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MEMORANDUM FOR DISTRIBUTION

SUBJECT: Shipbuilding Earned Value Management Amplifying Guidance

Recent EVM system reviews have highlighted differing interpretations and application of the ANSI-748 guidelines between the Defense Contract Management Agency (DCMA) and the NAVSEA Supervisor of Shipbuilding, Conversion, and Repair (SUPSHIP). Differing interpretations can cause confusion for contractors and lead to inefficiencies. The DON affirms that the Earned Value Management (EVM) guidelines apply to shipbuilding programs, but the application of these guidelines is different than most other industries and requires, therefore, amplifying guidance regarding application. This memorandum provides amplifying guidance to ANSI-748 guidelines in a manner acceptable to both DCMA and the DON.

DCMA acts on behalf of the Department of Defense to validate contractor EVM system compliance requirements in accordance with the Guidelines required by the ANSI-748 standard. Within the Department of the Navy (DON), the DASN (Management and Budget) Center for Earned Value Management (CEVM) drafts EVM policy and provides EVM oversight and independent analysis; NAVSEA 05C sets EVM processes for their Command; and SUPSHIP conducts surveillance and monitors shipbuilders' EVM systems to ensure they remain compliant with ANSI-748.

A team of EVM experts from DCMA, NAVSEA 05C, and the CEVM have met and coordinated language with shipbuilding stakeholders and leadership to establish a common methodology to assess compliance in five EVM guidelines that have been most susceptible to differing interpretations:

- Guideline 1 – Define Work Breakdown Structure
- Guideline 6 – Scheduling of Work
- Guideline 10 – Identify Discrete Work Packages
- Guideline 11 – Sum of Work Package Budgets Equal Control Account Budgets
- Guideline 21 – Material Cost Performance

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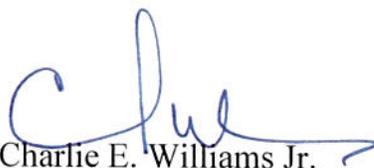
The DON expects all new shipbuilding contracts will require MIL STD-881C compliance through level 3 (ESWBS 100 level). In accordance with MIL STD-881C, Appendix E, shipbuilders will report EVM performance as stated in the appendix, but may plan and execute the work under a separate WBS. This approach allows contractors the freedom to plan according to the way ships are built, but also meet DON needs for a common reporting framework to improve cost estimates of future ships. Also, in accordance with current policy, the Integrated Master Schedule requires a field that maps each activity to its associated WBS. All shipbuilding EVM contract deliverables will be submitted to the DOD EVM Central Repository.

For contracts in execution, specifically, DDG 51 (through Hull 112), LPD-17 (through Hull 25), T-AKE, DDG-1000, LHA-6/7 and Virginia Class Submarines (through Hull 783) MIL STD-881C will not be retroactively applied. The DON has determined it would be cost prohibitive because the contract is either substantially complete or the last ships of the class are on contract. For similar reasons, Virginia Class Submarines Block III and LPD-17 (Hulls 26 and 27) have waivers in place and MIL STD-881 will not apply.

This memorandum documents the agreement between DCMA and the DON on these areas. Attachment (1), "Defense Contract Management Agency and Department of the Navy EVM Guideline Interpretation Agreement for Shipbuilding Programs", defines the basis for evaluating these five areas and will be used for assessing ANSI-748 compliance at shipyards. The expectations in this agreement will be used by both the DON and DCMA to assess contractor compliance to the EVM guidelines in the ANSI-748 standard.



Sean J. Stackley
Assistant Secretary of the Navy
Research, Development, and Acquisition



Charlie E. Williams Jr.
Director
Defense Contract Management Agency

Attachments:
As stated

Attachment 1
Defense Contract Management Agency and Department of the Navy
EVM Guideline Interpretation Agreement for Shipbuilding Programs

Guideline 1 – Define Work Breakdown Structure

Guideline Statement:

Define the authorized work elements for the program. A work breakdown structure (WBS), tailored for effective internal management control, is commonly used in this process.

Shipbuilding Context:

Shipbuilding construction practices pose several organizational process dilemmas as these practices must comply with both the ANSI/EIA-748-B guidelines and DOD policy for EVM and cost reporting. Guideline 1, states that the supplier (shipbuilder) must define the authorized work elements for the program, tailored for effective internal management control, and that a Work Breakdown Structure (WBS) is commonly used in this process. DOD policy requires that Format 1 of the Contract Performance Report (CPR) be in a product oriented WBS compliant with MIL-STD-881C, Work Breakdown Structures for Defense Material Items. Appendix E provides a product oriented WBS for sea systems based on the Extended Ships Work Breakdown Structure (ESWBS) which represents the ship in a systems- based WBS. Additionally, Appendix E states that it is permissible for the contractor's internal work breakdown structure to differ from these summary elements; however, the internal WBS should be mapped to the MIL-STD-881 WBS and definitions.

Current shipbuilding construction practice typically plans and executes based on a modular or milestone approach in which given modules/milestones would include system elements from across the ESWBS. The value of an internal WBS framework for planning and executing work that is consistent with the current module based construction practices is that it provides the shipbuilder and the Navy accurate management information to the program manager consistent with actual construction processes. The Navy requires an ESWBS based CPR Format 1 not only for compliance with DOD policy, but to support comparison of contract cost data and cost modeling in a common framework. While planning and executing work in a module based framework at an appropriate level the cost of work (planned, accomplished and actual) should be linked to the appropriate ESWBS element to support reporting that is compliant with DOD policy.

Compliance Requirement:

The shipbuilder shall define the authorized work elements for the program through a work breakdown structure tailored for effective management control. For shipbuilding programs, two work breakdown structures may be used. Internally, contractors may use an internal WBS that is consistent with the shipbuilders' construction processes (e.g. modular-based construction practices) and reflects the planning and execution of work. For external reporting, the contractor shall report EVM performance according to MIL STD-881.

The internal WBS shall breakdown all authorized work scope into appropriate elements for planning, budgeting, scheduling, cost accounting, work authorization, measuring

progress and management control. The shipbuilder shall map the internal WBS at an appropriate level to support reporting in a MIL-STD-881 compliant product oriented WBS for CPR Format 1 at the level required by the contract. This approach would provide a system that meets the shipbuilder's current management practices while meeting the government's need for a standard WBS structure across ship platforms. In cases where a formal waiver for MIL-STD 881 WBS is approved, the provisions of the waiver shall be used to assess compliance.

If the contractor chooses to manage with a modular construction structure, modular performance could be reported in Format 2 of the CPR. To meet reporting requirements stated in the CPR Data Item Description, major subcontractors subject to EVM flow-down requirements shall be included in Format 2, but may be flagged as "non-add" if costs are already captured in other reporting elements. The program office may request two Format 2 submittals if they desire EVM data by both a modular WBS and by trade-based organizations. Appropriate approvals shall be taken to implement a supplemental Format 2. Variance analysis against Format 1 and/or Format 2 will be defined in the CDRL.

Guideline 6 –Scheduling of Work

Guideline Statement:

Schedule the authorized work in a manner which describes the sequence of work and identifies significant task interdependencies required to meet the requirements of the program.

Shipbuilding Context:

Scheduling in a shipbuilding environment is of critical importance and must be accomplished in conjunction with the systems employed to manage material procurement and assembly. Guideline 6, states that the supplier (shipbuilder) must schedule the authorized work in a manner, which describes the sequence of work and identifies significant task interdependencies required to meet the requirements of the program. Shipbuilding by its very nature is manufacturing/production-oriented and shipbuilder's employ manufacturing resource planning (MRP) systems to manage procurement and assembly of material with associated labor through production orders or work bills. Shipbuilder's are potentially misinterpreting the scheduling guideline, and corresponding Integrated Master Schedule (IMS) contract deliverable, as a requirement to replicate the production orders/work bills within the MRP within the IMS including task interdependencies and sequencing.

Compliance Requirement:

The shipbuilder shall schedule the authorized work in a manner which describes the sequence of work and identifies significant task interdependencies. The IMS shall summarize the production orders/work bills maintained within the MRP system as work packages (or lower level) to ensure visibility of task interdependencies and network logic. The summarized MRP production orders/work bills shall be integrated into the IMS with the appropriate interdependencies and sequencing to preserve accurate network logic that supports the generation of a valid program-level critical path. In the event that all work cannot be detail planned to the work package level, higher level planning packages shall be used to represent efforts that cannot be planned to the same level of fidelity.

Guideline 10 – Identify Discrete Work Packages

Guideline Statement:

To the extent it is practicable to identify the authorized work in discrete work packages, establish budgets for this work in terms of dollars, hours, or other measurable units. Where the entire control account is not subdivided into work packages, identify the far-term effort in larger planning packages for budget and scheduling purposes.

Shipbuilding Context:

The establishment and management of budgets within the shipbuilding community is performed at the work package level (or the comparable equivalent) and managed by the Control Account Managers (CAMs) in terms of labor hours and material dollars. Concern has been expressed that a CAM management approach using labor hours and material dollars is non-compliant as the shipbuilder's CAMs do not have visibility of the cost impact of rate variations associated with varying skill levels and overtime premiums.

Compliance Requirement:

The use of labor hours as measurable units for identification and management of discrete work is permissible. The shipbuilder shall have internal management control processes that capture and assess the dollarized performance at the control account level before it is summarized. The shipbuilder shall have appropriate internal management processes such that a designated shipbuilding management organizational unit, such as Program Control/ Financial Management, is responsible for assessing the dollarized aspect of the control accounts, including periodic premium overtime and variance analyses. The processes shall provide for CAMs to be knowledgeable of the organizational unit responsible for monitoring the dollarized aspects of their control account. The CAM must maintain situational awareness through periodic receipt of reports. Program Controls or Financial Management may be responsible for capturing and identifying the dollarized aspect of the control accounts, but the CAM is responsible for managing and meeting control account budgets in hours and dollars.

Guideline 11 – Work Package Budgets Equal Control Account

Guideline Statement:

Provide that the sum of all work package budgets plus planning package budgets within a control account equals the control account budget

Shipbuilding Context:

Within the shipbuilding community several shipbuilder's establish target budgets at the work package level (or the comparable equivalent) based on engineering standards reflecting historical actuals or parametrics for comparison purposes. In many instances this results in the sum of the target and control account budgets at the work package level not being equal, and consequently not in compliance with the ANSI Guidelines. Guideline 11, states that the supplier (shipbuilder) must provide that the sum of all work package budgets plus planning package budgets within a control account equals the control account budget. Typically, the shipbuilder's target budgets are being employed as a benchmark for comparison purposes only and thus should not necessarily equal the sum of the work package (or the comparable equivalent) budgets at the control account level. The target values are reconcilable to a total target for the control account and the progress methodology used to progress within the control account ensures target progress is equal to budget progress.

Compliance Requirement:

The shipbuilder may provide for the use of target budgets in the EVMS as engineering standards, based on historical actuals or parametrics for comparison purposes, but not as a substitute for budgets established at the work package level (or the comparable equivalent) which are summarized at the control account level. Where targets are established, corresponding budgets shall be established at the work package level.

If targets are used as the basis for performance measurement, the contractor must have controls in place to limit changes to the targets. Stable targets based on objective technical accomplishments are essential for maintaining reliable performance measures. Processes must be in place to limit the frequency and magnitude of changes and minimize any retroactive performance impact to open work packages, production orders, or work bills. These processes must be documented in the EVM system description or other formal documents. Changes to the targets shall be based on changes to the way work will be accomplished, rather than the number of hours estimated to complete the effort.

Guideline 21 – Material Cost Performance

Guideline Statement:

For EVMS, the material accounting system will provide for:

- (1) Accurate cost accumulation and assignment of costs to control accounts in a manner consistent with the budgets using recognized, acceptable, cost techniques.
- (2) Cost recorded for accomplishing work performed in the same period that earned value is measured and at the point in time most suitable for the category of material involved, but no earlier than the time of actual receipt of material.
- (3) Full accountability of all material purchased for the program including residual inventory.

Shipbuilding Context:

Material management within a shipbuilding environment is of critical importance and must be accomplished in a manner which provides maximum identification of critical or high dollar material relative to the management visibility needed for less critical or low dollar material. Shipbuilder's often employ the use of statistical progressing/forecasting methods, often referred to as PERT, in material management and in many instances there is no differentiation between critical or high dollar material versus less critical or low dollar material. This results in a lack of visibility into true material progress through the EVMS.

Compliance Requirement:

Material performance shall be claimed by objective measures and as close to the point of consumption as practical. Objective methods may include: time when the material is applied to or installed on the deliverable item; at inventory release; based on receipt inspection and test; or apportioned. The contractor's system description shall identify different material categories (hatchable, non-hatchable, critical, etc.) and the appropriate methodologies for each type. BCWP and ACWP must be claimed in the same period and based on the same methodology. PERT shall only be used on low dollar or commodity type material.