BY ORDER OF THE COMMANDER

SMC Standard SMC-S-019, Rev A
11 August 2008

Supersedes:
SMC-S-019

Air Force Space Command

SPACE AND MISSILE SYSTEMS CENTER STANDARD

PROGRAM AND SUBCONTRACTOR MANAGEMENT

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED

FOREWORD

1. This standard defines the Government's requirements and expectations for contractor performance in SMC system acquisitions and technology developments.

2. This revised SMC standard contains the following major changes:

- SMC/PI co-signature
- Addition of Make/Buy Plan data product (Section 4.2.2.1)
- Minor typographical corrections

3. Beneficial comments (recommendations, changes, additions, deletions, etc.) and any pertinent data that may be of use in improving this standard should be forwarded to either of the following addressees using the Standardization Document Improvement Proposal appearing at the end of this document or by letter:

SMC/EA and/or SMC/PI
SPACE AND MISSILE SYSTEMS CENTER
Air Force Space Command
483 N. Aviation Blvd.
El Segundo, CA 90245

4. This standard has been approved for use on all Space and Missile Systems Center/Air Force Program Executive Office - Space development, acquisition, and sustainment contracts.

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1. Scope

1.1 Purpose

This standard establishes the requirements for preparation, implementation, and operation of a Program Management/Subcontract Management (PM/SM) program for application during the formulation, design, development, manufacture, assembly, integration, test, and sustainment of space and launch vehicle systems. These requirements are intended to:

1. Ensure a PM/SM program that defines all processes, roles, responsibilities, and resources required for the overall conduct and control of the program.

2. Develop and implement an Integrated Master Plan (IMP) linked with the Integrated Master Schedule (IMS) and integrated with the Earned Value Management System (EVMS).

3. Integrate all required technical, management, and administrative specialties fully into the product development and cross-product activities.

4. Define and implement a Subcontract Management Program that ensures that the activities and products of the subcontractors and suppliers are consistent with the overall program.

5. Implement a configuration management, change control, and approval process for any changes affecting the system requirements before the changes are implemented.

1.2 Application

This standard is intended for use in the acquisition of all SMC-developed weapons systems, including space and launch vehicle systems. This standard is intended to be cited in the contract, and may be tailored by the acquisition activity for a specific application or program.

1.3 Compliance with System Requirements

The requirements of this standard shall not relieve the contractor of the responsibility to comply with all equipment, system performance, and reliability requirements as set forth in the applicable specifications and contract.

2. Applicable Documents

ISO 14300-1 Space Systems Program Management, 2002.

ISO 17666 Space Systems Risk Management, 2003.

EIA 748-B Earned Value Management Systems, 2007.

3. Definitions and Abbreviations

3.1 Definitions

3.1.1 Acquisition Activity

The acquisition activity is the Government office or contractor acquiring the equipment, system, or subsystem for which this standard is being contractually applied.

3.1.2 Categories of Contractor

The term “contractor” signifies a producer of modules or higher-level items of equipment. A contractor that provides items to another contractor can be identified as a subcontractor. Some system programs have one major contractor identified as a prime contractor, who is responsible directly to the acquisition activity. Other programs may have two or more major contractors, each responsible directly to the acquisition activity (neither one subordinate to the other), which are called associate contractors.

Major/critical subcontracts are those in which failure would seriously jeopardize successful completion of a program within cost, quality, schedule, and technical performance specifications. Throughout the life of an individual prime contract, major/critical subcontracts will change as problems are identified and solved, milestone schedules passed, and tests completed.

Following are examples of factors to consider in determining whether a subcontract effort is major/critical and requires special management emphasis:

1. completely new R&D efforts involved
2. major redesign or repackaging effort involved
3. unique subsystems or components being furnished
4. potential subcontractors have a history of technical, quality, cost, or schedule difficulties
5. extremely long or short lead times involved
6. subcontract delivery schedule critical to the overall program and compatibility with the prime contractor’s delivery schedule
7. such small quantities or specialized items involved that potential subcontractors may refuse to propose
8. ensuring successful performance will require unusually heavy prime contractor personnel participation
9. subcontract effort pushing state of the art
10. critical interface between the subcontract effort and the prime contract end item
11. dollar value of the subcontract effort has substantial impact on the subcontractor’s financial ability.

3.2 Abbreviations

CDRL	Contract Data Requirements List
CM	Configuration Management
DID	Data Item Description
EVMS	Earned Value Management System

GIDEP	Government Industry Data Exchange Program
IMP	Integrated Master Plan
IMS	Integrated Master Schedule
MAR	Mission Assurance Requirements
PM/SM	Program Management/Subcontract Management
R&D	Research and Development
RMP	Risk Management Program
SDRL	Supplier Data Requirements List
SMC	Space and Missile Systems Center
SMP	Subcontract Management Plan
SOW	Statement of Work
TPM	Technical Performance Measure
WBS	Work Breakdown Structure

4. General Requirements

4.1 Program Management

The contractor shall implement a PM/SM program that defines the processes, roles, responsibilities, and resources that have been established for the overall conduct and control of the program. The PM/SM program shall include and address integration and coordination of all other processes applied to the program, allocation of resources and assignment of responsibilities within the program, communication interfaces across all participants in the program, risk management, EVMS, contract compliance, subcontract management processes and plans, and data management.

4.1.1 Work Breakdown Structure

The contractor will prepare a Work Breakdown Structure (WBS) and Statement of Work (SOW) defining the work required for the required products and processes. The contractor-prepared WBS will include an element structure and dictionary that outlines all work required to meet contract requirements and objectives, is consistent with the proposed system physical hierarchy and management and technical processes, and has sufficient granularity to allow the contractor and Government to determine the specific products driving cost and schedule problems. Subcontracts shall be traceable to the contractor's WBS and SOW.

4.1.2 Integrated Master Plan, Integrated Master Schedule, Earned Value Management System

The contractor will prepare and implement an IMP linked with the IMS and integrated with the EVMS. The IMP will list the contract requirements document(s) (Systems Requirements Document and Technical Requirements Document (system specification, or similar documents)) and events in the IMP will correspond to development and/or production activities required by the contract. It will include significant accomplishments encompassing all steps necessary to satisfy all contract objectives and requirements, manage all significant risks, and facilitate Government insight for each event. Significant accomplishments shall be networked to show their logical relationships and that they flow logically from one to another. The IMP, IMS, and EVMS products shall include the prime contractor, subcontractor, and major vendor activities and products.

4.1.2.1 The IMP will include narratives that define and clearly commit the critical processes necessary to meet contract objectives and requirements and define organizational positions or functions of individuals who have full responsibility, authority, and accountability for execution of each process and key personnel who support that individual.

4.1.2.2 The IMP will include a program management narrative and related cross-referenced narratives that define and commit to an integrated management process by which management decisions (1) are based on current technical and management status of the contract, (2) balance performance, cost, schedule, and risk, and (3) are supported by systems engineering and other critical processes.

4.1.2.3 The contractor will integrate each major subcontractor and vendor activities and products into the organizational structure consistent with how their products fit into the proposed product physical hierarchy.

4.1.3 Risk Management

The contractor shall implement a Risk Management Program (RMP), including a documented risk management process that establishes risk mitigation strategies, defines risk thresholds, and monitors progress in order to ensure that effects of potential risks are minimized. The contractor is responsible for planning, identification, assessment, evaluation, prioritization, reporting, mitigation, and tracking of all identified risk areas. The risk management process will monitor interface risks across the system/program. The RMP will include (1) risk management planning, (2) risk identification, (3) risk assessment, (4) risk handling, (5) risk monitoring and control, and (6) process metrics. The scope of the RMP will include risk management parameters in terms of cost, schedule, and technical performance. The RMP will be integrated with the System Engineering Plan and configuration management (CM) baseline control practices. The RMP will provide for an organized and disciplined means of identifying and assessing risks, and developing, selecting, and managing burn-down strategies that mitigate identified risks. Schedule risk management will be based on schedule margins relative to critical paths. Subcontract risk shall be addressed in the Subcontract Management Plan (SMP).

4.1.4 Metrics

The contractor will define metrics, technical performance measures, and risk watch lists to evaluate (1) conformance of the evolving products with contract requirements and objectives (including the cost requirements and objectives), (2) each known risk, and (3) the performance of each critical process.

4.1.5 Configuration Management

The contractor will implement a CM and change control and approval process for any changes affecting system requirements before changes are implemented. The contractor will assess, formally approve, and document the performance, cost, schedule, and risk of proposed changes to the evolving functional architecture, physical hierarchy, and baselines prior to implementation.

4.2 Subcontractor Management

The contractor will implement a Subcontract Management Program to ensure that the subcontractor’s activities and products are consistent with the overall program, to ensure that comprehensive and well defined acquisition/contracting mechanisms (e.g., solicitations, contracts, and procurement specifications) are developed and applied in order to provide verification of compliance and perform surveillance of these activities.

4.2.1 Subcontract Management Program

The prime contractor shall implement a Subcontract Management Program that provides for acquisition/subcontract planning, contract development and award, supplier selection, and continuous monitoring and verification of contractually required subcontractor activities to verify that program requirements are being met by the subcontractor. The contractor shall perform oversight on subcontractors and sub-tier suppliers to verify that their program plans and contracts are adequately implemented. The prime contractor is responsible for prescribing a scope and timing of program monitoring and control activities as necessary to ensure compliance.

4.2.2 Subcontract Management Plan

The contractor shall prepare a Subcontract Management Plan (SMP) that identifies management and surveillance responsibilities and identifies the methods to be used throughout the project to ensure subcontractor and sub-tier supplier compliance with program requirements. The SMP sets forth the processes for managing and integrating program activities and provides methods and guidance for selection and management of subcontractors using proven processes and methods that ensure successful program execution. The scope of the SMP begins at the preproposal stage and continues through subcontract execution, performance management, and closeout. Subcontractor and sub-tier supplier verification methods may include scheduling of reviews and status reporting meetings, evaluation of deliverables, contractor-supplied metrics and databases, and conduct of facility surveys and sampling. The SMP shall document surveillance milestones, reporting requirements, and detail risk mitigation options for implementation in the event that compliance cannot be verified. The contractor shall update the SMP as required throughout the project and shall ensure that changes to the program are reflected in current surveillance plans.

4.2.2.1 Data products from this task shall include, where appropriate:

1. criteria for assessing subcontractor compliance with program requirements in each project phase

2. program plans for subcontractor surveillance that detail the methods, milestones, and success criteria for subcontractor monitoring and control

3. task plans that identify the methodology to be used for each planned surveillance action (i.e., the plan for conducting a particular lot sample, site survey, or statistical analysis), and the report summarizing results of the action

4. periodic status reports evaluating subcontractor compliance with reliability program requirements

5. agenda, reports, and action items from formal reviews

6. evaluations of controlled drawings, Engineering Change Requests, waivers, and program outputs (e.g., program schedule, engineering reports, test reports. engineering analysis, etc.)

7. make/buy plans

4.2.3 Control of Subcontractors and Sub-Tier Suppliers

The contractor shall perform surveillance and management control of subcontractor and sub-tier suppliers so that program progress can be monitored, assessed and timely management action taken when warranted. The contractor shall ensure that subcontracted items obtained from first and all lower tier suppliers meet contract requirements compatible with required system performance. Intra-company work orders shall be considered subcontracts. Compliance with this task does not relieve the prime contractor of responsibility for the quality and reliability of all material delivered as a result of this contract.

4.2.3.1 Subcontractor and Sub-Tier Supplier Requirements Flowdown

Prime contractors will establish processes and procedures to ensure that program technical and program management requirements are clearly and comprehensively defined and effectively flowed down through the complete contractor structure. Contract provisions will be derived from key mission performance and mission assurance requirements. The contractor will define strategic and independent oversight of program processes including risk management. The contractor will establish a multistep verification process for primes and subcontractors. Subcontract and sub-tier supplier requirements documentation shall reflect the applicable requirements of this standard. The contractor will capture all Mission Assurance Requirements (MAR) in a single document (not scattered in SOW, specifications, Interface Control Documents, etc.), establish and stipulate traceability of MAR for lower-tier subcontractors in a compliance matrix, and stipulate Government engagement in contractors' sub-tier MAR compliance.

The contractor will identify critical program management flowdown characteristics. The contractor will define process requirements for risk, financial, schedule, baseline, sub-tier and resource management, and contract language (IMP, IMS, EVMS, CDRLs, SDRLs, DIDs).

4.2.3.2 Selection of Suppliers

The contractor shall establish and maintain compliance with the provisions of this document throughout contract performance. The contractor shall identify and impose requirements on sub-tier suppliers necessary to meet provisions specified herein. The requirements document will define requirements that should be flowed down to subcontractor and sub-tier suppliers, and will identify the processes and requirements to which contractors are required to perform. The prime contractor's program shall include procedures for determination, prior to issuance of the purchase document, of the capability of the prospective sub-tier suppliers (existing or new), to produce products or supply services in accordance with contractual requirements.

4.2.3.2.1 Pre-Award Subcontractor Surveys. The prime contractor will establish and implement procedures to perform pre-award surveys of subcontractors' facilities, or other techniques to evaluate subcontractors' capability to perform to contract requirements. The results shall be documented, available for review by the government, and serve as a basis for required corrective action upon receipt of the subcontract. Capability assessment requirements include both pre- and post-award activities. Pre- and post-award assessment requirements will address the following functional areas: engineering, manufacturing and integration operations, supplier management, mission assurance, quality assurance, and program management processes. Pre-award assessment

requirements will be conducted prior to contract award and the contractor shall provide for a documented capability analysis of "key suppliers." Post-award assessment requirements will be conducted following contract award, and the contractor shall ensure that subcontractors and their sources understand and comply with the requirements of related subcontracts.

4.2.3.2.1.1 Survey Elements. The following factors, appropriate to the products or services to be furnished, should be considered for evaluation during the survey:

1. management organization and approach
2. inspection planning, controls, capability, and management
3. product/commodity visibility and defect prevention program
4. product/commodity performance analysis
5. past experience with the type of product or service to be supplied
6. configuration management system
7. procedural control of hardware/software design and development documents and associated changes
8. control of nonconforming products
9. corrective action / continuous improvement program
10. product discipline
11. personnel availability, qualifications, and certification
12. review and audit capabilities
13. calibration capability and resources
14. manufacturing facilities
15. capability and condition of manufacturing equipment
16. control and maintenance of inspection equipment and production tools used as a medium of inspection
17. material storage and handling
18. control of nondestructive testing and special processes
19. software media controls
20. software development standards and procedures
21. existing software development, test and support tools, methods and measurements
22. software validation/verification methodologies
23. software library controls
24. independence and qualification of evaluators
25. ability to satisfy all mission assurance requirements

4.2.3.3 Periodic Audit of Subcontractors

The contractor shall conduct periodic audits of major/critical subcontractors. The type and frequency shall be defined in the prime contractor's procedures. The purpose of the reviews and audits will be to determine the continued capability of the subcontractors to ensure the quality of the products or services specified by the contract.

4.2.3.4 Supplier Rating

A supplier rating system shall be devised by the prime contractor and described in written procedures. Each subcontractor shall be rated for quality of performance for each type of commodity/product being purchased. The system shall consider applicable inspection and test results when available from

sources such as field personnel, as well as receiving inspection and subsequent subcontractor-responsible line rejects. The system shall yield necessary past performance data to provide visibility of subcontractor quality, cost, schedule, and technical performance and trends. These data shall be periodically updated to reflect current subcontractor ratings and shall be used by purchasing personnel. The supplier rating system must provide adequate separation and identification of subcontractors having a satisfactory rating from those having other than a satisfactory or acceptable rating. The rating shall be predicated on a history of quality performance.

4.2.3.5 Purchasing Specifications and Data

Prime contractor evaluation of purchase documents shall be accomplished under control of the quality organization to ensure that an adequate description, appropriate for products to be provided, is included in the documentation. The evaluation shall ensure that instructions are included in all purchase documents for the following as appropriate:

1. manufacturing requirements
2. inspection and testing
3. material specifications and standards/prohibited materials
4. control of critical components
5. special qualifications, approval, or certifications
6. nondestructive tests
7. control of hardware and software documentation and changes
8. applicable product and process specifications
9. reliability and maintainability
10. safety factors
11. preservation, packaging, marking, and packing
12. product storage and handling
13. contractor source quality control
14. GIDEP participation
15. shipping instructions
16. age control and shelf life
17. government-furnished equipment
18. contractor-furnished equipment
19. data retention
20. control of tool and test equipment
21. nonconforming products
22. control of manufacturing methods, materials, and processes
23. applicable workmanship standards
24. reviews and audits
25. identification of hardware and software deliverables
26. statistical process control program

4.2.3.6 Prime Contractor Control at Subcontractors' and Sub-Tier Suppliers' Facilities

The prime contractor is responsible for ensuring that all products and services purchased from subcontractors and sub-tier suppliers conform to the contract requirements. The prime contractor is

responsible for the following activities at subcontractors' and sub-tier suppliers' facilities, as appropriate:

1. performing complete or sampling inspection of product characteristics
2. ensuring the adequacy of and conformance to controls for special manufacturing processes
3. ensuring the adequacy of and conformance to controls for inspection and test equipment
4. verifying conformance to CM procedures for engineering drawings and computer software
5. determining conformance to the subcontractor's or sub-tier supplier's established quality program and inspection system
6. evaluating the methods for controlling nonconforming products and ensuring the correction of the cause of nonconformance
7. documenting results of evaluations and inspection performed
8. indicating acceptability of products contained in each shipment, as applicable
9. verifying that qualification and acceptance tests are conducted according to approved procedures
10. verifying compliance with applicable requirements to include timely notification to management when discrepancies and/or deficiencies are discovered

4.2.3.7 Control of Critical Items

The prime contractor shall be responsible for identifying and controlling critical items. Detailed procedures governing the manufacture, inspection, and control of critical items identified by the prime contractor shall be documented as a part of the contractor's total quality control program. The prime contractor must maintain strict control of critical items and their processing, regardless of manufacturing or process location. Purchase orders for critical items shall specify special transportation, handling, and storage requirements. When a critical item is purchased, the subcontractor is required to document in detail the critical methods and processes that will be used. The subcontractor must submit to the prime contractor for analysis and acceptance the following information:

1. methods and type of critical processing to be used (subject to limitations imposed because of proprietary information)
2. location in the processing cycle where inspections, audits, or walk throughs will take place
3. product attributes that will be inspected at each inspection point
4. materials and methods of preservation and packaging to be used to protect the product
5. handling and transportation precautions necessary to protect the product

Revision or variation to any of the above listed controls shall not take place until the prime contractor has approved the revision.

4.2.3.8 Receipt of Purchased Products/Receiving Inspection

Products and services produced by outside sources for incorporation in the contract end item shall be subject to inspection/audit at time of receipt prior to further processing at the prime contractor's plant or shipment to another location. Objective quality evidence submitted by the subcontractor or sub-tier supplier may be used by a prime contractor in lieu of inspection/audit. Use of such evidence does not relieve the prime contractor of responsibility to meet contract requirements. In addition to verifying

that the products and services comply with requirements of the purchase document, the products and services will also be verified against the latest applicable engineering changes and specifications.

SMC Standard Improvement Proposal

INSTRUCTIONS

1. Complete blocks 1 through 7. All blocks must be completed.
2. Send to the Preparing Activity specified in block 8.

NOTE: Do not be used to request copies of documents, or to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements. Comments submitted on this form do not constitute a commitment by the Preparing Activity to implement the suggestion; the Preparing Authority will coordinate a review of the comment and provide disposition to the comment submitter specified in Block 6.

SMC STANDARD CHANGE RECOMMENDATION:	**1. Document Number**	**2. Document Date**

3. Document Title	

4. Nature of Change
(Identify paragraph number; include proposed revision language and supporting data. Attach extra sheets as needed.)

5. Reason for Recommendation

6. Submitter Information

a. Name	**b. Organization**
c. Address	**d. Telephone**
e. E-mail address	**7. Date Submitted**

8. Preparing Activity

Space and Missile Systems Center
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Attention: SMC/EAE

March 2008