

**BY ORDER OF THE COMMANDER
SPACE AND MISSILE SYSTEMS
CENTER**

**SPACE AND MISSILE SYSTEMS CENTER
INSTRUCTION 63-108**

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Acquisition



**SOFTWARE ACQUISITION MANAGEMENT
PLAN (SWAMP)**

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This instruction provides the requirements for the preparation and approval of a Software Acquisition Management Plan (SWAMP) in association with the Software Acquisition Instruction 63-104, along with this document and Section 804 of the Bob Stump National Defense Authorization Act of 2003 for improving software acquisition processes at SMC. The SMC 63-104 requires that each program within each Directorate prepare a SWAMP to document the software acquisition activities. In addition to the SWAMP instructions set forth in this instruction, the SWAMP author will use the latest revision of the Software Acquisition Management Plan (SWAMP) Preparation Guide TOR-2006(1455)-5743 when authoring a SWAMP. The TOR is a guide book and offers a set of software engineering and development best practices that may be selected for inclusion in the programs acquisition strategy by the appropriate leadership. The TOR should be used in conjunction with the SWAMP Instruction. Refer recommended changes and questions about this publication to the office of primary responsibility (OPR) using the AF Form 847, Recommendation for Change of Publication; route the AF Form 847 from the field through major command (MAJCOM) publications/forms managers. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 36-363, Management of Records, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located at <https://my.af.mil/gcss-af61a/afirms/afirms/>.

1. Objective. The purpose of this instruction is to identify the requirements for the preparation and approval of a SWAMP. This instruction describes the software management requirements for the entire software acquisition life cycle and specifies the requirements for SMC management of software program acquisitions as stated in SMCI 63-104. It also serves to standardize all software acquisitions at SMC.

2. SWAMP Development, Review, and Approval Requirements. The SWAMP shall provide a schedule for updating the SWAMP activities that span the entire life cycle of the software program acquisition, from pre-systems acquisition through sustainment and disposal. The program shall develop an initial SWAMP at the Material Development Decision (MDD) activity for Milestone Decision Authority (MDA) approval. The initial SWAMP shall be updated at the start of the Material Solution Analysis (MSA) phase. The initial approved SWAMP shall be submitted to the SMC Chief Software Engineer (CSE) for tracking and reporting. The SWAMP shall then be updated, as needed, prior to each of the following phases; the Technology Development (TD) phase, the Engineering and Manufacturing Development (EMD) phase, the Production & Deployment (P&D) phase and the Operations & Support (O&S) phase. A group of small projects/efforts can be addressed by writing a SWAMP that delineates and covers the organizational approach to managing the software aspects of all of the projects/efforts in a single document.

2.1. The SWAMP shall be reviewed annually, and updated as required throughout the life cycle of the program or whenever the changes are made to the software acquisition strategy to assure the SWAMP reflects the current software acquisition organization, a major supplier or contractor, processes, products, resource requirements, and planned activities.

2.2. Refer to Table 1 for the detailed roles and responsibilities of the development, review, and approval of the SWAMP.

Table 1. Roles and Responsibilities for SWAMP.

Roles	Responsibilities
Program Chief Software Engineer (or Equivalent)	Develop/prepare, review and update the SWAMP
Program Manager	<p>Provide oversight to ensure a SWAMP is prepared and updated</p> <p>Ensure Program resources are applied to prepare and update the SWAMP</p> <p>Review and approve the SWAMP (Required Signature)</p>
Directorate Chief Software Engineer	<p>Provide guidance to ensure a SWAMP is prepared and updated in accordance with this instruction and Directorate specific needs</p> <p>Review and approve the SWAMP (Required Signature)</p>
Directorate Chief Systems Engineer	<p>Ensure system and software planning are integrated</p> <p>Review and endorse the SWAMP(s) (Required Signature)</p>
Directorate Director	<p>Ensure compliance with this instruction</p> <p>Review and endorse the SWAMP(s) (Required Signature)</p>
SMC Chief Software Engineer	<p>Provide guidance for the SWAMP</p> <p>Review and approve the SWAMP(s) and updates (Required Signature) for ACAT II and lower</p> <p>Review and endorse the SWAMP(s) for ACAT I and IA Programs</p> <p>Submit the completed SWAMP to the SMC/ENS Point of Contact (POC) for archival</p> <p>Review and grant or deny SWAMP exception request</p>
SMC Chief Systems Engineer	<p>Review and approval of all SWAMPs</p> <p>Review and endorse SWAMP exception requests</p>

3. SWAMP Contents Requirements. The SWAMP shall document the software acquisition activities to be performed, the processes to be used, and the products to be developed by the program, in the solicitation, management, sustainment, and disposal of a software space system, over the entire systems acquisition life cycle. Specific content requirements are provided in the following sections. In each section, the program can reference other program documentation that has the detailed information to address the SWAMP requirement.

3.1. Approval Signatures Requirement. Table 1 identifies the signatories required for approval of the SWAMP. The SWAMP shall include a signature page. The SWAMP shall describe the program's process for reviewing and approving the initial SWAMP and subsequent updates. This description shall include a change control process for the SWAMP.

3.2. Program Software Overview. The SWAMP shall provide the context of the SMC program acquisition environment in which the software is being developed. This context should include a description of the overall system and operational concept. This section shall include the organization, effort, cost, and schedule of the software. The organization shall include the software acquisition personnel, including supporting organizations such as Federally Funded Research and Development Centers (FFRDCs) and Systems Engineering and Technical Assistance (SETA) contractors. The description of the effort shall reference the software portions of the Cost Analysis Requirements Description (CARD). The extent of detail should be consistent with the current version of the CARD, for example, the program may use the draft CARD in the initial version of the SWAMP. The schedule shall include all the milestones for each phase of the software acquisition life cycle.

3.3. Software Solicitation Plan. The SWAMP shall document the software acquisition activities in support of the system solicitation. Type of solicitation activities include but are not limited to (Table 2).

Table 2. Types of Solicitation Activities to Include.

Description of the techniques/processes to be used by the program to develop an independent software size, cost and schedule estimate and to evaluate the contractors' estimates of size, cost, and schedule for realism. If the confidence level is lower than 80%, the lower confidence level must be justified; in no event shall the confidence level be lower than the mean of the program cost estimate distribution (typically 55-65%) or, where a distribution cannot be computed, the expected value of the cost estimate in accordance with AFI63-101 § 3.61. The software estimation shall include newly-developed code, modified code, reused code, Commercial Off-The-Shelf (COTS), Government Off-The-Shelf (GOTS), and Non-Developmental Item (NDI).

Selection of the software measurements to be collected and reported by the contractor to support the software acquisition, including the specification of metric thresholds and reporting frequency.

Identification of the software Contract Data Requirements List (CDRL) items to be delivered to the program from the contractor. (e.g., software specifications and standards, software quality, software safety, software reliability, maintainability, and availability, and software components of the award fee structure.)

Identification of the transition strategy from acquisition to sustainment when the software is accepted for operations to ensure the cost of sustainment is fully negotiated and "optimized" as part of the overall life cycle planning.

3.4. Internal/External Interface Plan. The SWAMP shall describe the structure of the organization utilized to support the software acquisition. It shall detail internal interfaces, inter-program office interfaces, and external interfaces. The SWAMP shall also describe the software acquisition schedule, software acquisition resources, software acquisition metrics, roles and responsibilities, stakeholders, tools, techniques, methods, staffing, and training necessary to support the software acquisition process.

3.5. Coordination with other Program Plans. The SWAMP shall specify the relationship of the SWAMP to other program plans, for example, System Engineering Plan (SEP), Risk Management Plan (RMP), Configuration Management (CM) Plan, Test and Evaluation Master Plan (TEMP), Life Cycle Management Plan (LCMP), Life Cycle Sustainment Plan (LCSP) or a higher-level SWAMP in a family of programs.

3.6. Software Requirement Plan. The SWAMP shall document how the program will integrate software and systems engineering activities to develop, manage, verify, and validate software requirements. The plan shall include the management process of the requirements flow down (e.g., System Requirements Document (SRD), Concept of Operations (CONOPS), requirements change, bi-directional traceability and verification for each software acquisition phase).

3.7. Software Acquisition Monitoring and Control Plan. The SWAMP shall describe the processes to be used by the acquirer for the technical monitoring of the contractor's software development processes. The SWAMP shall describe the processes to be used by the acquirer for management oversight of the contractor's performance and progress on the development

of software products. The process descriptions shall include the use of thresholds or quality measures to determine when performance is satisfactory. The SWAMP shall describe the management actions to take when performance is unsatisfactory, including the methods for communicating issues to the contractor and using incentives to improve performance. Also, suggestions on the life cycle software development processes from requirements and design through verification, operations and maintenance, see SMC-S-012, Software Development for Space Systems.

3.7.1. The processes for the technical monitoring shall include the use of metrics, Technical Performance Measures (TPMs), technical reviews, formal reviews and audits, and process appraisals. For suggestions on the technical reviews and audits standard, see SMC-S-21, Technical Reviews and Audits for Systems, Equipment and Computer Software Volume 1.

3.7.2. Describe how the software acquisition team will monitor the contractor's software testing and the use of Independent Verification and Validation (IV&V) to evaluate the correctness and quality of the software product throughout the acquisition life cycle.

3.7.3. The SWAMP shall describe the processes to collect and analyze Earned Value Management (EVM) data down to at least the Software Item (SI) level to provide objective measures of the software cost and schedule. The Earned Value Management System (EVMS) should support and be consistent with the software effort and schedule metrics.

3.8. Software Sustainment Plan. The SWAMP shall document the program's plans for software sustainment for the Operations and Support (O&S) phase of the systems acquisition life cycle. Software sustainment begins after system acceptance with the transition of the system to operational use and maintenance, and concludes with system retirement and follow-up analysis of the contract. (Refer to Air Force Instruction 63-101, Acquisition and Sustainment Life Cycle Management, 20 July 2010). Part of sustainment is including the component of "training and technical data and computer software rights needed for operation of the software.", and "training and technical data, computer software rights, and disposal." Refer to the companion document AFI 63-131, Modification Program Management, 6 November 2009, for additional acquisition and sustainment life cycle management instruction for modifications.

3.8.1. The SWAMP shall document the process for the transition of the software (a particular System version) from its development environment to its deployed/operational environment including the documentation, training, and data rights needed for operation of the software.

3.8.2. The SWAMP shall document the resources and processes necessary for transition of the software from the acquiring organization to the sustainment organization. Resources shall include items such as manpower planning, the product software baseline and associated documentation, and the software maintenance and testing tools, equipment and facilities. Processes shall include items such as sustainment Certification and Accreditation (C&A), testing strategy, deficiency reporting, system safety, configuration management, training, and data rights. The SWAMP shall document the sustainment budget and schedule planning associated with the resources and processes needed to transition to sustainment.

3.9. Software Risk Management Plan (RMP). The SWAMP shall describe the process to identify, track, and mitigate software-related program risks throughout the acquisition life cycle including transition of the software to sustainment in concert with the program RMP. The SWAMP shall describe how software risk management will be coordinated across stakeholders, including the program office (e.g., systems engineering and hardware), the sustainment organization, and the contractor. (Refer to Risk Management Guide for DoD Acquisition, August 2006).

3.10. Software Configuration Management Plan. The SWAMP shall document the configuration management processes and procedures, including configuration of both software acquisition products generated by the program and software deliverables received from the contractor. These procedures must describe how the software products delivered by the contractor and the software acquisition products generated by the program will be identified, configured, control, protected, and stored. (Refer to SMC-S-002, Configuration Management).

3.11. Data Management. The SWAMP shall describe the methods and processes to be used to manage the data, including both data generated by the software acquisition team and data received from the supplier. Data may be in the form of documents, databases, or analysis products and may be in the form of hardcopy or electronic format. Data products are delivered in accordance with the CDRL in the contract.

3.12. Software Safety Plan. The SWAMP shall describe the plan and actions taken to identify, assess, mitigate, and continuously track, control, and document any software related mishap risks encountered in the development, test, acquisition, and use of the software system. The plan shall apply the principles described in SMCI 63-1205 in the development of an overall software system safety management plan, which will be an integral component of the System Safety Management Plan (SSMP). As a component of the system safety process, it shall be accomplished as outlined in DoDI 5000.02.

3.13. Software Assurance Plan. The SWAMP shall describe the software acquisition tasks for software mission assurance within the framework of the systems acquisition activities. This description shall include how software acquisition will support the test program to ensure the mission assurance objectives for software are met. Support of the test program shall include reviews of the software test plans, test processes, test metrics, integration and verification plans, validation plans and the management oversight of the test results and progress of the software test activities against the plans. TOR-2006(8506)-5749, 30 September 2006 has the discussion of software tasks under mission assurance.

3.13.1. The SWAMP shall discuss the use of integrated tools (e.g., Mission Assurance Tool (iMAT)) to provide a set of standardized mission assurance processes and tasks to document and to evaluate the program's software assurance program.

3.13.2. The SWAMP shall describe the use of the Joint Deficiency Report System for tracking software deficiencies, the process for transitioning any open deficiencies at turnover to sustainment, and the testing strategy to be used after transition to sustainment.

3.14. Software Information Assurance Plan. The SWAMP shall describe how the software acquisition will comply with the DoD Information Assurance (IA) Policy (DoDD 8500.01E). This description shall include how the software acquisition will support the DoD Information Assurance Certification and Accreditation Process (DIACAP) (DoDI 8510.01) or other Information Assurance (IA) activities.

3.15. Software Security Plan. The SWAMP shall describe the processes used to reduce the software security risks (including those related to foreign-developed software) for all COTS, newly developed software, and software reuse. The plan shall clearly identify how the software security related risks will be mitigated and controlled.

3.16. Data Rights. The SWAMP shall describe the program's plans for identifying needed technical data and computer software rights for the program including those needed for operation and maintenance of the software. The SWAMP also shall describe the process to obtain these rights. (Refer to: “Acquiring and Enforcing the Government’s Rights in Technical Data and Computer Software Under Department of Defense Contracts: A Practical Handbook for Acquisition Professionals”, 2nd Edition January 2010, SMC Staff Judge Advocate.)

3.17. Software Total Cost of Ownership (TCO). The SWAMP shall describe the plan and actions taken to minimize total cost of ownership. Areas to consider when determining TCO are vendor provided support such as patch implementation and security updates (for example: Win2K is no longer supported by Microsoft). In cases of known software obsolescence, include the cost of software upgrades to ensure supportability.

4. Exception to the SWAMP Requirement. A program may request an exception from the requirement to write a SWAMP. The request shall be submitted in writing to the SMC Chief Software Engineer. To be eligible for an exception, the program must satisfy one of the Table 3 conditions:

Table 3. Eligible SWAMP Exception Conditions.

SMC ACAT III program satisfied the definition defined in DoDI 5000.2 Enclosure 3.

Any SMC legacy program past milestone B that has an existing Computer Resources Lifecycle Management Plan (CRLCMP) or Computer Resources Support Plan (CRSP).

Any SMC program that does not require software or firmware activities.

4.1. An exception request must be submitted in Microsoft Word format and address the items in Tables 4 and 5:

Table 4. As a Minimum, the Exception Request Shall Include the Following Items.

Identify SMC Program name The capability the program provides by SMC Acquisition category assigned by SMC A program rationale for the exception Any planned follow-on contracts A description of the management approach that the program will use to acquire or maintain the software. The exception request shall address a minimum set of requirements (Refer Table 5) contained within this instruction.

Table 5. List of Management Approach in Exception.

A Software Overview section(Refer to section 3.2) to describe the program overview A Software Requirement Plan (Refer to section 3.6) to manage software requirement A Software Acquisition Monitor and Control Plan (Refer to section 3.7) to monitor and control the contractor's activities and progress A Software Configuration Management Plan (Refer to section 3.10) section to perform program configuration management

4.2. The exception request shall be granted by the SMC Chief Software Engineer (CSE) and endorsed by the SMC Chief Systems Engineer. The SMC CSE office will respond to the exception request via a memo indicating approval or disapproval.

DAVID E. SWANSON, Colonel, USAF
Director of Engineering

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

Air Force Instruction 63-101, Acquisition and Sustainment Life Cycle Management, 20 July 2010

AFI 63-131, Modification Program Management, 6 November 2009

DoD Instruction 5000.02, Operation of the Defense Acquisition System, December 8, 2008

Space and Missile Systems Center Instruction 63-1205, Space System Safety Policy, Process, and Techniques, 20 August 2007

DoD Directive 8500.01E, DoD Directive Information Assurance Certification and Accreditation Process, 23 April 2007

DoD Instruction 8510.01, DoD Information Assurance Certification and Accreditation Process (DIACAP) November 28, 2007

Risk Management Guide for DoD Acquisition, August, 2006

Space and Missile Systems Center Instruction 63-104, Software Acquisition Instruction, 26 May 2009.

Bob Stump National Defense Authorization Act of 2003 (Pub.L. 107-314), Section 804. (FY03 NDAA Section 804.)

Space and Missile Systems Center Policy, SMC Policy on Chief Software Engineers, 13 May 2009.

SMC-S-002, Configuration Management, Space and Missile Systems Center, 13 June 2008

SMC-S-012, Software Development for Space Systems, 13 June 2008

SMC-S-21, Technical Reviews and Audits for Systems, Equipment and Computer Software Volume 1, 15 September 2009

Acquiring and Enforcing the Government's Rights in Technical Data and Computer Software Under Department of Defense Contracts: A Practical Handbook for Acquisition Professionals, 2nd Edition January 2010, SMC Staff Judge Advocate

Eslinger, S., Gechman, M.C., Harralson, D.J., Holloway, L.J., and Sisti, F. J., Software Acquisition Management Plan (SWAMP) Preparation Guide, The Aerospace Corporation Report TOR-2006(1455)-5743, 29 December 2006. Restricted distribution.

Ellis, C. M., Eslinger, S., Holloway, L. J., and D. Lutton, Mission Assurance Tasks for Software, The Aerospace Corporation Report TOR-2006(8506)-5749, 30 September 2006.

Abbreviations and Acronyms

ACAT—Acquisition Category

C&A—Certification and Accreditation

CARD—Cost Analysis Requirements Document

CDRL—Contract Data Requirements List
CONOPS—Concept of Operations
COTS—Commercial Off-The-Shelf
CM—Configuration Management
CRLCMP—Computer Resources Lifecycle Management Plan
CRSP—Computer Resources Support Plan
CSE—Chief Software Engineer
DIACAP—DoD Information Assurance Certification and Accreditation Process
DoD—Department of Defense
DoDD—Department of Defense Directive
DoDI—Department of Defense Instruction
EAS—Engineering Architecture System
EMD—Engineering and Manufacturing Development
ENSS—Engineering System Software
EVM—Earned Value Management
EVMS—Earned Value Management System
FFRDC—Federally Funded Research and Development Center
GOTS—Government Off-The-Shelf
IA—Information Assurance
MAT—Integrated Mission Assurance Tool
IV&V—Independent Verification and Validation
LCMP—Life Cycle Management Plan
LSCP—Life Cycle Sustainment Plan
MDA—Milestone Decision authority
MDD—Material Development Decision
MSA—Material Solution Analysis
NDI—Non-Developmental Item
O&S—Operations and Support
P&D—Production & Deployment
POC—Point of Contact
RMP—Risk Management Plan
SEP—Systems Engineering Plan

SETA—Systems Engineering And Technical Assistance

SI—Software Item

SMC—Space and Missile Systems Center

SMCI—Space and Missile Systems Center Instruction

SRD—System Requirements Document

SSMP—System Safety Management Plan

SWAMP—Software Acquisition Management Plan

TD—Technology Development

TOR—Technical Operating Report

TPM—Technical Performance Measure