OPNAV INSTRUCTION 5310.23A

From: Chief of Naval Operations

Subj: NAVY PERSONNEL HUMAN SYSTEMS INTEGRATION

Ref: (a) SECNAVINST 5000.2E
    (b) CJCSI 3170.01I
    (c) GAO Report Number 03-520S of June 2003
    (d) OPNAVINST 5450.180E
    (e) OPNAVINST 5102.1D
    (f) OPNAVINST 5100.23G
    (g) OPNAVINST 9640.1B
    (h) OPNAVINST 4700.8K
    (i) SECNAVINST 5100.10K
    (j) OPNAVINST 9070.1A
    (k) SECNAVINST 5223.2A

Encl: (1) Human Systems Integration in the Acquisition Process
      (2) Additional HSI Related Resources
      (3) Acronym Glossary

1. Purpose

   a. To address the development of requirements for human systems integration (HSI) within the Joint Capabilities Integration and Development System (JCIDS) and define the process through which Deputy Chief of Naval Operations for Manpower, Personnel, Training, and Education (CNO N1) exercises Navy HSI governance authority.

   b. This instruction is a complete revision and should be reviewed in its entirety. Significant changes are summarized in subparagraphs 1b(1) through 1b(5).

      (1) Enforces compliance with updated military standards for safety, habitability, human factors engineering, occupational health and survivability.

      (2) Updates and clarifies roles and responsibilities.

      (3) Requires certification of technologies and risk factors used to reduce manpower or improve training and human performance by technical warrant holders prior to fleet transition.
(4) Updates standards used for HSI metrics including total ownership cost (TOC) and ensures cost estimates document HSI elements.

(5) Reduces redundancy and updates supporting policies.

2. **Scope and Applicability.** This instruction applies to resource sponsors and program offices who draft capability documents containing Navy equities, and to organizations that provide inputs for capabilities documents containing Navy equities. These requirements apply to all acquisition programs, subject to reference (a).

3. **Cancellation.** OPNAVINST 5310.23.

4. **Background**

a. HSI is the application of systems engineering techniques to cost effectively integrate the domains of manpower, personnel, training, human factors engineering, safety and occupational health, habitability, and force protection and survivability into the materiel life-cycle. These domains collectively define how the human components of the system impact a system's capability or performance, (e.g., mission performance, safety, supportability, and cost). The HSI domains are concerned with the factors related to human operators and maintenance and support personnel of the system under development (e.g., the trade-offs, skill gaps and training requirements, workload and manning levels, and personnel characteristics such as body size and strength). The human components of the system include the whole range of stakeholders, that is, the trainers, operators, systems administrators, and maintainers. HSI’s role in solving acquisition problems includes providing solutions to reduce manpower requirements throughout the life-cycle of the program; avoiding design-related capability flaws which increase mishap probability; and improving readiness to support key performance parameters (KPP) related to the mission.

b. The Joint Chiefs of Staff, through reference (b), describe the documentation of a “capabilities-based” approach to solving gaps in execution of national military strategy.

c. In a Congressionally directed report, the Government Accountability Office (GAO), through reference (c), reported that the Navy’s varied approach to applying HSI has occurred partly because Navy guidance allows program managers (PM) considerable discretion in determining the extent to which they apply HSI principles in developing new systems. The GAO reported that in the absence of a clear requirement, that HSI be a key feature of all future acquisition programs. Efforts to reduce crew size will continue to vary due to the competing pressures placed on PMs. The GAO speculated that the Navy is likely to continue to miss opportunities to reduce personnel requirements for future ships.
d. The GAO report recommended the development and implementation of mandatory policies on HSI requirements, standards, and milestones. Specifically, for each system the Navy plans to acquire, the Secretary of the Navy (SECNAV) may require that:

1. HSI assessment is performed while alternate concepts for the system are developed and evaluated;

2. HSI analyses, including trade-off studies of design alternatives, are to be used to establish an optimized crew size goal that will become a KPP in the program requirements document; and

3. HSI assessments are updated prior to all subsequent milestones.

e. SECNAV, through reference (a), designates CNO N1 as the HSI and human performance advocate and the single governance authority for Navy HSI policy. Commander, Naval Safety Center maintains liaison as necessary to improve safety procedures and processes as outlined in reference (d).

f. Safety, habitability, and survivability processes help identify risks in legacy systems associated with mishaps. Recognition and control of these risks must be incorporated into requirements for new systems.

5. HSI Policy

a. The implementation of HSI policy is critical to the Navy’s ability to improve systems’ performance and reduce TOC. Implementation begins early in the acquisition process during the capabilities-based assessment (CBA). Program resource sponsors must ensure that analysis necessary to support acquisition decisions is provided in order to optimize manpower, personnel, and training requirements and TOC. Enclosures (1) through (3) are provided to assist resource sponsors and requirements managers in developing capabilities documents. The early-on requirements determination, resource estimates, and trade-off decisions will be documented.

b. Manpower, training, and human factors engineering requirements will be in compliance with references (e) and (f) along with the prerequisite KPP and attributes (including workload traded off to shore based activities). Risk factors (e.g., workload, duration, sleep deprivation) and technologies used to reduce manpower or improve training and human performance will be developed by the program office and certified by technical warrant holders at the systems commands (SYSCOM) throughout the acquisition process. The results will be maintained by the technical warrant holders for use by resource sponsors and Office of the Chief of Naval Operations (OPNAV) Director, Total Force Manpower, Training and Education Requirements Division (N12) in determining the sustainment manpower and training requirements prior to transition of the system from the program office to the fleet. Operators, maintainers, system
administrators, trainers, and support personnel represent a significant portion of operations and sustainment costs. The results from the manpower, personnel, and training analyses relating to costs will be included as factors in determining TOC.

c. Habitability military characteristics of U.S. Navy ships and shipboard facilities and spaces will be in compliance with established habitability criteria identified in reference (g); MIL-STD-1474E, Department of Defense (DoD) Design Criteria Standard: Noise Limits, 15 April 2015; Naval Sea Systems Command (NAVSEASYSCOM) Technical Publication T9640-AC-DSP-010/HAB, Shipboard Habitability Design Criteria and Practices Manual (Surface Ships) for New Ship Designs and Modernization, Revision 1, 21 December 2016; and certified by technical warrant holders at the SYSCOMs. Prior to ship custody transfer, shipboard habitability will be completed by the type commander pursuant to reference (h).

d. System safety practices will be in compliance with the acquisition procedures in references (a) and (i), and MIL-STD-882E, DoD Standard Practice for System Safety, 11 May 2012.

e. Occupational health standards, including occupational exposure criteria relevant to the system or equipment, may be implemented in compliance with reference (f), MIL-STD-882E, and MIL-STD-1474E.


g. The capability development document (CDD) and capability production document (CPD) will identify capabilities required for the system to perform the mission concept of operations (CONOPS). Where applicable, the CDD and CPD will address HSI, as described in enclosure (1).

h. CNO N1, in conjunction with NAVSEASYSCOM, Naval Air Systems Command (NAVAIRSYSCOM), Space and Naval Warfare Systems Command, Naval Supply Systems Command, and Naval Facilities Command will develop common SYSCOM HSI processes, tools, standards, and training and integrate these elements into engineering processes.

6. HSI Governance

a. As described in reference (a), and as delegated by CNO N1, OPNAV N12 serves as the Navy’s HSI and human performance advocate, and the Navy’s single governance authority for HSI policy.
b. SYSCOMs and program offices will brief HSI products as part of the Navy gated review process. These products include completion of the job duty task analysis; front end analysis; manpower estimate; preliminary ship or squadron manpower documents; Navy HSI Plan; training system plan; and programmatic environment, safety and occupational health evaluation report. Director, Warfare Integration (OPNAV N9I) and Commander, Operational Test and Evaluation Force test and evaluation will ensure suitability of systems and equipment. Deputy Chief of Naval Operations for Fleet Readiness and Logistics (CNO N4) will provide product life-cycle management assessments and support to the program office for pre-milestone B and C evaluations.

7. Roles and Responsibilities

a. CNO N1

(1) Provide resource sponsors with analysis of alternatives (AoA) planning data on cost of HSI based on similar scope studies performed on baseline comparison systems.

(2) Endorse HSI requirements in JCIDS documents.

(3) Program and fund for research, development, testing, and evaluation (RDT&E), and science and technology (S&T) for manpower, personnel, and training domains in coordination with the Office of Naval Research (ONR) and future naval capabilities technical oversight group.

(4) Serve as the Navy’s lead HSI advocate through the roles and responsibilities in subparagraphs 7a(4)(a) through 7a(4)(d).

(a) Represent Navy HSI service policy with DoD, government agencies, and international programs.

(b) Develop HSI policy in coordination with naval SYSCOMs and other stakeholder organizations. Enclosures (1), (2), and (3) provide instructions, standards, and guides, along with applicable acronyms and related resources for each domain.

(c) Develop manpower, personnel, and training priorities and provide guidance to resource sponsors, program executive offices (PEO) and PMs on processes.

(d) Conduct biennial review of Naval Post Graduate School HSI programs for military and civilian personnel. Approve and resource education skill requirements (ESR), core skill requirements (CSR), curriculum, program of record, subspecialty ratings, and education and training quotas for HSI education. Validate all HSI billets during zero-based review process using the ESR and CSR.
(5) Validate manpower requirements and associated programming for new and modified manpower estimates for enterprise manpower affordability, including training requirements and programming for new weapon system acquisition, and engineering change(s) provided by the warfare sponsors.

(6) Validate program training requirements in Navy training systems plans based on affordability, excluding training requirements for new weapon system acquisition and engineering change(s) provided by warfare sponsor.

(7) Assess HSI risk and recommend balanced solutions for Navy acquisition programs based on a risk assessment conducted by PMs.

(8) Ensure all service cost estimates document HSI elements pursuant to reference (k).

b. CNO N4, Deputy Chief of Naval Operations for Information Warfare (CNO N2N6), Deputy Chief of Naval Operations for Integration of Capabilities and Resources (CNO N8), Deputy Chief of Naval Operations for Warfare Systems (CNO N9), and Director of Innovation, Technology Requirements and Test and Evaluation (OPNAV N94/ONR)

(1) Ensure HSI system acquisition requirements are adequately resourced.

(2) Ensure operational test and evaluation strategies required to assess effectiveness and suitability of the materiel solution include HSI measures of effectiveness and performance.

(3) Ensure all service cost estimates document HSI elements pursuant to reference (k).

(4) Program and fund for RDT&E and S&T for HSI, in coordination with ONR and future naval capabilities technical oversight group.

c. SYSCOMs and PMs

(1) Validate and document completion of HSI domain criteria during system engineering technical review process (SETR).

(2) Execute HSI processes, procedures, and requirements pursuant to references (a) and (b).

(3) Collaborate with resource sponsors and acquisition community stakeholders to provide technical warrant holders certification prior to acquisition program trade off decisions affecting each domain as outlined in enclosure (1).

(4) Support PMs and CNO N1 in the documentation of system engineering requirements related to HSI to ensure adequate resource sponsorship and technical authority assessment.
(5) Provide technical expertise in HSI to programs and execute technical authority for HSI requirements through qualified and designated technical warrant holders.

(6) Ensure that HSI technical warrant holders are qualified in compliance with established SYSCOM policy.

(7) Ensure service cost estimates document HSI elements in coordination with the program office pursuant to reference (k).

(8) Incorporate safety, habitability, and survivability risk control procedures associated with mishaps into legacy and new systems.

d. Commander, Naval Safety Center

(1) Serve as Office of the Chief of Naval Operations (OPNAV) policy advisor for the safety aspects of human factors engineering.

(2) Perform and support safety analysis to identify potential hazards, trends, and preventive measures. Report mishap data and risk analysis to the respective program offices to support future system requirements.

e. Bureau of Medicine and Surgery

(1) Serve as OPNAV’s policy advisor for occupational health and ergonomic data pursuant to reference (f).

(2) Ensure all service cost estimates document HSI elements in coordination with the program office pursuant to reference (k).

(3) Provide subject matter expertise to identify emerging HSI RDT&E and S&T requirements for submission to appropriate resource sponsors.

(4) Coordinate RDT&E and S&T requirements with ONR.

(5) Advise OPNAV on manpower, personnel, and training; human factors engineering; safety and occupational health; habitability; and force protection and survivability domain requirements for capabilities documents.

(6) Provide periodic updates to resource sponsors, PEOs, and PMs on processes, standards, S&T, and RDT&E efforts.

(7) Conduct technical reviews, which include evaluation of HSI requirements.
8. **Administration.** CNO N1 has the authority, within the scope of this instruction, to modify technical guidance to achieve the objectives of the instruction.

9. **Records Management.** Records created as a result of this instruction, regardless of media and format, must be managed per SECNAV Manual 5210.1 of January 2012.

10. **Review and Effective Date.** Per OPNAVINST 5215.17A, CNO N1 will review this instruction annually on the anniversary of its issuance date to ensure applicability, currency, and consistency with Federal, DoD, SECNAV, and Navy policy and statutory authority using OPNAV 5215/40 Review of Instruction. This instruction will be in effect for 5 years, unless revised or cancelled in the interim, and will be reissued by the 5-year anniversary date if it is still required, unless it meets one of the exceptions in OPNAVINST 5215.17A, paragraph 9. If the instruction is no longer required, it will be processed for cancellation as soon as the need for cancellation is known following the guidance in OPNAV Manual 5215.1 of May 2016.

Releasability and distribution:
This instruction is cleared for public release and is available electronically only via Department of the Navy Issuances Web site, [http://doni.documentservices.dla.mil/](http://doni.documentservices.dla.mil/)
HUMAN SYSTEMS INTEGRATION IN THE ACQUISITION SYSTEM

1. **Purpose.** References (a) and (b) provide guidance on the development of CDDs and CPDs. A doctrine, organization, training, materiel, leadership, personnel and facilities (DOTMLPF) analysis that includes HSI considerations is part of this process.

   a. The CBA must account for both the current and projected manpower and personnel characteristics of the Navy. These analyses account for manned and unmanned systems, identify operational or environmental condition gaps between existing systems, and, if necessary, develop a DOTMLPF change request that may impact the performance of the operators, maintainers, and support personnel of future platforms and systems.

   b. The AoA results will help identify and define HSI gaps. Additionally, the AoA provides the general framework for the performance parameters of the CDD and CPD. HSI practitioners should be part of each Navy integrated product team and report results during the SETRs. The AoA must provide information to guide the acquisition of future systems and platforms, as well as provide information to guide the development of future characteristics.

2. **HSI Content.** CNO N1 will review each CDD for HSI considerations. DOTMLPF analyses that support a CDD will evaluate the HSI considerations included in subparagraphs 2a through 2d, where applicable.

   a. Address whether changes to manpower, personnel, and training concepts or human factors engineering modifications to existing systems could enhance current system performance enough to meet the capability gap.

   b. Discuss potential approaches or required solutions for enabling capabilities in the areas of HSI, especially design, training, personnel management, distance support, and maintenance logistics support.

   c. Describe any current or projected operator, maintainer, support personnel, major constraints and roles necessary to enable capability, especially any significant changes from current roles.

   d. Describe desired outcomes for the proposed solution. Possible examples are: improved human performance, anticipated reduction in manpower requirements afloat or ashore, significant reduction in personnel training requirements, etc.

3. **AoA.** The AoA provides the foundation for KPPs, key system attributes, and other attributes in CDDs and CPDs, therefore it is vitally important that HSI considerations, where applicable, be evaluated during the AoA. This allows HSI considerations (e.g., manpower and systems training) and their associated costs to be addressed when selecting the preferred alternative. When applicable, the AoA should address the HSI elements in subparagraphs 3a through 3c.
a. Identify general roles and constraints in manpower, personnel, and training (military, civilian, contractor) concepts of operators, maintainers, and support personnel for each operational task. Any roles or functional area metrics which vary significantly from current operations will be included. Describe manpower end strength cost including operators, maintainers, and support personnel for afloat, ashore, and other staffing concepts. Identify training requirements and cost to maintain and refresh knowledge, skills, abilities, and training, or develop personnel attributes and training not currently available to the Navy. Identify human factors engineering, habitability, safety and occupational health concepts and any requirements that will offset TOC or improve performance.

b. Identify the conditions associated with the operational tasks that will include those related to HSI. Conditions relating to the current and projected manpower and personnel limitations or availability will be included, along with environmental conditions (e.g., sea state, temperatures, and reduced visibility) that may impact performance of operators, maintainers, or support personnel.

c. HSI will be considered in the acquisition process through the activities contained in subparagraphs 3c(1) through 3c(7).

(1) Identify the development, modification, or maintenance of training, training infrastructure, and shore support. Conduct affordability assessments that include estimates of the TOC of the training infrastructure, manpower, and the training associated with each approach. Identify the supportability required for training and other supporting infrastructure.

(2) Identify technologies that are candidates for future maturation, including a high-level evaluation of the compatibility of those technologies with the skill sets of the projected user population.

(3) Identify the family of systems and system of systems approaches to include consideration for commonality of roles, tasks, and user interfaces across those systems. Common support equipment and systems should be evaluated with regard to efficiency, HSI, and safety characteristics.

(4) Identify high manpower drivers that optimize manpower and human performance in the emerging system solution by emphasizing challenging legacy system increments.

(5) Identify requirements for safety, survivability, habitability, and environment considerations that can resolve the identified capability gap(s). Assess the expected design approach impact on human performance, with emphasis on human error potential, mission impact and control of safety, health, environmental regulations, ergonomic and human engineering hazards, and risks.
(6) Reference (b) requires that CDDs and CPDs include a description of DOTMLPF impacts and constraints. Discussion of each DOTMLPF impact and constraint must address the HSI domains that have a major impact on system effectiveness, suitability, and affordability.

(7) Reference (a) requires that the Chief of Naval Operations determine accurate estimated manpower requirements for new and modified systems acquisitions. As a user representative, CNO N1 will help the resource sponsor identify, define, endorse, and prioritize mission requirements and capabilities needs, and program resource allocations to meet those requirements and needs, through the Planning, Programming, Budgeting, and Execution System.

4. **Definition of Terms.** For the purpose of this document, the terms listed in subparagraphs 4a through 4d apply.

   a. **Cognitive Workload.** A measure of the mental and perceptual activities required to perform a task to a specific performance level. Cognitive workload can be thought of as the amount of resources demanded by the task or job.

   b. **Physical Workload.** The total physical activity (e.g., pulling buttons, activating, standing, lifting,) required to perform a task.

   c. **Temporal Workload.** Mental demand relating to time pressure to perform a task. Temporal workload is a function of cognitive workload and physical workload in addition to all other time pressures (including any waiting time).

   d. **Workload.** The amount of work assigned to or expected from a worker in a specified time period.

5. **CDD and CPD.** HSI considerations will be addressed, where applicable, in the CDD and CPD, with particular emphasis on sections 6, 14, and 15. Specific considerations may include the sections cited in subparagraphs 5a through 5g.

   a. **Section 2 - Analysis Summary.** Briefly summarize the results and impact of analyses to support HSI, including top down requirements analyses, manning studies, human performance assessments, etc.

   b. **Section 3 - CONOPS Summary.** Within the synopsis of the CONOPS, briefly include (as part of the enabling capabilities) the roles of operators, maintainers, and support personnel, and preferred approaches for areas such as training, personnel management, human interaction with automation, maintenance, logistics, and distance support.

   c. **Section 6 - System Capabilities Required for the Current Increment(s).** Information to be included is listed in subparagraphs 5c(1) through 5c(3).
(1) A summary statement that indicates all required capabilities will be met with the human as part of the system.

(2) OPNAV N12 will confirm that the guidance in reference (a) has been correctly followed in determining system training, manpower, survivability, force protection KPP applicability. This confirmation will be provided in or during Navy JCIDS review period as part of the HSI considerations for the ForceNET consolidated compliance checklist.

(3) The description of any human-related attribute should help to ensure that the intent of the attribute is satisfied. For example, if a manpower key system attribute is appropriate, temporal workload or work-week requirements are necessary to ensure that a manpower key system attribute is met without overworking personnel. For CDDs and CPDs that define a new or modernized ship, submarine, aircraft, unmanned system, or command, control, communications, computers, and intelligence systems, the shore support requirements and limitations must be specified to ensure that manpower goals are not met by simply moving personnel ashore. Additionally, there may be HSI constraints or other parameters that must be identified for attributes that are strictly HSI related.

d. Section 12 - Assets Required to Achieve Initial Operational Capability (IOC) and Full Operational Capability (FOC). Describe the supporting capabilities in training infrastructure and shore support, including distance support required to achieve IOC (for the CDD) or FOC (for the CPD). Define the manpower and training quantities needed, and availability (e.g., crew quantities needed for original equipment manufacturer training, follow-on phasing, initial training, and specified locations for trainers by FOC).

e. Section 14 - Other DOTMLPF and Policy Considerations. In the CDD, summarize the DOTMLPF considerations that led to materiel and non-materiel solutions. In the CPD, identify changes to DOTMLPF to include all HSI domains associated with fielding the system. These guidelines will be applied to section 14 of the CDD and CPD where applicable.

(1) Provide a short description of HSI issues in the CDD and CPD, and fleet concerns regarding materiel solution implementation in the CPD. Include systems integration information concerning standardization and commonality of systems, equipment, and components and their optimization for intra- and inter-platform, joint, and combined interoperability and human performance as appropriate.

(2) Provide top-level manpower, personnel, and training guidance in the CDD for system developers to derive appropriate contractual manpower, personnel, and training requirements during the engineering and manufacturing development (EMD) phase of acquisition. This guidance will be updated in the CPD to guide the system developer to update derived manpower, personnel, and training requirements for the production and deployment phase. Examples of
derived manpower, personnel, and training requirements the system developer may be required
to create during the EMD and production and deployment phases are included in subparagraphs
5e(2)(a) through 5e(2)(e).

(a) Identify the integrated training system requirements for individual, collective,
joint, and fleet training support (e.g., Total Ship Training System for ships). Describe the
required aptitudes, and physical characteristics of operators, maintainers, and support personnel.

(b) Describe in measurable and testable terms, when relevant, the missions, functions,
or attributes used to optimize manpower personnel readiness requirements (e.g., improved
technology or automation that will reduce human cognitive workload). Identify human factors
engineering standards and metrics (e.g., accuracy, time, and fatigue) that improve human
machine interfaces that are intuitive, interoperable, and have common and consistent protocols
for system operation.

(c) Identify manpower, personnel, and training TOC savings achieved through
analysis of design human factors, workload, and associated key system attributes, resources, and
tools for all tasks allocated to humans required for the efficient operation, employment, and
support of the system.

(d) Describe any safety and occupational health, and environmental compliance
requirements that reduce the risk of fatalities, injury, illness, disability, or death of the operators,
maintainers, and support personnel. These include minimizing personal detection or targeting,
fratricide, or confinement within an attacked entity. Examples include egress from confined
spaces, ejection seats, assisted breathing devices, etc.

(e) Describe habitability requirements, such as berthing and personal stowage, food
service, medical, religious, security facilities, recreational and lounge spaces, and ambient
environment requirements (e.g., noise, lighting, heating, air conditioning, ventilation, and
workspace layout).

f. Section 15 - Other System Attributes. Include a summary HSI statement: “Total system
performance measures and requirements will include the merged performance of hardware,
software, and human performance (including operators, maintainers, and support personnel).”
This statement will ensure that Navy mission essential task lists can be developed within
assigned mission parameters. Where applicable, summarize capabilities-oriented performance-
based HSI requirements that drive design, cost, and risk.

g. Section 16 - Program Affordability. Ensure that the costs of developing and sustaining
the manpower and training required for the system and its supporting infrastructure (e.g.,
training, shore support) are incorporated into cost estimates. Describe the plans or process for
trading off increased design or acquisition cost to reduce operations and support or TOC.
ADDITIONAL HSI RELATED RESOURCES

1. Web Sites
   a. Navy
      (1) Human Analysis Requirements Planning System (HARPS): https://harps.nmci.navy.mil (CAC enabled - use e-mail certificate)
      (2) NAVSEASYSCOM Training Acquisition (SEATRACQ): register at https://register.nsle.navy.mil. Once registered login to portal and request access to SEATRACQ for an account.
      (3) NAVAIRSYSCOM Navy Training System Plan database: https://avtechtra.nmci.navy.mil/Main_Menu.htm (CAC enabled default to required certificate)
      (5) Naval Education and Training Command: https://www.netc.navy.mil
   b. Other Services and Government
      (1) Air Force Research Laboratory’s Human Effectiveness Directorate: http://www.wpafb.af.mil/afrl/he/
      (4) Federal Aviation Administration Human Factors Division: http://www.hf.faa.gov/
      (5) National Aeronautics and Space Administration Human Systems Integration Division: http://human-factors.arc.nasa.gov

2. Instructions
   a. DoD Instruction 5000.02 of 7 January 2015
   b. DoD Instruction 6055.07 of 6 June 2011
   c. OPNAVINST 1000.16L
3. Standards and Handbooks


   c. MIL-HDBK-502A, Product Support Analysis, 8 March 2013

   d. MIL-HDBK-29612-1A, Guidance for Acquisition of Training Data Products and Services, 31 March 2016


   f. MIL-HDBK-29612-3A, Development of Interactive Multimedia Instruction (IMI), 31 March 2016

   g. MIL-HDBK-29612-4A, Glossary for Training, 31 March 2016

   h. MIL-HDBK-29612-5, Advanced Distributed Learning (ADL) Products and Systems, 4 April 2016


4. **Guides**

   a. Defense Acquisition Guidebook, Chapter 5 Human Systems Integration (HSI), 26 February 2017

   b. HSI Plan Preparation Guide, Version 2.01, April 2008

   c. NAVPERS 15839I, Navy Officer Manpower and Personnel Classification – Volume I, Major Code Structures, Volume II, The Officer Data Card, 8 May 2017

# ACRONYM GLOSSARY

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>AoA</td>
<td>analysis of alternatives</td>
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<tr>
<td>CBA</td>
<td>capabilities-based assessment</td>
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<td>CDD</td>
<td>capability development document</td>
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<td>CONOPS</td>
<td>concept of operations</td>
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<td>CPD</td>
<td>capability production document</td>
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<td>CSR</td>
<td>core skill requirements</td>
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<td>DoD</td>
<td>Department of Defense</td>
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<tr>
<td>DOTMLPF</td>
<td>doctrine, organization, training, materiel, leadership, personnel, facilities</td>
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<td>EMD</td>
<td>engineering and manufacturing development</td>
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<td>ESR</td>
<td>education skill requirements</td>
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<td>FOC</td>
<td>full operational capability</td>
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<td>GAO</td>
<td>Government Accountability Office</td>
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<td>HARPS</td>
<td>Human Analysis and Requirements Planning System</td>
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<td>HSI</td>
<td>human systems integration</td>
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<td>IOC</td>
<td>initial operational capability</td>
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<td>JCIDS</td>
<td>Joint Capabilities Integration and Development System</td>
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<td>KPP</td>
<td>key performance parameter</td>
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<tr>
<td>NAVAIRSYSCOM</td>
<td>Naval Air Systems Command</td>
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<td>NAVSEASYSCOM</td>
<td>Naval Sea Systems Command</td>
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<td>ONR</td>
<td>Office of Naval Research</td>
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<td>Office of the Chief of Naval Operations</td>
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<td>OPNAVINST</td>
<td>Office of the Chief of Naval Operations Instruction</td>
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<tr>
<td>PEO</td>
<td>program executive office</td>
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<tr>
<td>PM</td>
<td>program manager</td>
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<td>RDT&amp;E</td>
<td>research, development, testing, and evaluation</td>
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<td>S&amp;T</td>
<td>science and technology</td>
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<td>Secretary of the Navy Instruction</td>
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<td>system engineering technical review</td>
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