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***Maintenance***

***MAINTENANCE MANAGEMENT OF  
SPACE LAUNCH SYSTEMS***

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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This instruction implements AFI21-108, *Maintenance Management of Space Systems* and AFI10-1201, *Space Operations*. It implements command guidance on both space launch and logistics standardization efforts for heritage launch systems only and has no applicability to operations or maintenance activities associated with the Evolved Expendable Launch Vehicle (EELV) program. It specifies the maintenance responsibilities and management procedures for work centers aligned under the Logistics Group, Operations Group, Space Launch Squadron (SLS), Operations Group Standardization and Evaluation (OGV), and SPACEAF. It also provides guidance for the SLS risk management function to AFSPC for mission accomplishment and public safety. Maintenance personnel must know the requirements of this instruction and allied publications that pertain to their responsibilities. Wherever this instruction is inconsistent with current contracts that support AFSPC's mission, the contract shall govern. This instruction is consistent with Air Force Occupational Safety and Health (AFOSH) standards and Department of Labor Occupational Safety and Health Act (OSHA) standards and numbers. This publication does not apply to Air Force Reserve Command nor Air National Guard units.

**Supplements.** Changes to the procedures contained in this publication are not authorized without approval of HQ AFSPC/LG. Units may develop supplements to this instruction and will submit drafts for approval (before printing) through the Stan/Eval (OGV) launch maintenance representative to HQ AFSPC/LGMS. Distribute approved supplements and training requests to HQ AFSPC/LGM, 150 Vandenberg St., Ste 1105, Peterson AFB CO 80914-4430 and SPACEAF/A3/A4, 747 Nebraska Ave Ste B109, Vandenberg AFB CA 93437-6268.

***SUMMARY OF REVISIONS***

As a direct result of the Broad Area Review (BAR) recommendations (Dec 99 and Aug 00), AFMC and AFSPC have redefined their roles and responsibilities for space launch activities. AFMC, through the Commander, Space and Missile Systems Center (SMC/CC) now has Flight Worthiness responsibility from cradle to grave for all missions involving USAF space assets. The SMC/CC will certify and document spaceflight worthiness at the conclusion of the Flight Readiness Review (FRR) or similar system

milestone. Once the SMC/CC certifies Flight Worthiness, AFSPC supported by AFMC, assumes the primary responsibility for ensuring launch vehicle readiness is maintained through launch execution. Additional emphasis was placed on Space Launch Squadron (SLS) personnel roles and responsibilities in supporting AFMC and assuring contractor compliance with their contractual agreements. The Task Categorization Matrix was deleted with task surveillance list requirements added to Workload Management Section 2.2. in its place. A documentation requirement for maintenance surveillance observations was added to SLS Maintenance Supervision (MA) and Maintenance Controller (MC) sections. A bar (|) indicates a revision from the previous edition.

## 1. Space Launch Maintenance Programs:

**1.1. Coverage.** All maintenance actions and management efforts must support the unit's space launch mission. Units will maintain a philosophy that ensures compliance with technical data, contractor procedures, safety, and security requirements.

1.1.1. Maintenance surveillance is the method by which the government is able to see and understand clearly the nature of contractor activities directly related to or in support of the space launch mission. Space Launch Maintenance Management will use Joint Master Surveillance Plans (JMSP) as well as task surveillance lists approved IAW this instruction to identify which contractor activities require "maintenance surveillance" by space launch Maintenance Controllers (MCs).

1.1.2. Maintenance surveillance provides for safe and successful space launch maintenance activities throughout all phases of launch base operations.

### 1.2. Objectives/Goals:

1.2.1. Objectives. To optimize the processing and launch of USAF space systems in terms of standard practices, resource safety, and responsibilities outlined in this instruction and associated documents i.e., Memorandums of Agreement (MOA), JMSPs, lease and license agreements, higher level instructions, etc.

1.2.2. Goals. Optimum use of space launch systems to satisfy national needs. Implement JMSP and task lists for maintenance surveillance to ensure mission success and reduce Air Force costs.

## 2. Resonsibilities:

**2.1. General Maintenance.** Squadron maintenance personnel act with the authority of the squadron commander to assure space launch system assets are reliable and ready for operation through the integration, facilitation, surveillance, and verification of contractor activities. All activities to manage contractors will be consistent with the contract-specific delegation of authority as provided by the Administrative Contracting Officer (ACO).

2.1.1. Verify contractor compliance/accountability for effective management and operation of space launch hardware and infrastructure. SLS maintenance personnel will accomplish this through surveillance and day-to-day coordination/communication with appropriate base agencies (contractors, BCE, CONS, COMM, etc.).

2.1.2. Contract surveillance will be performed using guidelines set forth in AFI63-124, AFI63-501 and any applicable supplements. The goal is to verify the contractor has met all contractual requirements. In all cases, SLS Commanders will ensure personnel assigned Quality Assurance Evaluator (QAE) responsibilities meet all QAE training requirements (Attachment 2).

2.1.3. Verify compliance with contractor system processing procedures, higher headquarters directives and instructions IAW contractual requirements.

2.1.4. Verify the contractor documents discrepancies that occur during receipt, processing, launch and recovery IAW contractual requirements.

2.1.5. Assure efficient use of AF resources and compliance with technical/engineering data, resource safety, mission assurance, safety, security, procedural and environmental requirements, as well as general maintenance practices at the work site.

2.1.5.1. Safety. Ensure operations and maintenance are conducted with adequate protection of Air Force resources, personnel, and the general public. Contractors maintain the responsibility for compliance with all applicable federal, state and local safety requirements.

2.1.5.2. Security. Ensure effective security programs in coordination with unit security manager and host base security agencies.

2.1.5.3. Environmental. Environmental compliance is the responsibility of the contractor(s) and Base Civil Engineering personnel. SLS maintenance personnel will conduct themselves and survey contractors within the scope of the contract and to the level SLS training allows.

2.1.5.3.1. Assure implementation of federal, state, local, USAF and base environmental compliance policy and procedures.

2.1.5.3.2. Verify integration of environmental requirements into unit training and quality assurance programs.

2.1.5.3.3. Ensure unit personnel are trained to report environmental concerns to the correct level of authority.

**2.2. Workload Management.** Maintenance personnel scheduling shall reflect optimum use of SLS personnel resources ensuring compliance with crew rest and maximum work shift/scheduling requirements established in Eastern and Western Range Safety Requirements 127-1. Each unit is responsible for developing specific guidelines to manage personnel resources.

2.2.1. SLS personnel and resources providing launch processing surveillance, integration and other associated activities will be utilized to ensure AF DoD missions receive the highest priority. Although local commanders have the discretionary authority to manage their resources as they see fit, DoD space launch missions should always take priority. Any non-DoD mission use of these resources must not interfere with AF launch mission requirements.

2.2.2. Maintenance Supervision manages AF maintenance personnel and resources to best meet scheduling needs melding such resources and operations schedules into a daily maintenance plan/schedule.

2.2.3. Launch processing surveillance activities are governed by the JMSP using a flight worthiness certification matrix developed between the SLS and resident SMC detachment. Additional facility, booster, and spacecraft processing task surveillance lists are generated by SLS flight supervision and approved by the Maintenance Advisor (MA).

2.2.3.1. Develop task surveillance lists considering, but not limited to, the following factors: (weighting of each factor is at the discretion of the unit)

2.2.3.1.1. System/test redundancy

- 2.2.3.1.2. Schedule impact
- 2.2.3.1.3. Maturity of operations/maintenance tasks
- 2.2.3.1.4. Past experience/trends/anomalies
- 2.2.3.1.5. DoD vs. Civil or Commercial mission
- 2.2.3.1.6. System verification
- 2.2.3.1.7. Task complexity/difficulty

### **2.3. Space Air Force (SPACEAF):**

- 2.3.1. Serve as primary space launch focal point for maintenance, operations, sustainment, scheduling and readiness issues and as liaison between space launch, range units and HQ AFSPC/LGMS/DOSL.
- 2.3.2. Responsible to advocate for maintenance, operations and logistics standardization initiatives for space launch and range units.
- 2.3.3. Review, coordinate and supplement space launch policy and concept documents as required.
- 2.3.4. Validate operational requirements, concept of operations, concept of employment and situation report status.
- 2.3.5. Monitor space launch flight development and evaluation (FD&E) activities.
- 2.3.6. Validate Operational Review Board (ORB) minutes for issues occurring during space launch generation or recovery.
- 2.3.7. Assist MAJCOM or units as needed.
- 2.3.8. Participate in Standardization Evaluation Teams and Staff Assistance Visits to space launch and range units.
- 2.3.9. Monitor space launch generation, execution, and recovery activities.
- 2.3.10. Participate as a member of the Multi-mission Process.
- 2.3.11. Chair Launch Schedule Review Board (CLSRB) process.
- 2.3.12. Chair space launch Constellation Sustainment Assessment Team (CSAT) activities for Combatant Command (COCOM) missions.
- 2.3.13. Review 30 OGV and 45 OGV quarterly maintenance cross feed and trend analysis reports.
- 2.3.14. Participate in accident and safety investigation boards as required.
- 2.3.15. Act as lead for Space Launch Maintenance during Guardian Challenge Competition planning and execution.

### **2.4. Logistics Group Commander:**

- 2.4.1. Assure personnel nominated by the SLS/CC (para [2.5.6.](#)) receive Phase I and Phase II QAE training and are formally appointed in writing by the contracting officer for their assigned areas of responsibility.

2.4.2. Ensure close coordination and unity of effort between the appropriate Logistic Group agencies and SLS Maintenance Management.

2.4.3. For performance based contracts on operations and maintenance of critical launch facilities, where SLS personnel are not delegated responsibilities or trained as QAEs, ensure the contracting officer provides SLS personnel training. Such training should thoroughly address the contract SOW, the government's performance management approach, and the SLS' role as customer.

## **2.5. SLS Commander:**

2.5.1. Serve as advocate for logistics and maintenance initiatives.

2.5.2. Include maintenance mission support requirements in appropriate plans, programs, host/associate and contract agreements.

2.5.3. Coordinate SLS surveillance efforts with assigned SMC/Det on areas designated as AFMC responsibility. Instill a cooperative management approach with SMC/Det ensuring open lines of communication throughout all levels of management and surveillance activities.

2.5.4. Develop methods to accomplish the following responsibilities: (2 SLS uses Squadron Coordination Center (SCC) to meet these requirements):

2.5.4.1. Ensure actual day-to-day monitoring of space launch system maintenance processing and emergency reaction on the launch complex(s).

2.5.4.2. Plan, schedule, coordinate and integrate AF requirements for maintenance, operations and contractor schedules. Coordinate the accomplishment of scheduled and unscheduled tasks and resolve conflicts.

2.5.4.3. Coordinate with applicable agencies on maintenance discrepancies.

2.5.4.4. Ensure SLS resources are available to meet required schedules.

2.5.4.5. Provide primary briefing/debriefing function for the MA and establish briefing/debriefing requirements.

2.5.4.6. Serve as the focal point for discrepancy reporting on areas of assigned responsibility.

2.5.4.7. Maintain current status of assigned flight hardware.

2.5.4.8. Maintain current status of critical facilities, hardware and support equipment.

2.5.4.9. Respond to emergencies and disasters IAW local procedures and host/associate agreements.

2.5.5. Execute Operational Directives (OD) as required.

2.5.6. Ensure QAEs are nominated to the contracting officer.

**2.6. SLS Maintenance Supervision (MA).** Responsible for overall management and supervision of maintenance functions and resources of the SLS. MA will manage maintenance flights:

2.6.1. Ensure squadron task surveillance lists are developed, as necessary, and act as final maintenance approval authority.

2.6.2. Ensure effective training programs IAW AFI36-2201 and this instruction.

- 2.6.3. Advocate for maintenance and logistics initiatives.
- 2.6.4. Serve as primary maintenance liaison to operations.
- 2.6.5. Serve as focal point for maintenance reports, correspondence and policy.
- 2.6.6. Serve as focal point for any maintenance requirements concerning wartime/contingency-planning teams.
- 2.6.7. Serve as senior maintenance advisor to the squadron commander.
- 2.6.8. Provide assistance to the program management office (PMO), Base Civil Engineer (BCE) or applicable contractor in coordinating modifications and forecasting alteration and construction affecting Real Property (RP) and Real Property Installed Equipment (RPIE).
- 2.6.9. Advocate and integrate maintenance forecasts and schedules with appropriate local agencies, to include contractors.
- 2.6.10. Responsible for assigned surveillance requirements of space launch systems maintenance performed at the launch base regardless of agency performing tasks.
- 2.6.11. Integrate base support agencies' and contractors' activities affecting or involving launch complex, processing facilities, equipment, hardware and infrastructure.
- 2.6.12. Ensure flight personnel have a working knowledge of contracts, Statements of Work (SOW), Joint Working Agreements (JWA), Memorandum of Agreements (MOA) and other applicable documents.
  - 2.6.12.1. For performance based contracts on operations and maintenance of critical launch facilities, where SLS personnel are not delegated and trained as QAEs, request contracting officer provide appropriate SLS personnel training. Such training should thoroughly address the contract SOW/SOO, the government's performance management approach, and the SLS' role as customer.
- 2.6.13. Participate in Operations Review Board (ORB) investigation review meetings.
- 2.6.14. Establish AF pre-task briefing/debriefing procedures.
- 2.6.15. Establish and employ a robust field visit program.
  - 2.6.15.1. Ensure field visits are conducted and documented on at least 25 percent of qualified MCs quarterly. Each MC must be observed annually. Documentation will include strengths and areas for improvement as a minimum.
- 2.6.16. Ensure a process is in place for MCs to document maintenance surveillance observations and activities. Documentation will include, as a minimum, contract specific surveillance requirements IAW JMSP/ASP and any other specific surveillance requirements necessary to meet AF mission needs.
  - 2.6.16.1. Ensure all surveillance documentation is maintained and reviewed to support contract surveillance and award fee processes, IAW JMSP/ASP.
  - 2.6.16.2. Ensure observations are documented IAW paragraph [2.9.6](#).

**2.7. Flight Supervision.** The following are the common responsibilities of maintenance flights. Flight Supervision is responsible to the MA for management of their assigned functional area. Flight Supervision will:

- 2.7.1. Ensure personnel are aware of changes to applicable policy, instructions and contractor procedures.
- 2.7.2. Review reports and analyses to identify deficient areas (especially concerning training and quality assurance) and take corrective action.
- 2.7.3. Provide wartime/contingency planning team members to MA.
- 2.7.4. Provide current maintenance, mission, and readiness status to the MA.
- 2.7.5. Participate in the contractors' maintenance planning and forecasting activities. Primary emphasis is to ensure contractors are performing their integration functions IAW their contractual requirements. Participation in these activities does not imply the AF chair or lead them.
- 2.7.6. Ensure MCs and engineers are qualified to perform assigned duties.
- 2.7.7. Assure compliance with AF pre-task briefing/debriefing procedures.
- 2.7.8. Notify OGV once an individual has completed training requirements and is ready to assume MC duties.

**2.8. Section Supervision .** The following are the common responsibilities of maintenance sections. Section Supervision is responsible to the flight for management of the assigned functional area. Section Supervision will:

- 2.8.1. Comply with training program IAW AFI36-2201 and this instruction.
- 2.8.2. Provide current maintenance, mission, and readiness status to the flight.
- 2.8.3. Participate in the contractors' maintenance planning and forecasting activities. Primary emphasis is to assure contractors are performing their integration functions IAW their contractual requirements. Participation in these activities does not imply the AF chair or lead them.
- 2.8.4. Ensure MCs or engineers are qualified to perform assigned duties.
- 2.8.5. Implement/conduct Pre-task briefing procedures to include the following:
  - 2.8.5.1. Ensure SLS personnel have the necessary materials, coordination and procedures to cover/perform the task.
  - 2.8.5.2. Ensure MCs understand associated tasks related to work being performed in parallel, communications requirements and coordinate with the supporting work centers.
  - 2.8.5.3. Ensure personnel are knowledgeable of space launch systems safety requirements, buddy care program, security requirements, emergency procedures and environmental requirements.
  - 2.8.5.4. If an MC is replaced/relieved on duty, assure a changeover briefing is conducted.
- 2.8.6. Implement/conduct debriefing procedures.

**2.9. Maintenance Controller (MC).** Responsible to Flight Supervision for providing surveillance of contractors performing maintenance or processing activities on assigned space launch systems. Maintenance Controllers will:

- 2.9.1. Verify compliance with contractor system processing procedures, higher headquarters directives and instructions.
- 2.9.2. Assure personnel follow safety regulations and conduct operations in a safe manner. MC's may direct personnel to stop or modify (requires coordinated AF/contractor resolution) an operation for any one of the following reasons: Public Safety, Mission Assurance, Imminent Personnel Danger, and Risk to AF Personnel and Property. MC's must rely on their task knowledge and proper judgment when determining to stop or modify any operation.
- 2.9.3. Verify proper test configuration is maintained until valid data go is achieved.
- 2.9.4. Verify environmental compliance and integration of pollution prevention concepts. Report deviations/violations IAW with local procedures.
- 2.9.5. Document all surveillance observations on procedures performed on assigned space launch systems and make every effort to attend contractor pre-task briefings.
- 2.9.6. Document observations with respect to the following categories:
  - 2.9.6.1. Safety Compliance.
  - 2.9.6.2. Procedural Compliance.
  - 2.9.6.3. Task preparation.
  - 2.9.6.4. Proper task coordination/integration.
    - 2.9.6.4.1. Document any schedule impacts or deviations from schedule that may affect milestones or task completion.
  - 2.9.6.5. Environmental Compliance.
  - 2.9.6.6. Security.
  - 2.9.6.7. Start/finish time for observed tasks or activities.
  - 2.9.6.8. Identify potential award fee inputs.
- 2.9.7. Comply with briefing/debriefing requirements identified by the MA.
- 2.9.8. When escorting personnel, ensure a thorough safety briefing is given to all visitors and personnel not trained or qualified on hazards or emergency responsibilities applicable to the area they are being escorted.
- 2.9.9. Coordinate actions, updated status delays or concerns with flight supervision.
- 2.9.10. Assure facility, booster or payload contractors comply with configuration control requirements IAW all governing Air Force guidance and/or contractual specifications as applicable.
- 2.9.11. Review and coordinate or approve/disapprove contractor procedures IAW contractual delegations.
- 2.9.12. Participate on ORB, recovery teams and problem/anomaly resolutions as required.

2.9.13. Review current technical procedures before beginning surveillance on task(s) and ensure procedures are available for immediate review during the task.

2.9.14. Comply with established emergency and safety procedures.

2.9.15. Provide subject matter expertise on assigned systems to space launch management.

2.9.16. Review pertinent data obtained during processing and launch.

2.9.17. Participate or provide support for the following launch base activities, as needed:

2.9.17.1. Sub-working Groups (SWGs), Facility Working Groups, and Technical Interchange Meetings (TIMs) to resolve issues on space launch systems.

2.9.17.2. Hardware/software turnover acceptance reviews.

2.9.17.3. Design reviews for new or modified flight and support equipment to ensure launch base processing needs are met.

2.9.18. Participate in facility, booster and spacecraft walk-downs, and in final system inspections prior to launch. Assure responsible contractor clears discrepancies IAW contractual requirements.

2.9.19. Provide support to on-console positions during major tasks and the launch countdown.

2.9.20. Coordinate with outside agencies as required.

2.9.21. If replaced/relieved on duty, conduct a changeover briefing to ensure, as a minimum, on-coming personnel are aware of task status, any open requirements and overall task flow.

**2.10. Engineers.** Responsible to Flight Supervision for engineering support. Engineers will:

2.10.1. Support engineering analysis, functional requirements, integrated test plans, system safety, and certain Maintenance Controller responsibilities of assigned space launch systems.

2.10.2. Participate, support, and coordinate problem and issue resolution efforts.

2.10.3. Provide subject matter expertise and engineering recommendations on assigned systems and processes.

2.10.4. Provide system safety expertise to assure mission success.

2.10.5. Review new and revised launch site test and integrated procedures and approve/disapprove, IAW contractual delegations. Maintain sufficient technical surveillance to assure contractor is using sound engineering practices. Coordinate with outside agencies as required.

2.10.6. Review pertinent data obtained during processing and launch.

2.10.7. Assure proper configuration of space launch systems through review of pertinent data and walk-downs.

2.10.8. Support operational concept definitions, design reviews, and hardware/software acceptance reviews for new or modified space launch systems to ensure launch base processing needs are met. Support SWGs and TIMs to resolve issues on space launch systems.

2.10.9. Provide technical surveillance into both government and contractor launch vehicle reviews to include, but not limited to, hardware reviews and internal contractor reviews.

2.10.10. Provide support to on-console positions during major tasks and the launch countdown.

2.10.11. Provide assistance to the procuring agency in correcting space launch system deficiencies and improving the cost effectiveness of launch base operations.

2.10.12. Participate in post-flight data review for initial assessment of operations results or mission outcome.

2.10.13. Support AFMC/SMC Operational Safety Suitability and Effectiveness (OSS&E) process.

### 3. AF Standardization and Evaluation Program:

**3.1. General.** The Standardization and Evaluation program is designed to standardize and improve processes, assess personnel proficiency, ensure effectiveness of maintenance management and provide feedback to supervision. OGV is charged with managing the maintenance QA program and Group Level Training responsibilities. OGV serves as liaison between units, SPACEAF and HQ for policy and guidance. OGV will use Operational Standardization Team visits, Inspections and reports as tools to ensure quality maintenance.

**3.2. Operations Standardization Team (OST) Visits.** OSTs are generally oriented toward the management function within a particular functional area (work-center). OGV determines the inspection scope (what to inspect) and process (how to inspect it). OGV will develop formalized checklists and conduct inspections based on regulatory requirements. Provide copies of checklists to SPACEAF/A3/A4 and HQ AFSPC/LGMS.

**3.3. Special Inspections (SI).** SIs are used to inspect maintenance management processes and specific areas of concern. SIs are performed at OGV discretion or at the unit's request.

**3.4. Personnel Proficiency Inspections (PPI)** PPI's are used to determine MC's proficiency IAW their responsibilities outlined in this instruction. As a minimum, conduct annually on at least 20 % of all qualified MC personnel assigned in each squadron's maintenance sections. The goal would be to divide these inspections equally on a quarterly basis. In addition, perform 20% proficiency inspection on all assigned trainers annually per squadron. Use the following inspection and briefing guidelines, as appropriate.

#### 3.4.1. Inspection Guidelines:

3.4.1.1. Perform inspections on a non-interference basis to contractor operations.

3.4.1.2. Verify inspectee is task certified.

3.4.1.3. Inspectors should stop, correct, and alert appropriate agencies of any situations affecting safety, security, resource safety, or mission assurance.

3.4.2. Briefing Guidelines. Brief the inspectee(s) before beginning an inspection. For tasks already in progress, notify the inspectee(s) they are under inspection and brief them as soon as practical. Include the following:

3.4.2.1. Tasks/procedures to be inspected.

3.4.2.2. All safety and security requirements must be met.

3.4.2.3. The inspectee is responsible for tasks and related actions. The inspector's presence does not shift MC responsibilities.

3.4.2.4. Questions may be asked to determine the inspectee's knowledge of the tasks. The

individual may use any source available to answer questions.

3.4.2.5. The inspectee must notify the inspector of pertinent information that could affect the task.

3.4.2.6. A critique will be conducted as soon as possible after the completion of the inspection.

3.4.2.7. Explain each deviation and discuss the correct procedures.

3.4.3. The following additional items apply to trainer inspection briefings:

3.4.3.1. Any situation involving safety, security, or mission assurance must be corrected immediately by the trainee or instructor. The instructor will be given consideration as to the degree of control they had over the trainee.

3.4.3.2. All other discrepancies must be corrected or documented before completion of the training session.

3.4.3.3. Inspectors may ask to see all applicable paperwork once it is completed.

3.4.4. Critique guidelines:

3.4.4.1. Review the inspectee's strengths and areas requiring additional improvement.

3.4.4.2. Recommend methods of task accomplishment.

3.4.4.3. Exchange ideas and techniques.

**3.5. Reports.** OGV will use inspection and quarterly cross-feed reports to provide feedback to all levels of maintenance supervision.

3.5.1. Inspection Reports:

3.5.1.1. Document strengths, weaknesses, and areas of concern and make recommendations for improvements. Use references where applicable.

3.5.1.2. Route inspection reports to unit for coordination.

3.5.1.3. Maintain inspection reports.

3.5.2. Quarterly cross-feed reports:

3.5.2.1. Cross-feed reports will incorporate sanitized elements from various inspection reports highlighting noted strengths and weaknesses.

3.5.2.2. Distribute reports to al SLS', 30 and 45 OG CC/MA/OGV, SPACEAF/A3/A4 and HQ AFSPC/LGMS, as a minimum, on a quarterly basis.

#### **4. AF Maintenance Training:**

**4.1. General.** Training managers/trainers will schedule, monitor, and control the various maintenance training programs IAW applicable training directives and guidelines to provide management with trained personnel to meet mission requirements.

#### **4.2. Group-level Maintenance Training Responsibilities:**

4.2.1. Provide guidance to standardize unit training programs.

- 4.2.2. Serve as liaison between units and higher headquarters for all maintenance training issues.
- 4.2.3. Assist unit training in development and management of maintenance training programs IAW AFI36-2201.
- 4.2.4. Serve as the focal point for obtaining and assist scheduling of maintenance training quotas for courses conducted by outside agencies (on or off-base).
- 4.2.5. Use AF Form 403, **Request for Special Technical Training**, and DD Form 1556, **Request, Authorization, Agreement, Certification of Training and Reimbursement**, to request special training needs. Submit requests to HQ AFSPC/LGMS with an informational copy to SPACEAF/A3/A4.
- 4.2.6. Conduct quarterly maintenance training working group meetings with the maintenance squadrons.
- 4.2.7. Career Field Education Training Plan (CFETP) Review. A CFETP review board, chaired by group-level training, will review CFETPs and local AF Forms 797, **Job Qualification Standard Continuation/Command JQS**, for proper coverage and currency. The CFETP review board will:
  - 4.2.7.1. Use local AF Forms 797 to document training on new tasks not in the CFETP.
  - 4.2.7.2. Ensure the board consists of all affected work-centers and OGV.
  - 4.2.7.3. Review CFETP changes and local AF Form 797s.
  - 4.2.7.4. Assign task responsibility to appropriate workcenter.
  - 4.2.7.5. Review and validate new documents within 30 days of receipt and make local additions as necessary.
  - 4.2.7.6. Submit CFETP changes to higher headquarters as required.

### 4.3. Unit Training Responsibilities :

- 4.3.1. Manage unit training programs.
- 4.3.2. Observe all instructors conducting training at least once a year. Do not exceed 12 months between observations.
- 4.3.3. Develop and distribute a schedule of future training classes and an awaiting action listing in sufficient time for management to meet training requirements.
- 4.3.4. Serve as the squadron focal point for requesting and scheduling of maintenance training quotas for courses conducted by outside agencies (on or off base). Notify group level training of scheduled class.
- 4.3.5. Use AF Form 403 to request funding for special training needs. Submit requests to group-level training. Use DD Form 1556 for unit-funded training and provide courtesy copy to group-level training.
- 4.3.6. Assist in monitoring overdue training and notify the appropriate level of supervision to correct training deficiencies.
- 4.3.7. Designate an Instructional System Development (ISD) specialist. The ISD specialist will:

4.3.7.1. Attend ISD course. Previous 3S2X1 technical training satisfies the attendance requirements for ISD course. (Recommend all trainers attend ISD course to support lesson plan development)

4.3.7.2. Assist in preparing lesson plans, ensure all lesson plans follow ISD guidance, and assist in developing local training programs.

4.3.8. Manage learning center resources and equipment.

4.3.9. Ensure training records are accurate and current.

4.3.10. Ensure proper administration of on-the-job training (OJT), ancillary training (Attachment 2), and enlisted specialty training (EST) IAW AFI36-2201.

4.3.11. Assist supervisors with the Training Evaluation Program IAW AFI36-2201.

4.3.12. Conduct initial interview/evaluation of new arrivals with their supervisor IAW AFI36-2201.

4.3.13. Ensure all maintenance flights develop/implement training plans. Provide training plans and validation data copies to group-level training.

4.3.14. Use the ISD process to develop maintenance training programs.

4.3.15. Ensure development/use of lesson plans for technical tasks.

4.3.16. Review lesson plans at least once a year, not to exceed 12 months between reviews.

4.3.17. Establish, implement, and manage initial and recurring training programs for all maintenance flights.

4.3.18. Conduct training meetings IAW AFI36-2201, Developing, Managing and Conducting Training.

4.3.19. Ensure OGV is coordinated with after initial instructor observation.

#### **4.4. Section Training Responsibilities:**

4.4.1. Ensure initial interview/evaluation is conducted IAW AFI36-2201.

4.4.2. Conduct initial and recurring training:

4.4.2.1. Ensure training programs meet ISD requirements and are technically accurate and complete.

4.4.2.2. Ensure lesson plans are correct, current (reviewed annually) and used for training.

4.4.2.3. Coordinate with unit training on trainee progression.

4.4.2.4. Promptly identify and correct training deficiencies.

4.4.2.5. Maintain accurate and current training records.

4.4.3. Recurring Training (RT):

4.4.3.1. Conduct RT Semi-annually, as a minimum.

4.4.3.2. Tailor program to individual and flight needs. Ancillary training does not meet the intent of the RT program.

4.4.3.3. Coordinate with Unit Training and OGV.

4.4.3.4. Notify Unit Training when completed.

4.4.4. Identify requirements and ensure completion of ancillary training.

4.4.5. Assist trainee with upgrade training.

4.4.6. Establish a consolidated task coverage file to ensure 100 percent task coverage within the section. Ensure a training capability exists for each Career Field Education Training Plan technical task performed.

**4.5. Officer Training.** Unit/Section Training will develop, manage, and document training for all officers assigned to MA IAW this instruction, CFETPs, and local training requirements.

**4.6. Section Trainer Qualifications.** Prior to performing unsupervised instructor duties, personnel selected as instructors must:

4.6.1. Be a certified trainer IAW AFI36-2201.

4.6.2. Be observed by Unit Training/ISD specialist and the individual's supervisor.

**4.7. Training Requirements.** See [Attachment 2](#) for training requirements specified by this instruction.

## **5. Changes, Requests For Clarification And Waivers:**

**5.1. Recommendations.** Submit recommendations to waiver, change, or clarify this instruction or other management directives to HQ AFSPC/LGMS with an information copy to SPACEAF/A3/A4.

**5.2. Change Requirements.** Originators of changes, requests for clarification, or waivers should ensure all units, which could be affected, are included as informational addressees.

KAI LEE NORWOOD, Col, USAF  
Director of Logistics

**Attachment 1****GLOSSARY OF REFERENCES AND TERMS*****References***

AFCAT36-2223, USAF Formal Schools.

AFI10-1211, Space Launch Operations

AFI21-105, Aerospace Equipment Structural Maintenance

AFI21-108, Maintenance Management of Space Systems

AFI36-2201, Developing, Managing, and Conducting Training

AFI38-101, Air Force Organization

AFI63-124, Performance-Based Service Contracts (PBSC)

AFI63-501, Air Force Acquisition Quality Program

AFI63-1101, Modification Management

AFI63-1201, Assurance of Operational Safety, Suitability, & Effectiveness (OSS&E)

AFI91-213, Operational Risk Management

AFSPCI21-104, Configuration Control Process

AFSPCI21-105, AFSPC Corrosion Control Program

AFI63-501, AFSPC Supplement 1 to Air Force Acquisition Quality Program

AFPD21-1, Managing Aerospace Equipment Maintenance

AFPD63-501, Quality Assurance

DoDI-5000.2, Defense Acquisition Management Policies and Procedures

FAR Part 42 (Contract Administration)

FAR Part 46 (Quality Assurance)

AFSPCHOI10-1, AFSPC Operational Requirements Document

Career Field Education Training Plan (CFETP): 2M0XX, 21MX

Eastern and Western Range (EWR) 127-1, Range Safety Requirements

HQ AFSPC Logistics/Civil Engineering Concept of Maintenance, 13 Jun 94

***NOTE:***

Information contained in the above publications is useful to the maintenance community. The list is not inclusive of all directives required for maintenance managers, but is an excellent starting point to find needed information.

### *Terms*

**Acceptance.**—Government acceptance of the results of a contractor-executed test procedure or task and acceptance of close-out/disposition of all anomalies or out-of-family/out-of-spec data associated with that procedure or task. Acceptance will be performed by one, or a combination of the following agencies: Detachment, SPO, SLS, and AFQA (depending on the subject). The Aerospace Corporation will provide a technical recommendation on acceptance or rejection. Acceptance takes on two forms: One is an acceptance of items/processes/procedures as required by the contract; the other is technical acceptance that the contractor's actions have adequately resolved any anomalies/non-conformances and satisfies Flight/Task Certification Matrix requirements.

**Aerospace Ground Equipment (AGE)**— Ground processing end items that are required to make a space system operational, and is not designated as Special Tooling or other production tooling defined as being allocated to an airborne configuration item, and is not designated as Real Property Installed Equipment.

**Annual**—When used as a requirement, the term “annual” refers to a 12-month interval.

**Anomaly**— An unexpected or unplanned condition that does not meet AFMC-provided system performance parameters and requires the development, validation and approval of additional troubleshooting and/or corrective action as part of isolation and resolution.

**Anomaly Resolution**—The process to resolve an anomaly. An anomaly resolution team will be formed to resolve/disposition all system anomalies. This team may consist of AFMC, AFSPC, contractors and any other personnel needed to resolve the anomaly.

**Approval**—Approval signifies AFSPC approval/acceptance/coordination IAW AFSPC instructions and Memorandum of Agreements.

**Contract Administration/Surveillance**—(for the purpose of this instruction) The active surveillance of the contractor to ensure compliance with various contract or statement of work requirements. Examples include safety, quality assurance, security, property management, and base support. This surveillance task may be performed by the contracting office or delegated to another government office, which has resident expertise and/or is co-located with contractor operations.

**Contract Management**—(for the purpose of this instruction) The active management of the contract and/or contractor by the contracting officer for the purpose of ensuring satisfactory delivery of end items meeting USAF requirements. This includes such activities as contract negotiation and business clearance, as delegated by SMC.

**Critical System(s)**—Critical systems are those that are necessary for a successful mission and are identified as having test/processing procedures that require direct government observation or data review. Critical systems will be identified for each launch vehicle and satellite system by the government team and are depicted on a Flight Certification Matrix (FCM) or as directed by the SLS Commander.

**Data Review**—Government review of all data, resulting from completion of a contractor-executed test procedure or task, required for government acceptance of that test procedure or task. Data from contractor-run tests and procedures will be reviewed by Detachments, SPO, SLS, Aerospace, and/or AFQA according to the Flight Certification Matrix. This data review is to ensure the test/procedure produced the desired results, to identify any anomaly/non-conformances, and to develop trend data.

**Discrepancy**—An unexpected or unplanned condition that does not meet system performance parameters

but which can be corrected by organizational maintenance resources in accordance with validated procedures at the unit level.

**Flight Hardware**—All physical elements of the space launch systems that lift off, in contrast to those space system elements that remain on the ground.

**Flight Readiness**—AFSPC responsibility to orchestrate and conduct pre-launch countdown activities IAW approved procedures to prepare the integrated booster and spacecraft for flight. These activities include such processes as conducting final spacecraft power-up and testing, booster propellant loading and final propulsion, electrical and hydraulic system checks and tests, and verification that necessary range assets and facilities are mission capable.

**Flight/Section Supervision**—Flight Supervision is composed of a flight commander and/or a flight superintendent/OIC and NCOICs with sufficient background and knowledge required to manage sections under their authority in support of the mission.

**Flight Worthiness**—AFMC responsibility to ensure the design meets the requirements, the hardware is built in accordance with that design, and the processes and procedures used in the factory and at the launch base meet the requirements. Additionally, launch base processing is completed in accordance with the approved procedures, and that any anomalous conditions are resolved.

**Flight Worthiness Certification Matrix**—A detailed description of all flight-critical hardware and software test procedures and tasks, the execution of which must be personally observed by a government representative and/or be approved through appropriate data review. Completion of this matrix and related sub-matrices (non-conformances, material review boards, special test procedures, unplanned work, and special interest items) will be used in the certification by SMC of the flight hardware for launch. This matrix will be updated for each mission. It will be verified and executed by all members of the launch team, to include the Detachments, SPO, Launch Squadrons, AFQA, and Aerospace.

**Joint Master Surveillance Plan(s) (JMSP)**—Plans developed and executed between the 45th and 30th Space Wings and AFMC/Dets 8 and 9. These plans provide a comprehensive and cohesive approach to satisfy the complementary responsibilities of flight worthiness, public safety, resource protection and contract compliance for Air Force Space Command (AFSPC) and Air Force Materiel Command (AFMC).

**Launch Processing**—Launch base performance of Operations and Maintenance tasks associated with flight hardware/software and support equipment (SE) (i.e., AGE, RP, and RPIE) to employ the integrated space launch vehicle consisting of the launch vehicle, upper stage, and spacecraft.

**Launch Processing Management**—Functions performed by the Space Wing and associated SMC Detachment to manage contractor launch processing actions in accordance with the contract and appropriate delegations.

**Launch Service**—A capability provided by a contractor to place a space system into orbit. Launch services include the launch vehicle hardware and the processing necessary to launch the payload into orbit.

**Mission Assurance**—Mission assurance is a joint responsibility of all stakeholders. It is accomplished through the contractor's demonstration of their production, operation, maintenance, and problem resolution processes with government personnel performing maintenance surveillance to ensure these processes result in acceptable level of mission risk to the government.

**Maintenance Functions**—Maintenance functions include: launch base transport, assembly, checkout,

preparation, corrective maintenance, and preventative maintenance inspections of space launch vehicles, payloads, space launch complexes, support equipment (SE); and real property (RP) that support launch activities. All maintenance personnel will follow approved AFSPC maintenance policy and guidance in support of space launch operations.

**Maintenance Surveillance**—Actions conducted by SLS personnel to include Contract Surveillance, which are used to ensure/determine if space launch system assets are reliable and ready for operation by assuring adherence to technical procedures, general maintenance practices, safety requirements, security guidelines, environmental compliance, efficient utilization of resources, resource safety, and mission assurance to include directing an immediate halt to any actions detrimental to personnel or equipment.

**Observation**—Direct government observation of the execution and recording (if applicable) of a test procedure or task. An “Observed” test procedure or task is one in which all steps (or certain pre-defined steps) have been completed, all anomalies have been noted (with appropriate documentation generated), and all applicable data captured while being observed by a government representative. Observed test procedures or tasks are typically those that must be accomplished correctly, cannot be easily verified by data review or post-test, and include a high risk of inducing collateral damage that could remain undetected.

**Post Test Review**—Review of as-run test procedures or tasks to verify documented non-conformances are correctly dispositioned. It also verifies that appropriate optional sequences (use/void sections) have been executed, critical data entries are acceptable and procedural deviations do not compromise the original procedure intent or leave systems in an improper state for continued processing, and are properly identified as temporary or permanent deviations. Review also ensures the procedure was correctly performed, that data values recorded are within published limits, and documents any changes to the processes/procedures, now or in the future, based on actual test data (documents lessons learned and ensures incorporation of redlines for the next revision).

**Prime Contractor**—Contractor that has primary operation/maintenance responsibility of the system.

**Procedure Review**—Review of new procedures, procedures with revised portions, and pre-test briefings, to include applicable technical, quality, and safety requirements.

**Public Safety**—Safety involving risks to the general public of the United States or foreign countries and/or their property

**Real Property (RP)**—Land, buildings, structures, utilities, improvements and appurtenances thereto. Includes equipment attached to, and made part of, buildings and structures but not movable equipment. Primarily consisting of facilities and other non-equipment support system infrastructure.

**Real Property Installed Equipment**—Real Property Installed Equipment (RPIE). Government-owned or leased support equipment, apparatus and fixtures that are essential to the function of the real property and permanently attached to, integrated into or on government-owned or leased property.

**Resource Safety**—The protection of Air Force facilities, support equipment, or other property from damage due to mishaps.

**Space Launch Maintenance**—Maintenance functions conducted by USAF or contractor personnel at the launch base in support of operations to attain and maintain the capability to command, control and execute a space launch mission.

**Space Launch Operations**—Actions conducted by USAF and/or contractor personnel at the launch base

to command and control space launch systems (i.e., launch countdown, integrated system test, etc.).

**Support Equipment (SE)**—All equipment (i.e., AGE, RPIE, etc.) required to make or keep a space launch system, subsystem or item of support equipment operational in its intended environment.

**Surveillance**—The continuing monitoring, technical evaluation and verification of the status of procedures, methods, conditions, processes, products, services, records, and where delegated; contractor performance monitoring, to ensure specified requirements are being met.

**Technical Procedures**—All in-line checkout documents (system processing/periodic maintenance procedures), special test instructions and non-standard work (troubleshooting/corrective maintenance/launch base modification) implementation documents.

**Technical Tasks**—Technical tasks should be viewed as those processes which require some type of technical procedures to perform maintenance surveillance.

**Verify**—To review, inspect, test, check, measure, audit or otherwise confirm that products, processes, or documents conform to specified requirements. Verification may be performed after work completion, e.g., safety wiring.

**Attachment 2****TRAINING REQUIREMENTS****A2.1. Maintenance Management Training:**

APPLIES TO: All maintenance personnel

FREQUENCY: One time.

OPR: Unit Training.

REMARKS: Ensure personnel understand AFPD21-1, AFI21-108, AFSPCI21-0108, and HQ AFSPCIs that apply to the maintenance organization.

**A2.2. Corrosion Control Training:**

APPLIES TO: All maintenance personnel

FREQUENCY: One time

OPR: Unit Training.

REMARKS: Ensure an understanding of the requirements of the Corrosion Control Program. AFSPCI21-105 Para 1.3

**A2.3. Environmental Awareness Training:**

APPLIES TO: All 2M0XX, 21MX, 62XX who perform maintenance surveillance

FREQUENCY: Annual.

OPR: Unit Training.

REMARKS: OSHA Standard 1910.120

**A2.4. Cardiopulmonary Resuscitation (CPR)/First Aid:**

APPLIES TO: All 2M0XX, 21MX, 62XX who perform maintenance surveillance

FREQUENCY: CPR (locally defined) / First Aid (Initial/Every two years)

OPR: Unit Training.

REMARKS: OSHA Standard 1910.151, 1910.269(b) (1) and AFI 36-2238

**A2.5. Explosive Safety:**

APPLIES TO: All 2M0XX, 21MX, 62XX who perform maintenance surveillance.

FREQUENCY: Initial/Annual

OPR: Unit Training.

REMARKS: Ensure all MC's understand explosive safety standards required during processing and launch. Local explosive safety course (initial class) will fulfill this requirement. AFI 91-202

**A2.6. Propellant Training:**

APPLIES TO: All 2M0XX, 21MX, 62XX who perform maintenance surveillance.

FREQUENCY: Initial/Annual.

OPR: Unit Training.

REMARKS: EWR 127-1/AFOSH STDs 91-67 and 48-8.

**A2.7. Confined Space Training:**

APPLIES TO: All 2M0XX, 21MX, 62XX who perform maintenance surveillance.

FREQUENCY: Annual.

OPR: Unit Training.

REMARKS: AFOSH Standard 91-25.

**A2.8. Overhead Crane Safety Training:**

APPLIES TO: All 2M0XX, 21MX, 62XX who perform maintenance surveillance.

FREQUENCY: One time.

OPR: Unit Training.

REMARKS: AFOSH Standard 91-46, Chap 5.

**A2.9. Rigging Fundamentals Training:**

APPLIES TO: All 2M0XX, 21MX, 62XX who perform maintenance surveillance.

FREQUENCY: One Time.

OPR: Unit Training.

REMARKS: Required for all MC's, usually provided through contractor training.

**A2.10. Fire Extinguisher Training:**

APPLIES TO: All personnel.

FREQUENCY: Annual.

OPR: Unit Training.

REMARKS: AFOSH91-56.

**A2.11. Launch Complex Safety Training:**

APPLIES TO: All maintenance personnel.

FREQUENCY: Initial/Every 3 Years.

OPR: Unit Training.

REMARKS: EWR 127-1.

**A2.12. Process Safety Management.**

APPLIES TO: All 2M0XX, 21MX, 62XX who perform maintenance surveillance.

FREQUENCY: Every 3 Years.

OPR: Unit Training.

REMARKS: EWR 127-1, Chap 6.

**A2.13. Quality Assurance Evaluator (QAE) Training (Phase 1):**

APPLIES TO: All.

FREQUENCY: Initial.

OPR: Quality Assurance Branch.

REMARKS: AFI63-124/AFI63-501 and applicable supplements. This training is intended to provide all SLS maintenance personnel with basic contract familiarization training due to the day-to-day interactions with contracts/contractors, per para 2.6.12.1.

**A2.14. Quality Assurance Evaluator (QAE) Training (Phase 2):**

APPLIES TO: Appointed QAE's only.

FREQUENCY: Initial/every 3 years, or as required.

OPR: Contracting Office.

REMARKS: AFI63-124/AFI63-501 and applicable supplements.