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COST ASSESSMENT AND
PROGRAM EVALUATION

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE (ACQUISITION,
TECHNOLOGY, AND LOGISTICS)
ASSISTANT SECRETARY OF THE ARMY (ACQUISITION,
LOGISTICS AND TECHNOLOGY)
ASSISTANT SECRETARY OF THE ARMY (FINANCIAL
MANAGEMENT AND COMPTROLLER)
ASSISTANT SECRETARY OF THE NAVY (RESEARCH,
DEVELOPMENT AND ACQUISITION)
ASSISTANT SECRETARY OF THE NAVY (FINANCIAL
MANAGEMENT AND COMPTROLLER)
ASSISTANT SECRETARY OF THE AIR FORCE (ACQUISITION)
ASSISTANT SECRETARY OF THE AIR FORCE (FINANCIAL
MANAGEMENT AND COMPTROLLER)

SUBJECT: Cost Analysis Requirements Description (CARD) Interim Policy

On June 9, 2015, the Director of Cost Assessment and Program Evaluation (CAPE) signed and issued DoD Instruction (DoDI) 5000.73, "Cost Analysis Guidance and Procedures." To support the policies and procedures in the new DoDI 5000.73, CAPE is issuing updated guidance for the preparation and maintenance of the CARD. The attached document sets forth the interim CARD policy and is effective immediately. CAPE anticipates issuing the final CARD guidance by October 2015.

My point of contact for this effort is Curt Khol at 703-697-0319 or curtis.a.khol.civ@mail.mil.



Jamie M. Morin
Director

Enclosure (as stated)

INTERIM GUIDELINES FOR THE PREPARATION AND MAINTENANCE OF THE
COST ANALYSIS REQUIREMENTS DESCRIPTION (CARD)

1. CARD PREPARATION

a. The CARD provides a complete, detailed description of the acquisition program that is used to prepare the Independent Cost Estimate (ICE), Program Office Estimate (POE), DoD Component Cost Estimate (CCE), DoD Component Cost Position (CCP), and other cost estimates, as required. The CARD succinctly describes the key technical, programmatic, and operational characteristics of an acquisition program. The foundation of a sound cost estimate is a well-defined program, and the CARD is used to provide that foundation. The CARD, along with supporting data sources, provides all of the information necessary to develop a cost estimate.

b. The CARD provides the essential information necessary to support the preparation of life-cycle cost estimates. Ideally, the narrative of the CARD, not including tables and figures, should be about 20 pages in length. Major defense acquisition programs (MDAPs) that are composed of system of systems with distinct elements may have separate CARDS for each element.

c. The CARD should make liberal references to other program documents (e.g., the acquisition strategy, test and evaluation master plan, or systems engineering plan), thus eliminating any redundancies between the CARD and other documents and streamlining the CARD preparation process. For example, for a program with a formal acquisition strategy document, the CARD need only provide a brief synopsis of the acquisition strategy and provide a reference or link to the source document. The CARD must provide a statement that affirms that each source document is current, authoritative, and provides a reasonable definition of approved program content. The preparation of the CARD should be synchronized with the preparation of the source documents, so that the final CARD is consistent with other final program documents. The CARD must also be consistent with any contractual solicitations, such as a Request for Proposal (RFP) or any related document (e.g., System Requirements Document).

d. The CARD will be prepared by the Program Management Office (PMO) or other DoD Component designated organization. The initial CARD must be prepared to support the first milestone review after the Materiel Development Decision (MDD). Following the milestone review, the CARD must be updated annually to reflect both the most recent President's Budget and the associated Future Years Defense Program (FYDP). The CARD update must be submitted to the appropriate service cost agency and the Director of Cost Assessment and Program Evaluation (CAPE). All CARDS submitted to CAPE must be sent by email to osd.pentagon.cape.list.cost-librarian@mail.mil. CARDS produced in support of milestone decisions must be signed by the program manager and the Program Executive Officer (PEO). Annual updates which do not support a milestone decision may be signed by the program manager.

e. For joint programs, the CARD must include the common program agreed to by all

participating DoD Components, as well as any unique program requirements of the participating DoD Components.

f. These guidelines focus on CARD preparation for MDAPs and should be tailored for Major Automated Information System programs.

2. CARD CONTENT

a. The CARD consists of narratives, tabular data, figures, and diagrams. Liberal use of tables, figures, and diagrams to reduce narrative descriptions is encouraged. The CARD outline below may be tailored to accommodate the specific circumstances for each program, and not all outline headings may apply to every program.

b. Level of Detail

(1) The level of detail provided in the CARD will depend on the maturity of the program. Programs at Milestone A typically have the least definition. Therefore, tailoring of the Milestone A CARD, with CAPE concurrence, is encouraged. Similarly, programs at Milestone B are less well-defined than programs at Milestone C or at Full Rate Production. In cases where there are gaps or uncertainties in general program concepts or specific program data, the uncertainties must be acknowledged in the CARD.

(2) For uncertainties in program concepts, nominal assumptions must be specified for cost-estimating purposes. For example, if the future depot maintenance concept is not yet determined, the CARD must provide nominal, but specific, assumptions about the maintenance concept.

(3) For uncertainties in numerical data, ranges that bound the likely values (e.g., low, most likely, and high estimates) must be included. In general, values that are “to be determined” are not adequate for cost estimating. Dealing with program uncertainty in the CARD greatly facilitates subsequent sensitivity or quantitative risk analyses in the life-cycle cost estimate.

c. Specific cases for Milestones

(1) For those programs in which the Preliminary Design Review (PDR) is conducted before Milestone B, the results of the PDR must be reflected in the final CARD at Milestone B and the resulting CCE and ICE, even if the results were not available in time to support the preparation of the draft CARD.

(2) When the Defense Acquisition Board (DAB) milestone review process overlaps with a competitive source selection process, there may be two or more competing contractor teams responding to a RFP with viable solutions.

(a) For programs in which the source selection outcome will be known well in advance (nominally 45 days or more) of the OIPT review and coordination between the source

selection and supporting program cost estimate is desired by leadership, a two stage CARD process is recommended. The draft version of the CARD will reflect the program development, test, operations and support, and disposal elements of the program along with a discussion of potential technologies and designs of likely hardware solutions. Upon determination of the source selection winner, the final version of the CARD will be submitted which incorporates the technologies and design associated with the winning proposal. The ICE will reflect the program content of the winning offer.

(b) For programs where the source selection outcome will not be known well in advance of the DAB review, there are two possible approaches to CARD preparation.

1. If the competing contractors are using similar technologies and are proposing similar design concepts, then a single generic CARD, based on a nominal government design, may be used to prepare a single CCE and a single ICE based on the nominal design.

2. If the competing teams have significantly different technologies or design concepts, then the PMO must prepare multiple offeror-specific CARDS, which in turn will be the basis for multiple CCEs and ICEs.

(c) In all cases, the program office should meet with representatives from the service cost agency and CAPE at least 180 days before planned milestone to review potential source selection outcomes and enable CAPE to make a determination as to which approach will be followed.

(d) Beginning with the first annual CARD update following the DAB review, only information on the contracted solution is required.

d. Program and System Description Section

(1) System Overview. This section provides concise background information about the system, including a system description, an explanation of the missions that the system will perform and the threats that it is expected to encounter, and a summary of the system program history. A diagram or picture of the system must be included.

(2) Interfaces with Other Systems. This section describes the relationships between the system and other systems, including the nature of any interfaces that will be required. Any associated modifications to the hardware or software of the other systems also will be described. The interface boundaries to other systems, programs, and subprograms must be clearly identified.

(3) System Performance Parameters and Characteristics. This section provides a summary of the approved key performance parameters established through the Joint Capabilities Integration and Development System (JCIDS) and documented in an approved capabilities needs document (Capability Development Document or Capability Production Document). The key performance parameters must be expressed in terms of threshold and objective values and, where appropriate, current estimates of performance. Tabular presentation of data is highly

encouraged. Further information on the JCIDS process is found in Chairman of the Joint Chiefs of Staff Instruction 3170.01H and the Manual for the Operation of the Joint Capabilities Integration and Development System. In addition, this section must provide other important performance parameters or attributes, with emphasis on those that would be of interest to cost estimators. The discussion must explain the sources of the data (e.g., contract specifications, current engineering estimates, or actual values supported by test results).

(4) Program Milestone Schedule. This section provides a summary of the integrated master schedule including a figure or diagram that displays when major work efforts will support tasks and events for each phase over the program life cycle. Use of a standard program briefing chart is encouraged. Typically, schedule charts include identification of major acquisition milestone approvals or program reviews; major contractual events (e.g., source selections or contract awards); systems engineering related technical reviews and audits, such as the critical design review or the physical configuration audit; manufacturing start dates and important intermediate milestones, and system deliveries during development and production; planned developmental, operational, and live fire testing; and major fielding and sustainment activities and events (e.g., initial operational capability, site activations, and declaration of organic maintenance capabilities). This section also should provide a discussion that explains the critical paths for the program schedule. A milestone tab is included in the commodity workbook to capture key event dates.

(5) Acquisition Strategy. This section provides a summary of the program acquisition strategy, including identification of the prime and major sub-contractors during each acquisition phase, if known. The section must also explain the nature and degree of competition throughout the program development, production and deployment, and sustainment. A discussion of the contract type(s) (i.e., cost plus, fixed-price incentive, or firm-fixed price) that will be used in each phase of the program also must be provided, along with an explanation of the use of contract incentives such as award fees. Other possible discussion topics include the use of an event-driven program structure and approach, use of multi-year contracting, use of Agile acquisition, use of a cloud computing approach, use of custom software or commercial-off-the-shelf (COTS) applications, use of a modular open systems approach, and an assessment of critical industrial capabilities. The acquisition strategy for sustainment or product support will be described in the system support concept section of the CARD.

(6) Time-Phased System Quantity Requirements. This section consists of a table that identifies the quantities of systems to be developed, procured, and deployed. The data must be displayed by acquisition phase and fiscal year. The table should note the quantity of fully-configured end items associated with development and procurement used to calculate the unit cost metrics, the program acquisition unit cost, and average procurement unit cost. Any systems associated with backup inventory or attrition reserve must be identified separately. If possible, any system quantities associated with known foreign military sales (FMS) should be identified and displayed separately, including historical FMS sales for legacy system(s).

(7) Design Description. This subsection provides the top-level description of the system design, including physical design parameters. Tabular presentation of data is highly encouraged.

(8) Critical Technologies. This section identifies new or novel technologies that the system will depend on to meet key performance parameters or other design goals. This section also must summarize the current and projected technology readiness levels of each critical technology, as presented in the technology readiness assessment. For programs that are approaching a Milestone B approval, this section identifies any critical technologies that will not be considered mature at the anticipated time of the approval and summarize the associated technology maturation plan.

(9) Assessment of Program Risks and Risk Mitigation Measures. This section describes the anticipated risk areas that have the most likely potential to cause a significant deviation (cost, schedule, or performance) from the planned program. The risk assessment will consider such factors as technology development, design concepts, stringency of test requirements, manufacturing capabilities, funding availability and program stability, schedule sufficiency, and relevant sustainment and disposal issues. This section also summarizes the program's risk mitigation strategies and risk monitoring approaches.

(10) Program Protection Features and Embedded Security. This section describes any design features associated with the protection of program technology, components, or information from compromise or disclosure. In particular, any hardware or software associated with embedded security should be noted.

(11) Government-Furnished Equipment and Property. This section identifies the subsystems, components, or other items that will be furnished by the government to the system contractor(s). Any government-furnished COTS software will be included in the discussion.

(12) Test and Evaluation. This section summarizes all testing to be accomplished for developmental, operational, and live fire testing. The number, type, location, and expected duration of the tests should be identified, along with the organizations that will conduct the test programs. This section should also describe any contingency or margin for test failures in the program test and evaluation plan.

(13) Facilities and Tooling Requirements. This section describes the facilities and equipment required to support the program during all phases of the system life cycle at both the contractor site and Government facilities.

(a) Facilities. The description must provide quantities (in an appropriate unit of measure, such as square feet) of facilities associated with production, test and evaluation, operations, training, and sustainment by appropriate facility category and geographic location. (See the DoD Facilities Pricing Guide for further information about facilities categories, geographic areas, and construction and sustainment cost factors.) The description must make the distinction between government versus contractor owned, new construction versus existing facilities that will be modified, and program-unique versus facilities shared with other programs, and explain how these various distinctions will be accounted for in the program cost estimates. Any exotic or unique infrastructure requirements must be explained. Any requirements for land acquisition must also be noted. Describe Government facilities required to train, maintain, and sustain the system including any requirements at the depot maintenance facility.

(b) Tooling. Describe tooling and test equipment requirements for all phases of the system life cycle, including end items and system sub-elements provided to contractor and Government laboratories; test equipment at development, production, and sustainment facilities; and tooling for low rate and full rate production. Describe tooling and equipment required at the depot maintenance facility.

(14) Environment, Safety, and Occupational Health (ESOH) Considerations. This section describes the environmental conditions and ESOH considerations that are anticipated throughout the system life cycle, and the system design features or other program actions that will be taken to eliminate or reduce those risks. The discussion must identify any toxic, radiological, or other hazardous material used or generated over each phase of the system life cycle, and describe the appropriate equipment and procedures associated with the handling of such material. Other possible ESOH topics to be addressed include hazards and associated mitigations related to system mishaps and accidents, personnel injury, adverse health and ergonomic effects, or significant environmental impacts (including noise).

e. Technical and Physical Description Section. This section provides a description of the technical and physical characteristics of the system as well as identifying predecessor and/or reference technology analogies, and technology and material readiness levels. A predecessor or reference system is a currently operational or pre-existing system with a mission similar to that of the proposed system. The predecessor or reference system is often the system being replaced or augmented by the new acquisition. When a particular value is not known, a program estimate of the range (minimum, most likely, maximum) must be included.

f. Software Description and Sizing Information Section. This section describes each computer software configuration item (including system applications as well as support software). For each configuration item that is to be developed, this section will provide:

(1) Sizing information (e.g., counts of source lines of code, function points, or reports, interfaces, conversions and enhancements—forms and workflows objects) stratified by new, modified, and reused code.

(2) Information about the programming language and environment.

(3) Any other factors that will influence the size of the software development and maintenance effort.

(4) For configuration items being developed incrementally, it is necessary to display the sizing information for each increment or build. For configuration items being developed using the Agile concept, it is necessary to display sizing information (e.g., story points, themes, user stories), schedule, and productivity (e.g., burn-down, backlog) for each Sprint. This section also includes schedule milestone information regarding both the configuration item builds, and the dependencies between the configuration items and related hardware.

(5) This section describes the host computer system(s) on which the software

configuration items will be operating. The host system should be readily identifiable in the system WBS. In addition, any firmware used in the system also should be identified.

g. System Operations and Support Concept Section

(1) System Operational Concept. This group of sections describes how the system will be employed and organized in peacetime, contingency, and wartime situations. Where appropriate, the description of the system operational concept must begin with an overview of system employment in support of approved operations plans or defense planning scenarios. The primary focus will still be peacetime employment which is the basis for the Life Cycle Cost Estimate. Further definition of the terminology below can be found in the Operating and Support Cost Estimating Guide published by the Office of the Secretary of Defense-Cost Assessment and Program Evaluation in March of 2014.

(a) Organizational and Unit Structure. This section describes how the system will be organized within operational units or other force structure elements. In some cases, the description may need to explain any hierarchy of multiple echelons. It should clearly delineate from the total force, all operator, maintenance, and other support manpower at operating units (or at maintenance and support units that are organizationally related and adjacent to the operating units). Unit-Level Manpower includes active and reserve military, government civilian, and contractors. The elements of unit-level manpower are Operations, Unit-Level Maintenance, and Other Unit-Level Manpower. This section should capture or complement what is detailed for Unit Level Manpower in the more thorough Manpower Estimate.

(b) Unit Operations. Unit Operations will describe the employment of the system. Particular focus should be given to the peacetime training demands that will generate the annual operating costs. Principally covered here will be the operating tempo (OPTEMPO) it takes to maintain required training levels. This will allow calculations for consumption of operating materials such as fuel, electricity, expendable stores, training munitions, and other operating materials. Unit Operations costs provided through a system support contract should be separately identified from those provided organically for each cost element. The elements of Unit Operations are Operating Material, Support Services, Temporary Duty and Transportation to training sites.

(c) Maintenance. This section should cover the general concept of maintenance support as well as whether or not this system has a “Core” maintenance determination that will reduce the sustainment options. If there are any special conditions such as Conditions Based Maintenance, it should be covered here. This section should cover the expected Equipment Useful Life (EUL) and overhaul plan (e.g., a 26 year EUL with one major overhaul at 13 years, or 30 year EUL with two 10 year Inspect and Replace Only As Necessary (IROAN) events). Additionally, if there is an Intermediate Level Maintenance organization, its structure should be captured here instead of in the Unit Manpower organization.

(d) Sustaining Support. This section includes support activities provided by centrally managed organizations external to the units that own the operating systems. Elements of this can be system-specific operator or Maintenance Training requirements, support equipment

replacement and repair, and very importantly, the transition from the early procurement funded Systems Engineering and Program Management (SEPM) to the long-term, steady state O&M funded SEPM, tech manual updates, and Simulator planned upgrades.

(e) Continuing Systems Improvements. The section should give an overview of planned hardware and software modifications. If there is a complementary procurement funded effort that adds capability to the system, it should be referenced here so the delineation between maintaining current capability and compatibility is not confused with modification or ECP programs that lead to a different system nomenclature.

(f) Indirect Costs. The indirect costs of the program are beyond the program manager's control. However, the CARD should provide details so that the Life Cycle Cost Estimate can capture all of these associated costs such as installation support, personnel support, and general training and education, some of which are captured in the Full Cost of Manpower (FCOM) model.

(g) Additional Information. This section describes other information necessary for developing an O&S cost estimate, including Reliability, Availability, and Sustainability metrics and whether these metrics are based upon actual test results or engineering estimates.

1. Reliability estimates address both mission and logistics reliability. The former describes the probability of carrying out a mission without a mission-critical failure. The latter refers to the frequency of adverse events, such as failures, maintenance actions, removals for corrective maintenance, or demands on supply. Reliability estimates should be at system maturity, with corresponding reliability growth curves. Mean Time between Failure (MTBF) for each of the appropriate production level 3 WBS elements must be provided.

2. Maintainability estimates address the ease and efficiency of which servicing, preventative maintenance, and corrective maintenance can be conducted (assuming maintenance is conducted by personnel of specified skill levels with prescribed procedures and resources). Maintainability estimates are usually quantified in terms of labor effort such as maintenance man-hours per operating hour or mean time to repair and may also include diagnostic measures such as percentage of faults accurately detected and identified as well as false alarm rates. Mean Time To Repair (MTTR) will be provided by the appropriate production level 3 WBS element.

3. Availability estimates address the readiness of the system (i.e., the percentage of time that the system would be available for a mission or its ability to sustain planned operations tempo). Availability, in part, is a function of the ability of the system to perform without failure (reliability) and, given a failure, to be quickly restored to service (maintainability). Availability is also a function of the level of planned supply resources and the projected timeliness of the supply process.

4. This section discusses the level of Tech Data that will be pursued during development and procurement of the system. This level of Tech Data greatly impacts the ability of the service to execute organic repair and overhaul.

(2) System Specific Information. This section discusses information necessary for understanding the basing, deployment, and employment of the system and includes:

(a) Transportability. Transportability refers to the system characteristics that affect the capability of the system, and its associated support assets, to be moved or deployed by towing, self-propulsion, or the use of external transportation assets through any means (e.g., oceans, airways, railways, highways). Any constraints that would make the system unsuitable for transportation by specific methods or assets must be identified.

(b) Logistics Footprint. Logistics footprint refers to the presence and size of logistics support required to sustain the system, often in a deployed environment. Measurable elements might include relevant support equipment, spare parts, manpower, facilities, and real estate, and also could include measures of transportation requirements for deployable elements (e.g., number of C-17 loads).

(c) Fielding, Basing and Deployment. This section lists the fielding plan of the systems by location and year, with information detailing any Initial/Interim Contractor Logistics Support. This information is very important for determining the timeline for the estimate. For systems that routinely deploy, this section must also describe the anticipated deployment scheme of the system in terms of number of sites and nominal operating locations. The program life-cycle cost estimate is made to reflect peacetime conditions. However, for some programs, various elements or activities are resourced in peacetime to support contingency requirements. Some programs may stockpile support equipment, spare parts, or other materiel or establish a surge unit-level or depot maintenance capacity to support contingency requirements. The costs of procuring and maintaining these additional resources are included in the program cost estimate when funding associated with peacetime conditions is used to pay for these resources.

h. Disposal Section. This section describes the activities associated with the system demilitarization and disposal at the end of its useful life. Typical elements of the disposal process include transportation (to the disposal or storage site), demilitarization, hazardous materials removal and disposal, and final storage (if applicable). The discussion must explain the final disposition of the system or major elements of the system upon retirement: long-term storage, foreign military sale, or scrap. The discussion must note if there would be any economic benefits associated with resource recovery and recycling (e.g., reclamation of parts).

i. CARD Plan. The CARD must contain a section stating when annual updates of the CARD will be submitted. The PMO must coordinate with the appropriate service cost agency to develop this schedule.

j. CSDR Plan. The CARD must contain a copy of the approved CSDR plan. If the plan has yet to be approved, then the proposed plan must be included.

k. Track to Prior Card. The last section of the CARD summarizes significant changes from the previous CARD. The discussion must include changes in system performance or design, program schedule, or other aspects.