would hope to be able to do, and I don't know whether I can do it or not, is not to compound them too much, so that one ship ends up with too many problems as a distribution or a share the poverty, in the wring-out of new developments.

Questions by a member, RADM Daspit:

Q. Isn't it true, though, Admiral Brockett, that under our procedures we left it up to the shipbuilder to a large extent as to what equipment he puts into a ship?
A. That is correct.

Q. And even if we built five GEORGE WASHINGTONS, and each ship is left up to the shipbuilder, so the spare parts are not interchangeable between the five ships that are essentially sister ships?
A. Yes, sir, that's exactly right.

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Questions by the president:

Q. Admiral Brockett, you stated, and others have stated before this court, that HY-80 is the only steel with which it is practicable to build a b(1) foot submarine. Well, how about a 700 foot submarine?

A. I believe, and I say this with a line under it, that a 700 foot submarine, which would be a so-called feasible design, could be built of one of the other steels, such as HT. On the other hand, if we go back a little bit, we will remember that high tensile steel was not the answer to a maiden's prayer either, and I would say at this stage of the game that we have as good, if not a better handling HY-80 than we ever had on the preceding steels that we used.

Questions by a member, CAPT Osborn:

Q. You discussed the degree of competence with respect to people making real technical decisions. I would like for you to discuss the competence of the Ships Characteristics Board with respect to tying your hands with respect to the design of a ship, in which such various items as BUPERS, BUMED have a vote on that particular board.

A. I would be glad to answer your question, but I wonder if it's appropriate to this court.

Q. It's very appropriate to me in the fact that the characteristics as such and were later developed in design as you went down the chain in the THRESHER were really not translated into operational characteristics or operational appreciation of the ability to best operate the ship, because the ship was thrust on the people in a time when they had to complete it, and with very little time to acquaint themselves with the chances they were taking.

A. This is part and parcel of the step function versus the curve which we seem to be on, where you are always pushing the state of the art. The unfortunate thing about this is that a ship is not conceived or built overnight. If it were, we could build them without changes, but the time span is longer than in any other military area that I know of; really you're talking about five years from the time the concept is fairly well solidified until such time as you have the hardware. Now a bright idea comes along and it may be an excellent one, and most of them are, but I think there is a tendency to incorporate this into the ship's characteristics, possibly too early in the game, and it causes us to scramble, but this, in a sense, is what we are there for. I feel that every now and then we are over-run with somebody stepping on our heels, saying "we've got this and it looks pretty good" and the next thing you know you pick up the ship's characteristics and it's in it.

Q. Two particular areas I'm particularly interested in. One is the lack of proper damage control assessment in the THRESHER prior to its operation, which I would like to have you discuss, and the second area I'm primarily interested in is the desirability for so many remote, automatic, complicated system controls, how they came about, and do we really need them?

A. All right, let me take the first one. First of all, let me claim no expertise on this particular area of the details of what I assume would be the looping, say of your salt water system, the separation of your vital and non-vital components; your ability to secure a system without securing the main plant. As to the history of this I frankly do not have direct and personal knowledge, and I hope I can confine myself to those things in which I do have this knowledge. As regards to the other one, I will give you a philosophy statement without again addressing myself to the THRESHER design.

Automation -- the work by itself always has made me somewhat suspicious and I view it as something you have to be extremely careful with. There are three types of automation in my mind. One is automation for automation's sake and you find this every once in a while. The second is automation in the sense of doing something better, hopefully, than a man can do it, and the third one is the proposition of automating because the man simply can't do it, and all through this you can see the time threat generally. One of the areas of discussion I expect to interject myself into as time goes on, as a connection with the results of this board, is this question of how many needs to be remotely operated, speaking specifically of the valve systems, and how far do you go. Electronics, and I use it in the broad sense, I guess I should say electrical devices, can fail, they can cross you up. On the other hand, in many cases, depending upon the rapidity of the action of the individual in the crew, you can get away without such devices. It's a question that is difficult to answer in the broad sense, as I guess I've indicated by my answer, but it is one that certainly should be understood.

Q. We have a tough problem in connection with submarine personnel and their experience in which we have tried to make the system easier to operate, simpler to operate, perhaps less technical training to operate it required, but a real lack of appreciation of consequences involved, particularly with respect to casualties. There are some things that we have to do automatically if we get high performance, but I do think, having had a lot of experience on the ships, that the number of things that we are doing automatically are considerably higher than they should be. We probably ought to consider a lot more casualty action than reliability.

A. This is correct. I really don't know exactly where this would break out in the THRESHER, but I would hope you would agree with my philosophy on the three kinds of automatic devices and it's the middle one that needs the greatest attention on our part. There are other things that everybody will admit are done better by a device, a senser, or what have you. It's this middle area, where a man can't do, and this is strictly a time element, how fast does it have to be, how quickly does the corrective action have to be taken when you get to a certain area.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. We have heard testimony which indicates that there may be a disparity in the standards of construction and quality assurance as between the reactor compartment and the remaining areas of a nuclear submarine; examples are maintenance of clean areas, and welding specifications and requirements. Can you comment on the practicability of extending the standards to a uniform high level?

A. Well, as in all things you run into the phase of cost effectiveness. Where a system is of vital importance to a ship, and the nuclear reactor and its associated equipment being obviously one of these, with a big star on it, and I would also suggest that within this group is such things as salt water systems, anything with sea pressure, hydraulics, high pressure air, etc., these should, and certainly will require that they get very special attention; the whole envelope itself gets it right now. But how far you go is, I think again, something that we are in the process of reviewing. There is nobody who can possibly fault in any respect the quality control imposed, exercised and made to stock of the Nuclear Reactor Branch. Whether or not this is warranted across the board remains in my mind something of a moot question. We certainly don't want to be in a position of neglecting those things which are in fact important.

Neither the counsel for the court, the court, nor the counsel for RADM Palmer, a party, wished to examine this witness further.

The president informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness said that he had nothing further to state.

The witness was warned concerning his testimony and withdrew from the courtroom.

The court recessed at 1245 hours, 9 May 1963.

The court opened at 1415, 9 May 1963, with open doors.

All persons connected with the inquiry who were present when the court closed were again present, with the exception of (b) (6), who was relieved by (b) (6) as reporter.

No witnesses not otherwise connected with the inquiry were present.

Rear Admiral Ralph K. James, U. S. Navy, was called as a witness for the court, was informed of the subject matter of the inquiry, was advised of his rights under Article 31, Uniform Code of Military Justice, was duly sworn, and examined as follows:

COUNSEL FOR THE COURT: Admiral James, this is an open session of the court, and members of the public are present. For that reason, classified information cannot be divulged. If, in your judgment, the answer to any question put to you by a member of the court or counsel would require the inclusion of classified matter to make it complete, you will not answer the question but will so indicate instead.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, grade, organization, and present duty station.
A. My name is Ralph K. James, Rear Admiral, United States Navy, currently attached to the Bureau of Ships, Washington, D. C.

Q. What is the nature of your present duty, sir?
A. I have just been relieved as Chief of the Bureau of Ships at the expiration of my four-year appointment, and I am currently serving in the capacity of a special assistant to the Secretary of the Navy on tasks that he, from time to time, shall assign until my retirement becomes effective on 30 June of this year.

Q. Would you briefly summarize your naval and professional background and experience, sir?
A. I was graduated with the Class of 1928 at the U. S. Naval Academy; a sea-going line officer for a period of two years, followed by a three year post-graduate course at Massachusetts Institute of Technology that terminated in the award of the degree of Master of Science in Naval Architecture and Marine Engineering.

I was subsequently attached to and served in several Naval Shipyards in varying capacities from the role of Ship Superintendent, doing the job of undertaking the overhaul of ships, through the planning, design for ship overhaul, and construction. I served at sea with the fleet in repair ships as a Repair Officer. Overseas during the war both in the African and in the Pacific Theatres in varying capacities, largely in charge of ship repair to the battle damaged ships that were in the respective areas in which I have served. Subsequent to the war, I served as the original Executive Officer and subsequently as Commanding Officer of a new establishment for the handling and storage of repair boats for ships of the Navy. Subsequently a student at the Naval War College, followed by a tour of duty at a naval shipyard as Shipbuilding Superintendent. This brings me to 1951, when I created for the Navy an activity known as the Shipbuilding Scheduling Activity, where I served as its first commanding officer. Thence to the Bureau of Ships as Comptroller of the Bureau for a period of two years, following which I commanded the Long Beach Naval Shipyard in California for three years. In 1958 I returned to the Bureau of Ships

as Assistant Chief for Field Activities, having the direct administrative responsibility for the various field activities, including Naval Shipyards, Laboratories, and Supervisors of Shipbuilding offices. And in April, 1959, I was appointed Chief of the Bureau of Ships by the President, and have served in that capacity until April 29, 1963, just passed.

Q. As Chief of the Bureau of Ships, were you knowledgeable of THRESHER's design, and did you review her design during the period that you were Chief of the Bureau?

A. The THRESHER's design was one that, in its initial phases - shall we identify it as the contract design phase - was completed prior to my tenure in office. The ship was actually laid down in 1958 before I became Chief. Subsequently, however, because of the various aspects of the THRESHER's design which were raised, it has been the subject, more or less, of a continuing analysis. THRESHER represented -- I am pausing in order that I may phrase it in a non-classified manner - represented a significant step forward in the state of the art for ship silencing and for depths to which submarines could go. For this reason, it represented an area where there were continuing interests on the part of the operating force in all aspects of the craft that subjected the THRESHER, perhaps more than most other ships, to review from time to time of the various aspects involved. Subsequent to that time there have been two or three analyses and reviews of the design, including one that has been instituted only since the tragedy of her loss.

Q. What is your appraisal of the soundness of THRESHER's design and her reliability and safety for operating within her design limits?

A. Well, because of the very nature of the reviews to which the design of THRESHER was subjected, I think I can speak with great feeling. In my judgment, as a practicing Naval Architect with over thirty-three years experience and background, that this ship represented the finest in capability to perform her duties at sea and to be possessed of the greatest of safety capability that was within the means of ingenuity to produce and work into the design and construction of this ship.

Q. What actions did you take as a result of THRESHER's loss?

A. Well, the loss of THRESHER, of course, came on the heels of a feeling, as I have expressed it, of great confidence in the design of THRESHER. I might elaborate a little on your prior question. We achieved significant increases in depth capability as demonstrated by the THRESHER herself. In succeeding excursions to test depth during her short lifetime, we achieved significant reduction in sound and noise of this craft as a result of many changes brought about that paid off handsomely in the suitability of this ship as a warship to carry on her prescribed assignment. Notwithstanding this feeling of confidence, the day of the tragic news of her loss, a soul-searching by myself immediately followed as to, had we overlooked anything that might have contributed to her loss? As of that moment, there was little knowledge that was available to me as to what might have been the cause of her loss, which perforce was a question of heart and mind to examine again into all aspects of THRESHER and the ships that will subsequently follow her design that are in the building ways today.

So I instituted a study group, having informed the Secretary of the Navy of my intention to do this. I made one fundamental policy determination that in a re-review of every element of THRESHER's design, I would exclude from participation any who had, in fact, participated in the original THRESHER design. This perforce led me to recall officers skilled in submarine design from the retired list because the availability of experts - and I use the term advisedly - in the

design of submarines is rather limited. It is limited essentially to naval officers of engineering duty discipline or to civilian engineers who have been associated with the program in naval establishments, with the single exception of civilian engineers attached to the Electric Boat Division of the General Dynamics Corporation.

So from this spectrum I appointed a group of, I believe it is eight individuals, headed up by a retired rear admiral, Rear Admiral A. I. McKee, who in the vernacular of those knowledgeable in submarine matters is virtually known as "Mr. Submarine," not only in the United States Navy, but he enjoys this recognition in foreign countries where the submarine is part of the operating fleets of those countries - those friendly countries, at least. Admiral McKee is currently heading up this group.

On Monday of last week, the last day of my tenure in office, this group undertook a detailed review, system by system, of everything that went into the original design of THRESHER. As an outcome of this, I am sure, because of the contrast of the high-grade talent, there will be suggestions for improvements. This group, however, is not given the specific task of attempting to uncover anything that might have been a contributory cause of this accident, but in full recognition that this court has the responsibility to determine the answer to that specific question, there is no desire or intent to overlap the objectives. In fact, it is expected that the results of your labors will contribute significantly to the efforts on the part of the McKee Board. I expect they will be in session no less than three months, during which time they will, in areas of structural design, take it apart piece by piece. In the electrical system, they will take it apart piece by piece. In the piping system, in the propulsion system - anything that contributes to the safety of the ship to operate at sea will be re-reviewed for whatever fundamental knowledge and information might flow from such a review. That constitutes my action subsequent to the tragedy, except, of course, in the concluding days of my tenure in office to learn as much as I could from sources available to me as to the circumstances that might have been contributory to the tradegy.

Q. Based on information you hold today, have you formed any opinion as to the possible cause of the loss of THRESHER?

A. I would say that speculation, rather than opinion, has been -- I have speculated, of course, as any responsible officer has done, as to the cause. I have been privy to certain information that has made my speculation perhaps a little more intelligent than others who have not been afforded the benefit of this information, but I am afraid here you are leading into revelation of highly classified information that is the basis for my speculation. So I yield to the ultimate outcome of the results of this court as the most authoritative source of intelligent speculation.

Neither counsel for the court, the court, nor counsel for RADM Palmer, a party, desired further to examine this witness during this open session of the court.

The president of the court advised the witness that neither counsel for the court, the members of the court, nor counsel for RADM Palmer desired to propound questions which could be answered in open court, but informed the witness that he was privileged in open court to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

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The witness made the following statement:

WITNESS: Well, perhaps one supplemental point to supplement what I have already said. THRESHER, of course, was the lead ship of a class of submarines of which there are a significant number. I don't recall the exact number under construction. I believe it's nineteen. The court has access to data to correct that if I am in error. As of the time of the tragedy and the subsequent review of the events, inevitably the question had to be asked: Should we cease and desist on the program to complete those ships now on the stocks, or should we proceed? This matter was reviewed rather extensively by myself and my counselors in the Bureau of Ships, and was a question raised by the Secretary of the Navy to get his own feeling toward this matter. My counsel to the Secretary, supported by others not within the Bureau of Ships, was that the THRESHER is fundamentally an excellent design; it has, as a lead ship, demonstrated her capability; and that there should, therefore, be no termination of the program to complete the follow-on THRESHERS now under construction. This has been accepted by the Secretary without question, and we are continuing with the program.

At this point the court was cleared of those persons not connected with the inquiry, and the following proceedings were conducted behind closed doors.

COUNSEL FOR THE COURT: During the closed session of the court, sir, classified information, of course, can be divulged.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. When the court was closed, you were responding to a question concerning any speculation or opinions you might have as to the possible cause of the loss of THRESHER. Do you have anything further which you would like to add to your previous answer in this regard?

A. I know I will contribute little to the court's knowledge, except just what are my feelings in the matter, because I know you have been informed of the various data that my own people have contributed. There is also the knowledge of what has been published in the newspapers of events as reported by the messages that were exchanged between the surface ship tending the THRESHER and the THRESHER herself. I think the most significant factor in my formulating an opinion was the information recorded in the SOSUS tapes and the analyses of these that have been made by the various groups in Norfolk and which are subsequently being reviewed by the crime laboratory in New York which gave a rather detailed picture of events as they occurred, minute by minute, including the fact of a reactor SCRAM, including the time intervals which were of significance; events that occurred which could be described as perhaps the collapse of part or all of the pressure hull, and then the subsequent collapse that could be described as the collapse of various particular pieces of equipment within the pressure hull. This, plus the knowledge, as I say, of that which has been made public leads me to a completely unsupported opinion that THRESHER suffered some sort of a casualty that, at the inception of which, could not have been considered serious by the operating personnel. Let me restate that: could not have been considered catastrophic by the operating personnel.

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I support this by the alleged exchange of messages which said, "Experiencing minor difficulties," and doing the following things: These "minor" difficulties appear to have been the possible source of an electrical failure that might have caused a reactor SCRAM. If at that time the boat was in negative buoyancy and at or close to - and I believe she was at or close to - test depth, then the loss of power would have been a significant deficiency in recovery that normally the crew might have expected possible with the continuing availability of power. If this speculation has any validity, then the boat could have rather rapidly proceeded below collapse depth, with all of the attendant tragedy that would immediately follow. I qualify my speculation as being only partially informed on events, but I have to believe that it had its start somewhere in some deficiency that occurred to the material of the ship before she got into real trouble.

Q. Admiral, over the past three years there have been a number of failures of silver brazed joints in submarine sea water systems, hydraulic systems, and high-pressure air systems. These failures have given impetus to considerations as to the safety and reliability of silver brazed joints for service in vital submarine piping systems. Can you comment on the reliability of silver brazed joints in vital systems as distinguished from welded joints in the same systems?

A. Well, I don't think there is any fundamental basis for a direct comparison of reliability of one kind of a joint versus the other kind; rather, in my judgement, this comparison is valid only on the basis of the workmanship as reflected in one kind of a joint and the workmanship reflected in another kind of a joint. A well executed silver brazed joint in piping systems exposed to high pressure has been demonstrated by true pragmatic tests in various ships to be as completely suitable as a well executed welded joint in a comparable system. Perhaps because the state of the art of workmanship in welding was greater than in the state of the art of silver brazing of joints, we get an onerous comparison that could be made between the two if we disregard the issue of workmanship.

We have been greatly concerned in the Bureau of Ships for a prolonged period of time for virtually all of my tenure in office with the question of joints in submarines because of the serious implications of a joint failure. We instituted processes to verify the adequacy of workmanship some three and a half years ago and found, to our great distress, that the workmanship that we had believed to be adequate in some instances was not adequate. Now, confounded by the inability to see inside of a joint after it had been made up by the devices then available to us, radiography revealed certain features of a joint, but did not reveal all of the features. There was need to have a means to see inside the joint, and we have pursued this problem with some vigor in various areas to find a non-destructive way to verify the amount of a joint having been properly made, and have succeeded in recent months in developing non-destructive ultrasonic testing methods that will give us the assurance that a joint is in fact properly made up.

A welded joint is relatively easy to make up and to inspect for its adequacy if it is a shop joint, but in submarines, as most of you know, you have many, many problems with joints that are made up in some of the tightest, most difficult to enter corners, where a welded joint can suffer from lack of proper workmanship just due to the physical difficulties involved in getting around the circumference of a pipe to weld it properly and subsequently to examine it. We have, however, as a recognized change in construction techniques, directed - and I can't recall how long ago, but it was approximately one and a half to two years ago - that all joints in all piping that were exposed to sea pressure, of three inches and greater sizes outboard of back-up valves on our submarines, were to be welded joints. And this is being fitted in all new submarines as a means, we believe, of giving us the assurance that the joints have a greater possibility of being sound.

At the same time we have instituted some tremendous efforts in all submarines built in yards, both private and naval, to make sure that the techniques for silver brazing will develop joints that will give us a minimum bond of 25 percent or better, the 25 percent figure being one that our tests have demonstrated gives an adequate joint. We aspire to significantly better than that minimum and are prescribing limits of - the exact figure escapes me - but on the order of 70 to 75 percent of bond between the silver brazing material and the joint. These two actions were planned to be back-fitted ship by ship into the already completed and delivered boats as the opportunity to do so presented itself.

Q. Do you have at hand any directives you may have sent out expressing your concern for the quality of silver-brazed joints and the state of the art in the construction of silver-brazed joints?

A. Well, there are a number of directives, but perhaps one of significance was at a time when the problem of the silver brazed joints and welded joints was one of the hotter topics in the Bureau of Ships. I did dispatch a message to all of the Naval Shipyards, to all of the Supervisors of Shipbuilding in private yards, not just for submarine construction but for surface ship construction, where these same techniques are being applied in high-pressure steam lines, expressing my significant concern about this problem and tried to impress upon my Shipyard Commanders, and my Supervisors of Shipbuilding the need for them personally to inject themselves into an appreciation of this problem and to apply the processes that were then current to the work, repair and/or construction involving joints out of copper-nickel and involving silver braze.

Q. Do you have a copy of that message?

A. I have a rather beaten up copy of a message that went out on the subject in September of 1961.

The witness produced a copy of Bureau of Ships message 152241Z of September 1961, and it was submitted to the court and to counsel for RADM Palmer and was offered in evidence by counsel for the court.

There being no objection, it was so received and marked "Exhibit 177."

Counsel for the party waived the reading of Exhibit 177.

Questions by counsel for the court:

Q. As a result of your efforts and the efforts of all the others working on the problem, would you say that the quality of construction of sil-braze joints over the years has improved and that joints being constructed today provide a reasonable measure of reliability?

A. I believe, to make a short answer to that, definitely.

Q. Admiral, could you express your own views on the choice of HY-80 steel for use in the construction of pressure hulls in deep-diving submarines?

A. The development of HY-80 steel came in part from the need, as expressed by the operating forces of the Navy, to achieve greater depth of operating submarines and yet allow for significantly increased pay loads over the submarines built using the ordinary carbon steels or the special treatment steels. The development of HY-80, a high-yield steel, possessing great ductility and yield at 80,000 pounds per square inch, was carried on over a period of years, and with its final manufacturing development, was identified as the fundamental steel to be used in the SKIPJACK, the 585. Prior to that, the

closest approximation of that kind of a steel that had been put into submarines was used in the ALBACORE, in which we used special treatment steel. Because of the high yield capabilities of HY-80, you are able to either go to greater pressure, or greater depths, with the same kind of a hull, or go to the lesser depths and carry a greater payload of those things which make a submarine a submarine. So it was a development that made possible the proceeding to the b(1) foot depth boat that was being sought by the operating personnel.

The application of HY-80 brought with it headaches to the shipbuilders that have been a constant source of concern by the very nature of it. It has to be specially heat controlled for preparation of joints before welding. The welding rod itself has to be of special quality, and it has to be treated before use by a heating at those prescribed temperature ranges. It has to be free of moisture, and the circumstances under which the welding should be done prescribe that better welds can be attained in the controlled atmosphere rather than in the natural atmosphere that might obtain.

Over a period of years, from the start of SKIPJACK to the present, we have undertaken many studies of the question of the application of HY-80 to submarines. It had started before I took office.

In the early months of my tenure, a problem came up with the THEODORE ROOSEVELT which involved a section of the submarine that had been borrowed from a SKIPJACK class hull on the ways and worked into the THEODORE ROOSEVELT at Mare Island, the first Polaris submarine, and we found cracking of the welding, which had characterized this material when welded under less than completely controlled circumstances. As a result of a discussion with the then Chief of Naval Operations, Admiral Burke, we challenged the validity of the choice of HY-80, and in - I believe it was in November of 1959, I assigned to the then Assistant Chief for Shipbuilding, Admiral Farrin, the task of creating a panel to study this question to satisfy me, a relative new-comer to the Bureau, that the Bureau's prior decision was a valid one to use this material in submarines.

Such a study was initially finished early in 1960. The results were made known to me, reviewed by me, and accepted by me. I so informed the Chief of Naval Operations that I had reviewed and endorsed the application of HY-80 as a basic construction material in the submarines of the then current shipbuilding programs, but that I was continuing the study because as a result of the analysis of this material by a group comprised largely of engineer officers of the Bureau of Ships, the senior civilians, supplemented by a large number of people from industry, such as Babcock-Wilcox, the University of Illinois, Doctor Freudenthal from the University of Columbia, and others from the shipyard building submarines, welding experts, we blessed with holy water, if I may be so indelicate to use that expression, the use of HY-80 but recognized the need for further analysis of its fatigue capabilities.

We found that the knowledge of fatigue failures in the world was extraordinarily limited. We recognized that in the aircraft industry they had to resort to such things, as many of you will recall they suffered a series of aircraft crashes -- they had to resort to the testing of full-scale airplanes submerged in a tank in order to apply the necessary cycles to cause its failure in an effort to determine why these other aircraft failed.

We believed our studies should go on as a result of the simple reassurance from the panel about the application of HY-80 to the current construction program and what it meant in terms of the lifetime of submarines. So a series of

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projects were undertaken, largely involving the collection of data from the submarines themselves to determine the number of cyclical excursions a submarine experienced in the course of a year's operating service. We started instrumenting certain critical areas on boats to collect strain gauge data to assist in compiling a factual background; and began the testing of models at the David Taylor Model Basin and the Portsmouth Naval Shipyard up to eight-tenths scale models, subjecting these to actual cyclical variations of stress and strain.

These programs are continuing. Our fundamental knowledge of fatigue is building up rapidly. We, the Bureau, have not concluded on a lifetime probability for HY-80 type submarines, but we believe that with the cyclical operation of submarines from surface to test depth and in between, that we can see with some degree of certainty a minimum lifetime of thirteen years, and we are continuing our examinations to find out what, in fact, this amounts to. Now, when I say a lifetime of thirteen years, I don't mean in thirteen years we will have a catastrophic failure and all is lost. I mean that, unless actions are taken to dig out and repair cracks, that such a possibility would exist.

We have instituted a system in all of the submarines in the shipyard to examine for the presence of cracks, and at the time of determining that there are, in fact, cracks in the HY-80, to take the simple corrective measure of restoring the fundamental strength of submarines to resist. This program will continue, but I think we have significantly improved our knowledge.

As a final note, the desire for even greater depths cannot be satisfied completely with HY-80, because it alone will cause high prices to be paid in payloads as we go down to depths already under construction in the b(1) foot AGSS-555. We must, therefore, look ahead. We have contracts on the street today for the development of HY-120. We are pressing further laboratory tests and developments of an HY-200. We are looking at alternate materials, including aluminum, titanium, and even filament-wound fiberglass hulls, all because of the desire on the part of the Chief of Naval Operations and his support staff to achieve even greater depths.

Q. Is it your judgment that with our present equipment and, more particularly, with present practices, we can adequately survey the hulls of HY-80 submarines to insure that there will be no undue risk to safety involved in the operation of such submarines?

A. I believe this sincerely.

Q. We have had evidence that there is a difference in the standards of construction and quality assurance as between that maintained in the reactor compartment and in remaining areas of a nuclear submarine; examples are the maintenance of clean areas during the conduct of certain work, and the standards and requirements for the welding of pipe. Can you comment on the practicability of extending the standards on a uniform basis throughout the ship?

A. Well, of course, it would be practicable to extend these standards throughout the ship from a point of view of, could it be done? But the wisdom of doing so would be lacking, in my judgment. There is the need in the reactor area to assert the greatest of care to preclude events which might cause a ship to become "hot" and have a failure that had to be dealt with; also to minimize the possibility of such failures. So there is a selecting process by which these higher standards are applied to the reactor area and to the piping and equipment within the area as contrasted to other areas where a breakdown could be dealt with in a way that today the Navy accepts as normal, without subjecting

ourselves to the tremendously increased costs of construction, the tremendously increased complication of electronic equipment, the tremendous increased time to produce our ships that would flow from a general application of those same standards into every system in a ship.

Now I want to make one point here: it isn't either all white or all black. By this I mean that a system, because it is in the nuclear area, isn't the only system that receives special care and attention and all else receives little or no comparable care and attention in the construction area. Each of these receives the degree of attention that is merited by the gravity of the system and the need for protecting it during construction from anything that might derange it and add to the problem of completing it.

Q. From the detached and dispassionate view of a man who is the ex-Chief of the Bureau of Ships, could you comment on the adequacy of the military staffing of your bureau, with particular reference to the submarine personnel?

A. If the court is prepared to stay in session for about six hours I can give an adequate description of this problem. I shall try, however, in the next two or three minutes to discuss this problem. Perhaps the greatest single unfinished part of the business that I left behind for my successor to worry about for reasons that are too numerous to mention and perhaps inappropriate to this forum, has been a lack of support for the younger officers of the Navy to seek out technical careers, more particularly to seek out technical specialist careers. The impact of this has been great.

Instead of having an input of the kind of officers qualified to carry on the very great responsibilities of assisting in the design of these ships, participating in the construction of them, participating in their maintenance thereafter, we are receiving, over a period of years, a greatly diminished number of officers coming into the engineering specialties, to the point where staffing of not just those with submarine qualifications and the jobs they fulfill, but the staffing of engineering officer billets in naval shipyards has become a matter of very serious concern.

Q. Could you direct your discussion, if you will, to the effects any shortage of trained personnel could have had in the design, construction and repair of THRESHER?

A. Well, specifically, this Shipyard is running significantly below its authorized strength of engineering duty officers. This Shipyard is not unique in this respect, but it is feeling the paucity of manpower. Therefore, the administration of the affairs of this Shipyard must place a greater demand on those remaining officers available, and on the civilian engineers, whom they generally direct, to carry on the roles that are the responsibilities of those of us who serve ashore in providing the required service to the fleet. I would say that this shortage of officers is significantly reflected in the sometime inadequancy that we find in specific systems, programs that we have.

I can cite you examples in connection with problems dealing with certain destroyer classes where, because of the inability of our manpower to review detailed plans on certain reduction gear that went into the BIDDLE class destroyer, defects were allowed to creep in that had a significant impact on the production of the equipment and thereby contributed to an unimportant failure, nevertheless, in the ship. I cite this as the kind of thing that is also a reflection of the increased volume of work that the Bureau of Ships must administer.

The appropriations have grown in the four years of my tenure in office from something around two and a half billion dollars to something over four and a half billion dollars. During the same period of time, the civilian personnel of the Bureau has been reduced from roughly 3800 down to 3100, a reduction that has been taking place in the engineering area as paralleled in the staffing of engineering duty officers, at a time when we find ourselves with almost double the burden, with a reduction of 20 percent in personnel to do the job. This has been a long-winded answer, but is a subject that touches me right to the quick, and I haven't been able to do a damn thing about it.

Unclassified

(b) (6) relieved (b) (6) as reporter at this point.

Questions by the president, VADM Austin:

Q. Admiral James, to put it in capsule form, at a time when the complexity of shipbuilding is increasing at the most rapid rate, perhaps, in the history of man, you are experiencing not the ability to get a greater input of talent to cope with this greater complexity, but are finding that despite all that you could do you had to accept a lesser quantity of talent to cope with this incressing complexity; is that correct?

A. That is absolutely correct, sir.

Questions by counsel for the court:

Q. Did your remarks apply equally as well to the civilian staffing of the Bureau as in our Naval Shipyards?

A. My remarks applied specifically to the civilian staffing of the Bureau of Ships. Staffing at the Naval Shipyards is another subject and is perhaps less serious than is that at Bureau Headquarters.

EXAMINATION BY THE COURT

Questions by a member, CAPT Osborn:

Q. Admiral James, we've had one other case involving pressure from the operating forces and pressure from the technical sections of the Bureau to maintain a piece of equipment in operation that was a bad bit. I refer to the pancake engines on the 563 class submarines. Do you think in an effort to increase our production that this has been the case with sil-brazed joints?

A. I don't relate the two at all, Captain. One is a process; one is a product. And I think you can distinguish between the two.

Q. I am referring to the result in each case, Admiral. In one case we have no, really, opposition with respect to sil-braze work, a method of determining our particular status when, at the time the problem existed, we really had no method that had then been developed?

A. I would say that there is no question about it but what the preparation for introducing this new process into the shipbuilding industry, both private and naval, lacked certain imagination at the time it was adopted. We did not prepare our manpower to the degree that now we know to have been necessary. The process, however, under controlled conditions, as I have stated, leaves nothing to be desired.

Q. I have no doubt of the process once it's under control and properly ultrasonically tested, Admiral. I am just referring with respect to the slowness and particularly with respect to, say, the status of, say, THRESHER or TINOSA, how to establish those other than having to pay pretty dearly for it.

A. Well I must confess to only a superficial knowledge of the pancake problem except to know that it is not a very sterling performance producing this engine. Re-engining of the ships, of course, was a significant problem that we all shied away from as the last resort. Perhaps we postponed the last resort too damn long, trying to get operating submarines.

Unclassified

Q. Well I don't share that this is any particular individual responsibility. I'm just looking at the whole process as a whole, and certainly with a big advantage in retrospect. How do you feel about it in retrospect?

A. How do I feel about--

Q. About silver brazing, in retrospect?

A. I have no concern about properly executed silver brazed piping in any state. But I must confess I was aghast at how little control we found evident across the board both in building and repairing. We allowed our mechanical forces in various places to do slaphappy jobs. Now we are identifying each and every joint to the man who creates it. We believe by this device that we will establish a sense of responsibility that was lacking that may now make all the difference in the world.

Questions by the president, VADM Austin:

Q. Admiral James, a letter has been introduced into the record as Exhibit 115 which is from the Chief, Bureau of Ships, to the Commander, Portsmouth Naval Shipyard, and it's dated 28 August 1962. This letter is signed by R. L. Moore, Jr., Deputy Chief of the Bureau. I would like to show you this letter and ask if the subject treated in this letter was discussed with you before the letter was sent. (The witness was handed Exhibit 115).

A. The specific letter I only recall having seen of recent date. The subject matter, however, is one that I am constantly aware of and consulted with, and participated in the discussions of, from the beginning of our concern with this through to the 29th of April, 1963.

Q. So that your Deputy, in signing this letter, was signing it with the benefit of prior discussions of this general subject with you on many occasions perhaps?

A. My Deputy would have signed this letter only in the full appreciation of the fact that I would generally concur with whatever he signed. I am trying to recall the date here, whether I was in town or not, and I'm afraid I'm going to be unable to do so. But I would say with certainty that Admiral Moore and Admiral James were as singularly minded thinking a pair as I have ever witnessed in the Bureau of Ships.

Q. This letter indicated that it was the desire of the Bureau of Ships that a minimum of at least one ultrasonic test team be employed throughout the entire assigned post shakedown availability of the THRESHER--

A. A minimum of what, sir?

Q. A minimum of one ultrasonic test team--and that insofar as possible the maximum number of sil-brazed joints be covered by this team. That would seem to indicate that the Bureau of Ships did place reliance on the ultrasonic test method and that the Bureau of Ships was desirous of getting more information than it then had as to the reliability of the silver brazed joints which were then in the THRESHER. Is that a correct interpretation?

A. I would think so, yes, sir. The ultrasonic test methods were devised separately, but in collaboration, both at Mare Island and at the Electric Boat Company, and we wished to introduce here at Portsmouth a full awareness of the potential of this system; and I believe this was a factor in prescribing the requirement here for the Portsmouth Shipyard to get in the act.

Q. Admiral James, I believe that during the time that you were the Chief of the Bureau of Ships, you exerted efforts to try to obtain officers not specially qualified as Engineering Duty Only officers, but officers with operating experience from the line of the Navy who may not have had the benefit of special education in the engineering field, to bring to your Bureau a continuous input of fleet experience and operating viewpoint. Is that correct?

A. This is absolutely correct; and I achieved a degree of success in this effort through the cooperative appreciation by the Deputy CNO of the wisdom of this action. For example, when I took office we had what we called a Sea Exchange Program that brought roughly twenty-five to forty operating officers into the Bureau's shore areas in exchange for a corresponding number of Engineering Duty Officers. In my tenure in office, we have increased this number to seventy-five. In the specific area of your interest, I was completely frustrated, however, and made an appeal on several occasions, for the assignment within the Bureau of Ships of former commanding officers of nuclear-powered submarines, and found that there was a great demand for the services of these highly trained officers elsewhere. My wishes were acknowledged as valid but were not supported by any action to give me the kind of talent that I think would have brought great information and value to our performance within the Bureau.

Q. Does that apply even to Code 1500 of the Bureau?

A. Well, no, because Code 1500 is a closed corporation, and he can levy upon his former associates in the nuclear submarine field at will. But Mr. 1500 is one of the areas where I hoped for support to carry out my other intentions and I found it difficult to convince him that any such officers should be anywhere but in the 1500 area.

Q. Now Admiral James, we have had testimony which seemed to indicate that the instruction booklet, Ships Instruction Book, which normally is given to a ship by the building yard, in the case of THRESHER, was not approved by your Bureau; that it had been let to an outside contractor, and the outside contractor had been given a former booklet which did not have the sophisticated silencing equipment and other things that THRESHER had; and that, therefore, the THRESHER went to sea with a preliminary booklet--that former guideline booklet was of the 588 class. This booklet, which was called a Preliminary Ships Instruction Book, did not address itself too much to damage control. It addressed itself more to the safe operation of the plant and the description of the systems involved. Can you say anything on this subject which would help the court to understand why the damage control feature was not more seriously treated in the Ships Instruction Booklet?

A. I will have to plead ignorance to the specific case that you are citing. I think I could only serve to muddy the court's information if I attempted to comment on it. After a period of study I could make a responsive answer, but at this moment I don't believe I can.

Q. Well I don't think that will be necessary, Admiral. We have had testimony from those in your Bureau who are closer to the subject than you and I did not know whether you had any other knowledge that would add to our understanding of this.

A. No, sir, I am completely without knowledge on this.

Neither counsel for the court, the court, nor the party desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement:

WITNESS: I believe I have nothing further to add except to wish the court well in their tremendous undertaking. From the conclusions of this court will flow great information of value to prevent a recurrence of this tremendous tragedy.

PRESIDENT: We are all very mindful of that responsibility.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

The court recessed at 1528 hours, 9 May 1963.

The court opened at 1547 hours, 9 May 1963.

All persons connected with the court who were present when the court adjourned were again present in court.

No witnesses not otherwise connected with the inquiry were present.

Thomas R. West, a former witness for the court, was recalled as a witness for the court, was reminded that the oath he had previously taken was still binding, and was examined as follows:

DIRECT EXAMINATION

Questions by counsel for the court:

Q. Mr. West, you are a Leadingman Pipefitter of Shop 56, are you not?
A. This is correct.

COUNSEL FOR THE COURT: This is a closed session. Classified information may be divulged.

Q. Do you have a plan of the Marotta Reducing Valve in b(1) high-pressure air system in THRESHER?
A. I do, sir.

Q. Does it show the screen assembly installed in the valve?
A. It does, sir.

The above-cited plan was submitted to the party and to the court, and was offered in evidence by counsel for the court. There being no objection, it was received in evidence as Exhibit 178.

Q. Would you show the screen assembly installed in the valve, please, Mr. West?

A. (The witness pointed out the screen assembly on Exhibit 178) The screen assembly installed in the valve is installed on the inlet port and it sets on a land; and this tailpiece adapter will hold this on the land.

Q. Do you know of any instructions to remove the filter from the valve assembly?

A. I know of no instructions. I have checked with Design and there are no instructions to remove this screen from the reducer, sir.

Q. To the best of your knowledge, how many of such screen assemblies of Marotta Valves were installed in THRESHER?

A. There were three installed on your b(1) reducers. One of your reducers is in the forward room for Number One bank; and two of these are in the Air Regenerating Room, sir.

Q. On the high pressure manifold?

A. These are in the reducers on the high pressure manifold, yes, sir.

Q. Do you recall a Planning Conference around the first day of April, 1963, at which the subject of these filter screens was brought up?

A. This is correct, sir. The Captain of the ship, Captain Harvey, requested the shop to remove these so that his people could check and make sure that these screens were still in these valves. These valves had been removed and gone in eighty and come back and were put in and he wanted a verification of this.

Question by the president, VADM Austin:

Q. A verification of what now?

A. That the screens were still in the reducers, sir.

Questions by counsel for the court:

Q. Was it your understanding that he wished the screens to be in the reducing valves and wanted to have it demonstrated to his satisfaction that they were installed?

A. This is correct.

Q. Was such an inspection made to the satisfaction of the commanding officer?

A. That is correct, sir.

Q. Can you tell us about it?

A. I had one man go aboard the boat with. Chief Johnson was his representative, and they secured one system at a time, removed the Marotta valves and inspected to see that the screen was there. At the end of this I checked with Chief Johnson and the ship was then satisfied that none of these were put in without screens.

EXAMINATION BY THE COURT

Questions by a member, RADM Daspit:

Q. Is there any provision for automatically by-passing this screen in case it clogged up?
A. There is none for automatically by-passing the screen, sir; but you can by-pass the reducer.

Questions by the president, VADM Austin:

Q. Mr. West, what was the material of this screen?
A. The actual material of the screen, sir, I cannot state. I do not know the actual material, sir.

Q. Was it the conical screen which was furnished by the Marotta Valve people?
A. This is correct, sir.

Q. And you are reasonably certain of this point?
A. Yes, sir, I am.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. In by-passing the Marotta Reducer Valve, what size line is provided for the by-pass?
A. That line is an inch and a quarter tube size, sir.

Neither counsel for the court, the court, nor the party desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

Raymond E. Bemis, a former witness for the court, was recalled as a witness for the court, was reminded that the oath he had previously taken was still binding, and was examined as follows:

Unclassified

DIRECT EXAMINATION

Questions by counsel for the court:

Q. Mr. Bemis, you are in the Design Division of the Portsmouth Naval Shipyard, Code 263 BRAVO, are you not?

A. Yes, sir.

Q. You have previously testified as to the overall design capabilities of the trim and drain system, have you not, sir?

A. Yes, sir.

COUNSEL FOR THE COURT: This is a closed session of the court and you can give classified information.

Q. In particular, you also testified concerning certain water hammer tests that were conducted during June of 1961 on THRESHER's trim system subsequent to her second sea trials?

A. That would be after the second sea trials.

Q. Yes, "after". "Subsequent to." You testified that during those tests peak pressures as high as 1100 pounds per square inch were induced. Since that time have further studies and calculations been made which indicate the approximate peak pressures which resulted from operation of the trim system at test depth during those sea trials?

A. Yes, sir.

Q. Can you give us that information?

A. Yes, sir, I can. During the first and second sea trials of the THRESHER, the hull and back-up valves of the various systems, and I'm speaking particularly of the trim system, was cycled at 100 foot increments to test the workability at various depths. They were cycled four times during the first sea trials and they were aborted because the hull valves were not operating correctly. The second sea trials they were operated seven times during the second sea trials. During the cycling of the hull back-up valves to the trim system, to the trim suction main, full sea pressure was abruptly admitted to the trim section main with the valves at the extremity of this main shut. As this suction main was at or below atmospheric pressure, a violent water hammer was induced, and during this cycling there were two joint failures; one, a four inch line; and one, a three-quarter inch line. These were both silver brazed joints. There is no definite knowledge that both of these joints failed during the last cycling of the valves. It is evident, however, that the system was exposed to abnormal pressure since the four inch pipe adjacent to the test valve at the forward trim tank, which is the extremity of the line, bulged to, or expanded to and remained at seventy-thousandths above the maximum allowable diameter of the pipe specifications. The yield strength of this tubing is 18,000 pounds. The calculations that we have made state that the calculated force necessary to expand this tubing to seventy-thousandths larger than its diameter and remain there was approximately 16,500 pounds per square inch. Further, the floats in all three priming valves attached to the trim suction mains were crushed. These floats were made of .050 or fifty-thousandths Inconel, which has a yield strength of 50,000 psi. The calculated force necessary to crush these floats was 15,680 pounds. From these two figures that I previously stated, 16,500 to expand the pipe, and 15,680 pounds to crush the ball, it is safe to assume that the peak pressure assumed during this water hammer was in the neighborhood of 16,500 pounds. I couldn't bring the pipe to show the expansion of the pipe, but I do have one of the floats that was in one of the priming valves. This float was taken out of one of the priming valves after the second sea trials.

Unclassified

This is what happened to it (the witness displayed a markedly crushed circular ball float). This float is full of water. It has not leaked since we took it out of the system. We have examined the seam, which you can see in here with a magnifying glass, and there appears to be a slight fracture in the seam. We are assuming that this seam opened up during this water hammer, allowed the water to enter this ball, and then closed; and since then the ball has not leaked. This is a five-inch diameter Inconel .050 thickness ball. These ends here (indicating) are the seats and the guides that seat this float when the air is evacuated from the system. As the water rises in the priming valve, this float is listed and this ball here seats this little ball and prevents any salt water from getting into the priming system. By then you have approximately twenty-two inches of vacuum in the trim suction main. That's all I have on the crushing effect of the water hammer.

Q. Do you have a copy of the Test Lab Report on the trim system piping failure?

A. Yes, sir.

Q. Will you identify it?

A. This is a test report put out by the Materials Test Lab on the second of June, 1961, pertaining to the failure of the two aforementioned silver brazed joints. There are photographs included.

A Test Report dated 2 June 1961 was submitted to the party and to the court and was offered in evidence by counsel for the court. There being no objection, it was received in evidence as Exhibit 179. Counsel for the party, RADM Palmer, waived reading the exhibit.

Q. Do you know what distribution was made of this report?

A. No, sir. I endeavored to find out and there was no distribution. Mr. Sheehan in the Materials Test Lab told me personally that he knows this was provided to the Planning Officer, the Design Officer, and the various codes in Design Division.

Q. Is that knowledge confirmed by various internal memoranda which discuss the conduct and results of the tests made?

A. It doesn't specifically refer to this Test Report, no, sir.

Q. The high peak pressures that were impressed on the trim system induced certain failures. What subsequent tests and inspections were made to determine that these high peak pressures did not induce incipient failures in systems, joints and valves?

A. After the vessel came in from the second sea trials, we were requested by the Bureau of Ships to conduct a series of waterhammer tests. These tests were conducted in the No. 2 drydock by filling an old conning tower partly full of water and putting air pressure on top of this water. This pressure was abruptly admitted to the various systems, the trim system especially, to induce water hammer. We started at a low pressure and built it up to a high pressure. We started with the valves opening rapidly, less than one second. We ended up with the valves opening in seven to nine seconds and shutting in two seconds. And this reduced the water hammer. In some cases by increasing the tank pressure by thirty-eight per cent, the peak pressure was decreased by twenty-eight per cent.

Unclassified

Q. Mr. Bemis, I was referring to any possible latent weakening effect that these high peak pressures might have had on the system as a whole; that is, was each joint or valve visually inspected or inspected by some nondestructive test method to determine whether it suffered any weakening effect.

A. I can't answer this fully. All I can answer is that these systems were tested to one and a half times b(1) pressure before and after the water hammer test. These pressures were maintained for six hours. There was insignificant pressure drop during these six hours. And that's all I can tell you.

Q. Do you have any personal judgment as to whether it was possible that there was a weakening of the joints and valves in the system as a result of the high peak pressure?

A. I would hesitate to answer that, sir.

Q. Either way?

A. Either way.

Unclassified

(b) (6) relieved (b) (6) at this point as reporter.

Q. You indicated a failure in a four-inch joint of the trim system. Will you more fully describe the type of failure which occurred in that joint?

A. Yes, sir. This joint was in a four-inch suction main. The piping was copper-nickel. The coupling that joined the pipe was made of nickel-copper. This last was a joint that was put in due to the effects of expansion and contraction of the trim main. We installed an expansion loop of pipe -- four-inch pipe-- in the diesel generator room. This is where the failure occurred. The coupling was made up of monel with a Grade IV silver brazing insert -- pre-inserted ring. This was brazed in place and for some unknown reason the shop put a fillet silver brazing on top of the joint of Grade III silver. This is described in this joint failure brochure. The photographs of the joint indicated that the water hammer broke the joint apart at the top of the joint. The bottom of the joint held. Further photographs show that due to the larger amount of heat necessary to melt Grade III silver, that all of the Grade IV silver in the joint ran to the bottom of the joint, leaving only the Grade III silver at the top of the joint bonding the joint.

Q. Mr. Bemis, you stated the yield strength of the tubing of four-inch diameter in the trim system was 18 thousand pounds per square inch. What type of material was this?

A. Copper-nickel 70/30 - seventy per cent copper, thirty per cent nickel; seamless tubing.

EXAMINATION BY THE COURT

Questions by a court member, Captain Nash:

Q. Mr. Bemis, you told of a section of line which was bulged.

A. Yes, sir.

Q. Was anything done to this line after the completion of the sea trials?

A. Not to my knowledge.

Q. It was left in its bulged condition?

A. Yes, sir.

Q. Do I understand correctly, however, that it was subjected to test pressure after the bulging occurred?

A. Yes, sir, b(1) test pressure.

Questions by a court member, Captain Osborn:

Q. Static pressure, you calculated 18000 pounds per square inch?

A. No, sir, that wasn't static pressure; this is the yield strength of copper-nickel tubing.

Q. Well, what did you do to give you the seventy thousandths deflection? -- What pressure did you calculate to give you the seventy thousandths deflection?

A. Oh, 16,500 pounds.

Unclassified

Q. 16.500. Is that a static pressure that would do this?
A. No, sir, water hammer -- a peak.

Neither counsel for the court, the court, nor counsel for RADM Palmer, a party, desired further to examine this witness.

The president informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to offer.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

John B. Heeney, a civilian, was called as a witness for the court, was informed of the subject matter of the inquiry, was advised of his rights against self-incrimination, was sworn, and examined as follows:

COUNSEL FOR THE COURT: This is a closed session of the court, Mr. Heeney and classified information can be divulged here. At the conclusion of your testimony, I shall ask you what classification you would ascribe to it taking your testimony as a whole.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, address and present occupation.
A. John B. Heeney, (b) (6) and I am a Production Specialist in the Planning and Estimating Division of the Planning Department.

Q. You are employed at the Portsmouth Naval Shipyard, are you not?
A. I am.

Q. Would you describe, briefly, the nature of your duties in your job?
A. Yes, sir. I am what is locally described as a Planning and Estimating Department Type Desk. In my duties at the Shipyard, I am normally the assistant to a commissioned officer who is designated as an Assistant Planning and Estimating Superintendent. In connection with the THRESHER, I was the civilian assistant to the Planning and Estimating Superintendent who had charge of the THRESHER overhaul.

Q. What was his name please?
A. Lieutenant Commander Billings.

Q. State, briefly, your background and experience?
A. I came on the Shipyard 27 years ago as an apprentice. I served my apprenticeship as a machinist in Shop 31, during which four years I spend six months in the outside machine shop and three months in the drafting room. At the end of my four-year apprenticeship, I served four years as a journeyman machinist; after which time I was transferred to the Planning and Estimating Division. I served a period of time -- I can't tell you exactly how long -- as a Planner and Estimator, and became a Type Desk Assistant beginning with the TANG class, the 563.

Q. Directing your attention to the period around the beginning of December, 1962, were you aware of the fact that a survey was requested by the Bureau of Ships to be conducted on the silver brazed joints of the piping systems in THRESHER by ultrasonic methods?
A. Yes, sir, I was.

Q. Were you aware of a memorandum from Code 303B here at the Shipyard, addressed to Code 213X regarding unlagging of joints for further inspection by ultrasonic methods? -- In that connection I show you Exhibit 116 before this court.
A. Yes, sir, I was aware of that memorandum.

Q. Did you sign a reply to that memo which has been admitted before this court as Exhibit 117? (Showing document to witness)
A. I did, yes, sir -- that's my signature.

Q. Can you describe the process by which the decision was made to sign the answer which you have signed on Exhibit 117?
A. Yes, sir. If I may, I would like to point out first, that one of the duties of the Planning and Estimating Type Desk and one of the duties which was mine, was to instruct the Production Department, different particular Production Department shops, as to exactly what work they were to accomplish, and all work accomplished by the Production shops had to be signed and has to be signed to this day, by a member of the Planning and Estimating Type Desk. Acting as the Planning and Estimating Type Desk, I signed a job order. If I may please read a job order out of context.

Q. Could you produce the job order first. I believe it is pertinent enough to introduce into evidence.
A. Yes, sir. (Hands document to counsel for the court)

The cited job order and associated design liasion instructions and condition reports were then offered in evidence by counsel for the court. There being no objection it was so received and marked as Exhibit 180. Counsel for RADM Palmer, a party, waived the reading of the exhibit at this point.

Q. Refer to Exhibit 180 and read the excerpts from them which are pertinent to your answer.
A. Reading out of context from the job order, the portion that is pertinent to my answer reads as follows: "Check first those joints in the system that are not lagged. If, at a later date, time allows than lagging will be removed. Keep P & E and Design informed on the results of this inspection periodically, especially rejected joints, so that replacement action may be taken."

Q. Now you were explaining the background of the composing of your reply which is Exhibit 117 --
A. Oh, I am sorry. Do you want me to go on from there?

Q. Yes, please do.
A. I was explaining my reply. Now if I may, when I received the memorandum from Code 303 --

Q. Exhibit 116. Proceed.
A. I have the original. At the time I received the memorandum from Code 303B-2--

Q. Referred to in this court as Exhibit 116 -- go ahead.
A. -- this was a follow-up and requested follow up action on the job order 90393 which I previously read and which has been introduced as evidence. At the time I received this, my one duty was to report and answer 303B as to the Shipyard's ability to accomplish the inspection of the unlagged joints during the availability. This was a Production Department decision but it should be passed out by Planning and Estimating because Planning and Estimating dictates to the Production Department. At that time I called on the telephone the then acting assistant ship superintendent for the 593, Chief Warrant Officer Charles Cadenhead.

Q. How do you spell his name, please?
A. I spelled it in my own way as C-A-D-E-N-H-E-A-D. That is close. At that time I made a note in my own handwriting on the original of the 303 memo which says: "11/30/62. No inspection of lagged joints will be possible during PSA. Cadenhead." These comments are my own. The handwriting is my own. At the same time I prepared my reply to the 303B-2 memo. This is my reply of 4 December.

Q. Exhibit 117 before this court.
A. May I go on?

Q. Please do.
A. At the time I prepared my reply, which eventually was dated 4 December, I did not sign it. It was not dated. It was routed to the Production Department and on the original copy of the 303B memo, I have in my own handwriting a note which says "213" -- that is myself -- "by reply by memo of 4 December, route sheet of which was approved by 313 prior to issue." What this means, gentlemen, is that I prepared my reply, my memorandum of 4 December. I did not sign it. I sent it down to the Production Department on a route sheet for the approval of the Ship Superintendent Code 313.

Q. Who was that?
A. I don't know today. Records will show but I do not know today whether at that time the Ship Superintendent was Lieutenant Biederman who was lost on THRESHER, or whether it was Lieutenant Frank Seymour. The Ship Superintendent changed somewhere in between and I don't know which of these two gentlemen it was. Since that time I have attempted to obtain a copy of the route sheet which bore the ship superintendent's initials. Unfortunately, this route sheet is not in existence because Central Files has informed me that they do not keep copies of internal route sheets unless they bear what to them is a pertinent note. I have only my own handwriting on the original to bear me out on this. I might add though that this memo -- my memo reply of 4 December -- was routed, copy to Commanding Officer SSN 593; Code 310, the Shipbuilding Superintendent; Code 313, the assistant shipbuilding superintendent who would be either Lieutenant Biederman or Lieutenant Frank Seymour; Code 241D of design; and Code 260 of Design.

Q. Was the note also routed to Code 303B and Code 303B-2 of Quality Assurance?
A. It was, yes, sir.

Q. Was a decision then made on the basis of the time factor involved?
A. Yes, sir, it was.

Q. Do you have a copy of a letter written by Lieutenant Commander Billings, setting forth an arrival conference agreement that the Shipyard would ultrasonically test silver-brazed joints not lagged and that lagged joints would be so tested only if time permitted? Do you have such a copy of a letter?

A. Yes, sir, I do.

Q. Would you produce it please?
A. Yes, sir.

Q. I show you a Portsmouth Naval Shipyard letter dated August 9, 1962, addressed to the Bureau of Ships entitled "Piping Joints Inspection Sea Water Systems USS THRESHER." Does this refer to the conference?
A. Yes, sir, it does -- paragraph 2.

The cited document was then offered in evidence by counsel for the court. There being no objection by the court or counsel for RADM Palmer, a party, the document was so received and marked as Exhibit 181. Counsel for RADM Palmer, a party, waived reading the exhibit at this time.

PRESIDENT: Was this letter ever sent?

WITNESS: Yes, sir, it was.

PRESIDENT: Why then is it signed by the originator?

WITNESS: I can't see it from here, Admiral. I don't understand.

Q. Is that the original or a reproduction? (Handing Exhibit 181 to witness)
A. I had assumed that this was a reproduction. May I point out that in SUBLANT Letter of 7 September '62, Reference (a) is COMNAVSHIPYD PTSMH ltr serial 213 SSN593/9480 of 9 August 1962.

PRESIDENT: I think we want to enter that as an exhibit.

Questions by counsel for the court:

Q. My question related to a letter prepared by Lieutenant Commander Billings. I note that this is not signed by him. Was it so prepared to your own knowledge?
A. Yes, sir, it was by evidence of the file number which started out "Code 213."

Q. Would you describe the arrival conference to which you made reference?
A. Yes, sir. This was the arrival conference of THRESHER, quoting from memory, at which representatives of the ship, Bureau of Ships and SUBLANT were present. Again quoting from memory, I do recall that the question of inspection of silver brazed fittings was very important to that meeting, and it was definetely decided -- and now I am reading from this letter: "As agreed by all attendees" -- "the following inspection of sea water systems will be accomplished during THRESHER PSA." And we spoke at the time of the "visual inspection of all silbrazed joints two inches and above, which are unlagged and readily accessible" -- and this is important -- "including all joints between hull and backup valves. Ultrasonic test all suspect joints found by this visual inspection." But it was recognized by all present at the arrival conference that the inspection of all -- repeat -- all silver-brazed joints lagged and unlagged, would virtually impossible during the availability.

Unclassified

Q. Do you recall the names of those present at the conference?
A. Members of the ship's force, and I hesitate to say who was represented by the ship's force -- I believe the commanding officer, but I will not say that. From SUBLANT -- and again I'm relying on memory, would it have been Captain Hamby?

Q. If you don't know -- don't say.
A. Well, I am not sure who it was. From Bureau of Ships it was Commander Woolston. Other than that, gentlemen, I am just relying on memory; I can't say. I might also point out that because this was considered of prime importance at the arrival converence, I left the conference for the express purpose of having an estimator write a job order covering the inspection of silver-brazed joints which was later read at the arrival conference and found acceptable to all present.

Q. Did you later receive a letter from Commander Submarine Force United States Atlantic Fleet, early in September, 1962, which made certain modifications in that agreement?
A. Yes, sir, I did.

Q. Would you produce it?
A. Yes, sir. (Hands document to counsel for the court)

The cited document, a letter from Commander Submarine Force, U. S. Atlantic Fleet, dated 7 September 1962 was then offered in evidence by counsel for the court. There being no objection by the court or counsel for RADM Palmer, a party, the document was then received in evidence and marked as Exhibit 182. Counsel for RADM Palmer, a party, waived the reading of the document at this time.

Q. Do you have any further background material with reference to your decision which resulted in your memorandum of 4 December -- Exhibit 117 before this court?
A. No, sir, I do not.

Q. You do not. At the time you signed Exhibit 117, did you have in mind any directive from the Bureau of Ships on this subject?
A. Yes, sir. There was a Bureau of Ships letter which spelled out in detail the Bureau of Ships desires in regard to the inspection of the silber-brazed joints on the 593.

Q. Was that in your mind at the time of preparation of this letter?
A. I knew of this letter and I had read it.

Q. Would that be Exhibit 115 -- Is this the one? (showing document to witness)
A. The Bureau of Ships letter of 28 August.

Q. Yes, the Bureau letter of 28 August I just showed you which is Exhibit 115.
A. Yes, sir.

Q. This is the letter that you had in mind?
A. Yes, sir.

EXAMINATION BY THE COURT

Unclassified

Questions by a court member, Captain Nash:

Q. Did you realize that the action which was decided upon was contrary to the instructions of the Chief of the Bureau of Ships?
A. No, sir, I did not.

Q. Do you now realize that?
A. No, sir, I do not.

Q. Let me be sure we are talking about the same letter. You looked at Exhibit 117?
A. Which is the Bureau letter of 28 August?

COUNSEL FOR THE COURT: Exhibit 115.

CAPT NASH: I am sorry, Exhibit 115.

WITNESS: I have a copy of it here.

Q. Now we are talking about the same letter?
A. Yes, sir.

Q. Do you see any contradictions between what you decided upon, and the instructions of the Chief of the Bureau of Ships?
A. In the first place, Captain, let me explain, let me ask what you mean when you say that I decided upon -- what decision did I make?

Q. No, do you recognize any contradiction between the Bureau instruction and the decision that was arrived at?
A. That was made, and the Bureau of Ships letter of 28 August? -- no I don't, Captain, no, sir.

Q. I didn't mean to debate whether you made that decision or not.
A. Understood. No, sir, I do not see any difference between the decision that was made and the letter of 28 August, no, sir, I do not.

Questions by a court member, Captain Hushing:

Q. Mr. Heeney, about when did the THRESHER availability start?
A. Shortly before July of 1962.

Q. Exhibit 180 is the job order which called for ultrasonic testing. Will you read from that job order the date it was issued?
A. The job order was issued, Captain, of the 25th of September 1962.

Q. Do you have any knowledge as to why there was a two to three months' delay in issuing that job order?
A. Yes, sir, I do.

Q. Can you tell us?
A. Yes, I can, Captain. Actually there were two job orders issued on THRESHER which accomplished primarily the same purpose. On is Job Order 90393, which has been introduced into evidence. This was dated 25 September 1962, and was signed by myself. This, if I may add, was Work List Item N-116. And prior to that time

there was another Work List Item. This was Work List Item N-60. This was issued on July the 28th, 1962.

Q. And what is the job order number?
A. 50812.

Q. And what does that call for?
A. If I may read from it, Captain -- in the first place the references are identical on the job orders. This job order will be issued in three parts. Initial test of the system, repair or replacement of rejected joints, final tests. The general instructions of the job order were to hydrostatically test sea water systems, references (A) to (K) per instructions on Sheet 4 through 6 of this job order. If I may skip and read it out of context to show the similarity. "Remove lagging from all silver brazed joints between and including hull valves and backup valves of the systems listed under references (A) through (K)." "Visually inspect all silver-brazed joints between and including hull valve and backup valves, and all others in the system that are not lagged and are accessible without the removal of any interferences." This job, Captain, was issued on the 28th of July.

Q. When did it call for the work to start?
A. The 27th of July -- the scheduling division called for the start of work on the 27th of July.

Q. And when did the scheduling division call for the start of ultrasonic testing as appeared on 90393?
A. September the 25th.

Q. Do I understand correctly then that there was approximately two months between the issue of the starting of work on job order 50612 and the starting of the ultrasonic test on job order 90393?
A. If I may refer back to 50612, which was issued on the 28th of July, it says "Have any joints that fail on visual inspection ultrasonically inspected by Shop 54." And this is in the job order dated the 28th of July, so ultrasonic test was covered in the job order dated 28 July.

Q. So far as you know ultrasonic tests could have started as early as 28 July?
A. Yes, sir, it could have.

Q. I believe the job order which was introduced as Exhibit 180 called for periodic reports from the inspection group on ultrasonic test, did it not?
A. It did.

Q. Did you receive such periodic reports or did anyone in Planning receive such periodic reports?
A. Yes. These periodic reports were prepared in the form of Design liaison instructions.

Q. As a result of condition sheets or something of that nature?
A. Yes, sir.

Q. Do the condition sheets give any indication of how many joints had been ultrasonically tested or do they concern themselves only with one deficiency?

A. No, sir, they give an indication -- I am sorry -- the deficiency reports contain information on one deficiency at a time. They do not summarize -- the condition reports -- do not summarize the number of joints tested. This did not come up until the 303 memo to my knowledge.

Q. So you have individual reports of deficiencies; but you did not have any periodic reports of the total number of joints tested?
A. I did not.

Q. Do you know if anyone in Planning and Estimating did? -- Doesn't this job order call for a report from Planning and Estimating?
A. It does.

Q. Do you know if anyone received such periodic reports other than condition reports or design liaison reports for individual defects?
A. No, sir, I do not.

Q. Is there anyone, whom you can think of, who might have such information?
A. Anyone who I might think of who might have such information? -- Yes. I believe this would be Code 263B of the Design Division.

Questions by the court president:

Q. Mr. Heeney, referring again to Exhibit 115, I read to you from this letter from the Chief of the Bureau of Ships: "To this end Portsmouth Naval Shipyard is directed to initiate the following actions during THRESHER's PSA" --
A. Excuse me, Admiral, what page?

Q. This is page 2. "a. Employ a minimum of at least one ultrasonic test team throughout the entire assigned PSA to examine, insofar as possible, the maximum number of sil-braze joints." In which job order is the spirit of that directive reflected, if at all?
A. In the spirit of the job order 90393.

Q. Please will you read that part of the job order which is responsive to that directive?
A. Yes, sir. Shop 32 "visually inspects per section 3B reference (M), and ultrasonically inspect all silver brazed joints two inches and above on all piping systems, references (A) to (K) that are subjected to sea pressure. A man will be assigned to the inspection crew to serialize joints for identification and recording purposes. Check first those joints in the system that are not lagged. If, at a later date, time allows, than lagging will be removed."

Q. Did the Bureau say to let lagging stand in your way or did the Bureau say "Insofar as possible the maximum number of sil-braze joints"?
A. On page 3 -- in paragraph 6d, the Bureau letter said and I quote: "All joints which do not indicate by ultrasonic test an average of 40 percent bond with a minimum of 25 percent bond on either land, shall be considered defective. Defective joints shall be repaired or replaced on a 'not-to-delay' ship basis."

Q. "Defective joints will be repaired or replaced on a 'not-to-delay' ship basis."
A. Yes, sir.

Q. But Mr. Heeney, we are getting away from my point. Let us go back now to the language to which I invited your attention. "Employ a minimum of of at least one ultrasonic test team throughout the entire assigned PSA to examine, insofar as possible, the maximum number of sil-braze joints." As you read from the job order, I did not understand that a sil-braze test team -- ultrasonic test team -- was being put on this job to stay on it for every day of the PSA, and that's what they told you to do.

A. It was the intention of the job order, Admiral, as the job order was written, to do exactly that, until we reached the point in the availability when the test program would not permit us to go into the silver-brazed joints -- into the lagged joints -- which were not accessible, by virtue of the fact that the test program would not permit us to go into the lagged joints.

Q. Mr. Heeney, I have not yet heard, either quoted from the job order itself or from your testimony, anything that seems to me to coincide with the spirit and letter of this paragraph -- this subparagraph "a" of paragraph 6, page 2, Exhibit 115 which I have read to you twice. You, in your job order, said that a man would be designated, and will you read from it again to get the exact working?

A. Yes, sir. "A man will be assigned to the inspection crew to serialize joints for identification purposes."

Q. To identify them for recording purposes. Now was that to be the ultrasonic test team?

A. No. This was a directive to Shop 32 to assign a man to do this for the test people, Admiral.

Q. Yes, but where do you direct any shop to assign a minimum of at least one test -- ultrasonic test team -- through the PSA in order that the maximum number of sil-braze joints shall be tested?

A. Under job order 50612, and I quote: "Provide services of ultrasonic inspection team as requested by Code 303B"--

Q. As requested by?

A. 303B, the inspection division.

Q. Did you direct Code 303 to keep one team minimum on this job?

A. Key op 03 of the job order. "During initial hydrostatic test of sea water systems, visually inspect all silver-brazed joints between and including hull valve and backup valves, and all others in the system that are not lagged and are accessible without the removal of any interferences.

(b) (6) was relieved by (b) (6) as reporter at this point.

Q. That says "visually inspect" those that are not lagged. That does not say "ultrasonically inspect the maximum possible number." Do you find anything in the job orders, Mr. Heeney, responsive to my question?

A. Not in the job orders that I signed, I do not, Admiral, which goes beyond what I have already read, so far as the team to conduct the inspection throughout the test.

Q. Was there anything in correspondence which has not yet been cited which removed this requirement, or modified this requirement, to the best of your knowledge?

A. No, sir.

Q. Was there anything at the arrival conference, at which the Bureau of Ships had a representative, that modified this requirement?

A. There was, Admiral, to this effect; that the Bureau of Ships letter went beyond the sea water system and asked us to ultrasonically test hydraulic systems and high pressure air systems which the Shipyard was not capable of doing, by virtue of the fact that most of these systems were below two inches, and we did not have the capability for ultrasonically testing these systems. We went back to the Bureau, pointing this out, and to the best of my knowledge, Admiral, we never received a reply.

Q. But at the arrival conference, this point that I have been asking you about, was not discussed, this minimum of one ultrasonic team and maximum number of joints?

A. This was discussed, Admiral, and the point was made that this would be done.

Q. But no lagging would be taken down?

A. That is correct; no lagging would be taken off unless eventually the availability stated that we could do this. We just did not guarantee, or we did not say that we wouldn't remove lagging until the point came that a decision could be made.

Q. What was the date of the arrival conference; do you recall, or do you have papers from which you can refresh your memory?

A. Yes, I do. Have I given my letter in evidence, Code 302 letter of 8 August?

PRESIDENT: I have it here. It refers to the arrival conference, but it doesn't give the date.

WITNESS: July the 12th, I think.

Q. It would appear to have been before 9 August.

A. Yes, sir, it was approximately July 12. Don't quote me, but I believe that was it.

Q. This Bureau letter was written 28 August; therefore, the Bureau letter was subsequent to the arrival conference, and is presumably the latest information, up to that time, of the Bureau's desires.

The witness did not answer.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. At the time you signed your memorandum in December, in response to the request as to whether or not lagged joints should be bared for ultrasonic testing, what information did you have as to the termination date of the post shakedown availability; do you recall?
A. I do not recall, no.

Q. Did you check at that time?
A. Whatever the termination of the post shakedown availability was, I can only say that I was aware of it, because there never was a day that I wasn't aware of the termination of the availability, as the availability increased from time to time.

Q. Did it increase after the time you signed your memorandum of 4 December, do you know?
A. Yes, it did.

CROSS-EXAMINATION

Questions by counsel for RADM Palmer:

Q. Mr. Heeney, can you help us on whether or not an ultrasonic test team was assigned to carry out the required inspections?
A. May I refer you to Production Department for this statement?

Q. Do you have any knowledge of this?
A. As I sit up in the office, Captain, I do not have exact knowledge of what goes on in the Production Department. I know what we expect of them. I know what we tell them to do, but I do not always get a feedback as to what they do.

Q. Whether by job order or otherwise, did anybody in your section, to your knowledge, cause a team to be assigned to the inspection?
A. Yes.

Q. Can you give assurance that a team was assigned to the inspection, from your knowledge?
A. I cannot give the court assurance that it was assigned.

Q. You said in your earlier testimony that the decision, set forth in the December 4th memorandum, was based on the time factor. Will you elaborate on what you meant by the time factor?
A. When I said the time factor the decision was made by the Production Department, based on the time factor, meaning only this, meaning the status of the art of an inspection of the systems at the time Production was asked to make a decision "Can we go into the unlagged joints" and Production came back to me and said "No, we cannot" and this was based on the fact that in order to meet the then existing completion date, they would have to continue with their test program which was already under way.

Q. Was the length of the availability another time factor which entered into consideration here?
A. I think the length of the availability must have, Captain, based on the fact that they had tested their program and they knew when they had to complete it to complete the availability.

Q. Now do I correctly summarize your testimony that the decision as represented by the 4 December memorandum, was based on, first, the agreement reached at the arrival conference; was that the first basis?
A. Yes, sir.

Q. And I believe you stated that there was a BUSHIPS representative at that conference.
A. Yes, sir, there was.

Q. Additionally, you left the conference and prepared a job order that you have cited.
A. I left the conference and caused a job order to be prepared.

Q. And brought it back to the conference?
A. Yes.

Q. And this met with the unanimous agreement of all the conferees; is this correct?
A. I believe it did. I was not at the conference at the time the job order was read or approved by the representatives present, but I did cause to have the job order written, and the job order was introduced at the arrival conference.

Q. Did you receive any information that anybody dissented from the job order that you prepared?
A. No, sir, I did not.

Q. And is it also correct to state that the second basis for the decision was the time factor that you have described?
A. Yes, sir.

Q. Now as to the level of management at which this decision was made, can you help us as to whether this conformed with existing policy or operating procedures in the Yard, or a decision of this nature to be made by the Production Department?
A. Yes, sir.

Q. It was?
A. It was, in accordance with the existing instructions; yes, sir.

Neither the counsel for the court, the court, nor the counsel for RADM Palmer, a party, wished to examine this witness further.

The president informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness said that he had nothing further to state.

The witness was warned concerning his testimony and withdrew from the courtroom.

The court adjourned at 1720 hours, 9 May 1963.

TWENTY-FOURTH DAY

Portsmouth Naval Shipyard
Portsmouth, New Hampshire
Friday, 10 May 1963

The court met in executive session at 0830 hours.

Present: All members of the court and the counsel for the court.

The history and standards of welding in general, radiography techniques, and capabilities of industry, and their application to both castings and pipe joints, were the subjects of discussion during the executive session.

The court opened at 1015 hours and announced that this session would be held with closed doors.

All persons connected with the inquiry who were present when the court adjourned were again present in court. RADM Palmer, a party, and LCDR Hecker, a party, and his counsel, waived their right to be present at this session of the court. Counsel for RADM Palmer was present.

Commander Shelley E. Rule, U. S. Navy, a former witness, was recalled as a witness for the court, advised that his prior oath was still binding, and was examined as follows:

COUNSEL FOR THE COURT: Commander Rule, this is a closed session of the court and classified information may be divulged.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. You are the Quality Assurance Superintendent, Code 303, at the Portsmouth Naval Shipyard; is that correct?
A. Yes, sir.

Q. Will you, first of all, briefly outline for us the provisions in the Shipyard instructions setting forth the responsibilities and functions of the Quality Assurance Control Committee? Do you have the instruction?
A. Yes, sir.

Portsmouth Naval Shipyard Instruction 5420.25B, dated 12 February 1963, was submitted in evidence and there being no objection it was so received as Exhibit (183). Counsel for RADM Palmer waived reading of this exhibit at this time.

Q. You came to this Shipyard in September of 1962, did you not?
A. In January of 1962.

Q. At that time was a previous precept or instruction for the Quality Assurance Committee in effect?
A. Yes. The Quality Assurance Committee was in existence before I came here.

Q. I show you Portsmouth Naval Shipyard Instruction 5420.25A of 20 November 1962. When you came was this the directive under which the committee was operating?

A. No, this was preceded by 5420.25, which was already in existence when I arrived. It was modified in November of '62 by this one, and later in '63 by the exhibit.

Portsmouth Naval Shipyard Instruction 5420.25A, dated 20 November 1962, was offered in evidence and there being no objection it was so received as Exhibit (184).

Q. Commander Rule, there was an earlier instruction with the same title, dated 11 July 1961, entitled Portsmouth Naval Shipyard Instruction 5420.25. Was it substantially the same as 5420.25A?
A. Substantially the same as 25A, yes, sir.

Q. When did you become the Chairman of the Quality Assurance Committee here at the Portsmouth Naval Shipyard?
A. In the beginning of November, 1962.

Q. Do you recall the date?
A. About the 4th of November, I believe.

Q. Prior to that time, how long had you been a member of the committee?
A. I had not been a member. I came to it as Chairman when I took over the job of Quality Assurance Superintendent.

PRESIDENT: This was also in November?

WITNESS: Yes, sir.

Q. Briefly describe the proceedings of the committee and the nature of the business which it conducted during the period while you were Chairman?
A. The committee took over the business and the plan of action as it found it from the previous group. The committee consisted in general of people in the middle management level across the various departments. They met, not invariably, but approximately at two-week intervals. Their work was broken down into separate tasks, which were shown in a Plan of Action. Each task was assigned to an individual in general, a member of the committee itself, as the senior action code, to be further assisted by such other people as he required, and these tasks were then to be worked on outside and reported to the committee by some specified date.

Q. Was there a Plan of Action dated 7 December 1962?
A. There was, yes, sir.

Q. Is that the latest published Plan of Action of the Committee?
A. Yes, sir, it is.

Q. Would you produce it, please?

(The witness did so)

Q. This is Quality Assurance Program, Portsmouth Naval Shipyard Plan of Action, with a pen date of 7 December 1962; is that correct?
A. That is correct.

Q. Signed in what way?
A. It was submitted by me as Chairman, accepted by the Production Officer and approved by Admiral Palmer.

The above cited Plan of Action, dated 7 December 1962, was submitted in evidence, and there being no objection it was so received as Exhibit (185). Counsel for RADM Palmer waived the reading of this exhibit at this time.

Q. Was it the practice of the committee to maintain folders in which to place records of action taken under each one of the tasks enumerated in Exhibit (185)?
A. Yes, sir, there are folders.

Q. Referring to items No. 15 and No. 16, tasks numbers 15 and 16 in Exhibit (185) "Prepare a plan for audit and evaluation of general conformance to establish quality assurance directives and procedures, etc." and item 16, "Inspection procedures. Develop inspection procedure, etc." Has a plan every been prepared as outlined in task No. 15?
A. No complete plan as such, overall; various audit procedures have been developed for individual areas.

Q. Now with reference to item 16, "Develop Inspection procedures to include processing of data in all areas other than combat systems"; does your folder show that that item had been developed and placed into effect?
A. The folder itself doesn't indicate that a complete system of procedures has been developed. We have individual procedures in various areas.

Q. I note that items 15 and 16 are also assigned old numbers in this plan. Can you testify how long items 15 and 16, perhaps under different numbers, have been in the plan of the committee?
A. Item 15, was old No. 21, which appeared on a prior Plan of Action dated 15 June 1962, with a target completion date of 10-15-62. Item 16 refers to old numbers 5 and 22, which respectively had target completion dates of 12-5-62 and in the case of the old item 22, a continuing entry as a target completion.

Q. Is it a fact that you were not only Chairman of the Quality Assurance Committee, starting early in November, but you were also appointed Quality Assurance Coordinator?
A. I was appointed Coordinator, Quality Assurance Coordinator in a later revision to this Instruction.

Q. Can you give us the reasons for the dual title?
A. The second title arose from the issue of a BUSHIPS Instruction which called for the designation of a Coordinator and the formation of Quality Assurance teams.

Q. What instruction is that?
A. BUSHIPS 4355.23 of 3 December 1962. "The Quality Assurance Teams; establishment of".

Bureau of Ships Instruction 4355.23, of 3 December 1962, was offered in evidence and there being no objection it was so received as Exhibit (186). Counsel for RADM Palmer waived the reading of this exhibit at this time.

Q. Referring now to Exhibit (184), the 20 November '62 directive, Commander Rule, I note sub-paragraph 3(b) refers to a Management Policy Board. Would you tell us who composed the Management Policy Board during the month of November, 1962?

A. The Management Policy Board is composed of department heads and heads of offices; the chairmanship rotates from time to time. The Chairman, at that time, I believe, was Captain Guerry, Production Officer.

Q. Did the Chairmanship and constitution of the board remain the same during December of 1962?
A. The board remained the same; the Chairmanship changed to Captain Rehler, Public Works Officer; I do not recall the date.

Q. Was that in December, 1962?
A. I couldn't say.

Q. Who drafted Exhibit (184)?
A. I drafted that myself, with some modifications, possibly, by the Management and Engineering Office.

Q. I refer you to Exhibit (116) before this court, a memorandum from Code 303B-2 of the Shipyard to Code 213, subject: "U.S.S. THRESHER sea-water silver brazed joints; inspection of". The memorandum is signed by R. E. FITE of the Quality Assurance Branch; is that correct?
A. Yes, sir.

Q. The general tenor of the memorandum is that the results of ultrasonic inspection of silver brazed joints are set out and it ends up with a declaratory sentence that "Code 303B-2 would like a decision at this time in regards to the lagged portions of the systems in THRESHER." That memorandum was answered, was it not?
A. Yes, sir, on the 4th of December 1962.

Q. Were you aware of the status of the inspection of silver brazed joints in THRESHER at the time that the request was made by your division for a ruling on whether or not the lagged joints should also be inspected?
A. I was aware of that memo when it went out; yes, sir.

Q. Were you aware of the reply signed by Mr. Heeney when it was received in your division?
A. Yes, sir.

Q. At that time were you also aware of a letter from the Chief of the Bureau of Ships to the Commander, Portsmouth Naval Shipyard dated 28 August 1962, which is numbered before this court as Exhibit (115)?
A. I was aware of this, yes, sir.

Q. Taking the three documents together, then, the basic directive from the Bureau of Ships directing that the silver brazed joints in THRESHER be ultrasonically tested, and that a minimum of at least one ultrasonic test team, throughout the entire post shakedown availability period, be employed to examine the maximum number of silver brazed joints, insofar as possible, did you consider the matter of sufficient importance from the point of view of your responsibility in the quality assurance field, to reverse this decision to the Management Policy Board?
A. No, sir.

Q. I refer you to Exhibit (184) before this court, the directive then in effect covering the activities and responsibilities of the Quality Assurance

Committee, and to paragraph 3 (b) "Keep the Management Policy Board and other committees informed as appropriate where areas of interest develop". Could you explain why you did not consider it necessary or desirable to keep the Management Policy Board informed of this matter?

A. I didn't consider it as a matter for the Quality Assurance Committee and Management Policy Board. I considered it a matter for the Quality Assurance Division, that is Code 303, and the Production Department and so on.

Q. Would you explain your reasoning?

A. I did not consider it a matter of broad policy. I might say I considered it a matter of day to day work, so to speak, on the vessel.

Q. The ultrasonic testing of silver brazed joints in THRESHER pursuant to the directive contained in Exhibit (115) was a matter in which you had a direct interest; was it not?

A. Yes, sir.

Q. The directive calls for the carrying on of that testing to the maximum extent possible during the entire post shakedown period of availability. Is it a fact that the post shakedown period of availability was extended from time to time after the initial determination not to unlag the joints was made?

A. It was extended, yes.

Q. Did you have any occasion to review in your own mind the desirability to revise the initial decision not to unlag, in view of the greater period of time available in which to accomplish the testing?

A. I don't recall that I gave it any particular attention after December.

Q. Did you ever discuss the decision not to unlag the joints in THRESHER with anyone higher in the chain of responsibility than yourself?

A. I don't recall; I may have discussed it with the Repair Superintendent at the time. I believe I discussed it with the Production Officer. I did not discuss it with anyone outside the Production Department.

Q. Is it your recollection that there was any concern in higher management over this decision not to unlag and inspect?

A. I couldn't answer that outright. I was aware, and others were aware of the figures in the report of November and the percentage rates that were involved.

Q. I note that Exhibit (117), an internal memorandum of the Portsmouth Naval Shipyard, which stated that time did not permit the unlagging of joints in THRESHER for ultrasonic testing, included provisions for a copy to the Commanding Officer of THRESHER. Did any of the ship's personnel make representations to you after the date of Exhibit (117) to the effect that they questioned or protested this decision not to unlag?

A. I recall no contacts on that with the ship.

PRESIDENT: Counsel, what is the date of Exhibit (117)?

COUNSEL FOR THE COURT: 4 December, sir.

Q. With specific reference to the ultrasonic inspection of silver brazed piping joints, and the radiography of piping joints in THRESHER, can you describe the record keeping in Quality Assurance control for such work items during THRESHER's post shakedown availability?

A. The joints which were found on the original inspection by either visual or ultrasonic inspections to be defective, were submitted to the Planning Department for repair. At the same time the shop was made aware of this. The shop would then commence to repair it when they received instructions on the joints. There was an ultrasonic report made out at the time the first test was made, and the card, a so-called No. 5 card, made out on inspection at that time. Another card, the same sort and the same set, was made out by the shop when they commenced the repair. When the shop then had repaired the joint, which had to be ultrasonically tested again, that is one made in place aboard ship, the inspection people were called again and they in turn tested this, reported the second ultrasonic test, and noted it on the card itself. There was one card then held by the shop, another card was held by the ultrasonic inspectors, and the third card which was held by the 303B inspectors.

Q. Was the same procedure followed in radiography of welded joints?
A. Radiography is slightly different, in that there is another form which is sent from 26 shop to the radiography section to ask for radiography.

Q. Where was the master check-off list maintained of the joints and the piping that had to be inspected in the Quality Assurance program?
A. There was no master check-off list as a list. There were drawings which were followed in the course of the inspection. The joints were marked on the drawings as the inspection proceeded.

Q. The Quality Assurance Branch, as part, of the total Shipyard effort, did not keep a master check-off list to insure that every item, that every joint requiring non-destructive testing by radiography or ultrasonic methods was in fact satisfactorily tested; is that correct?
A. They did not keep a list; they kept a drawing.

Q. Has this item been considered by the Quality Assurance Committee as a device for keeping a positive control on the joints to be tested?
A. It has been considered by the committee and it has been considered also by the Quality Assurance Division, both in areas of pipe joints and structural joints, as well. We, in this case, made up drawings as we went along. In other cases we have had so-called "Indent. Drawings" furnished which we followed. This practice varies from ship to ship in accordance with what kind of material we are furnished. It varies between the overall type of work, of which we may consider the PSA a part, and new construction work. We have endeavored to improve this from time to time, and at the present time have a considerably more formal system in effect on the SSB(N) 636, for instance.

Q. In the post shakedown availability period of THRESHER, howdid you audit those prints and plans in order to determine if any joints had been left uncovered so far as testing was concerned?
A. It would be a matter of checking against the job order, which listed plan numbers to be covered and described the type of joints to be covered. A matter of comparing that with the drawings themselves to see which joints were marked as having been tested and when, possibly, and what kind of results were obtained.

Q. Was such an audit regularly performed?
A. Not a regular audit; this was a day to day duty of the man on the job who was conducting the inspection.

Q. Did you require any sort of reports to you so that you could be assured that no joint requiring testing was left untested?
A. No.

Q. Do you have a copy of the survey of silver brazed piping joints in THRESHER's hydraulic system, which was conducted by Electric Boat Division in Groton, Connecticut?
A. I believe so, yes, sir.

Q. Will you produce it, please?

(The witness did so.)

Q. By whom is it signed?
A. By E. J. Behney, Manager, Quality Assurance Control.

Q. What is subject?
A. The subject is "Ultrasonic testing of sil brazed joints two inches or less in diameter located on the hydraulic system of the U.S.S. THRESHER SS(N) 593; Results of".

Q. And the shop order?
A. The shop order under which this was conducted is 3930-136.

The above survey order was offered in evidence, and there being no objection, it was so received as Exhibit (187). Counsel for RADM Palmer waived the reading of this exhibit at this time.

Q. Do you have any personal familiarity or knowledge of the events which Exhibit (187) relates?
A. None at all; no, sir.

Q. Are you familiar with the details of the conduct of the inspection of silver brazed pipe joints in THRESHER at the Portsmouth Naval Shipyard made at the request of the Bureau of Ships during THRESHER's PSA?
A. The details that I have gathered from a search of the records afterwards and from such other things as I mentioned earlier.

Q. Would you relate the details to this court? You may refer to your files to refresh your recollection on this point.
A. The survey was conducted under instructions, or a set of ground rules, so-called, which were originally written for a survey on SKIPJACK, and later used on THRESHER. This outlined the manner in which the control cards were to be generated and inspections performed. It also indicated the manner in which the joints nomenclature was to be used for identification of joints. The survey was commenced in response to a job order 50612 and continued under a job order 90393. The first condition reports of defects found were generated about the 10th of September. Following that there was a series of condition reports covering defects as found. On the 29th of November, a summary report was given, not a joint identification, but a summary account of it was submitted by the Planning Department to the type desk. This is the one referred to previously, which requested instructions for further actions with regard to the lagged portions. Then later on the same figures, with some corrections in arithmetic that arose in the meantime, were put in a memorandum and finally with the same figures, again with these corrections, in a letter to the Bureau of Ships on 22 April, in which the results of the survey were reported. The report to the Bureau again did not list individual joints, but only contained a summary count of the joints covered and the results found.

Q. What was the date of that report?
A. 22 April.

Q. Was that report prepared by you?
A. It was prepared by my staff, yes and passed by me on the way out. It was signed by the Shipyard Commander.

(b) (6) relieved (b) (6) at this point as reporter.

A. (Continued) Following this, and in more recent days, there has been compiled a list of joints covered in this survey by joint name showing the results obtained on each individual joint.

Q. That was made as a result of a re-examination of the records, was it not?
A. That's correct.

Q. How was that re-examination of the records conducted?
A. By search of the marked-up plans that were made at the time, by correlation of the files between the Inspection Branch and the Ultrasonic Testing Branch.

Q. Did you document this re-examination?
A. Yes, sir.

Q. Do you have that paper with you?
A. I have a list of those joints.

Q. Would you produce it, please?
A. This is it here.

The witness produced said document.

Q. This is a list of silver-brazed piping joints 2 inches inside pipe size and over-subjected to submergence pressure in Trim and Drain, Auxiliary Sea Water, and 8000 gallons-per-day distiller systems, which were ultrasonically tested during THRESHER's post shakedown availability. Is that correct?
A. That's correct, sir.

The aforementioned document was submitted to the court and to counsel for RADM Palmer, a party, and was offered in evidence by counsel for the court.

PRESIDENT: Let the court see the tabulated data on joints inspected.

Exhibit 118 was submitted to the court for examination and comparison.

There being no objection, the aforementioned list of silver-brazed piping joints was received in evidence and marked "Exhibit 188."

Questions by counsel for the court:

Q. Turning to Exhibit 118 before this court, a memorandum from 303B-2 to Code 303 at this Shipyard, dated 17 April, was the total of the column "New Joints Installed" on Exhibit 118 included in the totals of the columns to the left of it which would indicate the total joints inspected?
A. Partly, but not entirely.

Q. Would you explain that, please?
A. The first three columns of that--namely, the 125 joints accepted by UT, the 45 accepted visually on the basis of the visual inspection only, and the 20 which were rejected by UT, represents the total initial coverage. In order to repair the 20 defective joints, other joints--some of which were within the original scope of the survey and some of which were not--had to be unmade in order to get at the defective joints. Therefore, the 67 covers all of the 20

which had to be remade. It covers some of the so-called good joints that were just inspected and some of the adjacent joints that possibly had not been.

Questions by a court member, CAPT OSBORN:

Q. Let me get squared away here. The 67 were required to put in proper condition the 20 rejected, is that correct?
A. Yes, sir, it is. The 20 plus the others.

Question by counsel for the court:

Q. Now, referring to Exhibit 188, would you explain those tabulations and the final notation thereon, with particular reference to an explanation of the "Averages" column, which contains underlined figures?
A. Yes, sir. This tabulation was made up by system and by compartment in the ship. It so happens to be divided by drawing as well. The joint number, or joint name, is the nomenclature that was used in the survey. The column headed "Heat" indicates the number of times that the joint had to undergo a brazing process. A zero would indicate that it was the joint as found. As to the "Bond Percentage," the outer indicates the land on the side of the groove which is near the pipe. The inner column refers to land which is near the fitting--that is, the center of the coupling or the disc of the flange. The "Average" column represents the numerical average of the other two, except for a few cases which I will explain. The underline in the last column indicates that was the final reading on that joint and the reading upon which the acceptance was based. Now, certain of these joints were on a zero reading and rejected. The figure "3", for instance, were all rejected joints. It is noted they were replaced later by welded joints for reasons other than just the silbraze survey. The first was rejected on the basis of a low average bond. It would have failed on the basis of the inner land anyway. The second appears to be good, but it was rejected for excessive number of no-bond segments; and the third, on the basis of low average. In general, any joint which has a zero heat number and no further entries was good on the first try. The nomenclature--If the fitting starts off with an "F", that is the original joint. If it is "NF", that means in the course of repair a new fitting had to be installed.

EXAMINATION BY THE COURT

Questions by a court member, CAPT HUSHING:

Q. Does the "1" before "ANF" mean, for example, the first heat?
A. The "1" before that means another new fitting; it has nothing to do--it doesn't designate the number of heats, although it is associated with it.

Q. On page 1, under the Midships Compartment, the first joint coupling P10-2B/ANF-92-1 shows an average bond of 41, is not underlined, and I assume, therefore, that it was rejected?
A. Yes, sir.

Q. Skip one, and we come to P10-2B/1 ANF-92-1, and we find average bond 53, underlined, indicating an accepted joint?
A. Yes, sir.

Q. Is that one and the same joint?
A. It is the same joint by location in the system, but a new fitting had to be installed. The first joint, line 1, was a new fitting, and it is all right; but, later on, after a re-heat, it had to be renewed.

Q. But the figure "1" indicates the same joint but a new fitting?
A. The same joint.

Q. So, if we have a "1" right after the slant, we always have a new fitting, which also means we have at least one heat?
A. Yes, sir.

Questions by a court member, RADM DASPIT:

Q. You said an "F" was the original joint, an "ANF" is a new joint, and "1-ANF" is still another new joint. What is a plain "NF"?
A. Perhaps I should read the full five designations and this would help explain it. An "F" is the original fitting as it came in the Yard. An "AF" is a joint which was not shown on the plan but it was found to be in place on arrival. It is a so-called field joint. "NF" is a new fitting which was put in an old joint during the PSA.

Q. Put in where an old joint was removed?
A. That's correct, sir. An "NAF" is a new fitting put in an old joint which was there but not shown on the plan . . .

Q. Just a minute. You said an "NAF". Do you mean an "ANF"?
A. No, sir--"NAF". "ANF" is a new joint which was created during this availability, and is not shown on the drawing as it arrived. In other words, a new field joint.

COURT MEMBER, RADM DASPIT: Counsel, would you get the legend to add to the exhibit.

COUNSEL FOR THE COURT: Aye, aye, sir.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. Would you proceed with your explanation?
A. This list of twelve pages, then, shows 161 distinct joints, as opposed to the 145 which were covered on the inspection proper. These additional joints, as I said, were necessary in order to make the total required.

RE-EXAMINATION BY THE COURT

Questions by a court member, CAPT OSBORN:

Q. I didn't get that 145. I either got 125 UT accepted, 45 visually; and now we are discussing the 45 visually inspected. Is that correct?
A. Yes, sir.

Q. So, take the 125 joints with the 20 rejects, there are 161 detailed fittings UT tested?
A. Would you state that again, please?

Q. Well, you state it for me on what it is.
A. Yes, sir. We accepted 125 original joints and turned down 20. We made a total of 67 new joints, some of which were welded. We have on this list, as I counted them, 161 separate joints.

Questions by the president, VADM AUSTIN:

Q. Of those 161 joints, were 10 rejected ultrasonically, or 20?
A. Twenty of the original joints had been rejected. There were quite a number of rejects above that during the course of repairs, each of which had to be repaired in turn, so the number was greater than 20, actually.

Q. In your last paragraph on page 12 of this exhibit, you say, "The foregoing list, made 4 May 1963 from prime shop and inspection records, indicate that of the 161 distinct joints, 151 were accepted on the first ultrasonic inspection."
A. Yes, sir.

Q. Now, my arithmetic says 161 minus 151 leaves 10, so that is what has us confused, the discrepancy, the differential between 161 and 151 on this piece of paper, and the 20 joints that failed ultrasonically on the other piece of paper, you see.
A. Yes, sir.

Q. Can you explain that for us?
A. The 20 joints which are shown as having failed on the letter to the Bureau failed, of course, before any brazing was commenced, and then some additional joints failed during the course of brazing, or did not pass the test, so the first failures will show on a zero heat. Of the subsequent failures, some will show on a zero heat; if it is an additional joint, it will show on Heat 1 or Heat 2 prior to the final underlined failure.

Q. I am about one heat behind you. Let us try to reduce this to a little simpler version. Now, citing Exhibit 118, which has the tabulation designated as a detailed summary of inspections accomplished shown in table below, that is the memorandum from 303-B2 to 303, dated 17 April 1963.
A. Yes, sir.

Q. As of the date that that memorandum was written, this was a summary of joints tested, passed and rejected, both ultrasonically and visually, is that correct?
A. Yes, sir.

Q. Now, the first column totals up to 125 and it is labeled, "Joints accepted UT Inspection."
A. Yes, sir.

Q. Are we to interpret that that is the total number of ultrasonic tests which passed, or is it the total number of joints that passed?
A. This is the total number of joints as the ship came in the Yard, sir.

Q. Now, those were all old joints?
A. These would be old joints, yes, sir.

Q. All old joints, because all joints in the right-hand column, which total 67, although some of them may have been found defective on one heat, were reheated until they passed, is that correct?
A. Yes, sir.

Q. Because that is labeled, "New Joints Installed"?
A. Yes, sir.

Q. So, the 67 figure is not included in the total of 125?
A. Some of them are for the reason that if an old joint was passed, it was counted in the first column.

Q. Some of the 67 are included in the 125?
A. Yes, sir, in the same geographical location in the ship.

Q. I think that may be inaccurate. Would you reconsider that statement? Some of the joints in the left-hand column which were accepted probably had to be torn out due to the work that had to be done installing a new tee or something that had been found defective?
A. Yes, sir.

Q. So, isn't it more likely that your joints in Column 1, and that totals 125, might have included some of those that are listed over in the right-hand column?
A. Well, let me say, there is an overlap between the two columns. I don't know that you want to say that this column includes some of those in the right-hand column and the right-hand column includes some of the left.

Q. Well, now, the "Visual Inspection Joints" stand alone. They are not overlapped or duplicated in either of the other columns, is that correct?
A. They are not duplicated in either the first or third columns; some of them could be in the last column.

Q. Some could be included in the last column?
A. Yes, sir.

Q. Well, now, going back to your new catalog and summary here, Exhibit 188, will you explain to the court, in the light of our discussion, will you explain the sentence at the bottom of page 12, which says, "The foregoing list, made 4 May 1963, from prime shop inspection records, indicates that of the 161 distinct joints, 151 were accepted on the first ultrasonic inspections, either as found or as first brazed." Will you explain what it was intended to communicate by that sentence?
A. That either the joints were good when the ship came in and were left undisturbed or that the first brazing job performed on that joint in the Yard was acceptable.

Q. Oh, that makes it clear. We are deeply grateful. It means, then, that this pair of figures does not give any index whatever to the number or the percentage of old joints tested which failed ultrasonically?
A. No, sir.

Q. That is the point which has not been clear.
A. Yes, sir.

Questions by a court member, CAPT OSBORN:

Q. But for the foggy section over here, will you clarify one question for me? I understand that is a complete explanation of the joint problem, but I particularly focus my attention on old joints--that is, the joints that came into the Yard in THRESHER, no work having been done on them--was that 20 out of a total of 145 joints which were found defective on ultrasonic testing?
A. That's correct, sir.

FURTHER REDIRECT EXAMINATION

Questions by counsel for the court:

Q. On the basis of your re-examination of records of ultrasonic inspections of silver-brazed joints done under this survey, Exhibit 188, and of your computations, what was the rejection rate of old joints rejected by ultrasonic tests?
A. This would be the quotient of 20 over 145, or 13.8 per cent.

Q. Did you conduct an examination of inspection records of silver-brazed piping joints which were made in THRESHER's vital sea systems during her post shakedown availability period which were not included in this survey?
A. Yes. I have reviewed certain other joints that were tested in sea water systems.

Q. Did you document that review?
A. Yes, sir. I have a list of diesel generator cooling joints, for instance, and some in other systems.

Q. Do you have three lists in all?
A. Yes. I have a list of diesel generator cooling joints; I have some piping joints which are not subject to submergence pressure; and a list of welded joints that are subjected to submergence pressure.

Q. Would you produce them, please?
A. Yes, sir.

The witness produced three lists as follows: (1) Welded Piping Joints in Air Conditioning, Auxiliary Salt Water, and Trim & Drain Systems; (2) Silver Brazed Piping Joints Remade in Filling Lines; and (3) Silver Brazed Piping Joints Remade in Diesel Generator Cooling System.

COUNSEL FOR THE COURT: Here are three separate lists, sir. These are offered for the purpose of showing success rates with other joints.

The aforementioned documents were submitted to the court and to counsel for RADM Palmer, and were offered in evidence by counsel for the court.

There being no objection, they were so received and marked, "Exhibit 189," "Exhibit 190" and "Exhibit 191," respectively.

Counsel for the party waived the reading of these exhibits.

Questions by counsel for the court:

Q. The last annotation on each of the exhibits contains a computation of success rates with the joints, does it not?
A. Yes, sir. This is not to be confused with a rejection rate.

Q. It is the success rate?
A. Yes, sir.

Q. Did you conduct a similar examination of inspection records on welded joints on THRESHER's sea water system completed during her post shakedown availability period?
A. Yes, sir.

Q. On what systems?
A. On the air conditioning, the salt water to air conditioning, the auxiliary salt water, and trim and drain systems.

Q. Would you produce the document showing the results of that examination?
A. That is Exhibit 189, sir.

Q. Was there any means provided for feed-back of inspections disclosed by your inspection results under the quality assurance program to the shops concerned; that is, for example, from Code 303 to Shop 56, the Pipe Shop?
A. In the case of welded joints, the Radiography Branch gives back to the shop the results of the radiographs and this, in turn, generates action on their part to proceed to make repairs. The UT records of tests of silver-brazed joints also goes back to the shop. That is the notification indicating that it has not passed, and this goes back to the shop for action.

Q. Was there any corrective staff work done by the Quality Assurance Division when a pattern of inferior silver-braze work, for example, was displayed by their records? Could you synthesize the information from a great many tests and present that to the pipe shop?
A. There has been an audit of silver-braze work in general. It is taken throughout the yard without regard to the ship the work is being done on. It is not conducted to spotlight a particular ship or job order.

Q. Has consideration been given to the establishment of a procedure for feed-back when a pattern of inferior work shows up on one ship?
A. Yes, sir. We have picked up individual indications and traced them back to find out what caused them. In one particular case we found it was a matter of sizing of pipe that caused a particular run of bad joints, for instance.

Q. Job Order 90393, Exhibit 180 before this court, was one of the original job orders written pursuant to the directive to ultrasonically test sil-braze joints in THRESHER during her post shakedown availability. Included in that job order was the directive to keep P. & E. and Design periodically informed of the results of such inspections. Were such periodic reports made to P. & E. and Design by Code 303?
A. Yes, sir.

Q. Do you have records of these reports?
A. I have some as samples, not the complete records. I mentioned earlier that the first of the condition reports was submitted in about the first two weeks of September, and I have here a few examples of those that were submitted afterwards.

Q. Would you produce them, please?
A. These are copies, and I believe the court has the originals.

Q. These indicate individual joints which were rejected?
A. These are individual joints which have been found to be rejected on ultrasonic or visual tests.

Q. Was there any staff report by Code 303, giving the total of the joints inspected and totals within that of those found rejectable?
A. I don't believe there were any summary reports. There was no totalizing up until the time of the November 29th memorandum.

Q. You have indicated that ultrasonic test inspections were made of certain joints in the trim and drain system, and it has been reported that there were failures in the silver-brazed joints in the trim system due to water hammer effect on the first deep dive. The major failure was a joint in the 4-inch suction line located in the diesel engine space, port side. From your records of inspection, can you state whether any joints in this trim suction line in the vicinity of the failure were inspected?
A. I have no personal knowledge of this and have no records here, I believe, that I could identify as such.

Q. Was there any consideration given to ultrasonic inspections of the trim system, particularly in the area of the failures, in view of the known overstressing of the system during her first deep dive?
A. I couldn't say, sir.

RE-EXAMINATION BY THE COURT

Questions by a court member, CAPT NASH:

Q. Commander Rule, I refer to Exhibit 115; were the instructions of the Chief of the Bureau of Ships, as outlined in Exhibit 115, known to the membership of the Quality Assurance Committee?
A. Not to the Committee, sir. I was aware of them, myself, as Code 303.

Q. Did you discuss these instructions with the Committee?
A. No, sir.

Q. Was the Committee aware of the plan for surveillance in THRESHER?
A. Not as a committee, no, sir.

Q. What steps did you discuss with the Committee to implement the instructions of the Bureau Chief in his letter?
A. This letter and the matter of the survey on THRESHER was never taken up as a committee matter. It was handled solely as a matter by the Production Department and the Planning Department.

Q. Looking at this as a matter of important philosophy in surveillance, is it not an item which should properly have been considered by the Committee?
A. I don't feel so, sir.

Questions by a court member, CAPT HUSHING:

Q. Commander Rule, I believe you reported to the Shipyard in January, 1962?
A. Yes, sir.

Q. Now, what was your initial assignment in the Shipyard?
A. Production Engineering Officer.

Q. And when were you made the Quality Assurance Superintendent?
A. November of 1962.

Q. Did you have Quality Assurance under your cognizance as Production Engineering Officer?
A. No, sir. That is a separate division.

Q. So that you were moved in the Shipyard to take charge of the Quality Assurance in November of 1962?
A. Yes, sir.

Q. You did not have the THRESHER availability for Quality Assurance except for that period from November, 1962, until she left in April of 1963, is that correct?
A. Yes, sir.

(b) (6) relieved (b) (6) as reporter at this point.

Q. Turning to another subject, you mentioned I believe that your inspectors used drawings for the purpose of check-off lists of joints which were worked on during the availability, did they not?
A. Yes, sir.

Q. Are those joints part of your records; are they maintained anywhere in the Quality Assurance Division?
A. The drawings, sir?

Q. Marked-up drawings?
A. Marked-up drawings we have covering this area of the survey.

Q. How about new work where inspection is required.
A. Do we keep drawings on new work? On some, yes. On new construction we do have marked-up drawings.

Q. Suppose we have a job order which calls for five or ten joints in the ASW system to be replaced and the job order calls for U/T inspection. Do you get a copy of this job order?
A. My office gets a copy, yes, sir.

Q. Does Code 303 get a copy of that job order?
A. Yes, sir.

Q. How does 303 insure that all of the new joints which are created as a result of this job order are in fact inspected?
A. 303, in general, and this is on repair work, answers the inspection call of the shop to inspect the joints when they are fitted. This would either be a visual inspection in process, or a U/T inspection or visual inspection when completed.

Q. Suppose through inadvertence a shop makes no such call?
A. Then it would be up to the knowledge of the inspector and his reminding the shop that this has occurred, or it is possible that it could be missed.

Questions by a member, CAPT Osborn:

Q. Did we do any ultrasonic testing on SKIPJACK?
A. I couldn't say at the moment. I would say that we did, but I don't know of it in particular.

Q. Did you think the rate of inspection was a fairly productive rate in terms of ultrasonic joints during the THRESHER availability?
A. If you mean the number of joints inspected versus the time available, it was less than the optimum rate of inspection, due, possibly, on the one hand, to interference in getting at the joints; possibly, on the other, to a lack of manpower to get all the joints.

Q. Lack of manpower? Weren't you directed to use one complete ultrasonic team?
A. Yes, sir.

Q. Don't you have a complete ultrasonic team in the Yard?
A. Yes, sir.

Q. How many joints do you think an ultrasonic team can inspect a day on a fairly sustained schedule?

A. If the joints are available readily to a team, they can average eight joints in a day for a team. Under certain circumstances they can exceed that; under other circumstances, where interference is involved, they fall far below that.

Q. Does the ultrasonic team ordinarily prepare the joints they inspect or are the joints prepared by someone else? I mean with respect to clearing interference and this type of thing.

A. The physical interference is supposed to be cleared by other trades. The matter of tagging the joint, which is another part of preparation for ultrasonic survey, is sometimes done by the trades, sometimes by the 303B inspector, and sometimes is left to the ultrasonic team to find it.

Q. In view of the apparent urgency of Bureau of Ships letter of 28 August, was every effort given to assist the ultrasonic teams to assist them in inspecting a maximum number of joints?

A. Every joint, I feel, that the inspectors turned up, the ultrasonic team was informed of.

Q. That's not what I'm interested in doing. Was the maximum amount of help given, or assistance given, to let this team inspect as many joints as it possibly could?

A. I couldn't speak at this time on what the shops put into clearing physical interference. I was speaking of the visual inspections prior to ultrasonic.

Q. You've been in the Yard for quite some time. What is the feeling about ultrasonic testing in the Yard? I don't mean in your particular shop; I just mean the general feeling of Portsmouth Naval Shipyard.

A. I'm not sure I know what the feelings of all parts of the Shipyard are with regard to ultrasonics. It's an expanding field, it's relatively young, and it's changing every day.

Q. Is it hard to sell; do you get excellent cooperation by the people; are the people very sympathetic to your problems, or this sort of thing?

A. There could be some reluctance to accept a reading on an oscilloscope as evidence of what kind of workmanship is inside the joint.

Q. Where does this reluctance come from?

A. It could come from anyone who is not familiar with the ultrasonic testing equipment.

Q. Have you noticed any reluctance on anybody's part to support the ultrasonic testing?

A. I've never had any objections raised to me.

Q. In reviewing back over the record, twenty out of one hundred forty-five old joints tested fell below the standard. Did you have any indication that this was the rejection rate as the tests were being made?

A. I had the indication in November when this report was turned in.

Q. Whom did you discuss this with?

A. I don't recall at the moment whom I may have discussed it with. I beleive that I discussed it with the Repair Superintendent and with the Production Officer.

Q. In retrospect, do you think it was a pretty high rejection rate?

A. The thirteen percent is about the same as the Yard itself gets on ultrasonic tests of new joints made in their better months. The rejection rate runs from there up to possibly eighteen percent.

Q. But all of the joints that are detected in the Yard are repaired, are they not?

A. All those that are rejected are repaired.

Questions by the president, VADM Austin:

Q. Commander Rule, in answer to a question, you just remarked that although there was some reluctance on the part of some to accept the reading on the oscilloscope as proof of unsatisfactory work inside of a joint, that you have never had any objections raised to you. Now, with the system in effect, would not it be easier for those who make the joints not to call out your ultrasonic testing team to test them than to argue with you about it; in other words, this reluctance on their part to have their work subjected to ultrasonic testing might well result in joints not being tested if the initiative for test is left with the people who make the joints. Is that correct?

A. It could be so, sir; I don't know.

Q. Now, Commander Rule, you have responded to the request of this court for a number of records and you have produced those records promptly and, it appears, fully. You do seem to have a great deal of organization and system in your Quality Control, and yet I wonder if the object of your organization is kept in mind sufficiently to insure the accomplishment of its mission. In the case of the THRESHER, we had a letter from the Chief of the Bureau of Ships written subsequent to a letter from the Navy Yard, Portsmouth, in which the Navy Yard, Portsmouth, indicated that it thought that ultrasonic testing of the old joints of THRESHER was redundant; and yet the Chief of the Bureau, on the 28th of August, addressed a letter which not only did not concur with that view, or appraisal, or estimate, but indicated rather strongly that an inspection of the sil-brazed joints in the THRESHER was to be done, at least to the extent it could be done by a single ultrasonic team; and the words used in the letter would seem to indicate that it was desirable to have the maximum number of sil-brazed joints so inspected. The original job order which was written in the Planning and Estimating Division covering the inspection of sil-brazed joints did not provide specifically for a minimum of at least one sil-braze ultrasonic testing team to be assigned to this task, but it did ask that the Planning and Estimating Division be kept informed from time to time as to the results found on this test. Can you explain how your Division failed to sense the importance of these tests, and, instead of making several summary reports, only made one summary report as late as late in November? You did make individual reports of failed joints, but I believe that you testified that you made no summary of reports. Can you explain that in further detail?

A. I would say, sir, that the fault very likely lies on myself, for the reason that you stated earlier, that sometimes the mission of the division is lost sight of in day to day detail work.

Q. The court recognizes that there is a great deal of detail involved in running your division, that you do have much record-keeping to do, and many job orders to watch; but it would seem that the over-all mission here was lost sight of in that you didn't seem to submit summary reports as you found these old joints that were not always passing ultrasonic tests; is that correct?

A. Yes, sir.

Q. Well now, did you at any time, to your recollection, raise this point as a matter of some concern to you, as the Head of the Quality Assurance Division, with higher authority?
A. No, sir, I can't recall any specific occasions.

Q. Now, I believe you did say that you thought you had discussed with the Repair Superintendent and perhaps the Production Officer the summary of the results which were reported on the 29th of November. Do you recall whether or not you were given to feel that this was not to be considered as a matter of great concern or not?
A. I do recall the impression, and I couldn't quote the remarks at this point, that the press of the schedule on availability was such as to make it difficult to go any further than we had gone. We asked at the time of this report concerning the joints which were lagged if we should do any more in that direction; but at that time I believe the schedule was much shorter than it eventually turned out to be. It was the pressure of getting the ship finished.

Q. In other words, your recollection is that it was a matter of what could be done in the time available which was the governing consideration?
A. Yes, sir.

Questions by a member, CAPT Hushing:

Q. Commander Rule, when did you take the position of Quality Assurance Superintendent?
A. About the 4th of November, 1962.

Q. And when was the report of the Quality Assurance Division relative to the sil-brazed inspection on the THRESHER submitted to the Planning and Estimating Department?
A. 29 November, I believe.

Q. This was a period, then, of about three and a half weeks?
A. Yes, sir.

Q. During that time were you busy acclimating yourself to your new position?
A. Yes, sir.

Q. Were there other crises and other problems in the Yard during this time to which you addressed yourself?
A. There was the daily business, both of new construction and repair. I don't recall specific crises at this moment.

Q. But you were learning a new job?
A. Yes, sir.

Q. Did you find that anyone in your organization brought to your attention the importance or seriousness of the ultrasonic testing of the THRESHER?
A. I don't recall any specific discussion on this matter.

Q. Did you discern this problem, then, by virtue of the preparation of the report?
A. I was aware of the report itself when it came out, yes, sir.

Q. In your opinion was it then already too late to do additional ultrasonic testing without actually delaying the ship?

A. I don't know that I formed an opinion like that. We asked that question, really, instead of attempting to answer it ourselves. My habit at that time was, and still is, to discuss the events of the day from time to time in the evening with the Repair Superintendent and Production Officer and this very likely came up along at that time. I don't recall the specific occasion.

Questions by a member, CAPT Osborn:

Q. Who did you relieve as Quality Control Officer?

A. I came in as the first military head. Mr. Rogers had been head of the division, and Mr. Rogers is now 303X, my head civilian assistant.

Q. On your letter of 22 April that you prepared for Admiral Palmer to the Bureau of Ships, summarizing the reports required in the 28 August 1962 letter, who prepared that letter?

A. This was prepared by one of the members of my Engineering Evaluation Branch, who discussed it with me, and modified it, and so on.

Q. Who is this member of your Engineering Evaluation Branch?

A. This is Mr. Frank Trowlick, I believe.

Q. When you were taking over, you were in the Yard in another position here and you were taking over Quality Assurance. Once you got the word that you were going to have this job, what did you think your biggest job would be?

A. Really, learning the difference between Quality Assurance as it now exists and the old concept of the Inspection Division as it existed the last time I say the Yard.

Q. What was the general feeling of other departments in the Yard with respect to the silver brazed joints in a period, say, two years ago and at the present time, when you took over?

A. I was not directly connected with this end of it a few years before. With the deeper depths and consummate higher pressures, I know that much more attention has been focused on the silver brazed joints.

Q. You knew it was a particularly hot subject around this Yard, didn't you; there wasn't any doubt in your mind about that, was there?

A. Yes, sir, I knew that.

Neither the counsel for the court, the court, nor the party desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement:

WITNESS: I have one correction to a paragraph in a letter which we sent to the Bureau on the 22nd of April which may be of interest. This involves paragraph 4 of that letter which contains a couple of arithmetical mistakes and some duplications in the counting of joints. I don't know that it materially affects the letter as a whole, but I have it here for the court. (The witness handed a document to counsel.)

PRESIDENT: Commander Rule, can you synchronize this as to the necessary corrections in the Bureau letter?

WITNESS: I can re-word paragraph 4, sir.

PRESIDENT: All right, that's better.

WITNESS: Shall I do it orally, sir?

PRESIDENT: Yes.

WITNESS: This would be the corrected paragraph 4 in a letter to the Bureau dated 22 April 1963. "In addition to the 190 joints inspected and passed in connection with the foregoing job, 33 joints, two inches IPS and over were made under other job orders during the availability. Of these, 20 were fabricated in the shop and inspected visually before and during hydrostatic tests. The remaining 13 were fabricated aboard ship and tested ultrasonically, except for one, a tapered fitting which was accepted by visual examination during hydro.

COUNSEL FOR THE COURT: Let the record show that the witness was referring to a letter which is Exhibit 160 before this court.

The witness stated that he had nothing further to say.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

The court recessed at 1233 hours, 10 May 1963.

The court opened at 1355 hours, 10 May 1963.

All persons connected with the inquiry who were present when the court recessed were again present in court.

No witnesses not otherwise connected with the inquiry were present.

Edmund T. Scarponi, (b) (6) was called as a witness for the court, was informed of the subject matter of the inquiry, advised of his rights against self-incrimination, duly sworn, and examined as follows:

COUNSEL FOR THE COURT: This is a closed session of the court, Mr. Scarponi, and classified information can be divulged here.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, address, and present occupation?
A. Yes, sir. My name is Edmund T. Scarponi, Foreman Pipefitter, Portsmouth Naval Shipyard, Address: (b) (6)

Q. How long have you held your present position in the Shipyard?
A. Since July the 7th, 1961.

Q. Would you state briefly the nature of your present duties?

A. Yes, sir. I am a Foreman Pipefitter in charge of the Pipe Shop, which includes pipefitters, coppersmiths, air conditioning and refrigeration mechanics, insulators, helpers and apprentices in each of the trades.

Q. What is your background and experience in your present line of work?

A. I came to the Portsmouth Naval Shipyard in 1936 as a machine operator. I served in that capacity for approximately ten months and I received a call as an apprentice coppersmith and I served my apprenticeship as a coppersmith in the Pipe Shop. Upon attaining journeyman's rating I worked at the coppersmith trade for approximately four years and became an instructor coppersmith to work and train trainees during the early part of the war, both in classroom work and shop work and ship work. In 1944 I was made a Leadingman Coppersmith, then Quarterman Coppersmith sometime later, then became a Chief Quarterman Pipefitter, and subsequently Foreman Pipefitter.

Q. My questions now will relate to the period of THRESHER's post shakedown availability.

A. Yes, sir.

Q. Will you describe how Shop 56 was organized and managed in order to carry on its business?

A. Yes, sir. As a Foreman Pipefitter I work through the Chief Quarterman Pipefitter. We have a reactor plant quarterman with five leadingmen that work for him on reactor plant work. We have two leadingmen air-conditioning refrigeration mechanics; we have two leadingmen insulators; we have a quarterman in charge of all shop work in the Pipe Shop with five leadingmen. We have three Quartermen Pipefitters on the afternoon shift, and nine Quartermen Pipefitters on the various projects.

Q. How many in all were normally employed in Shop 56 during the post shakedown availability of THRESHER?

A. Approximately 780.

Q. What means did you use to pass on the orders and instructions which you had to the people who had jobs to do on THRESHER?

A. The way we were and are organized in Shop 56, the job order briefs and instructions, DLI's, DM's, and various documents that authorize work, go through the mail system in the outfitting group and are dispatched directly to the Project Quarterman. This pertains to all projects. A copy of all job orders is retained in the shop for shop planners and shop scanning and perusal. The supplementary instructions that are required to supplement the job orders and job order authorizing documents, plans, DLI's, and so forth, such as instructions by me or the Chief Quarterman, are given either verbally or by memo or directly to the Project Quarterman by visitation to the Project Quarterman's Field Office.

Q. By what means did you insure that the orders and directives which were issued to your men were not only carried out, but were carried out in strict compliance with the conditions of your directives?

A. I wonder if you'd care to repeat that, please?

Q. By what means did you insure that the orders and instructions given to your men were not only carried out, but were carried out in strict compliance with your directives?

A. We have manpower distribution charts that we maintain daily. This gives me an indication as to the amount of people, the numbers of people that are working on any particular project, both nuclear and non-nuclear, air conditioning, refrigeration, and insulation, any of the departments within my department, so that I can

keep a close watch on the manpower distribution. The joint completion charts are another method whereby I can keep a status report as to the progress of the work. Personal observation, of course. As regards to brazing cards, speaking of quality, we watch quite carefully not only the reports that are sent down weekly by the ultrasonic people to keep a close check on the individual brazers who may not be performing as well as we think they should be. In most cases where we think they may need it, they are assigned to a refresher or additional training. That's about it.

Q. Would you describe in some greater detail the joint completion charts to which you referred?

A. Yes, sir. We have a joint count on each plan that is required by plan. These are projected into a master joint count chart. Dates are projected as to when we will start or when we should start a test program on the various plants and systems, and we constantly plot a chart of actual progress against the predicted progress; and the variants in the predicted plot against the actual plot indicate usually that we're behind; and it indicates the rate of progress.

Q. How frequently during THRESHER's post shakedown availability did you board the ship to make sure that the work being done by your men was being done the way you directed it be done?

A. Quite frequently. I don't recall very many days that I was not somewhere around, on, or in, or about the THRESHER. I attended many of the plan of the day conferences at 115 that were held in the field office with Lieutenant Biederman's Project Team; and this included my project supervisors. To answer your question, I was aboard the THRESHER quite often.

Q. When was the last time before she sailed that you were on board her to check the work of your men?

A. I cannot remember specifically. I do remember that while THRESHER was in Dock Number 3 I went down -- oh, yes, I went down to check with one of my supervisors to see if a flange on the Diesel salt water hull opening was accessible. Somebody mentioned that it may be under a backing block. We went down, looked at it, observed it, found that it was very accessible. And, as a matter of fact, while we were down there, there was still a foot of water in the dock or a little more, and Captain Harvey came down in there and he had his boots on and we passed a few remarks about the water in the dock. This was -- I don't remember the date -- during the time the ship was in dock. I was on the ship after that when it came around the pier.

Q. In answering a question as to how you check up on the quality of work performed by your men, you said you paid attention to individual reports of ultrasonic testing which could indicate to you when individual brazers were not performing as well as they should be?

A. Yes, sir.

Q. Can you recall instances where the work performed by either brazers or welders working for you was sub-standard so that you had to take action in their case?

A. Yes.

Q. Please relate them to us?

A. Quite often we, by means of this report and by other means, such as supervisors reporting back that a particular brazer was not applying heat properly, or that they suspected that his eyesight might be getting poor, or that he might be a little overweight, so that we could have the flexibility to use these people where it was necessary to use the, or color blindness, in several cases we disqualified brazers. Those are some of the actions that were taken. The action that was

taken in these particular cases was disqualification and the removal from their possession of brazing qualification cards. They were not permitted to braze.

Q. Do you recall any instance where a man's continued sub-standard performance led to his being released from his employment?
A. No, sir, I do not. There was no continued sub-standard performance in the brazing.

Q. With reference to welding, what is your answer?
A. I don't know anything about welding. I do not have control of the welders.

Q. You referred to the joint completion charts which assisted you in keeping track of the progress of the work to be performed by your shop. During a post shakedown availability or overhaul in this Yard, how did you assure that every joint made by your personnel which required non-destructive testing actually received non-destructive tests?
A. The systems in which non-destructive testing -- and we're speaking ultrasonically, I assume --

Q. Yes.
A. -- were clearly named, clearly spelled out. On those systems where a joint was made in position that was over two inch, an ultrasonic brazing card was submitted to the ultrasonic people for non-destructive tests.

Q. By whom?
A. By the pipefitter supervisor.

Q. How could you check up to make sure that this happened in every case where it was required?
A. The only way we had as a check, there were two cards made for each joint brazed, a pink card and a white card. The pink card was retained in the Project Quarterman's fild --

Q. Are you referring, Mr. Scarponi, to the situation which would exist after the card was made out?
A. After the cards were made out, yes, sir.

Q. I'm asking you how you could be sure the cards were made out in every case where they should be.
A. Oh, I'm sorry. There is no way to be absolutely sure.

Q. Under the system that existed then?
A. Yes, sir.

Q. Does the system still exist?
A. Yes, sir.

Q. Have you considered establishment of a centralized control system to insure that joints in vital piping systems do get the testing that they require?
A. Yes, sir.

Q. Have you recommended the establishment of such a system?
A. Yes, sir.

Q. What is the status of it?
A. It is, I assume, being set up. It is being studied and will be set up.

Q. In the meantime, have you taken any steps within your own Piping Shop to keep track of the joints being made by your men to assure yourself that they are being tested?

A. Yes, sir, I have issued orders and instructions that all joints that are in hazardous systems, regardless of ships, will have a card made out and filed and just as soon as the Shipyard has the capability of ultrasonically testing, they will be done.

Q. Has an instance come to your attention in which a card should have been made out and filed and was not?

A. A particular instance?

Q. Yes.

A. No, sir.

Q. A general instance if not a particular one?

A. I don't have any firsthand knowledge -- no, sir, I don't have any firsthand knowledge that even generally speaking cards were not made out that should have been made out.

Q. Do you have any secondhand knowledge?

A. No, sir.

Q. Would you describe the training program that is in effect for your silver brazers?

A. Yes, sir. We have and have had a formal training plan for all silver brazers and a qualification test for all silver brazers which included some very technical instructions on very technical phases of brazing which are necessary, such as material identification as regards to acid checking, and co-efficients of expansion and contraction for the various materials, conductivity of the various materials, metals; size and mass and configurations of the various metal materials. It includes simulated conditions that a brazer could be expected to encounter during ship-board work as well as shop work.

(b) (6) relieved (b) (6) as reporter at this point.

Q. In the last twelve months, how many silver-brazer cards have you pulled away from your workmen when you sent the men back to be retrained?
A. I don't know the exact figure.

Q. Would you estimate it?
A. Yes, sir. We do not pull cards away from people when they need to be refreshed. We just -- We have an expiration date on all brazing cards. After they are refreshed or trained we have a refresher -- I am sorry -- an expiration date on the card, which is three months, 90 days - or 88 days actually. And then they are brought back by tickler to a refresher, and their card is not taken away from them. However, to answer your question, I would estimate, that over the past two years, for various reasons, between 60 and 70 people have been disqualified.

Q. How many of those were restored to silver brazing duty?
A. Some.

Q. What percentage?
A. I don't know. I would hazard a guess if you would like.

Q. Yes, please do.
A. I would say probably 15 per cent.

Q. Only 15 per cent of those were restored to silver brazing duty?
A. Of those that were at one time disqualified.

Q. What happened to the others?
A. What happened to the other people?

Q. Yes.
A. Nothing.

Q. Did they go along silver brazing?
A. Oh no, sir.

Q. What happened?
A. They are in other phases of pipe fitting work such as pipefitting, flushing, testing, hangering, other phases of pipefitting work.

Q. Who are your five best silver brazers? Will you name them please?
A. I think I can, yes, sir. Mr. Bouliard; Mr. Vigneault; Mr. Morin, Mr. Giorgi; Mr. Martel.

Q. Did they all work in THRESHER?
A. Oh no, sir.

Q. Did any of them work in THRESHER?
A. I would say, yes.

Q. You don't know?
A. No, sir not off hand.

Q. Was there any shortage of silver brazers to perform work in THRESHER?
A. No, sir.

Q. Was the situation tight at all with reference to silver brazing?
A. No, sir.

Q. Will you relate any significant difficulties experienced by your men on THRESHER work during her post shakedown availability?
A. Other than the normal rejected fittings due to lack of bond or porosity, hull fittings, I have no knowledge of any difficulties, major difficulties in piping work. And if I may continue, outside of also the rejected-repaired, and rejected and repaired welded fittings-and specifically I am talking about the Hammel-Dahl valve installation that took an excessive amount of time to get clear shots of the butt-welded joints - no, sir, I have no knowledge of any unusual difficulties.

Q. How would you estimate the quality of the pipe work in THRESHER on the day she put to sea after her post shakedown availabilty?
A. To my knowledge, the pipe work, including the flexible hose installation, was very satisfactory.

Q. Your answer referred, did it not, to the work done in THRESHER during her post shakedown availability by your men?
A. Yes, sir.

Q. Referring to her construction period, are you familiar with the casualty which occurred in BARBEL in late 1960?
A. Yes, sir.

Q. Would you estimate what percentage of completion existed in THRESHER at the time of that casualty so far as your piping work went?
A. At the time of the casualty on the BARBEL, how complete was the THRESHER?

Q. Yes, exactly.
A. I would say very complete -- I am sorry; I don't know the degree of completeness. I would say pretty well completed.

Q. Did you institute any changes in Shop 56 as a result of the BARBEL casualty?
A. Yes, sir, as a direct result.

Q. Would you mention them to us please?
A. Immediately, one of the first things that was done -- that I did - was the positive material identification program that is still with us. At the point of issue -- shall I elaborate on this?

Q. I think we have heard an account of the identification process. Would you itemize the steps taken please.
A. All right. An accelerated training program was initiated on, not only silver brazing but many other areas -- 29 to be specific. We initiated the 90-day expiration date on brazing certificates, and we again - I again - emphasized the need for a joint identification plan.

Q. The purpose of your changes was to improve the quality of the work performed by your men, was it not?
A. Yes, sir.

Q. Were all of the changes that you have related to us directed by higher authority?
A. No, sir.

Q. Which ones were instituted by you as a result of your own initiative?
A. I would say the material identification procedure and the permanent etching of all material, was. The training program was developed with the assistance of the Training Division; and the assistance of all my quartermen as a team identifying the areas in which we needed the training first, the most urgent ones. We had intended to have many, many more than 29 areas and we still intend to. The expiration date on the brazing cards was later - I am almost certain later - recommended by the Bureau.

Q. What did you do to go back and audit the piping work done by your men in THRESHER after the BARBEL incident?
A. What did I do?

Q. Yes.
A. To my knowledge and my memory, I initiated no action.

Q. Do you know of any action which was initiated by anyone else at that time?
A. No, sir, I do not.

Q. Testimony has been received by this court that in certain instances during THRESHER's post shakedown availability, valves in THRESHER's sea water system were installed backwards. Would you discuss this aspect of the piping work done by personnel of your shop?
A. Yes, sir. I'm kind of sorry that the word "backwards" was used. I am sure that another word could have been used. However, there were some cases on THRESHER valve installation that the valves were put in reversed intentionally so that we could proceed with certain salt water test - in other words isolate the system. In other cases the actuator on the valves was reversed. In other cases it was only a question of loosening the two nuts that made the mechanical joints that made the valves into the pipe system, and rotate the valve so that the handle would be more readily accessible.

Q. Were there other occasions when the valve innards were left out and the valve was used only as a dummy spacer?
A. No, sir. There were cases where the valve was used as a spacer to make up the piping and no specific attention was paid to the flow of that particular valve until after the brazing and cleaning was done.

Q. In such instances as those which you have told us about, were your men instructed to tag the valves, or to physically identify them in any way, so that it was clear that they were not in their correct, ultimate position?
A. To my knowledge, they were not instructed to do so, no sir.

Q. Are they so instructed now?
A. No, sir.

EXAMINATION BY THE COURT

Questions by a court member, Captain Nash:

Q. Mr. Scarponi, you have been here for some time now.
A. Yes, sir.

Q. Do you recall the name of the first submarine on which you worked here at Portsmouth -- or one of the first?
A. I should, yes.

Q. Would you please name what you can of the submarines that you have worked on?

A. Yes, sir. I worked on the HARDER -- it was not built here. We worked on the SEA ROBIN, SEA DOG, SQUALUS, SAILFISH, SEA FOX. 567--I don't remember the name of it. the SWORDFISH, the SEADRAGON, the ABRAHAM LINCOLN, the THRESHER. I didn't actually turn wrenches -- that's all I can remember.

Q. Have you noticed any change in the requirements in connection with the pipefitting work since the days of the SEA FOX for instance?

A. Yes, sir.

Q. What have you done to familiarize yourself with the great change in requirements for THRESHER as compared to SEA FOX?

A. Well, I think as much as possible to keep up with the -- try to keep up with the technological aspects, particularly where it relates to the mechanics of the trade, not only mine -- it's very difficult to be an isolationist; I wish we could be. I don't like to learn too much about radiography but sometimes we have to; I don't like to have learn how to read an ultrasonic screen, but sometimes we have to. I attended, back along when Captain Jackson ran an after hours lecture -- I think there were some 20-odd lectures as they related to the Design Division; I attended those. I think that I can say that I have kept up with the brazing picture pretty well, as much as possible. I have kept up and am knowledgeable of the radius requirements on various systems and materials, on the types of joints that are required and why they are required on various systems and materials.

Q. Has most of this been done through Shipyard-sponsored courses, or have you pursued some studies outside the Shipyard?

A. There were several outside the Shipyard not relating too much to the mechanics of the trade or the trades themselves. It was more of a management-type course conducted by the University of New Hampshire. There were some Shipyard-sponsored program-some of each.

Q. Do you feel that you have an awareness of the difference in the pressures which faces SEA FOX and the pressures that have faced subsequent submarines up to and including THRESHER?

A. Yes, sir.

Q. Do you feel that your quartermen and other men are aware of this great change?

A. Yes, sir.

Q. We've talked a great deal about the evaluation of performance of silbrazers. I'd like to ask you how you evaluate the performance of your quartermen and other senior workmen?

A. The attention to detail, the way they run their particular project and the discussions that I have with each and every one of them; and the way their people - the loyalty that their people have and the respect that they have, their people and their leadingmen, toward their quartermen; the type of a ship he runs; the kind of instructions that he in turn gives his people. This is my measuring stick.

Q. How do you receive the information that enables you to use that measuring stick?

A. Daily contact and the reports that come back, that are fed back through to me plus the fact that I weekly go through the outlined erection schedule with each of the quartermen that have a project.

Q. Do you require the quartermen or leadingmen to keep any records in the form of a log book?

A. Yes, sir, the quartermen and the leadingmen that have a project have log books that they use for shift turnover and these logbooks highlight--actually all they are are reminders to the second or third shift as to the required turnover, the jobs that were highlighted. It isn't intended to be a diary; it is intended to be a logbook.

Q. Do you ever examine these logbooks?

A. Yes, sir.

Q. Mr. Scarponi, what training courses do you carry on for the quartermen and leadingmen?

A. I have none sponsored by me.

Q. If we are to expect that the qualification of the silver brazers, the qualifications of the junior members of your shop are to stay up to date, does it not follow that we have to keep the quartermen and leadingmen up to date?

A. Yes, sir, it certainly does. I don't know whether I mentioned it or not - it may help in this. I have a meeting for an hour with all of my quartermen every Thursday afternoon at three o'clock and this has been going on for, I would say, a year and a half, an informational clambake.

Q. Would you give me some examples of the things that are discussed?

A. Yes, sir. Almost invariably, almost every week, we talk about systems' cleanliness and what we should do, could do, and will do to improve housekeeping and system cleanliness. Almost invariably every week we talk about brazing, and almost invariably every week we talk about loafing and what we can do to get more productivity from our respective people. These are the three that we always talk about. And then other current topics of the week.

Q. Do you ever have occasion to visit the various shifts?

A. Yes, sir.

Q. Could you tell me if you do this as a planned program with a regular frequency, or how you do accomplish these visits?

A. I have no plan, nor do I do it every night nor every week; sometimes twice a week - sometimes it is just when I feel the need. It is quite often, however, quite often. Many times it's for a hour. During the THRESHER's fast cruise - it was on a Sunday afternoon - my wife and I drove in down around the dock and drove out again. Another time, during the THRESHER pre-dock work, I came in here and we had -- this was probably a month, five weeks prior to her completion - we had a little job; it was changing the water level indicator lines, and I was there until three o'clock in the morning. I came in about eight. Very often, prior to the lauching of the JACK and prior to the launching of the JOHN ADAMS, when we had more people up on the building ways, I quite frequently came in, talked to my afternoon supervisors. Sometimes I would go in my office and catch up on some of my mail - quite often without compensation however.

Questions by a court member, Captain Hushing:

Q. Mr. Scarponi, I believe you said you became the foreman pipefitter on July 7, 1961?

A. July 7, 1961, yes, sir--7-7.

Q. What were you before that time?

A. Chief Quarterman pipefitter.

Q. Do I take it from that, there was someone else in charge of the pipe shop before you became the foreman pipefitter?
A. Yes, sir.

Q. Who was that?
A. Mr. Lord was the master pipefitter.

Q. Mr. Lord was the master pipefitter for the period 1956 to 1960?
A. Yes, sir.

Q. So that during the period of the building of THRESHER - you said she was essentially completed by the end of 1960 - Mr. Lord was the senior pipefitter in this Shipyard?
A. Yes, sir.

Q. Was Mr. Lord available continuously during that time -- I mean did he come to work every day during the period of the building of THRESHER?
A. He had a period of illness, and I would guess -- I'm not sure of the dates right now, but it was toward the latter part of his stay, of his employment where he was absent.

Q. Might this be the period from 1958 to 1960?
A. Oh, it was definitely within that period, but it was the latter part of that period.

Q. During that period when he was not available to be the senior pipefitter, on whom did this duty fall?
A. Me.

Q. On you?
A. Yes, sir.

Q. Did Shop 56 go through a period of expansion between 1956 and 1960?
A. Yes, sir.

Q. Was it a large expansion?
A. I'm sure that the figures are available, Captain.

Q. Do you have any feel for the expansion -- was it ten per cent, 20 per cent, 50 per cent?
A. I don't know how large it was -- it was in 1958 I would say.

Q. Compare the end of 1960 to the end of 1956?
A. 1960 to what?

Q. To 1956.
A. It was substantially larger in 1960, yes, sir.

Q. 50 per cent?
A. I don't think it was 50 per cent.

Q. 25 per cent?
A. I would say between 25 and 30, and this is to the best of my memory.

Q. What brought about the expansion in Shop 56 during this period - increased work load?
A. Yes, sir.

Q. Higher technology requirements?
A. Yes, sir.

Q. Was there extensive training necessary during this period for Shop 56 personnel?
A. Yes, sir.

Q. Was extensive training given to Shop 56 personnel?
A. Not extensive, no sir.

Q. By this you mean that there should have been more?
A. Yes, sir, I believe there should have been more.

Q. To meet the complexity and the work load?
A. Yes, sir.

Q. Or is there one more than the other -- is it more because of increasing complexity, or more because of increased work load?
A. I'm not sure that we should separate them.

Q. During this period, were there any reductions in force?
A. During the period 1956?

Q. '56 to 1960 say.
A. Yes, sir. It seems to me that in 1949--

Q. 1956 to 1960 I am talking about.
A. Oh I am sorry; I don't remember--I don't know.

Q. Let's turn for a minute to your supervisors from the quarterman level up.
A. Yes, sir.

Q. Speaking in relative terms, using the words "outstanding," "excellent," "satisfactory," "fair" and "poor," how would you describe your chief quarterman?
A. Very good.

Q. Very good.
A. Yes, sir.

Q. How would you describe your quartermen?
A. In general?

Q. In general.
A. Some of them excellent; others very good.

Q. So that you think --
A. As quartermen.

Q. Do you think that they are all covered by this "very good" to "excellent" category?
A. Generally speaking yes.

Q. Do you have any weak quartermen?
A. Some weaker than others.

Q. Are they weaker than "very good" or are they still very good quartermen but "weaker" in a relative sense?
A. Weaker in a relative sense, yes, sir.

Q. So you don't think any of them are less than very good?
A. No, sir.

Q. Let's turn to the quality assurance program. Prior to say 1958, was there extensive quality assurance program in this Shipyard in the way we now know it?
A. Prior to 1958, Captain?

Q. Yes. Let me rephrase my question. Prior to 1958, was the mechanic and his leadingman essentially responsible for the quality of the product, with little or no inspection by the inspection department in the Shipyard?
A. No, it wasn't entirely the leadingman and mechanic. We didn't have as much quality control, quality assurance or inspection as we have in the past several years, but we were not without it.

Q. Well then what you are saying is that it has grown?
A. Yes, it has grown.

Q. Has it grown substantially -- has the number of inspectors in the pipefitting area doubled - quadrupled?
A. Inspectors in the pipefitting area?

Q. Yes.
A. Yes. I would say, yes, it has grown quite substantially.

Q. How many times?
A. I would say -- there again I don't know.

Q. Give me your best judgment.
A. I would say at least 50 per cent.

Q. Fifty per cent?
A. Yes, sir.

Q. How about the number of quality assurance inspections madeby people like ultrasonic inspectors and radiography examiners and so on. Has this increased considerably?
A. Yes, sir.

Q. How about since 1960?
A. Yes, sir.

Q. Has there been a large increase in these areas?
A. Yes, sir, I would say a hundred per cent in that area.

Q. Would you say then that the quality assurance of the THRESHER's PSA was at a higher level than the quality assurance of the construction of THESHER?
A. Yes, sir, I certainly do.

Q. Does this give you any higher confidence in the product of the pipe job for the THRESHER PSA than for the THRESHER building period?
A. Yes, sir.

Q. In connection with the THRESHER PSA, did you see any of the condition reports as a result of the ultrasonic inspection on piping joints on the surveillance program?
A. No condition reports -- I saw some of the reject slips.

Q. All right, reject slips or condition reports.
A. Yes, sir, I did.

Q. You saw some of those?
A. Yes, sir, some of them.

Q. Did you get any feedback from the Quality Assurance Division of the Shipyard as to the number of original joints which failed to meet the current criteria for acceptance?
A. In terms of how many?

Q. Yes. Say out of a hundred inspected, how many of them failed to meet the criteria -- did you get any such information from Code 303?
A. No, sir.

Q. Did anyone in your shop compile such information?
A. Compile information, no, sir.

Q. Could anyone in your shop compile such information?
A. What was that, sir, "would" or "could"?

Q. "Could" anyone in your shop compile such information -- would you have enough records available to compile such information?
A. No, sir. I don't believe so. However, each one of these reject slips meant something to us as pipefitters?

Q. Well, what did they mean to you as pipefitters?
A. It meant that the work had to be done over again, repaired, replaced, remade. But I don't -- I have no knowledge that we had any compilation of the scope, or the magnitude.

Q. Did you get any feel from the defect reports and the condition reports, and the things that you said you have seen, as to what percentage of the old joints in THRESHER - the old sil-brazed joints, that is - which were not meeting the current standard?
A. No. I'm afraid I don't - I've got two things confused here, Captain.

Q. Let me rephrase the question.
A. Are we talking about bond now, meeting the criteria on a certain one fitting or numbers of fittings?

Q. Let me rephrase the question. Maybe I can make myself a little clearer to you.
A. Yes, sir.

Q. There were applied to the joints to be inspected certain new criteria for bond. With these criteria certain systems on THRESHER were to be inspected by the ultrasonic testing technique.
A. Yes, sir.

Q. The application of this technique to these new criteria at the joint, resulted in a certain number of rejections by ultrasonic test. Now did you have any feel for how many joints were so inspected and how many of these joints failed to meet these criteria?
A. No, sir.

Q. All you knew was the case where the individual joint had failed to meet them?
A. Yes, sir.

Q. Now in connection with the pipfitting trade --
A. Yes, sir.

Q. --is it more complex today than it was five years ago?
A. Yes, sir.

Q. Is it a great deal more complex than it was ten years ago?
A. Yes, sir, a great deal more.

Q. Do I understand that it is continuing to increase in complexity and difficulty from what you said?
A. Yes, sir. Up until this very moment it is continuing to become more difficult, yes, sir.

Q. Is this because of higher pressures and higher service requirements of the systems?
A. This is one of the reasons.

Q. Well, how about new technical processes, new technology in the trade; is this on the rise in increasing difficulties and perplexities?
A. Well, there are many, Captain.

Q. Tell me why it is getting tougher?
A. Well, pressure requirement is among the very foremost. The cleanliness requirements, the end prep requirements, the tolerance requirements, the automatic control requirements, the additional components and additional things that we have to put into a certain space, makes it more difficult; the complexity of the configurations that we have to achieve, makes pipefitting more difficult. The various types of materials that we have to know about makes it more difficult. The various types of fixtures, things, and valves, and the hangering is becoming a science rather than a trade. These are things that contribute to making pipefitting much more difficult than it was.

Q. Do you think that this added complexity and difficulty makes more important the predetermination of the work to be done in the form of instructions, or is it still at such a level which permits the individual tradesmen to be given a simple job order and be sent off to do the job?
A. There isn't any question about that in my opinion; much more sequencing, pre-planning pre-ordering, predetermination must be done.

Q. Do you think that you have adequate resources within your shop to do this? Do you have enough planning personnel of the right type? Do you have engineering talent if you feel you need engineering talent?
A. To a limited degree, yes, we can.

Q. By "limited" you mean that you can go to a certain level of complexity?
A. Yes.

Q. Or do you mean that you can cover small areas of it?
A. To a certain degree of complexity.

Q. What do you feel are your limitations in this area today?
A. Well this, Captain, varies. When we hire - when people come into the pipe shop - we hire them as pipefitters. The additional knowledge that they might accidentally have that we can put to use, of course, varies with the individual.

Q. Can you take a plumber off the hiring list and put him right to work on these ships such as THRESHER?
A. No, sir.

Q. What do you have to do?
A. We have to train him, either formally or informally. He has to learn. He has to be taught the different requirements in pressure, different requirements in techniques, different requirements of the overall pipefitting industry - submarine building as opposed to house plumbing.

Q. Let's turn for a moment to process instructions and procedural control.
A. Yes, sir.

Q. Do you think your people are disciplined to carry out process instructions and process controls?
A. Yes, sir.

Q. How do you audit and check to see that they are in fact carrying out process instructions?
A. Some of them, of course, are audited in various methods. For instance the process instruction that sizes - pipe, is audited by the brazer when he tries to insert a feeler gauge. It is automatically rejected. The process instruction on end "prep" is automatically audited by either the inspector or the welder when the end "prep" doesn't meet the geometry that is necessary by the process instruction.

Q. But workmen tend to get friendly and often, working as close as they do, they might tend to fluff things off a little bit. How do you audit or how do you check from time to time to insure that things aren't getting this way?
A. Well the immediate supervisor is constantly reminded that this is his responsibility of insuring that the work is done properly, according to job instructions. We don't have any foolproof method of doing this.

Q. Do you have a spot check method?
A. Yes, sir. All supervisors in the brazing, random check, spot check, and in those cases where it is required, in-process inspect.

Q. Do you get a report back of how many deviations they might have found on any given day from this procedure?
A. Not a formal feedback as such, but we constantly talk to each other about this.

Q. How about in the area of installation of flexible hoses? How do you audit that to be sure they are not twisted when they are installed in ships?
A. There is a process instruction on flex hoses, of course. This covers the area of assembly of flexible hoses, and the installation aboard ship of flexible hoses is continued with qualified pipefitters as a normal trade requirement. And as far as auditing that they are not distorted or twisted, this is done on an installation check and signed off on a flexible hose test memo list, checkoff list.

Q. I understand how it works. What I want to know is how do you, or people you designate, audit some of these processes across the board on a given day, for example? Will you go look at people installing flexible hoses? Do you ever do that?

A. Yes, sir, I do it, not as frequently as the supervisors do. They do it every day.

Q. Do you get a report back from the supervisors as to what they found wrong?

A. Yes, sir, in certain cases, yes, sir.

Q. Well tell me, for example, in the flex hose area, what have they found wrong as a recurring pattern?

A. That in some cases where the hoses were not only installed improperly but that somebody has been climbing over them and walking over them, and now they are distorted, and we have to protect them. In the case of one of our ships, we are putting strong backs on all the hoses that we install, and in all of the others, we don't install them until we absolutely have to. This is one of the things we learned by auditing, one of the things that we get as a result of feed back information - don't put them in until it is absolutely necessary, as late as possible.

Q. Have you audited time cards lately for your shop?

A. I am sorry -- I don't understand the question.

Q. The time cards, the signing of them - initialing of the time cards. The time cards contain a place for the job order to which a man is charged.

A. The cost cards, yes, sir.

Q. Have you audited the cost cards for charging lately?

A. No.

Q. Has anyone in the shop done it lately?

A. To my knowledge, I don't think so. I don't know.

Q. Is there a Shipyard procedure for having audits by the Comptroller Department, do you know?

A. No, sir, I do not.

Q. Let's talk about brazing for a moment. Has the quality of brazing in this Shipyard improved over the past two to three years?

A. Yes, sir.

Q. Do you think it is now good, excellent, outstanding? Or if you think it is worse than good you can say that too, of course.

A. I think it's excellent.

Q. You think it is excellent?

A. Yes, sir.

Q. Using that as a reference point, what would you say about the quality of brazing in 1959 in the Shipyard?

A. Not so good.

Q. Not so good. Do you think that the quality of brazing today is adequate for the purpose intended; i.e., high performance submarines which dive to deep depths such as the TINOSA?

A. Well, sir --

Q. Let me restate the question. The quality of the brazing that we are getting today, is it adequate for the purpose for which it is intended to be put; that is, in high performance submarines which are to go to deep depths such as TINOSA?

A. To my knowledge, yes, sir.

Q. Do you have any questions at all about the adequacy of the silver brazed joints in TINOSA today?

A. Yes, sir.

Q. You have.

A. Yes, sir.

Q. Will you please tell me what that question is?

A. Well I would like to be reassured that the joints that were made prior to our joint certification cards could be non-destructively tested, ultrasonically.

Q. When did the joint certification program go into effect?

A. After the TINOSA was started.

Q. Well was this a year ago or two years ago?

A. It was more than a year ago.

Q. More than a year ago?

A. Yes, sir.

Q. You are satisfied with the joints that have been installed since the joint certification program?

A. Yes, sir.

Q. But you have a question in your mind and you would like to be reassured about those which were installed before, is that correct?

A. Yes, sir.

(b) (6) was relieved as reporter by (b) (6) at this point.

Questions by a member, CAPT Osborn:

Q. Have you so stated your opinion on the TINOSA to anyone, Mr. Scarponi?
A. I didn't have to because I understand that it is being talked about now, and certainly I shall. I have not, no, sir.

Q. This seems to be of our biggest problems that retrofitting new technology back in the ships.
A. Yes, sir, it is.

Q. Now, I'll refresh your memory just a little bit, but I want to be sure that you're correct on this. The BARBEL incident occurred on 30 November 1960.
A. Yes, sir.

Q. The THRESHER completed fire range testing about 15 March 1961, and the BARBEL investigation occurred in the first weeks of April, 1961. Now in that setting, the improvement that you made in the silver braze field, would you think it reasonable that a large number of those back-fits were possible rejects in the THRESHER at all?
A. Would have been?

Q. Yes.
A. Yes, sir.

Q. Do you think a large number of them would?
A. Could have been.

Q. I mean were they?
A. I don't have any knowledge whether they were or not. I'm sorry, but I don't remember.

Q. But to your knowledge, you did not go down and tear out any of the systems then existing in THRESHER, which I know you had a tough completion schedule to make, and recheck the joints in any manner?
A. Yes, sir.

Q. You did not?
A. To my knowledge, we did not, but I'm not sure that we did not.

Q. I would like to have an evaluation, personally, on three of your men, Mr. Joe Smith, Mr. Collins and Mr. West. From your personal observations, what do you think of these three men with respect to their individual capabilities as pipefitters?
A. Capabilities as a pipefitter?

Q. Pipefitter and a pipefitter supervisor?
A. Which?

Q. Take them in order; Mr. Smith, Mr. Collins, Mr. West, or take them individually, then; what do you think of Mr. Smith?
A. As a supervisor?

Q. Yes.
A. Quarterman?

Q. Yes.
A. Very good.

Q. Mr. Collins.
A. Not quite so very good.

Q. Fair or better than fair?
A. Between good and very good.

Q. How about Mr. West?
A. Mr. West is very good. As a matter of fact, outstanding.

Q. Now realizing that you had a big technological barrier to get over in the pipe shop itself, with respect to advanced testing involving complicated electronics, how do you people look on this gadgetry, so to speak? The people in your shop. Do they like it; do they like the non-destructive testing?
A. Ultrasonically you're talking about?

Q. Yes.
A. Yes, sir, they're very enthused about it, very enthused about it.

Q. Do most of the brazers know how to read one of those scopes?
A. Well, I don't know, sir; they know what the scope will give them, however; they know what they have been told it will give them.

Q. Who is your immediate officer supervisor; military supervisor?
A. I have none. My supervisor, of course, is Mr. Poor, our Outfitting Group Master.

Q. Do you have any officers coming around the shops to look around to see what's going on?
A. They're always welcome, sir.

Q. How often are they over there?
A. Quite often.

Q. What's quite often?
A. I would say there's somebody in there almost daily.

Q. How much work have you done in detailed mockup in shop fitting up of pipe assembly; how much work have you done in this area?
A. Lately quite a bit. In the past several years we have advanced greatly in of-site fabrication.

Q. What percentage of the joints do you make in the shop right now, say on the THRESHER?
A. Seventy percent, I would say.

Q. About how many joints of two inches or above are in the THRESHER?
A. Two inches or above?

Q. Yes, that includes two inches.
A. Not on hazardous systems, all systems?

Q. On hazardous systems. Would it be close to five hundred, five thousand, ten thousand or fifteen thousand?

A. It would be closer to two thousand; less than two thousand.

Q. And you make at the present time about seventy percent of those in the shop?
A. Yes, sir.

Q. When you were building the THRESHER, how many of them did you make in the shop?
A. I would say seventy percent.

Q. Seventy percent then too?
A. Yes.

Q. How well did you know Commander Axene, the first Skipper of the THRESHER?
A. I knew him quite well.

Q. Was he ever up to the shop to take a look at the techniques?
A. I don't remember, specifically, whether he was or not.

Q. How about Captain Harvey?
A. To my knowledge, he wasn't, no sir. He was invited.

Q. Have you ever ridden the THRESHER on sea trials?
A. No, sir. I was aboard her, about to go on sea trials when the sea trials were cancelled.

Q. You were scheduled to go?
A. Yes, sir. This was on the initial sea trials, or the second sea trials.

Q. How many nuclear submarines have you been on trials with; have you ridden a nuclear submarine on sea trials?
A. No, sir.

Q. Do you think you can get a good handle on pipefitting on a nuclear submarine by just going aboard and taking a look at it? You sure can't get a good handle on pipefitting in a submarine from the shop. You actually have to get on and take a look; is that correct?
A. When you say "handle", yes, this will be true.

Q. I mean the appreciation of the problem; an appreciation of the configuration and the complexities.
A. Yes, sir.

Questions by a member, RADM Daspit:

Q. Mr. Scarponi, you have had to study various things to keep abreast of the new stuff, like radiography and ultrasonic testing. You were honest with us and you said you didn't like to do the studying. Is there a possibility that some of this permeated down to your supervisors and your men, that they didn't like this new stuff at all and wanted to keep it in the old ways? Did you notice any of that?
A. No, sir.

Q. All right, a new subject. Portsmouth is a yard that has been in existence for a long time. I spent four years on one ship that was built here in 1934, and it was a good ship. Your shop is a fairly old one and I'm sure that you want new

things to enable you to do better work and safer work and cleaner work. Can you give us a list of things that you have been wanting to have and have not been able to get for you shop; the major things, or have you gotten everything that you wanted?

A. No, sir, I haven't gotten everything I wanted. Space seems to be the biggest thing that I have asked for the most frequently. Space where I could marshal my troops, so to speak, and put them all together, so that we could have an orderly, as much as possible in the piping industry code of work, so that we could have departments for cleaning, sizing, bending; it would give us much better material control, as well as control of the various operations along the line, right down to cleaning and final packing for shipment to the various ships. As far as facilities are concerned, I think that I've gotten pretty much what I've asked for, after a while anyway.

Questions by the President:

Q. Mr. Scarponi, you indicated that you would be happier if you had the opportunity to apply ultrasonic testing to those joints of the TINOSA which were not made after your Joint Inventory Control System?

A. Yes, sir, which were made prior to that.

Q. Of course all of THRESHER's joints were made prior to that?

A. Yes, sir.

Q. When the THRESHER came in for PSA, did you have a similar feeling, a desire to look into the safety of her joints?

A. No, sir.

Q. Was your feeling in this case different because you knew that the THRESHER had been out operating at design depths, that she had been through her shock tests, or why did you feel differently about the THRESHER? All of these joints were made prior to the Joint **Inventory** Control. Why did you feel differently about the TINOSA?

A. I guess all of those things combined, with the fact of my knowledge that the THRESHER had been through an extensive post shakedown test on all of her sea water piping systems, and we were greatly impressed with that, with the soundness of her sea water system, the reliability.

Q. So that when the Bureau of Ships directed the surveillance of the silbrazed joints in THRESHER, utilizing a minimum of one ultrasonic test team with a view to getting the maximum of number of joints tested, this did not cause you to feel that this was a matter of great urgency at all?

A. No, sir.

Q. Did you, Mr. Scarponi, ever see the letter which the Bureau of Ships addressed to the Commander of the Portsmouth Naval Shipyard on 28 August 1962? (The letter was handed to the witness.)

A. I don't recall ever having seen that, no, sir.

Q. You did perhaps see the job orders which were written as a result of this, which called for --

A. I don't know whether I saw them; I had knowledge of them, yes, sir.

Q. Now, Mr. Scarponi, this court has been told that the ultrasonic testing of silver brazed joints is done on call-out by Shop 56; is that correct?

A. Yes, sir.

Q. How do you insure that all silver brazed joints, two inches and above, are in fact silver brazed by a call-out from your shop? I mean ultrasonically tested by a call-out from your shop.

A. All joints over two inch, not including two inch, that were done in position, required an ultrasonic inspection. The procedure that was established was that a card would be initiated by the Shop 56 brazer and supervisor and would be forwarded to the ultrasonic inspection team. However, to answer your question, Admiral, there isn't any way that I have to be absolutely sure.

Q. Now has the rule about the number of joints to be inspected changed since the THRESHER accident? In other words, do you now have to ultrasonically test those that are made in the shop as well as those made in place?

A. Yes, sir.

Q. And that is being done?

A. This is in the process of being done. We are initiating a card and as rapidly as ultrasonic section has the capabilities they will be done.

Q. In other words, this new rule will overtax your capabilities to ultrasonically test at this time?

A. I would suspect so, sir, at the present time.

CROSS-EXAMINATION

Questions by counsel for RADM Palmer:

Q. Mr. Scarponi, this court has heard testimony of a casualty that occurred in a four-inch line in or near an expansion loop in the trim system located in the diesel generator space. Are you familiar with that casualty?

A. Yes, sir.

Q. Can you tell the court what action, if any, was taken to correct the situation?

A. Yes, sir, as well as my memory serves me, this line was replaced. This joint was replaced as well as the section of pipe adjacent to it.

Q. Do you recall to what extent, or how far the replacement went?

A. Yes, sir, I think I can. I would say about a four-foot section.

Q. Now can you help us as to what, if any, tests were applied to this newly installed pipe and its associated joints after repairs?

A. I can't, no sir; I can't recall but I'm sure that it was hydrostatically tested. It was not ultrasonically tested at that time, and subsequently the pulsation test was applied.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. In the hydrostatic testing of vital sea water systems, what level of supervision from you shop do you consider essential to install the test setup, check the setup and monitor the running of the test?

A. Leadingmen level.

Q. During THRESHER's post shakedown availability, did you have specific written instructions to your supervisors, laying down the responsibilities for

running such tests?
A. No, sir.

Q. Are you knowledgeable regarding the final hydrostatic test which was applied to THRESHER's auxiliary sea water system aft?
A. No, sir, not personally knowledgeable.

Q. Do you know who was responsible from your shop for supervising that test?
A. No, sir.

Neither the counsel for the court, the court, nor the counsel for RADM Palmer, a party, wished to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness said that he had nothing further to state.

The witness was cautioned concerning his testimony and withdrew from the courtroom.

The court recessed at 1550 hours, 10 May 1963.

The court opened at 1600 hours, 10 May 1963.

All persons connected with the inquiry who were present when the court recessed were again present.

Robert P. Sturtevant, Jr., was called as a witness for the court, was informed of the subject matter of the inquiry, was advised as to his rights against self-incrimination, was duly sworn and examined as follows:

COUNSEL FOR THE COURT: This is a closed session of the court, Mr. Sturtevant, and you can divulge classified information here.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. Would you state your name, address and present occupation, please?
A. Robert P. Sturtevant, Jr., (b) (6) I'm the Foreman Marine Machinist.

Q. Are you employed here here at the Portsmouth Naval Shipyard?
A. Yes, at the Portsmouth Naval Shipyard.

Q. What is the nature of your duties?
A. I'm the foreman of the marine machinists in Shop 38; I supervise the employees of Shop 38.

Q. How long have you held your present position?
A. Two years this July.

Q. Will you briefly describe your background and experience in your present work?

A. Yes, sir. I first worked at the Bath Iron Works, and came up here and served my apprenticeship in Shop 31, Inside Machine Shop. Transferred to the Outside Machine Shop, and I served a period in the Army. I returned in 1950. I became a Leadingman and in '55 a Quarterman. Since '59 Chief Quarterman and in '61. Foreman Machinist.

Q. Will you describe how Shop 38 is organized to manage and carry on its work?
A. Under the direct supervision of Mr. Poor, the Group Master of Outfitting, I am responsible for my immediate subordinate, who is Al Perry, Chief Quarterman Marine; under him there are eight Quartermen and twenty-five Leadingmen, nine Shop Planners, instructors and apprentices, for a total of 308 machinists and a shop total of 461 at present.

Q. On what means do you rely to audit and check upon the work of those persons who work for you?
A. By immediate observation by myself, by reports from my subordinates, by reports from other codes, such as Nuclear Code, Polaris Code, 303.

Q. Turning to THRESHER's post shakedown availability period, how frequently did you go on her to monitor the work being done by your personnel?
A. On the THRESHER I was on her at least three times a week, and when I was unable to go the Chief Quarterman went on. Shop 38 had Foreman level or Chief Quarterman level attention at least once a day.

Q. When were you last on board THRESHER?
A. I was on board THRESHER immediately before her undocking on the Monday before she put to sea, which would be the 8th, I believe.

Q. Would you describe how your shop was involved in the Quality Assurance Program?
A. Shop 38 Quality Assurance rests first with the mechanics and then with the Leadingmen. The Leadingman has the role of the first line inspection; the Quarterman over him, the Chief Quarterman and lastly myself.

Q. Does the Quality Assurance Division touch on your work?
A. It does. Not as much as formerly. Formerly we did the operation. Presently the operation has been taken over by Code 303T. We supply machinists who work with them under their supervision.

Q. Are you satisfied with the operation of this program?
A. This is a comparatively new program and it has problems which affect me directly, and one of the primary ones is the lack of attention. The machinists and supervisors build up a system or a component to the operating system and then it is taken over by Code 303T. We must then, in most cases, supply the men to do the operation, although we lost the control of the completion of the job.

Q. When did this system come into effect?
A. I believe the first boat that it came into effect on was the 606.

Q. It does not apply then to THRESHER?
A. No, sir.

Q. Would you discuss any significant problems which the personnel who work for you had encountered in working on THRESHER during her post shakedown availability?
A. Would these be technical problems?

Q. Not only technical problems, but those caused by unsatisfactory work, and casualties that occurred.

A. To the best of my knowledge, there was no unsatisfactory work that was not stopped at the Leadingman level; it was never brought to my attention.

Q. As to the work performed by people under you, what is your estimate of the quality of such work in THRESHER at the time she left here after her post shakedown availability?

A. I think I could say without exception that we left no job uncompleted or with any problems attached to it.

EXAMINATION BY THE COURT

Questions by a member, CAPT Hushing:

Q. Mr. Sturtevant, do you have a standard rip-out procedure in use in Shop 38 when you remove items from ship's systems; say, for example, a valve that goes back up in the shop?

A. The standard procedure to rip out a valve would be to remove the valve, blank the valve, blank the remaining opening, and then there would be a 995 tag attached.

Q. What is a "995 tag"?

A. This is a multi-leaf shipping document. It is attached to the valve, and I believe the sending agent, who might be the man on the dock, and the receiving agent, who would be the man in the shop to which it was sent, they would each retain a copy and it would become a matter of record.

Q. During THRESHER's post shakedown availability, when you took a component out and blanked the flange, how would the ship know that it had been taken out?

A. Other than by direct observation, I couldn't say, or it would be called for and a receipt given and the ship would have a copy of it also.

Q. Let us suppose now that instead of taking the valve or other appurtenance out of the system, it is put into the system in an unnatural mode for test purposes on the part of the system, say a reversal of a valve; how would you handle that situation?

A. In the first place it would not be a function of 38 to do anything like that; we do not test the system; that is strictly a Pipe Shop deal.

Q. But might it not be a part of Shop 38's job to do some of the machinist work in connection with this?

A. The only machinist work that would be done would be to overhaul the valve in place, replacing the components, grinding the valve in, etc.

Q. While that is being done is there any thought of a notification made to the ship's force, or to other shops, that this job is being done in the system?

A. If it was a system that had a fluid, or some component that was to be operated, we have caution tags to tie on, and in the case of a system like the periscope system, we have locks to apply to the manifold and we supply a key to the ship.

Q. Do you handle Marotta valves in air systems?

A. No, sir.

Q. When you take a Marotta valve out of the air system of a ship like THRESHER, are there any indications put on the BCP or elsewhere in the ship that that valve is out?

A. We do not take Marotta valves out; this is purely a 56 job.

Q. Oh, I misunderstood you; I thought you said you did.

A. No, sir.

Neither the counsel for the court, the court, nor the counsel for RADM Palmer, a party, wished to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was cautioned concerning his testimony and withdrew from the courtroom.

William G. Poor, a former witness, was recalled as a witness for the court, was informed that his prior oath was still binding, and was examined as follows:

COUNSEL FOR THE COURT: Mr. Poor, this is a closed session of the court and you can give classified information here.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. You are the Master Mechanic, Outfitting, are you not?

A. Yes, sir.

Q. This includes Shop 56, the Piping Shop, and Shop 38, Marine Machinists, does it not?

A. Yes, sir.

Q. You have previously described the organizational arrangements for management and operation of your group. Would you now describe what means you rely upon to audit and check the work of those who are subordinate to you?

A. Those people who are directly subordinate to me are the two Foremen, one in Shop 38 and the other in Shop 56. We have three offices, side by side. We talk frequently with each other directly. I write very few, practically no directives to them. I call their attention to the Shipyard directives as they come out and they in turn report back to me on the way things are going as regards what should be done, the shipwork in general, not necessarily in detail. The way I audit their performance is by the reports that I get from the other meetings that I attend, the management meetings, at which the output of the shops is measured and reported on.

Q. Do you actually pay visits to the ships on which your men are working in order to see how the work is being performed at the actual level of accomplishment?

A. I pay visits to the ships when I get some free time to do it, but not specifically to see how the workmen are doing the work, necessarily, but more to see how the ship is, overall, the progress of a ship, if I can get an idea of it; how much of it has been torn apart and what stage of completion it is in. These

are just rough ideas so that I can correlate my thinking with others when we get management meetings as to just where we stand, but as far as the details of the various jobs, or course in the pipefitting area I have to rely on the Foreman of the Pipe Shop to tell me the procedures, etc. that the pipefitters use for doing the specific work. I am more informed in the machinist's work, having been a machinist.

Q. How often did you visit THRESHER during her post shakedown availability?
A. Not very often during the first three-quarters of it. I went aboard the ship maybe every two weeks to see what the progress of the ship was. Towards the end, when a specific job was highlighted, I went aboard then.

Q. When were you last on board THRESHER?
A. The weekend it was in drydock; that would have ended up the 7th of April.

Q. What were the circumstances of that visit?
A. I went down particularly to see the job of the installation of the roller guides on the main sea water valves, and at that time I looked at the b(3) 10 valves, went through the ship and came off the other end.

Q. Will you discuss very briefly your responsibilities with regard to the Quality Assurance Program here at the Yard?
A. My responsibility in being the administrative head of the Group, is to see that the Shipyard's instructions are disseminated to the people who need them. I do this through my administrative group, to discuss the methods, not necessarily the methods, but the way we are goind to handle this current instruction for quality assurance, as well as anything else, for that matter, and I have an administrative office, but I do not keep in that office quality assurance records, since we keep very few quality assurance records in our Group.

Q. What checks do you have to insure shop compliance with Quality Assurance procedures?
A. This again, in discussions with the Foremen, if they have problems in this area, and I have an overall interest in the Shop Planning effort, although in my group I have assigned the Shop Planners directly to the Quartermen; I do not have a Shop Planners supervisor as such, so I visit with the Shop Planners, especially in the area of maintenance of the joint control records, because it's my responsibility to provide the people to look after the records, see the equipment is stored and see that they are properly maintained. I have to depend on reports of this man to know how we are doing.

Q. Please relate any significant problems you may have had with respect to the work of the shops in your group in THRESHER during the post shakedown availability? I'm referring to problems resulting from defective workmanship tests.
A. To go back to the testimony I gave before, where I discussed the fact that I directed the Foreman of Shop 56 to investigate the reasons behind the reserve feed tank being over-pressurized, and this resulted in disciplinary action against two Leadingmen, an apprentice and a mechanic.

Q. Will you relate the disciplinary action taken at that time?
A. The disciplinary action was letters of reprimand.

Q. Did any problems arise in the area of sil-brazing during the period of THRESHER's post shakedown availability; any problems which reached you?
A. Not resulting from poor workmanship.

Q. With regard to the work done in THRESHER during her post shakedown availability by the personnel fo the shops under your cognizance, would you state your estimate of the quality of the work performed?

A. I was completely satisfied with the work performed by both shops.

EXAMINATION BY THE COURT

Questions by a member, CAPT Hushing:

Q. Mr. Poor, you stated that you had grown up the chain of responsibility from the machinist's side, I believe?

A. Yes, sir. I was the Master Machinist here prior to November of 1960, when I was appointed a Group Head.

Q. Do you find that this background makes it difficult for you to understand the problems of Shop 56, or makes it easy for you to understand?

A. I think it makes it easy, because the years when I was an apprentice, a mechanic and a Leadingman in Shop 38 in Boston, we made up a lot of the pipe, because this would be mechanical joints, but we worked closely with the pipefitters and I haven't really found any problems that I haven't been somewhat familiar with from the past, and I can catch onto it fairly readily now.

Q. If you will think for a minute about the way you spend your time, can you give me an idea how much of your time is devoted to supervising Shop 56 as compared to Shop 38; is it equal; do you spend more time thinking about 38 because of your background, or do you spend more time thinking about Shop 56 because it is not of your background?

A. I was going to give you a rough estimate of about 90% with 56 and 10% with 38.

Q. Why?

A. 56 is a larger shop, has more people; therefore, I have more administrative problems. It has more supervision. We had more training programs, which we have cut back recently. We have many more problems in 56, becuase over the past few years, as you are well aware, the silver braze problems, the problems resulting from the BARBEL. Well, everything just leads me to have to spend more time, or I feel that I have to spend more time with 56.

Q. So you have, in fact, been devoting more time to 56 than 38?

A. Yes, sir.

Q. As a result of devoting more time to 56, have you formed opinions as to the adequacy of 56 personnel?

A. I haven't gotten to know the working levels of supervision as intimitately as I might like to have; the Foremen. The Chief Quartermen, and some of the Quartermen I've got to know real well, and I have formed opinions of them.

Q. To use words that you and I are familiar with, in evaluating personnel, outstanding, excellent, good, fair, unsatisfactory; would you give me your opinion of Mr. Scarponi, on that scale?

A. Satisfactory.

Q. Would you give me your opinion of his Chief Quarterman on that scale?

A. I'm sorry; Mr. Scarponi would be in the category of good, and the Chief Quarterman, Mr. Charlie Perry I'm speaking of now, he would be excellent.

Q. How about Mr. Smith?
A. Mr. Smith is a good Quarterman.

Q. How about some of the Quartermen now, say Mr. Collins?
A. Mr. Collins is a satisfactory Quarterman. He was the only other Quarterman connected with the THRESHER directly.

Q. How about the general level of the Quartermen in Shop 56?
A. The general level, I would say, is good.

Q. What do you think of the general level of Quartermen in Shop 38; what would be your evaluation?
A. They are about the same.

Q. Do you think there's any substantial difference in overall supervision between the two shops? Rate 56 supervision overall, and rate 38, using the same terms.
A. They would be about equal, and they would be good.

Questions by a member, CAPT Osborn:

Q. How do you rate yourself, Mr. Poor.
A. Is that a fair question, Captain?

Q. Yes, very fair, that's what I'm trying to find out.
A. How do I rate myself?

Q. Yes.
A. Good; I have a lot of shortcomings, and I know some of them.

Q. That's not necessarily associated just with you. Quite frequently when you're supervising something you can get a better idea of the supervision from asking someone external to your organization how you're doing, or what other people think of the work; do you do a lot of this?
A. Yes, sir. I continually ask others in other trades, what they think of my supervisors. We in the Shipyard have this Project Team concept, where our people work closely together with the Ship Superintendent. A good measure of what a Quarterman or a Leadingman is doing is to ask other members of the Project Team how things are going, "Are you having trouble?" and to ask the Shipbuilding Superintendent is a good measure of how the supervision is, because he's very quick to give you an answer.

(b) (6) relieved (b) (6) at this point as reporter.

Q. I asked Mr. Scarponi the other day if he remembered very many officers coming through his shop; and he told me he wouldn't remember it. My reply was, if I went through his shop and inspected it, he sure as hell would remember it. His reply to that was that he would probably throw me out. Do you think this is a good estimate of the situation?

A. No, sir. I'm sure it was only facetious. Mr. Scarponi's shop--I might provide this additional information: His office is not in his shop, and he has many visitors in the shop that he never sees. I am sure if he knew you were going to be there, he would be there personally to escort you through the shop.

Q. One thing I am trying to get clear in my mind, particularly with respect to Shop 56, is that in the past three years to five years the average technical requirements have increased immeasurably. I am particularly interested in establishing whether the shop has kept pace with this technical advance, what steps they have taken to keep themselves abreast of it, and do you think it is working?

A. I can't recall how many years ago this was, because I've been connected with them for only two years. When I took them over, they had an extensive training program in the shop during working hours, and we had people continually in training. I have in my pocket a list of the courses that were taught, and we had as many as thirty or more instructors that were doing this teaching, some in sil-brazing, some in target make-up of joints, and so forth, and we ran into the problem of these people being charged to overhead. As a result we had to cut our instructors back to two. We now teach brazing and the make-up of flexible pipe from time to time. We have provided other training in conjunction with the New Hampshire Technical Institute, which some of the men attend on their own time, and I think there is a graduation next Monday night. The training recently has been inadequate to bring the people up technically to the level of our work which we are required to perform, except in one area. I feel it is too bad we can't continue that program.

Q. Were you working in the Shipyard in Boston in 1949 and '50?

A. Yes, sir.

Q. Do you remember your experiences working on the GRAMPUS in that Shipyard?

A. Yes, sir, very well. I was the leadingman on that ship.

Q. I know you were the leadingman on the ship. How would you consider the performance of the Yard and the men in advancing the status of the Yard in Boston under that construction program as compared to the Portsmouth Yard as far as the construction of THRESHER was concerned?

A. Are you asking me to compare the level of competence in Boston on the fleet type boat of 1949 as compared to the construction of the THRESHER in the 1960's?

Q. Yes.

A. I think Portsmouth was ahead of Boston. We learned pretty much the hard way in Boston. We didn't have any training programs. We were assigned to the work and studied it out.

Neither counsel for the court, the court, nor counsel for RADM Palmer desired further to examine this witness.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement:

THE WITNESS: There is only one statement I would like to make, Admiral, and that is relative to my statements the last time I was in this room, and the press picked up the remark that I made in which I said I was "generally satisfied" with the workmanship on the ship at the time she went on sea trials, and in my remarks today I said that I was completely satisfied with the workmanship. As I explained to Commander Davis and Captain Woodall this morning, the reservation I had in mind at that time was my reservation in regard to the valves, the material that had been installed in the boat and the number of times my people had removed them and installed them.

PRESIDENT: These are the Marotta valves?

THE WITNESS: The Marotta valves, Servo valves, and the diving systems. If you look back over my testimony, you'll find that I changed from "generally" to "completely". I think my people did a good job, a fine job on the boat.

PRESIDENT: Are you familiar with the first test that was conducted on the TINOSA air blow system at the request of the court?

THE WITNESS: No, not directly. I've heard people talking about it and discussed it at lunch among the masters themselves.

PRESIDENT: It seems that the conical strainers upstream of the reducers were casualties in that test, and I wondered if you had any theory as to why that might have been.

THE WITNESS: No, sir, I haven't looked into the problem.

The witness stated that he had nothing further to say.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

Clarence E. Cole, a civilian, was called as a witness for the court, was informed of the subject matter of the inquiry, was advised of his rights against self-incrimination, was duly sworn, and examined as follows:

COUNSEL FOR THE COURT: Mr. Cole, this is a closed session of the court, and classified information can be divulged here.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, address, and present occupation.
A. Clarence E. Cole, (b) (6) I am the foreman welder here.

Q. That's at the Portsmouth Naval Shipyard?
A. Yes.

Q. State very briefly the nature of the duties which you perform at the Shipyard?
A. Supervise all of the welding and burning in the construction, overhaul and repair of submarines, and all other work in the Shipyard.

Q. You are the foreman of Shop 26, are you not?
A. Right.

Q. How long have you held your present position?
A. Since some time in 1951.

Q. Can you very briefly describe your background and experience in your line of work?
A. I started as a welder about 1928, and have worked in private industry. I worked at the Bath Iron Works. I came to the Portsmouth Naval Shipyard in January, 1940, and worked up through the ranks, through leadingman, up to the present position I hold now.

Q. How is Shop 26 organized to manage and carry on its work?
A. I work for a Group Master. I am the head of the shop. I have a Chief Quarterman, thirteen quartermen, and fifty leadingmen that carry on and supervise the work in the shop.

Q. How many men all told are there in your shop?
A. Eight hundred and about seventy-five.

Q. What means do you rely upon to audit and check the actual work performed by the men under you?
A. Some through personal observation, then through my Chief Quarterman and quartermen - reports from them.

Q. How often were you on THRESHER during her post shakedown availability to check on the work of your men?
A. This is a hard question to answer. I don't know how often. The last time I was inside of the ship was just before it came out of the dock, Number 1 dock.

Q. When she was here for an extended period of time during her post shakedown availability, would you say you were on her three times during that period?
A. Oh, more than that. Maybe six or eight times.

Q. What program do you have in effect in your shop for insuring the accuracy and quality of the work performed in your shop?
A. We have forms that have to be filled out by the supervisor before we weld a job. It has to be signed by the trade that fits it up. It is checked by the Quality Assurance group, and I will get a report of a deficiency.

Q. Are you satisfied with the quality of the work being performed or could you suggest ways to improve it?
A. The quality of the welding?

Q. Yes.

A. I don't think I would ever be satisfied with the quality of the work until it is perfect, but we are trying to improve it all the time. I would say it is real good work, however.

Q. What training programs do you have for those performing welding work involving vital submarine piping systems?

A. We have a training program that all of our pipe welders go through. We pick what we consider to be the top welders in the Shipyard, and this is an opinion of maybe eight or nine quartermen and the Chief Quarterman. These people are selected and given extensive training in pipe welding. This is theory and actual practice and demonstration. We have a regular training plan for this.

Q. Are your best pipe welders--~~syphoned~~ SIPHONED off for work in the reactor compartments of submarines?

A. Yes. I would say that we select the very best people we had in the shop to be in the nuclear area, yes.

Q. How would they compare with those left behind to work in the rest of the submarine? How much better are they?

A. Some of them are better and, on the other hand, some of them are not better, because a welder that might be real good on structural might not be so good on pipe welding, because of his size or maybe his eyesight isn't good, such as having near vision, or something like this.

Q. There are some variations, but over all the people in the reactor compartment are your better welders?

A. Yes, sir.

Q. Who directed that they be selected and sent to the reactor compartment?

A. The Nuclear Power Superintendent has, in many instances, at meetings asked the question, "Have you got the best people in the Shipyard working on nuclear piping?" And I have to answer yes.

Q. Do your men regard the welding specification requirements as a goal which they have to meet or a goal towards which they have to strive?

A. It is a goal that we try to meet, and they consider it as a goal they try to meet.

Q. Do they regard the standards as unnecessarily high?

A. I don't think they regard them as unnecessarily high. I do think that we have people interpreting maybe the specifications, or the x-ray standards, and then I think it gets into a lot of opinions as to whether it does or does not meet the specifications. Is it a crack, for instance, or an incomplete penetration?

Q. Is the attitude of your people the same towards the specifications which have to be met in the reactor compartment and the specifications which have to be met with regard to the rest of the ship, or do they consider those as unnecessarily high?

A. I wouldn't say they regard them unnecessarily high. I would say it is a goal which they try to meet in both the reactor and non-reactor.

Q. It is the same for both?

A. Yes, sir.

Q. Would you describe any significant problems you may have encountered in connection with welding done in THRESHER during her post shakedown availability, work which may have proved to be defective?

A. I only know of one area where we had a man here from the Bureau, a Mr. Dawson, to look at an area that I believe the Shipyard called as a crack, and he accepted this as not being a crack, and they ran figures in Design to prove this was an adequate joint. It was a double-bevel tee joint and had a slight point at the point of the bevel.

Q. What do you consider was the cause of welding defects in the PUFFS hydrophone area?

A. We removed a casting from the ship, a fabrication from the ship, and I saw some of the welding which, I would say, was not good, and I believe it was location. I think it had a wrong bevel on it, and the position the man had to get into in order to see this joint, it was a tough job to do. This had flaws in it.

Q. How do you suppose it got by the inspector or the supervisor at the time?

A. This is very easy to do, because a supervisor will have anywheres from--he will probably average 15 to 18 people working for him, and this was in back of a frame or foundation on the top side. The supervisor going by sees the man welding, but he can't actually see what is being put in that weld. The only man who knows what is happening is the man looking at the arc. This was not radiographed, because it does not lend itself to radiography. The joint was magni-fluxed.

Q. Is there any question at all of the qualifications or the training of the man who made that weld?

A. I don't know who made the weld. It was so long afterward. We were not able to tell who made that weld, and if they are big heavy welds, maybe six, eight, or even ten men work on this.

Q. Is there any question in your mind as to the quality of work and the integrity of the work performed by your men in THRESHER during her post shakedown availability?

A. None. Absolutely none.

EXAMINATION BY THE COURT

Questions by a court member, CAPT NASH:

Q. Mr. Cole, can you recall any failures of welded joints?

A. Pipe joints?

Q. Yes.

A. I have never known of any, and I have tried to find where some pipe joint has failed, and I have never been able to find one anywhere.

Q. I am sure that you have given some thought as to the comparative strength of different processes?

A. Yes, sir.

Q. Would you express your opinion as to the relative strength of a welded joint and a silver-brazed joint?

A. Is this--I would like to ask a question, if I may. Are we talking about a sleeve joint, a socket weld, a butt joint, and silver braze?

Q. Take a butt joint.

A. I would much prefer a butt joint, because you can inspect it and be sure of your inspection. I think it is a much better joint than a brazed joint. If we're talking about a socket joint, if the silver-brazed joint is properly done, I think the silver-braze joint will stand all that a socket welded joint will stand. But, again, the socket welded joint is much easier to inspect than a silver-brazed joint, because you can see the outer layers of the weld metal.

Q. In recent times we have made considerable progress in the methods of surveillance for both types?

A. Right.

Q. Do you think we can today adequately check both types so that we can be assured that we have a good joint?

A. I'm not sure that I am qualified to answer this question, because I do not have the silver brazers. I think that, with ultrasonics, it might be possible; but, here again, you have to depend on the man who is reading this bunch of pips here, and there can be variations. I'm not qualified to answer your question fully.

Q. In summary, however, do I understand that, in your opinion, if you are able adequately to check the two joints and knew that they were properly installed, their strength is comparable?

A. A silver-brazed joint against a socket welded joint, in my opinion, one would be as good as the other.

Questions by the president, VADM AUSTIN:

Q. Mr. Cole, of your 875 men in Shop 26, how many are qualified to do pipe welding?

A. We have a crew of about 125, but the 125 are not qualified to do all of the different materials, and we are gradually, now that the workload is letting off, and I am taking off the people that we think are not quite as good as someone else.

Q. If this Shipyard were required to do all joints by welding, would you have difficulty in obtaining qualified welders to do all the pipe welding that would have to be done?

A. Yes, if it was decided right now to do it. It would take a period of time, and this is an area where it takes young people to do this, because they have to have good eyesight and have to be able to see almost around corners and in close areas. When a welder gets where he has to wear bifocals, he usually has gained a lot of experience and knows a lot more, but he is handicapped by his lack of good eyesight. If we were to undertake this program, there would have to be a training program over a period of time before we would be able to do a thing like this.

Questions by a court member, CAPT HUSHING:

Q. Mr. Cole, I believe you said you had 875 welders, of whom 125 you considered qualified in pipe welding?

A. Yes, sir.

Q. Let's address ourselves specifically to carbon steel welding and to non-nuclear standards. How many of those 125 do you consider good enough to be assigned to the job of welding carbon steel piping with a reject rate estimated at less than 20 per cent?

A. I have to answer this question and qualify my answer. Probably close to 50 per cent of them.

Q. Half of them.

A. Now, why I said I have to qualify my answer is because we don't, at this Shipyard, have a good handle on what is a rejection rate. I get a report weekly from the Quality Assurance group by check number, so that I know who is welding the X-rayed joints, and this is something that we are getting into. I've been getting these reports for three or four months, and the rejection rate is all over the road. It shows on paper probably twice as high as it really is, because when a joint is X-rayed and rejected, then we go out and look at the joint and say, "Well, this is a wagon track sort of an X-ray." So, we will remove the backing ring, and it is ground out, X-rayed again, and it passes. This should not be called a welding reject. Again, we will find instances where a joint is rejected by a reader, and we go out and we find something on the surface that should be ground a little bit, and it goes through as a welding reject. So, we don't really have a good handle on it yet.

Q. Well, suppose you had a need to weld a section of pipe and you wanted to be real sure that it was done properly and would not be rejected. Do you feel that you could call on any welder in this Shipyard with 100 per cent assurance that his work would not be rejected?

A. No, sir. And I don't believe, in my opinion, you could find one in the country.

Q. Suppose you were willing to take a 5 per cent chance on rejection, would there be anyone in this shipyard who might qualify?

A. I would hate to try to guarantee this, because there are so many variables that it is impossible. We will have a man that will do four or five joints in a row and they will pass 100 per cent, and maybe the next four or five will be rejected.

Q. But some people are better than others?

A. We have to say some people are better than others, because their rejection rate is lower.

Q. What I am trying to determine is those people in the very cream of the crop welding-wise, as far as you have been able to determine then, what rejection rate would you consider would be reasonable for your best welder working on carbon steel?

A. This is going to sound foolish to you, because he gets the toughest job.

Q. Well, let's take a flat-out straight, or average joint to which your good welders would be assigned, would you have a 90 per cent confidence level in that man, 80 per cent confidence level?

A. I would probably have an 80 per cent confidence level in my best people.

Q. And of the 125 pipe welders you have, how many would that be?
A. You see what I've done here. In this 125 I have a certain number of people whom I have trained on carbon steel and some--

Q. Let's talk about carbon steel welders.
A. This 125 are not capable of welding carbon steel.

Q. I understand that, but I asked about their capabilities on carbon steel--this 125.
A. That I would have 80 per cent confidence in?

Q. Yes.
A. Perhaps 6 or 8.

Neither counsel for the court, the court, nor counsel for RADM Palmer desired further to examine this witness.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

The court adjourned at 1700 hours, 10 May 1963.

Unclassified

TWENTY-FIFTH DAY

Portsmouth Naval Shipyard
Portsmouth, New Hampshire
Saturday, 11 May 1963

The court met in executive session at 0830.

Present: All members of the court and the counsel for the court.

The court opened at 0932 hours and announced that this session would be held with closed doors.

All persons connected with the inquiry who were present when the court adjourned were again present in court, with the exception of (b) (6), who was relieved as reporter by (b) (6). RADM Palmer, a party, and LCDR Hecker, a party, and his counsel waived their right to be present at this session of the court. Counsel for RADM Palmer was present.

John G. Guerry, Jr., Captain, U. S. Navy, was called as a witness for the court, informed of the subject matter of the inquiry, advised of his rights against self-incrimination, duly sworn, and examined as follows:

COUNSEL FOR THE COURT: Captain Guerry, this is a closed session of the court. Classified information can be divulged here.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, grade, organization and present duty station?
A. I am John G. Guerry, Jr., Captain, U. S. Navy, 1400 officer. I am the Production Officer of the Portsmouth Naval Shipyard.

Q. How do you spell your last name?
A. G-U-E-R-R-Y.

Q. Would you describe the responsibilities of your present position?
A. I would like to read the ship's organization into the record if I can put my hand on it, if that is agreeable. (The witness was unable to find the document he was seeking amongst those in his possession.) Well I am responsible to the Shipyard Commander for the orderly, economical work that is authorized by the Planning Department to be accomplished, and to insure that the work is done in accordance with the published specifications, the specifications in effect at the time.

Q. Would you briefly describe your naval and professional background and experience?
A. I graduated from the Naval Academy in 1939 and I was at sea for the next seven years, short tour on a battleship, the rest of the time in destroyers. I had command of a destroyer the last year of the war. I came ashore and went to PG School in '46, one year at the Naval Academy, Post-Graduate School at the Naval Academy, and two years at the Carnegie Institute of Technology, where I majored in Metallurgy, obtained my Master's Degree in Metallurgy. On completion of my course in Metallurgy, I went to sea again as Chief Engineer of a carrier,

Unclassified

USS LEYTE, was aboard her for thirty-four months. Came ashore, back to the Bureau -- I became an ED, Engineering Duty Officer, while aboard the carrier -- that was in October of '51. I came ashore in '52 and was in the Bureau of Ships in the Materials Development Division of the Bureau of Ships from '52 to '55. I was in Charleston Naval Shipyard as Assistant Repair Sup from '55 to '58. I was on the Board of Inspection and Survey for one year. And I was in the Bureau in charge of the Turbine and Gear Desk, and then moved up in charge of the Machinery Division of the Bureau of Ships for one year. Then I came up here in December of '61 and took over as Production Officer.

Q. How much of your background and experience relates specifically to submarine construction?

A. Very little. As Repair Sup in Charleston, we did overhaul conventional fleet type submarines. I was involved in that work.

Q. Do you feel that this lack of extensive experience in submarine construction has been a handicap to you in the performance of your presently assigned duties?

A. I think it has limited me somewhat. I have been fortunate in having a competent Shipbuilding and Repair Sup, but without him I think I would have been in trouble at times.

Q. Turning to the period of THRESHER's post shakedown availability, would you relate the major factors contributing to difficulties and delays in the Production Department's completion of the work in THRESHER?

A. I would say without hesitation that the controlling job in causing the delay was the tank stiffening job and underestimating the time involved to get in and do that work within the tank, putting in the Intercostals, tying them in, problems related to welding according to plan; in fact, it was impossible in many, many cases and we had to get design changes before we could proceed with the job. And then after we had finished the production, welding, the inspection, getting the tanks to be crack-free. That overextended our scheduled time by a factor of over six weeks, which is one of the largest contributing factors to the increased time. In other words, we were not able to proceed with the work on top of the tanks or around the tanks until we had cleaned up and finished our work in those tanks.

The other job that I think we had not fully estimated the full scope of was the PUFFS installation. Our expenditures on that exceeded by a factor of two, two and a half, what we originally thought it would take to do the job. Again, we started that job without complete plans on it. It was designed and planned as we proceeded, so we had to sort of feel our way along that job.

The other job, which we took on late in the availability, although we had planned originally to do it, was the placement of the b(3) 10 USC condensate pumps. The pumps were late getting here and we found when they got here we could not go through the top of the ship -- we had to cut a hole into the bottom -- and the work involved in putting that in through the bottom, and also as we tried to pipe up according to plan, it wouldn't go; we had to more or less feel our way along on the piping end of the condensate pumps. The other large job which stretched out was the change of the pumps on the auxiliary salt water, change of the motors on the auxiliary salt water pumps. That also necessitated a change in the shock mounting. b(3) 10 USC 130 After that job was done we found we had to re-pipe in order to get adequate balanced

loading on our mounting. We had to change some of our piping. That was discovered late in the availability. We took on the installation of Loran "C" job in the radio room, made the availability to be compatible with the ASROC capability. This, as we got into it, necessitated a rather large change in our radio room arrangement. This, too, was late in the availability and entailed a lot of work.

Q. At the request of counsel for this court, have you prepared a list of the key dates in THRESHER's construction and post shakedown availability period?
A. Yes, I have. (The witness handed counsel a document)

Q. Is this list true and correct to the best of your knowledge?
A. To the best of my knowledge. This covers the key events of the building period, the shock hardening availability, the patch hull availability, and shock trials. The dates we obtained through Planning.

The above described document was submitted to the party and to the court, and was offered in evidence by counsel for the court. There being no objection, it was received in evidence as Exhibit 192.

Q. Anent your previous testimony, Captain Guerry, do you have in your possession an official chart showing the specific responsibilities of the Production Officer at this Shipyard?
A. Yes, I do. (The witness handed counsel the requested document)

The above described chart was submitted to the party and to the court, and was offered in evidence by counsel for the court. There being no objection, it was received in evidence as Exhibit 193.

Q. I note that the date of Exhibit 193 is 1 May 1963. Were these same duties performed by you during your total service at the Shipyard?
A. That is correct.

Q. Turning to the work performed in THRESHER during her post shakedown availability period, do you have a compilation of figures which show the manpower loading employed in THRESHER during the months of March and April 1963?
A. Yes, I do. (The witness handed counsel the requested document)

Q. Are these figures true and correct to the best of your belief?
A. These are the daily figures as taken off our daily distribution of forces report.

Q. And the tabulation on the left hand side of each page indicates the day and the month?
A. That is correct.

The compilations of figures showing the manpower loading employed in THRESHER during the months of March and April were submitted to the party and to the court, and were offered in evidence by counsel for the court. There being no objection, the compilation for March was received in evidence as Exhibit 194, and the compilation for April was received in evidence as Exhibit 195.

Q. Referring to Exhibits 194 and 195, Captain Guerry, do you consider the manpower loadings to be so great in the case of THRESHER as to interfere with the quality and productivity of the work performed in her?
A. No, I do not.

Q. Will you describe the system which existed in the Shipyard during THRESHER's post-shakedown availability period for the cross-flow of information between major units within the Shipyard organization, such as the Design Division, the Production Department, and Quality Assurance Division?

A. Well, Shipyard Instruction 4854.1B is the basic document for the transfer of information back and forth between various groups. The documents referred to in this instruction, first, is a Condition Report, which is a First Naval District document -- I've got the number of it -- anyhow it's a local Shipyard document, 1018, if I can read my writing correctly --

Q. Just tell us instead what the organization was for cross-flow of information between those organizations?

A. O.K. Again, I'll sort of briefly go down the functions. Design Division basically draws the design, comes up, engineers the design, passes the work down to the P&E Division, who, in turn, write up the job order, the work authorization document, to the Production Department. Sometimes Design is not involved -- it's a straight work request, and P&E acts as the customer liaison man with the customer and spells out the job in detail as to what the Production Department is supposed to accomplish. Then it's up to the Production Department to execute the work. And in lots of cases, as the work proceeds, we discover conditions which are not as had been planned. It is incumbent upon the Production Department, then, in that case, to submit Condition Reports. These Condition Reports, P&E doesn't know ahead of time what the Condition Reports are or what they call for; other times we run into unknowns or things not seemingly covered in the job order, and we submit the Condition Reports and P&E then issues work authorization on that or not. In our Inpsection Division, as they follow through and run Inspection Reports, if they run across conditions where they feel that Production and shops have not complied with the work as authorized, they issue an UNSAT Condition Report. This goes to the Ship Superintendent.

Q. May I interrupt, sir. When you speak of the Inspection Division, are you referring to the Quality Assurance Division?

A. Quality Assurance Division, yes.

Q. Proceed.

A. In time these reports go to the Ship's Superintendent. If he feels that the Job Order definitely covers him and the shops have been remiss, he authorizes work for the shops to proceed and correct or to accomplish the work. If he feels this is beyond the scope of the Job Order then he submits this data back to P&E for issuance of work, go back to the customer if necessary, for whether they feel the Job Order, the work document from the customer, entails work to be done. Then they, in turn, give us Job Order coverage to proceed.

Q. As a specific example of the working of this cross-flow of information, will you relate your participation in the decision made early in December, 1962, to limit the extent of the surveillance of silver brazed piping joints in THRESHER during her post shakedown availability?

A. Yes. I'll put it this way. I was aware of this decision; in fact, I was part of the -- when the recommendation of the Repair Superintendent --

Q. Would you name him, please?

A. That was Captain Heronemus. We felt that we had to knock off the inspection work or dismantling of the piping systems that were involved, the trim and drain

and auxiliary salt water systems, start putting them back together in order to meet our undocking date, which at that time was supposed to be the third week in December. And this decision, I think, was made right around the 27th or 28th of November. And I was aware of that and passed the word on.

Q. I'm not sure you've completely explained to me the flow of information from the Quality Assurance Division and the Design Division and the Production Department in all of this?

A. All right. The work as it proceeded on the silver braze. We had a four man team working as a group. We had the pipefitter, who was working with the unlagging, that kind of work; we had the Quality Assurance man, the ultrasonic man, who made the inspection; a P&E man who authorized the work on the spot, what was to be done; and the Design man issued the Design Liaison Instructions that were involved where work changes had to be made in order to effect repairs of the joint found defective. So as joints were found, both departments were aware of it at the time, and repair instructions were issued on day by day notice. I did get a weekly report of how many joints had been inspected and how many were defective, and this report was submitted weekly to the Planning Officer and to the Admiral on our weekly summary -- or a status report on the THRESHER, which we held a weekly meeting on every Wednesday morning in preparation for the Commanding Officer's Conference.

Q. Do you have copies of those weekly reports of the inspections performed on THRESHER?

A. Again, it's a summary of it. I do not have those available. They are available, but I do not have them with me.

Q. You were aware then of the rejection rate of silver brazed piping joints disclosed by the survey?

A. I was aware when we stopped that we had rejected -- at that time I remember it was twenty out of one hundred sixty-nine.

Q. Did you consider this figure sufficiently high to raise a serious question in your mind as to whether or not the surveillance work should continue?

A. No, I did not.

Q. Would you state your reasoning to us, please?

A. Again, the job was issued on a "not to delay" basis and I was more interested, frankly, in trying to get on with the job and stay on schedule and I really, probably, in looking back on hindsight, didn't give it the full consideration I should have at the time; because I will have to admit at the time I did not even know just how bad the rejected joints were. I had talked to Casualty as to just what was the condition, and the general opinion of the Quality Assurance people was that it was in good shape; and, too, from static tests that have been made in the yard, we have found that under test conditions that with brazed areas less than fifteen to twenty percent they were still stronger than the base metal of the material.

Q. Were you familiar with instructions from the Bureau of Ships on the basis of which a team of ultrasonic testing people were assigned to THRESHER?

A. I have read it. Is that the document dated 28 August?

Q. Yes. I show you Exhibit 115 before this court and I read an excerpt from it: " * * * The importance of this matter to the submarine forces is such, however, that we must commence at the earliest possible date to attack the problem in a planned, step-by-step approach * * * . To this end Portsmouth Naval Shipyard is directed to initiate the following actions during THRESHER's PSA.

"a. Employ a minimum of at least one ultrasonic test team throughout the entire assigned PSA to examine, insofar as possible, the maximum number of sil-braze joints."

Turning back, now, to your testimony that you were aware of the total number of joints which had been inspected by the ultrasonic testing team, do you consider that their work output was consonant with the Bureau's directive that the maximum number of sil-braze joints be examined insofar as possible in the post shakedown availability period?

A. We complied. We had one team, and a couple of times two teams, down there, a workload at a time, and they were just getting ultrasonic capability started basically at that time, and we only had a limit of around eight -- no, I didn't have eight teams. But I did put as many as two teams down there. I had one team on a continuous basis. I hope eventually we'll be able to speed up, get more productivity than was obtained at that time, but it is a slow process. And, again, whether we covered all that I think that we should have -- I had hoped at the time, during the two months that we worked, that we would have covered more than 169 joints; but, again, I do know that we had the teams, as much as two teams a good portion of the time, and one team continuously, in compliance with the job order.

Q. Did the teams work for a total period of only two months?

A. Three months. They started early in September -- October and November.

Q. Do you have any facts which you can give us as to the amount of time spent by the second team to which you referred?

A. No, sir, I cannot.

Q. Three months, one hundred and sixty joints --

A. One hundred sixty-nine.

Q. All right, 169. Considering that no unlagging was done, as Production Officer are you satisfied with the rate of accomplishment of your one team assisted sometimes by a second team?

A. I'll have to admit it sounds like a very low number.

Q. Did it seem low to you at the time you were receiving the progress reports?

A. I think I commented at the time, and I believe I was given a logical explanation. I don't recall right now what it was, as to why the progress was so slow as it was.

Q. But these weekly progress reports were taken up at the weekly conferences which you described to us?

A. That is correct.

Q. In the presence of the Shipyard Commander?

A. That is correct.

Q. Who else would have been present during those weekly conferences?
A. The Repair Superintendent and the Planning Officer.

Q. Were the actual figures of the work accomplished and the rejection rates found submitted orally at these conferences to which you refer?
A. They were.

Q. Would you relate your relationship with, and evaluation of, the Shipyard's Quality Assurance Program, with particular reference to the audits performed on work and the various inspections performed?
A. The Quality Assurance Division is one of the Divisions within my department. As such, they work for me. The Quality Division Superintendent, Commander Rule, he's been in that job since around the first of October. Before that time it was headed up by a civilian, Mr. James Rogers. I'll give the history of that Division. It started off, basically, until the last couple of years anyway, as primarily an Inspection Branch and not so much quality assurance. I hope we've made progress in trying to get more quality assurance measures by means of auditing, seeing that we are complying with our directives, instructions, and so forth; and less, basically, as an inspecting group inspecting the final product to see whether it meets specifications or not. However, in all honesty, it's still, to my way of thinking, too much inspection-oriented yet. But we do conduct an audit on our steel construction, done on almost a continuous basis. We take samples of at least ten or fifteen percent, and monthly summaries of those are given to me. We have started, and I am not satisfied with the results we are getting right now, on our pipefitting, pipe welding work. In fact, we have a new instruction going on the street right now setting up a change in the procedure somewhat, and I hope to make it more effective.

The silver brazing, which has been running on an audit position, against strictly from a visual point of view until the ultrasonic teams came into effect, but that was supposedly fifteen to twenty percent of the joints were supposed to be visually inspected and, in fact, upon systems checked out, I would say that almost 100% of the joints were inspected visually to see whether they looked correct or not.

(b) (6) relieved (b) (6) as reporter at this point.

Q. Turning your attention back to early in December of 1962, had you heard any information about a casualty in BARBEL which had occurred more than a year previously and which had been the subject of an investigation?
A. I was aware of it.

Q. Would you now discuss the requirements for special instructions and documents to be furnished the Production Department by the Design Division for the installing of Marotta reducing valves in THRESHER's high-pressure blow system?
A. We were given the plans for it. That's all that--we were given the Job Order and the instructions, as well as the plan.

Q. Did the Job Order instructions and plan include the installation of a strainer in the system?
A. Yes. I think that's part of the basic make-up of the valve itself and is shown on the valve drawing as an integral part of the valve, an appendage to the valve.

Q. What was the impact of the defective and inadequate workmanship, if any, on the completion dates variously extended for the THRESHER's post shakedown availability?
A. Well, as Production Officer, I am not satisfied with the productivity of our people. That has been my constant harp since I've been here in the Shipyard. They seem to work well if they get a clear, concise road to go down, but if there is any room for any confusion, any question in the minds of our people, production comes to a halt. I feel our coordination in the completion of complex work leaves a lot to be desired.

Q. What have you done about it while you have been Production Officer here?
A. Well, I hope--we are working on higher standards, and we have been doing so right along. In the absence of standards, I have preached. Now, recently, I have issued in one ship a mandate of what I consider the maximum man-days work to be expended, and if this is not met, I have notified the master that this would be unsatisfactory. And I expect that the leadingmen and the quartermen will assign a standard rather than tell "Joe Blow" to do this job; he is to tell "Joe Blow" that he is to do this job by Friday afternoon, for instance.

Q. As a specific example, take the pipe shop, Shop 56; were you wholly satisfied with the efficiency and the quality of the output during THRESHER's post shakedown availability?
A. From my personal observation and from the reports that I've gotten, I think the quality of the work was satisfactory. Again--and maybe it's because I am not a pipefitter--I don't think we got all the productivity out of them that we should have.

Q. Were you satisfied with the performance of the supervisory personnel in that shop at every level?
A. Well, again, except that I don't think that they get enough work out of their people and the lack of standards, I have not been able to do anything other than try to wheedle people into doing more.

Q. Speaking now to silver-brazed joints, were you satisfied with the quality of silver-brazed pipe joints produced in the pipe shop during THRESHER's post shakedown availability?
A. Yes, sir, I was.

Q. Did you make any personal audits on the in-process work on those joints during THRESHER's post shakedown availability?
A. Well, I visually looked at quite a few, both in THRESHER and throughout the Shipyard, at the time; and in the last couple of months I have seen the ultrasonic report of some of the work.

Q. Did you personally audit any of the old joints in THRESHER made prior to her post shakedown availability?
A. No, I did not.

Q. What personal attention did you pay to the work of the ultrasonic inspecting teams working in THRESHER during her post shakedown availability on the surveillance of the old silver-brazed joints made during her construction period?
A. None. I don't think I watched their performance at all. My trips through the ship, I don't think I really watched them at all.

Q. What do you think, as Production Officer, of the reliability of those flex hoses which were installed in THRESHER's vital systems?
A. I believe we put in as good a suit of flex hoses in the THRESHER as are made anywhere.

Q. Are they a little sensitive to improper installation?
A. Yes.

Q. How did you insure the qualifications of those people who installed those hoses in THRESHER and how did you audit their performance?
A. Again, we have had a rather extensive training program within the pipe shop since the BARBEL incident actually covering silver brazing, and one of the subjects covered was hose installations. We had a team of qualified--what I considered to be qualified--people to do that job. I have to admit, whether the people they were schooling in this were always used in the actual installation, I do not have an audit report that such was the case. So, I have to rely that the supervisor would do that.

Q. I understand there was a training program for those who fabricated the installations of flexible hoses in the shop and that they were required to possess a card showing they were so qualified. Is that correct?
A. That is my understanding, yes.

Q. Testimony before the court, however, is that that was not true in the case of those who actually installed the flexible hoses in the ship and that the installation could be done by a laborer--by a pipefitter who was not required to possess a card or to have had the benefit of a specific training program. Do you consider this a weakness in the system for installing flexible hoses?
A. I would have to look into it more, but right off-hand, it indicates to me that qualified people should be used throughout.

Q. You have indicated that you did not personally supervise the audits of the silver-brazed joints made in THRESHER. Do you feel that your supervisors adequately performed this function?

A. That and my Ship Superintendent. In response to my question, "Are we getting all that we should out of these people?" I was assured that we were.

EXAMINATION BY THE COURT

Questions by a court member, CAPT HUSHING:

Q. Captain Guerry, is there within the Shipyard a procedure for testing the various systems and components of ships which undergo repair or post shakedown availability?

A. Above and beyond the hydrostatic tests?

Q. No. Is there a program or a procedure of any kind which does require the various tests necessary to insure that systems are properly installed and are working properly?

A. Well, again, I think the Job Order in most cases spells out in detail how a hydrostatic test is to be put on. Such was the case, I know, in one instance which I just checked on recently. The Job Order covered the hydrostatic testing of salt water systems before checking the job ultrasonically. It is spelled out in detail. They are spelled out in test memoranda, or job orders.

Q. Let's talk about ASW systems. Was the ASW system hydrostatically tested before the ultrasonic tests started?

A. It was.

Q. Was there a hydrostatic test of the ASW system after the ultrasonic tests had been performed?

A. It was.

Q. Did these tests give you the necessary assurance to disregard the surveillance inspection information which you were receiving?

A. Put it this way, Bill: That in both cases it satisfactorily passed the test, and the final test of the ASW system was especially tight.

Q. Did the previous operations of the ship, including a number of test dives, give you a feeling of confidence in the ASW system as originally built?

A. Yes, it did. In fact, I think that was a governing factor in my judgment, the fact that the system had operated satisfactorily and had been subjected to as rugged a test as any system in any submarine.

Q. Did the shock test give you confidence in the adequacy of the ASW system construction?

A. Yes, it did.

Q. Did the absence of a deep dive after the shock test in any way diminish that confidence?

A. No, it did not.

Q. Did you assess the importance of that lack of a deep dive in your thinking at that time?

A. I will have to admit, I did not.

Q. Were you aware that the BARBEL casualty occurred many months after the construction of the ship and after a considerable number of operational cycles?
A. Yes, I knew that.

Q. Did you consider this as an element of your thinking process in considering the THRESHER's condition at the end of the surveillance?
A. I can't say that I did.

Q. Do you think it is an important consideration?
A. Yes, I think it is.

Q. Can you summarize again for me the basic elements which led to your concurrence in the decision of early December not to further survey the ASW system of the THRESHER?
A. The two factors that really I recall which governed my concurrence in the decision was the fact that the Job Order was on a "not to delay" basis and that we had to get the trim and drain system and the auxiliary salt water system buttoned up prior to undocking, and we felt we had about two or three weeks' work before we knocked off before we would be ready for that.

Q. Was there any question in your mind whatsoever as to the safety of that ship as a result of that decision?
A. No, there was not; and, again, I felt she had been out and had satisfactorily performed and, as I say, I did not take into account the fact probably the BARBEL had also done this and had later gone sour. But, in addition to our survey, we made material checks, since the BARBEL incident was attributed to the use of wrong faulty material, and in our material checks we found no evidence of faulty material having been used in THRESHER.

Q. What is your current opinion as to the adequacy of the silver-brazed joints being made in Shop 56 in this Shipyard?
A. I am convinced they are as good as are being made anywhere in the country. I think they are adequate.

Q. For a high performance deep-diving submarine?
A. For a high performance deep-diving submarine, yes.

Q. Do you have any question in your mind at this time as to the adequacy of the silver-brazed joints of any ship currently building in this Shipyard?
A. No, I do not.

Q. Specifically, do you have any question about TINOSA?
A. The piping in TINOSA was over half completed before the instructions that followed the BARBEL incident came into being. Our controls were not near as rigid. However, from visual checks of her systems, we still feel that we have a good system. We don't have the joint certification card, but we have conducted visual inspections for alignment and for flow, and we feel we've got a good system.

Q. Have you sample-audited TINOSA since the THRESHER casualty?
A. We have not. We are preparing to do so.

Q. What is that sample or audit to consist of?

A. That is still in a state of--it hasn't been settled yet. Since last fall, all joints made in the ship have been in compliance with Bureau instructions. All field joints have been ultrasonically tested; that is, in the high-pressure system.

Q. Do you feel you have an adequate number of officers to perform the necessary coordinating and supervising functions which are required of the military people in our bilineal organization?

A. No, I do not. Not so much that we haven't gotten the coverage, but we've gotten the coverage almost at the expense of the health of my people.

Q. Would you describe this situation?

A. My Ship Superintendent on the THRESHER, Lieutenant Biederman, since he took over in December, has worked anywhere from 16 to 18 hours a day for six and a half or seven days a week since he took over. And I think that is an abnormal condition to expect from anybody in a sustained period.

Q. Would you say that was rather typical of the situation with your officers?

A. It is.

Q. Do you think this kind of situation can be continued very long?

A. No, I do not, not without a falling off of performance.

Q. Do you think the future quality and perhaps safety of the submarine force in ships and the material condition will be adversely affected by a continuation of this situation?

A. Definitely, if we don't take some steps to correct this condition. I'm not sure that military people are the only ones that can do this job, but we have to organize ourselves and utilize our civilian people to a greater extent; and I think one step in doing this is--which we have not done heretofore--is to set up a quality control coordinator and have somebody with that sole job of coordinating the quality of the work. Right now, I feel the quality work is being done in this Shipyard, but to try to come up with the records to assure yourself of sufficient confidence in quality has been a major task.

Q. Do you think that civilian personnel can replace completely the military personnel in your organization?

A. No, I do not.

Q. Do you have currently available in this Shipyard civilian personnel who can really relieve military personnel of the kind of functions they are currently performing?

A. To a limited degree only.

Q. By "limited" do you mean 5 per cent, 10 per cent, 20 per cent of military functions?

A. Well, we have used a civilian Ship Supt. We have this tank coordination work, or hull coordination work, and we have assigned a quarterman out of the structural shop, who has not the necessary background and breadth to cope with this job, but we have in several cases been successful in getting a limited coverage and good support.

Q. Was this the process used for the later stages of THRESHER?

A. Yes. Mr. Valley served in that capacity.

Q. And despite that, Lieutenant Biederman worked 16 to 18 hours a day?
A. Yes, he did, and we are faced with this as long as we are working two or two and a half shifts, since there are questions that come up that have to be answered; and, in general, the coordination cannot really pass from one to the other unless you have a good overlap of two officers working side by side. That's the reason the senior Ship Supt. worked the hours he did.

Q. Do you have any line officers with 1100 designators in your department?
A. Yes, I do.

Q. Are any of them submarine qualified?
A. Yes, they are.

Q. Have any of them had experience as an engineer or an executive officer or commanding officer of a submarine?
A. The one I am thinking about, I think, was an engineer of a conventional type.

Q. But do you have anyone, say, with nuclear engineering experience or as commanding officer or executive officer of any kind of submarine?
A. Well, I've got a recent EDO in-put from the line.

Q. What is his rank?
A. Lieutenant Commander.

Q. Has he been a help to you in getting the operational flavor into your efforts?
A. Yes, he has. So far, we have used him primarily with the planning of the forthcoming overhaul.

Q. Would additional officers of this kind be of assistance?
A. Extremely so.

Q. Of great assistance?
A. Yes.

Q. Have you made any effort to get these kind of officers?
A. Yes. We've written several letters on this. We have one on the street again directed to this very subject.

Q. Do I take it from the tenor of your answers that you have not had any favorable response to these letters?
A. Very limited response.

Q. Have you had any response?
A. We've gotten some LDO's in here lately.

Q. If I were to ask you what is the most serious problem which you see for the future, disregarding what we've been through, what would your answer be as related to the construction of high performance submarines?
A. I would say adequate management, and this includes down through the working--through the Ship Superintendent level.

Questions by a court member, CAPT OSBORN:

Q. When did you organize your ultrasonic team in the Yard?
A. I believe it was last summer--late spring or summer. We had done a little as experimental work, primarily limited to hull work, but as it was associated with pipe work; it was last year.

Q. Let's say about July of 1962?
A. That's right, give or take a couple of months.

Q. Then, I take it the ultrasonic work done on the THRESHER was the first job in a production sort of way that the ultrasonic team had undertaken?
A. That's correct.

Q. You did not do any of this work on the SKIPJACK?
A. No, we did not.

Q. Now, ultrasonic work in the shop is a very different problem than ultrasonic testing in the ship. How would you evaluate your teams in getting started; do you think they were a little slow?
A. They were slow. We sent a couple of teams out to Mare Island for two weeks, and they came back and acted as instructors for our group, and we would read joints, peel them back to see the results of our program.

Q. Did you do anything with respect to assisting them, like having non-testers prepare the joints the best you could with respect to upping their production?
A. Well, we had one trained man and one untrained man to make up a team. One was moving ahead of the other. I can't speak with first-hand knowledge just how much we progressed.

Q. All I was trying to do was to establish whether you made it possible so far as you could from the Production Officer's point of view to utilize your men to the maximum with the techniques involved.
A. Looking back on it, I probably did not do as much as I could have.

Q. This wasn't the real big issue; the ultrasonic men themselves did not complain about this?
A. No, they did not. Not that I heard anyhow.

Q. Most of this work, to a great extent, involving ultrasonic testing was done prior to the time that Commander Rule took over the Quality Assurance Division. What is your personal evaluation of Mr. Rogers, who was then the head of that section?
A. I think he is a competent man, but to come back to the problem, he was snowed under in trying to bring our radiography up to an acceptable standard. Just about the time I took over here as Production Officer I made a radical change in the radiography set-up. We made several attempts to hire somebody to take over that group but we weren't successful until eight months later. So Mr. Rogers was really limited to one small facet of the whole Quality Assurance Division and did not get an opportunity to do a complete job.

Q. Mr. Rogers, to some extent, is a graduate of the so-called "Preble-Rogers" school at Portsmouth, which had a lot to do with inspections following the SQUALUS casualty. Do you think in attitude he was oriented toward inspection by personal observation rather than use of the technical tools of the trade?
A. I do.

Q. Do you think that this extends down to your working level as well?
A. To a large extent, yes. Put it this way: The Quality Assurance Division is still the "X" inspection group, and as such, although we have brought in quality assurance engineers and set up an organization of engineers, getting in in-put into this group and changing the swing has been a slow process.

Q. Then you would say from the area that we are in in Quality Assurance on one hand, it is a combination of inspection and technical tests, that we are still in Portsmouth closer to the inspection set-up than the pushing of technical science?
A. I have to admit that we are, but I hope we are making headway the other way.

Q. Under those conditions, how would you evaluate Commander Rule's position on taking over this particular division at the time?
A. Well, I hope he went in with an open mind. I have talked with him considerably, and I feel he definitely has been helping to spearhead this change in direction, and has succeeded in easing the workload. The workload has been rather heavy.

Q. Do you think that the performance and output improved a lot since Commander Rule has taken over the division?
A. Definitely.

Q. Has he acquainted you very well with his problems?
A. Yes, he has.

Q. Of course, I imagine the problem he is looking at is one of hindrance with respect to getting the work done; is this true?

A. It has its effects that way, yes, but at the same time, in the long run, I think that if we can get this organization running so that we are not delayed too long, we will make money.

Q. Really the primary job of quality assurance division in the first place is to know full well when they are going to test something it is going to be successful; isn't this correct?
A. That is correct.

Q. We have had a lot of testimony to date with respect to foreign particles, dirt, in the air systems. What measures as the Production Officer have you taken to clean up the in-put of air to the systems?
A. We are proceeding now to build a clean room for the overhaul of all our pneumatic equipment. I have issued instructions that we will still practically follow nuclear power controls on air systems.

Q. This includes both air and hydraulic?
A. That's correct.

Q. What are you doing with respect to the supply of air - that is, when you charge the banks - to insure that that air is of the quality that should be put into the ship?
A. Well, again, all we can do in that case is supply it through the specified filters.

Q. Do you have those filters installed now?
A. Yes, we do. These are the micro-filters. The systems filters, yes.

Q. What measure of your time was taken up in entering delays in the ship construction with respect to, say, the last three months of THRESHER's overhaul?
A. Five per cent.

Q. I know that your Repair Superintendent had to make at least two trips out of the yard to the Bureau of Ships and once to CINCLANTFLEET. Did this hurt you very much?
A. Yes. It is always a handicap to lose your Repair Superintendent. It is a time-consuming as well as an embarrassing situation.

Q. What did you think of Lieutenant Commander Lyman as an officer?
A. I was very much impressed with him. He was very quiet but firm in what he wanted. He was not -- Just leave it that way: he was quiet but dedicated and firm in what he wanted.

(b) (6) relieved (b) (6) at this point as reporter.

Q. Was he efficient and uncompromising in the standards required of the Yard?
A. I'd say so, yes. He had the facts, generally, when he came up with something that this was what, and he pointed these out if there was any argument -- in fact I think he won every argument he came to talk about.

Q. Did you have any personal relationships in the latter phases of the overhaul with respect to Captain Harvey?
A. A few, yes. I talked to him quite frequently.

Q. Did you consider him of the same school.
A. Definitely. If anything, even more so. In fact, he has basically changed our philosophy around here - when we go on fast cruise we are to be complete. That had not been the policy before - - if we felt some painting could be done, some odds and ends; but Harvey's idea was he wanted a complete ship, and I can't help but agree he is partly right.

Q. On the fast cruise itself, I was a little concerned at the lack of information coming out in capsule form with respect to the large number of deficiencies being discovered on the ship. What did you think of it?
A. What do you mean?

Q. I mean I think it has been testified in the court we had 438 deficiencies on the fast cruise.
A. Yes.

Q. And the fast cruise was more or less - the first fast cruise - was more or less terminated because of the large number of deficiencies. Did you have any inkling this was happening before the cruise was over?
A. No, I did not. In fact it is hearsay evidence, but I don't think quite a few of his officers realized that Captain Harvey, the skipper, was about to make this decision. So we had no inkling at all until he decided to quit, that he was thinking this.

Q. I want to cover one more item involving the reserve feed tank casualty which happened on 8 March. Did it enter your mind that there might have been some physical derangement that weakened the piping in that area?
A. No, it did not. I went down the next morning after it happened, came to the tank and then looked definitely at the top, and the reason it did not give me any concern -- and maybe I didn't look as closely as I should -- but the still itself, the distilling unit, although it had shifted and moved definitely out of position, it was still not up hard against the snubber stops on the shock mountings. So I felt this definitely stayed within the limits of what the piping systems were keyed to take.

Q. Did you personally look at the salt water in-put and out-put lines of the still?
A. No, I did not.

Q. To satisfy yourself on the problems, did you and Captain Heronemus ask for some technical assistance in this area?
A. Yes, we did. We asked Design to come down but I think -- well, put it that way, I asked to get Design down and give some suggestions as to what do we do, and I think structural people only were called. But I cannot verify this.

Q. The considered judgment in terms of the ship, the Production people and Design people, was that there was no derangement to the piping?
A. That is correct.

Q. You were adequately assured that this was the technical decision also?
A. Put it this way. I was told that we had Design concurrence on our repair procedure.

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Questions by a court member, RADM Daspit:

Q. Captain Guerry, the pipe joint failure on the BARBEL occurred at the end of November 1960. It was also almost immediately apparent that this was due, not only to poor workmanship, but to the wrong material being used, and one of the immediate outcomings in Portsmouth was the installation of a material control system. Now the THRESHER was pretty far along in construction at that time. Can you tell us whether the joints and the piping on the THRESHER were visually inspected, and inspected to make sure that the right material was used after the BARBEL incident?

A. They were visually inspected. It would be strictly hearsay, and I have not checked the record, to see whether a material check was made throughout too. It is my impression right now that it was not, but I cannot say positively that is the case.

Q. Then this information was not used by you in evaluating the decision to stop the inspection of piping systems in November, 1962?

A. No, sir, it was not a factor.

Q. I understand that the thing apart in this decision was the need to button up the systems and go ahead so that you could complete the ship at the time that it was then scheduled to be completed. But isn't it true that visual and UT inspections would not necessarily delay the buttoning up of the system; it would, only had you found bad joints?

A. Bad joints, that is correct sir.

Q. One other thing. You testified that the final test on the ASW system was exceptionally tight.

A. Yes, sir.

Q. On what do you base that information?

A. By no drop on the hydrostatic test, with no drops reported, sir.

Q. We have had a great deal of difficulty in finding out that the test was ever completed and when it was completed. Could you tell us when it was completed?

A. Again your evidence might be better than mine as far as what is done, but I was assured it was tested right around the second week in March.

Q. Well, we think that it was tested on the 8th of March, but we had a lot of trouble, and we only found one man and he had no details as to how tight the test was or anything else. This is what impressed me that somebody apparently told you it was a tight system.

A. Yes, sir. The Repair Superintendent had told me that.

Q. Who?

A. The Repair Superintendent -- Captain Heronemus.

PRESIDENT: Captain Guerry, your forthright answers to the many questions that have been put to you by this court are appreciated.

WITNESS: Thank you, sir.

PRESIDENT: It is further appreciated that you have been the Production Officer at the Naval Shipyard at Portsmouth during a period of considerable change; that you

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as Production Officer have faced many problems, and that apparently you have not had the tools with which to do your job to the standards which you have set for yourself as a naval officer. It is hoped that one of the by-products of this court of inquiry will be a better appreciation of problems such as yours, so that remedial action can be taken to increase your capability and the capabilities of others in positions such as yours to do your job as you would like to do it.

Question by court president:

Q. Regarding the conical strainers for the Marotta valves, they are furnished by the Marotta Valve Company, I understand.
A. That is my understanding too, sir. The plan would so indicate.

Q. It is also our information that Captain Harvey required inspection to be made late in the PSA to insure that conical strainers were in fact in place in the Marotta valves. Do you know about this?
A. I was told that was definitely the case, by the pipefitters themselves, that this was one of the things that he definitely insisted, that they were in place.

Q. Now, is there any possibility that as a result of this demand late in the availability period that conical strainers other than those available from the manufacturer might have been installed, in your opinion?
A. I don't think so, but it is a possibility. But the very fact that it has to be tailor-made for this application would lead me to believe if we had to make a replacement, we would have probably got one through the spare parts chain.

Q. Will you undertake to look into that for this court?
A. I will, sir.

Q. And if you find any evidence that substitute strainers were employed other than those provided by the manufacturer, will you advise the court?
A. I certainly will, sir.

Q. Captain, you have said that at the time you took the decision, or rather you participated or concurred in the decision not to unlag and go further with the ultrasonic testing program on the THRESHER, that you at that time did not have concern for the safety of the THRESHER as a result of such a decision.
A. That is right, sir.

Q. In retrospect, do you feel that you should have had concern at that time?
A. Well, I wished we'd have done more, yes, sir.

Q. Now, you have testified --
A. Again let me say though that in looking in the bond situation we found that in no cases were those bonds below 26 per cent and most were in the 30 to 40 category. So it lends evidence that although we did reject a few of the joints -- and this was all hindsight, I did not know it at the time -- they were not as bad as it could have been.

Q. Were not below that level of bonding which had been found to be stronger than the piping on which the joints were made?
A. That is correct, sir.

Q. Is it not highly probable that this knowledge of the strength of lower than Bureau of Ships standard joints, entered into the consideration of whoever participated in that decision?
A. It could have, sir.

Q. Now, you have testified that Lieutenant Biederman took over the job of Ship Superintendent in THRESHER in December 1962?
A. That is correct, sir.

Q. The Commanding Officer of THRESHER and the Executive Officer of THRESHER also relieved on their jobs about the same time, did they not?
A. Two weeks later, I think.

Q. Two weeks later. So that the men most responsible for the quality of work and the completeness of work and the safety of work in THRESHER both on the Yard side and on the ship side, came new to the job, roughly three months before this PSA was due to be completed?
A. That is correct, sir.

Q. You also testified that Lieutenant Biederman found it necessary to work approximately 14 to 18 hours a day. How many days a week did he work, Captain?
A. I'd say six days and he came in frequently on Sundays but we did normally work a small shift on Sunday except for a couple of weekends.

Q. It would not, therefore, be far from wrong if one deduced that you have one shift of ship superintendents, to cope with and supervise the work of three shifts of Navy Yard workers?
A. That, basically, is a true statement, sir. I did, in the last two months of the availability, get a new officer and put him on the night shift.

Q. The court notes with pleasure the fact that a clean room is being constructed for the air systems' work because testimony before the court has indicated that there is a definite need for that.
A. Yes, sir.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. You have testified your not having extensive construction and engineering experience in submarine work prior to coming to the job as Production Officer, has acted as a handicap. Would it be your recommendation that in future assignments of production officers to a shipyard engaged so heavily in submarine work, a strong effort should be made to choose an officer with prior experience in submarine construction and repair?
A. I would so recommend.

Q. You testified that the reports of the progress of the ultrasonic surveillance of THRESHER's old silver-brazed joints, that such reports, were orally given at the weekly conferences with the Shipyard Commander. Was the decision not to unlag the joints for ultrasonic testing also reported orally at this weekly conference with the Shipyard Commander?
A. I am sure he was aware of it.

Q. I will request you to obtain specific detailed information as to the employment of a second ultrasonic team during THRESHER's post shakedown availability and it may be necessary to recall you to give that information.
A. All right.

RE-EXAMINATION BY THE COURT

Questions by a court member, Captain Hushing:

Q. Now, Captain Guerry, in addition to your other duties, are you currently serving as more or less executive director of the Portsmouth welding project?
A. Yes, I am.

Q. Will you describe, briefly, what this project consists of?
A. Yes. About a year ago, in July of last year, as a result of a re-audit of our radiography procedures in all yards and a good hard look, we found that our welding of our pipe left a lot to be desired, so much so that our repair rejection rate was very high, and it was affecting production schedules. We took this story to the Bureau. They set up a project team with Portsmouth as the chairman of the project team to see what we could do about coming up with changes and recommended changes in our training procedure, our inspection procedure, the standards themselves, with engineering backing for any change that was made; and it was to be a combined effort of all yards involved in the building of submarines. That includes the four civilian yards -- five civilian yards -- and two shipyards. So we now have a joint project underway in this area with tesks assigned to each of the groups to follow through and make recommendations and Portsmouth is acting as the coordinating agency for this group.

Q. Would you say that this is a large technical undertaking or a small one?
A. It is a rather large technical undertaking.

Q. On another subject, have you as Production Officer approved the disciplinary discharge of any workers in your department since you have been Production Officer?
A. Yes, I have. It's been fairly limited but I think since I have been here, a case of about four.

Q. Have you had any difficulties in making these discharges stick?
A. Very much so. However, we have, and I think the only reason we got them through is they were in the conditional period rather than--they had not gotten their permanent appointments or permanent status.

Q. Do I infer from your answer to this question that it is difficult for you to make disciplinary dismissals of permanent status employees as such--difficult if not impossible?
A. It is difficult. It is not impossible, but it is a time-consuming process.

Q. Do you think this difficulty inhibits you and your subordinate supervisors in the maintenance of proper discipline among the productive workers of the Shipyard?
A. Yes, I do.

Q. Do you think that this in some way could be attributed to the lack of productivity on the part of some of the workers?
A. I do.

Q. Do you think that if management had stronger disciplinary procedures, including dismissal, that the productivity situation could be improved?
A. I do.

Q. Do you spend much of your time in various kinds of grievance hearings and appeals from various disciplinary actions?
A. About one per cent, one to two per cent.

Q. Do you now, in addition to dealing with employees through the NCPI have to deal with separate units?
A. Not yet.

Q. Is this on the horizon?
A. Yes, sir, it is.

Q. Will this further complicate your dealings with your productive personnel?
A. I hope not, but I am afraid it might. Let me back up. We have recently--I've had several affairs dealing with--rather than personal grievances--union grievances, so I have already got involved in this.

Q. How many civilian personnel are in the Production Department?
A. We are down now to around 6200--6240, I think.

Q. Six thousand two hundred and forty?
A. Yes.

Q. These personnel are all under your supervision?
A. That is correct.

Q. How many military personnel are there?
A. I have right around twenty-eight I think, but I'd want to verify those figures.

Q. How many ships do you have under construction at the present time?
A. I have five ships under construction.

Q. Are any two of them alike?
A. Two are very similar, the two Polaris boats--636 and 620 are the nearest things we have to build of two alike.

Q. Would you say that they could be called sister ships?
A. They are classed as sister ships. The only change in that is the growth or the change factor from 616 to 636. They are different year programs.

Q. How many ships do you have under repair at the present time?
A. Well I have one under conversion, the ALBACORE--extensive conversion; and we only have the one conventional boat under repair.

Q. Would these then be additional types of ships to the ones under construction?
A. Yes, they are.

Q. So that, essentially, your ship work load is made up of different kinds of submarines of varying degrees of complexity and varying degrees of age?
A. That is correct.

Q. Would you say then that the technical spectrum which you must cover as Production Officer is extensive?
A. Definitely.

Q. Do you feel that you have adequate engineering and administrative personnel available to you to handle this complex job?
A. No, I feel that eventually in the Shipyard organization that we've got to strengthen the engineering technical knowledge and technical know-how in the Production Department.

Q. Do you feel the need for such engineering and technical personnel within the confines of the individual shops?
A. We basically are doing that now in Shop 56 on a contract basis and to answer the question definitely, I feel it is highly desirable and I don't believe our Shipyard will be competitive until we get such capabilities.

Q. Tell me about what you are doing in Shop 56?
A. Well, through Design, we have a contract with one of the engineering firms here and their job, primarily, is to study plans, simplify joint elimination, come up with easier process procedures, clean up. They have assisted us in our silver brazing project, our induction brazing--day by day chores of that nature--trying to improve our extrusion process. Their primary job is to come up with a joint elimination program.

Q. If your work load could be changed from the broad spectrum that we have discussed, to one of either new construction or repair, would your problems be simplified?

A. Yes, I think it would. It would also mean rather a radical change in the work force, but I think carrying on a dual function does add to the administrative and technical load, yes.

Q. Do you think that such a division might, in the long run, be better for the Navy than the current distribution of work load at the Portsmouth Shipyard?

A. Well, that's a hard one to answer in that I don't know whether we want to get the Shipyard out of the new construction business or not. However, I am in agreement that I think the primary reason for a shipyard and its reason for being, is to be of service, and readily available service, to overhaul and repair the fleet.

Q. I am attempting to focus this attention on the application of the limited resources to a number of difficult problems, and recognizing that there are few management-type personnel available to you and to the Shipyard Commander, I am trying to elicit your opinion as to whether the overall good of the Navy would be better served by having Portsmouth concentrate entirely on new construction or entirely on repair, including repair and overhaul of nuclear submarines?

A. I will have to agree, or make the statement, that I think we could be a more efficient organization if we were limited to one field.

Questions by a court member, Captain Osborn:

Q. I'd like you to discuss just a minute, Captain Guerry, the difficulties involved from a standpoint of construction and repair, new construction and repair, and which job you think will be more difficult in the future, that of repair or that of new construction?

A. Well, I think that once you get a repetitive work load in the repair business or in new construction, I think that either one would be simplified but as pointed out in the answers given to Captain Hushing, that when you get no two ships alike coming in, in a period, it's a new technical problem in every case. Now if our overhaul load turns out to be this type--not a repetitive type--then I could foresee, with shorter working time and all, that could become even a greater problem than in new construction; but if we could get a repetitive work load as the Polaris boats go on the line and get nothing but Polaris boats coming, then I think that, in the long run, work could be brought down to more of a routine nature and as such could be easier than new construction.

Q. Well let us look at one sixty-four dollar question right now. How do you think the job would be to compare repair or update say a 598 class to an A-3 missile capability, compared to building say the JOHN ADAMS: How do you rate those two jobs?

A. Well, the building of the JOHN ADAMS is a much larger job in time but at the same time we have been normally given much more time in which to perform. So again I think you have got to look at how fast you are trying to come up with the solution to this to accomplish the work, and with the target figures which I have seen, kicking the $64 question around, the time which the planners are talking about for this job, I think it is going to be a tremendous undertaking.

Q. Well really, the thing I was trying to get you to point out, I think this is really the problem in a new construction job; you can plan your work ahead and more or less have a good idea of what you have to do. On the repair of ships on the other hand you have to wait and see. This in itself leads to an almost inevitability of current planning being up with production. Is this correct?

A. That is correct, and that is one of the reasons I point out once you get these things in a routine nature where you are going to anticipate what you run into on these ships and not have each one present a new set of problems, then I think your planning can more or less anticipate what you are going to run into and do a better job than we have done so far on the nuclear boats where each overhaul has presented unforeseen problems where the planning has been inadequate.

Q. Has the hangover effect from NAUTILUS, SKIPJACK and THRESHER reared itself, in repairing nuclear submarines, a lot worse than say construction of new ships of that type?

A. Well, again, Captain Osborn, it is a time factor involved. We want faster decisions and, frankly, that is the case right now. You need faster decisions on a repair and conversion job than you do on new construction. So I think you have to come up with technical decisions faster, generally.

Neither counsel for the court, the court, nor counsel for RADM Palmer, a party, desired further to examine this witness.

The president informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to add.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

The court then recessed at 1020 hours, Saturday, 11 May 1963.

The court opened at 1130 hours, 11 May 1963.

All persons connected with the inquiry who were present when the court recessed are again present with the exception of (b) (6), who was relieved by (b) (6) as reporter.

RADM Charles J. Palmer, U. S. Navy, a party to the inquiry and a former witness was recalled as a witness for the court, was informed that his prior oath was still binding, of his rights as a party, and was examined as follows:

COUNSEL FOR THE COURT: This is a closed session of the court, Admiral Palmer, and classified information can be divulged here.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. Will you briefly describe the principal items of work, other than work on THRESHER, in which the Shipyard was engaged during the post shakedown availability period for THRESHER?

A. Our major projects were, first of all, construction of two SSB(N)'s, two other SS(N)'s, an experimental submarine and also, during the first two month's of THRESHER's PSA, there was an overlap with the SKIPJACK's overhaul.

Q. What proportion of the total work effort of the Shipyard would you say was required by THRESHER during the post shakedown availability?

A. At the peak I would say something anywhere between ten and twelve per cent of our productive personnel were engaged.

Q. What do you consider was the impact of the frequent changes in the scope and time of THRESHER's post shakedown availability on the production shops in terms of the orderly and timely completion of their work and the quality of their work?

A. It put them at a disadvantage for reasons of being unable to plan their work; the fact that plans were necessarily later than we would have liked to have had them, and in many cases we had material deficiencies, and by deficiencies I mean late delivery of material.

Q. Do you think it affected the quality of the work performed?

A. I don't think it affected the quality of the work; it certainly affected the cost and the length of time required.

Q. To what extent did you personally participate in the supervision of work performed on THRESHER?

A. I touched briefly on this in my previous testimony. First of all, I met with my Production Officer and Planning Officer each weekday, Mondays through Fridays, to discuss progress on all of the ships in the Yard, under construction or otherwise. Once a week, of course, I had a meeting with the commanding officers of the ships and got their viewpoints. Once a week I had a written report, which was a copy of a report from the Ship Superintendent to the Production Officer, giving his estimate of the situation as to status of materials, plans and projects, and finally, I attempted to visit the ships personally once a week; usually I didn't make it more than once every other week, because of interference of other items.

Q. BARBEL's major salt water casualty occurred on 30 November 1960; were you aware of this casualty?

A. I was aware of it, of course, after it happened. I did not come on board until the following February.

Q. Did you learn the details of the failure of the silver brazed joint that caused that casualty?

A. Yes, I did.

Q. As a result of the BARBEL casualty and the findings of the Board of Investigation, which investigated it, did you consider that the performance of any Shipyard shop involved with BARBEL was sub-standard?

A. Well, limiting it to the mechanics that were on the job, it was certainly sub-standard; it was completely unsatisfactory.

Q. What specific management changes, quality assurance changes and personnel changes did you institute following the BARBEL casualty?

A. The action towards improving the general overall performance of the Pipe Shop was gotten underway by my predecessor before I arrived. It involved a number of things, starting from real basics, such as, for example, identifying types of skills required in the shop. By types of skills I mean ability to do sil-brazing, ability to bend pipe, ability to make certain types of fittings, and so on. Having identified these skills, an inventory was made as to the people who had these skills, and in the areas where there were deficiencies, a training program was undertaken to bring them up, or to get enough people who had the necessary skills. In the most critical areas, of course, such as sil-brazing, the people who were qualified were required to have a card with them, so stating. Going on from there, and incidentally, this training program has continued substantially, I think I mentioned a figure of something like four hundred thousand dollars that we put in training in that shop in the past two years. Many other things have been done in that particular shop.

One of the most important, both as far as quality and as far as cost is concerned, was to do as much pre-fabrication of the ship as possible. This permitted better access to the work and hence, a better quality. We set up a system of better certification of materials in the shop. In fact I had a material center established in the shop under the custody and under the direction of the Supply Officer, so that only authorized people could draw materials. In other words, people couldn't just walk in and take any basic material they desired. Of course, the most important thing was the matter of developing procedures to insure quality.

This was an evolutionary process; it was culminated by a Production Department Instruction, which I think may possibly have been introduced in this court; it was along about August of 1961. It covered such matters as material identification and follow-ups to insure that on the material identification, on the makeup of joints, inspections on it, not only by supervisors but by inspectors, the assurance that people that were doing silver brazing were qualified, spot checks on this; this type of thing. As time went on, first of all, the use of radiography was brought into play, and finally, just about a year ago, the ultrasonic methods were instituted.

Q. Would you say then that a major effort was expended to improve the quality of the silver brazed joints which were being made by the personnel of Shop 56?

A. I certainly do, and that was the intent.

Q. Admiral, may I show you certain letters now, to refresh your recollection perhaps? First, a letter dated 29 May 1963, Exhibit 157 before this court, from the Chief of the Bureau of Ships to the Commander, Portsmouth Naval Shipyard, referring to the inspection of silver brazed joints in THRESHER, which was projected for the future. Do you recall this one, sir?

A. I don't recall it at the moment; I recall the sense of it.

Q. Now reference (a) of that letter was Portsmouth Naval Shipyard letter dated 9 May 1963, which said in effect that no further ultrasonic testing of THRESHER's old silver brazed joints would be considered necessary during her post shakedown availability, and requesting Bureau concurrence.

A. The first time I saw that letter was this morning.

Q. Now Exhibit 157, which you said you did see, also included as reference (b), the Bureau of Ship's letter, Exhibit 158 before this court, dated 13 February, which also mentioned projected times for the ultrasonic testing of THRESHER's joints.

BY THE PRESIDENT: Which letter was that the Admiral hadn't seen until this morning?

COUNSEL FOR THE COURT: The letter of 9 May signed by Captain Heller. The exhibit number of the 9 May letter is 156 before this court.

Q. With that as background, Admiral Palmer, I show you Exhibit 115 before this court, a letter from the Chief of the Bureau of Ships, to Commander, Portsmouth Naval Shipyard, dated 28 August 1962; subject "U.S.S. THRESHER silver brazed piping," which directed that ultrasonic testing of silver brazed piping in THRESHER be conducted to the maximum possible extent throughout her post shakedown period of availability with a minimum of at least one ultrasonic test team. Did you keep yourself informed of the progress made under the directive contained in Exhibit 115?

A. Exhibit 115 now is the 28 August letter?

Q. Yes, sir, with reference to the ultrasonic surveillance of the silver brazed joints in THRESHER made prior to her PSA.

A. This particular letter did not come directly to me. This is understandable, of course; there are several hundred pieces of correspondence which come into the Shipyard every day, and some discretion has to be used. I assume that when it was not routed to me it was because of the fact that it mentioned work to be done on an optical basis and so on. However, in such case the department who gets it for action calls it to my attention, and this was done by my Planning Officer. He gave me the gist of the letter. With regard to following up on the work called for in this letter, in the first place I would like to say that I had complete confidence in the integrity of the salt water systems on the THRESHER. I felt that these had proven themselves in service and had been tested more drastically and more extensively than any other salt water systems that we had installed. Hence, there was no question of integrity in my mind, and it appeared that this was a matter which could be handled adequately by my heads of departments, and hence I don't believe I specifically followed up on this letter in any particular instance; I don't recall any.

Q. Do you recall whether oral reports were made at the conferences with your department heads as to the progress of the work performed by the ultrasonic team surveilling the old joints?
A. There could have been, but I don't recall.

Q. Were you informed of the decision made early in December, 1962, with reference to this surveillance of the old silver brazed joints in THRESHER, the decision embodied in Exhibit (117) before this court,which I show you now which was not to unlag any joints in the system for the purpose of conducting UT surveillance?
A. I do not recall having been so advised.

Q. Bearing in mind all of the correspondence on this point, which I have showed you, and taking into consideration your own estimate of the integrity of THRESHER's sea water system, would you have concurred or disagreed with this decision had it been brought to your attention?
A. Well, given the benefit of hindsight, no.

Q. But at the time?
A. At the time, I believe if it had been brought to me at the time, I would have called for the original directive and studied it a little more carefully.

Q. It has been brought to the attention of this court that the total results of the efforts expended in the surveillance made pursuant to the Bureau of Ships letter of 28 August 1962, our Exhibit (115), during the entire period of THRESHER's post shakedown availability, amounted to some one hundred and sixty odd joints, silver brazed joints. What do you think of the adequacy of the Shipyard's response to the directive contained in Exhibit (115) that the maximum number of silver brazed joints be surveyed by a minimum of one ultrasonic inspection team during the entire course of the post shakedown availability?
A. I think it was inadequate.

Q. What would you consider to be a reasonable number of joints to have been the product of the work of the Shipyard pursuant to that directive?
A. I wouldn't want to venture a guess. I would want to review the number of joints and what had been previously tested, before I made a guess at that.

Q. Turning now to an overview of the entire Quality Assurance Program in the Shipyard, as it was practiced during THRESHER's post shakedown availability; in your opinion did the Shipyard management meet the requirements and intent of the Bureau of Ships directive in the area of quality assurance for submarine construction and repair?
A. To the best of my knowledge, and certainly to my intent.

Q. Is it your view that the Bureau of Ships directives in this field are adequate if followed?
A. This covers quite a bit of territory. Now if you want to limit this to one particular area for sil-braze, or what? Limiting it to sil-braze, this has been a developing matter and there have been developments in this as new means of non-destructive testing have been developed, their directives have been changed, they have been changed within the last three days, and I don't believe that I can say that they are adequate now. We have to review what the impact of these proposed changes are, and what they mean.

Q. My question was intended to be general. Would you say that this was a new and ever growing field, the field of quality assurance of work performed on high performance submarines?

A. As far as the newer types of submarines are concerned, yes.

Q. Do you consider that there were shortcomings or weak spots in the Quality Assurance Program at this Shipyard, as applicable to THRESHER's post shakedown availability?

A. If there were, I'm not aware of them.

Q. We have heard testimony that estimates of cost and time to accomplish THRESHER's PSA package were under-estimated and had to be revised, at a rate something other than that normally experienced in such matters. Did you consider that this pointed up any weaknesses in your organization or in the personnel whom you have assigned in the organization in this field?

A. First of all, I would like to say that a good ninety percent of the work done on THRESHER during PSA had never been done before, by us or by anybody. Hence, I wouldn't expect the estimates to be as good as they normally would be on a competitive type job. I do believe that in our SS(N) and SSB(N) type of submarines, all of us, the Shipyard and I think in the Fleet, have got to realize that we've got an altogether different kind of machine here; it's a much more complicated machine. The inter-relations between systems and what have you is much greater when you tear into a job in one of these boats where you are effecting several other systems. This is something that is a process of education, and what we are going to do on the NAUTILUS, and I had a dry run on it on the BANG, realizing the whole type of submarine, is that I've required every planner who is planning a job after the ship gets in, to go down aboard ship and review this job, particularly from the point of interferences; I have required the Production Department to do the same thing, from the point of view of, particularly in view of their scheduling, of the adequacy of the job orders. I feel that this will improve the quality of the estimating, and this will be followed on NAUTILUS.

Q. Would you ascribe any of this to the shortcomings of personnel who work for you in this field?

A. No, I would not.

Q. You would differ then with a previous witness, Captain Heronemus, who took personal blame for this?

A. I don't see why he should take personal blame for this matter.

Q. On the occasion of your last appearance as a witness, the President of the Court asked that you furnish information on the submarine background of your various officers. Are you prepared to do so at this time?

A. Yes. I prepared a summary and if the court so desires I have the detailed experiences of each of the officers. First, I have considered only the production and planning officers because they are the ones who are making the decisions vitally affecting the ships. As of the first of April, we had forty-five officers on board. Of these, twenty-nine, or sixty-four percent, were qualified in submarines, either as officer or enlisted. Another nine have had considerable previous experience in submarine activities; hence, are considered to be well acquainted with submarines; they have had very specialized experience applicable to submarines, such as some of our nuclear power people. This gives us about eighty-four percent of our people, our officers, who I think are knowledgeable of submarines. Of the remaining seven, five were young officers here

on their first tour of shipyard duty, under indoctrination as nuclear ship superintendents, and the remaining two were young reserve officers. As far as the application of these people to the THRESHER overhaul of the three who were most directly connected with the overhaul the Assistant Design Superintendent, Assistant P&E Superintendent and the Assistant Shipbuilding Superintendent, two were qualified to command submarines and the one is qualified in submarines.

Q. Do you have that compilation available?
A. I have a summary and also a complete --

PRESIDENT: Counsel, I think that answer is well enough without anything further.

Q. Speaking again to the complexities of a modern submarine, do you believe that the talent and skill of the officer personnel and the civilian personnel of this Shipyard were adequate for the task of producing detailed design plans for modifications made during THRESHER's post shakedown availability?
A. I certainly do.

Q. Were they also adequate for the task of producing the necessary job orders and work instructions to permit the proper and orderly conduct of the work during THRESHER's post shakedown availability?
A. With the limitations that we have already discussed, of lack of familiarity with new jobs, remembering a lot of them came out late, not permitting as careful a scrutiny aboard ship, the answer is I think they were fully qualified.

Q. Do you consider they were also adequate and qualified for the task of using the detailed design plans and working instructions to accomplish the work and deliver a safe and reliable product?
A. I do.

Q. Your previous review of your professional experience when you testified the last time, indicated, I believe, that you were at one time the Production Officer at this Shipyard; is that correct?
A. Repair and Shipbuilding Superintendent.

Q. Did you have submarine construction experience prior to having that job?
A. Not construction; I had conversion experience and some small design experience.

Q. Do you consider that some submarine experience is necessary for a man properly to fill the job of Production Officer in this Shipyard?
A. This is desirable; I don't think that it is absolutely necessary. It all depends on what other background he has. There are, particularly with the nuclear power submarines, with the steam plants -- this is a new animal in submarines, and someone who is a good Marine Engineer certainly has something to contribute.

Q. Would you say that the lack of a submarine background would be a handicap to a Production Officer in a yard engaged in the sort of work that this yard is?
A. I don't think so, if he is properly supported by other officers who do have the background, and as I have indicated in my summary, about eighty-four percent of our officers have had such experience.

Unclassified

Q. We have heard testimony that the authority and disciplinary control of shop supervisors has been diluted to the extent that obtaining your good quality product with minimum expenditure of man-days, is affected thereby. Would you give us your opinion of the civilian supervisory authority controls in this Shipyard, based on your own personal observation?

A. The civilian supervisor has all of the authority he needs. It's a question whether he wants to exercise it or not. This goes into a matter of comparison. For example, in a private enterprise and an enterprise staffed with Civil Service personnel, private enterprise has many of the same problems that we have, particularly with regard to control of non-supervisory personnel and their contracts with labor unions. Our significant part of it is, by and large the supervisors in private yards are not covered by these labor contracts. They may have annual or longer contracts, but for the most part their tenure of office is based upon performance. In an enterprise staffed by Civil Service personnel, the labor contract, if this is what you wish to call the Navy Civilian Personnel Instructions, applies to the supervisors as well as to the non-supervisory personnel. This is a real essential point, because of the many safeguards which are within our Navy Civilian Personnel Instructions, it makes the supervisor less dependent upon his next in line for his security, and what have you. Human beings being what they are, this, to a segment of the supervisors, makes them a little less eager, I think, so the real problem, and it's a real challenge, is to get the supervisor to do what he is supposed to do. He has got the authority if he will exercise it. He has got a stack of regulations like this that circumscribes him, and it takes time to do certain things, but the authority is there.

Q. What has been the effect with reference to the job you are trying to do at this Shipyard?

A. The problem is a leadership problem, and of course is the main objective of our leadership program, the same as it is in the military organization. However, the climate in the military organization makes a leadership program a little bit easier, but the problem is to get the supervisor to do what he should do. Some of them do and some of them don't.

Q. Not the problem, Admiral, the effect. How does it work out in practice here on the job that you are trying to do?

A. I would say that the effect is, that probably our utilization of personnel is not as efficient as it should be.

EXAMINATION BY THE COURT

Questions by a member, RADM Daspit:

Q. Admiral Palmer, I understood you to say that you had confidence in the silver brazed joints in the THRESHER, and that you thought they had been more adequately tested than any other ship. Is this confidence based mainly on the fact that she had been operating and had gone down to deep depths many times, and had undergone the shock testing, or was it due to more testing that was done on her after the BARBEL incident?

A. I would say that it is a combination of both, Admiral, but it is primarily due to her satisfactory performance in service that I say this.

Unclassified

Q. Do you know what special testing was done on her after the BARBEL incident?
A. The special testing which was done on the THRESHER after her first successful sea trials was not a result of the BARBEL incident; it was a result, primarily, of the water hammer effect that she experienced in the trim system and the realization that we would get some dynamic effects, and this was the reason why we cycled her salt water systems as well as went around banging while we were doing it.

Q. Was this done only in the trim and drain systems or did it extend into the auxiliary salt water systems?
A. It extended to the auxiliary sea water systems.

Q. Did it extend even to the point of removing lagging from the joints to visually inspect the joints?
A. My recollection is that we removed it from some of them, so that we could have something to hammer on. Yes, so that we could observe whether there was leakage. We did not remove all of the lagging, but my recollection is that some was removed, Admiral.

Questions by the President:

Q. Admiral Palmer, the decision that was taken at this Shipyard regarding the discontinuance of further ultrasonic testing of sil-brazed joints was a fairly important decision; was it not?
A. I would say it was important, Admiral. However, placed in the context of the letter directing this from the Bureau, the sense of the things was to develop data on which to base an inspection program. As I read the letter, the background was not to prove out, necessarily, the integrities of the systems, but to assist in the development of a future inspection program for other ships. However, that is very important.

Q. That's why I'm saying it, it's important. The art of sil-braze testing by ultrasonic means was not available in this Yard until slightly before, a matter of months before THRESHER began her PSA, sometime around July of 1962, and the THRESHER came in, I believe, in August; is that correct?
A. I thought it was the 25th of July that she started her PSA.

Q. Well, it was the same month, approximately. Therefore, all silver brazed joints in THRESHER were without the assurance which is given by ultrasonic testing at the time she entered the PSA?
A. No, sir, I believe that quite a few were tested at EB during the period when she was being prepared for shock trials.

Q. That is correct. This was a limited number of joints, however.
A. That's my recollection.

Q. And didn't a percentage of those so tested prove to be in need of redoing?
A. I'm sure that they did, but I'm not aware of the exact figures.

Q. The fact that some of those joints that were subjected to ultrasonic testing did prove to require redoing by the standards established at that time, would seem to indicate that those joints were sub-standard, if not unsafe.
A. I don't recollect the report that we received on that, Admiral; my recollection is that they were all smaller joints; there were no large joints involved.

Q. Had there not been, Navy-wise, a considerable experience, including that in BARBEL, of a nature to cause doubt of the safety of our sil-brazed joints that had not been ultrasonically tested?

A. A number of shipyards had made sil-brazed joints that failed in service, yes, sir.

Q. Speaking about supervisors having authority but being reluctant to use it, is this fundamentally the old human nature problem that you're dealing with, Admiral, where one man reluctantly breaks the rice bowl of another if his own rice bowl is not threatened?

A. Yes, sir, it is. The situation today where a man can be a Leadingman and tomorrow, because of reduction in force, he's working alongside the guy he's been supervising the day before, is part of this reluctance. Of course, in this area where people are close together, a lot of them are related together, many of them ride back and forth in the same car pools, so this adds to it.

Q. Admiral, do you have a system whereby you see those important letters which are signed to the chiefs of the bureaus by the Portsmouth Naval Shipyard, by your subordinates?

A. I do not have any mail file or any daily file, Admiral; I depend upon my heads of departments to call my attention to matters of importance, and my experience has been that they do.

Q. But the letter of 9 May, signed by Captain Heller, in which the Naval Shipyard at Portsmouth went on record as saying that any further tests of the pipelines in the THRESHER was redundant, was not brought to your attention?

A. That's right; I'm sure that if it had got to the Planning Officer it would have gotten to my attention. It should have been signed at a higher level.

Q. But Captain Heller, at the time of signing that letter, was Acting Planning Officer, was he not?

A. Yes, sir.

Questions by a member, CAPT Osborn:

Q. At the time of the sending of the letter in May '62, was it not true that you had no ultrasonic capability at that time in the Yard?

A. I'm sure that we did not have full capability; we had equipment in and out that we were playing with, but having equipment of our own, or people qualified to operate it, I'm sure that your statement is quite correct.

Q. I base this on the fact that it has previously been testified to that the ultrasonic teams came into being about July '62, and secondly, that no ultrasonic testing was done on SKIPJACK, so I assumed that when the letter was written in May, you were establishing an ultrasonic capability within the Yard at that time.

A. I think that is a good assumption.

Neither the counsel for the court, the court, nor the counsel for RADM Palmer, a party, wished to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to state.

The witness was duly warned concerning his testimony.

The witness addressed his counsel as follows:

With regards to exercising my rights as a party, is this the proper time, Captain French, to speak to the court?

COUNSEL FOR RADM PALMER: Mr. President, through the helpfulness of your most able counsel, the party, Admiral Palmer, and counsel, have been apprised of the intended nature of the testimony to be adduced from this point. It would appear to Admiral Palmer, and to his counsel, that it is a type of testimony as to which we do not have, what you might call, a direct interest. For this reason we request your permission to let the record show that Rear Admiral Palmer waives his rights to be present personally or through counsel with, by your leave, a reservation as to any specific witnesses that you may see fit to call. May the record show that waiver, sir?

PRESIDENT: The court will instruct counsel to advise you, as the counsel for Admiral Palmer, of any area which, in his opinion, affects the rights or interests of Admiral Palmer.

COUNSEL FOR THE COURT: Is this waiver stated by counsel for Admiral Palmer made with the express concurrence of Admiral Palmer?

RADM Palmer: It is.

The witness withdrew from the courtroom.

COUNSEL FOR THE COURT: Mr. President, I have no further witness for this day, sir.

PRESIDENT: Very well, we will close the court for a brief executive session.

The court closed at 1320 hours, 11 May 1963, and without reopening, adjourned at 1340 hours, 11 May 1963.

Unclassified

TWENTY-SIXTH DAY

Portsmouth Naval Shipyard
Portsmouth, New Hampshire
Monday, 13 May 1963

The court met in executive session at 0830.

Present: All members of the court and the counsel for the court.

The court opened at 0950 hours and announced that this session would be held with closed doors.

All persons connected with the inquiry who were present when the court adjourned were again present in court with the exception of counsel for RADM Palmer, who waived his right and the right of RADM Palmer to be present at this session of the court, and (b) (6), who was relieved as reporter by (b) (6). LCDR Hecker, a party, and his counsel waived their right to be present during the examination of the first witness at this session.

No witnesses not otherwise connected with the inquiry were present.

Rear Admiral Robert Lee Moore, Jr., U.S. Navy, was called as a witness for the court, informed of the subject matter of the inquiry, advised of his rights under Article 31, Uniform Code of Military Justice, duly sworn, and examined as follows:

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, grade, organization and present duty station?
A. I am Robert Lee Moore, Jr., Rear Admiral, U.S. Navy, now under orders as Chief of the Navy's Office of Industrial Relations.

Q. What is your naval and professional background and experience?
A. I am a graduate of the class of 1930 at the Naval Academy. I served as an unrestricted line officer until 1942. I am a graduate of the Submarine School, New London. I served as an active operator in submarines, qualified in command subsequent to, and then I have served in destroyers immediately prior to, the war. In 1942 I shifted over to ED work and since that time I have been in the Navy's shipbuilding and construction side of the house, with my principal assignments of duty being in the field of submarines. I have been assigned to the Bureau of Ships as a Deputy Head of the Electrical Section. I later was the Head of the Interior Communication and Fire Control Group in the Bureau of Ships. Next tour in the Bureau I was assigned with Admiral Rickover in Nuclear Power. I was also the Design Superintendent in this yard from 1946 to 1949. I was Supervisor of Shipbuilding at Groton from '52 until '56; and then was assigned here as Shipyard Commander from 1956 to 1959. From 1959 to April of this year I was Deputy Chief of the Bureau of Ships.

Q. Would you state as specifically as you can remember the dates when you were Shipyard Commander at Portsmouth?
A. I reported here in February of 1956 and I was detached in April of 1959, at which time I assumed duties as Deputy Chief of the Bureau of Ships.

Unclassified

Unclassified

Q. Were you connected with PROJECT PRESSURE?

A. Yes, I substantially initiated PROJECT PRESSURE during the time I was the Shipyard Commander here. It was a program similar to the same program that I had initiated when TANG was being built here. It was the first move that was made to increase our fleet type submarines from 400 to 700 feet. and the objective of this was to prove out all fittings that would see sea pressures, hatches, and what have you, to make sure that they would withstand the requirements of a 700 foot boat, in the case of TANG, and then later, in the case of THRESHER, to go through the same procedure in the case of fittings. valves. hatches, torpedo tubes, and so forth, that would be subjected to b(1) foot pressure. These tests, I might add, embraced three essential elements. namely: that of shock testing mechanically, of proving to one and a half times working pressure, and then further to subject those fittings to a hydraulic pressure surge that simulated what we would get under depth charging; and PROJECT PRESSURE was this kind of a program, that took into account all of the items that would see pressure in the case of THRESHER. These were all put out on a large brochure on an IBM run that was referred to as PROJECT PRESSURE. This was initiated almost at the inception of the assignment to work here at Portsmouth, and continued on through until the vessel was actually delivered.

Q. As to items that were tested within your own knowledge, and items that were used in THRESHER within your own knowledge, do you have any misgivings as to their adequacy to withstand the use for which they were designed?

A. So far as I am aware, substantially all of the items that were listed in PROJECT PRESSURE did pass the three tests that I indicated. There were some notable exceptions where work was initiated after -- for example, in the case of hatches, I believe that we didn't have the facilities here to actually test from a hydraulic impulse point of view the hatches, and we finally had to do those with an underwater explosion shock. And as a result of those underwater explosions we did discover certain difficulties and did redesign the hatches and several other items. But I think it's safe to say that we were satisfied with all of the items that we had, so much so that I rode the THRESHER on her first two dives and certainly had no misgivings about any of the items or I would have taken corrective action in this area before I went out on her dives.

Q. What is your evaluation of HY-80 steel as compared to HTS steel in connection with the construction of THRESHER?

A. I think if we're going to have a b(1) foot submarine it's essential that we do use HY-80. I think, as with all steels, there are problems in connection with the fabrication of it. There are strong points and weak points. But I believe that HY-80, as we see it, is essential for a b(1) foot boat at this time.

Q. While you were Commander of the Shipyard, what work was accomplished in THRESHER?

A. I laid the keel of the THRESHER personally in the spring of 1958. We started the structural work and, at the time I departed here a year later, we were still only in the structural elements of the hull. The first year or so is made up of putting your hull members together and assembling the hull, but we had not started with the so-called "fitting-out" phase. We hadn't got into the installation of piping and electrical wiring and things of that kind. It was mostly all in the hull structural area.

Q. Did you direct that any calculations and studies be made on her ballast tank blow capacity?
A. No, I did not, because plans at that time, of course, had not progressed sufficiently far that I would have normally called for such a study.

Q. Were you aware that her relative ballast tank blow capacity was considerably less than that possessed by earlier classes of submarines?
A. Are you talking about at that time or the present time?

Q. I'm talking about the time that you were Shipyard Commander.
A. No, I hadn't given any thought at that time to the blow rate. This is an item that would have been in the area of the Design Superintendent.

Q. While you were Shipyard Commander what damage control and casualty studies did you order to be conducted with regard to THRESHER?
A. I didn't order any because it wouldn't have been my job at that time. They hadn't proceeded at that phase of it. And I doubt very seriously if I would have called for any special damage control studies other than the same studies that have been run over the years in the case of submarines.

Q. Turning now to early November, 1961, the period of about 11 to 13 November, did you attend a conference in Mare Island regarding a casualty which occurred in SCULPIN?
A. Yes, I did.

Q. Would you tell us very briefly the highlights of that conference, what was found and what was decided to be done?
A. As I remember, SCULPIN was built at Ingalls and when she was operating on the West Coast she had suffered a casualty, I believe, in the salt water piping system in the reactor compartment. This is vague in my mind; this is the way I remember it. In any event, because of this failure and because we had had some previous difficulties in the case of BARBEL, and the Bureau had initiated an extensive program working with ComSubLant with a view of doing everything that we could to purify and improve the integrity of the salt water systems, I went to Mare Island with representatives of the Bureau and with representatives from the Portsmouth Naval Shipyard to give an assist in this area; and we considered at that time ways and means of checking the integrity of piping systems on SCULPIN.

The question of making non-destructive tests on salt water systems, copper nickel, or non-destructive tests of most any metal I know of, is an extremely tenuous one and the best that one can say is that it usually takes a large number of tools being used simultaneously, no one of which is conclusive in itself. We had, prior to this time, considered ways and means of guaranteeing the integrity of systems as far as we were able by non-destructive testing and we had come up with a visual inspection of the joints being required, one where you could, by observation, determine whether the joint was properly fit up -- that is, if the geometry was good; you could check for evidence of too much heat; you could check for evidence of face feeding. These were the tools that we had prescribed in connection with checking over these systems and if you ran into any joint that appeared to violate any of these items that I have just mentioned, it would then be X-Rayed; X-Raying, however, being another limited tool, could only tell you the position of the pipe in the sleeve joint -- that is, whether it's bottomed or not and whether or not you actually had a melted insert ring. It would not give you the degree of bonding.

At Mare Island we considered these techniques together with the technique that Portsmouth had developed, referred to as a high impulse bump test, that they had used after the THRESHER had carried away a joint on her dive. This wasn't quite successful on the THRESHER, in that we had checked out a number of the systems after her first dive to verify the integrity of her systems. These tests were all considered, as was an ultrasonic test technique that Mare Island was working on at that time and which they believed to have considerable merit. However, the technique is a rather tenuous one. It requires expert people to use it. It was extremely time-consuming. And when you got done you were not quite sure of what you had. Admiral Honsinger, who was then Shipyard Commander, and myself, attended all the time of the conference. We discussed with all the members there the relative merits of this, and we asked for an actual demonstration of several joints in the conference room itself, and both Admiral Honsinger and myself were convinced at that time that this was just another tool, because as we looked at "pips", and a "pip" will appear on the screen at various discontinuities, we had a number of people interpreting it and each of them interpreted, in our opinion, a little bit different than the other ones did. So that Admiral Honsinger and I concluded that here was a test that gave promise; it was certainly not conclusive; and it was not one that we wanted to rely on entirely in connection with the SCULPIN tests. This is pretty much the story of how we went ahead with making our final determination in connection with SCULPIN at Mare Island. It was a combination of all of these tests, with ultrasonics being a part and one of the tools that could be used in an over-all evaluation.

Q. I show you Bureau of Ships letter dated 28 August 1962 to the Commander of the Portsmouth Naval Shipyard, our Exhibit 115 before this court, signed by you.

A. Yes.

Q. Have you refreshed your recollection with respect to that letter recently, Admiral?

A. Yes, I remember this letter very well and I have gone over it in recent days.

Q. Would you explain the reasons why you sent that letter to Portsmouth Naval Shipyard and what you intended that Portsmouth Naval Shipyard accomplish as a result of that?

A. Well, as I told you, as a result of BARBEL, and again as a result of the SCULPIN incident, and while I was at Mare Island, I believe I remember having telephonic conversation with Admiral Daspit, who was then Deputy ComSubLant -- I believe he was Deputy ComSubLant at that time -- and he and I were both very concerned, not only in SCULPIN, but we were concerned with all the ships we had coming along and all the ships we had in the fleet at that time; and I told Admiral Daspit that Admiral Honsinger and myself were not completely pleased with any definity of tests that we got out of what we saw there, but it was my intention to take this information back to the Bureau and to start some kind of a program that would be aimed at going back into all ships that we had in the fleet, old and new, with a view of seeing how we could verify by non-destructive test techniques the integrity of all systems that we had in our submarines, this being somewhat analogous to the structural survey that we had for the hulls of the submarines over a long period of time.

After I came back and gave this dictum in the Bureau, there were many conferences, there was further talk between the Bureau and Mare Island, there was further talk between the Bureau and EBDiv, and it was agreed by the Bureau, and I was a party to this, as was Admiral James, that we would have Mare Island continue their work in ultrasonics; and I believe that they let a contract with Electric Boat Company to continue with the evaluation of ultrasonic testing; and we hoped that as a result of this and other programs that we had going under way that we could come up with some kind of a program that would fulfill the over-all objectives that I mentioned and discussed briefly with Admiral Daspit over the phone. This, in some measure, is a culmination of one facet of this program; specifically, that addressed to ultrasonic testing. It was my intent in this letter to initiate a program at Portsmouth and later at another yard that would take the techniques that had been developed at Mare Island and EBDiv and actually apply it to one submarine in this yard, specifically the THRESHER, with a view of trying to set up a system that could be applied for all of our submarines. Now this, generally, is the background of this letter.

EXAMINATION BY THE COURT

Questions by a member, CAPT Osborn:

Q. Admiral Moore, when you wrote this letter were you concerned that the silver braze process itself, both at Ingalls and Portsmouth, was under serious question?

A. Well I guess I would answer that by saying that either welding or silver brazing requires proper fit-up, proper geometry, and a proper processing technique. In the case of silver brazing, if the job is done right I am thoroughly convinced it then gives you a joint that is as good as a welded joint and certainly one that is infinitely cheaper and less time consuming than in the case of the welded joint. We recognized the fact, starting with BARBEL, that we had had difficulties with silver soldering techniques and we had put the word out to all shipbuilding yards and repair yards that they should jack up their procedures, that they should requalify their people in the art of silver brazing. We purified our instructions on this, which was a 250-638 publication on silver brazing, and it was a continuing program to make sure that people in the field were knowledgeable of requirements and that they were inspecting carefully to make sure that fit-up and proper procedures were followed.

Q. Now I realize these particular things happened after you left Portsmouth, but to refresh your memory a little bit, the BARBEL casualty happened 30 November 1960. The salt water systems were essentially completed in THRESHER in February of '61. Do you remember at the Bureau that you conducted any big program in THRESHER's systems in December of 1960 and January, 1961, on THRESHER itself?

A. I can't remember the timing on this because, as I say, there are so many things that could enter the picture. But certainly after BARBEL there was a series of many letters that went out of the Bureau. Admiral James discussed it with the CNO. We discussed it with ComSubLant. There had been many conferences wherein the Bureau had gone out into the field and we had called all representatives in from the field to go over all the ramifications of the difficulties that are associated with silver brazed joints. And I am knowledgeable that before the THRESHER was delivered that we had prescribed the techniques that I have mentioned before of checking out her systems, namely: that of making a visual examination for fit-up, for face feeding, for evidence of overheating. We further specified that she should be pressurized to one and a half times working pressure; that she should use what was known as a "mallet" test on it when it was under pressure

to see if you could get any of the joints to shake loose; and, at some time in the picture, this may have been a little bit later on but it was before THRESHER was delivered, we gave them the option, I believe, either of X-Raying the joints, for which we specified certain standards that had to be met, or that we should use ultrasonic testing and specified, if I remember rightly, the degree of bonding that we felt was appropriate for a sort of "go - no go" situation, although we were feeling our way as to what constituted a substandard joint and are still doing the same.

Q. On the basis of joints that you looked at in the SCULPIN that should have been satisfactory, which were several, at Mare Island, did you seriously question the brazing process at that time?

A. Well, I'm sure that we did. Wherever we had a bad joint you were bound to question it and there was a violation of a procedure that was out. There is no question about the procedures being adequate. They have been out for a long time. And if those procedures had been followed there would have been no problem. But you have to recognize in making the field weld, some of the areas that you get into are extremely difficult to make up, impossible to do a welding job on, and sometimes extremely difficult to get in and conduct a field weld that you would like to do. So certainly we were concerned about it. We were gravely concerned about it. And that was the reason for my going to Mare Island and was the reason for our arriving at a considered opinion of how we would go about the purification of the SCULPIN system, my subsequent conversation with Admiral Daspit on the subject, and the whole program that we had under way to come up with the best kind of non-destructive test technique that we could use for proving up our systems.

Q. Your letter of 28 August 1962 regarding the testing to be done in THRESHER, I interpret from your testimony that this was more of a pilot program with respect to the general non-destructive test model to be used in follow ships rather than a particular investigation on THRESHER itself?

A. This is correct, because the tests that we had performed before the delivery of THRESHER and after the dive embraced basically what we were calling for in this letter. However, we were extending the ultrasonic technique, which was an optional thing before, to as many systems as we could, with a view of checking the propriety of this thing, to get more statistics. The letter was aimed not specifically at proving the integrity of the systems on THRESHER, per se, but rather to be a part of the mosaic of the over-all check-out of the utility of ultrasonic testing as a good valid technique.

Q. Now in May, 1962, the Commander, Portsmouth Naval Shipyard, informed you that he didn't think further tests of THRESHER's systems were necessary and were essentially redundant. Did this have any influence on your letter of 28 August?

A. Well, I wasn't privy -- I've seen these letters after the fact. And you can recognize that I, as Deputy Chief of the Bureau of Ships, had many things to concern myself with and there has to be much day by day work that I may not be knowledgeable of. Admiral James and myself gave this matter command attention. We set out general policies, but the day by day details of having this thing executed were not necessarily called to our attention. I have read some of these things since the fact and I'm satisfied with the sequence of events, as I see it, as to what was finally evolved from this procedure and led to the 28 August letter.

Q. Now I'm interested in the redesign of THRESHER involving blow capacities, blow rates, and so forth, which have been the subject of considerable study over

the past year -- more in the interests of laying down new THRESHER than in the interests of doing something on the old one. Did you at any time transmit to the fleet for incorporation in operational procedures and operational techniques the inadequacies of these systems with respect to capacity and rate?

A. I was not knowledgeable of the fact that we had a lack of capacity in the boats, either from a capacity point of view or from a blowing point of view. I knew that PROJECT RECYCLE was going on. Admiral James and myself had both initiated this program with a view of purifying, as you have indicated, and many, many recommendations came out of this that had to do with the simplification of systems, improving of the integrity of the systems, making them more operational and easier to maintain and less costly to build. I was not aware personally of the fact that the blow rate had come in for consideration in connection with the recycle study, although, after the fact, I found out that this had been applied to certain of the POLARIS boats and, on a back fed basis, was being applied to our fast attack boats. I did have concern in the capacity of air. I had discussed it with Captain Axene on the first trials. He and Roseborough and myself had considered the quantity of air that we had aboard and I believe we had about b(1) air, and I had discussed with Axene whether or not our criteria was correct, whether we were carrying enough air. None of us, neither Axene, Roseborough or myself, had gotten involved in the blow rate, but only quantities of air. And when I got back to the Bureau after the preliminary trials on the 593, we did initiate studies to see what would be a valid criteria for the quantity of air that we had, because our specification and the operators had always been pretty loose on this and we had nothing that gave us a good bench mark on quantity, and certainly nothing on rate of blow. We had had a specification requirement, I believe, that you should be able to blow up twice using high pressure air. We recognized that this wasn't a definitive enough thing and, starting along about that time, a series of studies were initiated by the Bureau, where they got into not only considerations of quantity of air, but the blowing rate that we had. But this was never a definite specification requirement. I think, just about the time of the THRESHER casualty, various information was coming in from various computer studies that we had that bore on the blow rate.

Q. In approaching a design of THRESHER you had PROJECT PRESSURE, which essentially proved that the components were technically capable of performing their missions at deep depths. Was there any parallel program with respect to operational techniques, operational practices, and general intellectual preparation with respect to the forces to operate these submarines?

A. Well, you have to bear in mind that we were so busy in the first year of the building of the THRESHER, going ahead with the construction and getting PROJECT PRESSURE behind us, that in the normal sequence of events we wouldn't have gotten into the training aspects, which usually come later. So at the time I had left the yard, we had not gotten into this.

Q. There is one thing that impresses me with respect to this particular investigation, and that is, once hardware is put into design, the operational techniques available to an operator are essentially frozen. Do you concur with this?

A. Well, I wouldn't altogether, because the submarine people know their boats extremely well and anything comes up, either during the building period, or subsequent to the building period, that they think is inadequate, they are ones that have let their voice be heard; and, specifically in the case of the THRESHER, with the interest that I personally had in it and many of the other people had, there was nothing that was left undone that we believed was necessary to make this

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vessel the finest submarine in the world. And I believe that this vessel was exactly that and I had every confidence in this vessel. When I went out to ride her the first few times, even though we aborted on the first dive because of instrumentation, and subsequent to the casualty the Chief of the Bureau immediately called a conference to see what we might recommend or what we might say or what restrictions we would put on, and after collecting all the submarine talent that we had, none of us could suggest at that time -- we had none of the facts that you gentlemen here have now -- we could suggest nothing that would cause us to impose restrictions on the vessels as we saw it then. And all of us that had been out on her and knew about her would have no misgivings of going out on another of this class the following day.

Q. I realize that in answering this next question it will be one of retrospect, in that in '59 you felt very strongly that going from 700 to b(1) feet was no more difficult than going from 400 feet to 700 feet in the early fifties with the TANG class. Do you feel the same today?

A. I do. I think that the program in the case of going to b(1) feet, because of the experience that we have had, and particularly since I had directed both programs and had the experience of the first program, that the second, on PROJECT PRESSURE, moved much more smoothly than the one that we had had before. I think it was a tremendous program.

Questions by a member, RADM Daspit:

Q. Admiral Moore, as a result of the BARBEL failure at the end of November, 1960, we instituted a program of visual inspection and hammer mallet tests of joints while they were pressurized. As a result of the THRESHER's shock wave casualty on the trim line, Portsmouth developed the impulse shock test, which was also used up here I believe. During the conference at Mare Island, about November, 1961, on SCULPIN, Admiral Honsinger thought that the impulse testing was going to be quite effective and held out high hopes for it. In January, 1962, in response to a query from the Supervisor of the Electric Boat Division in regard to ETHAN ALLEN, the Bureau had changed its mind, said that the mallet test, while it was useful for new construction, after the ship had been down on a deep dive and operated, it didn't give anything worthwhile at all, and that the impulse test had evidently proven not effective under tests at Mare Island. According to your recollection, is that about the situation today?

A. This is the way I remember the record, but in reviewing what they did at Mare Island and very recently, I find out that as I see it the impulse test at Mare Island was conducted in a different fashion than we conducted it here. They were basically building the pressure up to two and a half times working pressure and then cyclically taking it on and putting it off, in contrast to the technique that was developed here at Portsmouth where you loaded a conning tower with air and then quickly opened a valve, simulating what happened on the THRESHER, when you opened a valve quickly and you had the unlimited resources or energy of the ocean coming in, and you pulsed it, and you might get peak pulses of at least ten or even twenty times normal sea pressure. So I think that there were some basic differences between the techniques that were employed. However, from my point of view, these were then details that were being carried out by our people who were watching every facet of the program and they had put the interpretation on the impulse testing that they did. Whether or not the impulse testing is one of the best tests or not, I would have to sit down and go over it with the technical people.

It seemed to have been more useful as applied here at Portsmouth than at Mare Island because it was applied in a different way, and it was extremely difficult to take the technique that Portsmouth used and apply it to all of your systems in the ASW system. Here at Portsmouth they checked, as I remember, the trim and the drain system and certain major portions of the ASW systems by this impulse technique.

Q. From what I've heard since I've been up here, there's no doubt in my mind that the ultrasonic test is the best non-destructive method we have, but I gather from what you have just told us that probably the THRESHER got a better impulse test than the one at Mare Island, which may not have been of very much use.

A. Much better. I talked to Axene. I talked to Harry Jackson, who was the design superintendent, during and after the impulse testing here, and it was an extremely severe test, so much so that people thought that you might do unnecessary destruction to the system. When you impulsed the way Portsmouth did it, you had pipes vibrating and jumping around in a rather severe fashion. So this again was another tool. And I believe that ultrasonics had good promise of being one of the best tools, but you have to recognize that this has been growing, with strong emphasis from the Bureau, over a period of about two years. It required the development of better equipment to do the job, and equipment that will get down into the smaller pipe sizes, and it takes extremely fine training to do the job and interpret it correctly.

Q. One of the key points in carrying out the Bureau's directive of August, 1962, was a reluctance to take the lagging off joints, a feeling that the piping had already been so thoroughly tested that it wasn't worth the time or the money to do this. Do you have any feel for how that feeling persisted during the building period of the THRESHER after the first dives and before she was delivered? Did they really go into the ASW system and take off the lagging, or did they only test what was available to them?

A. What they actually did here, Dan, I would not like to testify to. I would have to go back and refresh my memory on it.

Questions by the president, VADM Austin:

Q. Admiral Moore, you have indicated that the letter, which is Exhibit 115, from the Bureau of Ships, dated 28 August 1962, was written because of concern regarding the piping systems of THRESHER and other ships that had been built; is this correct?

A. This is correct, sir.

Q. Did that concern extend to the feeling that there may be danger in operating these ships at the depths designated for their operation at that time?

A. We believed that there was a hazard under conditions of poor workmanship of silver soldered joints for any ship, old or new, that might be out, Admiral Austin, and the thing that concerned me was the rash of difficulties that we were having in our piping systems on the current ships. I was gravely concerned with the same techniques that had been applied in yesteryear when the techniques were not as valid as they are today and were not as rigorous. This is the thing that bothered me.

Q. In that letter you specified that the Navy Yard, Portsmouth, would use a minimum of one ultrasonic testing team throughout the overhaul, to the end that the maximum number of joints might be tested. The execution of your instructions, directions, was so carried out that actually only about 160 joints were ultrasonically tested and some 45, I believe, were visually tested. Did this meet the intent of the directive or not?

A. Well, I wasn't knowledgeable until very recently of just what Portsmouth had done on this thing. I have recently found out what they actually did here and, in carrying out the priorities that I had assigned in this letter, in the case of the hydraulic high pressure air system and high pressure gas system, which we thought equally as important as the salt water system, we thought there were reasons why Portsmouth wasn't able to get at those joints. In many cases they were all welded. In some other cases, as I understand, Portsmouth was having difficulty in getting down to sizes below two inch because of the equipment they had available. But I understand that Portsmouth had picked up to Priority Four, which was an extension of the salt water systems inboard of back-up valves, the first priority being those between the hull valve and back-up valve. So, under the circumstances, this order of priority and technique would have met, certainly, with my full approval. And you'll bear in mind that since we were setting up a program, in all cases I indicated that this was to be on a "not to delay" basis, recognizing the need of getting the ship out and to get as much information as we could from a statistical point of view. This is what we're after; getting more statistics to check the validity of the system against inputs to give EBDiv and Mare Island. Now whether or not, in retrospect, and I believe that this report from Portsmouth probably hadn't even come in to the Bureau before I left, for certainly I wasn't made privy to it, whether or not I would have been

satisfied with the number of joints that they got or not is something that I would have to sit down with my technical people and go over the results, see what they had, and make an analysis of it.

Q. Had you received the report of the old joints that had failed, and it brought out that fourteen percent, or 13.8% of all the old joints tested had failed to meet the specifications for a safe joint, would you have been concerned enough to take more drastic action?

A. Admiral Austin, that's a hypothetical question, but I will try to stand behind giving an answer because it's a hypothetical question but will answer it as directly as I can. And this was because this was a technique by way of being developed and standards were varying depending upon information that we had at hand. I would have had to take the results that came in and find out what were the nature of the so-called joints that were classified as defective. Even though in this letter I had specified 25% on the lands and 40% in the over-all, I would have had to look at the results that came in to put an interpretation on it to see whether or not I thought these results were satisfactory or not satisfactory, because we had run a number of tests at the Engineering Experiment Station to find out what constituted a valid bond and had found out that with bonds of as little as ten percent bond that we could exceed the yield on the piping before the joint carried away. So the 40%, 25%, was a number that we were trying to pick out as a "go - no go" sort of situation; and I might have changed these numbers at the time I read this and with valid cause to some number less than forty, or I might have felt a little bit different about it and jacked it up a little bit higher. This is something that you take all the input that you have and try to evaluate as to what is reasonable to give you the kind of joint that you want.

Q. Admiral Moore, it is understood that there have been joints with only ten percent bond that held longer than the piping. It is also recognized though that the state of the art of ultrasonic testing has not developed beyond the point where you can rely upon it to a degree of more than about seventeen percent error, plus or minus. Therefore, would you not think that it was skating on pretty thin ice with the lives of submarine personnel to reduce your requirements to the point where you got failures?

A. Admiral Austin, I don't know where you come by the seventeen percent. I would say this: that if I were making the decision on it I certainly would want to err on the safe side. What constitutes satisfactory bond, I don't know; but we had set as a trial number the forty - twenty-five. I think that had I run into joints that were running ten percent, fifteen percent, or seventeen percent, my reaction is that I would certainly have wanted to do those joints over. But, in larger measure, I think it depends upon a critical examination of that joint. What was the fit-up in it? Because I would point out to you, Admiral Austin, that a seventeen percent bond in the case of a well fit-up joint might be considerably better than one that was not fit up very well and had a forty percent bond. These are some of the facets that come into the picture and it's hard to give a typical "go - no go" situation on it. We are still moving along to see what is the full meaning of this thing, and we hope that we will get something that is reasonable and will guarantee the integrity of these systems, one that the operators can apply and that we can go back and apply to all the ships that we have in the fleet, and certainly apply to all new construction, which we're certainly doing now; we're using all devices.

Q. The rate of failure, however, even by the Bureau-set standard, indicates that during the building period of the THRESHER, ultrasonic joints were not of sufficient degree of uniformity and safety to cause one to be absolutely reassured when one found this number of failures that was found in this small number that the yard did test, and it would seem to me that the Bureau would be interested in getting soundings before the ship went out for its final test?

A. Getting soundings?

Q. Getting reports from the yard as to what they were finding. After the ship has gone out and made its deep dive and is lost, it's too late to get their report and analyze it.

A. I would point out, Admiral Austin, that non-destructive testing all falls in this area of uncertainty; and I would point out that the rate of failures in the welded joints that we have right now -- and we have a large committee that is being chaired by the Bureau but it's specifically under the direction of Portsmouth, with inputs from all of our yards -- the rate of failure in the case of welded joints, including the criteria that we have now, far exceeds the rate of rejection of silver soldered joints. And we have this with us right now. And it gets back to the state of the art and the interpretation of the results. Because in the welded areas we have had rejected rates that are fantastic in copper nickel in welding, and, in a large measure, carbon steel, that are more mundane. I'm sure that Captain Hushing, who has been following this thing very closely, can confirm what I say and give you some numbers on the rate of rejection we have. We would have more reason, on the basis of non-destructive testing with our welded systems now, to have more concern than we did with silver soldered joints. And, in point of fact, because of all the difficulties that we've had with non-destructive techniques in the piping systems, many of the yards, many of the people with a knowledge of this thing, have come back and said, "I think we should veer away from the old welded joints and go back to silver soldered joints again." And the Bureau has been under these pressures, and we have had to fight hard to hold the line on saying that we do want all welded joints, and a minimum number of other types. I only bring out the question of welding to point out that as we look at this thing now, before we have a failure perhaps in a welded joint, we have a pattern that is worse in the way of welded joints than we do in the case of silver soldered joints.

Q. Well, Admiral Moore, I appreciate full well the many concerns of the Bureau of Ships and the people who are responsible for its actions, but would it not be important for the Bureau of Ships personnel to keep in mind that in this highly technical age in which we live, the technology is changing as fast as it is changing, that when they have grave concern regarding either silver brazed joints or welded joints, that they make these concerns known to the operating personnel and make recommendations for limitations of depths, or whatever may be necessary, until they can find a fixed answer?

A. Yes, sir, I agree with you whole-heartedly, Admiral Austin. And the one general comment that I could make is regardless of how hard I say the Bureau is working, or the concern that any of us had in this thing, I just wish to heavens that I had been smarter and I'm sure that all the people who had been close to THRESHER just wish that they could have been a little bit smarter, that we could have been a little bit more cautious, that we could have done something to have averted this casualty. But I believed in the excellence of that submarine, and as I felt about it, and I think to give you my feel as having been in it as a deputy and having been in on the concept of this thing, I believed in the ability of that submarine that, if time and circumstances had permitted, I probably would

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have been up riding it and with every assurance that no submarine could have been safer to ride. Now I might have been in a Fool's Paradise, but to show you in retrospect my confidence in that vessel, recognizing all the difficulties we had in building that vessel or any submarine that we have.

Questions by a member, CAPT Osborn:

Q. How do you feel, bearing in mind that the TINOSA is very late in terms of going to sea and was built to a great extent, probably with less -- the best talent went on the THRESHER during her construction period and not as good talent was available in the construction of TINOSA -- how do you feel about the condition of TINOSA?

A. I know nothing of the state of construction of the TINOSA. I only know of the over-all requirements under which she's being built. But to go down and look at the vessel and to look at her state of completion and the other facets that go in the over-all evaluation of when a ship is ready, I would have to take time out to check the records and see where we stand. I am knowledgeable that certain tests have been run on THRESHER since I left the Bureau. Because of my concern in this matter, I keep abreast of it. I do know that the yard has run certain tests on the blowing of tanks and certainly before I would want to take these vessels out I would want to do something about the Marotta valves and the strainers that give evidence of freezing up. As I say, again, I haven't looked these tests over; I only have an input that they did get some freezing up in these areas.

(b) (6) relieved (b) (6) at this point as reporter.

Q. How about the salt water system?

A. The salt water system, if the same general criteria that was used in the case of the THRESHER is done conscientiously, I would feel that you should have the integrity that you need in the system. Now as we have had the THRESHER casualty, I would probably want to go in session with the CNO Op 31 -- we have had certain meetings. I would want to discuss the matter with COMSUBLANT. bring the various technical matters I have to bear, to see what was done; what remains to be done; what does good prudence indicate that we should do; and whatever is good prudence, this is what I would dictate.

I would like to make one comment in connection with the blowing situation. I indicated to you my conversations with Captain Axene that led to our thinking in terms of greater quantity of air, and as a by-product of that we go into also increasing the blow rates. On initial dives -- and this was quite independent of our thinking of the THRESHER casualty -- Captain Roseborough and myself on several occasions did ask Captain Axene to demonstrate a blow up of the vessel. A blow up of -- a blowing up -- a b(1) foot boat or any of them that deep, gets to be a ticklish situation, because once you start blowing and start coming up, the bubble expands and unless you are extremely careful you could well end up in a situation where you bounce completely up out of the water and might be getting in trouble with things that are up on the surface. There was some reluctance. This wasn't a specified test that we had in blowing up, but Captain Axene in due course of time, after he had finished other tests in the case of THRESHER, called Captain Roseborough and myself over and said, "Now I will demonstrate blowing up for you." And he prescribed his own rules and regulations in it, but as I remember, in connection with the demonstration, he did order the blowing of the main ballast

tank and if I remember rightly he persisted in the blow for a matter of about -- I have in mind -- five or ten seconds at the very most, whereupon he secured blowing and almost immediately opened his vents. Now, I'm not being foresighted in this case and if we did get into a freezing situation it would have been fortuitous at that particular time if the blow had persisted to such an extent that we would have uncovered freezing and we could have looked at each other and said, "I'm not getting air." And if God had been with us on that particular occasion maybe we would have persisted in that blow -- which from a technical point of view we had no reasons other than we wanted to demonstrate a blow up. We were thwarted in that attempt just because we hadn't persisted in the blow very long and I think probably the same thing would have happened on TINOSA that would happen somewhere else. Now from a personal point of view I was not knowledgeable of the fact that we had strainers in the Marotta valves.-- these are technical problems that one doesn't get into -- certainly I had no misgiving or thoughts that if you persisted in that blow you would get valves frozen up. If we had known the opposite, we would have had the strainers out of there long since.

Neither counsel for the court, nor the court desired further to examine this witness.

The president informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith which had not been fully brought out by the previous questioning.

The witness stated as follows:

WITNESS: No, I think in the over-all, Admiral Austin, I have given you my overall feel on this submarine and the validity of it and the importance of this submarine and I'm sure that insofar as postulating what might have happened, with the larger input that the court has than I, that you have already speculated much closer to the truth than I have been able to speculate. I have my own thoughts on what might have happened but only based on what has come out in the papers, and what you have made privy to me in view of the Lofargrams which you told Captain Leehey he could discuss with Admiral James and myself from the technical viewpoint on any action we wanted to take. So with the testimony I have read in the papers and with these kinds of inputs, I have my own opinion on what might have happened, but again I feel your thoughts are much better than mine.

I have one thought, that there was not a catastrophic failure of the hull. I am dead certain that there was not a catastrophic failure of the hull and I believe if they didn't have a failure -- power failure -- I am convinced that they were unable to use power because there was no evidence of blade rate in the critical time on through until the breakup time, so I am convinced that either power was not available -- maybe power was not available, -- or if it was available they didn't use it, because blade rate would have made this point clear to us.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

The court then recessed at 0950 hours, Monday, May 13, 1963.

The court opened at 1010 hours, Monday, 13 May 1963.

All parties to the inquiry who were present when the court recessed were again present in court. In addition, Lieutenant Commander Hecker, a party, and his counsel were present. RADM Palmer and his counsel were not present, having expressly waived their right to be present at this session.

(b) (6) , RM3, U. S. Navy, a former witness, was recalled as a witness for the court, was reminded that his previous oath was still binding and was examined as follows:

COUNSEL FOR THE COURT: (b) (6) , this is a closed session of the court. You can speak freely here, whether or not you have classified information to give. Just answer the questions fully and completely to the best of your ability. If you do not understand the questions put to you by a member of the court or either counsel, don't hesitate to tell us so and have the question repeated and explained until you do understand it.

WITNESS: Yes, sir.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. (b) (6) , have you had an opportunity to review a transcript of the testimony you have already given to this court?
A. Yes, sir.

Q. Did you find anything in there that you wanted to change or alter in any way?
A. Well, there was a slight deviation, sir.

Q. Would you tell us what the deviation was about and point it out to us?
A. Well, sir, it was about the garbled message. There seems to be a difference in the time, and as to the fact that there was the time of the garbled message, the actual time of the garbled message.

Q. I will show you Exhibit 16, already introduced as the UQC log which you maintained on the 10th of April, and starting with the time sequence of 0853, we will take each of the entries which you recorded, in the order in which you recorded them; take your time, and tell us everything you remember about each one that is there and any messages which were not recorded by you which you now remember. First, 0853, there is an entry which says "Proceeding to test depth." Is that correct?
A. Yes, sir.

Q. Is that correctly recorded in there? You don't wish to change it in any way?
A. Well, sir, except for the time. It isn't 0853. That "0853" is Roger for his last transmission.

Q. What estimate can you give us then for the entry "Proceeding to test depth,"?
A. That would be approximately 0901.

Q. How do you arrive at that conclusion?
A. We rogered at 0902.

Q. And in the ordinary course of operating on the UQC, you roger for it within a minute of the time it is received?
A. Yes, sir.

Q. Do you remember whether there was any undue lag that morning, any lengthy interruption before you rogered for it?
A. No, sir.

Q. Then the next entry 0902 is the "roger",is it not?
A. Yes, sir.

Q. "R-O-U-T" -- what does that mean?
A. "Roger out."

Q. That was given by the SKYLARK?
A. Yes, sir.

Q. The next entry has no time attached to it. What does it say?
A. "Dipper Sierra this is War Club CORPEN 090."

Q. And there is a question mark which follows the "090." Could you explain that to us?
A. Well, sir, I wasn't sure when I took it down that it was correct. That is why I put the question mark there.

Q. Who was "War Club"?
A. That was THRESHER, sir.

Q. You weren't sure as to the word "Corpen" or the "090"? What is it that you weren't sure about? Was it that you weren't sure about the time but you were sure as to the message?
A. Well, sir, I didn't bother with the time. We usually put the time in when we roger for it because we roger for it just after he sends it.

Q. Then what was it you weren't sure about, (b)(6) ?
A. Well, I'm not sure right now, sir, but it could have been I wasn't sure I got the whole message.

Q. Is there no question in your mind though that you did hear this much?
A. Oh yes, sir.

Q. There is no question about that?
A. No, sir.

Q. The next entry appears to read "1910." Is that just a very slender "0" to begin with so it reads "0910"?
A. Yes, sir. It was supposed to have been a "0" -- "0910."

Q. It should read "0910" and that was just a request made by SKYLARK and it says "Say Again"?
A. Yes, sir.

Q. Why was that request made?
A. Well, it's -- we weren't sure what he sent then, I guess.

Q. I see. What is the next entry?
A. "War Club, this is Dipper Sierra Gertrude Check. Over."

Q. And the time for that?
A. 0912.

Q. And that is a correct time?
A. Yes, sir.

Q. Now following that, what do you read?
A. "Dipper Sierra, this is War Club, over."

Q. Not "over." Read what it actually says.
A. Well, sir, that is what it actually says.

Q. That is a "kilo," isn't it? Read the "kilo" so we will actually know you are reading this message and then you can interpret it any way you wish.
A. "Dipper Sierra, this is War Club. K." "War Club, this is Dipper Sierra, K." "Dipper Sierra, this is War Club. Have positive up angle -- attempting to blow."

Q. Now, all three of those entries have no time alongside of them, is that correct?
A. Yes, sir.

Q. Would you give us your best estimate of when each of them was transmitted and received. Turn the page if you wish to look at that.
A. Well, the roger was 0914.

Q. The kilo, you mean?
A. The roger -- when we rogered for this message.

Q. I see. You are now referring to "have positive up angle -- Am attempting to blow," is that right?
A. Yes, sir.

Q. And you notice on the following entry 0915 --
A. 0914.

Q. 0914 rather, "R out." Roger out, is that correct?
A. Yes, sir. So this positive up angle message would have been approximately 0913 and the preliminary call ups would have been between 0912 and 0913.

PRESIDENT: 0913 is the message that was understood to be "Have positive up angle -- attempting to blow"?

WITNESS: Yes, sir.

Q. Following the 0914 "R out," what is the next entry?
A. "War Club, this is Dipper Sierra, no contacts in area."

Q. Who sent out that message?
A. We did, sir.

Q. Do you recall who it was who actually sent it?
A. No, sir.

Q. All right. And the next entry reads how?
A. "0915. War Club, this is Dipper Sierra, My Corpen 270 interrogative range and bearing from you."

Q. Now the way it actually reads is, "My Corpen 270 i-n-t R & B f-m u," is that right?
A. Yes, sir.

Q. You have interpreted that to mean "interrogative range and bearing from you"?
A. Yes, sir.

Q. Now following the 0915 entry is a new entry and would you read it for us?
A. "War Club this is Dipper Sierra, are you in control?"

Q. Now I notice the entry in the book "D-i-p-s" is crossed out and "WC" added on top. The next column had "WC" crossed out and "D-i-p-s" added. Would you explain that for us?
A. Yes, sir. I got the call switched around that time. I corrected it.

Q. Who sent the message "Are you in control?" Can you remember?
A. The Captain, sir.

Q. Had he been on the bridge from the time 0902 when we started this discussion until this time? (indicating on Exhibit 16)
A. Well, sir, I wasn't paying attention to where he was over here (indicating on Exhibit 16) I was busy copying it down, but I know he was here from, I think it was around 0914 on. But I wasn't sure about those others because I wasn't paying any attention.

Q. All right. He said "Are you in control?" That entry has no time attached to it. Do you make out a quotation mark under the time "0915," or is that just a blur in the log?
A. It looks like a blur in the log, sir.

Q. You did not use quotation marks to indicate the same thing?
A. No, sir.

Q. Now can you give your best remembrance of when that message was sent?
A. I think it was sent after the garbled message came in, sir--the garbled message that wasn't logged.

Q. Well did it come in after the 0915 entry which says "My corpen 270 interrogative range and bearing from you"?
A. Yes, sir, I believe it did.

Q. It was sent out after 0915, is that correct?
A. I'm not positive, sir, but I would say it would.

Q. Why would you say it would?
A. Well, sir, there was no contacts in area and "My corpen 270 interrogative range and bearing from you," we were trying to contact him and I believe he called us back and it was garbled.

Q. Well, (b) (6) , let me ask you another question. Did you write these entries into the log one at a time as the things happened, or did you write up the log sometime after all of these events happened?
A. No, sir. I wrote the--the ones I did write in, I wrote as they came in, sir.

Q. Then if we see one entry following another in your log, are we correct in concluding that the message came in after the entry ahead of it?
A. Yes, sir.

Q. All right. Then the message we were talking about, "Are you in control" must have occurred after 0915, is that correct?
A. Yes, sir.

Q. All right, fine. Now, we're coming to a very critical point in all of this, starting at 0915 and thereafter, and I want you to remember as best you can what happened. The next entry in the log is marked "0917." It shows no call sign for an originator. It says "WC 900N(?)" Please explain what happened and how you happened to write the message in that way?

A. Well, sir, the captain asked War Club, "Are you in control" and when he released the button, this message came in. It wasn't a message; it was a flashback from a part of a message and what I believe happened, the radioman aboard the THRESHER didn't listen before he started transmitting and therefore he was cut out.

Q. Did you actually hear the words "900N" question mark?--What did you hear?

A. Well, sir, I thought I heard "nine hundred north."

Q. Just that way: "nine hundred north?"

A. Yes, sir, it was very fast.

Q. What was the question mark intended to mean at the end of the message?

A. Well, sir, that was intended that maybe I misunderstood.

Q. Was it your practice to put a question mark after a message when you weren't sure you were recording the whole message?

A. Yes, sir. Then after I get the full message I either erase the question mark or write in the full answer.

Q. So you put the question mark in there because you felt you had only heard part of a transmission?

A. Yes, sir.

Q. At any time during the time you were on watch taking messages, recording messages from THRESHER over the UQC, had a message ever come to you before with the word "hundred" instead of "00"--zero zero?

A. I believe so, every time he gave his course.

Q. He would give it as--

A. "hundred" sir.

Q. Is it possible he did not say "north" but something like that, or do you feel pretty confident he said "north"?

A. Sir, it is very possible he said something else.

Q. You recorded it as best you could and put a question mark down, is that correct?

A. Yes, sir.

Q. Now was there another garbled message received about this time that you didn't log at all?

A. Yes, sir.

Q. When was that heard by you?

A. Approximately 0915 right after the transmission we made sending our corpen.

Q. Would that have occurred before the Captain sent out his message "Are you in control?"
A. Well, sir, he sent out I think, three messages "Are you in control" during that time.

Q. Yes.
A. And it came, I believe, right before or after the first message he sent out.

Q. After 0915 and right before the first or second time that the captain sent out "Are you in control," is that correct?
A. Yes, sir.

Q. How much time separated his questions "Are you in control"--"are you in control?" Would you repeat them as best you can with the rapidity with which he repeated that question?
A. "War Club this is Dipper Sierra, are you in control? Over."

Q. No, I want the time; I want you to say it twice and put the time interval in that spaced the Captain's two questions.
A. Well sir, the normal listening time is around five or ten seconds; if they don't call you then, we are supposed to call back again.

Q. Just repeat it the way you heard it that morning.
A. "War Club, this is Dipper Sierra, are you in control? Over." (Pause) "War Club, this is Dipper Sierra, are you in control? Over."

Q. Like that?
A. Yes, sir.

Q. And it was just before or sandwiched in between those two messages that you heard a garble?
A. Yes, sir. Well, after he heard it, he didn't--well he waited until after the transmission was over and I believe we asked for a repeat of the transmission that War Club made.

Q. Is that listed in here anywhere?
A. No, sir.

Q. I'm not sure that I understand when you heard that garble. Was it just before or in between the two messages "War Club this is Dipper Sierra, are you in control" and "War Club this is Dipper Sierra, are you in control?" Was it in between the first and second of those that you heard the garbled message?
A. Yes, sir, it was. I believe it was right in there, sir.

Q. It must have been a real short message then, is that right?--You didn't leave much time in between the two questions.
A. Well, sir, that would have been normally, but with the garbled message in there, it would have been a longer space.

Q. Let me ask you again, will you put in the exact space that you remember. Give us the two messages again and leave in as much time as there was between the message when it actually happened that day.
A. That is including the garbled message?

Q. Yes, give it to us as you remember it.
A. "War Club, this is Dipper Sierra, are you in control? Over." (Pause) "Dipper Sierra, this is War Club"--the garbled message. "War Club, this is Dipper Sierra. Say again your last transmission. Over." "War Club, this is Dipper Sierra, are you in control? Over." "War Club, this is Dipper Sierra, are you in control? Over."

Q. Thank you.
A. And that is when the "900 North" came in.

Q. It was after that when the "900 North" came in?
A. Yes, sir.

Q. All of that happened, according to your log then, in a two minute period or less?
A. Yes, sir.

Q. Sometime after 0915 and sandwiched in between then and 0917?
A. Yes, sir.

Q. Did you ever hear from THRESHER again?
A. After that flashback, sir?

Q. After the words "900 North" or whatever they stood for?
A. No, sir.

Q. Did you hear any increase in background noise at any time after 0912 and up to the time you heard the words which you interpret as "900 North"?
A. Well, yes, sir. I heard one but I couldn't definitely say where it came in.

Q. You couldn't say when you heard it?
A. No, sir, because like I said before I wasn't familiar with the background noises and it didn't mean anything to me, sir.

Q. This was before "900 North" was received?
A. Yes, sir.

Q. What did you hear? Describe to the absolute limit of your ability, what you heard?
A. Well, sir, it sounded just like a static crash.

Q. A static what?
A. Crash. Just an outburst of very loud static on a frequency.

Q. Did you hear any increase in background noise after you heard the message which you have described as "900 North"?
A. I couldn't say for sure on that one, sir.

Q. If you couldn't say for sure, do you have an impression lingering in your memory that you might tell?
A. Yes, sir.

Q. You do have?
A. Yes, sir.

Q. What is your impression?
A. Well, sir, I believe, but I'm not sure, that there was another increase in the background noises after--well, right after the "900 North" message came in, sir.

Q. How soon after?
A. Oh two or three seconds later, sir.

Q. Well before the next entry in your log which is "0920," is that correct?
A. Yes, sir.

Q. Two or three seconds later. Again describe, to the limit of your ability, what the increase in background noise sounded like.
A. Well, sir, the only way I can describe it, it sounded like a static crash, a buildup in static.

Q. How long did it last?
A. Well, sir, I'd say three to five seconds. That was while I was noticing it. I didn't pay too much attention to it.

Q. Have you ever heard the sound of ballast tanks being blown underwater when you've been listening to the UQC?
A. Well sir, if I did, I never knew what it was.

Q. Did you hear anything which you could interpret as the sound of ballast tanks being blown after receipt of the message "Have positive up angle, attempting to blow up"?
A. No, sir, I can't identify background noises on the UQC. I don't have that much experience on it.

Q. I note that in the period which you and I have been talking about, as evidenced by the entries in the log, in every case a call sign is entered from the originator and to the addressee with one exception, and that is on the 0917 entry which reads "900 North" in the book here. You just put down "WC." Would you explain why?
A. Well "WC" stands for "War Club" sir, and there wasn't any preliminary call up since the message was clipped so I put down who the transmission came from--which boat.

EXAMINATION BY THE COURT

Questions by a court member, Captain Osborn:

Q. I want to be sure in my mind, (b)(6), you received the words "nine hundred north"?
A. Yes, sir.

Q. It wasn't "nine zero zero north"?
A. "Nine hundred north," sir, that is what I took that it was.

Q. Could it have been "nineteen hundred out"?--It was "Nine hundred" and a one syllable word?
A. Yes, sir.

Questions by a court member, RADM Daspit:

Q. Now did you hear a garbled message after that?
A. After the "nine hundred north," sir?

Q. Yes.
A. No, sir.

Q. Nothing at all?
A. No, sir.

Questions by court president:

Q. (b) (6) , you have spoken of the "nine hundred north" message as being a flashback.
A. Yes, sir.

Q. Would you explain what you mean by a "flashback"?
A. Well, sir, it is just a part of a message that has been clipped off. Like well, sir, I believe what happened, the radioman of the THRESHER, he didn't listen to his receiver to see if anybody was transmitting. He picked up the transmitter.

Q. In other words, he had been transmitting while your transmitter was on perhaps?
A. Yes, sir.

Q. And so only part of his message got out?
A. Yes, sir.

Q. In a way to be received by your receiver?
A. Yes, sir.

Q. But you are sure that that message at 0917 was from War Club?
A. Yes, sir. There wasn't but two people on the circuit at the time.

Q. Could you distinguish any difference between the voice of the person who was talking when you got the "nine hundred north" message and the messages before that? Did they sound like the same person?
A. Well, sir, it was too clipped to really distinguish any voice tone.

Q. Did you hear any noises at the same time that you heard that message?
A. Well, now, sir. There wasn't any time for noises. There was just--

Q. "Nine hundred north" sort of like that?
A. Yes, sir, like that.

Q. Could that have been "nineteen hundred" instead of "nine hundred"?
A. No, sir, all I heard was "nine hundred north" or something like that.

Q. That's the best you could get as to what you heard?
A. Yes, sir.

(b) (6) relieved (b) (6) as reporter at this point.

Questions by a member, CAPT Hushing:

Q. Were you on watch at 8 o'clock, (b) (6) ?
A. Yes, sir; I relieved the watch at 0800.

Q. Did you make the entry in the UQC Log at 0800?
A. Yes, sir.

Q. Will you read that message, please?
A. "0800 - WAR CLUB THIS IS DIPPER SIERRA, MY COURSE 180."

Q. "WAR CLUB THIS IS DIPPER SIERRA, MY COURSE 180"?
A. Yes, sir.

Q. What is the heading at the top of the columns?
A. "From" and "To."

Q. So that it is from WAR CLUB to DIPPER SIERRA, isn't it?
A. Yes, sir, but I log it differently.

Q. Will you please take one of the messages from WAR CLUB to DIPPER SIERRA that has a course change in it?
A. "DIPPER SIERRA, THIS IS WAR CLUB, MY COURSE 270."

Q. Now how did WAR CLUB state course changes?
A. Corpen, sir.

Q. Corpen 270?
A. Yes, sir.

Q. Is there any other change from WAR CLUB along about that time?
A. At 0824, sir,"DIPPER SIERRA, THIS IS WAR CLUB, MY CORPEN 090."

Q. And that's the way he said it, zero nine zero?
A. Yes, sir.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. One last question about the entry which you recorded at 900 North.

b(1)

A. Well, sir, I can't say, because that's as good as I could receive it.

Q. Would you say it was impossible?
A. No, sir, I wouldn't say it was impossible.

RE-EXAMINATION BY THE COURT

Questions by a member, RADM Daspit:

Q. (b) (6) , at the entry just under the 0815, could you read that one, please?

A. "DIPPER SIERRA, THIS IS WAR CLUB CORPEN NORTH OVER." I guess that would mean "My course is North."

Q. The way you understand your entry is that this was THRESHER saying that his course was North?

A. Yes, sir. I believe he gave figures North and I don't believe I got it, and I left it out, and I was going to get somebody to tell me what it was, and then this other stuff started.

Questions by a member, CAPT Osborn:

Q. You indicated previously that a garbled message came in from WAR CLUB, "THIS IS DIPPER SIERRA," garble; do you think this is possible, "WAR CLUB, THIS IS DIPPER SIERRA" garble?

A. No, sir, the message would have been from WAR CLUB.

Q. Yes, but it had to occur in between transmissions; it wouldn't occur with respect to "WAR CLUB, THIS IS DIPPER SIERRA" "THIS IS YOUR STATION CALLING," you couldn't get a garble in that way because your button would be down; isn't that correct?

A. Well, as long as we were transmitting we couldn't receive anything.

Q. This is correct. Ordinarily, you always call, or you give your call signs "WAR CLUB THIS IS DIPPER SIERRA" you still have your button down then you pass your message.

A. Yes, sir.

Q. But you testified that you heard that garbled message after your Captain had said "WAR CLUB, THIS IS DIPPER SIERRA" garble.

BY THE PRESIDENT: No, sir, you are mistaken. He said the garble came between or just before the first transmission by the Captain of the message "ARE YOU IN CONTROL?" and the second "ARE YOU IN CONTROL?", either before the first one or after the first one and before the second one. I'm pretty sure of that.

WITNESS: That's affirmative, sir.

PRESIDENT: Is that correct?

WITNESS: Yes, sir.

Neither counsel for the court, the court, nor the counsel for LCDR Hecker, a party, wished to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was warned concerning his testimony and withdrew from the courtroom.

Roy S. Mowen, boatswain's mate, third class, U. S. Navy, a former witness, was recalled as a witness for the court, informed that his prior oath was still binding, and examined as follows:

COUNSEL FOR THE COURT: Mowen, this is a closed session of the court and you may divulge classified information. If you do not understand any part of a question put to you by a member of the court or by counsel, feel perfectly free to tell us that you don't understand it and request that it be repeated or explained, so that your answers are given with full knowledge of the question, and then make your answers as complete as you can. Don't hesitate to say "I don't know" or "I don't remember." We are just taking soundings for the complete truth.

WITNESS: Aye, aye, sir.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. Prior to your coming in here to testify this morning, the counsel for the court showed you a complete transcript of the testimony you gave to us earlier. Have you looked it over very carefully to see whether it is true and correct, and contains no errors?
A. Yes, sir, I have.

Q. Is there anything that appeared in there that you would like to change or alter in any way?
A. No, sir.

Q. Directing your attention now to the morning of the 10th of April 1963, I show you the UQC Logbook of the SKYLARK, and I start with an entry logged at 0853; would you read the entry to us, please?
A. It was from WAR CLUB to DIPPER SIERRA "ROGER, OUT CORPEN 000."

Q. Now be very careful; was that from DIPPER SIERRA to WAR CLUB? Don't read the columns on the top.
A. That I don't know, sir; I don't remember that.

Q. Do you remember the entry that appears directly below it, which bears no time? Would you read that to us?
A. "PROCEEDING TO TEST DEPTH." It was from DIPPER SIERRA to WAR CLUB, and it was in reverse. This was from WAR CLUB to DIPPER SIERRA, "PROCEEDING TO TEST DEPTH."

Q. It would appear, then, that the first column is going to be the addressee and the second column is going to be the originator, doesn't it?
A. Yes, sir.

Q. Now when was that received?
A. It must have been received between 0853 and 0902, sir, because we ROGERED him for it.

Q. ROGERED for it 0902?
A. Yes, sir. It was in reverse too, WAR CLUB to DIPPER SIERRA, from WAR CLUB, "CORPEN 090."

Q. Do you happen to remember that message at all?
A. I remember him giving us "CORPEN 090" and I looked over the log before and if I recall correctly, I pointed this out that we had it in reverse in the log.

Q. Apart from the fact that in your mind the columns "From" and "To" appear to have been reversed, and running between the time which we started, 0853 to 0920, do these entries appear to you to record truly and accurately everything that you heard?
A. The message 0912, about him experiencing minor difficulties--

COUNSEL FOR THE COURT: Speak a little louder, will you, please?

A. The message that he sent "EXPERIENCING MINOR DIFFICULTIES, HAVE POSITIVE UP ANGLE, ATTEMPTING TO BLOW, WILL KEEP YOU INFORMED"--

Q. Blow up, you said?
A. He did not say that, sir; he said "ATTEMPTING TO BLOW;" that is not complete in the log.

Q. You have already testified to that, fully and completely. Apart from that, do you see any other inaccuracy or omission?
A. This entry at 0917: "900N" with a question mark after it; I don't recall this message at all, sir.

Q. Then let us focus on that. At 0915, an entry appears "MY CORPEN 270 INTERROGATORY RANGE AND BEARING FROM YOU;" that was followed by an entry without a time attached to it, sandwiched in between the 0915 entry and an 0917 entry, which says "ARE YOU IN CONTROL;" did you send that message?
A. No, sir.

Q. Tell us what happened then; did you give the message 0914 "ROGER AND OUT"?
A. This was for this message here, yes, sir.

Q. That was for the message "HAVE POSITIVE UP ANGLE"?
A. Yes, sir.

Q. You ROGERED for it?
A. Yes, sir.

Q. Did you send the message "NO CONTACTS IN AREA"?
A. I don't recall, sir; I don't think so.

Q. About that time what happened?
A. The Captain asked them if they were in control, sir, after "MY CORPEN 270 INTERROGATORY RANGE AND BEARING FROM YOU."

Q. I'm a little confused here. The Captain took the UQC after--
A. After this message.

Q. After what message? After "ROGER AND OUT"?
A. Yes, sir.

Q. Had he been standing there for some time, do you know?
A. I don't recall, sir. I backed away from the UQC. What clearly sticks in my mind, "ARE YOU IN CONTROL" the Captain asked him four or five times.

Q. Four or five times?
A. Yes, sir, to my knowledge. To my knowledge, it seemed to be four or five times; he asked him several times.

Q. In between his sending that message out several times, did any message come in which is not recorded there?
A. No, sir. None that I recall.

Q. You don't remember having heard a garble to your ship, either just before the first time he said "ARE YOU IN CONTROL?" or the second or third time he said "ARE YOU IN CONTROL?"
A. No, sir, I do not. I backed away from the UQC and kind of relaxed a little. I don't recall anything out of the ordinary come over.

Q. Were you close enough, and was it quiet enough so that if a message had been received, even a garbled one, you would have heard it?
A. I couldn't say, sir. It was quiet on the bridge, but I was about five to six feet away and I backed away from the UQC when the Captain was asking them if they were under control. I couldn't say.

Q. If you were asked the question, in the ordinary course of everyday life, and it it wasn't as important as it is today," did a message come in during that time, a garbled message, what would your answer be?
A. I would have to say, no, sir, because I didn't hear it.

Q. You didn't hear it and you probably would have heard it if it did come in? Is that what you mean by "No, sir, there was no message"?
A. Well, I didn't hear a message. I couldn't say if I could hear it or not, because if they were transmitting possibly I could hear it, but I don't recall, sir.

Q. Now, Mowen, that gets us down to the message which was received after a repeated series of transmissions from SKYLARK saying "ARE YOU UNDER CONTROL?" That message is recorded as having been received at 0917 from WAR CLUB, and what the log actually shows is "900 North" and a question mark in parenthesis. Tell us what you heard at 0917 in place of those figures "900 North" and question mark?
A. I'm not sure, but I take it that this is what--I don't see a test depth logged, but we received a message that sounded like "TEST DEPTH" from WAR CLUB and there was a garble between the call signs and "TEST DEPTH," a slight garble. It was unreadable; you couldn't understand it, sir.

Q. Was that message received after the last time the Captain had asked "ARE YOU IN TROUBLE?"
A. Yes, sir.

Q. After the last time?
A. Yes, sir.

Q. Does 0917 strike you as a good estimate of the time that it was received?
A. I couldn't say, sir.

Q. You heard a garble and then the words "TEST DEPTH"?
A. Yes, sir.

Q. Did you ever hear the words "900 North"?
A. No, sir.

Q. Could you have heard the words b(1)
A. No, sir, I did not hear anything to this effect that is in the log.

Q. You didn't hear it at all?
A. No, sir. I was back away from the UQC.

Q. But not so far away that you didn't hear "TEST DEPTH"?
A. Well, the UQC is up here (the witness demonstrated with his hands) and I was between four to five feet away and sort of off to the right of it, and after the Captain had transmitted this message, I had been moving around there and I happened to hear the call signs and then a garble and then what appeared to be "TEST DEPTH", sir.

Q. What was the atmosphere in the pilot house at the time you heard the words "TEST DEPTH"; were people excited; did they seem worried, or was this just a routine transmission received on UQC?
A. Well, it didn't seem to be anything out of the ordinary. The Captain asked three or four times if they were in control, and the people on the bridge who were there were quiet and were doing their normal duties as best I can recall, sir. I was just standing there; I didn't think anything of it.

Q. Were you listening hard because something was up, because you felt that something important was up?
A. I wasn't really listening hard? I don't understand it, sir.

Q. I'm not making myself as clear as I want to either. The Captain relieved you and said "ARE YOU IN CONTROL -- ARE YOU IN CONTROL" several times?
A. Yes, sir.

Q. You heard the words "TEST DEPTH" after he relieved you. Were you alerted to the fact that something important was happening, so that even though you were relieved you were listening hard to the UQC, straining to hear every word, or did you feel perfectly normal?
A. I wasn't really straining to hear it, sir. I stepped back and I relaxed a little after the Captain took over the UQC. As I recall, I lit up a cigarette; it might not have been right at the time, but I was smoking, and I was a little more relaxed, because I had been listening to it all morning.

Q. After the words "TEST DEPTH" which you heard, did you ever hear any other transmission from THRESHER?
A. No, sir.

Q. At the time you heard the words "TEST DEPTH" or a little before that, had you heard any background noises of any kind?
A. Well, there was normal background noise, and there was a noise of air like they were trying to blow tanks.

Q. You have that in your testimony which you have already given?
A. Yes, sir.

Q. After you heard the words "TEST DEPTH" did you hear any background noises?
A. Nothing out of the ordinary, sir. It just appeared to be regular noise, sound waves, coming through the UQC. I didn't notice anything out of the ordinary.

Q. You didn't notice anything out of the ordinary for the next five or ten minutes, either?
A. No, sir.

EXAMINATION BY THE COURT

Questions by a member, CAPT Nash:

Q. When the Commanding Officer sent the message "ARE YOU IN CONTROL?" did he release the UQC button, or did he send the message four or five times before he released the button?
A. I don't recall, sir.

Q. You are familiar with the background sound that is heard when a button has been released?
A. Yes, sir, Captain.

Q. Do you recall hearing this sound in between his transmission of "ARE YOU IN CONTROL?"
A. No, sir, I don't recall hearing that. Like I said before, I wasn't paying that much attention, sir; I had stepped back and I had relaxed. I had been on the UQC all morning, and I was taking a little breather.

Questions by a member, CAPT Hushing:

Q. Going to the 0917 message; you said that you heard the call from WAR CLUB?
A. Yes, sir. It sounded like a call.

Q. Specifically, what did you hear?
A. It sounded like "DIPPER SIERRA" and then a garble, and then words to the effect that "TEST DEPTH"; the garble, it sounded like "TEST DEPTH" to me, to the best of my knowledge.

Q. I want you to concentrate on the call "DIPPER SIERRA THIS IS WAR CLUB" or "DIPPER SIERRA FROM WAR CLUB"?
A. I don't recall; I recall the call signs being passed.

Q. Do you recall the call signs or the call sign from SKYLARK?
A. I remember hearing "DIPPER SIERRA" and then the garble and what appeared to be "TEST DEPTH".

CROSS EXAMINATION

Questions by counsel for LCDR Hecker:

Q. Mowen, directing your attention to the UQC Log, there is an entry immediately under time of 0914 "NO CONTACTS IN AREA"; did you send that message?

A. No, sir, I don't think so; not that I recall.

Q. Do you recall who did send that message?
A. I think it was the OOD, sir.

Q. Did the OOD come over and take the UQC microphone and send the message or did the OOD or the Captain give you an order to send that message?
A. I don't recall that, sir.

Q. So you can't really recall who sent that message or who gave an order to send that message?
A. About the contacts in the area, I recall the Captain telling CIC to scan the radar and check for contacts in the area, but like I said, I can't recall who sent the message. I may have sent it; I don't remember, sir.

Q. Do you recall who sent the next message at 0915 "MY CORPEN 270 INTERROGATORY YOUR RANGE AND BEARING FROM YOU"?
A. I could have sent that one, but as I say I don't recall that one either. This in between here is kind of vague. I remember the message at 0912 and the thing that sticks out in my mind is the Captain asking if they were in control, and he told radar to be alert for any contacts in the area.

Q. Now directing your attention again to 0914 "ROGER OUT"; did you transmit that message?
A. I ROGERED for that message at 0912, yes, sir.

Q. And it's logged at time 0914?
A. Yes, sir.

Q. Was it at this time that you heard sounds over the UQC resembling the blowing of air in the ballast tanks?
A. Yes, sir, after the ROGER message.

Q. Right at that time?
A. Yes, sir, it was after the message, right after I ROGERED, to the best of my knowledge.

Q. Did anyone in the vicinity also remark that it sounded like air?
A. Yes, sir.

Q. Who, if you recall?
A. I think it was the Captain; I had my back to him but I'm almost sure it was the Captain who said "It sounds as though he is attempting to blow his tanks" and the OOD, or someone else, remarked about it also. The Captain said to alert the lookouts for a submarine coming to the surface, and he also contacted the radar and told them to check for any contacts in the area, and gave the order to put four engines on the line, sir.

Q. Now directing your attention to your testimony regarding a message apparently received at about 0917 by SKYLARK from THRESHER; you have testified that you heard a call sign "DIPPER SIERRA" a garble and then what appeared to you to be the words "TEST DEPTH". I would like to ask if you heard that garble sufficiently clearly enough to be able to tell this court whether or not that garble could have been caused by air; was there a rise in the background that garbled those words between

call signs and "TEST DEPTH"?
A. No, sir, not that I recall.

Q. What do you think caused the garble; why didn't you hear the words that you might have heard had there not been a garble?
A. I wouldn't have any idea, sir.

Q. There was no noise, background noise at that time resembling the sound of air?
A. No, sir, not that I recall.

Q. Now Mowen, before the Commanding Officer took the UQC microphone from you, do you recall him ordering you to ask THRESHER "ARE YOU IN CONTROL?"
A. No, sir, that doesn't stick in my mind.

Q. With reference to your past operating experience with submarines while manning the UQC, in a situation in which it is apparent to the surface vessel that the submarine may be in the act of surfacing, is it standard procedure to advise the submarine of the fact that there are or are not contacts in the area?
A. Yes, sir, it is.

Q. Is it also standard procedure to advise the submarine of the course of the rescue vessel, and inquire to the submarine's range and bearing from the rescue vessel?
A. Yes, sir; from past experience it has been.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. Mowen, speaking of past experinece, did your experience with THRESHER the day previous to the day you are telling us about lead you to remember whether those who used the UQC in THRESHER expressed distances or courses with words like "hundred", such as "one hundred, one nine hundred" or did they use the phrase or words "zero, zero" or "double 0 or "0"?
A. It depended on who the operator is, sir, how you would get that; various operators say it different ways.

Q. Did any of the operators use the word "hundred" in giving figures?
A. I can't recall, sir.

Q. Can you recall whether the operator who said "TEST DEPTH" was the same operator who said "EXPERIENCING MINOR DIFFICULTIES, etc, etc."?
A. I couldn't say that, sir, either.

Q. I'm not encouraging you to say if you can't say, because your words to us are important. In answer to one question put to you by counsel, you said "The Captain said, 'It sounds like he is attempting to blow his tanks'." Is it possible that the Captain said "It sounds like he's blowing his tanks" or did your Captain say "Attempting to blow" or "trying to blow"?
A. I said "attempting"; I think he said "It sounds like he's trying to blow", or "he's blowing tanks". I don't remember the exact phraseology of it, sir.

Q. But you don't want to leave it with us that he did use the words "trying to blow" or "attempting to blow", you just don't remember?
A. No, sir, I don't remember.

Neither the counsel for the court, the court, nor the counsel for LCDR Hecker, a party, wished to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement:

I would like to say something in behalf of the Captain. I think he's one of the finest Captains I've ever served under, sir. He's level headed and he is an outstanding skipper.

The witness was duly warned concerning his testimony and withdrew from the courtroom.

The court recessed at 1115 hours, 13 May 1963.

The court opened at 1123 hours, 13 May 1963.

All persons connected with the inquiry who were present when the court recessed were again present in the court.

LTJG Ralph R. Lachance, USN, was called as a witness for the court, was informed of the subject matter of the inquiry, was advised of his rights under Article 31 of the Uniform Code of Military Justice, was duly sworn, and examined as follows:

COUNSEL FOR THE COURT: This is a closed session of the court, Lieutenant, and you can divulge classified information, to make your answers full and complete. If at any time you do not fully understand a question, do not attempt to answer it until you find out the full meaning of it. Ask for an explanation.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, grade, organization and present duty station.
A. My name is Ralph Raymond Lachance, Lieutenant (junior grade); I'm the Engineer of the SKYLARK.

Q. Lieutenant (junior grade), U.S. Navy?
A. Yes, sir.

Q. Please spell your last name for the record.
A. L-A-C-H-A-N-C-E.

Q. When did you report to SKYLARK for duty?
A. In October of 1961.

Q. Will you briefly trace your naval background and experience for us?

A. Yes, sir. I enlisted in the Navy in August 1951, served for approximately two years in the amphibious corps in Norfolk, Virginia, at which time I was transferred to New London, Connecticut. I entered the submarine service in 1955, worked my way up to Chief Quartermaster in 1959, and was commissioned in July of 1961. I reported to SKYLARK subsequent to attending LDO School.

Q. Directing your attention to the morning of 10 April 1963, were you the Officer of the Deck for the 0800 to 1200 watch?
A. Yes, sir.

Q. What time did you relieve as Officer of the Deck?
A. 0750.

Q. Will you state the instructions you obtained from the man you relieved at that time?
A. Yes, sir, I relieved Lieutenant (junior grade) Watson; he is the Navigator; it is customary for him to have the 4 to 8 watch. At the time I relieved he informed me that we were on station, that the THRESHER had commenced her deep dive, last bearing to her was 147, 3400 yards, which put her just forward of the port beam. At the time the ship was at ALL STOP. Our orders from THRESHER had been to lay to on station.

Q. Do you recollect the wind direction and velocity when you relieved?
A. Yes, sir, I estimate the wind from 310 true at 5 knots.

Q. And what was the state of the sea?
A. Sea state, there was a swell running more than a sea, about a foot and a half to two feet in height, with long periods between the swells.

Q. Did the weather change any in the next two hours?
A. No, sir.

Q. Could you describe the SKYLARK pilot house for us, very briefly?
A. Yes, sir. It's a semi-circular pilot house, projecting forward from the after bulkhead. There are two doors in the after bulkhead and the rest is fixed with glass ports, approximately twelve to fourteen inches in diameter. The ports were closed on the morning of 10 April.

Q. Were they closed from the time you took over the watch until at least 1000?
A. Yes, sir, I remember them as being closed.

Q. With the ports closed, and with the weather the way it was that morning, how would you describe the hearing conditions inside the pilot house?
A. Hearing conditions were excellent. I might add that the two after doors in the pilot house were open.

Q. I show you Exhibit 34 before this court. Can you identify it?
A. Yes, sir, this is the Quartermaster Log of the U.S.S. SKYLARK.

Q. Directing your attention to the entries made from 0800 to 1200 on the morning of 10 April, to the best of your knowledge are these entries true and correct and complete?
A. Yes, sir, with very slight variations. I have noted on speed; I believe at one time he has this logged at "AHEAD ONE THIRD"; we were making ten RMP's instead of ahead one third.

Q. You are referring to the entry marked 0915 on the morning of the 10th; is that correct?
A. Yes, sir. Also the one at 0715. I was making ten RPM's then.

Q. Do you have in your possession the Bell Book of SKYLARK and the page which has the entries for the 10th of April 1963?
A. Yes, sir.

Q. Would you produce it?

(The witness did so.)

Q. Have you looked at the entries that appear on that page and which reflect the bells given during your watch?
A. Yes, sir.

Q. Are they true, correct and complete, to the best of your remembrance?
A. Yes, sir.

The pages from the SKYLARK Bell Book containing entries for 10 April 1963 were offered in evidence, and there being no objection it was so received as Exhibit 196. Counsel for LCDR Hecker waived reading the exhibit at this time.

Q. Do you have in your possession a tabulation showing SKYLARK's RPM's versus knots data?
A. Yes, sir, I do.

Q. Is it true and correct to the best of your knowledge and belief?
A. Yes, sir.

The tabulations showing SKYLARK's RPM's versus knots data cited above was offered in evidence, and there being no objection it was so received as Exhibit 197. Counsel for LCDR Hecker waived reading of the exhibit at this time.

Q. Returning again to your standing the watch on the morning of 10 April 1963, can you tell us how accurate the bridge clock was that morning?
A. I cannot tell you exactly; I can only give you an opinion as to what I consider as to the accuracy of the clock.

Q. Give us your opinion and tell us upon what you base it.
A. I would say that the clock was accurate, within a minute, and I base this upon the fact that we have never -- the clock was a fairly stable one and we have never had a time problem, so far as it being erratic from other ships that we operated with, and the clock is periodically reset.

Q. I show you Exhibit 16 before this court, the UQC Log of SKYLARK. Referring to the entries made in the 0800 to 1200 watch on the 10th of April 1963, did you as Officer of the Deck supervise the recording of these entries?
A. I did not personally supervise the entries. I did know that we had a man logging the entries and I was aware that there was a record being kept during the transmissions.

Q. Have you had an occasion to study the entries made from around 0800 to around 1000 that day?

A. Yes, sir.

Q. Are they true and complete, to the best of your recollection?
A. They are true. I don't believe the log to be a complete description of the UQC transmissions that transpired between THRESHER and SKYLARK that morning.

Q. Would you refer to the log and explain as accurately as you can in what way it is not true and complete, starting with the 10th of April at the beginning of your watch?
A. The entry here from WAR CLUB to DIPPER SIERRA at 0749 "OK TO MANEUVER AS LONG AS YOU REMAIN IN PRESENT POSITION"; I remember the transmission as having been "FEEL FREE TO MANEUVER AS YOU DESIRE". The entry at 0809 "AM PROCEEDING ONE HALF SET DISTANCE". I do not remember any such transmission. At 0815 a transmission from WAR CLUB to DIPPER SIERRA is "CORPEN N" a blank and then "K". I believe this to be from the THRESHER telling us that his CORPEN was 000 North.

(b) (6) relieved (b) (6) as reporter at this point.

A. (Continued) The log at the entry at 0912 is from WAR CLUB to DIP SIERRA is logged as, "Have positive up angle. Attempting to blow up." I remember the transmission as having been preceded by, "Experiencing minor difficulty. Have positive angle. Am attempting to blow up." At 0914 it is logged, "No contacts in area." After having received THRESHER's message that he was experiencing difficulty, I said to him that there were no contacts in the area; he was all clear to surface. The log indicates at 0917: "900 N." I remember no such entry.

Q. That's far enough when you get to 1000. Where were you standing in the pilot house when the message came in, as you recall it, "Experiencing minor difficulty," and so forth?
A. I had just checked with the SONAR operator to see if he held THRESHER on SONAR. He had given me a negative reply, and I was standing on the opposite side of the QHB receiver, which is opposite the UQC.

Q. What did you do when you received that message?
A. Upon hearing the message, Mowen turned and repeated the message to me. I went down to the 21MC and called the Captain and relayed the message to him.

Q. Where did you call him?
A. In the Captain's Cabin.

Q. What happened then?
A. I turned to the Quartermaster and told him to get a LORAN, and told the man on the DRT to start a plot, and informed the THRESHER that he was clear to surface. In the meantime, the Captain arrived seconds later after I had notified him. He asked if I held him on the surface, and I replied in the negative. I informed the Captain that I had informed him he was clear to surface. The Captain told me to put four engines on the line.

Q. While you were doing these things, did you hear any sounds emanating from THRESHER coming over the UQC?
A. No, sir.

Q. Did you hear any blowing sounds, the sound which you might have interpreted as ballast tanks being blown coming over the UQC?

A. In reference to the question before, if I heard any sounds from THRESHER, when the Captain took the UQC mike and asked the THRESHER if he was in control, as he released the button on the mike, we heard -- at least I heard one garbled word and one legible word, which I understood to be "depth."

Q. Now, turning to Exhibit 16 and to the entry appearing after the 0915 entry reads, "MY CORPEN 270 INTERROGATORY RANGE AND BEARING FROM YOU." Following that appears the entry, "ARE YOU IN CONTROL" without a time attached to it. Was that message sent by your Captain?
A. Yes, sir.

Q. Did he send that message more than once?
A. Yes, sir, twice.

Q. He sent it twice?
A. Yes, sir.

Q. Are you certain he did not send it three times or more?
A. No, sir. I remember it as having been sent twice, "ARE YOU IN CONTROL? ARE YOU IN CONTROL?"

Q. How much time elapsed between the time he asked the question the first time and the time he asked it a second time?
A. As long as it would take me to say the words right now.

Q. He used the call signs as well, did he?
A. I would be speculating on that part. I remember his transmission. However, I'm not sure if he used the call signs. I would say yes, that he had.

Q. Would you repeat those messages at the same speed and the same time interval that the Captain took?
A. Yes, sir. I will use the call signs here. "WAR CLUB. THIS IS DIPPER SIERRA. ARE YOU IN CONTROL? ARE YOU IN CONTROL?" (The witness recited the aforementioned without hesitation between sentences.)

Q. You did not leave any time for hearing anything between the questions; as a consequence, there could not have been a transmission between the words, "ARE YOU IN CONTROL?" and "ARE YOU IN CONTROL?"
A. There was no transmission in between, sir.

Q. Immediately following the second transmission, what did you hear?
A. I heard one garbled word and the word "depth".

Q. Could it have been that at 0917, could it have been the entry which is recorded here as "900 N" and a question mark; could it have been at that time and in place of that message that you heard those words?
A. I understand your question to be that when the Captain did finish his transmission, could I have heard "900 North" instead of the garbled word and the word "depth"?

Q. Could you have heard the garbled message instead of "900 N"? What I am saying is, instead of this entry, if you were writing entries in this log, would you put in there, "Parenthesis garbled parenthesis, test depth" along side the time "0917"?

A. If I were keeping the log at the time I heard the transmission, I would have glanced at the clock, logged the time in, and put in the transmission as I heard it.

Q. Would that have been at 0917?
A. I have no definite way of knowing the exact time. I know it was in the vicinity of that time.

Q. After hearing the words "test depth," did you ever hear another transmission from THRESHER?
A. I did not hear the word "test".

Q. After hearing the word "depth," did you ever hear another transmission from THRESHER?
A. No, sir. The only other noise which I heard on the UQC, which may have come from THRESHER, was a sound which we evaluated at the time as being tanks blowing.

Q. When did you hear that?
A. I would say it was about 0917.

Q. Before or after you heard the garble followed by the word "depth"?
A. We heard the blowing sound after the word "depth".

Q. Could you describe the garble to us to the absolute best of your ability? How long was it? Was there any interference which made a garble of it?
A. No, it seemed to be quite clear. As far as the time, I remember thinking it was a very short blow. I would estimate it to be between three and five seconds.

Q. And the garble itself, how many words do you think were included in the garble followed by the word "depth"?
A. I only heard one garbled word before the word "depth".

Q. How do you account for that? Was it because SKYLARK was transmitting, or for some other reason?
A. My opinion is that it must have been for some other reason; otherwise the word "depth" would not have come through clearly at the end. I do not believe the word to be garbled because SKYLARK was transmitting on the UQC. For some reason, the word reached us garbled, and then the next word was clear.

Q. How soon after your Captain finished saying the word "control" in his final question, "Are you in control?" did you hear the beginning of the garble?
A. It was immediately as he released the button, we heard the two words.

Q. Is it possible you are mistaken as to when you heard the sound which you interpreted as ballast tanks being blown?
A. Mistaken in what respect?

Q. As to when you heard those sounds. Could it have been after the receipt of the message, "EXPERIENCING MINOR DIFFICULTY," and so forth?
A. No, sir.

Q. You've got it clear in your mind about that?
A. Yes, sir.

Q. I show you Exhibit 35, the Track Chart of THRESHER. Is this chart an accurate portrayal of SKYLARK's movements during your watch on the morning of 10 April?
A. Yes, sir.

EXAMINATION BY THE COURT

Questions by a court member, CAPT Hushing:

Q. I would like to direct your attention to the period about 0914, when you received a message from THRESHER in substance, "EXPERIENCING MINOR DIFFICULTY. HAVE POSITIVE UP ANGLE. AM ATTEMPTING TO BLOW." After that message, what did you do?
A. The first thing I did when I heard that message was notify the Captain on the 21MC.

Q. You notified the Captain on the 21MC?
A. Yes, sir.

Q. And then what did you do?
A. I checked with radar to see if he had any contacts in the near vicinity. I was fairly sure of this, but I just double checked to be sure. I told the THRESHER on the UQC that he was all clear to surface. I told the quartermaster to get a LORAN --

Q. Excuse me for interrupting, but what exactly did you tell THRESHER?
A. You mean my exact words?

Q. As close as you can remember them.
A. "WAR CLUB TO DIPPER SIERRA. YOU ARE ALL CLEAR TO SURFACE."

Q. All right, go on.
A. I told the quartermaster to take a LORAN, and then I told the man to start the DRT and start a track chart.

Q. Which man was this?
A. DeShong.

Q. Then what?
A. By this time the Captain arrived in the pilot house.

Q. Right after you told DeShong to start the DRT?
A. I believe it was just after that, yes, sir.

Q. The Captain came to the bridge?
A. Yes, sir.

Q. Then what did you do?
A. The Captain took a hurried look around the ports, through the ports, and asked if I held him on the surface. I replied in the negative. I told the Captain I had informed him he was clear to surface. The Captain then told me to put four engines on the line.

Q. He then told you to put four engines on the line?
A. Yes, sir.

Q. All right, then what happened?
A. Following this -- I'm not sure what the Captain's exact comments were, but I do remember when he went to the UQC, he took the mike and asked the THRESHER if he was in control.

Q. Would that have been just after the order to put four engines on the line?
A. It was somewhere after that order. I wouldn't say it was exactly right after that order.

Q. Was it 10 seconds, 20 seconds, or an appreciable time?
A. Within a minute, I would say. I might add that prior to this, before I received the THRESHER's message that he was in difficulty, and he had sent us the message which was garbled, I knew he was more astern of us in the baffles, and I came right to clear the UQC, and upon doing so, we received his transmission clearly at the time, and he was telling us that he had come to 090 on an easterly leg.

Q. This was before 0912?
A. Yes, sir. This was the last leg which he sent to us before he became in difficulty.

Q. And going back to that, after you changed course and cleared the baffles, was there a GERTRUDE check?
A. Yes, sir.

Q. Do you remember that?
A. I don't remember the check as well as I do his message telling us that he had come to 090.

Questions by a court member, RADM Daspit:

Q. You said that you told the THRESHER that it was all right to surface. Did you take the UQC yourself at that time, or did you merely direct that this message be transmitted?
A. No, sir. I took the UQC myself.

Q. After that there was a message, "MY CORPEN 270 INTERROGATORY. RANGE AND BEARING FROM YOU?" before the Captain sent out the message, "ARE YOU IN CONTROL?" Who transmitted that message or who ordered that it be transmitted?
A. I don't know, sir. I have no recollection of that message. It may have been sent. However, I don't remember it being sent.

Q. I have been given the impression that after you ceased transmitting and left the button up, it is three or four seconds before the receiver is in condition to receive. From your testimony, this impression is not correct. Can you receive as soon as you let the button up?
A. In replying right now, sir, I was standing behind the Captain when he sent this transmission. I didn't watch his finger come off the UQC mike. I do remember only what I've told you: one garbled word and the word "depth".

Q. As soon as he stopped talking, you heard the garbled word, and there was no time interval in there at all?
A. In trying to give you the best answer, I would say there could have been a few seconds in there.

CROSS-EXAMINATION

Questions by counsel for LCDR Hecker, party:

Q. Mr. Lachance, in reciting for Captain Hushing the action that you took upon receipt of THRESHER's next to last transmission, I would like to ask if you performed those actions in an orderly sequence - 1, 2, 3, 4, or were you performing them pretty nearly simultaneously, in that you were issuing orders to have these actions accomplished?
A. I'm a little -- After having received the message and informed the Captain I had told the THRESHER he was clear to surface, the thought came to me that it would be important to get a position; so I told the quartermaster to get a LORAN cut and then informed DeShong in Combat to start the DRT.

Q. How long a period of time did it take you to carry out or direct these actions be carried out? Was it 30 seconds, a minute?
A. I would say a minute would be closest.

Q. As a submariner, what was your own mental reaction on the bridge of SKYLARK when you received the next to last UQC transmission from THRESHER? Did you believe that she was about to surface, or just what did you envision was next going to occur?
A. One of the things that was misleading was the calm voice which the message was received in. It was a rather slow, unhurried transmission. I didn't really think that he was in that serious difficulty.

Q. But did you think he was going to surface?
A. Yes, sir.

Q. Now then, is it a normal procedure in submarine operations when a surface vessel escorting a submarine believes a submarine is going to surface to transmit to that submarine, "no contacts in the area," and give the submarine your course and speed and ask for his range and bearing from you?
A. Yes, sir.

At this point, the president announced that the court would be cleared.

The court was cleared at 1202, 13 May 1963.

The court opened at 1210, 13 May 1963.

All persons connected with the inquiry who were present when the court was cleared were again present.

Lieutenant (jg) Lachance, the witness under examination when the court was cleared, resumed the witness stand, was reminded that his oath previously taken was still binding, and continued his testimony as follows:

Unclassified

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. Would you state to us what you did as O.O.D. after receipt of the last message from THRESHER, in an orderly sequence from that point on during the remainder of your watch?
A. This is after the blowing sound?

Q. Yes.
A. I don't remember the course exactly, but I will tell you as I remember it. We worked our way to the north slowly, probably 2000 yards, or so - two or three thousand yards; changed course to the right, came back to the south; and the Captain at that time told me he wanted to start an expanding square search from the center.

Q. About what time did that occur?
A. At the very most - and I'm guessing now - it was five to ten seconds afterwards, at which time we started an expanding square search from the center.

Q. And you continued that for how long?
A. In the meantime we did run across a piece of white paper which at that time caught our eye, and we maneuvered to bring this along side. We weren't able to bring it aboard. We saw that it looked like a ditto tape sheet. It apparently had been in the water for some time, because it came apart as we tried to hook it and it sank. Progressing on, we resumed the expanding square. Then we brought the hand grenades up from the armory and started releasing three hand grenades at 10 minute intervals, I believe it was.

Q. Were there any discussion at that time as to what might have happened to THRESHER?
A. Yes, sir, there were informal discussions going on. I remember I had one with Mowen, in particular, who was quite concerned about what might have happened to THRESHER.

Q. Did you have any with the Commanding Officer?
A. None that I remember clearly, although we were talking during the watch as various things came up. He was quite busy with FXP-1. I believe it is, getting ready for this message if it was needed. By "message" I mean SUBMISS, and the communicator was conversing with the Commanding Officer quite a bit also. He had tied up the Captain mostly as far as conversation was concerned.

Q. Were you called into any discussion as to the initiation of SUBMISS?
A. No, sir.

Q. Did you discuss this with the Executive Officer at the time?
A. The Executive Officer was the Communicator and acting XO at the time. No, sir, I didn't discuss it with the Executive Officer.

Q. Do you recall when the decision was made firm to initiate SUBMISS?
A. I do not recall the time. I had busied myself with the watch. We were quite alert trying to pick up anything that might be on the surface. As a result, I was scanning the horizon mostly. I do remember that they had trouble getting out to NBL, Radio New London, once the decision had been made. The Communicator kept reporting he was having trouble. They were trying secondary circuits in trying to get this out.

Unclassified

Unclassified

Q. Can you give us any estimate as to how long the trouble persisted after the first attempt and before the actual transmission of the message?

A. This would be a very rough estimate. It seemed to be a good half hour at least - at the very least. It seems I remember the Communicator on several instances coming up and informing the Captain he still couldn't get out, and they were quite concerned about this.

Q. Did you hear any conversations on the bridge during your watch as to whether anyone had heard breaking up sounds over the UQC?

A. None that I remember clearly. At the time that we heard the sound, I believed it to be blowing; therefore, I would stick with that opinion of it.

Q. At the time you heard a sound which you have described to us as blowing, do you recall whether anyone had a contrary interpretation of that sound?

A. No, sir. When we heard it, the Captain said, "He's blowing," and I agreed. This was the only interpretation that I remember that morning in the pilot house.

REEXAMINATION BY THE COURT

Questions by the president, VADM Austin:

Q. Lieutenant Lachance, you were relieved about what time?

A. I would say about 1145, 1150.

Q. During this time, had anyone raised the question as to whether or not the information which you had on board regarding the indications of the disappearance of THRESHER should be communicated to anyone outside the ship?

A. As I have stated before, the Captain and the Communicator were engaged in quite a discussion at the time, and I had moved back to the forward part of the pilot house between the magnetic compass and the bulkhead, and I busied myself with running the ship, while the Captain took care of the other details. I don't remember overhearing any conversation. However, I was drifting around the pilot house at all times, and I can't account for the trend of the conversation.

Q. Without attempting to remember exactly what words you may or may not have heard, did you get the impression that there was a consideration of passing on to others the information which you had in the SKYLARK?

A. Well, at the time, once we did get the SUBMISS message out, in my own mind -- I didn't see the message. I didn't know what was included in the text, but I thought we had put the word out to the responsible people in the chain.

Q. But you did not hear any discussion as to the advisability or inadvisability of informing more fully than in the SUBMISS announcement higher authority of the last message that had been received from THRESHER?

A. No, sir, I did not hear any such conversations.

RECROSS-EXAMINATION

Questions by counsel for LCDR Hecker, party:

Q. Mr. Lachance, I would like to ask with reference to what was done after your received the last message from THRESHER and heard what you have testified to as being a blowing sound, (1) do you know whether or not UQC checks were instituted at regular intervals?

Unclassified

A. We had told the THRESHER prior to his starting his test dive that we wanted a UQC check at least every 15 minutes and his course changes. The UQC checks were much more frequent than this, however. I would say at about five minute intervals we were in communication with each other.

Q. Directing your attention to the next to the last message and the blowing sound, did SKYLARK then continue with UQC checks in an effort to re-establish communications?
A. Yes, sir. The Captain said he wanted UQC checks every minute, and we also had sonar keying. I've forgotten what we were keying at the time, but the meaning was equivalent to establishing communications.

Q. Do you recall whether or not the Commanding Officer directed that radar sweeps be made?
A. Yes, sir.

Q. Do you know whether or not the Commanding Officer directed that radio checks be instituted?
A. I do not recall this, sir.

Q. Directing your attention to Exhibit 16 in evidence before the court of inquiry, I would like to ask you to read the 1100 entry from the UQC Log of SKYLARK on date of April 10, 1963.
A. The time is 1100. "TO WAR CLUB FROM DIPPER SIERRA. INDICATE YOUR POSIT OR PREPARE TO SURFACE. ACKNOWLEDGE WITHIN 10 MINUTES OR WILL INITIATE SUBMISS."

Q. Is that message repeated?
A. Yes, sir.

Q. At what times is that message repeated?
A. At the times 1106, 1108, 1115, and 1121.

Q. And would you read the entry at 1129 from the UQC Log?
A. The time is 1129. "TO WAR CLUB FROM DIPPER SIERRA. HAVE INITIATED SUBMISS. INDICATE YOUR POSITION. ACKNOWLEDGE."

Q. Now, is there an entry at 1138 that purports to be the same message, and if so, would you read it?
A. As it is written here?

Q. Yes, exactly as written in the log.
A. The time is 1138. "TO HAOQ. FROM NJOF. HAVE INITIATED..." and then there's an arrow indicating the previous message, and the "...ETC. KING."

Q. Who is HAOQ?
A. I don't know, sir.

Q. Now, is there an entry at 1209 that purports to be the same as the message at 1129, and if so, would you read the entry?
A. Yes, sir. The time is 1209. "TO WAR CLUB. FROM DIPPER SIERRA." The entry here is "SAME AS DS 1129," which is "HAVE INITIATED SUBMISS. INDICATE YOUR POSITION. ACKNOWLEDGE."

Q. Would you read the 1217 entry?
A. The time is 1217. "TO WAR CLUB. FROM DIPPER SIERRA. HAVE INITIATED SUBMISS. INDICATE YOUR POSITION. ACKNOWLEDGE. OVER."

Q. Does the UQC log indicate that that message was sent out at regular intervals thereafter via the UQC?
A. Yes, sir.

Q. Did you hear any of those messages go out over the UQC?
A. Yes, sir.

Q. So you know that they did go out of your own personal knowledge, not just relying on the UQC log in evidence before this court?
A. Yes, sir.

Q. Mr. Lachance, you have testified regarding grenades. Do you know whether or not grenades were used by SKYLARK on this date, April 10, 1963?
A. Yes, sir.

Q. Do you know how many grenades were used and at what intervals?
A. Three grenades were dropped at 10 minute intervals.

Q. And what signal is that?
A. To indicate your position, or surface.

Neither the counsel for the court, the court, nor the party desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement.

WITNESS: In the period of time that's followed since we've lost THRESHER, I've gone over the details, and to the best of my recollection at this moment, I can't think of anything else which might add to the mystery surrounding THRESHER's loss. If possible, I would like to comment on Captain Hecker, if the court would permit it.

PRESIDENT: You are permitted at this time to say anything that you think has a bearing on this inquiry.

WITNESS: I might -- I would like to go back -- SKYLARK recently went through a yard period, at which time we had a change of command in November. Captain Fiore had then taken command. He was killed in an automobile accident on 2 January, at which time Captain Hecker took command. One of the things which impressed me, and I made a note of it that if I should ever find myself in a position such as Captain Hecker's, I thought it would be a good policy to do this. He held an Admin inspection in all departments on assuming command. At the time, he was living aboard, and his family was still in New York. I was impressed with the reading that he did as far as SKYLARK's Organization Manual was concerned. It was not uncommon to go into his cabin at late hours and find him pouring over these. Knowing he had been Executive Officer and was quite familiar with the ship's organization, it impressed me that he should take the extra trouble to go back over these.

In the period that followed, one incident stands out quite clearly in my memory. We were conducting diving ops at Block Island Sound, and the Executive Officer was stricken with oxygen poisoning. He was put in the chamber and at the time we had set special sea detail, and I went to the bridge and took the deck. I was considering how we could break our mooring. So I asked the Captain if he wanted to cut the nylon line aft and hitch it forward on the anchor. He said, "We are doing all we can for him. Tell those people on deck to take their time, and we will do the best we can." I was impressed with his calmness at that time. I think I would have cut the nylon, although I see now that there was no need for it.

Also, there have been little crises that have come up in the past, being engineer of the SKYLARK, and it has always been a pleasure to me to go up to the bridge and have the Captain very calmly let me handle the thing myself and show a little confidence in my ability. After the THRESHER incident, he called me up to his cabin and informed me at the time to tell the truth and that everything would be all right. That's all I have, sir.

The witness was duly warned concerning his testimony and withdrew from the courtroom.

(b) (6) , Chief Hospital Corpsman, U. S. Navy, was called as a witness for the court, was informed of the subject matter of the inquiry, was advised of his rights under Article 31, Uniform Code of Military Justice, was duly sworn, and examined as follows:

COUNSEL FOR THE COURT: This is a closed session of the court, and you can answer the questions fully and freely and include classified information in your answers. If you don't understand the question put to you during the examination, don't try to answer it, but make your lack of understanding known to us so that we can make it clear before you do answer the question.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, grade, organization, and present duty station.
A. (b) (6) , Hospital Corpsman Chief, U. S. Navy, stationed aboard the U.S.S. SKYLARK, ASR-20.

Q. Would you spell your last name?
A. (b) (6)

Q. Directing your attention to the 10th of April 1963, to the morning hours of that day, did you stand a watch in SKYLARK?
A. Yes, sir.

Q. What watch did you stand?
A. Junior Officer of the Deck.

Q. At what time?
A. I had the 8:00 to 12:00 watch.

Q. And you assumed the watch when?
A. At 0745.

Q. Can you tell us a little bit about your naval background and experience, please?
A. I joined the Navy in 1948. I went to boot camp in San Diego, California. I went to hospital corpman school in San Diego in 1949. Then I went to the Naval Hospital in Bethesda, Maryland, and following that to the Naval Air Station, Anacostia, Washington, D. C. Then I was transferred to the Marines in 1951 during the Korean conflict. I went to Camp Pendleton for training and was transferred to Korea with the First Marine Division, where I spent thirteen months. I came back to Camp Pendleton then for approximately three months. From Camp Pendleton I went to Texas, where I went to Diver's School. From Diver's School I went to Pearl Harbor. After Pearl Harbor, I came to Texas, and from Texas I went to the Naval Hospital, Portsmouth, Virginia, for ten months school, after which I went to the Naval Weapons Plant, Washington, D. C. I was then assigned to the U.S.S. FULTON at State Pier. Then I was sent to the U.S.S. PROTEUS in Holy Loch, Scotland. Then I was assigned to the U.S.S. SKYLARK.

Q. Turning back to the morning of 10 April and to the watch which you stood in SKYLARK, did you hear any of the messages going back and forth over the UQC between SKYLARK and THRESHER?

A. Yes, sir.

Q. What do you remember of them?

A. I recall the last one - not verbatim, but I recall that the words came through that they were experiencing difficulty and also that they were attempting to blow. To the best of my knowledge, those are the only words I can truthfully swear that I heard.

Q. Those were the only words that you heard the whole morning?

A. Well, prior to that, there was other talk over the UQC when we were getting 15 minute checks, and they were giving us their depths as they were going down. They were giving us their depth changes.

Q. Will you look at Exhibit 16, the UQC log, and refer to the entries of the morning of 10 April during your watch, and see whether it refreshes your memory as to any of the transmissions recorded there?

A. I remember this: "AM PROCEEDING HALF SET..." Well, he's got, "AM PROCEEDING HALF SET DISTANCE."

Q. That was an entry made with no time attached which occurred shortly after 0809?

A. Yes, sir, shortly after I came on watch. I remember this one (indicating).

Q. That's "PROCEEDING TO TEST DEPTH MINUS 300"?

A. That's correct, sir.

Q. That was entered at 0835?

A. Yes, sir. I remember, "PROCEEDING TO TEST DEPTH," but I don't remember anything else until this one down here.

Q. Which says, "HAVE POSITIVE UP ANGLE"?

A. Well, I wouldn't say that, because I didn't hear "POSITIVE ANGLE...."

(b) (6) relieved (b) (6) as reporter at this point.

Q. What did you hear?
A. I just heard, "Experiencing minor difficulty," or words to that effect, and "Attempting to blow." I did not hear, "Positive up angle."

Q. How many watches had you stood prior to that on the bridge?
A. On the USS SKYLARK, approximately, I'd say, about six to eight watches as JOOD.

Q. Had you had previous experience in listening to UQC transmissions?
A. On the SKYLARK?

Q. Or anywhere else?
A. On the USS COUKAL in Pearl Harbor, and on the USS SKYLARK.

Q. Do you think your familiarity with UQC was such that you could distinguish and interpret noises, other than words which you hear, as background?
A. No, sir.

Q. Where were you standing on the bridge at the time you heard the last message from THRESHER?
A. I was approximately between the amidships and the PPI, which puts me on the starboard side of the ship.

Q. After the last message received from THRESHER, state what happened during the remainder of your watch.
A. Well, as far as I could see, I thought it was a normal watch. I wasn't too much alarmed on the bridge. There was no, what I call, panic; absolutely no panic whatsoever. I have been on these runs before and there is times when they have no communications between the surface and the submarine; so I didn't move from my spot at all, normally, where I stand. It was calm weather so I had no need to move from there. And everything went normal. We continued the checks. And I don't exactly remember when we started giving them more frequent checks, but it changed from fifteen minutes to more frequent checks on them. It was a normal watch to me. I thought it was just training.

Q. Did you remember hearing any discussion after that last message you told us about, as to whether anyone had heard breaking up sounds?
A. Yes, sir.

Q. When did you hear that, and what did you hear?
A. Well, I heard several people on the mess deck saying that they heard breaking and crushing sounds. I can't name the individuals because I don't remember who exactly they were, but the word was out about the next day.

Q. The next day, but you heard nothing during your watch; is that correct?
A. No, sir, not during my watch.

Q. Did you hear anything during your watch in the way of discussion as to whether or not to send off a SUBMISS message?
A. Yes, sir.

Q. When did you hear it and what did you hear?
A. Mr. Goldsmith came up to the bridge and the Captain was the one that said, "Initiate SUBMISS," and Mr. Goldsmith went down and came back with a bunch of instructions and books to get this message drafted, I assume.

Q. Can you estimate the time of that incident for us?
A. Oh, I would say approximately one hour, perhaps less.

Q. One hour after what?
A. After that message.

Q. The message that said--
A. The last message--

Q. That you heard?
A. That I heard.

Q. The one that said, "Experiencing minor difficulties"?
A. Yes, sir.

Q. What was Mr. Goldsmith's job?
A. He was the Operations Officer.

Q. Was the Captain in the pilot house continuously during your watch?
A. When this message came through the UQC, the Captain was not on the bridge, but after we sent a messenger down to get him, then he stayed on the bridge there for about three days straight.

EXAMINATION BY THE COURT

Questions by the president, VADM Austin:

Q. (b)(6), where did you get your Purple Heart?
A. Korea, sir.

Q. Presidential Unit Citation, same place?
A. Yes, sir.

Q. First Marine Division?
A. Yes, sir.

Q. You have seen some real fighting.
A. Yes, sir, I was right next to it.

PRESIDENT: You evidently did all right or you wouldn't be wearing those two ribbons under those circumstances.

CROSS-EXAMINATION

Questions by counsel for LCDR Hecker, party:

Q. Chief (b)(6), how long have you served in SKYLARK?
A. I reported aboard for duty in June, 1961.

Q. Did you have prior service in SKYLARK?
A. Five weeks IAD from the USS FULTON.

Q. How many years service do you have in the Navy?
A. Approximately fifteen years, sir.

Q. I would like to ask you to tell the court what orders, if any, you received from the Captain later on in the afternoon regarding the use of any monitoring instruments to detect radiation.
A. Well, after I got off watch, it was determined that the USS THRESHER probably went down and that there was a possibility of radiation sources on the surface of the water, so the Captain called me up on the bridge and asked me to get the AN/PDR-27FOX and to go on main deck, walk around, and take readings. And I got Boatswain's Mate Mowen to go to the forward part of the ship with a line tied to a bucket, and when the ARS found the oil slick, we headed for it and I was taking readings. Then Mowen grabbed several samples of water with this bucket, which I monitored. We had some jars to save some samples. Then I came up to the bridge and I told the Captain I couldn't find any radiation over what I considered background for the SKYLARK.

Q. Was this activity of yours carried out in accordance with a regular bill in existence in SKYLARK, or was this a direct order from the Captain to carry out these activities separate and distinct from a regular bill that you might have?
A. No, this was not a bill on the ship. This was something the Captain wanted investigated; and he also sent me down to the engine room level to check the water source into the sea suction to the engines, and those areas below the water line, which I did not find any source other than background, or half milli-Roentgen reading.

Q. As a member of the Chief Petty Officers' Mess on the USS SKYLARK, and one of the leading petty officers in the ship, have you formed any opinion whatever regarding the Captain's performance of duty?
A. Well, no opinion, but I can say a lot of fact about the Captain since I've been aboard. I know he trusts me, and I trust him very much. There is no doubt that any order he gives me, I'll carry it out without any question about it. He's a perfect gentleman. I've never seen him raise his voice to anyone. I've never heard the Captain curse anywhere. He's very sharp as far as dress. Well, I'm also a diver, and Mr. Kaltenborn was my diving partner. When Mr. Kaltenborn had a convulsion forty feet out in Long Island Sound and I was his diving partner, and the Captain was back there, and he had a lot of faith and trust and knows the chiefs know their jobs, and let the Master Diver and Diving Officer do their job while he just stood by and watched, and he never panicked. I never seen the Captain panic. I've seen it rough up on the bridge, when he has to move from place to place, and in one instance he had to move into this particular spot and he told a seaman, "Excuse me, son, I've got to get in there." And I've been on several ships, seen several Captains, and right now I'd say that Captain Hecker is the top, the best, the best I've served with.

Q. What can you say about the morale on the SKYLARK at this time?
A. Very high, sir. It's the highest I've seen it, and I've been on it for almost two years.

Q. Now, you were with the Marines in Korea in combat. You followed your officers there. Do you have the same feeling regarding Captain Hecker? Would you follow him?

A. I'd follow a man who I can trust, who I know knows his job, who I know can get me through anything. I would willingly follow the Captain to--well, I think the worst place is Hell, and I'd follow him there.

Neither counsel for the party, counsel for the court, nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement:

WITNESS: Admiral, I have nothing further on the THRESHER, just comments on what I've heard on television and newspapers, that they have made the Captain look like a villain in this matter, and I sincerely say that I know, to the best of my knowledge, and from my experience, that he at all times performed his duties with the highest military standards. And I think a lot of the Captain in the short time I've known him. I don't get any special rewards, nothing special. I'm just a human being serving under him and he treats me that way. And I just hate to see the newspapers do him that way because it's a shame; it's not true.

PRESIDENT: Well, I trust that you appreciate that what you see in the newspapers, one has to take as coming from newspapers. This court has not villified your Captain; and this court told the press only the truth, and that was that your Captain's performance had become a subject of inquiry and to protect his rights, he was being made a party to the court. And that was all that this court told the press. So, any distortion that you may have heard of what you consider to be the truth is not the doing of this court. We deal in truth here, not in distortions.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

The court recessed at 1253 hours, 13 May 1963.

The court opened at 1355 hours, 13 May 1963.

(b)(6) , Quartermaster Second Class, U.S. Navy, was called as a witness for the court, informed of the subject matter of the inquiry, advised of his rights under Article 31, Uniform Code of Military Justice, duly sworn, and examined as follows:

COUNSEL FOR THE COURT: (b)(6) , this is a closed session of the court and classified information can be given here by you, so answer the questions fully and without regard to classified matter. If you do not understand a question put to you, don't hesitate to say so and to request that it be repeated and explained to you so that what we get from you will be the whole truth necessary for our understanding of what happened to THRESHER.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, rate, organization and present duty station.
A. My name is (b) (6) , Quartermaster Second Class, United States Navy. I am attached to the USS SKYLARK (ASR-20).

Q. How do you spell your last name?
A. (b) (6) .

Q. When did you report to the SKYLARK for duty?
A. I reported to the SKYLARK for duty on March 15, 1963.

Q. Very briefly, what has been your naval service before that?
A. Prior to reporting to the SKYLARK, I was attached to the USS SPRINGFIELD since Boot Camp.

Q. And when was that?
A. I came in the service in September of 1959--September 14th.

Q. Referring now to the 10th of April, 1963, did you have the eight to twelve watch in the SKYLARK?
A. Yes, sir, I did.

Q. What were your duties?
A. My duties were Quartermaster of the Watch, sir.

Q. Where did you stand those duties?
A. I stood the watch mostly at the Quartermaster's Desk.

Q. Where is the Quartermaster's Desk?
A. The Quartermaster's Desk is on the right side of the pilot house, just a little forward of the fathometer.

Q. Were you in a position to see and hear what transpired inside the pilot house during your watch?
A. Yes, sir, partially.

Q. Partially?
A. I could hear what was going on mostly.

Q. I show you Exhibit 34, the Quartermaster's Notebook of SKYLARK and refer you to the entries made for the eight to twelve watch for the 10th of April 1963, beginning with an entry marked, "0747"; are those your entries?
A. Yes, sir, they are.

Q. And do they end with the last entry, "1149," below which you have signed your name?
A. Yes, sir.

Q. Are they true and correct and complete, to the best of your knowledge and understanding?
A. Yes, sir, they are.

Q. How did you record the times for the entries in your Quartermaster's Notebook?
A. I used a comparing watch, sir.

Q. You used a comparing watch?
A. Yes, sir.

Q. When had you set that watch during your eight to twelve watch?
A. I hadn't set the watch on my watch.

Q. Had you compared it when you relieved the watch?
A. No, sir, I hadn't.

Q. Have you any idea as to whether it was keeping accurate time or not?
A. Yes, sir, to the best of my knowledge, it seemed to be keeping pretty good time.

Q. Now, how did you determine what minute to designate for an entry in your Notebook?
A. I take the time on the watch, like 9:11, and the seconds, all the way up to fifty-nine of that eleventh minute; and then I will go to the next minute.

Q. In other words, if there was something you needed to log and you glanced at your comparing watch and the watch read two minutes and fifty-five seconds, you would log that as two minutes?
A. Yes, sir, I would.

Q. Now, referring to the entries made during your watch, are they all in your handwriting?
A. Yes, sir, they are.

Q. I refer you to the entry on the 10th of April alongside of the time, "0908 R/FULL RUD." Then an asterisk, and then the words: "RECEIVED WORD FROM THRESHER OF DIFFICULTIES IN CONNECTION WITH DEEP DIVE."
A. Yes, sir.

Q. When did you record that line?
A. This line, beginning with "RECEIVED WORD FROM THRESHER OF DIFFICULTIES IN CONNECTION WITH DEEP DIVE," I recorded about 0914, or thereabouts. It was--I'd say, it was about three or four minutes after the 0911 that I entered that.

Q. You recorded all after the asterisk at around 0914?
A. Yes, sir.

Q. Why did you put a belated entry into your log?
A. Well, sir, when the word came over, I glanced at my watch and I noticed the time was 0911, but instead of making the entry right then, I was interested in what was being said, so I didn't put it in immediately then. Actually, I was a little stunned myself because I had never gone through a thing like this. This was kind of new to me. So, at 9:15, or 9:14, I put it in, though I had an entry at 9:11 that I put in. Even though this happened at the same time, I put it in later with an asterisk to note that it went to 9:11.

Q. At 0914 you put the belated entry into the log book, which is preceded by an asterisk. At 0914, when you wrote that, did you have an asterisk alongside that, or did you put that in at some later time?

A. No, sir, I put that in immediately when I put this in. I wrote an asterisk, then I recorded that. Then I put the asterisk at 0911.

Q. Now, you didn't hear that message until 0914?
A. No. I heard the message, sir, but I didn't put it in till 9:14.

Q. When did you hear it?
A. I heard it at 9:11, sir.

Q. You heard it at 9:11?
A. Yes, sir.

Q. Now, you have an entry for 9:11, "A/E STOP"?
A. Yes, sir.

Q. When did you put that entry in?
A. At 9:11, sir.

Q. Then, why did you have an asterisk alongside of it?
A. Well, this asterisk is to note this came here (indicating on Exhibit 34).

Q. Why could you not have put in the words: "Received word from THRESHER," et cetera, after the 0911 entry if you received it at 0911 and before the next entry, which is 0915?
A. That I don't know, sir. I don't know why I did that. I looked back to 0908 and I knew I had a little bit of space there, so I put it in right there.

Q. But you had a lot of space alongside of 0911, which is when you heard it?
A. Yes, sir, I did. I probably could have squeezed it in there, but I didn't. I put it in at 0908.

Q. Would there have been any squeezing to do if there were no entries following 0911?
A. Well, sir, this time was 9:14. Now, I'm not positive it was 9:14. It could have been 9:15, or it could have been after this entry that I decided to put it in. I'm not positive about the time. I'd say it was three or four minutes after I heard the word that I put it in.

Q. I am interested now in what you heard in the message from THRESHER. Do you remember exactly what words you heard?
A. Well, sir, the closest I can come to it--not exactly--I don't think I could remember exactly but, to my best knowledge, the word was: "DIPPER SIERRA, THIS IS WAR CLUB. WE ARE EXPERIENCING MINOR DIFFICULTIES WITH POSITIVE UP ANGLE. AM ATTEMPTING TO BLOW UP."

Q. Now, the UQC Log records receipt of a similar message at a different time from the time that you say you heard it. Of the two, which would you say is the more accurate so far as time goes?
A. I'd say my time, 0911.

Q. The UQC Log shows a 0912 CERTRUDE check and then two other transmissions which ended with "KILO," and then records the message. In other words, there are two messages in between 0912 and this one. Did you hear any of these?
A. No, sir, I can't say that I did.

Q. Do you think the UQC Log is mistaken and that there were no messages?
A. No, sir. There must have been messages. I heard the communications all morning long, but no specific message that I was paying attention to at the time until I heard that they had difficulty; that's when I turned around and paid attention to the UQC.

Q. What time do you have recorded in the Quartermaster's Notebook for the start of the deep dive by THRESHER?
A. I have 0747, sir.

Q. Now, that compares exactly with the UQC Log, so your clocks, your watch and the clock used by the UQC logger would appear to have been in harmony at that time?
A. Yes, sir.

Q. Would you say that it was possible that your belated entry of the message received from THRESHER about experiencing minor difficulty--
A. Could have been an error, sir?

Q. Could it be in error as to the time?
A. Yes, it could be. I'm not positive. But, to the best of my knowledge, it was 0911.

Q. Even though you didn't record it until some minutes later and you can't tell us how many minutes later?
A. No, sir, I can't say exactly.

Q. If you were so busy that you couldn't log it in at the time, how is it that you remember so superbly its time of receipt?
A. Well, it's rather a habit with me when I hear something coming over, I usually look at my watch first thing and then log it in after; but this message was more or less out of the ordinary, so I listened to the message before I made the entry, paid attention to the events going on around me before putting anything into the log.

Q. In fact, you paid attention for three or four minutes, did you not?
A. I heard the message and I looked around to see what was going on, but there was nothing else going on until the Captain came to the bridge a few minutes later.

Q. After you heard the message, "Experiencing minor difficulties," and so forth, did you hear any other message received from THRESHER after that?
A. No, sir, I didn't. I heard a garbled word, but I didn't hear any clear word that I could make out, myself.

Q. When did you hear the garble?
A. It was after the Captain had come to the bridge, and he went over to the UQC and was calling WAR CLUB to ask them if they had control.

Q. How long after you heard the message, "Experiencing minor difficulties . . .," would you estimate elapsed before the Captain said, for the first time, "Are you in control?"
A. I'd say a matter of two or three minutes at the most. That's only my own estimate, but I'd say two or three minutes.

Q. The transmission, "Are you in control?" is logged in the UQC Log a little after 9:15. Did you log it at all?
A. No, sir, I didn't.

Q. Subtracting two or three minutes from that would not bring it down to 9:11, would it?
A. Three minutes wouldn't, no; it would be 9:12.

Q. How many times did you hear the message: "Are you in control?"
A. I don't know for sure, sir.

Q. Was it once only?
A. No, sir, I think it was more than once. Possibly two or three times.

Q. Now, you heard a garble; was it after the last time the Captain repeated that message, or during the course of his repetition of the message?
A. I think it was during the course of his asking if they were in control that some word came back, but when he released his button, I think only two or three words came over, but I couldn't hear them. I heard a garble, but I couldn't make it out.

Q. Were you watching him?
A. No, sir, I wasn't.

Q. Have you had a chance to talk over the happenings that morning with other members of the crew?
A. Yes, sir.

Q. Do you think it might be as a result of your conversations that you came to the conclusion that he released the button and then you heard a garble?
A. No, sir. I think that actually happened. I know the button came up and then I heard a few garbled words, and that was it.

Q. You said, "The button came up." Did you hear the button coming up?
A. I heard a click, a sound on the UQC. It sounded like it must have been a button.

Q. How long was the garble that you heard; how many words would you estimate were included in it?
A. Oh, about two or three at the most.

Q. Even if you didn't hear them clearly, did you form an opinion as to what one or two of them might have meant?
A. No, sir, I didn't.

Q. Are you sure that they were garbled words and not other sounds coming from the loudspeaker?
A. No, sir, I'm not positive. I think they were garbled words, but I'm not positive.

(b) (6) relieved (b) (6) as reporter at this point.

Q. After that garble, did you hear any other message from THRESHER?
A. No, sir.

Q. Did you hear any sound after that garble which might have come from THRESHER?
A. No, sir.

Q. Did you hear any unusual background sound at all after that garbled message?
A. No, sir. Like I say, I haven't been on the SKYLARK very long and I am not familiar with that type of equipment. I am not even now. I have difficulty picking up and listening to the thing, I mean, if it is not coming in clearly.

Q. Would that be true, too, of the moments following receipt of a message, "Experiencing minor difficulties," et cetera, that you didn't hear any background noise?
A. No, sir, I didn't hear anything I could identify.

Q. After the last message, the garbled message, did you at any time on that day, or the following day, test your comparing watch for accuracy?
A. No, sir, I didn't.

Q. Did you remain on the bridge until nearly noon--in the pilot house?
A. Yes, sir, right close to noon.

Q. Did you hear any discussion about sending out a SUBMISS message?
A. I heard something about it, sir, but I wasn't paying too much attention to it.

Q. Whom did you hear discussing it?
A. This I'm not positive--I think it was the Captain and Mr. Goldsmith, but I wouldn't swear to that. I couldn't really positively say.

EXAMINATION BY THE COURT

Questions by a court member, Captain HUSHING:

Q. (b) (6) , do you make your entries into the Quartermaster's Notebook directly, or do you write them down on scraps of paper and then copy them in?
A. No, sir. On the morning of 10 April, I put the entries in just about direct. Occasionally, I'd have to put a few entries on scrap paper if I was taking the weather and something happened that I wasn't close to the log, I'd write it down, finish my weather rounds and then come in and log it.

Q. But on this morning you entered everything direct?
A. Yes, sir, this was directly.

CROSS-EXAMINATION

Questions by counsel for LCDR Hecker, a party:

Q. Do you know if the comparing watch was set against any time check that morning?
A. Yes, sir, I believe it was by a man named (b) (6).

Q. When you relieved as quartermaster of the watch, were you advised that the comparing watch had been set that morning?
A. I can't remember this, sir, but it seems to stick in my mind that somebody had said something--somebody said that it was set, but I am not positive.

Neither counsel for the court, the court, nor counsel for LCDR Hecker, a party, desired further to examine this witness.

The president informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

Raymond J. Hall, Seaman Apprentice, U. S. Navy, was called as a witness for the court, was informed of the subject matter of the inquiry, was advised of his rights under Article 31 of the Uniform Code of Military Justice, was duly sworn, and examined as follows:

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, rate, organization and present duty station.
A. Raymond Joseph Hall. I'm a seaman apprentice on the USS SKYLARK.

Q. Seaman apprentice, U. S. Navy?
A. Yes, sir.

Q. Hall, answer the questions which are put to you fully, even if your answer includes classified information; and if you don't understand any question put to you, don't hesitate to say so and request that it be repeated or clarified so that when you do answer us, you give us the full and complete answer. Do you understand?
A. Yes, sir.

Q. Now, how do you spell your last name?
A. H-A-L-L.

Q. And could you very briefly state your naval experience before reporting to SKYLARK?
A. Well, I just got out of boot camp.

Q. When did you report to SKYLARK?
A. A few days before Christmas, sir.

Q. That would be 1962, is that correct?
A. Yes, sir.

Q. On the 10th of April 1963, did you have the 0800 to 1200 watch in SKYLARK?
A. Yes, sir, I did.

Q. And what was your station?
A. I was at the helm, sir.

Q. During the 0800 to 1200 watch, did you happen to hear any messages sent or received over the UQC?
A. The only message that I heard was that they were experiencing difficulty and attempting to blow ballast, and that's all I paid attention to because I was at the helm at the time.

Q. Did you hear any discussion after that message about whether or not to send a message out of the ship telling them that a submarine was missing?
A. No, sir, I did not.

Neither the counsel for the court, the court, nor counsel for LCDR Hecker, a party, desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

(b) (6), Seaman Apprentice, U. S. Navy was called as a witness for the court, was informed of the subject matter of the inquiry, was advised of his rights under Article 31 of the Uniform Code of Military Justice, was duly sworn, and examined as follows:

COUNSEL FOR THE COURT: This is a closed session of the court. You can put classified information into your answers, if you need to, to make them full and complete. If you don't understand a question put to you by any member of the court or counsel, do not hesitate to say so, so that when you do answer the questions you will be telling the whole truth. Do you understand?

WITNESS: Yes, sir.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, rate, organization and present duty station.
A. (b) (6), seaman apprentice, (b) (6) I am on the USS SKYLARK.

Q. Is that seaman apprentice, U. S. Navy?
A. Yes, sir.

Q. How long have you been in the Navy?
A. Eight months, sir.

Q. When did you report to SKYLARK?
A. October '62--'62, sir.

Q. Now, on the 10th of April 1963, did you have the eight to twelve watch in SKYLARK?
A. Yes, I did, sir.

Q. What was your station?
A. I was messenger.

Q. Messenger of the watch?
A. Yes, sir.

Q. As such, where did you stand your watch?
A. On the port side next to the hatch.

Q. During the eight to twelve watch, was there a time when you were sent to get the commanding officer and ask him to come to the bridge?
A. No, sir.

Q. Did you hear any messages sent or received over the UQC gear?
A. I did not, sir.

EXAMINATION BY THE COURT

Questions by court president:

Q. (b)(6), you at no time heard anything over the UQC?
A. No, sir. I heard them talking back and forth, but I didn't hear any of the words that were spoken. I wasn't paying attention.

Neither the counsel for the court, the court, nor counsel for LCDR Hecker, a party, desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

Paul William DeShong, Machinist's Mate 1st Class, U. S. Navy, was called as a witness for the court, was informed of the subject matter of the inquiry, was advised of his rights under Article 31 of the Uniform Code of Military Justice, was duly sworn, and was examined as follows:

DIRECT EXAMINATION

Questions by counsel for the court:

Q. DeShong, this is a closed session of the court and if your answers need to have classified matter in them to make them full and complete, you can answer so; you can include classified information in your answers. If you don't understand a question put to you, do not try to answer it, but ask for a clarification. Do you understand that?
A. Yes, sir, I do, sir.

Q. State your name, rate, organization and present duty station.
A. Paul William DeShong, Machinist's Mate, First Class, U. S. Navy, USS SKYLARK, sir.

Q. How do you spell your last name?
A. D-e-S-H-O-N-G.

Q. When did you report to SKYLARK?
A. January of '60, sir.

Q. January, 1960. How long have you been in the Navy?
A. Twenty years, five months, sir.

Q. Directing your attention to the 0800 to 1200 watch, on 10 April 1963, were you on watch?
A. I was, sir.

Q. Where were you serving?
A. I was serving in the CIC, sir.

Q. What was your job?
A. Plotting, sir, supervisor.

Q. Who else was in CIC with you?
A. Another man by the name of (b) (6) , SKSN, sir. The first name is Robert. And (b) (6) .

Q. How much previous experience have you had in CIC work, including plotting and supervising?
A. Approximately two years, sir.

Q. Where were you with relation to the UQC gear?
A. In CIC, sir, plotting.

Q. Where is that in relation to the UQC loudspeaker?
A. Approximately ten to twelve feet from the UQC, sir.

Q. Was the door open in between you and the loudspeaker?
A. Fully open, sir.

Q. Could you hear talk going back and forth over the UQC during your watch?
A. Yes, sir.

Q. Can you remember having heard any particular message from THRESHER?
A. I heard one message, I repeat, heard one message, clearly and distinctly.

Q. What was that?
A. "We are experiencing minor difficulty."

Q. Can you tie the time down as to when you heard it?
A. Between 0900 and 0917, I would say, sir.

Q. Why do you end that with "0917"?
A. I plotted, sir, at 0900.

Q. You plotted what?
A. I began to plot at 0900, sir.

Q. But you didn't end plotting at 0917?
A. No, sir, I went on from there, sir.

Q. How do you happen to set that time as one of the terminal times?
A. For the simple reason the chart that I had plotted on, sir, was gathered, all these charts were gathered up and I had seen my chart, sir, and I was quite interested in my chart to begin with, and I recall a pattern we had laid out, sir.

Q. I'm not sure I understand you. Your chart was gathered up, but how do you know you heard that message between 0900 and 0917? Why couldn't it have been at 0919 or 0910?
A. I follow you, sir.

Q. That is what I want to know.
A. This I cannot clarify, sir. I have to perhaps think a while on this. I distinctly recall a pattern I had laid out on this chart, sir, on the paper starting from 0900 and in reference until 0917, it strikes a bell, but in what manner, I--

Q. Could it have been from discussing this very important matter afterward with members of the crew?
A. Yes, sir, positively, sir.

Q. Is it fair, then, to say that so far as your own recollection right now is concerned, you don't remember when you heard that message, except that it happened in your watch?
A. No, sir--no, sir.

Q. What is your best recollection?
A. The time element of 0900, sir, and 0930, within this time element here, sir, this recalls--I recall a great deal in this manner, sir. I am positive.

Q. You are positive of what?
A. Of perhaps the THRESHER going down at this time.

Q. I see. Did you have any radar contact after hearing that message?
A. That, I can't comment on. I don't recall right now, sir.

Q. I show you this book. Do you recognize it?
A. Yes, sir.

Q. Is this the CIC contact log of the USS SKYLARK which was in use on the 10th of April 1963?
A. Yes, sir, that's it.

Q. Does it refresh your memory at all, after you've looked at it as to whether or not you had any contacts?
A. Not on my watch, sir. "Not on my watch, sir."

Q. It does refresh your recollection?
A. Yes, sir.

Q. And as a result of having your recollection refreshed, can you now answer whether you had any contacts?
A. No, sir, no contacts.

Q. None during your watch?
A. No, sir.

Q. Did you check visually to see if there were any visual contacts after hearing that message?
A. Yes, I positively did, sir.

Q. What was the result?
A. Nothing, sir.

EXAMINATION BY THE COURT

Questions by a court member, CAPT HUSHING:

Q. DeShong, did you finish telling us about the message you did hear? You said you heard distinctly a message, "Having minor difficulties" or words to that effect.
A. Would you repeat that again, sir?

Q. Will you tell me again exactly what message you did hear from THRESHER to SKYLARK on the UQC?
A. The message I distinctly heard, sir, was: "We are experiencing minor difficulty."

Q. And that is all?
A. Yes, sir.

Neither the counsel for the court, the court, nor counsel for LCDR Hecker, a party, desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated as follows:

WITNESS: The only primary concern I have, sir, and I imagine you gentlemen are all aware of it, was the discoloration of the water in the shallower depths. I would say this was on the 8th of April. This concerned me, as it did the Captain, sir.

PRESIDENT: As I recall the evidence, that was sort of a murky discoloration beneath the surface of the water, was it not?

WITNESS: Yes, sir, it was. Yes, sir, it was.

PRESIDENT: And it was between the SKYLARK and the THRESHER at the time, wasn't it, when it was first discovered?

WITNESS: Yes, sir, Admiral.

PRESIDENT: But the THRESHER knew of this and could not account for it, nor could you, but still you think this was an interesting connection with the THRESHER was that murky water, do you?

WITNESS: I would say so, sir, because when the Captain had noticed this and myself--we were standing together, incidentally, sir, and our distance was approximately nine thousand yards from this area. The Captain did come about, went alongside, and the first thing I recall the Captain saying was that it had an acid smell to it, smelled like acid. I also recall the Captain saying, sir, that he had contacted the THRESHER in regard to discharging anything through their GDU.

PRESIDENT: This is all you can tell us about it?

WITNESS: Yes, sir.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

(b) (6) , SKSN, U. S. Navy, was called as a witness for the court, was informed of the subject matter of the inquiry, was advised of his rights under Article 31 of the Uniform Code of Military Justice, was duly sworn, and examined as follows:

DIRECT EXAMINATION

Questions by counsel for the court:

Q. (b) (6) , this is a closed session of the court; you can divulge classified information to make your answers full and complete. If you don't understand any question put to you, don't answer it, but tell us that you don't understand it and ask to have it explained so that the answers you do give us are full and complete and true to the best of your ability. Do you understand?
A. Yes, sir, I do.

Q. State your full name, rate, organization and present duty station.
A. (b) (6) , SKSN. I'm attached to the USS SKYLARK. My serial number is (b) (6)

Q. Your rate is storekeeper striker seaman, U. S. Navy, is that correct?
A. Yes, sir.

Q. When did you enter the Navy?
A. June the 22nd, 1960.

Q. When did you report for duty in the SKYLARK?
A. July 16, 1962.

Q. Now, directing your attention to the 10th of April 1963, were you on watch in the 0800 to 1200 watch that day?
A. Yes, sir, I was.

Q. What was your station?
A. Radar operator.

Q. What time did you assume your duties?
A. 0745.

Q. Where did you stand your duty?
A. In CIC.

Q. How close would you say your station in CIC was to the UQC loudspeaker?
A. Fifteen feet.

Q. Was there a door in between you and the loudspeaker which remained open during that watch?
A. Yes, sir.

Q. Do you remember having heard any transmissions over the UQC?
A. Yes, sir, I did hear a transmission.

Q. Do you recall any of the transmissions you heard?
A. Yes, sir, I recall one.

Q. Tell us what you heard and when you heard it.
A. Well, I don't know the time; I heard that they were attempting--this was from the THRESHER to us--they were attempting to blow up and they were having minor difficulty.

Q. Did you hear any others?
A. No, sir, I didn't.

Q. You heard them but you don't remember them, or you didn't hear them?
A. Well, I don't remember them.

Q. How do you spell your last name?
A. (b) (6)

Neither the counsel for the court, the court, nor counsel for LCDR Hecker, a party, desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

(b) (6) , Electronics Technician Third Class, U. S. Navy, was called as a witness for the court, was informed of the subject matter of the inquiry, was advised of his rights under Article 31, Uniform Code of Military Justice, was duly sworn, and was examined as follows:

Unclassified

DIRECT EXAMINATION

Questions by counsel for the court:

Q. (b) (6) , this is a closed session of the court and classified information can be divulged here.
A. Yes, sir.

Q. Therefore, you will make your answers true and complete and you may include classified information if necessary to make them so.
A. Yes, sir.

Q. If you don't understand any question put to you, don't answer it, but ask to have it explained so that when you do answer us, we will know you are giving a full and complete response to the question.
A. Yes, sir.

Q. State your name, rate, organization and present duty station.
A. My name is (b) (6) . My rate is ET3. I am in the U. S. Navy, aboard the USS SKYLARK.

Q. How do you spell your last name?
A. (b) (6)

Q. When did you report to SKYLARK for duty?
A. December 7, 1961.

Q. How much total naval service do you have?
A. Three years, six months.

Q. Directing your attention to the morning of 10 April 1963, did you stand a watch in SKYLARK?
A. Yes, sir, I did.

Q. What watch did you have?
A. I had the watch in Combat Information Center.

Q. Is that the 0800 to 1200 sonar watch?
A. Yes, sir.

Q. What time did you assume the watch?
A. I assumed the watch at 0730.

Q. Where is the sonar equipment located on board SKYLARK with relation to the UQC loudspeaker?
A. It is aft of it, sir. It's in the after part of the bridge.

Q. Is the CIC aft of the pilot house?
A. Yes, sir, it is.

Q. How far away were you from the loudspeaker, would you estimate?
A. I would estimate approximately ten to fifteen feet.

Unclassified

Q. What is your experience with the sonar equipment which you were operating on the morning of 0800 to 1200 watch on the 10th of April?

A. I have operated it periodically since November when it was placed aboard.

Q. November of 1962?

A. November of 1962, yes, sir.

Unclassified

Q. Would you describe that gear for us?
A. It is a piece--the sonar gear is operating at a range of approximately 3750 yards. It operates on a frequency of 25.5 kilocycles, and it has two modes. It operates in either active or in passive and listen.

Q. How was it functioning during your watch on 10 April?
A. It was operating in active position when I assumed the watch.

Q. And how was its range and quality of operation?
A. It was very good, sir.

Q. Now you say "very good." Could you qualify that by telling us what the maximum range was that you could usefully employ during that watch?
A. Full range.

Q. Full range?
A. Yes, sir.

Q. That would be how far?
A. 3750 yards.

Q. Is a sonar log maintained aboard SKYLARK?
A. Yes, sir, it is.

Q. Would you describe the procedure for maintaining that log?
A. If a contact is made on sonar, the bearing and the range obtained from the sonar is entered in the log.

Q. Do you recognize this as the sonar contact log that you were using on the morning of 10 April? (Hands book to witness)
A. Yes, sir, I do.

Q. You may refer to it to refresh your recollection before you answer my question. Did you have any sonar contacts on the 0800 to 1200 watch on 10 April 1963?
A. No, sir we did not.

Q. Did you change the mode of operation of your sonar during the 0800 to 1200 watch?
A. Yes, sir, I did. I changed it five times.

Q. For what purpose?
A. When I received word that the THRESHER may have been in trouble, I made a sweep with this sonar in active position. I then placed it in the listen position to attempt to see if I might hear something. The results were negative so I again placed it in active. Then I again made another sweep with also negative results. I placed it in passive once again with no results and then again I put it in active.

Q. When was the first time you switched to passive?
A. It was approximately 0915 - 0917 the morning of that day.

Q. How do you fix the time?
A. I had received several attempts over the UQC to contact the THRESHER and at that time I glanced at my watch.

Unclassified

Q. Can you hear UQC transmissions through your sonar gear?
A. Yes, sir, we can,-ours, but we cannot receive theirs.

Q. I see. How many SKYLARK calls did you hear for the first three or four minutes after that 0915-0917 period when someone told you THRESHER was in difficulty?
A. I'd say better than at least half a dozen.

Q. Do you remember the wording of any of them?
A. Well, I remember one. Quoting as directly as I can it was: "War Club this is Dipper Sierra, Dipper Sierra, Gertrude Check, Gertrude Check. Over." And also, there was one with the same call, "War Club, War Club, this is Dipper Sierra, Dipper Sierra, are you in control, are you in control? Over".

Q. You heard "Are you in control?" twice?
A. Yes, sir.

Q. When was the last time you had been able to get a range and bearing on THRESHER with your gear?
A. It had been the previous day, sir.

Q. Did you have any difficulty at that time in getting a range and bearing?
A. Well, I should say - withdraw that last statement. It wasn't actually the previous day. The last contact was with the radar gear the previous day. However, we had no contact with the sonar either that day or the previous day.

Q. Would you tell us in some more detail the name of the sonar equipment and its characteristics?
A. The name of the sonar is a QHB Alpha. Its characteristics--as I mentioned before--it operates on a frequency of 25.5 kilocycles; it has a range of 3750 yards. It has what may be called two dead zones. One is aft approximately seven and a half degrees each side of the horizontal center line, and the other is 15 degrees each side of the vertical center line.

Q. Is the 15 degrees blind zone dead under the ship?
A. Yes, sir, it is.

Q. Where are the transducers for the UQC and the QHB located in relation to each other in SKYLARK?
A. They are located exactly one foot apart.

Q. Where is that?
A. That is the sound room.

Q. Based on your experience, would you say that the QHB, when in the active mode, would tend to blank out UQC reception?
A. No, sir, it would not.

Q. What do you base that on?
A. The sonar operates on a frequency that is higher than that of the UQC. Therefore, it would be practically impossible for the QHB to drown out the UQC.

Q. And what would be the effect of sonar operated in the passive mode on UQC reception and transmission?
A. No effect whatsoever.

Unclassified

Q. During your watch, did you receive, on your equipment, any communication or contact which you can identify as originating from THRESHER?
A. No, sir, we did not.

EXAMINATION BY THE COURT

Questions by a court member, Captain Nash:

Q. In previous testimony we have heard reference to sounds that were heard on the UQC- background noise or a change in background noise, perhaps; something that might have emanated from the THRESHER. Did you hear any sound at all on the QHB while you were in the passive mode that might have emanated from THRESHER?
A. No, sir, we did not.

Questions by a court member, RADM Daspit:

Q. You said that the QHB-A was operated at full range on that particular day. How could you tell that without any contact?
A. Well, the best way we can tell is the presentation on the screen, say any kind of interference in the water and such. We had no direct contact. We had nothing that would activate the sonar as a direct contact. However, we did have, shall we say, noise on the picture that did give me that opinion.

Neither the counsel for the court, the court, nor counsel for LCDR Hecker, a party, desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

(b) (6) , QMSA, U. S. Navy, was called as a witness for the court, was informed of the subject matter of the inquiry, was advised of his rights under Article 31 of the Uniform Code of Military Justice, was duly sworn, and examined as follows:

DIRECT EXAMINATION

Questions by counsel for the court:

Q. (b) (6), this is a closed session of the court and you can include classified information in your answers if you have to to make your answers complete. Don't answer any questions unless you fully understand them and don't hesitate to ask us to repeat or explain the question so that when you do answer a question you can make your answer full and completely responsive. Is that understood?
A. Yes, sir.

Q. State your name, rate, organization and present duty station.

Unclassified

A. My name is (b)(6) , QMSA. I am presently aboard the USS SKYLARK (ASR 20) in duty status.

Q. You are a quartermaster seaman apprentice, U. S. Navy?
A. Yes, sir.

Q. How do you spell your first and last names please?
A. My first name is (b)(6) . My last name is (b)(6) .

Q. When did you report for duty in SKYLARK?
A. I believe either September or October of the year '62.

Q. How long have you been in the Navy?
A. One year and one month.

Q. Directing your attention then to the morning of 10 April 1963, did you have the 0400 to 0800 watch on that day?
A. I did, sir.

Q. What watch did you stand?
A. I stood the 0400 to 0800.

Q. You stood a quartermaster's watch?
A. Quartermaster's watch, yes, sir.

Q. What time did you assume that watch?
A. Approximately 0345.

Q. Is it a part of your normal duties as quartermaster of the watch to check the accuracy of the bridge clock during your watch?
A. No, sir.

Q. Did you on the 10th of April check the accuracy of the bridge clock?
A. No, sir.

Q. Did you not reset the bridge clock on the morning of 10 April during your watch?
A. I did, sir.

Q. Tell us what you did?
A. At approximately 0430, which was twilight time that morning. I went down to the radio shack with the comparing watch and got a time tick from WWV, came back up to the bridge, and because I had an accurate time tick, I set the bridge clock. This time tick was taken for shooting stars.

Q. Do you remember the approximate reset required at that time?
A. I can't say exactly now, but it was about a minute.

Q. Had you previously reset the clock while standing other watches?
A. I believe I set it on the previous night. Also, on the four to eight watch at twilight.

Q. Do you remember how much of a reset was required at that time?
A. I can't say. I imagine it was also about a minute.

Q. It wasn't so large that you would remember the clock as being an inaccurate timekeeper, is that correct?
A. That is correct. That clock in the bridge has been pretty accurate so far.

Q. Have you watched it carefully since that time?
A. I have. We wind the clocks every Monday and every Thursday. And this particular clock loses not more than three minutes at the very most. I remember it once being three minutes off.

Q. In a week?
A. That is right, sir.

Neither the counsel for the court, the court, nor counsel for LCDR Hecker, a party, desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

The court then recessed at 1500 hours, Monday, 13 May 1963.

The court opened at 1508 hours, 13 May 1963.

All persons connected with the inquiry who were present when the court recessed are again present, with the exception of (b) (6) who was relieved as reporter by (b) (6) .

The court announced that this session of the court will be held with open doors.

Lieutenant (b) (6) , USN, was called as a witness for the court, was informed of the subject matter of the inquiry, was advised as to his rights under Article 31 of the Uniform Code of Military Justice, was duly sworn, and examined as follows:

COUNSEL FOR THE COURT: This is an open session of the court, Mr. (b) (6) , and members of the public are present. For that reason, classified information may not be divulged here. If as a result of a question put to you by either counsel or any members of the court, in your judgment a reply to that question to make it complete would necessitate the inclusion of classified matter, you will not answer the question but will so indicate instead. Is that understood?

WITNESS: I understand, sir.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, grade, organization and present duty station.
A. (b) (6) , Lieutenant, (b) (6) , U.S.S. SKYLARK.

Q. You are a Lieutenant, U. S. Navy, is that correct?
A. Yes, sir.

Q. How do you spell your last name?
A. G-O-L-D-S-M-I-T-H.

Q. State very briefly your naval background and experience.

A. My naval background as an enlisted man was as a boatswain's mate and a deep sea diver. I served aboard an ASR as a third class boatswain's mate -- correction -- coxswain, in 1948 and filled the billet of a deep sea diver. I served two years aboard this ASR and remained in diving billets throughout my naval career. Served another tour of duty of three years on the same ASR that I was on previously in 1948. Prior to coming to U.S.S. SKYLARK, I was First Lieutenant aboard U.S.S. SUNBIRD (ASR15). I went aboard this ship as a Warrant Boatswain. During my tour on the ship I went from Warrant to Lieutenant (junior grade). Last month I made full Lieutenant.

Q. When did you report to SKYLARK?

A. In July of '62, sir.

Q. What duties were you assigned?

A. Operations and Communications as primary duties.

Q. Directing your attention to the 10th of April 1963, when did you first come to the pilot house of SKYLARK after 0800?

A. I first came to the pilot house about 0800 for my first turn that morning; stayed very briefly; saw that operations were running smoothly and went back to the office.

Q. After 0800 what was the first time you came to the pilot house?

A. At about 0920.

Q. How do you fix the time?

A. When I arrived in the pilot house it was shortly after -- when I arrived in the pilot house I was informed by Mr. Watson that they had received a transmission from the THRESHER and in order to arrive at the time I did, they had put the time in the log as they had received it, this last message, and it was just a short period of time after this that I arrived.

Q. What did you do in the pilot house after 0920?

A. Shortly after I arrived, I had some material in my hand which I had to get out to the ship's office to secure; I was only gone momentarily, and then returned to the pilot house, and I stayed there for fifteen or twenty minutes. They were still trying to re-establish communications with THRESHER, and they had not after fifteen or twenty minutes. This would fix the time at 0940. I then went to the locker, which was in the passageway adjacent to the pilot house, and broke out NWP 37 and COMSUBLANT's OpOrder for SUBMISS-SUBSUNK, and the addendum to NWP 37.

Q. What time did you do that?

A. I affixed this time at about 0940.

Q. Were you requested to break out those documents?

A. No, sir, I did this of my own accord at this time.

Q. What did you do after breaking them out?

A. I turned to the effective pages, which would give us the instructions as to sending a SUBMISS message, and I asked the Captain at this time should we send a SUBMISS?

Q. What was his reply?

A. He said, no, not at this time, it is too early. He felt that we should wait until we were sure; that the only thing we were sure of at this time was that we had lost communications.

Q. Can you carry the narrative on from there as to what occurred next?

A. Well, the Captain directed the UQC operator to commence calling every minute or so on UQC and also send a CW. This instruction was also given to the sonar operator to commence CW calling on the sonar. Not too long after this he directed the First Lieutenant to break out hand grenades to commence explosive signals to try to re-establish communications and he had started his search in order to re-establish his communications.

Q. When did the subject of notifying the authorities that the submarine was missing next raise itself?

A. I'm trying to recall times now. It was about 1045, I believe. I was making a call and at that time the Captain told me to initiate a message, and here again I was slightly confused as to who to send the message to, because the OpOrder, SUBMISS-SUBSUNK, gave us instructions for sending messages inside the three hundred fathom curve. I informed the Captain of this fact and he said we would initiate the message to COMSUBFLOT TWO, New London, info. COMSUBRON TEN, and COMSUBLANT (ADMIN). Portsmouth. At this time we commenced preparing the message.

Q. Did the regulations require maintenance of a pre-positioned message?

A. Not to my knowledge, sir.

Q. You commenced preparing the message, then, at 1045?

A. 1045, I believe. I cannot be sure of this time.

Q. Tell us the sequence of events, with regard to that message from then until the time it was actually transmitted?

A. I asked the Captain if in preparing this message did he desire me to put anything in the message concerning the THRESHER's report "Have up angle, am attempting to blow up" correction "Have positive up angle, attempting to blow up". He said no, we would only send the message we received that was definite, that they were approaching test depth, and we also gave our location in the message, and the message is in evidence, I believe. I can't recall the exact text of the message at this time. The Captain and I drafted the message together in the rough. I went to the radio shack, which was one deck below the pilot house, and gave it to the radioman to be typed with an Op Immediate precedence.. He put his message blank into the typewriter and the first thing he inserted was the time-date group of the message, and then he typed the message from my rough. After he had completed typing the message I read this message over for correctness, I signed it as drafting officer, and then I took it back to the pilot house for the Captain to release. The Captain read the message over and he released it. I went back to the radio shack to get this message out. The radio operator had had his transmitter turned to 2210 kilocycles. as we had communications with NBL, New London earlier in the morning on this frequency and no problem had been experienced in communications, but at this time we could not raise NBL on 2210 kilocycles. He kept trying for several minutes to raise NBL with no success. I went back to the pilot house to inform the Captain that we were having difficulties in raising NBL, so the Captain instructed me at this time to try to contact Portsmouth or Boston or even to try to contact any marine operator. His words to me were "I don't give a damn how you get it out, Goldy, just get it out", so I then went back to the radio shack, directed the operator to shift his frequency to a Portsmouth frequency -- I don't recall the kilocycles at this time -- and he tried this with no success. After several attempts and he still had not established communications with Portsmouth or any shore establishment, he then shifted his transmitter to another frequency for NBL, I cannot recall the frequency, and was able to establish communications with NBL, New London. He managed to get the message through to NBL.

Q. Do you remember when he was able to do that?
A. I can't recall without seeing my radio log as to the exact time we established this communication.

Q. I show you this paper; do you recognize it as the Radio Log of SKYLARK for the time in question?
A. Yes, sir, I do.

Q. Does it refresh your recollection as to the time of transmission of the message to which you refer?
A. May I have one moment, sir? This time shows it to be about 1725Z when we were able to contact NBL, and we relayed it to him thereafter.

Q. 1725Z, what time local time in SKYLARK?
A. 1225 local, sir.

Q. You listed yourself as the drafter; who actually composed that message?
A. The message was composed between the Captain and myself, sir.

Q. Did Mr. Watson enter the discussion with respect to releasing a SUBMISS message?
A. The only information I received from Mr. Watson for the purpose of drafting this message was the longitude and latitude of our position.

Q. Was Mr. Watson present when you discussed the initiation of the SUBMISS message either the first time of thereafter?
A. Mr. Watson was in the pilot house during this time, so I cannot be sure that he heard my conversation with the Captain at all.

The court did not wish to examine this witness.

CROSS EXAMINATION

Questions by counsel for LCDR Hecker:

Q. Mr. (b)(6), referring again to the radio log, can you tell me at what time NBL, New London receipted for SKYLARK's message?
A. Time 1745 is the best I can determine from the log that NBL receipted for our message.

Q. That would be 1245 local time?
A. 1245, local.

Q. Did SKYLARK receive a message from Commander Submarine Flotilla TWO at 1340, local time?
A. From COMSUBFLOTTWO?

Q. Yes.
A. I have a message here, it was received at 1840; I don't recognize the call sign at this time.

Q. What is the text of that message?
A. Excuse me, it's 1842; I did receive a message.

COUNSEL FOR THE COURT: Be sure you don't give an answer which contains classified information.
A. At 1842 I received this 101840Z.

Q. What was the text of that message? It is unclassified, is it not?
A. Yes, sir, it is; I have it here "UNCLAS DESIRE ~~COUNSEL~~ CANCEL YOUR PRESENT OPS TO ASSIST IN ~~ASR~~ SAR. REQUEST YOU SEND SITREP."

Q. Cancel your present ops; is that the word, "Cancel"?
A. Yes, sir, "CANCEL YOUR PRESENT OPS TO ASSIST IN ~~ASR~~ SAR".

Q. Did SKYLARK at 1433 local time receive from COMFLOTTWO another unclassified message shown there in the radio log?
A. What time, sir.

Q. 1433 local time; 1933Z.
A. Yes, I ROGERED at 1433R.

Q. Is the text of the message contained in your radio log?
A. Yes, sir, it's a little harder for me to read it from the radioman's log than it would be from the typed up message, but I'll make the best of this: "UNCLASSIFIED. REQUEST FOLLOW. (A) INITIAL POSIT OF DIVE: (B) INITIAL COURSE AND SPEED OF THRESHER: (C) POSITION" he had errors in this last here and made this notation with a series of "E's"; I believe this to be "POSITION OF LAST CONTACT: (D) EXPECTED TIME OF COMPLETION OF DIVE: (E) DEPTH OF WATER OF SOUNDINGS AND SEA STATE", end of message.

Q. Mr. (b) (6) , I show you an official transmission appearing on a message blank and prepared in SKYLARK. Can you identify it as one of SKYLARK's copies?
A. I have no way of definitely identifying this as a copy from the U.S.S. SKYLARK.

Q. Did you take that packet of dispatches from the SKYLARK and give it to your Captain to give to me?
A. Yes, sir, this package of messages was made up from my original copies which have the routing stamp and all the officers' initials on it.

Question by the President:

Q. You are reasonably sure that this is a proper copy?
A. Yes, sir, unless somebody could have inserted another copy of a message before I left.

PRESIDENT: We will assume that they didn't do so.

COMSUBLANT unclassified message 101925Z of April, 1963, was offered in evidence, and there being no objection it was received as Exhibit 198.

Q. Mr. Goldsmith, I would like you to read the text of that message.
A. From COMSUBLANT to COMSERVLANT with info copies to others "UNCLAS. 1. USS THRESHER CONDUCTING DEEP DIVE SEA TRIALS WITH SKYLARK ESCORT AT 41-43N 64-57W. COMMUNICATIONS LOST AT 101417Z. 2. REQUEST DIVERT RECOVERY TO ASSIST SKYLARK IN SEARCH FOR THRESHER".

Q. Do you recall the time at which anyone in a position of authority in the United States Navy, senior to your Commanding Officer, initiated an Event SUBMISS?
A. It was late in the afternoon of the 10th; I would have to refer to the log again to give you the time.

Q. Would it show in your radio log there?
A. I don't believe it would, because I believe this message came to us by teletype, which would not appear in my radio log.

Q. Mr. Goldsmith, at which time, if you recall, did RECOVERY join up with SKYLARK? May I refresh your recollection by showing you the Quartermaster's Notebook in evidence?
A. At 1639R on the 10th we had a radar contact bearing 264, which was later determined, at 1717, to be the U.S.S. RECOVERY.

Q. Prior to that time had your Commanding Officer been designated by anyone in authority as the Senior Officer, Search Force?
A. I don't recall a specific message designating him Senior Officer Search Force.

Q. To whom did RECOVERY report when he arrived in the area?
A. RECOVERY reported to Commanding Officer, U.S.S. SKYLARK.

Q. Then it must be assumed, must it not, that someone in authority had designated him Senior Officer Search Force; is that correct or incorrect?
A. It can only be assumed, sir.

Q. Did you give RECOVERY any orders at the request of your Commanding Officer, or at his direction?

A. Yes, sir; as best I can recall, upon his arrival in the area, his orders from the Commanding Officer, SKYLARK, were to commence search in the area and try to re-establish communications. I believe RECOVERY informed us that he had no sonar or UQC capability, and it was shortly after this that RECOVERY reported that he was in an oil slick.

Q. Do you know, of your own personal knowledge, that this oil slick was reported to anyone in higher authority at this time?

A. Yes, sir.

Q. Were aircraft units directed to report to Commanding Officer, SKYLARK at this time as the Senior Officer Search Force?

A. Yes, sir.

Q. Did aircraft report?

A. Yes, sir.

Q. Were aircraft given any orders or instructions by Commanding Officer, SKYLARK?

A. Yes, sir.

Q. Did any other ships of the Navy later on report to the Commanding Officer, SKYLARK as Senior Officer Search Force?

A. Yes, sir.

Q. Can you name those ships?

A. U.S.S. LIND and U.S.S. ---, it's another destroyer.

Q. Did the U.S.S. YARNELL?

A. The U.S.S. YARNELL was the other one, yes, sir.

Q. Do you know at what time Commanding Officer, SKYLARK was relieved of duties as Senior Officer Search Force? Was it that evening, or the following morning?

A. It was the following morning, it seems like, around the hour of five o'clock on the 11th.

Q. At approximately 0500 in the morning?

A. Yes, that would be the approximate time; it wouldn't be the exact time.

Q. Now directing your attention back to the time 1122R, when SKYLARK first began calling NBL, New London. Were you in the radio shack at that time?

A. Yes, sir.

Q. How long did you remain in the radio shack thereafter?

A. I remained in the radio shack throughout the night, leaving occasionally to talk to the Commanding Officer, sir, on the bridge.

Q. Were messages being passed back and forth fairly rapidly, or was the traffic dull; what would you state to this Court of Inquiry as to your estimate of the message traffic that was being handled?

A. After we were directed to send SITREPS every fifteen minutes I asked the Captain to make me releasing officer, to release these messages, to relieve him of some of his workload which he was burdened with at the time. He designated me

releasing officer, but I still contacted the Commanding Officer for information through the 21MC prior to releasing them. This cut down our traffic between the radio and the pilot house. I was continuously writing messages; the radioman would no sooner have one out than I would hand him another one to transmit; it was continuous.

Q. Were these more than SITREPS? They consisted of messages to other ships and to aircraft; is this correct?
A. After the others started joining.

Q. From 1122 local time on the 10th day of April, were you almost continuously in contact with NBL, New London, thereafter?
A. After we first established contact with NBL we were in continuous contact.

Q. How many times did you mention specifically to your Commanding Officer the notion of including the next to last UQC message received from THRESHER in one of SKYLARK's outgoing dispatches?
A. At least twice, sir.

Q. And on each occasion did you and the Commanding Officer discuss it?
A. Yes, sir.

Q. Did he at that time give you any reasons why he was not going to include that particular message?
A. He told me that he did not care to send this message, which, as you referred to as the next to last message, I believe you're referring to "Have positive angle, am attempting to blow up", that we would send the last message received "Am approaching test depth", this could be a message that he understood to be approaching test depth and any other message that we would send regarding messages from THRESHER we would give after we got back in port if the Court of Inquiry should happen to derive from the loss of THRESHER, but the main thing at the time, his thought was to reestablish communications and try to relocate the THRESHER.

Q. When was the first time that you as an individual heard Lieutenant (junior grade) Watson's comments regarding noises that appeared to be crushing sounds, or similar to breaking up noises?
A. After SKYLARK's arrival in New London, the following evening watching television in my home.

Q. When did you first learn that SKYLARK was to be the escort, or the accompanying vessel for THRESHER during her test dive?
A. As best I can recall I received a message on the 6th of April from COMSUBFLOT/TWO, which was a change to SUBFLOT/TWO Weekly OpSched.

Q. The 6th of April was what day of the week?
A. It was a Saturday; I was the Duty Officer on board.

Q. At that time did you request instructions from anyone as to what your function might be when accompanying THRESHER?
A. I called the Operations Officer of COMSUBRON TEN concerning the operations with THRESHER, realized that we were to stand by in accordance with the message from SUBFLOTTWO during deep dive, but I was confused with this message as to how to prepare my movement report.

Q. Did you have occasion to talk to any officer in THRESHER?
A. Yes, sir; after talking to the Operations Officer of COMSUBRON TEN, he told me I should go ahead and call THRESHER, who was here in this Shipyard at the time. My concern was the time we were to depart the outer area; I needed this information -- the outer area I refer to is the deep dive area -- I needed this information to complete my movement report. I made this phone call to the Operations Officer of the U.S.S. THRESHER to obtain this information.

Q. Without touching on classified information, could you tell the Court of Inquiry the substance of your telephone conversation with the Operations Officer of THRESHER?
A. Yes, sir; on the phone call that I made the Operations Officer of THRESHER came to the phone and I told him what I was concerned with; there was no rendezvous point mentioned other than the shallow area and the deep area, and I told him my concern was what time we would have to be leaving the deep area so that I could put this in my movement report. He told me at this time that we would remain in the shallow area for approximately two and a half hours; he would release us; we would proceed independently to the deep area. We would not have contact with THRESHER during this transit. THRESHER would transit to the deep area submerged. He told me that he realized the slowness of SKYLARK's speed, that we would probably be late arriving on station, but "Don't worry about it." After we arrived I was to start calling him on UQC. Then after we arrived in the deep area we would remain for approximately twelve hours at which time we would be detached to proceed back to New London.

REDIRECT EXAMINATION

Question by counsel for the court:

Q. What period of time does that portion of SKYLARK's radio log cover that you have there?
A. This radio log commences of 0300Z on the 9th of April and it ends at 2249Z, 12 April.

EXAMINATION BY THE COURT

Questions by a member, RADM Daspit:

Q. You said that you called the Operations Officer of Submarine Squadron TEN; did you mean COMSUBDEVGRP TWO?
A. No, sir, I meant Commander Submarine Squadron TEN.

Q. The THRESHER was assigned to SUBDEVGRP TWO.
A. But COMSUBRON TEN issues SKYLARK's movement orders, sir. SUBRON TEN is our squadron commander, so that's why I contacted him.

REDIRECT EXAMINATION

Question by counsel for the court:

Q. What was the name of the THRESHER officer with whom you spoke?
A. I can't give you a name, sir; he identified himself as THRESHER's Op Officer. He did not pick up the phone immediately; someone called him to the phone for me.

Neither the counsel for the court, the court, nor counsel for LCDR Hecker wished to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement:

I don't think I have anything more to offer up to and including the time the THRESHER was lost. I could only summarize the events that occurred aboard SKYLARK in the subsequent hours after the loss of THRESHER and our actual actions aboard SKYLARK.

PRESIDENT: Was there anything during those hours that you think would be pertinent to the task of this court in determining just what happened?

WITNESS: As to just what happened to THRESHER, no, sir, I don't have anything else.

The witness was warned concerning his testimony and withdrew from the courtroom.

COUNSEL FOR THE COURT: Mr. President, while counsel for the court has other witnesses to call, he has none available and ready to be called for the remainder of this day. It is the normal procedure for counsel for the parties not to call witnesses until the end of counsel for the court's presentation of witnesses. Although that is the normal practice, provision is made for deviations from that practice whenever the business of the court can be served more expeditiously thereby. I understand that counsel for the party, LCDR Hecker, has witnesses available to be called at this time, and I have no objection to their being called, as I know the general nature of their testimony and believe that it would be useful to hear them now.

COUNSEL FOR LCDR HECKER: Mr. President, if it please the court, I would like to address the court before I call my witnesses.

PRESIDENT: The court will be very happy to be addressed by counsel.

COUNSEL FOR LCDR HECKER: Mr. President and gentlemen of the court, from the outset this court has bent over backwards to be fair to the fullest extent to Lieutenant Commander Hecker, and Lieutenant Commander Hecker authorized me to say at this time that his designation as a party was a further example of the court's fairness in this matter. By doing that, the court has given him full opportunity to exercise his rights as provided by our Naval Law. This is a right which perhaps he would not have were we serving in the Navy of some other nation.

He had also authorized me to state in open court that the mere fact that this court determined that his conduct was subject to inquiry and saw fit to designate him a party, does not in any way mean that he is being branded as a SCAPEGOAT, and not for one minute does he understand that to be the meaning of the action taken by the court. In view of the fact that the court has been so fair to us, I would like to ask the court to permit me to present Lieutenant Commander Hecker's evidence in my own way. I would first propose to call him and let him explain in detail his actions, the reasons therefor, and since it is conceivable that this court, after reviewing all the evidence, will still make a determination that he must remain as a party and maybe even subject to disciplinary action, I also wish to present to this court evidence of the type of naval officer that he is. This court is aware, I believe, that I as an individual, first began my service in the Navy in 1934 and terminated it in June 30, 1960. In working on this case I have had occasion to learn things about Lieutenant Commander Hecker's performance of duty that I feel this court should know in order to reach a reasonable judgment in their final determination.

Specifically, we who have served in the Navy know that very often statements in an officer's behalf can be made by individuals simply because the officer is "under the gun" so to speak. I went to the SKYLARK and I interviewed any individual who thought that he had something to contribute. I interviewed the officers, and to a man they wanted to come before this court and testify as to their Commanding Officer's performance of duty. I rejected that, not because I disbelieved their sincerity, but knowing the Navy as well as I do, and knowing this trend, this tendency of loyalty that our traditions have inbred in us, I felt that that might be suspect, so I talked with the chief petty officers of the ship to find just what kind of a guy this fellow who was skippering SKYLARK, is. We who have served in the Navy a long time know that the chiefs lay the cards on the table. I talked to them alone and I said "You can level with me" and they did, Admiral, and this is where I'm going to ask the court's indulgence to permit me, after Lieutenant Commander Hecker has testified, to afford this court the opportunity to hear those chief petty officers.

Lieutenant Commander Hecker is called now as our first witness.

PRESIDENT: Counsel, the court is happy to receive any testimony which you may wish to present to the court regarding the performance and the esteem in which Commander Hecker is held by his crew, and the court is happy that Commander Hecker recognizes that in designating him a party to the court, the court has in no way, as it explained at the time, implied that there was any connection between him, and his performance of duty, and the loss of the U.S.S. THRESHER.

COUNSEL FOR LCDR HECKER: Yes, sir, that has been made eminently clear.

COUNSEL FOR THE COURT: Mr. Hecker, do you understand your rights as a party, which have already been explained to you?

LCDR HECKER: Yes, sir.

Lieutenant Commander Stanley Hecker, USN, a party, took the stand in his own behalf, was warned that his previous oath was still binding, and was examined as follows:

DIRECT EXAMINATION

Questions by counsel for LCDR Hecker:

Q. Commander Hecker, at what time did SKYLARK rendezvous with THRESHER on Wednesday, 10 April 1963?
A. I don't recollect the exact time, sir. I remember it was somewhere near 0645 that morning, sir.

Q. Did you have a call in your night order book for 0600 that morning?
A. Yes, sir.

Q. Had you been awakened prior to that time by anyone with a message that your ship had rendezvoused with THRESHER?
A. Yes, sir, I think it was about 0530 or 0545 that I received a message that we had communications with THRESHER.

Q. What time of the morning did you arrive at the bridge of SKYLARK?
A. Shortly after six, sir.

Q. What did you do upon arriving on the bridge?
A. I observed the overall situation, determined where THRESHER was at that time, and had a cup of coffee; checked the weather; checked the ship's position on the chart with the Navigator, who happened to be the Officer of the Deck at that time.

Q. Did you also discuss the position of the ship with the Quartermaster of the Watch, at that time?
A. Yes, sir, and this was based on the fact that the Loran Log during the previous night indicated that the Quartermaster's of the Watch had felt that the readings were not quite accurate. I asked the navigating quartermaster, who was the senior Quartermaster of the Watch, (b)(6), if he had a good fix, and he said yes, and he based in on the fact that he had DR'd the ship up from the previous evening's star fix, and by our speed of advance the Loran Position appeared to be reasonably accurate.

COUNSEL FOR THE COURT: I would ask the witness not to use expressions like "DR" when plain wording would be clearer.

A. "DR" is dead reckoning position, made up by our expected speed along a proposed track over a period of time.

Q. At this time, when you first came on the bridge, did you have occasion to note the depth of the water in which you were operating?
A. Yes, sir.

Q. Who was the Officer in Tactical Command between the Commanding Officer of the SKYLARK and the Commanding Officer of the THRESHER?
A. Commanding Officer, THRESHER, sir.

Q. Did you have occasion at any time that morning to direct the Officer of the Deck to increase or augment your bridge watch, in view of the fact that you would be operating with THRESHER during the conduct of the deep dive?
A. Yes, sir; we do not normally have a UQC operator as such, nor a recorder for the Log. The bridge personnel, or a spare person in the bridge area, generally answers the UQC, the Junior Officer of the Deck, the Officer of the Deck, or the Boatswain's Mate of the Watch, or occasionally the Quartermaster of the Watch, will answer the UQC and will record the transmissions in the UQC Log. In this case I felt that we should augment with a recorder and an operator, so that we could record all traffic coming over the circuit, considering that the submarine was making a deep dive.

Q. Did you place on watch on the UQC your best operator in SKYLARK?
A. Yes, sir; I asked the Officer of the Deck who he thought was the best operator, and he recommended Mowen; he said that Mowen had been on this UQC quite a number of times and the amount of time that he had been on board -- the Officer of the Deck, as I have mentioned, was Lieutenant Watson, who had been aboard the ship about two years.

Q. When Lieutenant (junior grade) Watson was relieved as Officer of the Deck by Lieutenant (junior grade) (b)(6) , were you on the bridge?
A. Yes, sir. Lieutenant Watson first reported having been relieved and Lieutenant (b)(6) then reported that he had assumed the deck; courtesy reports that are usually made to the Commanding Officer.

Q. At that time did you give Lieutenant (b)(6) any instructions at all?
A. I told him to maintain the present position, as had been requested by THRESHER. I also told him to put the ship on a "comfortable course". The ship, as I mentioned in previous testimony, does roll quite a bit in any sort of sea, and breakfast was going on at that time. To make it a little more comfortable for people having their breakfast, I told him to get the ship on a "comfortable course".

Q. At approximately 0747, you received information that THRESHER was starting her deep dive. Were you on the bridge at that time?
A. Yes, sir.

Q. What specific instructions, if any, did you give regarding UQC checks with THRESHER?
A. I directed that a message be sent to THRESHER requesting that he provide SKYLARK with a UQC check at least every fifteen minutes. There had been no mention prior to this of any UQC checks, and just to keep track of him I felt that we would need them at no greater than fifteen minute intervals.

Q. At 0853, SKYLARK received a message from THRESHER to the effect that she was proceeding to test depth; were you on the bridge at that time?
A. Yes, sir. The message before that I received in my room, the test depth minus three hundred.

Q. At the time you received this message "Proceeding to test depth" did you make any comments to anyone, issue any instructions to anyone?
A. I mentioned in passing to someone in the pilot house, I don't remember whether it was the Officer of the Deck or possibly the Navigator, that it looked like he was going to wrap up his dive pretty quick and we would be home quite a bit sooner than we expected.

Q. From 0853 on, were you on the bridge of your ship, or had you left the bridge for any reason after 0853?
A. No, sir, I was on the bridge from then on. Shortly before that, I believe, was when I got to the bridge.

Q. You have previously testified regarding the transmissions you heard. Can you add anything to clarify those transmissions at this time, or are you satisfied that your former testimony as to their contents is accurate?
A. Could I check the UQC Log, sir. (The UQC Log was handed to the witness.) This message about no contacts in the area, I seem to remember, if there were -- this is just beyond 0914, sir -- I remember asking if radar had any contacts. Now whether the Officer of the Deck took it and then asked the same thing, I don't remember. I am fairly sure that I directed this message on "MY CORPEN 270" INTERROGATORY RANGE AND BEARING FROM YOU" considering that he might possibly broach; I was somewhat concerned for my ship, and wanted to have a reasonably accurate idea of his location if he should broach. Then I took the UQC and asked if he were in control.

Q. Why did you take the UQC at that time, Captain Hecker?
A. I directed that the operator ask if he was in control and it was misunderstood, or the operator did not quite understand what I wanted, so I took the UQC.

Q. Tell the court, without using the call signs, simply the test of your messages, how you actually gave them, as if you were giving it again. Use blank blank for the call signs.

A. Many times on the UQC, when I have some question in my mind as to the communications, I will repeat a message twice; I will repeat the call sign twice and then the message twice and then over. In this case it would have been from me to him, I would have repeated his call twice, and this is -- my call twice and "ARE YOU IN CONTROL? ARE YOU IN CONTROL? OVER" and then released the button.

Q. Is that the way you did it on the morning in question?
A. Yes, sir; I remember I did say this message and I think that I did do it twice, but I cannot say yes, positively.

Q. Has it been your normal practice to transmit in that fashion?
A. Yes, sir.

Q. At this particular time, having heard the message from THRESHER, commencing with the words "Experiencing minor difficulties" did you feel at that time that anything was amiss within THRESHER?
A. Nothing very serious, sir. I have been in what I felt was his situation, where I was at, or working towards test depth, heavy, because of compression, with a sizeable up angle, and I felt that he would try to power up to a satisfactory depth and/or blow if he felt it was necessary.

Q. There was no hysteria, no alarm in the voice transmitting that message so as to alarm you?
A. No, sir.

Q. And when you transmitted that message "Are you in control?" were you alarmed?
A. No, sir. I just wanted to know if he had arrived at a satisfactory depth and was getting depth control, or whether he was in fact on his way to broach.

Q. We've had testimony regarding the last transmission received from THRESHER, and is it your recollection and your testimony now that it was at that time that you heard over the UQC, sounds that appeared to be air entering the ballast tanks?
A. It was shortly after I had made my transmission. I put the mike down or handed the mike to someone in the vicinity of the UQC and stepped away, and then I heard the blowing sound. Originally I said twenty to thirty seconds; it did sound like a long blow, but if twenty or thirty seconds is long or normal I can't really think right now, but it was a long blow.

Q. The thing I would like to tie down now is, if you recollect, was this last garbled transmission before or after or during that sound of air?
A. I heard it during what sounded like a blow. It sounded as though the transmission was being masked by the air.

Q. At this time did you direct the Officer of the Deck or the lookouts to be alert to pick up THRESHER as she came to the surface?
A. Either THRESHER or bubbles; if he had vented his tanks we would have gotten a bubble or possibly, depending on his depth, we may or may not have gotten a noticeable bubble; it may have dispersed.

(b) (6) relieved (b) (6) at this point as reporter.

Q. But you did direct that they look out for this sort of activity on the surface?
A. Yes, sir.

Q. What is your recollection regarding the circumstances surrounding any conversations leading to the transmission of a message to higher authority regarding the situation as it existed at approximately 0917 on Wednesday, 10 April 1963?
A. Well, after receiving the garbled transmission, we attempted to regain communications and were not successful. At about 0930, or somewhere between 0930 and 0945, Lieutenant (b) (6) came to the bridge and asked if I wanted to send a message to SUBFLOT TWO telling them we had lost communication, and I told him no, to check the book which told you that, on a communication loss, you wait an hour to confirm this communication loss, unless, of course, the communication loss had been planned, such as--

Q. Were you aware of that requirement without having to refer to the book?
A. Yes, sir.

Q. Then what happened, if anything, with reference to the drafting and transmission of such a message?
A. Later that morning, I did not realize how much time had gone by. After I had initiated these explosive signals, I asked what time it was, because I wanted to drop these things at 10 minute intervals. I was informed that it was 1040, and I thought, "My God.." Well, I thought it was quite some time, and I had Lieutenant (b) (6) start preparing a message, which I went over with him. He went down and got it typed and brought it back to the bridge, where I made another change, and then he took it down to the radio room to transmit this message.

Q. At that time did you give any reason to him as to why you were not going to include the next to last transmission in that message?
A. He asked if I wanted to put in the message about the positive angle, and I told him no, and I had some ideas on why I did not want to send this message, and they were personal ideas.

Q. Are they classified?
A. They could be considered classified, Captain.

Q. Would it help this court if you were to give this court those reasons? This is a very important question.
A. Yes, sir, I think it would.

COUNSEL FOR LCDR HECKER: Mr. President, if Captain Hecker feels this may require the divulgence of classified information, may I request your permission to clear this court in order that you may hear this answer?

PRESIDENT: Yes, the court will be cleared.

At 1618, 13 May 1963, the court was cleared of persons not connected with the inquiry in order that the proceedings which follow could be heard behind closed doors.

THE WITNESS: In answer to Captain Gray's question, I felt that at that time -- This may or may not be considered classified, Admiral. But if I initiated a

plain language message with that, the various non-nuclear groups we have in this country could conceivably have picked this up and made a big hullabaloo about the loss of a nuclear submarine. Based upon the fact that we had problems in San Diego with the local people there that were opposed to the whole idea of nuclear submarines and had the somewhat silly idea of the submarine blowing up in their harbor, I felt at that time this could be a lucrative plum for them, and this would cast a bad name for our Navy and our country both nationally and internationally.

COUNSEL FOR LCDR HECKER: I have no further questions in closed session, Admiral.

PRESIDENT: Are there any other questions in closed court?

COUNSEL FOR THE COURT: Yes, sir, if I may.

CROSS-EXAMINATION

Questions by counsel for the court:

Q. It is not quite clear to me as to the difference between telling the world we lost a nuclear submarine and telling them we lost a nuclear submarine after she had indicated she was experiencing minor difficulty?

A. Captain, I didn't say we had lost a submarine. I said we had lost communication with THRESHER.

Q. Did you later report that we had lost a submarine?

A. Yes, sir. I was anxious to get my UQC log to the authorities, and I did get it later to Admiral Ramage, and he did get it to the court.

Q. (By the president, VADM Austin) This UQC log was submitted to Admiral Ramage because this court had requested that the log be brought in before this court for evidence.

A. Yes, sir. I had intended to transfer it at the earliest opportunity, and I was directed to prepare Lieutenant Watson and Mowen for transfer to BLANDY. That was when I wanted the UQC log to go with Lieutenant Watson.

Q. (By counsel for the court) Bearing in mind the pros and cons of including that information in your message, was there any reason why you did not send a classified amplifying message?

A. No, sir. This I could have done, but I had my officers tied up. Taking Lieutenant (b) (6) from radio and putting him into the crypto room would have caused me to get somebody else into radio who was not as qualified as he.

Q. Do you feel that you had such opportunity at some time thereafter and before you testified here that you could have released a classified message?

A. Prior to the arrival of my log here, sir?

Q. Yes.

A. That's hard to say, Captain, because I had Lieutenant (b) (6) in the radio shack from the time of initiating the expanding search throughout that night into the next day, and that was when Admiral Ramage arrived.

REDIRECT EXAMINATION

Question by counsel for LCDR Hecker:

Q. Captain Hecker, did you feel that it was necessary for you to send such a message after you had reported the oil slick?
A. I still felt I had to get my UQC log to someone.

Neither counsel for LCDR Hecker, a party, counsel for the court, nor the court desired to examine this witness further during this closed session of the court.

At 1623, 13 May 1963, the court was opened and the following proceedings were held with open doors. LCDR Hecker, a party, continued his testimony as follows:

REDIRECT EXAMINATION (Continued)

Questions by counsel for LCDR Hecker, party:

Q. Captain Hecker, do you recall the time that you received instructions from anyone in authority designating you as Senior Officer of the Search Force on the Scene?
A. Yes, sir. It was the evening of the 10th. Exactly what time, I'm not sure, sir.

Q. Was it prior to your joining up with RECOVERY at about 1730?
A. Yes, sir. It was just shortly before that. I'm not positive of this, Captain. I think it was just shortly before that.

Q. During the afternoon, after you had received the unclassified message from COMSUBFLOT TWO requesting certain information from you, did any ships or aircraft join up with you?
A. Yes, sir. At 1600 one aircraft reported on station. I gave him directions on what area to search, and at about 1730 or so, shortly before 1730, RECOVERY reported, and I wanted him to join in the search, but I discovered he had no SONAR capability. He then informed me he was in an oil slick. I directed him to stay there, and we came over to him so that we could take samples. On arrival at the oil slick, we determined that it was very definitely a heavy oil slick. I sent him by light a message directing him to check for radioactivity before he touched anything in this oil slick, and to monitor his ship.

Q. Now, from the time you received the last transmission from THRESHER did you remain on the bridge of your ship?
A. Yes, sir.

Q. And as these various units reported to you as members of Search Force, did you have the responsibility of directing their movements?
A. Yes, sir.

Q. And did you, in fact, direct their movements?
A. Yes, sir.

Q. Can you recall the time at which you were relieved of your duties as Senior Officer, Search Force, and became a unit of Search Force?
A. It was about 0530 or so, the following morning, when Commander, Submarine Development Group TWO arrived. There was an exchange of traffic. He asked for situation reports, and I told him how many I had, and I asked him if he wanted all

the situation reports or if he wanted a situation summary. He stated that he wanted a situation summary, which we provided. He directed me to proceed to the search station that he had assigned in a message to me promulgated the previous evening. This, then, was when I felt he had assumed command as Senior Officer, Search Force. Shortly after that, we were called by Commander Submarine Flotilla TWO and reminded that we had missed a situation report. We called Commander Submarine Development Group TWO and informed him of this message, and asked if he desired that we continue to make the situation reports or whether he would make them. He said then that he would make the situation reports, and we informed Commander Flotilla TWO of this and were relieved of the situation reporting item.

Q. Captain Hecker, when did you graduate from Submarine School?
A. In June of 1951, sir.

Q. And what was your first assignment?
A. I had been on a submarine before I went to submarine school. I was assigned to the U.S.S. TORSK in 1950, and I went to submarine school from the TORSK. From the submarine school I went to the U.S.S. TENCH in June of 1951 and stayed with the TENCH until October of 1953.

Q. Did you qualify in submarines in TENCH?
A. I qualified for a command, yes, sir.

Q. When did you qualify in submarines?
A. I don't remember, sir.

Q. Do you know whether or not from among the officers of your submarine school class you were the first officer to qualify in submarines of that group?
A. I was one of the first, or the first, sir. I think I was the first, in fact, to qualify for command in my class.

Q. Did you later have occasion to serve in any of the experimental high-speed type submarines?
A. Yes, sir. From TENCH I went to ALBACORE in the commissioning detail. This was in late October of 1953. We commissioned ALBACORE in January of 1954, and I spent the better part of that year in ALBACORE as the Engineer and Diving Officer. I made the first dive as Diving Officer in ALBACORE, and the first deep dive.

Q. Is ALBACORE a relatively high-speed submarine?
A. Yes, sir.

Q. Captain Hecker, have you received a letter from Mrs. John W. Harvey since the loss of THRESHER?
A. Yes, sir, I have.

Q. Produce it.
A. (The witness produced said letter.)

Q. Can you identify this as Mrs. Harvey's writing and you know in fact that it is a letter from her?
A. Yes, sir.

The aforementioned letter was submitted to the court and to counsel for the court, and was offered in evidence by counsel for LCDR Hecker, a party.

There being no objection it was received in evidence and marked Exhibit 199.

Q. Captain Hecker, would you read the letter from Mrs. Harvey?
A. I received this letter on Friday, 19 April 1963. It is dated April 18,1963. "Dear Captain Hecker. I want to express in writing the thoughts and feelings I wished to convey in our telephone conversation of Wednesday morning. The emotional circumstances under which we spoke may not have adequately fulfilled both our purposes. Like most Navy wives, I do not understand all the technical terms and phraseology used by so many people, radio, television, and newspapers, in discussing loss of THRESHER. All the ideas and opinions and chit-chat regarding this tragedy

have been confusing to myself, and I am sure, to other families who lost loved ones. Television interviews of one of your young lieutenants and boatswain's mate regarding SKYLARK's part in the loss have been eagerly listened to, and in the minds of some, may have been the basis for forming more misleading ideas. I do want you to know, however, that I have compassion in my own heart and I feel certain all others who have suffered loss on THRESHER feel that you and SKYLARK were there, and that your performance was being done in assisting THRESHER during her sea trials. I am personally consoled by the thoughts that you exerted every possible means at your disposal to render aid and assistance to Wes and his ship. If consolation can be found in mere words, I know that you, as Commanding Officer of SKYLARK, and Wes, as Commanding Officer of THRESHER, fully and capably assumed your responsibilities of command and you can continue to feel proud of your ship and your crew. Bless you. Irene Harvey."

RECROSS-EXAMINATION

Questions by counsel for the court:

Q. Captain Hecker, have you had an opportunity to review the record of testimony you have given before this court prior to this day?
A. Yes, sir.

Q. Do you recall that, when asked who was in the pilot house or on the bridge at the time of the messages received from THRESHER during the 0800-1200 watch, you mentioned one (b)(6), boatswain's mate?
A. Yes, sir.

Q. Have you since ascertained that he was not in fact physically present in the pilot house at the time?
A. (b)(6) states that he was not physically in the pilot house, sir. He was in the bridge area.

Q. Apart from that change to the report of your testimony, is the record true and complete to the best of your knowledge and belief?
A. Yes, sir.

Q. While serving in an escort to a submarine which had submerged, had you ever experienced the loss of communication with them before the 10th of April 1963?
A. Yes, sir. Specific incidents I can't recount, sir, but I do remember losing communication before.

Q. Is the initial loss of communication with them an alarming thing in itself?
A. No, sir.

Q. Would you explain again then how it is that a message from a submarine saying, "Experiencing minor difficulties" would cause you to take the transmitting microphone and ask, "Are you in control?"
A. Considering the message that he sent indicating what I felt was this up angle, I felt he was also heavy, as I stated before, due to the compression and was cruising in the vicinity of test depth. Most of us like to stay on the upper side of test depth, and this could have been his minor problem. And this is a minor problem, or had been a minor problem up to this tragedy, where we would attempt to use power to get up to a satisfactory depth, or what the Commanding Officer felt was satisfactory, if necessary to blow a tank to give himself a little

more positive buoyancy and then vent when he could do so thereafter. By this time he would have overcome the compression problem and would be fairly close to a neutrally buoyant condition.

Q. The "control" then in "Are you in control" was meant to signify "Are you in control of your depth," rather than, "Are you in control of your submarine," is that correct?

A. Yes, sir. A few years back we had a serious incident where we lost the submarine STICKLEBACK in the Pearl Harbor area from a loss of depth control submerged in a similar situation that just multiplied itself, sir. This is one of the situations that ran through my mind.

Q. You stated in your testimony that from 0853 on the morning of 10 April on, you were on the bridge.

A. Yes, sir.

Q. From 0853 until when would you say?

A. Until the following morning, somewhere between 0930 and 1000, I would imagine, when Mr. (b)(6) came to the bridge and the message traffic had dropped off considerably, and we were on our way to the station assigned by Commander Submarine Development Group TWO, and he suggested that I go down and catch a cat nap, and I thought that was a pretty good idea and was getting ready to leave, when we sighted some debris and started maneuvering to pick up the debris.

Q. My question really relates to this: Is it possible that you left the bridge momentarily for reasons of a personal nature at any time after 0853 and before 10 o'clock?

A. I think I did leave the bridge one time to go down to the radio shack. It was during the night, and was just for a matter of seconds.

Q. My question related to 0853 to 10 o'clock in the morning on the 10th of April.

A. Oh, no, sir. I was on the bridge all that time.

Q. How do you account for some confusion on this point?

A. I don't know, sir. I was off the bridge for a short period of time - exactly how long I don't remember - prior to 0853. When I received this, "Proceeding to test depth minus 300" I thought he was going down real fast, and I immediately went to the bridge.

Q. You spoke about the fact that you transmitted the message, "Are you in control? Are you in control?", and that after you made your last transmission in that little series, you heard a garble which sounded to you as if the transmission was masked by air being blown?

A. Yes, sir.

Q. How soon after you stopped transmitting and lifted your finger from the button did you hear the garbled transmission?

A. I couldn't estimate that, sir.

Q. Is it outside the realm of possibility that his transmission commenced while you still had the button down for a second or two thereafter and that your transmitting had made it impossible for you to hear the beginning of his transmission?

A. It is possible, sir. However, the sound indicated that it was masked by this air, and this air was going on throughout this garbled transmission, which,

to me, was completely unintelligible.

Q. When was it that you formed the conviction in your own mind that there was more than a loss of communications with THRESHER involved in the events of that day?

A. When I got into that oil slick. I sighted the PC earlier during the day somewhere after noon, somewhere around 1330 or so, and I breathed a sigh of relief, "He has come to the surface." And then I became a little concerned about this because I had initiated this SUBMISS or had sent a message indicating there was a possibility of a SUBMISS.

Q. Were you reluctant to send the SUBMISS for fear that events might later prove that you had been wrong?

A. No, sir. After an hour of trying to re-establish communications, this is a reasonable time to assume this ship has got communications difficulties. Other times, I understand from talking to other ASR skippers, they have lost communications for extended periods of time, from six to ten to twelve hours. I have never lost them for quite that long, and I was concerned that he did not have communications and wasn't quite sure where I was and had no idea where he was. If he was moving around with any speed, he could be anywhere.

Q. On what day and date were you relieved of performing the duties of Senior Officer, Search Force?

A. It was on the 11th of April, sir, somewhere around 0530, local, that morning.

Q. Did you communicate with the officer who was relieving you?

A. Yes, sir.

Q. How did you communicate with him?

A. By radio, sir. He was in Norfolk, the DL, Norfolk.

Q. Did you consider at that time offering to turn over the information in your UQC log to him?

A. No, sir. I gave him a situation summary, and I don't remember offering him the information.

Q. Captain Hecker, is there anything else that you can tell us of the events which occurred on the morning of 10 April which is not included either in your present testimony or in the record of your previous testimony which you think could assist this court in its duties?

A. No, sir. I wish there were.

EXAMINATION BY THE COURT

Questions by the president, VADM Austin:

Q. Commander Hecker, did you receive a message from THRESHER giving you her estimate of the range and bearing of you from her?
A. Initially, Admiral, prior to--

Q. At any time on the morning in question?
A. Yes, sir.

Q. As I recall, that message said that you bore 3400 yards, and I've forgotten the bearing.
A. 147.

Q. That your range was 3400 yards and range 147?
A. Yes, Admiral.

Q. Which would mean that you were to the south east of her something short of a couple of miles?
A. Yes, Admiral.

Q. Did you keep a plot of where she was with respect to you from then on as best you could from her position and course given to you?
A. No, sir. We had the DRT, the dead reckoning tracer, going. Our log indicated zero. We were maintaining a position by minimum turns, as THRESHER had directed.

Q. Wouldn't she have given you other ranges and bearings if you had asked for them by UQC, as necessary to keep an idea as to where she was relative to you?
A. Yes, Admiral. This was the reason I asked for the 15-minute UQC checks. However, traffic got rather heavy, and we never actually got a range check as such after that one.

Q. What was the time of that last range and bearing, do you recall?
A. No, sir, but I can check the log, with your permission, Admiral.

Q. Yes.
A. At 0745, sir.

Q. 0745?
A. Yes, sir.

Neither counsel for the party, counsel for the court, nor the court desired to examine this witness further.

He resumed his seat as a party.

Maurice Earl Rogge, engineman chief, U.S. Navy, was called as a witness by LCDR Hecker, party, was informed of the subject matter of the inquiry, was advised of his rights under Article 31, Uniform Code of Military Justice, was duly sworn, and examined as follows:

COUNSEL FOR THE COURT: This is an open session of the court and members of the public are present. For that reason, classified information cannot be divulged here. If, in your judgment, an answer to any question put to you by counsel or the court would require the inclusion of classified matter to make it complete,

you will not answer the question but will so indicate instead.

Questions by counsel for the court:

Q. State your name, rate, organization and present duty station.
A. Maurice Earl Rogge, engineman chief, U.S.S. SKYLARK.

Q. Engineman Chief in the United States Navy?
A. Engineman Chief, U.S. Navy, yes, sir.

Q. Would you spell your last name, please?
A. R-O-G-G-E.

DIRECT EXAMINATION

Questions by counsel for LCDR Hecker, party:

Q. Chief, what is your assigned duty in SKYLARK?
A. I am the chief in charge of the engine room and the engine auxiliaries.

Q. Who is your immediate superior in SKYLARK?
A. Lieutenant (jg) (b)(6) . He's the Engineering Officer.

Q. On the morning of Wednesday, 10 April 1963, did you have occasion to come to the bridge or pilot house of the SKYLARK?
A. Yes, sir, I did.

Q. Can you recall the time and the reason?
A. I was called up there to-- There's a boiler-- We had made an adjustment on the boiler, and it was smoking, and Mr. (b)(6) was the Officer of the Deck. He called me up there to readjust it. This was at 0845 when he called me up there.

Q. Did you leave the engineering spaces at 0845?
A. I was on the bridge at 0845, because I looked at the clock while I was up there to see what time it was.

Q. When you came to the bridge, what were your movements? How did you come to the bridge, and what did you do?
A. I came into the pilot house-- I came up the ladder through the inside of the ship, into the pilot house, and was standing right inside the hatch in the pilot house, behind the Captain's chair.

Q. Was the Captain in his chair when you came up there?
A. Yes, he was.

Q. What did you do after you stepped into the pilot house?
A. I stepped into the pilot house and talked to the engineering officer for a few minutes, and I went out on the wing of the bridge.

Q. Did you look at the stack while you were on the wing of the bridge?
A. Yes, sir.

Q. Then you came back into the pilot house?
A. Yes.

Q. Then went back down to the engine room?
A. Yes, sir.

Q. How much total time do you think elapsed when you were in the pilot house or in the wing area before you went back down to the engineering spaces?
A. Probably about five minutes.

Q. Chief, how long have you been in the Navy?
A. Eighteen years.

Q. What type ships have you served on? Don't tell us the names of the ships, but give the court an indication of the types of ships in which you have served.
A. I've been on an ATF, an ATA, and destroyer escorts.

Q. Is this your first rescue vessel duty?
A. Yes, it is.

Q. How long have you been in SKYLARK?
A. Since October of last year.

Q. What can you tell this court about the morale in the engineering department in SKYLARK?
A. When I first came on the ship, the morale of the engineering department was pretty low, and there have been-- we had some bad times at first, and then in the last few months, or the last two or three months, the morale has come up very much.

Q. To what do you attribute this increase in morale?
A. To the Commanding Officer.

Q. What is your reason for stating that?
A. With the present Commanding Officer, there is-- well, he is firm. He's firm in whatever he says. You know there's no question about it; there's no doubt in your mind. If there's some job that has to be done, there's no question; you just go ahead and do it, and you know if the Captain says something, you make sure it is going to be done. He doesn't change his mind. He seems to know what he's talking about, and doesn't have to change any orders or anything.

Q. You feel that the men in the Engineering Department have confidence in the Commanding Officer of the ship?
A. Yes, they do. When there's work to be done, if it's something that needs to be done, there's no question about it; they go right ahead and do it. There's no waiting around.

(b) (6) relieved (b) (6) as reporter at this point.

Q. Your evaluation of the Commanding Officer, as the leading chief petty officer in the Engineering Department, as far as it affects your department, do you feel that the Commanding Officer has command of the respect of the men of that department?
A. Yes, yes, sir. He does, very much.

Q. And as far as you're concerned, would you say that the SKYLARK is a happy ship?
A. Yes, it is.

Q. And people know what they're supposed to do and do it?
A. Yes. We get any information that is available. It's put out to the crew, to the men.

Neither counsel for the party, counsel for the court, nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

The court recessed at 1700 hours, 13 May 1963.

The court opened at 1705 hours, 13 May 1963.

Lieutenant Commander Stanley Hecker, a party, a former witness for the court, was recalled as a witness by his counsel, acknowledged affirmatively that he was aware of his rights as a party, was reminded that the oath previously taken by him was still binding, and was examined as follows:

DIRECT EXAMINATION

Questions by counsel for LCDR Hecker, party:

Q. Commander Hecker, what specific changes have you made in SKYLARK since you assumed command in January?
A. We, in SKYLARK, have instituted a safety rail for our rescue chamber, which was one of the shortcomings in this ship when I served in SKYLARK last; and when I came aboard this time as Commanding Officer we still had a rescue chamber problem. The rescue chamber is roughly eleven tons and in any sort of a sea it moves around quite a bit and can cause serious injury to personnel and material in the ship. So we have constructed a safety rail to guide the rescue chamber outboard of the ship and to put it in the water. In addition, in our mooring procedures, we have instituted a towing method for our anchor and mooring gear to insure that the legs of the moor are seated properly. We have also instituted a recovery system whereby we can bring the ship alongside and recover the mooring buoys, and we have been successful in recovering all the buoys along the first pass since the initiation of this procedure.

Q. Have you made any other changes in the organization of the ship that are pertinent to her mission?
A. No, sir.

Q. I show you a document and ask you if you recognize it?
A. Yes, sir.

Q. Would you tell the court what it is?
A. This is a letter indicating commendable performance of the USS SKYLARK (ASR20), 21-22 March 1963, from Commander Destroyer Development Group TWO to Commander Submarine Squadron TEN.

The above described letter, Commander Destroyer Development Group TWO serial 160 of 27 March 1963, together with Commander Submarine Squadron TEN First Endorsement, serial 669 of 8 April 1963, thereon, and Deputy Commander Submarine Force, U. S. Atlantic Fleet, serial 2407 of 2 April 1963, was submitted to counsel for the court and the court, and was offered in evidence by counsel for Lieutenant Commander Hecker, party, for the purpose of reading it into the record, with the request that a true copy be substituted for the original at the conclusion of the court. There being no objection, it was received in evidence as Exhibit 200.

Q. Commander Hecker, I hand you Exhibit 200 and ask you to read the basic correspondence and Deputy COMSUBLANT's endorsement thereto?

The witness read the requested documents, copies appended hereto marked Exhibit 200.

Q. Captain Hecker, I show you a document dated 9 July 1962. Will you identify this document?
A. Yes, sir. This document is a report of the Operational Readiness Inspection of USS SKYLARK conducted on 5 June 1962.

Commander Submarine Flotilla SIX letter, serial 185 of 18 June 1962, Subject: Operational Readiness Inspection of USS SKYLARK (ASR-20); report of, with first and second endorsements thereon, was submitted to counsel for the court and the court, and was offered in evidence by counsel for LCDR Hecker, party, with the proviso that because of classified information contained therein, its contents would not be read aloud while the court was sitting with open doors. There being no objection, it was received in evidence as Exhibit 201. Counsel for the court waived the reading of the exhibit at this time.

Q. Captain Hecker, I show you another document and ask if you can identify it?
A. Yes, sir. This is a report of an Operational Readiness Inspection of USS SKYLARK conducted on 3, 4 and 5 April of 1963.

Unclassified

Commander Submarine Flotilla SIX ~~Confidential~~ letter, serial 051 of 18 April 1963, Subject: Operational Readiness Inspection USS SKYLARK (ASR-20), was submitted to counsel for the court and the court, and was offered in evidence by counsel for LCDR Hecker, party, with the proviso that because of its classified nature its contents would not be read aloud while the court was sitting with open doors. There being no objection, it was received in evidence as Exhibit 202. Counsel for the court waived the reading of the exhibit at this time.

Q. Captain Hecker, with reference to Exhibit 201, I am going to ask you only one question, which is unclassified. There's a seamanship exercise reported there, and out of a possible grade of one hundred, what was the grade achieved and the date?
A. The grade was seventy-seven, sir, and the date was 5 June 1962.

Q. With reference to Exhibit 202, a report of the same exercise, what was the grade achieved and what was the date?
A. The grade was ninety-three and the date was 3, 4 and 5 April of 1963.

Neither counsel for the court, the court, nor the party desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness resumed his seat as a party.

(b) (6) , Chief Electrician's Mate, U. S. Navy, was called as a witness by Lieutenant Commander Hecker, party, was informed of the subject matter of the inquiry, advised of his rights under Article 31, Uniform Code of Military Justice, was duly sworn, and examined as follows:

COUNSEL FOR THE COURT: (b) (6) , this is an open session of the court and members of the public are present. For that reason, classified information cannot be divulged. If the answer to any question put to you by counsel for the court, in your judgment, would require the inclusion of classified matter to make it complete, you will not answer the question but will so indicate instead. Is that understood?

WITNESS: Yes, sir.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, rank, organization and present duty station.
A. (b) (6) , Electrician's Mate Chief. I am in charge of the Electrical Department of the USS SKYLARK.

Q. How do you spell your name?
A. (b) (6) .

Q. And are you an Electrician's Mate Chief, United States Navy?
A. I am, sir.

Questions by counsel for LCDR Hecker, party:

Q. Chief, how long have you been in the Navy?
A. Fifteen years, Captain.

Q. What types of ships have you served in? You need not name them, just tell the court the types of ships.
A. ATF, AOG, two ASR's.

Q. How many years have you served in SKYLARK?
A. Two and a half years, sir, approximately.

Q. Have you seen any changes in SKYLARK within the last few months?
A. Yes, sir, I have.

Q. What sort of changes have these been?
A. An extreme increase in morale, for one thing, sir.

Q. To what do you attribute this?
A. To the excellent commanding of the ship, I would say, sir.

Q. Have you had personal occasion to observe the performance of the Commanding Officer, or are you giving your testimony here as an overall reflection of the attitude that you know exists within the ship?
A. I have seen circumstances where, for instance, the time that the Executive Officer was taken a casualty in the diving operation. The Commanding Officer then showed his ability to cope with emergencies and handle them without excitement and exact decisive action.

Q. You, as a chief petty officer in the United States Navy, have confidence in your Commanding Officer?
A. Yes, sir, I do.

Q. Can you name any specific trait of character possessed by your Commanding Officer that makes an impact and causes the ship to be a happy ship and an efficient ship?
A. Yes, sir. He is very fair in his dealings with the crew. He has never once refused to talk to any one of the crew, which I believe is good. He has kept us well informed, and also has outwardly shown interest in the crew itself, as far as liberty hours, and such.

Q. Is there any doubt in anyone's mind as to who is in command of that ship?
A. No, sir, there is not.

Neither counsel for the party, counsel for the court, nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement:

WITNESS: Sir, I know nothing of the actual casualty that took place that morning; I was down below. But as far as the Commanding Officer, which I believe that I'm here to state about, is that I believe him to be an excellent officer and without a doubt, in my opinion, the best naval officer that we've had as the Skipper aboard the SKYLARK.

PRESIDENT: Chief, it's always good to see Commanding Officers perform their duties in such a manner as to elicit the respect and admiration of those who serve under them.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

(b) (6) , Chief Shipfitter, U. S. Navy, was called as a witness by Lieutenant Commander Hecker, party, was informed of the subject matter of the inquiry, advised of his rights under Article 31, Uniform Code of Military Justice, was duly sworn, and examined as follows:

COUNSEL FOR THE COURT: (b) (6) , this is an open session of the court and members of the public are present. For that reason classified information cannot be given here. If in your judgment the answer to any question put to you by the court or counsel should require the inclusion of classified matter to make the answer complete, you will not answer the question but will so indicate instead. Do you understand that?

WITNESS: Aye, aye, sir.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, rate, organization and present duty station.
A. (b) (6) , shipfitter chief on the USS SKYLARK.

Q. Are you a Shipfitter Chief, United States Navy?
A. United States Navy.

Q. How do you spell your last name?
A. (b) (6)

Questions by counsel for Lieutenant Commander Hecker, party:

Q. Chief, how long have you been in the Navy?
A. With broken service, I have a little over seventeen years.

Q. What types of ships have you served in? You need not give the specific names, just the types.
A. Mostly all tenders and ASR type vessels.

Q. How long have you served in SKYLARK?
A. Since September 22, 1962.

Q. Do you possess any special qualifications?
A. I am Master Diver and also Chief Master-of-Arms of the SKYLARK.

Q. As Chief Master-at-Arms, are you the good right-hand of the Executive Officer in handling matters involving the chief petty officers and the crew of the ship?
A. Yes, sir, I am.

Q. What can you tell the court about the morale in SKYLARK at this time?
A. The morale at this time is the highest I've ever seen it and as good as any ship I've ever been on.

Q. Has there been a change in SKYLARK?
A. Considerably. When I first came aboard, the morale of that crew was down in their boots, and I've seen it come all the way up to an outstanding crew.

Q. How about your disciplinary problems, Chief? In your performance of duty as Chief Master-at-Arms, you would have occasion to be concerned about this. What is your evaluation of your disciplinary problem on SKYLARK at this time?
A. Disciplinary problems have gone down considerably since I came aboard.

Q. Would you say that you have a crew that is willing to work and does not have to be driven to work, and that they have a pride in ship and a pride in Navy now?
A. They have now.

Q. To what do you attribute this, Chief (b)(6) ?
A. I attribute it to the Captain and the Executive Officer, primarily.

Q. Did you have any occasion to be in the pilot house at any time on Wednesday, 10 April 1963?
A. Yes, sir, I was the Junior Officer-of-the-Deck on the twelve to four watch that afternoon.

Q. That's the afternoon watch?
A. Yes, sir.

Q. Is there any doubt in anyone's mind as to who is in command of SKYLARK?
A. None whatsoever, no, sir.

Q. Do you feel that the Commanding Officer commands the respect of his officers, chief petty officers and men?
A. He does. He's firm, but you have to really admire him, and I do very much.

Q. Do you admire him because of his competence as a naval officer in his performance of handling SKYLARK and its men?
A. Yes, sir, I do.

Neither counsel for the party, counsel for the court, nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

(b) (6) , Chief Boatswain's Mate, U. S. Navy, was called as a witness by Lieutenant Commander Hecker, party, was informed of the subject matter of the inquiry, advised of his rights under Article 31, Uniform Code of Military Justice, was duly sworn, and examined as follows:

COUNSEL FOR THE COURT: (b) (6), this is an open session of the court. Members of the public are present. For that reason you cannot divulge any classified information here. If in your judgment the answer to any question put to you by counsel or a member of the court were to require the inclusion of classified matter to make it complete, you will not answer the question but will so indicate instead.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, rate, organization and present duty station.
A. (b) (6) , Boatswain's Mate Chief, stationed on the SKYLARK, sir.

Q. Are you a Boatswain's Mate Chief in the United States Navy?
A. Yes, sir.

Q. How do you spell your last name?
A. (b) (6) , sir.

Questions by counsel for Lieutenant Commander Hecker, party:

Q. Chief, how long have you served in the Navy?
A. I have a little over nineteen years, sir.

Q. What types of ships have you served in? You need not name them, but just name the types of ships.
A. LST's during the war, sir, an AKA, an AS, and two ASR's.

Q. When did you join SKYLARK?
A. Approximately the middle of last November, sir.

Q. And what are your assigned duties in SKYLARK?
A. I am leading petty officer of the First Division.

Q. Do you have any special qualifications?
A. I am a first class diver.

Q. Can you tell this court what the morale within SKYLARK is at the present time and has been during the last few months?
A. Well, right now it's very high. I don't think I've ever seen a crew as close together as this crew is right now. When I first went on there, there was very little morale.

Q. To what do you contribute this change, Chief?
A. Leadership.

Q. And on whose part?
A. On the Commanding Officer's.

Q. Chief, you're a Boatswain's Mate Chief and you have a knowledge of seamanship. Have you had occasion to observe the Commanding Officer's ability as a seaman?

A. Yes, sir, quite often. I stand Junior Officer-of-the-Deck Watches under way.

Q. And what's your opinion of the Commanding Officer as a ship handler seaman? As we know traditionally in the Navy, after all, in the Navy, we're supposed to be seamen first and foremost.

A. I believe the Captain is a very fine seaman, sir. I've never seen him take a chance with his ship or his men.

Q. With reference to the last two inspections that SKYLARK had undergone, can you give the court an indication of the attitude of the deck force and the crew with reference to preparing for these inspections and carrying them through?

A. They seemed to work even more than they were asked to.

Q. Do you feel that you can speak for the deck force as well as for yourself?

A. Yes, sir, I have not heard a bad word about Captain Hecker.

Q. Do you feel that Captain Hecker commands the respect of his officers, chief petty officers, and men?

A. He most certainly does.

Neither counsel for the party, counsel for the court, nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

COUNSEL FOR LCDR HECKER, PARTY: Mr. President, at this time I have no further witnesses to call, but I do have a motion to present to the court and I move that on the basis of all the testimony introduced before this court to date regarding Captain Hecker's performance on the day the THRESHER was lost, that he no longer be designated a party, and that this Court of Inquiry make a determination that his conduct is no longer subject to inquiry. I am prepared to make a statement in his behalf in support of that motion, if the court would desire to hear that statement at this time.

PRESIDENT: The court would be pleased to hear any statement that you may have to make in behalf of the party.

COUNSEL FOR LCDR HECKER, PARTY: Mr. President, Gentlemen of the Court. Captain Hecker of SKYLARK, who stands before this Court of Inquiry as an interested party, has been raised and trained in the traditions of the

United States Navy. Captain Hecker appreciates and understands thoroughly these traditions. He is well aware that their very existence and their commandments constitute the guiding beacons for those who would dare to go to sea in the ships of the United States Navy in the service of our great nation and the American people. As he has climbed the ladder to reach and occupy the position of Captain of an American man-of-war, he has acquired first hand knowledge of the awesome and demanding responsibilities entrusted to those men who are fortunate enough to achieve command of a ship of the United States Navy. Captain Hecker accepted these responsibilities when he assumed command of SKYLARK just a few months ago. He accepted these responsibilities when his ship accompanied THRESHER in their last rendezvous with the perils of the sea on Wednesday, April 10th, 1963. Captain Hecker accepts these responsibilities now.

His testimony before this Court of Inquiry, and the testimony of witnessess called in his behalf, should not and must not be interpreted or understood to constitute a waiver of these responsibilities or an excuse for his performance of duty on the day the officers, men and civilians of THRESHER joined a host of other gallant submariners and their ships in giving their lives for our beloved country. Instead, his testimony and testimony in his behalf, have been placed before this court by proud, seafaring men of the United States Navy, who are well aware of the merciless power of the sea, who are confident of their own ability as seamen, and who are convinced that their performance was in accord with the traditions of the United States Navy at a time of great catastrophe. Further, through their testimony they have sought to aid and assist this Court of Inquiry in determining all the facts and circumstances surrounding the loss of THRESHER so that submariners may gain increased confidence and pride in their ships and in their Navy.

There is today a substantial body of opinion in the minds of the public at large that Captain Hecker has been branded as the scapegoat of the THRESHER disaster, and that his career as a naval officer has been brought to an end, solely by virtue of the fact that his conduct as Commanding Officer, SKYLARK, is subject to inquiry. Captain Hecker does not for one minute hold a view that this court has branded him as a scapegoat, nor does he consider that his performance as Captain of SKYLARK was such as to cause his seniors to reach a reasoned decision that he failed in any way to perform his duty as a competent Captain on the day that THRESHER was lost. He is well aware of the procedures of Naval Law, which led to his designation as a party; and he is proud that our system of Naval Law is such that he had the opportunity to present in detail a summary of his actions on the scene, rather than being dealt with arbitrarily and capriciously, as he might have been under some other system.

The weight of the testimony before this Court of Inquiry clearly indicates that Captain Hecker did not report the loss of communication with THRESHER within one hour as he was required to do by the written word of applicable directives. So, also, this testimony indicates that he did not at once report to higher authority the next to last message received from THRESHER by SKYLARK via the underwater telephone. In the case of the former, this court is clearly aware now of his reasons for delaying the message report of a loss in communications. Over the years there have been a great many occurrences of a loss in communications for more than one hour without the actual loss of the submarine

and without any report from an on-scene accompanying escort. This Court of Inquiry is aware that we have progressed far and rapidly in the tempo of submarine operations. Capabilities have increased; procedures have been enlarged upon; and the submariner's confidence in himself and in his ship have generated a disregard for many such directives, which, although they still remain on the books, they are given only lip service. Even so, Captain Hecker was aware of the report required, but was also aware of the caveats and warnings threaded throughout these requirements, all directing the on-scene commander to avoid creating an unnecessary burden and rescue alert. Furthermore, Captain Hecker exhausted every possibility of contact with THRESHER, and then he did report to higher authority in sufficient detail to cause the launching of a search and rescue incident. His dispatch clearly indicated that something was amiss, and was so interpreted by senior submariners far removed from the scene. The addition of the next to last message received from THRESHER could have added little more to his first dispatch and his subsequent situation reports. But this addition, had THRESHER turned up safely later on, would have created an unnecessary panic amongst THRESHER families, among nuclear experts, and among nations of the world.

In summary, gentlemen, the officer on the scene, in command, in accord with all the traditions and the longstanding traditions of the United States Navy, had a decision to make. He made that decision. And, gentlemen, he stands by it and his career is in your hands.

Thank you, Admiral.

PRESIDENT: Do you wish to respond?

(b) (6) relieved (b) (6) at this point as reporter.

COUNSEL FOR THE COURT: Yes, sir, very briefly. In coming to a decision, Mr. President, I would respectfully recommend that the court bear in mind the provisions of Article 0301 of the JAG Manual which defines a party as a person whose conduct or performance of duty is subject to inquiry or who has a direct interest in the subject under inquiry. "Subject to inquiry" is defined as follows: A person's conduct or performance of duty is subject to inquiry when the person is involved in the incident or event under investigation in such a way that disciplinary action may follow; or which may affect his rights or privileges, or jeopardize his personal reputation or professional standing. A person has a "direct interest" in the subject of the inquiry when the findings, opinions or recommendations of the fact-finding body may, in view of his relation to the incident or circumstances under investigation, reflect questionable or unsatisfactory conduct or performance of duty; or when the findings, opinions, or recommendations may relate to a matter over which the person has a duty or right to exercise official control.

Article 0303 of the JAG Manual is entitled "Change in Status of a Party." It states, very briefly, that if it no longer appears that a person previously designated as a party is involved in a material degree in the matter under investigation, his designation as a party may be withdrawn by the investigative body upon application of that party, or on the fact-finding body's own initiative.

PRESIDENT: Very well, counsel. The court will be cleared for deliberation.

The court then closed at 1748 hours, Monday, 13 May 1963.

The court opened at 1828 hours, Monday, 13 May 1963.

All persons connected with the inquiry who were present when the court closed were again present, the court sitting with open doors.

PRESIDENT: The court has considered the testimony to date bearing on the loss of the USS THRESHER and has received a motion and statement of Lieutenant Commander Hecker's counsel. The court, after such consideration, agrees that it no longer appears that Lieutenant Commander Hecker is involved in a material degree in the matter under investigation. Lieutenant Commander Hecker's designation as a party is accordingly withdrawn pursuant to his request.

COUNSEL FOR PARTY, LCDR HECKER: Thank you, Admiral, and gentlemen of the court.

COUNSEL FOR THE COURT: Mr. President, I have no further witnesses at this time.

COUNSEL FOR PARTY, LCDR HECKER: I would just like to say one thing to the court. I went through some battles in the halls of Congress when our system of jurisprudence in the armed forces was being subjected to scathing denunciation. I felt then, and I feel now, that the fairness that shown throughout in our system, is not achieved in any other system to which I have been exposed, and I am most grateful to you, Admiral, and to the members of the court for the consideration shown us. I thank you, sir.

The court then adjourned at 1833 hours, Monday, 13 May 1963.