

APPENDIX IX

90. ENGINEERING CHANGES (COMPUTER SOFTWARE)

90.1 Purpose. This appendix describes the requirements necessary to provide uniform procedures for preparing, formatting, and processing changes to Computer Software Configuration Items (CSCIs).

90.2 Scope. This appendix establishes the requirements for configuration control that are unique to computer software. It:

- a. Supplements MIL-STD-480.
- b. Replaces MIL-STD-480 paragraph 5.1 titled "Class I engineering change", (paragraph 5.1.1 titled "Class I engineering change to a privately developed item", is excluded) and paragraph 5.2 titled "Class II-engineering change".
- c. Provides guidance in preparing the DD 1692 series of forms for engineering changes to CSCIs. Hardware oriented requirements of MIL-STD-480 pertaining to engineering drawings, production/manufacturing, and logistics support do not apply to CSCIs. Other requirements of MIL-STD-480 which have not been supplemented by this appendix shall remain as contractually invoked.

90.3 Applicability. The requirements of this appendix are applicable to all contracts involving computer software CIs during the acquisition and operation phases of CSCI design, development, test and updating, and modifications. Each contractor to the Government shall be responsible for his compliance with this appendix as well as the compliance of his subcontractors, vendors and suppliers to the extent that they are involved in preparing, formatting, and processing engineering change proposals to computer software CIs for which the prime contractor is responsible.

90.4 Multiple HWCI/CSCI ECPs. When more than one HWCI/CSCI is affected by a change under the cognizance of a single procuring activity, a single ECP with separate dash numbers for each HWCI/CSCI may be used in lieu of separate ECPs for each HWCI/CSCI.

90.5 Classification. The originator of an engineering change to a CSCI shall classify the change as Class I or Class II. Assuming that its purpose and necessity have been established, each ECP shall be assigned the appropriate classification by the originator in accordance with the definitions in this appendix (paragraph 90.6). Disagreements as to classification of computer software changes shall be processed in accordance with the procedures set forth in MIL-STD-480.

90.6 Definition of classification. Paragraphs 80.4.1 and 80.4.2 are replaced by the following with respect to Class I and Class II computer software changes.

90.6.1 Class I change. A computer software change shall be classified Class I when one or more of the factors listed (subparagraphs a, b, c, d, or e) below is affected:

- a. The Functional Configuration Identification (FCI) or Allocated Configuration Identification (ACI).
- b. Product Configuration Identification (PCI) as contractually specified.
- c. Technical requirements below contained in the PCI as contractually specified, including referenced drawings and specifications.
 - (1) Performance, including reliability, maintainability or survivability, correctness, efficiency, integrity, testability, usability, outside stated tolerance.
 - (2) Interface characteristics (external to the CSCI).
- d. Non-technical contractual provisions:
 - (1) Fee
 - (2) Incentives
 - (3) Cost to the Government
 - (4) Schedules
 - (5) Guarantees or deliveries.
- e. Other factors:
 - (1) Government Furnished Property (GFP)
 - (2) Safety
 - (3) Other computer software
 - (4) Compatibility with support resources, trainers or training devices/equipment
 - (5) Delivered operation and maintenance manuals for which adequate change/revision funding is not on existing contracts

- (6) Preset adjustments or schedules affecting operating limits or performance to such extent as to require assignment of a new identification number
- (7) Skills, manning, training, biomedical factors or human engineering design.

90.6.2 Class II change. A computer software change shall be classified Class II when it does not fall within the definition of a Class I change in paragraph 90.6.1 above. Examples of a Class II change are (a) a change in documentation only (e.g., correction of errors, maintenance type code corrections which do not affect program logic, design or mathematical formulation or addition of clarifying notes), or (b) other changes of a minor nature within categories specifically defined by the procuring activity in a given procurement (e.g., adaptation data or recompiling within specified limits).

90.6.3 Class I ECP types. The type of Class I ECP application to CSCIs shall be used in accordance with the following guidelines. A preliminary ECP may be submitted prior to availability for review of the information necessary to support a formal ECP in accordance with MIL-STD-480. A formal ECP shall contain an assigned SCN number and sufficient definition of a proposed change and its impact, including schedule and cost data, to support formal approval and contractual authorization. Definition of the proposed change provided with a formal ECP need not normally include exact changes in CSCI specification data to the degree that such data represents products of the total computer software change implementation-process.

90.7 Instructions for the preparation of ECP forms.

- a. The contractor shall use the ECP form and format illustrated in MIL-STD-480 for the preparation of all Class I ECP to CSCIs.
- b. Instructions for ECP preparation contained in Appendix A to MIL-STD-480 shall apply except as noted herein.
- c. ECPs shall be submitted in the uniform format specified herein for all proposed changes;
 - (1) To the functional configuration identification and allocated configuration identification both before and after establishment of a product baseline for the CSCI, and,
 - (2) To the product configuration identification after the product baseline has been established.

90.7.1 Engineering Change Proposal DD Form 1692, Page 1.

90.7.2 Block 2, ECP Class. Enter I or II for the applicable ECP Class as defined in 90.6.1 and 90.6.2 above.

90.7.3 Block 5, ECP designation. Instructions contained in paragraph 50.1.5 of MIL-STD-480 titled Block 5. ECP Designation shall apply, except for modified subparagraphs (a) and (b) as noted below:

- a. Model/type - enter the CSCI identification.
- b. Enter either a "P" for preliminary or "F" for formal, in accordance with 90.6.3 herein.

90.7.4 Block 8, Specifications affected-test plans. The data items to be examined by the contractor for identification in this block shall include, at the minimum, all listed on the Contract Data Requirements List (CDRL) for the CSCI development contract, as well as previously-delivered handbooks and user manuals associated with the CSCI. This entry shall identify each data item affected by the proposed change, the nature of the effect, and any relevant impact on schedule or delivery of the item.

90.7.5 Block 9, Drawings affected. List all drawings affected by the change.

90.7.6 Block 14, In production. This block is not applicable to CSCIs.

90.7.7 Block 15, Lowest assembly affected. Enter the names of Computer Software Components (CSCs) or units affected.

90.7.8 Block 16, Description of change. Enter the identification and revision status designator of each CSC and unit identified in Block 14.

90.7.9 Block 18, Equipment Serial No. Covered. Identify, by CSCI version number, the version of the CSCI into which the change will be incorporated. Enter the date(s) of the SCN(s). In the ECP submittal, the contractor shall indicate the new version number in Block 18. If the impact of the ECP merits the issuance of a new version of the CSCI, Block 18 of the ECP submittal shall also include a recommendation to this effect. Serial numbers may be used in lieu of version numbers upon agreement of the procuring activity.

90.7.10 Block 19, Effect on Delivery Schedule. Identify effect on delivery schedule.

90.7.11 Block 20, Retrofit. This block may or may not apply to CSCIs. However, if the CSCI change is part of a larger hardware/equipment change and incorporation of the CSCI change is per a hardware retrofit schedule, that information will be included here either directly or by reference.

90.7.12 Block 21, Estimated cost/savings under contract. Enter a dollar estimate of costs (contract funding), either increased or decreased, which will result if the change is approved by the Government. If the contractor at the time of submission of the formal-ECP has available the firm cost proposal, this proposal shall be submitted and shall be accompanied by the appropriate cost breakdown.

90.8 Engineering Change Proposal DD Form 1692-1, page 2, Effects on functional/allocated configuration identification.

90.8.1 Block 29, Effects on employment, integrated logistics support, training, operational effectiveness, or software. The contractor shall enter the following information as applicable to the phase of CSCI development/operation at the time of ECP submission:

- a. Describe effects of the proposed change on personnel and training requirements, including any changes or the effects on the operability or support of the system.
- b. Identify any effect on contract engineering technical services that increases the scope or dollar limitation established in the contract.
- c. Identify any required changes to the data base parameters or values, or to data base management procedures.
- d. Identify and explain any estimated effects of the proposed change on acceptable computer operating time and cycle time utilization.
- e. Provide an estimate of the net effect on computer software storage.
- f. Identify and explain any other relevant impact of the proposed change on utilization of the system.

90.8.2 Block 31, Developmental requirements and status. The contractor shall identify in this block the schedule sequence of computer software design/development/test activities which will be required to implement the proposed change. In the case of ECPs which are initiated following the completion of significant preliminary design of the CSCI, or of a new CSCI version, specific information shall be entered in this block to identify significant requirements for computer software redesign, re-assembly, re-compiling, recoding, retest, special installation, adaptation, checkout, or live environment testing, as applicable, and to identify the specific impact of these factors on existing schedules for completion.

90.9 Engineering Change Proposal DD Form 1692-2, page 3, Effects on product configuration identification. Specific terms of information to be reported on DD Form 1692-2, as specified in the instructions under Section 50.3 of Appendix A to MIL-STD-480 are either already provided on the forms 1692 and 1692-1 or do not readily apply to computer software. In general, factors associated

with the use and operation of CSCIs depend more directly on characteristics defined at the level of the requirements specification (Software Requirements Specification, and if applicable Interface Requirements Specification(s)) than on those defined at the product configuration level; and factors of computer programming support are rarely, if ever, affected by modifications in the CSCI product configuration. However, the contractor shall review these factors and comply with the intent of Blocks 37, 38, 42, 43, 44, and 46.

90.10 Engineering Change Proposal DD Form 1692-3, page 4, Estimated net total cost impact. DD form 1692-3 shall not be used with ECPs to CSCIs. Net total cost estimates shall be based on all impact factors identified in the relevant blocks of DD Forms 1692 and 1692-1 and shall be reported as specified in 90.7.12 herein.

90.11 Engineering Change Proposal, Page 5, Cost savings summary. DD form 1692-4 shall not apply in the case where all related ECPs being summarized refer to computer software changes only. When the related ECPs include changes to HWCI, the form shall be used in accordance with instructions contained in Section 50.5 of Appendix A to MIL-STD-480.

90.12 Engineering Change Proposal DD Form 1692-5, Page 6, Milestone chart. DD Form 1692-5 shall not be used with ECPs for CSCIs. The significant scheduling information associated with computer software changes is normally that information relating to milestones in the change analysis/design/ development/test process (e.g., as required in block 31 of DD Form 1692-1; see 90.8.2 herein). Schedule information for CSCI changes shall be provided, listing significant developmental milestones associated with the change, and representing events by the use of standard milestone chart symbols.

90.13 Instructions for preparation of Notice of Revision (NOR) DD For 1695.

90.13.1 Blocks 1 - 9. A NOR is applicable to a CSCI when it was not specifically developed for a given system (commercially available) but is utilized with the system. For example, maintenance/ diagnostic and utility programs that are provided with a given general purpose computer and must be modified/changed to operate within the allocated systems environment. The NOR would provide a record of change to the commercially available software for present and future use.