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OF THE AIR FORCE**

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Safety

**AIR FORCE NUCLEAR
WEAPONS SURETY PROGRAM**

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This instruction implements Air Force Policy Directive (AFPD) 91-1, *Nuclear Weapons and Systems Surety*, and Headquarters Mission Directive (HAFMD) 1-46, *Chief of Safety*, and is consistent with AFPD 13-5, *Air Force Nuclear Mission*.

This publication applies to all civilian employees and uniformed members of the Regular Air Force, the Air Force Reserve, the Air National Guard, the United States Space Force, the Civil Air Patrol when conducting missions as the official Air Force Auxiliary, and those with a contractual obligation to abide by the terms of Department of the Air Force (DAF) publications.

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through the chain of command to the appropriate tier waiver approval authority or alternately to the requestor's commander for non-tiered compliance items.

SUMMARY OF CHANGES

This interim change provides minor changes to a few key policies. Modifications are provided for side flash protection. Modifications are provided for deviations to nuclear design criteria. Modifications are provided for some roles and responsibilities. Modifications are provided in the organization of requirements for storage and operational use of critical components. Modifications are provided to explosives storage requirements. Modifications are provided for better clarity. A margin bar (|) indicates newly revised material.

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Chapter 1

INTRODUCTION

1.1. Purpose.

1.1.1. The purpose of the Air Force Nuclear Weapons Surety Program is to maximize nuclear weapons surety, consistent with operational requirements, throughout nuclear weapon lifecycle in accordance with (IAW) Nuclear Weapon Surety Standards.

1.1.2. This instruction directs positive measures to prevent unauthorized activation of critical functions, to include unapproved or inadvertent authorization, pre-arming, arming, launching, releasing, and navigation validation and to protect against inherent risks and threats, throughout the stockpile-to-target sequence. Provides positive measures to ensure approved hardware and software are used only with the systems they are certified for. Once a weapon system is certified as a nuclear weapon system it remains a nuclear weapon system regardless of mission capable status until formal nuclear safety design decertification is completed IAW this instruction.

1.1.3. This document serves as the parent instruction to the following 91-1XX publications: Department of the Air Force Manual (DAFMAN) 91-118, *Safety Design and Criteria for Nuclear Weapon Systems*; and DAFMAN 91-119, *Safety Design Criteria for Nuclear Weapon Systems Software*.

1.2. Nuclear Weapons Surety Standards. The Air Force Nuclear Weapons Surety Program enables personnel that design and operate nuclear weapon systems to satisfy the surety standards in Department of Defense (DoD) Instruction (DoDI) 3150.02, *DoD Nuclear Weapon Systems Surety Program*. Completion of the processes outlined in this document, DAFMAN 91-118, and DAFMAN 91-119 is considered the minimum for ensuring compliance with the four DoD surety standards of DoDI 3150.02. The four DoD nuclear weapons surety standards are:

1.2.1. There shall be positive measures to prevent nuclear weapons involved in accidents or incidents, or jettisoned weapons, from producing a nuclear yield. **Note:** A significant nuclear yield is considered the equivalent of four pounds of TNT as constrained by the Department of Energy's (DOE) one-point safety design criteria IAW DOE Order 452.1E, *Nuclear Explosive and Weapon Surety Program*. The DoD policy is to design, maintain, transport, store, and use nuclear weapons systems in a manner that ensures safety and adequate security are maintained throughout their life cycle.

1.2.2. There shall be positive measures to prevent deliberate pre-arming, arming, launching, or releasing of nuclear weapons, except upon execution of emergency war orders or when directed by competent authority.

1.2.3. There shall be positive measures to prevent inadvertent pre-arming, arming, launching, or releasing of nuclear weapons in all normal and credible abnormal environments.

1.2.4. Prevent unauthorized access or unauthorized actions, by physical or digital means, that may result in loss or unauthorized pre-arming, arming, launching, or releasing of a nuclear weapon.

1.3. Commanders and Directors. Commanders and directors at all levels are responsible for the success of the Air Force Nuclear Weapons Surety Program. Commanders and directors must emphasize that safety, security, control, and effectiveness of nuclear weapons are of vital importance to the United States.

Chapter 2

ROLES AND RESPONSIBILITIES

2.1. Assistant Secretary of the Air Force for Acquisition, Technology, & Logistics (SAF/AQ) shall:

- 2.1.1. Assign a Program Manager for nuclear certified items.
- 2.1.2. Ensure any shortfall in meeting nuclear safety design requirements is corrected by the Program Executive Officer or granted a deviation IAW **Chapter 10**. Operational risk acceptance is owned by the lead command. **Note:** When the using command and lead command are not the same, the lead command shall coordinate with the using command for risk acceptance. The Program Executive Officer does not own operational risk acceptance.

2.2. Air Force Chief of Safety (AF/SE) shall:

- 2.2.1. Administer and execute Nuclear Safety Design Certification (NSDC) and Nuclear Weapon System Safety Rules (WSSRs) responsibilities.
- 2.2.2. Remove NSDC for any weapon system failing to meet surety standards.
- 2.2.3. Establish nuclear weapons surety program requirements.
- 2.2.4. Publish instructions and guidance on the various portions of the nuclear weapons surety program.
- 2.2.5. Maintain liaison for nuclear weapons surety matters with organizations outside the Air Force.
- 2.2.6. Advise SAF/AQ on required nuclear surety policies associated with new technologies.
- 2.2.7. Ensure deviations are reviewed and briefed during Air Force Nuclear Surety Council (AFNSC) and NWSSG meetings. **Note:** This publication establishes the AFNSC while AFI 91-102, *Nuclear Weapon System Safety Studies, Operational Safety Reviews, and Safety Rules*, provides for the NWSSG.
- 2.2.8. Appoint an AF Surety Deviation Program Manager to maintain record of all deviations for the Air Force.
- 2.2.9. Appoint a representative for nuclear weapon and nuclear weapon related (e.g., Use Control) Project Officer Groups in writing to the Lead Project Officer. Representatives shall be capable of representing organizational interest to the Project Officer Group. Additionally, representatives should be familiar with the Nuclear Weapons Council Procedural Guidelines for the Phase 6.X Process, DoDM 5030.55, *DoD Procedures for Joint DoD-Department of Energy/National Nuclear Security Administration (DOE/NNSA) Nuclear Weapon Life-Cycle Activities* and this publication.
- 2.2.10. Direct program managers to submit items into the nuclear certification process when there is evidence to suggest that an item should be granted NSDC.
- 2.2.11. Establish a training program to perform the following:
 - 2.2.11.1. Establish the minimum content of the nuclear surety training program.

- 2.2.11.2. Create and distribute standardized nuclear weapons surety training lesson plans, training slides, and test bank questions to MAJCOM weapons safety offices.
- 2.2.11.3. Coordinate lesson plans through Air Education and Training Command, Nuclear Integration, (AETC/A3LN) prior to distribution to MAJCOMs.
- 2.2.12. Create and distribute new nuclear weapons surety test bank questions to MAJCOMs when requested and deemed appropriate by the Air Force Safety Center, Weapons Safety Division (AFSEC/SEW). New questions will be distributed within two months of an approved request to meet MAJCOM testing needs.
- 2.2.13. Oversee the Air Force Nuclear Surety Tamper Control and Detection Programs.
- 2.2.14. Certify the design of tamper detection indicators IAW [Chapter 4](#) and approve their use to protect the certification status of critical components.
- 2.2.15. Establish requirements to designate, certify, and manage the critical component process IAW [Chapter 7](#).
- 2.2.16. Approve new or major changes to OPCERT/DECERT procedures and procedural controls for critical components. These procedures must verify the system or component functions as design certified and mitigate all credible threats and scenarios. **Note:** The abbreviated terms OPCERT and DECERT are uniquely distinct from the unabbreviated Operational Certification and Operational Decertification terms. See [Paragraph 7.3](#) for additional information.
- 2.2.17. Establish criteria that the Program Managers will use to identify Nuclear Surety Procedures (NSPs).
- 2.2.18. Approve identified NSPs.
- 2.2.19. Provide assistance or augmentation to the MAJCOM safety office as requested for inspections, staff assistance efforts, or special interest evaluations relating to nuclear weapons surety at any level within the requesting command.
- 2.2.20. Certify the design of sealing methods proposed for use in nuclear weapon systems IAW [Chapter 4](#).
- 2.2.21. Designate split-handling or split-knowledge procedures for critical components if not previously determined or if procedures proposed or in use are determined by AFSEC/SEW to be inadequate.
- 2.2.22. Approve vaults and containers used to store critical components. See [Chapter 7](#) for more details.
- 2.2.23. Develop and publish Air Force safety design and evaluation criteria.
- 2.2.24. Review certification deliverables (Nuclear Surety Evaluations (NSE), Independent Nuclear Surety Evaluations (INSE), Nuclear Safety Regression Tests, and Nuclear Safety Software Verification Plans and reports, etc.) for compliance with all NSDC requirements.
- 2.2.25. Identify, if required, the suspense time/date for safety design certification actions. **Note:** The suspense time/date is normally identified in the Certification Requirements Plan (CRP).

2.2.26. Establish the Air Force Nuclear Safety Design Deviations Reporting Program.

2.2.27. Review/coordinate as appropriate and evaluate deviation requests, i.e., AF Form 116, *Request for Deviation from Security Criteria*, and DAF Form 116A, *Safety Design Deviation Request* IAW [Chapter 10](#).

2.2.28. Review high-fidelity joint test assembly maintenance procedures performed in Department of the Air Force facilities.

2.2.29. Establish and chair the AF Nuclear Surety Council or alternate process to discuss and manage nuclear surety issues across the AF Nuclear Enterprise.

2.3. Deputy Chief of Staff, Operations (AF/A3) shall:

2.3.1. Coordinate with the Deputy Chief of Staff, Strategic Deterrence & Nuclear Integration (AF/A10) to ensure nuclear operations capabilities and effects are included in appropriate Concepts of Operations and reviewed and implemented through the Air Force Core Function Support Plans and Joint capabilities review processes.

2.3.2. Ensure that treaties or international agreements do not contain provisions or are implemented in a manner to undermine the physical security of nuclear weapons under Air Force control.

2.4. Deputy Chief of Staff, Strategic Deterrence & Nuclear Integration (AF/A10) shall:

2.4.1. Ensure consistency of nuclear policy and guidance which impacts people, organizations, processes, procedures, infrastructure, and systems that are used to train, plan, develop, test, acquire, support, maintain, execute, transport, inspect, and (when applicable) dispose of nuclear assets, operations, and forces across the Air Force and the nuclear mission.

2.4.2. Assist the Office of Administration and Management (SAF/AM) in developing guidance to manage, control, and classify information related to nuclear weapons and/or nuclear weapon systems.

2.4.3. Provide procedures for the Nuclear Weapons Personnel Reliability Assurance Program (PRAP).

2.5. Deputy Chief of Staff, Logistics, Engineering and Force Protection (AF/A4) shall:

2.5.1. Serve as the single point of contact for nuclear weapon and nuclear weapon system logistic matters.

2.5.2. Develop and publish nuclear weapon system maintenance and supply chain guidance.

2.5.3. Include AFSEC/SEW on the distribution for the annual security deviation report to ensure the AF/SE has oversight of the overall AF Surety Program.

2.5.4. Appoint the Director of Civil Engineers as the single point of contact for nuclear weapon system explosive ordnance disposal matters.

2.5.5. Appoint the Director of Air Force Security Forces as the single point of contact for nuclear weapon and nuclear weapon system physical security guidance. The Director of Air Force Security Forces shall:

2.5.5.1. Develop and publish guidance for the physical security of nuclear weapons and nuclear weapon systems.

2.5.5.2. Evaluate nuclear weapon system designs for their impact on nuclear security IAW DoDM S-5210.41_AFMAN 31-108-S, *Nuclear Weapon Security Manual*.

2.6. Nuclear Weapon System Surety Group shall:

2.6.1. Review nuclear weapon system designs and operations to determine if they meet the DoD nuclear weapon system surety standards, propose safety rules and recommend changes to improve nuclear weapon system surety. Refer to AFI 91-102 for additional information.

2.6.2. Accomplish its charter by:

2.6.2.1. Recommending nuclear weapon system components for designation as critical components by the AF/SE.

2.6.2.2. Designating which critical components require split-handling or split-knowledge procedures.

2.6.2.3. Recommending split-handling or split-knowledge procedures during the lifecycle of the critical component.

2.6.2.4. Reviewing and, if required, updating WSSRs.

2.6.2.5. Recommending sealing requirements in operational nuclear weapon systems IAW AFI 91-102.

2.7. MAJCOM, Field Operating Agencies, and Direct Reporting Units Commanders shall:

2.7.1. Provide protection for all nuclear weapon systems incorporating policies, procedures, and equipment in a layered approach of physical security, information assurance, personnel actions, procedures, and nuclear weapon design features as determined through risk analysis.

2.7.2. Ensure weapons are transported in compliance with DoDI 4540.05, *DoD Transportation of U.S. Nuclear Weapons*.

2.7.3. Coordinate with AF/A10 to track and ensure personnel with Sigma 14 access are prohibited from being part of a two-person control team.

2.7.4. Lead and using command commanders shall designate a Nuclear Certification Manager to manage the nuclear certification program.

2.7.5. Send all MAJCOM supplements affecting Two-Person Concept (TPC) during Prime Nuclear Airlift Force missions to Air Mobility Command, Nuclear Airlift Branch (AMC/A10NA), 402 Scott Drive Unit 3A1, Scott AFB, IL 62225-5301 or email to amc.a3na@us.af.mil.

2.7.6. At bases with units and personnel from two or more MAJCOMs, delegate the MAJCOM responsibilities outlined in this chapter to the host/gaining command. Memorandums of Understanding/Memorandums of Agreement may be developed between MAJCOMs to delineate the actions required by each command to meet these responsibilities.

2.7.7. Recommend new uses for tamper detection indicators and request approval from AFSEC/SEW.

2.7.8. Ensure OPCERT of critical components before use and initiate DECERT when needed.

2.7.9. Ensure units report deficiencies on certified items IAW DAFMAN 91-221, *Weapons Safety Investigations and Reports*.

2.7.10. Designate a Program Manager for the certification and configuration control of nuclear facilities (as defined in [paragraph 5.3.1.10](#)) to include Facility Lifting and Suspension Systems. Perform the following when serving as the Program Manager for facility certification:

2.7.10.1. Prepare a Nuclear Certification Impact Statement (NCIS) IAW DAFI 63-125, *Nuclear Certification Program*, facility modifications to support the NSDC process. Additional information is available in [paragraph 5.6.2](#).

2.7.10.2. Develop the nuclear safety certification annex to the CRP for each facility to be granted NSDC.

2.7.10.3. Evaluate nuclear weapons maintenance and storage facilities for compliance with nuclear weapons safety design requirements and document results in an NSE to support certification actions.

2.7.10.4. Review deficiencies (e.g., materiel deficiency reports, service bulletins, mishaps, DULL SWORDS, and nuclear safety deficiency reports) for possible impact on facility certification status and implement required corrective action.

2.7.11. Request, through the MAJCOM safety office, any required AFSEC/SEW assistance or augmentation for inspections, staff assistance efforts, or special interest evaluations relating to nuclear weapons surety at any level within the requesting command. The request shall include a proposed schedule, locations to be visited, and scope of effort for AFSEC to determine team composition and level of support. The requesting MAJCOM is responsible for funding AFSEC support efforts.

2.7.12. Review and approve the MAJCOM annual Nuclear Surety Report IAW [Chapter 11](#).

2.7.13. Implement a MAJCOM Nuclear Safety Design Deviations Reporting Program and designate an OPR.

2.7.14. Serve as the operational risk acceptance authority for any deviation submitted for nuclear weapons systems and nuclear related facilities.

2.7.15. Work with the Program Executive Officer to evaluate operational risks of any deviation from nuclear safety design criteria IAW [Chapter 10](#).

2.7.16. Consult combatant commanders on all risk management decisions affecting the combat capability of allocated/assigned nuclear systems.

2.7.17. Send data on proposed changes to nuclear weapon systems to AFSEC/SEW. **Note:** Ideally this should be accomplished during the material solution analysis phase of acquisition.

2.7.18. Conduct nuclear surety inspections of nuclear-capable units IAW DAFI 90-302, *The Inspection System of the Department of the Air Force* and Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3263.05, *Nuclear Weapons Technical Inspections*.

2.7.19. Ensure new weapon systems and facility acquisitions, and modifications to existing weapon systems and facilities are involved in requirements generation discussions prior to the Program Manager (PM) decision to submit a Nuclear Certification Impact Statement (NCIS) notification for Nuclear Safety Design Certification and the general nuclear certification process.

2.7.20. Request any necessary deviations and provide supporting engineering analyses IAW [Chapter 10](#).

2.7.21. Establish a Nuclear Surety Council IAW [Chapter 3](#).

2.7.22. Establish training programs IAW [paragraph 4.5.2](#).

2.7.23. Establish a tamper control program IAW [paragraph 4.6](#).

2.7.24. Establish a Non-Nuclear Verification Program which will:

2.7.24.1. Establish procedures to ensure that a test assembly is not a nuclear weapon.

2.7.24.2. Ensure verification of test assembly is completed at the last practical opportunity before conducting operational test.

2.7.25. MAJCOMs who are integrated into nuclear missions under the Total Force Integration construct, will follow the MAJCOMs supplements governing the Nuclear Surety program requirements.

2.7.26. Establish processes for subordinate nuclear and non-nuclear units to report on nuclear weapons surety issues and deficiencies for nuclear certified equipment within their wing.

2.7.27. Ensure physical security and facility security software updates and upgrades are coordinated through the Weapon Safety Manager.

2.8. MAJCOMs Nuclear Safety Design Deviation Reporting Program OPR shall:

2.8.1. Support the deviation coordination and approval process IAW [Chapter 10](#).

2.8.2. Review the deviation request, compensatory measures, associated risks, and proposed corrective actions. Coordinate the request to the MAJCOM technical representative prior to submitting the deviation request to AFSEC for technical review.

2.8.3. Submit a MAJCOM commander approved annual Nuclear Safety Design Deviations Report, IAW [Chapter 10](#).

2.8.4. Brief all Nuclear Safety Design Deviations to the Air Force Nuclear Surety Council annually.

2.9. Air Force Materiel Command Commander. In addition to the responsibilities listed in [paragraph 2.7](#), shall:

2.9.1. Provide nuclear weapons related programs assistance for the execution of the nuclear certification process.

2.9.2. Review nuclear mishap and deficiency reports pertaining to materiel or technical data deficiencies, take corrective action when appropriate, and provide reports and summaries IAW DAFI 91-204, *Safety Investigations and Reports*.

2.9.3. When requested provide programmatic briefings in support of NWSSG.

2.9.4. Through the Air Force Nuclear Weapons Center (AFNWC) Commander:

2.9.4.1. Serve as the administrative focal point for the nuclear certification process identified in DAFI 63-125.

2.9.4.2. Provide Nuclear Certification Program guidance to MAJCOMs, product centers, and air logistics complexes.

2.9.4.3. Ensure Product Centers and Air Logistics Complexes have policies and procedures in place to identify nuclear certified items, processes, and modifications IAW DAFI 91-101, AFI 91-102, DAFI 63-125 and to assess modifications to determine if nuclear certification is required.

2.9.4.4. Act as a point of contact regarding Air Force Materiel Command (AFMC) - sourced independent review, evaluation, and analysis to support AFSEC.

2.9.4.5. Maintain archives of all pertinent documentation related to nuclear certification from program inception to program retirement. These documents include Nuclear Certification Manager's Appointment Letter, NCIS, NCIS Coordination Form, NCIS No-Impact Notification Letter, Basic Certification Requirements Plan, CRP, NSDCL, Weapon System Safety Rules Approval Notification, Formal Technical Order (TO) Approval Notification, Nuclear Compatibility Certification Statement, Compatibility Certification Letter, Facility Certification Configuration Document, Operational Certification Letter, Design Certification Summary Letter, Nuclear Certification Summary Letter, PM Release Recommendation, Lead/Using Command Release Authorization.

2.9.4.6. Ensure designated critical components are properly identified in the Master Nuclear Certification List (MNCL).

2.10. Program Executive Officers shall:

2.10.1. Acknowledge and identify risks IAW AFI 90-802, *Risk Management*, DAFI 63-101/20-101, *Integrated Life Cycle Management*, Military Standard (MIL-STD)-882E, *System Safety*, and [Chapter 10](#).

2.10.2. Ensure program risk acceptance is properly approved and documented.

2.10.3. Ensure all deviations are routed through the lead command IAW [Chapter 10](#).

2.11. Program Managers Responsible for Procuring or Modifying a Nuclear Weapon System shall:

2.11.1. When reviewing new nuclear weapon system acquisitions or modifications to existing systems, initiate the design certification process for all items having any parameters or characteristics governed by DAFMAN 91-118 or DAFMAN 91-119. **Note:** AFSEC personnel should be involved in the project at Material Solution Analysis and will be available to help with this determination as well as the design decisions that lead up to the determination.

2.11.2. Appoint a nuclear certification manager.

2.11.2.1. Submit items for nuclear certification IAW this publication, DAFI 63-125, or if directed by AF/SE.

2.11.2.2. Ensure nuclear-capable and certified weapon systems, and nuclear certified mission support items comply with established design requirements.

2.11.3. The host nation as PM shall submit certification documentation through AFNWC Engineering Liaison Office (ELO), which shall serve as the interface between the host nation and the United States on all nuclear safety certification processes and issues.

2.11.4. Field and maintain configuration control of hardware and computer systems, programmable logic devices, application-specific integrated circuits, and software as nuclear safety design certified throughout the lifecycle.

2.11.5. When conducting Environment, Safety, and Occupational Health Risk Management and Assessment IAW DoDD 5000.01, *The Defense Acquisition System*, DAFI 63-101_20-101, and MIL-STD-882E, identify any hazards that could potentially compromise DoD Nuclear Surety Standards, and project any specific requirements for nuclear safety design, if needed.

2.11.6. Evaluate all aspects of the proposed program(s) for potential nuclear weapons surety degradation. This evaluation includes conditions that could violate DAFMAN 91-118 or DAFMAN 91-119 requirements, degrade safety and internal security features of the weapon system, or contribute to an AFI 91-106 scenario.

2.11.7. Comply with the NSDC program IAW **Chapter 5**.

2.11.8. Perform unauthorized launch, threat mitigation, and launch action studies IAW AFI 91-106 to support AFSEC/SEW.

2.11.9. Support the tamper detection indicator development and evaluation process.

2.11.10. Evaluate Air Force use of DOE/NNSA-certified equipment with nuclear weapons systems to determine whether operating environments are consistent with the design environments and if any differences impact nuclear weapons surety.

2.11.11. Review deficiencies (material deficiency reports, service bulletins, and nuclear safety deficiency reports) for possible impact on nuclear weapons surety or certification status and implement required corrective action.

2.11.12. With respect to NSPs:

2.11.12.1. Ensure each NSP is individually marked with the NSP symbol to enable positive identification IAW MIL-STD-38784, *General Style and Format Requirements for Technical Manuals*.

2.11.12.2. Apply special emphasis to the NSPs to protect against degrading or rendering ineffective the critical nuclear safety features of the weapon system as determined by AFSEC/SEW.

2.11.12.3. Except for minor grammatical corrections, changes to NSP-coded steps shall be coordinated with AFSEC/SEW.

2.11.13. Develop OPCERT and DECERT procedures to be approved by AFSEC/SEW.

2.11.14. Assist the Program Executive Officer's compliance with established design requirements as identified by the lead command.

2.11.15. Notify AFSEC/SEW of weapon system modifications.

2.11.16. Recommend items for critical component status to AFSEC/SEW.

2.11.17. Recommend OPCERT and DECERT concepts and technical order procedures of critical components to AFSEC/SEW.

2.11.18. Recommend decertification of critical components when the component is no longer part of an assembled nuclear weapon system.

2.11.19. Ensure nuclear weapon systems and technical orders or other certified procedures for troubleshooting and maintaining loaded nuclear weapon systems adhere to safety criteria established by the DoD and Air Force, e.g., a delivery vehicle with one or more nuclear weapons mechanically and electrically connected in a normal operational configuration.

2.11.20. Maximize engineered-in weapon safety design features to minimize steps called out as NSPs within technical orders/checklists.

2.12. Air Force Global Strike Command Commander shall: In addition to the responsibilities listed in [paragraph 2.7](#), through AFGSC/A4Z, Air Force Global Strike Command, Nuclear Stockpile Division:

2.12.1. Publish data on weapons maintenance, shipping, and storage configurations in the appropriate 11N-series technical orders and Explosive Ordnance Disposal Procedures in the 60-series technical orders published through the Joint Nuclear Weapons Publications Systems.

2.12.2. Provide the single point of contact within the Air Force for the management and coordination of nuclear weapon system defects and deficiency procedures as specified in Technical Order 11N-5-1, *Unsatisfactory Reports*.

2.12.3. Ensure AFSEC/SEW is notified about nuclear weapon system alterations, modifications, and maintenance or test procedures not defined as a weapon alteration or modification (see [chapter 5](#)) accomplished in Air Force facilities.

2.12.4. Review nuclear mishap reports pertaining to materiel or technical data deficiencies, take corrective action when appropriate, and provide reports and summaries IAW DAFI 91-204.

2.13. US Air Forces in Europe Commanders shall: In addition to the responsibilities listed in [paragraph 2.7](#):

2.13.1. Establish nuclear weapons surety programs within US Air Forces Europe–Air Forces Africa to support ally-operated nuclear weapon systems and related surety programs.

2.13.2. Verify allied nations comply with the WSSRs.

2.13.3. Verify allied nations accomplish nuclear support equipment Time Compliance Technical Orders (TCTO). Notify TCTO issuing agency, ELO and AFSEC/SEW when the TCTO does not apply.

2.13.4. Verify, through the Air Force custodial unit, that allied delivery vehicles meet approved standards for nuclear loading and delivery.

2.13.5. Verify unit's established guidance to report and investigate nuclear mishaps and deficiencies involving US-owned, ally-operated nuclear weapon systems IAW DAFMAN 91-221.

2.13.6. Permit parent wings of maintenance and munitions support squadrons to assign nuclear weapons surety and safety responsibilities outlined in [paragraphs 2.23 and 2.28](#) to wing/base level weapon safety managers or unit safety representatives as necessary to meet requirements. Wing/unit shall document responsibilities in writing to ensure all requirements are addressed.

2.14. Air Education and Training Command Commander. The Air Education and Training Command Commander's training and education role is vitally important to the Air Force Nuclear Weapons Surety Program's success, as it enables a successful nuclear surety culture across the nuclear mission. In addition to the applicable responsibilities listed in [paragraph 2.7](#), the Air Education and Training Command Commander shall:

2.14.1. Integrate, in coordination with impacted career field managers, nuclear weapons surety concepts and skills into technical training courses.

2.14.1.1. Ensure nuclear weapons surety concepts and skills are included in technical training courses involving nuclear weapons, nuclear weapon systems, or critical components.

2.14.1.2. Ensure nuclear weapons surety concepts and skills are included in technical/formal training courses when greater than 50% percent of students are expected to perform in positions subject to the PRAP.

2.14.1.3. Ensure technical training courses which include nuclear concepts and skills also include a presentation to promote understanding of unique cultural aspects within the nuclear mission. Presentation topics should include: deterrence concepts and national strategy related to nuclear weapons; US nuclear force structure; definition and tenets of nuclear weapons surety; the PRAP; individual responsibilities; and contributions to nuclear deterrence operations.

2.14.2. Develop and implement inspection standards for the Air Education and Training Command Nuclear Surety Program.

2.14.3. When requested, provide AFSEC with any technical support required and technical assistance to properly assess compliance with applicable NSDC criteria.

2.15. Headquarters Air Force/Center Requirement Owners and MAJCOM Staff Agencies shall:

2.15.1. Review deviations (specific to design requests) to ensure adequate compensatory measures have been put into place and associated risks have been analyzed correctly.

2.15.2. Ensure deviations submitted by wing/unit commanders to address weapons systems that have become non-operational or inoperable have adequate compensatory measures and associated risks have been analyzed correctly.

2.15.3. Coordinate waivers affecting nuclear surety to publications outside of the 91-series (e.g., 11-series, 21-series, 33-series) through the MAJCOM Safety Directorate prior to approval.

2.16. MAJCOM Weapons Safety Office shall:

2.16.1. Serve as the MAJCOM OPR for nuclear weapons surety matters.

2.16.2. Develop criteria for wing nuclear surety councils IAW [Chapter 3](#).

2.16.3. Advise the MAJCOM staff on nuclear weapons surety issues.

2.16.4. Publish directives and supplements outlining MAJCOM unique nuclear weapons surety requirements as appropriate.

2.16.5. Provide MAJCOM inspection teams with requested information related to nuclear weapons surety matters.

2.16.6. Review plans submitted for storage of conventional and nuclear weapons within the same facility, and submit to AFSEC/SEW for concurrence.

2.16.7. Provide training on MAJCOM unique items and Nuclear Surety Program Management to subordinate safety staff within 90 calendar days of assuming their positions.

2.16.8. Distribute standardized nuclear weapons surety training lesson plans to applicable units.

2.16.9. Approve and document additional wing/unit nuclear weapons surety training lesson plan instructional material.

2.16.10. Request new or updated standardized nuclear weapons surety test bank questions, lesson plans, or training slides from AFSEC/SEW if current material is deemed inadequate to support testing needs.

2.16.11. Approve MAJCOM/wing specific nuclear surety test questions submitted by/to units.

2.17. Numbered Air Force Weapons Safety Managers shall:

2.17.1. Advise the Numbered Air Force Director of Safety and staff on nuclear weapons surety issues.

2.17.2. If delegated by the MAJCOM, assume Weapon Safety Manager training responsibilities and conduct training in conjunction with staff assistance visits.

2.17.3. Assist Numbered Air Force staff on PRAP issues.

2.17.4. Review the adequacy and completeness of nuclear mishap and nuclear deficiency reports.

2.17.5. Review the adequacy and completeness of the corrective actions for nuclear weapons surety problems found during higher headquarters inspections or assistance visits.

2.17.6. Review plans submitted for new weapon storage facilities acquisitions or modified weapon storage facilities, areas, and sites and notify the MAJCOM and AFSEC/SEW.

2.18. Joint Basing. Unless otherwise provided for in the Joint Basing Memorandum of Agreement, all applicable responsibilities prescribed in this publication shall remain with the Joint Base Air Force Commander exercising command and control over nuclear mission functions.

2.19. Commanders of Organizations Possessing Critical Components shall:

2.19.1. Control certified critical components IAW [Chapter 7](#) of this publication.

2.19.2. Control certified critical components IAW Emergency Action Procedures-Strategic (EAP-STRAT), Volume 16, *ICBM Code Component Control Policy and Procedures*.

2.20. Wing or Installation Commanders shall:

2.20.1. Establish a Nuclear Surety Program and provide guidance to subordinate units.

2.20.2. Submit requests for deviations, if applicable, through the Numbered Air Force to MAJCOM Nuclear Safety Design Deviation Reporting Program OPR.

- 2.20.3. Perform all general duties IAW [paragraph 4.2](#).
- 2.20.4. Ensure host and tenant unit(s) relationships are established and reflected in a host-tenant agreement(s) for nuclear weapons surety requirements IAW [paragraph 4.3](#).
- 2.20.5. Establish a Nuclear Surety Council IAW [Chapter 3](#).
- 2.20.6. Follow all facility directives IAW [paragraph 4.4](#).
- 2.20.7. Ensure training program directives are implemented IAW [paragraph 4.5](#).
- 2.20.8. Ensure the Public Affairs office screens and releases mishap information to the public IAW DAFI 91-204.
- 2.20.9. If tasked, ensure plans and procedures support Airborne Launch Control System requirements as outlined in DoD S-5210.92M, *Physical Security Requirements for Nuclear Command and Control (NC2) Facilities*.
- 2.20.10. Establish policy and procedures to prevent unauthorized aerial system incursions during nuclear weapons movements, near nuclear loaded aircraft, nuclear airlift ground operations, or when nuclear weapons are located outside of a Protective Aircraft Shelter (PAS).
- 2.20.11. DELETED
- 2.20.12. Establish nuclear surety programs within units, no lower than squadron level, that perform nuclear surety functions (e.g., nuclear surety training plans; handle, stores, maintains, or loads nuclear weapons).
- 2.20.13. Immediately implement locally developed compensatory measures upon identification of a nuclear weapon surety deficiency until MAJCOM approved compensatory measures can be acquired. If the deficiency cannot be corrected within 90 calendar days, a safety design deviation request shall be immediately submitted to the MAJCOM commander for approval, IAW [Chapter 10](#).
- 2.20.14. Provide firefighting, medical, public affairs, and logistics support as required.

2.21. Wing/Delta Commanders Without a Nuclear Mission shall: Establish a process for their units to inform them on nuclear weapons surety issues and reporting deficiencies on nuclear certified equipment within their purview. For information on nuclear flagwords (e.g., DULL SWORD, BROKEN ARROW) refer to DAFMAN 91-221.

2.22. Air Force Reserve and Air National Guard Commanders shall: In addition to the responsibilities in [paragraph 2.20](#), if tasked to source nuclear tasked units or personnel, provide headquarters and unit-level OPRs to coordinate and assist the gaining unit with the duties and responsibilities outlined in this publication.

2.23. Wing/Delta/Installation Level Weapon Safety Managers will:

- 2.23.1. Review all locally developed checklists, instructions, operating procedures, plans, training, and programs impacting nuclear surety. For locally developed workcards, checklists, job guides, and page supplements for nuclear weapons follow guidance in Technical Order 00-5-1, *AF Technical Order System*.

2.23.2. Ensure adequacy of corrective actions for nuclear weapons surety findings, and critical and substantive deficiencies identified against the Weapons Safety Office during higher headquarters inspections, Nuclear Surety Staff Assistance Visits, Group and Squadron Safety inspections, and Safety representative spot inspections.

2.23.3. Conduct and/or assist in nuclear safety reporting as prescribed in DAFI 91-204 and DAFMAN 91-221 to include safety reporting of nuclear certified equipment located in both nuclear and non-nuclear units.

2.23.4. Review and disseminate information from nuclear mishap and deficiency reports.

2.23.5. Keep the commander, staff, and supervisors informed of issues and changes in the Nuclear Surety Program.

2.23.6. Verify supervisors only allow the use of authorized or certified equipment and only allow the use of Air Force-approved technical orders, checklists, or procedures during nuclear operations.

2.23.7. Participate in the preparation of Safe Haven, Prime Nuclear Airlift Force, and Airborne Launch Control System mission support plans as applicable.

2.23.8. Verify nuclear surety programs are established within units, no lower than squadron level, that perform nuclear surety functions (e.g., nuclear surety training plans; handle, stores, maintains, or loads nuclear weapons).

2.23.9. Perform annual safety inspections on established nuclear surety programs IAW DAFI 91-202, *The Department of the Air Force Mishap Prevention Program*.

2.23.9.1. The inspection should incorporate the unit's nuclear surety culture of compliance through safety procedures and performance-based evaluations of nuclear surety related requirements.

2.23.9.2. Inspections should be accomplished over the course of a year through the "Spot Inspection Program" IAW DAFI 91-202.

2.23.10. Develop localized specific training, as applicable, and incorporate into the standardized nuclear weapons surety training lesson plan.

2.23.10.1. Localized specific training should be inserted into the appropriate section to ensure proper flow of lesson objectives.

2.23.10.2. Evaluate classroom training session periodically throughout the course of the year and document IAW DAFI 91-202, Chapter 3 Safety Assurance.

2.23.11. Review and coordinate site plans for new or modified nuclear facilities IAW Defense Explosives Safety Regulation (DESR) 6055.09_DAFMAN 91-201, *Explosives Safety Standards*.

2.23.12. Ensure nuclear weapons surety training for senior staff (as designated by the wing commander) and Unit Safety Representatives assigned to a unit with a nuclear mission is accomplished and documented. Wing/installation-level Weapon Safety Managers are authorized to delegate the teaching of nuclear weapons surety training to other wing/installation agencies whose mission scope normally includes nuclear weapons surety training.

2.23.13. Ensure currency/completeness of electromagnetic radiation surveys IAW DAFI 91-208, *Hazards of Electromagnetic Radiation to Ordnance (HERO) Certification and Management*.

2.23.14. Ensure compliance with the TPC, IAW [Chapter 6](#).

2.23.15. Ensure compliance with safety requirements/precautions specified in pertinent directives in the areas of weapons handling, assembly, maintenance, storage operations, and logistics movements.

2.23.16. Ensure compliance with WSSRs and safety practices.

2.23.17. Ensure Nuclear Certified Equipment (NCE) monitors are trained IAW DAFI 63-125 to identify nuclear certified equipment within the unit; use the MNCL to identify and report deficiencies IAW DAFMAN 91-221.

2.23.18. Support personnel in submitting items for restriction from use with nuclear weapons systems (e.g., damage, modifications, or changes to intended usage).

2.23.19. Approve common minor modifications to NCE IAW [paragraph 5.4.10](#). If the modification is deemed other than minor, follow the procedures outlined in [paragraph 5.4.10.3.3](#).

2.24. Maintenance Squadron Commander shall: In addition to the duties in [paragraph 2.27.:](#)

2.24.1. Ensure, IAW [Chapter 6](#), maintenance personnel, aircrews, missile combat crews, and other involved personnel are trained to recognize distinctive markings or unique identifiers on malleable seals and to identify singularly unique wing identifiers or serial numbers, as well as a color control system on self-locking, non-reversible seals.

2.24.2. Ensure sealing procedures are followed IAW [Chapter 6](#).

2.25. Civil Engineer Commander shall: In addition to the duties in [paragraph 2.27.:](#)

2.25.1. Ensure fire protection personnel are trained to fight fires involving nuclear weapon systems.

2.25.2. Conduct inspections, test, maintenance, and repair of facilities and real property installed equipment used to secure and maintain nuclear weapons.

2.25.3. Coordinate plans for building or modifying nuclear weapon facilities with the weapon safety manager, security forces commander, and the affected unit to ensure proposed changes comply with [Chapter 5](#) and [Chapter 6](#).

2.25.4. Establish a nuclear accident and incident response organization IAW DAFI 10-2501, *Emergency Management Program*. **Note:** Ensure that during exercises, personnel do not wear complete chemical ensembles when handling war reserve nuclear weapon systems (e.g., remove the gas mask to aid in personal identification and gloves to ensure weapons are not inadvertently damaged).

2.25.5. Develop and annually route through the Wing Weapon Safety Office pre-fire plans and firefighting checklists for all areas and locations where nuclear weapons or nuclear weapon systems are present.

2.25.6. Ensure the assigned or host base emergency operations center personnel develop nuclear accident and incident response procedures including emergency management plans and ensure disaster response force members and initial response element training is accomplished IAW DAFI 10-2501.

2.25.7. Ensure Explosive Ordnance Disposal (EOD) personnel develop nuclear accident and incident response procedures, maintain training on weapons in Air Force custody, and maintain task certification for supported weapons systems/delivery vehicles for all weapons systems at that location. Training and certification requirements are detailed in AFMAN 32-3001, *Explosive Ordnance Disposal (EOD) Program*.

2.25.8. Assist response force members in the development of checklists and advise on training and equipping personnel to respond to nuclear accidents and incidents.

2.26. Security Forces Commander shall: In addition to the duties in [paragraph 2.27.:](#)

2.26.1. Ensure, in coordination with Wing Weapon Safety Manager, applicable locally developed unit security policies, procedures, and directives comply with nuclear weapons surety requirements, WSSRs, support of Safe Haven requirements, and diversions of nuclear-laden aircraft, and Airborne Launch Control System support plans.

2.26.2. Ensure the Safe Haven plan includes the following responsibilities:

2.26.2.1. Park vehicles afforded Safe Haven in a secure and lighted area.

2.26.2.2. Temporary physical security if DOE couriers are disabled or request security assistance.

2.26.2.3. When appropriate, command and control if an accident involving the shipment occurs on the installation.

2.26.2.4. Provide notification to Munitions Accountable Systems Officer of Safe Haven.

2.26.3. Evaluate, in conjunction with munitions personnel, logistical plans for the movement of nuclear cargo during the overall review of plans for nuclear weapon sites.

2.26.4. Support PRAP investigation requirements.

2.26.5. Ensure subordinate security forces' functional guidance complies with nuclear weapons surety requirements.

2.26.6. In conjunction with applicable munitions/maintenance and EOD personnel, review the plans for any movement of nuclear cargo, IAW AFMAN 21-203, *Nuclear Accountability Procedures*, and AFMAN 13-526, *Nuclear Airlift Operations*.

2.27. Unit/Squadron Commanders shall:

2.27.1. Provide leadership emphasis on nuclear surety culture and enforce Nuclear Surety Program requirements.

2.27.2. Correct nuclear weapons surety findings and deficiencies identified during nuclear surety inspections.

2.27.3. Perform PRAP responsibilities IAW DoDM 5210.42_DAFMAN 13-501, *Nuclear Weapons Personnel Reliability Program* and DAFI 31-117, *Arming and Use of Force by Air Force Personnel*.

2.27.4. Appoint a primary and alternate Unit Safety Representative to serve as liaison to the wing Weapons Safety Office and identify the number of nuclear spot inspections to be completed on a specified basis (e.g., monthly; weekly; etc.) within the appointment memo.

2.27.5. Ensure all personnel, whether transportation or contractor personnel, report deficiencies on nuclear certified equipment to the Wing/Installation Level Weapon Safety Manager.

2.28. Unit Safety Representatives shall:

2.28.1. Perform nuclear surety-focused spot inspections IAW DAFI 91-202 and emphasize nuclear surety culture.

2.28.2. Ensure initial and recurring nuclear weapons surety training is documented for unit individuals.

2.28.3. Coordinate with the Weapon Safety Manager on all matters concerning nuclear weapons surety.

2.28.4. Use nuclear weapons surety cross-feed reports for unit mishap prevention.

2.28.5. Contact the Weapon Safety Manager for training after being appointed a Unit Safety Representative IAW DAFI 91-202.

2.28.6. Ensure locally developed unit checklists, instructions, operating procedures, and plans that impact nuclear surety are coordinated through the Weapon Safety Manager.

2.29. Supervisors shall:

2.29.1. Enforce nuclear surety culture and ensure personnel are properly trained and certified before starting nuclear operations.

2.29.2. Enforce no-lone zone programs are implemented IAW [paragraph 4.7](#).

2.29.3. Enforce reporting of all nuclear deficiencies.

2.29.4. Inform personnel of all changes to the Nuclear Surety Program.

2.29.5. Perform PRAP responsibilities IAW DoDM 5210.42_DAFMAN 13-501 and DAFI 31-117.

2.29.6. Enforce personnel to use only authorized or certified equipment and allow only the use of Air Force-approved technical orders, checklists, or procedures during nuclear operations.

2.30. Individuals shall:

2.30.1. Promote nuclear surety culture and inform supervisors if they are not qualified to perform a particular task.

2.30.2. Report nuclear safety hazards/deficiencies or security problems to supervisors and Unit Safety Representatives.

2.30.3. Comply with the TPC. See [paragraph 6.2](#) for additional details.

2.30.4. Immediately identify unreliable personnel to their supervisor, certifying official, or commander.

2.30.5. Report information which could affect their own ability or reliability to perform a task due to medical or other problems.

Chapter 3

AIR FORCE NUCLEAR SURETY COUNCIL

3.1. Overview. The AFNSC or alternative process provides a forum for the AF/SE to discuss and manage nuclear surety issues with safety leaders from across the Air Force Nuclear Enterprise. The AFNSC provides a vehicle for the AF/SE, in the Chief of Safety nuclear surety oversight role IAW HQAFMD 1-46 and AFPD 91-1, to assess the health of the nuclear surety program. It also ensures the dissemination of critical cross-tell surety information, resolves surety issues, and provides unity of effort and standardization of the nuclear surety program across the Nuclear Enterprise.

3.2. Purpose.

- 3.2.1. Provide a forum to openly discuss and manage nuclear surety issues.
- 3.2.2. Resolve, plan, and staff nuclear surety tasks.
- 3.2.3. Integrate nuclear surety actions across the Air Force Nuclear Enterprise.
- 3.2.4. Provide and discuss recommendations to reverse negative nuclear surety trends.
- 3.2.5. Ensure the Air Force remains focused on the safety, security, reliability, control and recovery of nuclear weapons and nuclear weapon systems.

3.3. Membership.

- 3.3.1. AF/SE chairs the AFNSC.
- 3.3.2. The AFNSC is comprised of O-6/GS-15 representatives or deputy Directors of Safety from MAJCOMs and select Headquarters Air Force (HAF) agencies.
- 3.3.3. Only appointed council members or their designated representatives shall represent organization positions and/or voting at AFNSC meetings. **(T-1)** Technical Advisors are highly encouraged to attend council meetings as subject matter experts to provide tailored information to the voting members. They shall not represent MAJCOMs or HAF agencies in official positions unless appointed as such by their organization. **(T-1)**
- 3.3.4. AFNSC Membership.
 - 3.3.4.1. Council Member Organizations.
 - 3.3.4.1.1. ACC/SE - Air Combat Command Safety.
 - 3.3.4.1.2. AETC/SE - Air Education and Training Command Safety.
 - 3.3.4.1.3. AFGSC/SE - Air Force Global Strike Command Safety.
 - 3.3.4.1.4. AFIA/NI - Air Force Inspection Agency Nuclear Inspections.
 - 3.3.4.1.5. AFMC/SE - Air Force Materiel Command Safety.
 - 3.3.4.1.6. AFNWC/CD - Air Force Nuclear Weapons Center, Deputy Commander.
 - 3.3.4.1.7. AFRC/SE - Air Force Reserve Command Safety.
 - 3.3.4.1.8. AFSEC/SEW - Air Force Safety Center Weapons Safety.

- 3.3.4.1.9. AFSOC/SE - Air Force Special Operations Command.
- 3.3.4.1.10. AMC/SE - Air Mobility Command Safety.
- 3.3.4.1.11. NGB/SE - National Guard Bureau Safety.
- 3.3.4.1.12. PACAF/SE - Pacific Air Forces Safety.
- 3.3.4.1.13. USAFE-AFAFRICA/SE - United States Air Forces in Europe and Air Forces Africa Safety.
- 3.3.4.1.14. AF/A4L - Air Force Logistics.
- 3.3.4.1.15. AF/A4S - Air Force Force Protection.
- 3.3.4.1.16. AF/A10 - Air Force Strategic Deterrence and Nuclear Integration.
- 3.3.4.1.17. Technical Advisors and Organizations. Additional AFSNC members or advisors may be approved by the AFNSC Chair as needed.

3.4. Responsibilities.

3.4.1. AFSEC/SEW shall:

- 3.4.1.1. Provide scheduling and logistical information regarding AFNSC meetings to members and advisors, to include publishing the schedule at least 45 calendar days prior to semi-annual council meetings.
- 3.4.1.2. Establish and coordinate agenda, using inputs solicited from AFNSC membership.
- 3.4.1.3. Facilitate AFNSC Meetings.
- 3.4.1.4. Publish meeting minutes.
- 3.4.1.5. Track and staff AFNSC action items.

3.4.2. MAJCOMs shall:

- 3.4.2.1. Establish a Nuclear Surety Council or alternative process to advise the MAJCOM staff on nuclear surety matters. **(T-1)**
- 3.4.2.2. Designate the MAJCOM commander or deputy commander chair of the council, unless otherwise delegated, and establish the frequency in which MAJCOMs Nuclear Surety Council shall meet, not less than semi-annually. **(T-1)**

3.4.3. Wings/Installations with a Nuclear Mission shall:

- 3.4.3.1. Establish a Nuclear Surety Council or alternative process to examine and resolve problems affecting the successful execution of the organization's nuclear surety program. The Nuclear Surety Council shall act as a review board to assist the commander in ensuring all facets of the nuclear weapons surety program function in an effective manner. The wing or group commander or the deputy wing or group commander shall chair the Nuclear Surety Council. **(T-1)**
- 3.4.3.2. Request as appropriate, host or tenant units shall attend Nuclear Surety Councils. **(T-1)**

3.4.3.3. Include all members who are PRAP certifying officials or their alternate, commanders of security forces personnel, the installation PRAP Monitor, and advisors and functional experts who support the Nuclear Surety Program. **(T-1)**

3.4.3.4. Monitor changes affecting wing/installation Nuclear Surety Program. **(T-1)**

3.4.3.5. Include a review of wing Nuclear Safety Design Deviations. **(T-1)**

3.4.4. Wings/Installations without a nuclear mission. may establish an alternative process to inform local commanders as needed on nuclear surety issues, including those pertaining to nuclear certified equipment.

Chapter 4

AIR FORCE INSTALLATION LEVEL NUCLEAR SURETY PROGRAM

4.1. Purpose. The purpose of an installation level nuclear weapons surety program is to maximize nuclear surety, consistent with operational requirements, from nuclear weapon system development to target or dismantlement, in support of this publication. This chapter details guidance and procedures necessary to execute the various pieces of this program. This document serves as the parent document to the 91-1XX publications stated in [paragraph 1.1.3](#) and is to be used in conjunction to those documents.

4.2. Wing/Installation shall:

4.2.1. Support the NWSSG IAW AFI 91-102. **(T-1)**

4.2.2. Implement individual PRAP responsibilities IAW DoDM 5210.42_DAFMAN 13-501 and DAFI 31-117. **(T-0)**

4.2.3. Ensure applicable nuclear surety topics are included in training directives and programs for assigned personnel, including an annual review of the WSSRs for their specific weapon system(s). **(T-1)**

4.2.4. Comply with guidance and procedures for maintenance, personnel certification, logistics movement, and accountability procedures for nuclear weapons IAW applicable AFI 21-series publications. **(T-1)**

4.2.5. Promote senior leader emphasis on nuclear surety culture, enforce compliance with nuclear weapons surety requirements, and mishap prevention. **(T-1)**

4.2.6. Identify, investigate, correct, and report nuclear weapons surety deficiencies. **(T-1)**

4.2.7. Establish reviews of nuclear surety plans and procedures by affected agencies before implementation. **(T-1)**

4.2.8. Implement a nuclear weapons surety awards program to recognize deserving individuals and provide incentive for integrating nuclear surety culture and practices into daily activities. **(T-1)** Nomination procedures and selection criteria for nuclear weapons surety awards can be found in DAFMAN 36-2806, *Military Awards: Criteria and Procedures*.

4.2.9. Establish plans and procedures to support Safe Haven requirements as outlined in DoDM S-5210.41_AFMAN 31-108-S, DAFI 31-101, *Base Defense Operations*, and Technical Order 11N-45-51, *Transportation of Nuclear Weapons Materials*. **(T-0)**

4.2.10. Develop emergency management plans to address nuclear accidents and incidents IAW DAFI 10-2501. **(T-1)**

4.2.11. If tasked, establish plans and procedures to support Airborne Launch Control System requirements as outlined in DoD S-5210.92M. **(T-0)**

4.3. Host Tenant Agreements.

4.3.1. Per [paragraph 2.20.4](#), host-tenant agreement(s) specify the support required to implement an effective Nuclear Surety Program. As a minimum, the host-tenant agreement shall include the following areas:

4.3.1.1. Nuclear Surety Program management. **(T-1)**

4.3.1.2. Inspections (e.g., nuclear weapons surety, 12-month, spot). **(T-1)**

4.3.1.3. PRAP. **(T-1)**

4.3.1.4. Review of local procedures in support of WSSRs. **(T-1)**

4.3.1.5. Mishap investigations, boards, and reporting responsibilities. **(T-1)**

4.3.1.6. Major accident response procedures. **(T-1)**

4.3.2. Submit in writing, those areas where a host-tenant agreement cannot be reached, to the appropriate MAJCOM(s) for resolution. **(T-1)** Refer to AFI 25-201, *Intra-Service, Intra-Agency, and Inter-Agency Support Agreements Procedures*, for implementation of host-tenant agreement(s).

4.4. Explosives Storage Requirements.

4.4.1. Do not store nuclear and conventional munitions together in the same facility or structure, except as noted below. **(T-1)**

4.4.1.1. In the event of fire, flood, or natural disaster, or if the nuclear storage facility can no longer be secured, Wing/Installation Commanders shall:

4.4.1.1.1. Establish procedures to provide the immediate storage, when appropriate, of nuclear and conventional munitions within a facility for up to 72 hours. **(T-1)** DESR 6055.09_DAFMAN 91-201 and Technical Order 11N-20-7, *Nuclear Safety Criteria*, contain specific guidance.

4.4.1.1.2. If emergency storage is required beyond 72 hours, MAJCOM commander approval is required, with AFSEC/SEW notification. **(T-1)**

4.4.1.1.3. In the event of simultaneous conventional and nuclear weapons storage due to an emergency situation, initiate PINNACLE EMERGENCY EVACUATION (OPREP-3PEV) procedures prescribed in AFMAN 10-206, *Operational Reporting (OPREP)*. **(T-1)**

4.4.1.1.4. If required, units will gain AF/SE approval for storage of nuclear and conventional munitions within the same facility for more than 90 calendar days. **(T-1)** Note: Storing nuclear weapons in one facility and conventional munitions in another facility within the same weapon storage area is not considered simultaneous presence and does not require MAJCOM or AF/SE approval. Conventional munitions inherently part of a nuclear weapon system, nuclear weapon component (e.g., forward shroud, forward section, electrical explosive devices, and limited life components), and/or ammunition for close-in security located in the same assembly, surveillance, and inspection/maintenance and inspection, vault or storage facility are not considered simultaneous presence.

4.4.1.1.4.1. At a minimum, the approval request shall include a management action plan containing the reason for the request, risk assessment, any corrective action and expected duration of the use of the facility. **(T-1)**

4.4.1.1.4.2. MAJCOM and wing commanders shall review, at least once every three months, the progress of the management action plan and provide an update to AFSEC/SEW on behalf of the AF/SE. (T-1)

4.4.1.1.4.3. AF/SE rescinds approval once the management action plan has been completed to the satisfaction of the MAJCOM and wing commanders.

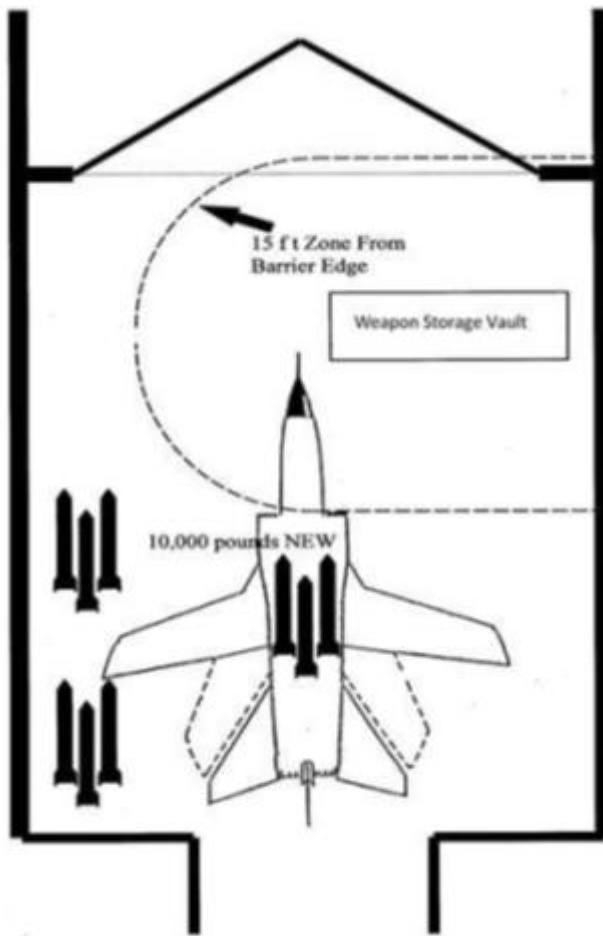
4.4.1.2. Operations in a Hardened or Protective Aircraft Shelter with a Weapon Storage Vault.

4.4.1.2.1. Reference AFI 91-112 *Safety Rules for U.S./NATO Dual Capable Aircraft* and DESR 6055.09_DAFMAN 91-201 for additional specific guidance and procedures on simultaneous presence of conventional munitions and nuclear weapons in a HAS or PAS.

4.4.1.2.2. In a protective aircraft shelter with a nuclear weapon-loaded weapon storage vault, conventional munitions will not exceed 10,000 pounds net explosive weight. (T-1)

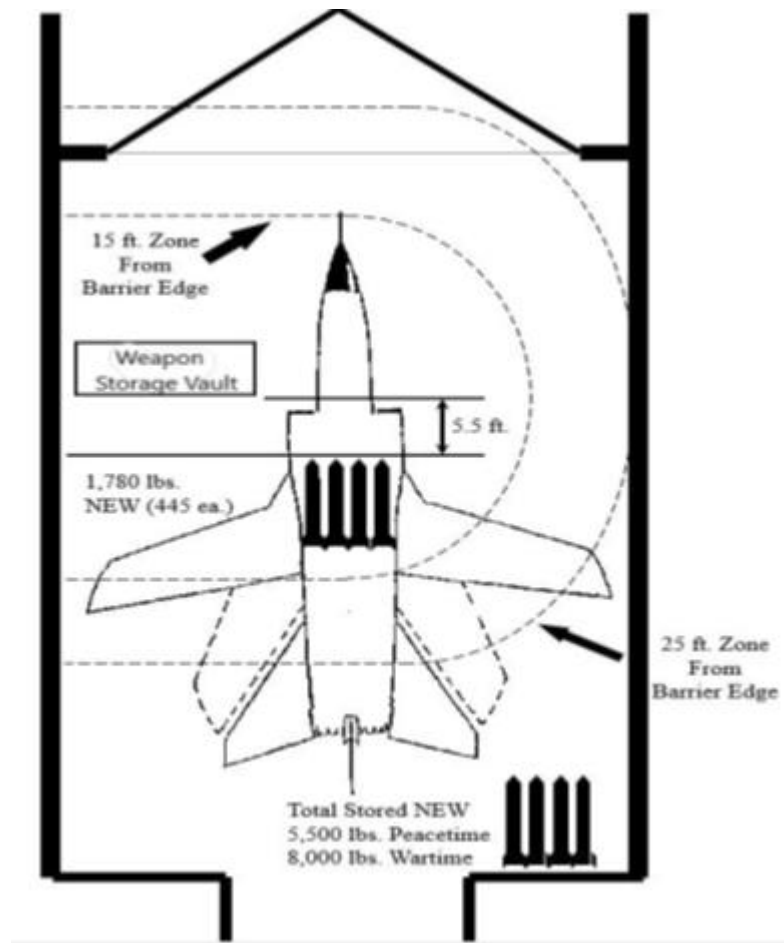
4.4.1.2.3. Conventional munitions (except for missiles) must be positioned no closer than 15 feet from the weapon storage vault ([Figure 4.1](#)). (T-1) Do not position forward firing munitions in storage with the nose or exhaust pointed directly at an opened nuclear weapon-loaded weapon storage vault. (T-1) Missiles, countermeasures, and aircraft gun ammunition loaded in preparation for strike are authorized if they are electrically and/or mechanically safed, as directed by technical orders. In addition, hazard division 1.3 and 1.4 training munitions, countermeasures, loaded and safed, on aircraft may be stored within 15 feet of a closed and locked weapon storage vault to accommodate parking two aircraft in a third generation protective aircraft shelter.

Figure 4.1. Placement of Munitions 15 Feet from Weapon Storage Vault.



4.4.1.2.4. If the placement of the weapon storage vault, the physical dimensions of the protective aircraft shelter, and the size of a single aircraft are such that the single aircraft (e.g., PA-200 in 1st generation protective aircraft shelter) cannot have munitions loaded and meet the 15-foot restriction from the weapon storage vault, then the following additional restrictions apply when loading conventional munitions in the protective aircraft shelter ([Figure 4.2.](#))

Figure 4.2. Placement of Munitions When 15-Foot Restriction Cannot Be Met.



4.4.1.2.4.1. Park aircraft as far from the weapon storage vault as practical.

4.4.1.2.4.2. No conventional weapon in the protective aircraft shelter (on- or off-aircraft) may exceed 445 pounds net explosive weight each. **(T-1)**

4.4.1.2.4.3. Total net explosive weight in the protective aircraft shelter will not exceed 5,500 pounds. **(T-1)**

4.4.1.2.4.4. During combat contingency operations, heightened tensions or wartime operations, the host unit commander may authorize an increase in the total net explosive weight, not to exceed 8,000 pounds.

4.4.1.2.5. All conventional munitions not loaded on the aircraft will be at least 25 feet from the weapon storage vault. **(T-1)**

4.4.1.2.6. Do not exceed 445 pounds net explosive weight per aircraft weapon station. **(T-1)**

4.4.1.2.7. Do not exceed four aircraft-loaded bombs within 15 feet of the weapon storage vault. No aircraft-loaded bomb may be closer to the weapon storage vault than 5.5 feet. **(T-1)**

4.4.1.2.8. The preceding restrictions do not limit towing or taxi operations of aircraft loaded with conventional munitions into or out of a protective aircraft shelter containing a weapon storage vault when down and locked.

4.4.1.3. DELETED

4.4.2. Establish procedures to ensure nuclear weapons and conventional munitions are not stored together, except as part of flightline or protective aircraft shelter operations conducted IAW weapons system safety rules. **(T-1)**

4.4.3. DELETED

4.4.3.1. DELETED

4.4.3.2. DELETED

4.4.3.3. DELETED

4.5. Training Programs.

4.5.1. Wings/Deltas/Installations will:

4.5.1.1. Establish procedures to ensure individuals assigned to the Weapons Safety Office are trained IAW their role in nuclear surety. **(T-1)** This requirement refers to any individual having a role in nuclear surety-related activities.

4.5.1.2. Establish procedures to ensure Weapon Safety Managers in both nuclear and non-nuclear units are trained, knowledgeable, and qualified. **(T-2)**

4.5.1.3. Establish procedures to ensure full-time Weapon Safety Managers are not assigned additional tasks which detract from their primary safety duties. **(T-2)**

4.5.2. MAJCOMs, FLDCOMs, Field Operating Agencies, and Direct Reporting Units, as appropriate, will:

4.5.2.1. Establish a program to ensure personnel are trained and certified on the following functional tasks as applicable:

4.5.2.1.1. Nuclear weapons system maintenance, mate/demate, handling, and final assembly checkouts. **(T-1)**

4.5.2.1.2. Loading and unloading of nuclear weapons for transport and delivery vehicles. **(T-1)**

4.5.2.1.3. Explosive Ordnance Disposal component diagnosis and recovery procedures. **(T-1)**

4.5.2.1.4. Weapon convoys. **(T-1)**

4.5.2.2. Establish a program to ensure personnel are trained on the following functional tasks, nuclear weapons surety concepts, and support programs as applicable:

4.5.2.2.1. Security procedures. **(T-1)**

4.5.2.2.2. Custody procedures. **(T-1)**

4.5.2.2.3. Operational control. **(T-1)**

4.5.2.2.4. Nuclear certified equipment tracking procedures and deficiency reporting procedures at both nuclear and non-nuclear units. **(T-1)**

4.5.2.2.5. Weapons safety reporting at both nuclear and non-nuclear units IAW DAFMAN 91-221. **(T-1)**

4.5.2.2.6. NSPs. **(T-1)**

4.5.2.3. Establish procedures to ensure individuals receive instructor-led nuclear weapons surety training. **(T-1)**

4.5.2.3.1. Initial training is to occur before individuals work with nuclear weapons, nuclear weapons systems, certified critical components, perform nuclear-related duties, control entry into no-long zones, perform duties as a PRAP certifying official and support necessary Divert-O-Plans (e.g., bomber, prime nuclear airlift force). **(T-1)**

4.5.2.3.2. Recurring nuclear weapons surety training is to occur every 15 months. **(T-1)** Individuals shall be restricted from any nuclear related duties if not current on nuclear weapons surety training. **(T-1)**

4.5.2.3.3. Individuals shall complete a closed-book test with a minimum passing score of 80 percent. **(T-1)** A test score of less than 80 percent requires remedial training and retesting with a different test before that person may perform nuclear-related duties.

4.5.2.3.4. Tests shall be randomly built from an AFSEC validated test bank using at least two test questions for each mandatory topic for a minimum of 20 questions per test. **(T-1)**

4.5.2.3.5. MAJCOM unique questions may be added IAW paragraphs [2.16.7](#), [2.16.11](#), and [2.23.10](#).

4.5.2.3.6. Training/testing shall include, at a minimum, the standardized nuclear weapons surety lesson plan and testing topics below. **(T-1)** Nuclear surety culture shall be emphasized during initial and recurring nuclear weapons surety training. **(T-1)** Unique topics commensurate with the unit's nuclear duties shall also be trained (i.e., Safe Haven procedures, sealing of nuclear components, local situations increasing the risk of nuclear mishaps). **(T-1)**

4.5.2.3.6.1. Importance of, and need for, a US nuclear capability. **(T-1)**

4.5.2.3.6.2. Nuclear mishap prevention responsibilities of those personnel who work with nuclear weapon systems. **(T-1)**

4.5.2.3.6.3. Possible adverse impact on US nuclear capability in the event of a serious nuclear mishap. **(T-1)**

4.5.2.3.6.4. Security requirements. **(T-1)**

4.5.2.3.6.5. TPC, sole vouching authority, and associated requirements and procedures. **(T-1)**

4.5.2.3.6.6. PRAP requirements IAW DoDM 5210.42_AFMAN 13-501 and DAFI 31-117. **(T-1)** **Note:** This requirement is specific to nuclear surety and not required to be certified under PRAP.

4.5.2.3.6.7. Mishap and hazard reporting. (T-1)

4.5.2.3.6.8. Use of MNCL as the sole source for verifying the certification status of nuclear certified weapon systems, hardware, support equipment, and facilities. (T-1)

4.5.2.3.6.9. Intrinsic radiation and the As Low as Reasonably Achievable concept IAW AFMAN 48-148, *Ionizing Radiation Protection*. (T-1)

4.5.2.3.6.10. WSSRs. (T-1)

4.5.2.3.7. Document initial and 15-month recurring nuclear weapons surety training. (T-1)

4.6. Tamper Control and Detection Programs. MAJCOMs, Field Operating Agencies, and Direct Reporting Units, as appropriate, shall:

4.6.1. Develop and publish field publications, as needed, to implement and enforce the Air Force Nuclear Surety Tamper Control and Detection Programs. (T-1)

4.6.2. Develop and distribute procedures for sealing, where appropriate. At a minimum, the procedural publication shall:

4.6.2.1. State when, and by whom, seals can be applied and removed. (T-1)

4.6.2.2. Establish controls for the handling, receipt, storage, issue, inventory, and disposal of tamper detection indicators (including all residue), controlled dies, and self-locking, non-reversible seals (e.g., roto-seals). (T-1)

4.6.2.3. Establish procedures to ensure tamper detection indicators, controlled dies and self-locking, non-reversible seals are stored and accounted for by individuals not responsible for their installation. (T-1)

4.6.2.4. Establish procedures to ensure personnel comply with Tamper Detection Program requirements IAW [Chapter 6](#). (T-1)

4.6.2.5. Establish procedures to accomplish periodic inspections of seals on nuclear weapon-loaded aircraft, missile systems, and certified critical components in storage or transport. (T-1)

4.6.2.6. Establish procedures to ensure only TPC teams install seals and verify they remain intact. (T-1)

4.7. No-Lone Zone Programs. Procedures shall be established by supervisors to:

4.7.1. Ensure all personnel prior to entering a no-lone zone receive a pre-task/safety brief or visitors brief including nuclear weapons surety. (T-1)

4.7.2. Ensure the pre-task safety brief includes as a minimum an outline of the operation, identification of applicable no-lone zones, location of war reserve weapons and/or critical components within the no-lone zone, intrinsic radiation procedures, applicable safety, emergency procedures and TPC. (T-1)

4.7.3. Ensure visitor briefs are tailored to personnel being allowed access to the no-lone zone and the area being visited. The briefing shall include applicable safety precautions, escort requirements, and specific actions to be taken in the event of an emergency at a minimum.
(T-1)

Chapter 5

AIR FORCE NUCLEAR SAFETY DESIGN CERTIFICATION PROGRAM

5.1. Overview. NSDC evaluates facilities, hardware, and/or software associated with nuclear weapon systems for compliance with nuclear safety design and evaluation criteria. IAW DODM 3150.02, *DoD Nuclear Weapon System Safety Program Manual* and AFPD 91-1, this addresses the Safety Certification requirement to validate that the system; item of equipment; or nuclear maintenance, handling, and storage facility can be used safely in support of nuclear mission operations. The NSDC process begins with early identification during acquisition. The entry is formalized much later with the receipt of an NCIS. Once an NCIS is approved an initial set of Nuclear Safety Design requirements suitable to the maturity of the information provided is established and called the Basic Certification Requirements Plan. A refined set of requirements are later captured in a document called the Certification Requirements Plan. The program is responsible for showing compliance with the CRP in a document called the Nuclear Surety Evaluation. Deviations to these requirements are addressed through the safety design certification process and visible to the MSB decision authority and NWSSG Special Safety Studies.

5.1.1. The safety design certification process ensures nuclear weapons and nuclear weapon systems are designed, built, and used in a manner so the equipment does not impose abnormal environments, inadvertently provide unintended critical signals, or aid in providing unauthorized critical signals to the weapon. Safety design requirements ensure the DOE-certified safety probabilities remain valid; unintentional significant nuclear yield numerical requirements are in DAFMAN 91-118. It also ensures that the Air Force meets DODM 3150.02 safety certification requirements.

5.1.2. The Air Force uses DAFI 63-125 for a broader coordination process among stakeholders for ensuring various certification processes are addressed and coordinated including but not limited to the Nuclear Certification Analysis Tool and MNCL instructions regarding the Air Force Nuclear Certification Program.

5.2. System Safety Groups.

5.2.1. All applicable aircraft, weapons and space programs shall conduct System Safety Groups (SSGs) IAW DAFI 91-202. **(T-1)**

5.2.2. All nuclear weapon delivery vehicles that require NSDC shall establish SSGs. **(T-1)**

5.2.3. IAW DAFI 91-202, all nuclear weapons system SSGs shall include AFSEC/SEW as a mandatory SSG advisor. **(T-1)**

5.3. Items Requiring Nuclear Safety Design Certification.

5.3.1. The following systems, hardware and software items require certification:

5.3.1.1. Delivery vehicles as defined in this publication. **(T-1)**

5.3.1.2. Operational and support equipment used to move, support, store, handle, load and unload, or mate and demate nuclear weapons. **(T-1)**

5.3.1.3. All hardware and software components that directly interface (electrically or physically) with a nuclear weapon or critical component. **(T-1)**

5.3.1.4. Items that, if failed or operated incorrectly, could degrade the operator's ability to monitor the status of the nuclear weapon or weapon system critical components. **(T-1)**

5.3.1.5. Items that, if failed or operated incorrectly, could degrade the operator's ability to send a safing command. **(T-1)**

5.3.1.6. Items designated as critical components IAW **Chapter 7**. **(T-1)**

5.3.1.7. All hardware or software used to directly control critical functions or signals, as defined in DAFMAN 91-118 and DAFMAN 91-119. **(T-1)**

5.3.1.8. Tamper detection indicators used to maintain the OPCERT status of critical components and protection of secure nuclear command and control codes and coded components. **(T-1)**

5.3.1.9. Operational and maintenance hardware and software used to command and control critical functions or signals and perform status reporting as required in DAFMAN 91-118 and DAFMAN 91-119. **(T-1)**

5.3.1.10. Nuclear Weapons Maintenance and Storage Facilities. NSDC of facilities shall be based on the design and evaluation of essential facility systems, IAW DAFMAN 91-118 and DAFMAN 91-119. **(T-1)**

5.3.1.11. Modifications to non-specialized equipment that could impact the item's primary structure, electrical and hydraulic power systems, load-bearing capacity, steering and braking capability, computer systems, programmable logic devices, software, or positive control features, as well as any changes resulting in noncompliance with specific DAFMAN 91-118 or DAFMAN 91-119 design criteria. **(T-1)**

5.3.1.12. Test equipment that:

5.3.1.12.1. Verifies the proper operation of circuits and functions of the unit under test that perform critical functions. See DAFMAN 91-118 or DAFMAN 91-119 for further applicability guidance. **(T-1)**

5.3.1.12.2. Interfaces directly with a nuclear weapon or critical component. **(T-1)**

5.3.1.12.3. Is used in special test or maintenance programs to identify system anomalies or failures IAW **paragraph 5.7**. **(T-1)**

5.3.1.12.4. Depot and intermediate-level test equipment if the critical circuits of the tested items are not verified at the organizational level before use with nuclear weapons.

5.3.2. Any zero-emission, hybrid or autonomous-capable equipment used to move, support, store, handle, load and unload, or mate and demate nuclear weapons will require a nuclear safety design certification.

5.3.3. Procedures. Nuclear weapon system technical order procedures involving OPCERT/DECERT or identified as NSPs shall be approved IAW this document. **(T-1)** All other nuclear weapon or nuclear weapon system technical order procedures shall be nuclear certified IAW DAFI 63-125. **(T-1)**

5.3.3.1. Technical orders containing NSPs shall be submitted to AFSEC at least 120 calendar days prior to desired certification date. **(T-1)**

5.3.3.2. NSPs. A goal of NSDC is to maximize nuclear weapon safety within the design to minimize steps called out as NSP within technical orders/checklists. NSPs must be performed exactly as written. **(T-1)**

5.3.3.3. AFSEC/SEW is the approval authority for all NSPs.

5.3.4. Host nation-operated nuclear weapon systems and procedures shall satisfy the same nuclear safety criteria required for Air Force systems and procedures, when used with nuclear weapons in Air Force custody. **(T-1)**

5.3.5. Other. When items do not clearly fall into any of the categories identified, AFSEC/SEW is the authority for determining if NSDC is required. **(T-1)**

5.3.6. Items already or previously safety design certified for a specific weapon system, shall be re-evaluated for nuclear certification impact IAW AFI 63-125 if planned to be used with a new weapon system (T-1).

5.4. Administrative Certification. The following are administratively granted NSDC and therefore do not require separate Air Force NSDC actions provided the item is in its original, unmodified condition, and is used in its intended operating environment IAW approved technical data. **(T-1)**

5.4.1. General purpose hand tools, such as pliers, wrenches, and screwdrivers.

5.4.2. Depot and intermediate-level test equipment if the critical circuits of the tested items are verified at the organizational level before use with nuclear weapons.

5.4.3. Common, multipurpose, and non-specialized test equipment, such as multimeters, decade resistance boxes, and impedance bridges unless the equipment directly interfaces with nuclear weapons.

5.4.4. All Department of the Air Force equipment designed and used for proficiency training, such as full-scale and miniature practice delivery bombs and bomb dispensers, practice loading bombs and warheads, training re-entry vehicles and payload sections, explosive ordnance disposal disassembly/reassembly training equipment.

5.4.5. Individual bomb roller assemblies.

5.4.6. Bridge plates, shoring ramps and similar items.

5.4.7. Wheeled pry bars (J-Bars) and pallet jacks. **Note:** Pallet jacks must meet Commercial Item Description (CID) A-A-59333A, dated 24 March 2005, and the nuclear load will be limited to 50 percent of the rated load.

5.4.8. Restraints. Tiedown chains and cables, straps, and adjusters used for restraint during transportation so long as they comply with other Department of the Air Force transportation restraint standards.

5.4.9. Other Department of Defense (DoD) Agencies Equipment. Equipment used for nuclear logistics movements, which other DoD agencies have certified for nuclear weapons handling, are approved for the Air Force if used within established operating criteria.

5.4.10. Common minor modifications include but are not limited to common add-on equipment such as fire extinguishers, radios, lights, bedliners, camper shells, sirens, trailer light cable adapters, or foreign object damage magnets or containers and forklift spacers.

5.4.10.1. The following process will be used by the field unit to determine the appropriate course of action for evaluation and local approval of minor field-level modifications:

5.4.10.2. Identify item(s) to be modified and provide a complete description of the proposed changes to the item maintenance supervisor/superintendent (or equivalent) and the wing safety office (or any geographically separated units that function as a wing). These offices will jointly review the proposed modification to determine if approval can be granted at the unit level or if further evaluation of the nuclear safety impact is necessary. **(T-1)**

5.4.10.2.1. If there is no impact to nuclear surety, approve the modification locally.

5.4.10.2.2. If further evaluation is required, submit a formal request for evaluation/approval from the using MAJCOM safety office. **(T-1)**

5.4.10.3. If formal nuclear safety design certification is not required, the using MAJCOM will:

5.4.10.3.1. Provide formal approval to the field unit. **(T-1)**

5.4.10.3.2. Inform the Program Manager (PM) and Air Force Safety Center, Nuclear Weapons Branch (AFSEC/SEWN) of the approved modification. **(T-1)**

5.4.10.3.3. If the modification requires formal nuclear safety design certification, the using MAJCOM will:

5.4.10.3.3.1. Notify the submitter that further evaluation is necessary. **(T-1)**

5.4.10.3.3.2. Follow the process specified in this document. **(T-1)**

5.4.11. Department of Energy Qualified Equipment. Department of Energy-qualified test, handling, and support equipment provided by Department of Energy to the Department of the Air Force for use with nuclear weapons or nuclear weapons systems, provided the equipment is used on other Department of Energy qualified equipment, as outlined in approved Joint Nuclear Weapons Publication System publications, special procedures, or authorized unsatisfactory reports responses. **Note:** Not applicable for items provided by Department of Energy when acting in a contracting capacity.

5.5. Targeting Data. Targeting data received through National Command Channels is considered valid upon receipt and shall be protected IAW DAFMAN 91-119 by the weapon system for the purpose of safety design.

5.6. Nuclear Safety Design Certification Process.

5.6.1. The operational MAJCOM or any Program Manager identifies items, programs, or future mission capability need that may require NSDC according to [paragraph 5.3](#).

5.6.1.1. The Program Manager maintains configuration control of identified hardware, software, and facilities to be nuclear safety design certified throughout their life cycles.

5.6.1.2. The lead or using command performs the Program Manager role for nuclear-related weapons maintenance and storage facilities certification process, unless otherwise assigned to a Program Office.

5.6.1.3. For host nation-owned nuclear weapon systems, the host nation functions like a Program Manager in coordination with the AFNWC and USAFE-AFAFRICA.

5.6.2. For new weapon systems acquisitions or weapon system modifications, the Program Manager or MAJCOM notifies AFSEC. Early notification in the acquisition process allows the NSDC informed development of the nuclear certification NCIS IAW DAFI 63-125. The NCIS will be matured into a set of generalized requirements in the Basic Certification Requirements Plan and the owning organization will coordinate on the CRP for implementation and recommend a certification approach for verifying compliance with this publication and AFI 91-106. **(T-1)**

5.6.3. As the development or modification effort nears completion, the Program Manager or equivalent prepares an NSE. **(T-1)** Refer to NSE Data Item Description document number DI-NUOR-82401, *Nuclear Surety Evaluation* on <https://quicksearch.dla.mil/qsSearch.aspx>. The NSE focuses on all Safety Design Criteria in this publication. It also includes a recommendation for certification or certification with restrictions if design and evaluation criteria are not met. The evaluation and certification recommendation shall be submitted to AFSEC/SEW with copy to the AFNWC. **(T-1)**

5.6.3.1. If a safety study is an identified requirement within the CRP, the Program Manager shall submit the NSE to AFSEC/SEW IAW AFI 91-102 in preparation for the NWSSG. **(T-1)** This NSE is only a part of the broader Nuclear Safety Analysis Report required to support the NWSSG. See DoDM 3150.02 and AFI 91-102 for additional information on safety studies and the NWSSG.

5.6.3.2. If a safety study is not required, submit the NSE at least 60 calendar days before the required operational capability or certification need date. **(T-1)**

5.6.4. AFSEC/SEW shall evaluate the NSE or request another organization meeting independence requirements conduct an Independent Nuclear Surety Evaluation (INSE) for review by AFSEC. The INSE is intended to confirm that the program provided NSE is complete and correct and that all applicable safety design criteria have been satisfied. The INSE shall be submitted at least 20 calendar days before the required operational capability or certification need date **(T-1)**. An INSE:

5.6.4.1. Must be technically accurate and provide enough depth within the evaluation to prove compliance with design requirements. Reference NSE DID DI-NUOR-82401. **(T-1)**

5.6.4.2. Specifically addresses the design requirements. **(T-1)**

5.6.4.3. Indicates if the design meets the NSDC requirements of this publication. **(T-1)**

5.6.4.4. Includes a recommendation for NSDC IAW NSE Data Item Description on **(T-1)** <https://quicksearch.dla.mil/qsSearch.aspx>.

5.6.5. When requirements are not met, the NSE and INSE shall include comments and documentation on the adequacy of the design and may recommend compensatory measures. PM shall submit a deviation IAW **Chapter 10**. **(T-1)**

5.6.6. Computer Systems, Programmable Logic Devices, application-specific integrated circuit, and Software Evaluations. For software evaluation requirements see DAFMAN 91-119.

5.6.7. For host nation-procured support equipment, the INSE is conducted internally during the NSE development process conducted by AFNWC ELO.

5.6.8. For host nation-owned nuclear weapon systems, the host nation shall submit NSDC documentation through the AFNWC ELO. **(T-1)** ELO shall interface between the host nation and the USAF on all NSDC processes and issues. **(T-1)**

5.6.9. When all safety design requirements have been evaluated by AFSEC/SEW to meet the requirements in the approved CRP, AFSEC/SEW shall complete an NSDC letter satisfying the DOD safety certification and copy the AFNWC for coordination through the Nuclear Certification Analysis Tool. **(T-1)** **Note:** Restrictions on the use of items in a nuclear role may be imposed to compensate for design deficiencies or significant operational hazards.

5.7. Special Test and Maintenance Programs.

5.7.1. The Program Manager shall evaluate all aspects of proposed special test and maintenance program(s) for potential nuclear weapons surety degradation. **(T-1)**

5.7.2. The Program Manager provides this evaluation and requests approval of the proposed program(s) from AFSEC/SEW. **(T-1)**

5.7.3. AFSEC/SEW bases the approval decision on the findings of the evaluation and an independent review of the proposed program(s) (if required). A special safety study may also be required IAW AFI 91-102.

5.7.4. Special test or maintenance programs conducted in operational facilities that are not covered by certified procedures shall be approved by AFSEC/SEW.

5.8. Warhead and Bomb Maintenance or Test Procedures.

5.8.1. The Program Manager or equivalent shall perform an evaluation of all new or revised nuclear weapon maintenance and test procedures to ensure facility features and compensatory measures are adequate. **(T-1)** This requirement applies to procedures in specific facilities where maintenance or test procedures are conducted as well to those procedures not specifically approved for any given facility.

5.8.2. AFSEC/SEW shall approve implementation of all new or revised nuclear weapon maintenance or test procedures that shall be accomplished in Air Force facilities. **(T-1)** Additionally, AFSEC/SEW will be the approval authority for request to use approved procedures in a facility not currently approved for such procedures. **(T-1)** Examples include:

5.8.2.1. Procedures to accomplish weapon alterations and modifications.

5.8.2.2. Any procedures that require bypassing or disabling any weapon safety features.

5.8.2.3. Procedures that introduce new or significant potential safety hazards, e.g., sources of electrical energy, fire hazards.

5.8.3. The AFGSC/A4Z shall notify AFSEC/SEW of warhead and bomb alterations or modifications and any other new or revised maintenance or test procedures accomplished in Air Force facilities. **(T-1)** The notification via a statement of intent shall initiate an Air Force safety review/evaluation of the proposed procedures in relation to the specific facility where they are to be performed and shall:

5.8.3.1. Provide background information and describe the maintenance action to be performed. (T-1)

5.8.3.2. Identify any proposed temporary removal, bypass, or disablement of the surety features of the weapon itself and provide general information concerning the susceptibility present due to the temporary removal, bypass, or disablement of these surety features. (T-1)

5.8.3.3. Specify the Air Force facility where the procedures shall be performed. (T-1)

5.8.4. For product change proposals, the AFGSC/A4Z shall submit the notification statement of intent no later than 180 calendar days before scheduled maintenance. (T-1) For special procedures and retrofit orders, submit the notification when it is distributed for Air Force review/coordination. (T-1)

5.8.5. AFSEC approval (via formal documentation) shall be obtained before implementation of procedures described in paragraphs 5.8.2 and 5.8.3. (T-1)

5.8.6. Any planned update to expand the approved maintenance or test procedures to additional facilities not specified in the original statement of intent shall be sent to AFSEC/SEW via a new statement of intent for approval. (T-1)

5.9. Nuclear Safety Design Removal and Restrictions.

5.9.1. Only AFSEC/SEW may remove NSDC for items that have demonstrated inadequate safety through analysis, testing, or operational performance. The MNCL will be updated accordingly. (T-1)

5.9.2. Any organization or individual (MAJCOM, field unit, System Program Office (SPO), Joint Program Office (JPO), crew, airman, etc.) may recommend removal of nuclear items from the MNCL. The MNCL administrators will coordinate the request through the lead/using command(s) for concurrence. (T-1)

5.9.3. Any organization or individual (MAJCOM, field unit, SPO, JPO, crew, airman, etc.) may restrict nuclear items on the MNCL from use with nuclear weapon systems any time for any reason. MNCL restrictions do not constitute removal of nuclear safety design certification. The MNCL administrators will coordinate the restriction with the lead/using command(s). (T-1)

5.9.3.1. The MNCL administrators shall notify AFSEC/SEWN and SPO of proposed MNCL restriction removal no less than 7 days prior to removal. (T-1)

5.10. Side Flash Protection.

5.10.1. Side Flash Protection for Nuclear Weapons. The Nuclear Weapon System Safety Group adopted a standard side flash separation distance value of seven feet as a conservative baseline for nuclear safety critical operations. This section provides for application of the side flash separation based on weapon configuration and location as well as a reduction of the standard side flash separation distance through an AFSEC-approved deviation. (T-1)

5.10.1.1. The side flash protection requirements for all nuclear weapons, when not in their operational configuration, are listed in **Table 5.1**. The term “major maintenance” refers to the weapon configuration resulting from any maintenance operations where major sub-assemblies (e.g., nose, tail, preflight...) are separated which could result in exposure of the weapon’s internal components to electrical energy. Nuclear weapons in their operational configuration (fully assembled) do not require application of side flash separation.

Table 5.1. Lightning Side Flash Policy for Nuclear Weapon Configurations.

Weapon	Configuration^{1,2,3}	Side flash Policy Requirement
W80, W84, W78, W87	All TO 11N-WXX-1 Configurations	No Separation distance required
B83	During major maintenance when EIDs/EEDs do not have metallic or EMR caps ²	Apply separation distance IAW paragraphs 5.10.1 and 5.10.3
B61-7/11	During major maintenance when operations are performed inside the weapon’s sealed case, i.e., disassembled beyond fully installed cover plate with through connectors fully in place, or when EIDs/EEDs do not have metallic or EMR caps ²	Apply separation distance IAW paragraphs 5.10.1 and 5.10.3
B61-12/13	All TO 11N-B61D-1 configurations	No separation distance required
	During Extended Level Maintenance (ELM) IAW TO 11N-B61D-1A or when EIDs/EEDs do not have shorting caps ²	Apply separation distance IAW paragraph 5.10.1. and 5.10.3
Notes: 1. Maintenance Actions accomplished in accordance with Special Procedures, Alts or Mods must be reviewed and approved in accordance with paragraph 5.10.2 . Side flash policy requirements must be determined on a case-by-case basis and properly documented via Special Procedures, Alts or Mods. (T-1) 2. Temporary exposure of EIDs/EEDs during disconnects, inspections, reconnects, or shielding does not require application of side flash separation distance (e.g. S-1 / S-2 plug swapping). 3. Weapon configurations are for nuclear safety protection. Weapon specific technical orders may apply additional lightning safe configurations for weapon and /or personnel safety.		

5.10.1.2. The required side flash separation distance is properly applied to a nuclear weapon (or STMS) when an unobstructed minimum seven-foot clear zone exists between the weapon (or STMS) and the facility’s walls, ceiling, or any other structural member capable of conducting electrical energy (e.g., steel columns, rebar-reinforced interior walls, columns or beams).

5.10.1.3. Objects in the floor such as concrete rebar, floor grounds, and structural members of the Weapon Storage Vault, when the vault is in a full down position, do not require the application of the side flash separation distance.

5.10.1.4. Transient or temporary infringement of the side flash separation distance requirement can be permitted. Examples include the movement of personnel and tooling through the facility or the requirement to use an overhead crane during approved maintenance procedures. Avoid these actions whenever possible or minimize their duration.

5.10.1.5. Deviations from [paragraph 5.10](#) must be approved by AFSEC/SEW. **(T-1)**

5.10.2. Location Considerations for Side Flash Separation Distance.

5.10.2.1. If operations are being performed inside a Hardened Aircraft Shelter (HAS) or a protective aircraft shelter (PAS) and these operations include weapon configurations that require a side flash separation distance (see [Table 5.1](#)) then:

5.10.2.1.1. When using a Secure Transportable Maintenance System (STMS), no minimum side flash separation distance is required between the STMS and the HAS or PAS during nuclear weapon operations. If STMS Lightning Protection System is degraded/defective, side flash separation of STMS and the HAS or PAS is required per [paragraph 5.10.1.2](#).

5.10.2.1.2. When nuclear weapon major maintenance is conducted in a HAS or PAS without a STMS, a minimum side flash separation distance of seven feet is required between the weapon and the HAS or PAS. **(T-1)** See [paragraph 5.10.1.2](#) for proper application of side flash separation distance.

5.10.3. If operations are being performed at any location other than in a HAS or a PAS and these operations include weapon configurations that require a side flash separation distance, then a minimum side flash separation distance of seven feet is required between the weapon and facility (see [paragraph 5.10.1.2](#) and [Table 5.1](#) for proper application of separation distance). **(T-1)**

5.10.4. The standard separation distance of seven feet may be reduced by determining the specific side flash separation value for a particular facility.

5.10.4.1. Side flash separation distance reduction is based on faraday shield impedance characterization testing, adequate bonding, and appropriate installation of surge suppression using a methodology approved by AFSEC/SEW prior to implementation. **(T-1)**

5.10.4.2. Documentation of the bonding and surge suppression configuration, including the associated separation distance calculations, in an attachment to the Explosive Site Plan, must accompany the characterization test results for formal review and approval by AFSEC/SEW before a deviation to the 7-foot standard separation distance is granted. **(T-1)** Changes to the bonding and surge suppression configuration must be submitted to AFSEC/SEW for approval prior to implementation. **(T-1)**

5.10.4.3. Faraday shield characterization and implementation methodologies must include specific maintenance and inspection procedures and comply with the following requirements (see AFMAN 32-1065, *Grounding & Electrical*):

5.10.4.3.1. Maintain and inspect the Lightning Protection System (LPS) per DESR 6055.09_DAFMAN 91-201. **(T-1)**

5.10.4.3.2. Conduct resistance measurements per AFMAN 32-1065. (T-1) Such measurements are required when the facility is subjected to acts of nature (earthquake, tornado, flood) that could have affected the integrity of the bonds. Conduct measurements for modification, maintenance, penetration, or repair to the structure, or any LPS component that requires the bond or connection to be broken. (T-1)

5.10.4.3.3. Faraday-like shielding is not the preferred lightning protection solution. Maintain LPS, even for structures that also contain Faraday-like shielding. (T-1)

5.10.4.3.4. Maintain records per DESR 6055.09_DAFMAN 91-201 and AFMAN 32-1065. (T-1)

5.11. Software Advisory Group.

5.11.1. Overview. The Software Advisory Group (SAG) provides a forum for AFSEC/SEWN and stakeholders to discuss and manage software issues, concerns, and certification efforts in support of the DoD Nuclear Surety Standard. The goal of the SAG is to perform the following:

5.11.1.1. Provide a forum to openly discuss and manage software-related nuclear certification efforts and concerns.

5.11.1.2. Resolve conflicts and establish corrective action plans to meet DAFMAN 91-119 requirements.

5.11.1.3. Share best practices across developmental organizations.

5.11.1.4. Gather input from stakeholders on future software development trends.

5.11.1.5. Ensure all stakeholders understand the importance of complying with the four DoD Nuclear Surety Standards.

5.11.2. Membership.

5.11.2.1. AFSEC/SEW shall chair a SAG as required for certification efforts requiring Nuclear Safety Analysis and Technical Evaluation or Nuclear Safety Cross-Check Analysis.

5.11.2.2. The SAG shall be attended by the following members:

5.11.2.2.1. Development Organization.

5.11.2.2.2. System Program Office (SPO).

5.11.2.2.3. Independent Verification Organization.

5.11.2.2.4. Technical Advisors as approved by AFSEC/SEW.

5.11.2.2.5. Nuclear Certification Manager.

5.11.3. Responsibilities. AFSEC/SEWN shall:

5.11.3.1. Provide scheduling and logistical information regarding SAG meetings to members and advisors.

5.11.3.2. Establish and coordinate agenda, using inputs solicited from SAG membership.

5.11.3.3. Facilitate SAG Meetings.

5.11.3.4. Publish meeting minutes.

5.11.3.5. Track and staff SAG action items.

Chapter 6

NUCLEAR SURETY TAMPER CONTROL AND DETECTION PROGRAMS

6.1. Tamper Control Program. TPC is central to nuclear surety tamper control measures. It is designed to minimize and detect opportunities for a lone individual to perform an incorrect act or unauthorized procedure on a nuclear weapon, nuclear weapon system, or critical component.

6.2. TPC Requirements. The TPC minimizes the possibility that an unauthorized or inadvertent act could degrade a nuclear weapon. **Note:** TPC for a critical component may begin at the time of production or OPCERT and continue until the critical component's destruction or may occur during any interim period.

6.2.1. Clearly mark all no-lone zones at internal entry control points. Do not post signs or devices externally to identify areas, aircraft or facilities requiring TPC. **(T-1)**

6.2.2. Implement procedures to limit entry to authorized persons who meet the requirements of [paragraph 6.2.6](#). **(T-1)**

6.2.3. Enforce the TPC while performing a task or operation and continue to enforce it until relieved by authorized personnel or you have secured the nuclear weapon, nuclear weapon system, or critical component. **(T-1)**

6.2.4. Take immediate, positive steps to prevent or stop an incorrect procedure or unauthorized act. **(T-1)**

6.2.5. Report two-person deviations immediately to the appropriate supervisor. **(T-1)** **Note:** DULL SWORD reporting may be required IAW DAFMAN 91-221.

6.2.6. A TPC team consists of at least two individuals authorized by the commander and verified by their supervisor to meet the following requirements (Refer to [paragraph 6.5.1](#) for criteria on foreign nationals):

6.2.6.1. Are certified under the PRAP, as specified in DoDM 5210.42_DAFMAN 13-501 and DAFI 31-117. **(T-0)**

6.2.6.2. Know the nuclear weapons surety requirements of the task they perform. **(T-1)**

6.2.6.3. Can promptly detect an incorrect act or unauthorized procedure. **(T-1)**

6.2.6.4. Have successfully completed nuclear weapons surety training in accordance [paragraph 4.5](#). **(T-1)**

6.2.6.5. Are designated to perform the required task. **(T-1)**

6.3. TPC Violations and Reporting. All personnel are required to report a TPC violation if they detect that a lone individual in a no-lone zone has had the opportunity to tamper with or damage a nuclear weapon, nuclear weapon system, or critical component. **(T-1)** Refer to DAFMAN 91-221 for reporting guidance.

6.3.1. If TPC is maintained by more than two persons, a lone individual may be temporarily obscured from sight or not directly observed by the remaining TPC team. The TPC is not violated if the lone individual were in a location that would preclude the ability to perform an incorrect act or unauthorized procedure that could affect the nuclear weapons, the nuclear weapon system, or critical components. The TPC team shall maintain awareness of the location and justification for the lone individual to be temporarily out of sight (e.g., an individual on the PRAP or non-PRAP member under escort may enter a lavatory or other sealed compartment within a no-lone zone without continuous direct observation by the remaining TPC team as long as that compartment does not afford access as previously described). **(T-1)**

6.3.2. A momentary breach of the no-lone zone is not a violation if no individual had the opportunity to perform an incorrect act or unauthorized procedure. In performing certain tasks, team members may lose sight of each other or be far apart. One team member may be briefly out of sight to perform a specific task if it is unsafe or physically impossible to maintain constant observation.

6.4. Authorized Deviations. Deviation from the TPC is authorized when: **(T-1)**

6.4.1. The WSSRs specifically authorize a deviation.

6.4.2. An emergency presents an immediate threat to the safety of personnel or the security of a nuclear weapon, nuclear weapon system, or critical component. This type of an occurrence is to be reported to the wing weapons safety office IAW DAFMAN 91-221. War plan exercises are not considered emergencies. **Note:** Any TPC deviations in an emergency may still require reporting through DULL SWORD reporting channels IAW DAFMAN 91-221.

6.4.3. All critical components are removed from a Launch Control Point (LCP) and the Security Control Center service lift room door is monitored by one TPC qualified member, the entrance is secured with two General Services Administration approved combination locks, and at least one of the following two methods are used:

6.4.3.1. If the TPC qualified member monitoring the door is in possession of one lock combination, follow the below:

6.4.3.1.1. The maintenance team shall seal the door with a National Security Agency-provided and AFSEC approved serialized wire loop seal placed on their corresponding door hasp. **(T-1)**

6.4.3.1.2. Lock combinations for the locks described in [paragraph 6.4.3](#) shall be split between the TPC qualified member and the maintenance team throughout the duration of site maintenance. **(T-1)**

6.4.3.1.3. The maintenance team shall verify the seal serial number with an off-site entity (e.g., Secondary-LCP or unit codes flight) upon sealing and purposeful break. **(T-1)**

6.4.3.1.4. Unused seals shall not be stored or maintained on-site. **(T-1)**

6.4.3.1.5. Seals shall be issued daily to the maintenance team. **(T-1)**

6.4.3.1.6. Upon initial entry and prior to sealing the Security Control Center service lift room door, the maintenance team shall ensure the Security Control Center service lift room external access door is properly secured. **(T-1)**

6.4.3.1.7. An individual team member shall never be permitted to have knowledge of both lock combinations. **(T-1)**

6.4.3.2. If the TPC member monitoring the Security Control Center service lift room door does not possess either of the two split lock combinations, follow the below: **(Note:** In this method the LCP no-lone zone extends to the Security Control Center service lift room door.)

6.4.3.2.1. The maintenance team shall designate team members and split lock combination knowledge. **(T-1)** Split knowledge of the lock combinations shall remain in place until completion of site configuration and maintenance. **(T-1)** At no point shall an individual maintenance team member be permitted to have knowledge of both lock combinations. **(T-1)**

6.4.3.2.2. At no point shall the TPC qualified member monitoring the door be permitted to have knowledge of either lock combination for the duration of site configuration and maintenance. **(T-1)**

6.4.3.2.3. Upon initial entry and prior to securing the Security Control Center service lift room door, the maintenance team shall ensure the Security Control Center service lift room external access door is properly secured. **(T-1)**

6.5. Additional Conditions.

6.5.1. For US custodial units at allied installations, foreign nationals may be part of a TPC team if the host nation provides personnel subject to equivalent PRAPs. **Note:** When the host-nation pilot is the Sole Vouching Authority, a US custody agent or custody force member shall always be present in the exclusion areas to ensure US custody is continuously maintained until authorized release. **(T-1)**

6.5.2. TPC applies to entry control personnel into a no-lone zone. Entry controllers may not form a TPC team with personnel inside the no-lone zone. **(T-1)**

6.5.3. Couriers ensure that the host installation meets TPC requirements and no-lone zones are delineated around nuclear logistics aircraft. **(T-1)**

6.5.4. Two interim-certified individuals as defined in DoDM 5210.42_DAFMAN 13-501 may not form a TPC team. **(T-0)**

6.5.5. An interim-certified member may not pilot a single-seat aircraft loaded with nuclear weapons. **(T-1)**

6.5.6. An individual who does not qualify as a member of a TPC team may enter a no-lone zone to perform a specific task only if escorted by a TPC team. Escorts shall be capable of detecting incorrect acts or unauthorized procedures. Escort procedures shall be accomplished IAW the applicable directive(s) governing the nuclear weapon system or critical component defining the no-lone zone. **(T-1)**

6.5.7. Personnel granted DOE Sigma 14 access are prohibited from being part of a TPC team that may afford access to a nuclear weapon. **(T-0)** For additional information on DOE Sigma categories and requirements, see DoDI 3150.02.

6.5.8. Personnel with the Assignment Limitation Code “M” are prohibited from being part of a TPC team that may afford access to a nuclear weapon. **(T-0)** For additional information on Assignment Limitation Code “M,” see AFI 91-106.

6.6. Tamper Detection Indicators.

6.6.1. For certification of tamper detection indicators, the operational MAJCOM or Program Manager determines the need for tamper detection indicator application and shall send a request to AFSEC/SEW that includes the following: **(T-1)**

6.6.1.1. Identifies the critical component requiring tamper detection indicators. **(T-1)**

6.6.1.2. Justifies why a tamper detection indicator is needed. **(T-1)**

6.6.1.3. States whether the tamper detection indicator will be used in an operational system or a nonoperational environment for storage and transportation. **(T-1)**

6.6.2. AFSEC/SEW evaluates the tamper detection indicator application request and sends the approved application to the National Security Agency for development of a suitable tamper detection indicator.

6.6.3. By agreement, the National Security Agency:

6.6.3.1. Develops the appropriate tamper detection indicator based on the parameters and intended-use data provided by the operational MAJCOM.

6.6.3.2. Coordinates tamper detection indicator development with the organization having program management responsibility.

6.6.3.3. Sends the tamper detection indicator data required for application, control, storage, and inspection procedures to AFSEC/SEW for certification.

6.6.4. The requesting MAJCOM maintains responsibility for all procurement actions and costs associated with tamper detection indicator development and integration.

6.6.5. Tamper detection indicators may be used to protect the OPCERT status of critical components if sufficient justification exists for their use. Tamper detection indicators may not be used to substitute TPC control of codes, coded devices, or critical components when an operational code that cannot be overwritten passes through it or if the code component or device has no approved DECERT procedure. **(T-1)** Tamper detection indicators used in an operational system are identified in the safety rules for the affected nuclear weapon system IAW this publication.

6.7. Sealing Methods. Certain items shall be sealed because either WSSRs require it or the seals protect the OPCERT status of critical components while in storage or during transportation, as specified in [Chapter 7](#). **(T-1)** Authorized sealing methods include:

6.7.1. Safety Wiring and Sealing. Two types of seals are authorized. The first method consists of seals composed of a malleable material installed with a crimping device and controlled die to form an impressed distinctive mark or unique identifier (determined locally). The second method consists of seals applied with self-locking, non-reversible feature with a singularly unique wing identifier or serial number, as well as a color control system. Both types of seals are connected to certain switches, covers, handles, or levers. Breakage or alteration of the wire or seal provides evidence/detection of possible unauthorized acts, access, or tampering. Use this method only in no-lone zones.

6.7.1.1. Destroy all distinctive markings on malleable seals, self-locking, and non-reversible seals after removal. **(T-1) Note:** Malleable seals can be ‘destroyed’ by ensuring the distinguish markings are no longer legible. Self-locking and non-reversible seals can be destroyed by cutting the serial numbers and any wing designations into smaller pieces.”

6.7.1.2. Direct personnel to verify seal integrity immediately following installation. **Note:** For aircraft only, verify seals before and after any task or operation performed in the immediate area of the seal. Do not verify aircraft seals before an operation or task during alert crew member exercises or actual responses but do verify the seals after the exercise or alert. **(T-1)**

6.7.2. The Maintenance Squadron commander shall prescribe a course of action when an installed seal is found broken or shows evidence of tampering. At a minimum:

6.7.2.1. Coordinate with the Weapons Safety Manager for investigation of the event and mishap reporting IAW DAFMAN 91-221. **(T-1)** Refer to specific WSSRs for additional guidance.

6.7.2.2. Establish procedures to maintain control of the system until the situation is resolved. **(T-1)**

6.7.2.3. Check the integrity of the weapon system and reseal if integrity is assured. **(T-1)**

6.7.2.4. Seals broken on accident, while performing authorized actions, do not require a mishap report if TPC was not lost. However, the following actions shall be taken:

6.7.2.4.1. Personnel shall secure items per applicable guidance **(T-1)**

6.7.2.4.2. Personnel shall replace the broken seals immediately. **(T-1)**

6.7.3. Training seals shall be easily distinguished from, and shall not be used as, operational seals. **(T-1)**

6.7.4. Tamper detection indicators. If tamper indicators are used, an approved tamper detection indicator is placed so it shall indicate if someone has activated or had access to the interior of a critical component. **(T-1)** Once the tamper detection indicator is installed, evidence of tampering shall be visible to the naked eye or can be detected using special equipment. Tamper detection indicators and other authorized sealing methods proposed for use in nuclear weapons systems shall be properly nuclear certified prior to use.

Chapter 7

CRITICAL COMPONENTS

7.1. Critical Components. The critical components of a nuclear weapon system(s) are those that if bypassed, activated, or tampered with could result in, or contribute to, deliberate or inadvertent authorizing, pre-arming, arming, release or launch of a delivery vehicle carrying a nuclear weapon, or the employment of a nuclear weapon against anything other than an authorized target.

7.1.1. Critical Components are designated by AF/SE.

7.1.2. For NSDC of critical components, the Program Manager shall develop OPCERT and DECERT procedures for critical components and send the procedures to AFSEC/SEW for approval. **(T-1)** The procedures shall meet the following requirements:

7.1.2.1. These procedures shall adequately verify the system or component functions as design certified. **(T-1)**

7.1.2.2. These procedures shall adequately mitigate all identified vulnerabilities identified by Unauthorized Launch, Threat Mitigation, and Launch Action Studies per AFI 91-106. **(T-1)**

7.1.3. The goal for programs is to design a system without Critical Components. However, if that cannot be done, TPC in combination with OPCERT provides the level of confidence and trust required for nuclear operations.

7.2. Designating Critical components.

7.2.1. Items designated as a critical component shall be clearly identified as a critical component in the MNCL. **(T-1)**

7.2.2. The National Security Agency may request critical component designation for National Security Agency-produced computer systems, programmable logic devices, software and hardware used with a nuclear weapon or nuclear weapon systems. The National Security Agency provided computer systems, programmable logic devices, software and hardware items receive certification equal to that provided by the Air Force; therefore, do not need additional Air Force design certification.

7.3. OPCERT and DECERT of Critical Components.

7.3.1. OPCERT and DECERT are distinctly different from the Operational Certification or Operational Decertification as it relates to Nuclear Certification. OPCERT and DECERT only applies to the critical components of a nuclear weapon system as identified per this publication, after completion of the Nuclear Certification Process. OPCERT and DECERT procedures are captured by Technical Orders for the applicable nuclear weapon system.

7.3.2. Critical components require OPCERT before use in operational systems to verify the component is functioning as design certified. Certain critical components also require specific procedures for DECERT. (Refer to this publication and AFI 91-106 for details on OPCERT and DECERT.)

7.3.3. Critical components that have been improperly stored or not maintained IAW this publication require DECERT if the resulting investigation does not positively rule out tampering. DECERT is also required if a critical component is connected to an uncertified interface (i.e., not certified via OPCERT procedures or through NSDC approval as described in this publication).

7.3.4. MAJCOMs may DECERT critical components if they use approved DECERT procedures (when applicable) and the intended life cycle for the critical component does not specifically prohibit DECERT.

7.4. Marking Critical Components. Organizations possessing critical components shall:

7.4.1. Affix the label or tag to the outside of the critical component and the component's shipping container, except Intercontinental Ballistic Missile (ICBM) code components which shall be tagged while outside of shipping containers. **(T-1)**

7.4.2. Cover the label or tag when the component is not certified for operational use. **(T-1)**

7.4.3. Ensure no external markings are made which identify areas, facilities, aircraft, or equipment as containing critical components (e.g., adding identifying paint stripe). **(T-1)**

7.5. Shipping Requirements. If using a TPC team or National Security Agency approved tamper detection indicators to protect certification status during transport operations, use the DoD courier processes identified in DoDM 5200.01V3_DAFMAN 16-1404V3, Information Security Program: Protection of Classified Information. **(T-0)**

7.6. Storage Requirements and Operational Use of Critical Components. These storage requirements apply to certified critical components. Decertified critical components require storage conditions meeting security classification requirements, IAW CG-W-5, *Joint DOE/DoD Nuclear Weapons Classification Policy Guide*. **(T-1)**

7.6.1. Maintaining any critical component under continuously manned, Two-Person Concept (TPC) protection alone is sufficient to ensure nuclear surety standards are maintained. **(T-1)**

7.6.1.1. Method 1. Store components in an approved reinforced concrete vault or storage container and apply the following: **(T-1)**

7.6.1.1.1. Store the component in a no-lone zone. **(T-1)**

7.6.1.1.2. Secure every entrance to the no-lone zone with two General Services Administration General Field Service Padlocks, or a General Services Administration approved combination lock which requires two separate combinations to be dialed out for it to be unlocked ensuring no lone individual can gain access to the no-lone zone. **(T-1)**

7.6.1.1.3. Use volumetric motion detectors and door detectors with the capability to cover all facility openings greater than 96 square inches; all detectors shall report independently to a remote, continuously staffed location. **(T-1)**

7.6.1.1.3.1. Incorporate a line supervision scheme within the alarm reporting circuits for the storage area that detects tampering and reports it to the remote monitoring facility. **(T-1)**

7.6.1.1.3.2. Keep at least one person focused on physical security functions at the alarm monitor location. **(T-1)**

7.6.1.2. Method 2. Protect components with tamper detection indicators approved IAW **Chapter 6**. **(T-1)**

7.6.2. If TPC is not maintained by personnel handling, the following two alternate methods may be used to store critical components **(T-1)**:

7.6.2.1. Method 1. Store components in a GSA-approved storage container, or a vault, room, or area approved for use IAW DoDM 5200-V3_AFMAN 16-1404V3 *Information Security Program: Protection of Classified Information*, and apply the following: **(T-1)**

7.6.2.1.1. Store the component in a no-lone zone. **(T-1)**

7.6.2.1.2. Secure every entrance to the no-lone zone with two General Services Administration General Field Service Padlocks, or a General Services Administration approved combination lock which requires two separate combinations to open, ensuring no lone individual can gain access to the no-lone zone. **(T-1)**

7.6.2.1.3. Use volumetric motion detectors and door detectors with the capability to cover all facility openings greater than 96 square inches; all detectors shall report independently to a remote, continuously staffed location. **(T-1)**

7.6.2.1.3.1. Incorporate a line supervision scheme within the alarm reporting circuits for the storage area that detects tampering and reports it to the remote monitoring facility. **(T-1)**

7.6.2.1.3.2. Keep at least one person focused on physical security functions at the alarm monitor location. **(T-1)**

7.6.2.2. Method 2. Protect components with tamper detection indicators approved IAW **Chapter 6**. **(T-1)**

7.6.3. Protect the components as their classification warrants. **(T-1)** See EAP-STRAT Volume 16, for procedures concerning code components.

Chapter 8

TROUBLESHOOTING AND MAINTENANCE OPERATIONS

8.1. Introduction. Weapon system designers shall apply safety criteria established by the DoD and Air Force when developing technical orders or other certified procedures for troubleshooting and maintaining loaded nuclear weapon systems (e.g., a delivery vehicle with one or more nuclear weapons mechanically and electrically connected in a normal operational configuration or Weapon Storage and Security System with one or more nuclear weapons mechanically and/or electrically connected in a normal storage configuration). Field-level maintenance personnel shall use these criteria to perform troubleshooting and maintenance operations.

8.1.1. Nuclear weapons shall not be used for troubleshooting (i.e., to confirm the existence of a fault, aid in fault isolation, or verify that a fault has been corrected) except as explicitly allowed by specific safety rules and technical data. **(T-0)**

8.1.2. Nuclear weapons shall not be used for training except as explicitly allowed by a specific safety rule and technical data. **(T-0)**

8.1.3. Implement procedures and plans to direct personnel to cease all weapon operations and take appropriate safety precautions (e.g., personnel evacuation, termination of weapons operations, equipment shut down, consider security/custody personnel lightning exposure during explosive maintenance operations planning) when lightning is within 10 miles or if there are indications of a possible strike and weapons operations are not within a facility protected by an operational LPS. Operations may resume when electrical storms are beyond 10 miles or if a Lightning Warning System sensor show positive indications that hazards from lightning have passed. If the Lightning Warning System cannot provide information to determine local lightning conditions, operations shall not resume until 30 minutes after the last indication of lightning within 5 miles. **(T-1)**

8.2. Faults. The primary consideration is to ensure the system is safe and weapons are not subjected to inadvertent power application or control signals when a fault occurs on a loaded nuclear weapon system.

8.2.1. Nuclear System Faults. Personnel shall cease current operation and take appropriate actions to identify, locate, and correct the fault if permitted IAW technical guidance when a nuclear system fault occurs on a loaded nuclear weapon system. **(T-1)**

8.2.2. Personnel shall positively identify faults before declaring them non-critical. **(T-1)** Treat the fault as critical if the built-in test system's fault identification is ambiguous or inconclusive or if personnel cannot confidently assess the potential hazards associated with corrective actions. **(T-1)** The SPO determines whether the system fault is critical by conducting a technical assessment of its potential impact on the nuclear weapons or the weapon system's primary nuclear safety features and the possible hazards associated with troubleshooting the fault. The SPO's determination is the basis for any technical order procedure that permits troubleshooting.

8.2.3. Troubleshooting procedures shall use built-in test system capabilities, rather than determinations by field-level personnel, to identify faults and use only initial fault detection data to identify the fault and prohibit diagnostic testing to identify the fault while nuclear weapons are electrically mated. **(T-1)** When faults occur that personnel cannot identify by using approved procedures, the operating MAJCOM shall provide guidance after consulting with the SPO, AFGSC/A4Z, and AFSEC/SEW.

8.2.4. Before developing troubleshooting procedures, the SPO shall delineate specific instructions for each built-in test system fault that verifies the reliability and accuracy of built-in test data, assesses the potential consequences of the actions for each fault to assure troubleshooting shall not adversely impact nuclear safety, and request evaluation and approval from AFSEC/SEW before troubleshooting non-critical faults.

8.2.5. Non-critical Faults. Nuclear weapons may remain electrically mated during troubleshooting operations for faults that the SPO has determined to be non-critical. Every attempt shall be made to isolate the weapons unless isolating the weapons causes a severe operational impact. **(T-1)**

8.2.6. Before developing troubleshooting procedures, the SPO shall delineate specific instructions for each built-in test system fault that verifies the reliability and accuracy of built-in test data, assesses the potential consequences of the actions for each fault to assure troubleshooting shall not adversely impact nuclear safety, and request evaluation and approval from AFSEC/SEW before troubleshooting non-critical faults.

8.3. Critical Faults.

8.3.1. Critical Faults. For critical faults, personnel shall isolate the affected nuclear weapons from the critical fault before initiating troubleshooting. **(T-0)** The method of weapon isolation depends on the type of fault and the potential for inadvertent application of power or control signals to the weapon interface. Methods to isolate weapons include: downloading the weapon(s); demating the electrical signal lines to the weapon(s) and making the release system mechanically safe; demating the electrical signal lines to both the weapon(s) and the release system.

8.3.2. Personnel shall treat any nuclear system fault that prevents electrical monitoring of the nuclear weapon's status as critical. **(T-1)** This condition includes hardware and software failures that prevent execution of the monitoring function and failures that prevent proper display of the results of a monitoring function.

8.3.3. If authorized procedures are insufficient or inappropriate or if uncertainty exists about nuclear weapon system impacts or the proper maintenance response, the operating MAJCOM shall:

8.3.3.1. Consult with AFGSC/A4Z through the Unsatisfactory Reports system to determine the appropriate course of action. **(T-1)**

8.3.3.2. Declare weapons non-operational that could have been affected by the fault. **(T-1)**

8.3.3.3. Keep weapons in non-operational status and do not load them on delivery vehicles until authorized by AFGSC/A4Z. **(T-1)**

8.3.3.4. Prohibit performance of electrical checks on these weapons unless directed by AFGSC/A4Z or until the original fault is resolved and the weapons have been returned to operational status. **(T-1)**

8.3.4. Nuclear weapons shall remain isolated until the fault is identified, located, corrected, or the fault is isolated to a pylon, bomb rack unit, or nuclear weapon delivery vehicle. **(T-1)** Only then can the weapon system be operationally returned to service. The faulty pylon, bomb rack unit, or nuclear weapon delivery vehicle shall not be loaded with a nuclear weapon until the fault is corrected. **(T-1)**

8.4. Allowable Operations. Weapon system designers shall define allowable troubleshooting and maintenance operations for loaded nuclear weapon systems in applicable weapon system technical orders or other certified procedures. **Note:** Troubleshooting does not include replacing the "most likely to fail" item when personnel replace the item using approved technical data. Troubleshooting and maintenance operations shall:

8.4.1. Prohibit using any nuclear weapons as a troubleshooting tool. **(T-0)**

8.4.2. Only use nuclear certified equipment listed in the MNCL or common use items, as identified in this publication. **(T-0)**

8.4.3. Adhere to applicable nuclear WSSRs and approved technical procedures. **(T-0)**

8.4.4. In event of a critical fault, immediately isolate nuclear weapons from the potential hazard(s). Maintain appropriate safety and physical security of the nuclear weapons. **(T-1)**

8.5. Nuclear Operations in Explosive Storage Spaces. Additional requirements can be found in DESR 6055.09_DAFMAN 91-201 and AFMAN 21-204 para 5.1.2.9.

8.5.1. Conduct nuclear weapons maintenance in a weapons storage vault configured HAS or PAS consistent with applicable WSSRs. **(T-1)**

8.5.2. Permissive action link operations, minor surface repair, cleaning, or stenciling of weapons or containers is authorized for nuclear weapons in any explosives storage space IAW applicable weapons system safety rules (WSSRs) and technical procedures. **(T-0)**

8.6. Operations Outside of Certified Technical Data. The MAJCOM using the procedures shall consult with the SPO, AFNWC, and AFSEC/SEW if authorized procedures do not adequately address the specific fault. **(T-0)**

8.7. Field-level Maintenance Personnel. Field-level maintenance personnel shall not perform maintenance operations that affect the nuclear weapon system's structural, propulsion, electrical, or hydraulic power systems unless the Air Force has established specific procedures for these operations. **(T-1)** The purpose of this restriction is to protect against the possibility of exposing nuclear weapons to an adverse environment, particularly if a safety-related incident occurs.

Chapter 9

NUCLEAR DELIVERY VEHICLE SPECIFIC PHILOSOPHY AND REQUIREMENTS

9.1. Criteria Unique to Aircraft Systems.

9.1.1. When personnel cannot identify the cause of a fault, the unit shall receive authorization from the operating MAJCOM to return the aircraft to mission capable status. **(T-1)** Upon receipt of proper command authority, the aircraft may be declared mission capable if each of these conditions are met:

9.1.1.1. A substitute aircraft is not available. **(T-1)**

9.1.1.2. Nuclear WSSRs and technical order restrictions are not violated. **(T-1)**

9.1.1.3. The fault is isolated to either specific weapon stations or a component associated only with those stations and the faulty stations are not loaded. **(T-1)**

9.1.1.4. The fault cannot cause or contribute to a critical fault on any loaded station. **(T-1)**
Note: As used here, "station" refers to an individual weapon location rather than a carriage store or launcher connection.

9.1.1.5. Competent authority (not lower than the maintenance group commander or equivalent) approves the loading. **(T-1)**

9.1.2. Mechanical Mating Problems.

9.1.2.1. Visually verify no obvious damage exists to electrical connections with the aircraft nuclear system before proceeding with the loading operation when a mechanical mating problem occurs that prevents load completion. **(T-1)**

9.1.2.2. If resolving the mechanical problem does not involve the aircraft nuclear system (for example, an out-of-adjustment bomb rack rigging or a physically incompatible pullout cable), proceed with the loading operation after correcting the mechanical problem. **(T-1)**

9.1.2.3. If resolving the mechanical problem requires removing and replacing or reinstalling a component in the aircraft nuclear system, return the aircraft to mission capable status after correcting the mechanical problem. **(T-1)**

9.1.2.4. If mechanical mating problems lead to potential aircraft or weapon damage, complete applicable technical order inspection procedures prior to subsequent mating. **(T-1)**

9.1.3. Electrical Power Application. Keep application of electrical power to a loaded nuclear aircraft to a minimum. **(T-1)**

9.1.4. Minor Maintenance. Perform only minor maintenance and operational checks not related to the nuclear weapon interface according to approved technical data and the nuclear WSSRs. **(T-1)** Examples of these operations include preflight checks, aircraft servicing, aircraft towing, fuel management actions, operational checks of lighting, navigation, radar, and communications systems, and load software into aircraft control processors prior to application of monitor power.

9.1.5. Non-nuclear System Faults. When a fault occurs outside the nuclear system on a loaded nuclear aircraft, personnel shall perform corrective actions according to specific aircraft technical orders. **(T-1)** When corrective actions for a non-nuclear fault require personnel to demate weapons, personnel shall perform all post-load electrical and mechanical checks after re-mating the weapons. **(T-1)** The aircraft remains mission capable.

9.1.6. Prohibited Maintenance. Observe the restrictions described in Technical Order 11A-1-33, *Handling and Maintenance of Explosive Loaded Aircraft*. In addition, personnel shall not conduct these specific maintenance actions on loaded nuclear aircraft: **(T-1)**

9.1.6.1. Aircraft engine and Alternate Power Unit changes. **(T-1)**

9.1.6.2. Landing gear maintenance requiring fuselage jacking. **(T-1)**

9.1.6.3. Major structural repair. **(T-1)**

9.1.6.4. Disruptions to fuel system, with the exception of fuel management operations (i.e., topping-off) associated with keeping an aircraft mission ready. **(T-1)**

9.1.6.5. Repairing the launcher primary structure or any other structure that directly supports the loaded nuclear weapon or nuclear weapon system. **(T-1)**

9.2. Criteria Unique to Ground-Launched Missile Systems.

9.2.1. Ground-Launched Missile System Philosophy and Description. Ground-launched missile systems, or ICBM systems are unique because of the geographical separation between the operator and the nuclear weapon and are continuously mated with a nuclear weapon while on alert status. The separation of operators and the nuclear weapon makes it critical operators can detect and respond to unauthorized attempts to access the nuclear weapon from anywhere within the nuclear weapon system.

9.2.2. The launch control system consists of the hardware, firmware, software, weapon system infrastructure, and secure codes the weapon system uses to authorize a missile launch and launch of the missile. The separation of Launch Control Points and Launch Points makes it critical operators can detect and defeat unauthorized attempts to launch from anywhere within the weapon system.

9.2.2.1. Launch Control Point. The LCP is manned by operators who are responsible for:

9.2.2.1.1. Transmitting unambiguous human intent for critical function activation.

9.2.2.1.2. Continuously monitor the nuclear weapons in their custody.

9.2.2.1.3. Accomplish timely compensatory actions when unauthorized status is received.

9.2.2.2. Launch Point (LP). The LP is the facility containing the delivery vehicle and secures the nuclear weapon until it is launched. The LP ensures the launch of a missile only occurs through the intentional operation of the authorization and launch systems after unambiguous human intent has been validated.

9.2.3. System Limitations. Due to the geographical separation between the human (e.g., operators, maintainers), the nuclear weapon, and nuclear weapon storage facilities (e.g., LCP ground-launched missile systems rely on procedural controls to maintain nuclear surety). The following are examples of procedural controls:

9.2.3.1. TPC (which includes PRAP).

9.2.3.2. No-Lone Zones.

9.2.3.3. Using approved procedures, which includes NSP.

9.2.3.4. OPCERT/DECERT of Critical Components.

9.2.3.5. Do not use nuclear weapons for training or troubleshooting.

9.2.3.6. Do not use nuclear weapons in exercises or system-level testing that could generate critical functions.

9.2.4. Monitor and Compensatory Action. A key design feature of a ground-launched missile system is the ability to monitor the status of all LCPs and LPs that are electrically connected. The geographical separation between operators and the nuclear weapon is mitigated by at least two LCPs continuously monitoring LPs to detect and respond to status changes. Compensatory actions mitigate unauthorized critical functions or attempts to access the nuclear weapon system or critical functions. Compensatory actions can be initiated by the operator or automatically.

9.2.5. Approved Procedures. Remove the reentry system before proceeding if maintenance personnel cannot identify the fault by using approved procedures. **(T-0)**

9.2.6. Prohibited Procedures on Loaded Nuclear Missiles. Do not conduct these maintenance operations on a loaded nuclear missile system:

9.2.6.1. Welding operations in or on the launcher (unless specifically authorized by the SPO). **(T-1)**

9.2.6.2. System-level testing that could inject critical commands. **(T-1)**

9.2.6.3. Use of uncertified test equipment. **(T-0)**

9.2.6.4. Suspension system work (except minor servicing or repair). **(T-1)**

9.2.6.5. Ordnance testing or activation. **(T-0)**

9.3. Internal Weapons Components. Maintenance operations involving nuclear weapons where contact with internal weapon components is possible shall only be conducted in maintenance facilities or nuclear safety design certified maintenance vehicles (i.e., Secure Transportable Maintenance System). The following apply when conducting maintenance operations:

9.3.1. Alternating Current (AC) Devices. Use of portable AC devices (i.e., AC powered tools and equipment) is prohibited unless specifically authorized by technical orders. **(T-1)**

9.3.2. Direct Current (DC) Devices. Use of portable DC devices (e.g., battery powered tools and equipment including but not limited to cameras, flashlights, measurement devices) inside or directly above nuclear weapons supporting weapon maintenance operations where contact with installed or uninstalled internal weapon components is possible (e.g., limited life component exchange, alterations, special procedures, modifications) is only authorized when: **(T-1)**

9.3.2.1. DC Devices specifically authorized by technical orders and/or provided by the DOE, National Nuclear Security Administration. **(T-1)**

9.3.2.2. DC Devices shall meet all the following criteria:

- 9.3.2.2.1. No electromagnetic radiation emitter (e.g., Bluetooth technology, cellular signaling, or Wi-Fi). **(T-1)**
- 9.3.2.2.2. Has a voltage of less than 50 volts. **(T-1)**
- 9.3.2.2.3. Is in a serviceable condition without exposed conductors or wiring. **(T-1)**
Rechargeable devices with exposed contacts (which are for ease of charging at a station) batteries, or any equipment with a charged conductive surface are prohibited.
Note: Those having sealed inductive charging capabilities are allowed.
- 9.3.2.2.4. Direct contact between DC devices and weapon-exposed conductors or electrical connector pins is prohibited unless specifically authorized by technical orders. **(T-1)**
- 9.3.2.3. A list of DC powered devices meeting [paragraph 9.3.2.2](#) criteria may be maintained by the MAJCOM to help units identify which DC powered devices have been authorized for use.

Chapter 10

AIR FORCE NUCLEAR SAFETY DESIGN DEVIATIONS

10.1. Introduction. This publication is not an all-encompassing guide for risk assessment and management for nuclear weapon system environmental, safety, occupational, and health risks. For guidance on assessing and managing additional risk consult AFI 90-802, MIL-STD-882E, DoD Instruction (DoDI) 5000.02, *Operation of the Adaptive Acquisition Framework*, DAFI 63-101/20-101, and 91-202.

10.1.1. Inability to meet a requirement described in DoDM 3150.02 *DoD Nuclear Weapon System Safety Program Manual*, or other Department of Defense-level requirements requires submittal of a waiver package IAW DoDM 3150.02.

10.1.2. Safety design criteria described in DAFMAN 91-118 and DAFMAN 91-119 are intended to reduce the probability of the occurrence of an event with nuclear-scale consequences such that the aggregate risk is reduced as much as possible, and consistent with Department of Defense Nuclear Surety Standards.

10.1.3. Inability to meet safety design criteria described in DAFMAN 91-118, and DAFMAN 91-119 requires a nuclear safety design deviation as described in this chapter. **(T-0)**

10.1.4. Security Forces units shall follow the nuclear security deviation process as outlined in DoDM S-5210.41 AFMAN 31-108-S in lieu of the deviation process described in this chapter. **(T-0)**

10.2. The Air Force Nuclear Safety Design Deviation Program.

10.2.1. This chapter provides a methodology for commands with a nuclear mission to determine any adverse impacts to nuclear weapons surety derived from deviations to nuclear safety design policy and guidance. The scope of the Air Force Nuclear Safety Design Deviation Program ascertains the risk accepted by the appropriate approval authority.

10.2.2. Nuclear Safety Design Deviations are used to communicate an inability to meet design criteria during the lifecycle of a nuclear weapon system and identifies a specific departure(s) from DAFMAN 91-118 or DAFMAN 91-119 requirements as they relate to nuclear safety design.

10.3. Safety Design Deviation Approval Authority.

10.3.1. For all Safety Design Deviations, except as noted in [paragraph 10.3.2](#), the lead MAJCOM commander as designated IAW DAFFD 10-9, *Lead Command/Lead Agent Designation and Responsibilities for United States Air Force Weapon Systems, Non-Weapon Systems, and Activities* is the approval authority. Using commands shall coordinate and concur throughout the deviation approval process, as necessary. **(T-1)**

10.3.2. For Technical Deviations the Air Force Chief of Safety is the approval authority. See [paragraph 10.4.3](#) for more information on equivalency determination. MAJCOMs may specify higher MAJCOM approval authority in a supplement to this publication. Program Offices shall ensure the deviation approval process is followed in accordance with [paragraph 10.5](#).

10.3.3. The MNCL managed by AFNWC is not a risk acceptance tool. Restrictions identified on the MNCL are to identify and mitigate nuclear certified items from usage until the proper risk acceptance process can be accomplished. Anyone can submit a restriction for any reason as an avenue of identifying a risk or shortfall in design and precluding that item from nuclear use.

10.4. Nuclear Safety Design Deviation Categories.

10.4.1. Permanent. A Permanent deviation is a departure from a safety design requirement that creates a potential nuclear surety vulnerability, and the corrective actions required to fully comply with safety design criteria are either not feasible or not cost effective. Permanent deviations require compensatory measures, need only be approved once, and do not require an expiration date. A compensatory measure can be a technical solution, or a procedural one (e.g., a Weapon System Safety Rule). **(T-1)** The lead MAJCOM shall review permanent deviations for validity annually, and whenever criteria or conditions change that may positively or negatively affect them. **(T-1)**

10.4.2. Temporary. A Temporary deviation is a departure from a safety design requirement that creates a potential nuclear surety vulnerability, and a corrective action has been identified but not yet implemented. Temporary deviations shall be approved for a period not to exceed 12 months. Temporary deviations require compensatory measures. A compensatory measure can be a technical solution, or a procedural one (e.g., a Weapon System Safety Rule). **(T-1)**

10.4.3. Technical. A Technical deviation is a departure from a nuclear weapons system related safety design requirement that meets an equivalent level of nuclear weapons surety. Isolated technical deviations do not create vulnerabilities, do not require compensatory measures, and may be approved for an indefinite period. In some cases, if a technical deviation is approved, AFSEC/SEW will update safety design requirements to incorporate the valid method of compliance. **(T-1)**

10.5. Submission Process for Nuclear Safety Design Deviations. Deviations related to the design of a nuclear weapon system shall follow established processes IAW AFI 10-601, *Operational Capability Requirements Documentation and Validation*, DAFI 63-101/20-101, DAFI 63-125, DoDM 5030.55 AFMAN 63-103, *DoD Procedures for Joint DoD-Department of Energy/National Nuclear Security Administration (DOE/NNSA) Nuclear Weapon Life-Cycle Activities* and this publication. **(T-0)**

10.5.1. For systems under development, if criteria in DAFMAN 91-118 or DAFMAN 91-119 cannot be met, the Program Manager shall initiate a deviation. **(T-0)**

10.5.2. Currently certified weapon system deviations shall be initiated by the MAJCOM Deviation Reporting Program OPR or at the wings/installation level. **(T-1)** This includes essential facility systems that have become non-operational or inoperable. **Note:** Deviation requests are not required for an existing operational system or component that does not meet current surety criteria implemented after the system or component received its original operational certification. When modifying an existing system or component, current surety criteria will apply, and deviation requests are required as applicable.

10.5.3. MAJCOMs or Program Offices shall ensure deviation requests receive a technical review prior to routing for further approval. **(T-1)** The MAJCOM Deviation Reporting Program OPR shall include pertinent Numbered Air Force/Center organizations in the overall staffing process as mandated by MAJCOM policy. **(T-1)**

10.5.4. Deviation Technical Review. The technical review for currently certified systems and facilities should be conducted at the action officer level. The technical review for systems under development shall be conducted by the Program Manager's Office or equivalent level for facilities. **(T-1)** This ensures a thorough review of the deviation package and if applicable, collective deviations on a singular system do not establish an overall system vulnerability greater than the designated compensatory measures.

10.5.4.1. The technical review shall provide a quantified risk, establishing the probability of violating a DoD Nuclear Surety Standard or nuclear safety design requirement, and to ensure the equipment does not impose abnormal environments, inadvertently provide unintended signals, or aid in providing unauthorized signals to the weapon. If unable to provide a quantifiable probability, a qualified risk with potential outcomes affecting nuclear surety shall be provided. **(T-1)** If any supplementary risk acceptance methodologies, such as AFI 90-802 or MIL-STD-882E, as appropriate, were used they shall also be annotated in the technical review. **(T-1)**

10.5.4.2. Technical reviews shall also identify compensatory measures utilized to reduce overall risk of not complying with safety design criteria. **(T-1)**

10.5.4.3. The intent of the compensatory measure is to mitigate risk to a lower level, and, in some cases, two or more measures must be used to reduce the risk to an acceptable level.

10.5.5. Additional deviation package requirements. In addition to the technical review, deviations packages shall contain the following information:

10.5.5.1. Analysis of Alternatives. Provide a rationale for why the deviation is required, what is driving the current safety design non-compliance, and what the cost is (in dollars and/or time) to comply with the safety design requirement. **(T-1)**

10.5.5.2. An expected "fix date" if actions are being undertaken to comply with safety design requirements. **(T-1)**

10.5.5.3. Identification of other deviations approved or submitted on the system or requirement. **(T-1)**

10.5.6. Deviation Package Routing.

10.5.6.1. Air Force Nuclear Safety Design Deviations shall be processed via DAF Form 116A and shall be submitted through the applicable MAJCOM Deviation Reporting Program OPR. **(T-1)** The MAJCOM Deviation Reporting Program OPR should establish a process to ensure necessary formal staff coordination for formal MAJCOM approval in accepting the risk of the deviation, if required. Technical deviations approved by AF/SE will be sent to MAJCOMs for incorporation into their respective annual deviation report. See [paragraph 10.3.2](#) for technical deviations approvals.

10.5.6.2. Deviations submissions shall adhere to the following naming convention: CY/Weapon System/Originator/Deviation Type/three place sequential number per originator. **(T-1)** Specifically, two-digit calendar year/ the airframe, missile, or Essential Facility System/ TEMP, or PERM/ three-digit sequential number. For example: 23F35TECH001, 23EFSTEMP002, or 23MMIIIPERM003.

10.5.6.3. MAJCOM Deviation Reporting Program OPR shall ensure the technical review is completed and compensatory measures identified as required prior to submission to AFSEC/SEW for independent risk assessment and concurrence. **(T-1)**

10.5.6.4. As part of the formal staff coordination, the DAF Form 116A shall be routed through AFSEC/SEW for an independent risk assessment and shall annotate on the DAF Form 116A any additional risk or technical analysis determined to affect nuclear surety not currently captured. AFSEC will annotate review on the DAF Form 116A. **(T-1)**

10.5.6.5. Once approved, a copy of the final signed nuclear safety design deviation package shall be forwarded to the MAJCOM Deviation Reporting Program OPR to update tracking status and routing to AFSEC/SEW. **(T-1)**

10.5.7. The DAF Form 116A process does not alleviate the requirement to document the deviation, risk, risk assessment, mitigations, and formal risk acceptance in the NSE as specified in DAFI 63-125 and AFI 91-102.

10.6. Deviation Cancellation.

10.6.1. The deviation originating agency/unit must submit a new DAF Form 116A summarizing the corrective actions and request cancellation of the deviation to the MAJCOM Deviation Reporting Program OPR. **(T-1)** MAJCOM Nuclear Safety Design Deviation OPR shall ensure this process conforms to all MAJCOM coordination policy directives. **(T-1)**

10.6.2. Following a technical review, the MAJCOM Design Deviation Reporting Program OPR shall ensure the nuclear safety design deviation request receives formal coordination IAW [paragraph 10.5](#). **(T-1)**

10.6.3. Following MAJCOM commander approval, the MAJCOM Deviation Reporting Program shall update the tracking status and route approved cancellation package to AFSEC/SEW, except for technical deviations. **(T-1)**

10.7. Updated Nuclear Safety Design Requirements. AFSEC/SEW shall update DAFMAN 91-118 and DAFMAN 91-119, and other safety criteria on a continuous basis IAW DAFI 90-160, and to account for updated and emerging technology and threats. **(T-1)**

10.7.1. For systems under development and without an approved CRP, updated and published safety design requirements shall apply. **(T-1)** The deviation process should be initiated as soon as possible for any item not expected to comply with nuclear safety design requirements. This gives the lead command authority the ability to assess any updated identified risk to nuclear surety.

10.7.2. When modifying an existing and certified system or component, current safety design requirements will apply, and deviation requests are required as applicable. **(T-1)**

10.7.3. When safety design requirements are updated, AFSEC/SEW, in coordination with the SPO and lead command of systems with an approved CRP, shall conduct a risk analysis to bring to the attention of the MAJCOM commander any item found to contain a newly identified risk to nuclear surety in order to recommend compensatory measures, other mitigations, and/or apply restrictions, as appropriate. **(T-1)**

10.7.4. IAW DoDM 3150.02 and AFI 91-102, the Air Force Nuclear Weapons System Surety Group shall conduct periodic Operational Safety Reviews on certified nuclear weapon systems to examine the adequacy and suitability of the nuclear weapon system's design safety and security features and may recommend updated WSSRs or other mitigations. **(T-0)** During these periodic reviews, current safety design criteria and existing, approved safety design deviations will be considered for overall risk management. **(T-0)**

Chapter 11

ANNUAL NUCLEAR SURETY REPORT

11.1. Overview. The Annual Nuclear Surety Report provides DAF leadership information on the trends and health of the Air Force Nuclear Surety program.

11.2. Timeline. AFSEC/SEW shall consolidate and produce an annual nuclear weapons surety report, with a semi-annual update providing an overall analysis and assessment of impacts to nuclear weapons surety. **(T-1)** The report shall consist of various inputs, including quarterly DULL SWORD and other deficiency reports (see DAFMAN 91-221), semi-annual Nuclear Surety Staff Assistance Visit Report Summaries (see AFI 91-121, *Nuclear Surety Staff Assistance Visit Program*), nuclear safety design and security deviations, Operational Safety Reviews or other NWSSG reports as applicable, and any other information deemed pertinent to nuclear surety.

11.2.1. AFSEC/SEW shall provide a template for safety design deviation inputs for MAJCOMs by 15 October of the reporting year for any inputs needed. **(T-1)**

11.2.2. MAJCOMs shall submit their annual safety design deviations with a remediation plan inputs no later than 15 March to AFSEC/SEW. **(T-1)**

11.2.3. AF/A4S shall submit a summary of security deviations with a remediation plan no later than 15 March to AFSEC/SEW. **(T-1)**

11.2.4. MAJCOMs shall submit Nuclear Surety Staff Assistance Visit, and DULL SWORD and other deficiency information as required by AFI 91-121 and DAFMAN 91-221 no later than 15 March. **(T-1)**

11.2.5. AFSEC/SEW will consolidate MAJCOM, AF/A4S, and AFSEC/SEW approved reports, and remediation plan(s), if applicable. **(T-1)** AFSEC/SEW will evaluate the impacts to nuclear weapons surety and provide an overall analysis of surety issues report to AF/SE, MAJCOM/FIELD COMs, and other DAF agencies as appropriate by 15 April. **(T-1)**

11.2.6. AFSEC/SEW shall provide a semi-annual update consisting of any new items that require attention during the reporting period as appropriate by 15 November. **(T-1)**

MICHAEL A. THOMAS
Colonel, USAF
Acting Air Force Chief of Safety

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

CJCSI 3263.05F, *Nuclear Weapons Technical Inspections*, 20 January 2024

CG-W-5, *Joint DoE/DoD Nuclear Weapons Classification Policy Guide*, 25 August 2017

DoDD 5210.41, *Security Policy for Protecting Nuclear Weapons*, 22 January 2015

DoD S-5210.92M, *Physical Security Requirements for Nuclear Command and Control (NC2) Facilities*, 26 August 2010

DoDI 3150.02, *DoD Nuclear Weapon Systems Surety Program*, 17 December 2024

DoDI 4540.05, *DoD Transportation of U.S. Nuclear Weapons*, 23 June 2011

DoDI 5000.02, *Operation of the Adaptive Acquisition Framework*, 23 January 2020

DoDM 3150.02, *DoD Nuclear Weapon System Safety Program Manual*, 17 December 2024

DoDM 5030.55_AFMAN 63-103, *DoD Procedures for Joint DoD-Department of Energy/National Nuclear Security Administration (DOE/NNSA) Nuclear Weapon Life-Cycle Activities*, 10 August 2018

DoDM 5200.01V3_DAFMAN16-1404V3, *Information Security Program: Protection of Classified Information*, 6 April 2022

DoDM 5210.42_DAFMAN13-501, *Nuclear Weapons Personnel Reliability Program (PRP)*, 3 April 2024

DoDM S-5210.41_AFMAN 31-108-S, *Nuclear Weapon Security Manual*, 11 July 2023

DOE O 452.1E, *Nuclear Explosive and Weapon Surety Program*, 26 January 2015

EAP-STRAT, Volume 16, *ICBM Code Component Control Policy and Procedures*, 1 December 2016

MIL-STD-38784, *General Style and Format Requirements for Technical Manuals*, 16 November 2020

MIL-STD-882E, *System Safety*, 27 September 2023

HAFMD 1-46, *Chief of Safety*, 9 November 2021

DAFPD 10-9, *Lead Command/Lead Agent Designation and Responsibilities for United States Air Force Weapon Systems, Non-Weapon Systems, and Activities*, 25 May 2021

AFPD 13-5, *Air Force Nuclear Mission*, 17 July 2018

AFPD 91-1, *Nuclear Weapons and Systems Surety*, 24 October 2019

AFI 10-601, *Operational Capability Requirements Documentation and Validation*, 27 April 2021

DAFI 10-2501, *Emergency Management Program*, 16 October 2023

AFI 25-201, *Intra-Service, Intra-Agency, and Inter-Agency Support Agreements Procedures*, 18 October 2013

DAFI 31-101, *Base Defense Operations*, 10 September 2024

DAFI 31-117, *Arming and Use of Force*, 10 December 2024

AFI 33-322, *Records Management and Information Governance Program*, 23 March 2020

DAFI 63-101/20-101, *Integrated Life Cycle Management*, 16 February 2024

DAFI 63-125, *Nuclear Certification Program*, 16 January 2020

DAFI 90-160, *Publications and Forms Management*, 14 April 2022

DAFI 90-302, *The Inspection System of the Department of the Air Force*, 15 March 2023

AFI 90-802, *Risk Management*, 1 April 2019

AFI 91-102, *Nuclear Weapon System Safety Studies, Operational Safety Reviews, and Safety Rules*, 23 May 2023

AFI 91-106, *Unauthorized Launch, Threat Mitigation, and Launch Action Studies*, 28 August 2019

AFI 91-108, *Air Force Nuclear Weapons Intrinsic Radiation and 91(B) Radioactive Material Safety Program*, 14 May 2020

AFI 91-111, *Safety Rules for U.S. Strategic Bomber Aircraft*, 26 January 2024

AFI 91-112, *Safety Rules for U.S./NATO Dual Capable Aircraft*, 22 September 2022

AFI 91-114, *Safety Rules for the Intercontinental Ballistic Missile System*, 6 January 2023

AFI 91-115, *Safety Rules for Nuclear Airlift Operations*, 1 November 2022

AFI 91-116, *Safety Rules for Long-Term Storage and Maintenance Operations for Nuclear Weapons*, 4 December 2024

AFI 91-117, *Safety Rules for the Airborne Launch Control System*, 29 August 2022

AFI 91-121, *Nuclear Surety Staff Assistance Visit Program*, 6 January 2023

DAFI 91-202, *The Department of the Air Force Mishap Prevention Program*, 20 March 2020

DAFI 91-204, *Safety Investigations and Reports*, 10 March 2021

DAFI 91-208, *Hazards of Electromagnetic Radiation to Ordnance (HERO) Certification and Management*, 24 October 2019

AFMAN 10-206, *Operational Reporting (OPREP)*, 18 June 2018

AFMAN 13-526, *Nuclear Airlift Operations*, 5 December 2022

AFMAN 21-203, *Nuclear Accountability Procedures*, 3 September 2024

AFMAN 32-1065, *Grounding & Electrical Systems*, 17 July 2020

AFMAN 32-3001, *Explosive Ordnance Disposal (EOD) Program*, 22 April 2022

DAFMAN 36-2806, *Military Awards: Criteria and Procedures*, 18 January 2024

AFMAN 48-148, *Ionizing Radiation Protection*, 20 July 2020

DAFMAN 91-118, *Safety Design and Evaluation Criteria for Nuclear Weapon Systems*, 13 March 2020

DAFMAN 91-119, *Safety Design Criteria for Nuclear Weapon Systems Software*, 11 March 2020

DAFMAN 91-221, *Weapons Safety Investigations and Reports*, 12 September 2024

DESR 6055.09_DAFMAN 91-201, *Explosives Safety Standards*, 18 June 2025

Technical Order 00-5-1, *AF Technical Order System*, 25 January 2021

Technical Order 11A-1-33, *Handling and Maintenance of Explosive Loaded Aircraft*, 27 May 2009

Technical Order 11N-20-7, *Nuclear Safety Criteria*, 21 October 2019

Technical Order 11N-45-51, *Transportation of Nuclear Weapons Materials*, 27 November 2023

Technical Order 11N-5-1, *Unsatisfactory Reports*, 28 March 2018

Prescribed Forms

DAF Form 116A, *Safety Design Deviation Request*

Adopted Forms

AF Form 116, *Request for Deviation from Security Criteria*

DAF Form 847, *Recommendation for Change of Publication*

Abbreviations and Acronyms

AC—Alternating Current

AF—Air Force

AFB—Air Force Base

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFNSC—Air Force Nuclear Surety Council

AFNWC—Air Force Nuclear Weapons Center

AFPD—Air Force Policy Directive

AFSEC—Air Force Safety Center

CJCSI—Chairman of the Joint Chiefs of Staff Instruction

CRP—Certification Requirement Plan

DAF—Department of the Air Force

DAFI—Department of the Air Force Instruction

DAFPD—Department of the Air Force Policy Directive

DAFMAN—Department of the Air Force Manual

DC—Direct Current

DECERT—Operational Decertification Note: This abbreviated term is uniquely distinct from the Operational Decertification term without this abbreviation.

DESR—Defense Explosives Safety Regulation

DoD—Department of Defense

DoDD—Department of Defense Directive

DoDI—Department of Defense Instruction

DoDM—Department of Defense Manual

DOE—Department of Energy

EAP-STRAT—Emergency Action Procedures-Strategic

EED—Electro-Explosive Device

EID—Electrically Initiated Device

ELO—Engineering Liaison Office

EOD—Explosive Ordnance Disposal

FLDCOM—Field Command

HAF—Headquarters Air Force

HAS—Hardened Aircraft Shelter

HAFMD—Headquarters Air Force Mission Directive

IAW—In Accordance With

INSE—Independent Nuclear Surety Evaluation

JPO—Joint Program Office

LCP—Launch Control Point

LP—Launch Point

LPS—Lightning Protection System

MAJCOM—Major Command

MIL-STD—Military Standard

MNCL—Master Nuclear Certification List

NCIS—Nuclear Certification Impact Statement

NNSA—National Nuclear Security Administration

NSDC—Nuclear Safety Design Certification

NCE—Nuclear Certified Equipment

NSE—Nuclear Surety Evaluation

NSP—Nuclear Surety Procedures

NWSSG—Nuclear Weapon System Surety Group

OPCERT—Operational CertificationNote: This abbreviated term is uniquely distinct from the Operational Certification term without this abbreviation.

OPR—Office of Primary Responsibility

PAS—Protective Aircraft Shelter

PRAP—Personnel Reliability Assurance Program

SAG—Software Advisory Group

SPO—System Program Office

SSG—System Surety Group

STMS—Secure Transportable Maintenance System

TCTO—Time Compliance Technical Orders

TO—Technical Order

TPC—Two-person Concept

US—United States

USAF—United States Air Force

WSSR—Weapon System Safety Rule

Office Symbols

ACC/SE—Air Combat Command Safety

AETC/A3LN—Air Education and Training Command Nuclear Integration

AETC/SE—Air Force Education Command Safety

AF/A3—Deputy Chief of Staff, Operations

AF/A4—Deputy Chief of Staff, Logistics, Engineering and Force Protection

AF/A4L—Deputy Chief of Staff, Logistics, Engineering and Force Protection, Directorate of Logistics

AF/A4S—Deputy Chief of Staff, Logistics, Engineering and Force Protection, Directorate of Security Forces

AF/A5R—Director of Operational Capability Requirements

AF/A10—Deputy Chief of Staff, Strategic Deterrence & Nuclear Integration

AFGSC/A4Z—Air Force Global Strike Command, Directorate of Logistics, Nuclear Stockpile Division

AFGSC/SE—Air Force Global Strike Command Safety

AFIA/NI—Air Force Inspection Agency, Directorate of Nuclear Inspection

AFMC—Air Force Materiel Command

AFMC/SE—Air Force Materiel Command Safety

AFNWC/CD—Air Force Nuclear Weapons Center, Deputy Commander

AFRC/SE—Air Force Reserve Command Safety

AF/SE—Air Force Chief of Safety

AFSEC/SEW—AFSEC, Weapons Safety Division

AFSEC/SEWN—AFSEC/SEW, Nuclear Weapons Branch

AMC/A10NA—Air Mobility Command Nuclear Airlift Branch

AMC/SE—Air Mobility Command Safety

NGB/SE—National Guard Bureau Safety

SAF/AM—Office of Administration and Management

SAF/AQ—Assistant Secretary of the Air Force for Acquisition Technology, and Logistics

USAFE-AFAFRICA/SE—United States Air Forces in Europe and Air Forces Africa

Terms

Abnormal Environment—Environments as defined in a weapon's Stockpile-to-Target Sequence and Military Characteristics in which a nuclear weapon or a nuclear weapon system is not expected to retain full operational reliability.

Air Force Nuclear Weapons Surety Program—Air Force policies, procedures, and safeguards used to comply with DoD nuclear weapon system surety standards.

Aircraft Monitoring and Control—Equipment installed in aircraft to permit monitoring and control of safing, and fuzing functions of nuclear weapons or nuclear weapon systems.

Arming—Readying a nuclear weapon so that a fuzing signal will operate the firing system, includes operation or reversal of safing items.

Authorization—Critical function representing Presidential consent allowing the use of a nuclear weapon.

Code Component—Any device, assembly material, software, or information so designated by the National Security Agency.

Command and Control—The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission.

Compensatory Measure—An action or design feature that mitigates risk to an acceptable level.

Computer Systems—Any hardware and software setup with everything needed to implement computing performance.

Credible Abnormal Environment—An Abnormal Environment that has a plausible and reasonable probability of occurrence under a given set of circumstances.

Critical Component—A component of a nuclear weapon system that if bypassed, activated, or tampered with could result in, or contribute to, deliberate or inadvertent authorizing, pre-arming, arming, or launch of a combat delivery platform carrying a nuclear weapon, or the employment of a nuclear weapon against anything other than an authorized target.

Critical Fault—Any nuclear weapon system malfunction that results in inadvertent application of control signals or power to the bomb, warhead, or missile propulsion system; degradation in the integrity of pre-arm, launch, or release primary safety features; unintentional issuance of critical function command signals; or inability to determine weapon system safe status.

Critical Function—A function that readies a nuclear weapon system for use by controlling the authorization, pre-arming, arming, or launching/releasing of a nuclear weapon, or the navigation validation of a nuclear weapon.

Critical Nuclear Safety Features—Design features that constitute the safety theme for the National Nuclear Security Administration-provided warhead or bomb.

Critical Signal—Critical Signals are any signals or data, either analog or digital, which logically represent human intent to activate or deactivate critical functions. If Critical Signals are not properly protected, human intent could be lost and cause an inadvertent or unauthorized activation of a Critical Function.

Custodial Unit—A US unit designated to maintain custody of nuclear weapons.

Custody—The responsibility for the control of, transfer and movement of, access to, and maintenance of accountability for weapons and components.

DECERT—Action by proper authority to remove a certified critical component from operational use. When it becomes necessary to remove an OPCERT'ed critical component from the operational weapon system, DECERT is accomplished prior to removing two-person control. DECERT consists of removal of classified/code material and the subsequent removal from nuclear certified control. **Note:** This abbreviated term is uniquely distinct from the Operational Decertification term without this abbreviation.

Deficiencies—A deviation from procedures or criteria prescribed in pertinent technical publications or other Service publications that directly implement DoD requirements.

Delivery Vehicle—The portion(s) of a weapon system that provides carriage of a nuclear weapon configured for DoD usage from take-off or launch to its authorized target, usually a combination of a missile and/or aircraft.

Design Certification—Occurs when each of four components is accomplished for the weapon system: Compatibility Certification, Nuclear Safety Design Certification, WSSRs Approval, and Technical Orders Approval.

Development Organization—A group of persons independent of the Verification Organization, including subcontractors and other entities performing auxiliary activities such as configuration management or quality assurance, that is responsible for designing, implementing, modifying, testing, or maintaining software in a nuclear weapon system.

Electro-Explosive Device (EED)—An explosive or pyrotechnic component that initiates an explosive, burning, electrical, or mechanical train and is activated by the application of electrical energy. (JP 1-02, DoD Dictionary).

Electrically Initiated Device (EID)—An EID is a single unit, device, or subassembly that uses electrical energy to produce an explosive, pyrotechnic, thermal, or mechanical output. Examples include: electro explosive devices (such as hot bridge wire, semiconductor bridge, carbon bridge, and conductive composition), exploding foil initiators, laser initiators, burn wires, and fusible links. (MIL-STD-464D).

Essential Facility Systems—Systems and sub-systems that are determined to affect the four DoD Surety Standards directly, within a facility.

Exclusion Area—A designated area immediately surrounding one or more nuclear weapons(s). Normally, the boundaries of the area are the walls, floors, and ceiling of a structure or are delineated by a permanent or temporary barrier. In the absence of positive measures, access to the Exclusion Area constitutes access to the nuclear weapon(s).

Facility Lifting and Suspension Systems—Equipment (i.e., a hoist, crane, or suspended load frame) installed in a facility that is used to lift or support nuclear weapons.

Inadvertent Programmed Launch—The unintentional entry into terminal countdown or launch countdown and the resultant launch of a missile.

Incident—An unexpected event that presents the potential for negative consequences that may be caused by accidental or intentional acts, acts of God, unfavorable environmental conditions, or other factors.

Independent Nuclear Surety Evaluation—An optional, third-party analysis that is performed to identify whether a program submitted nuclear surety evaluation is technically correct and complete.

Independent Verification Organization—A group of persons managerially, financially, and technically independent of the Development Organization that is responsible for verifying software for Nuclear Safety Design Certification.

Intrinsic Radiation—Ionizing radiation emitted through the weapon surface or directly from exposed components of nuclear weapons.

Jettison—The intentional separation of an unarmed weapon from its delivery platform or transport carrier in response to an emergency.

Launch Control Point—The control center from which system operators' control, monitor, and launch a ground-launched missile. Also known as the Launch Control Center.

Launch Point—The geographical area or facility from which a ground-launched missile is launched.

Launching—Propulsion of a missile with a nuclear warhead into flight, through the ignition of any rocket motor or propulsion system, beyond the immediate area of the launching site.

Lead Command—The MAJCOM that serves as the operator's interface with the PM for a weapon system as defined by DAFPD 10-9, *Lead Command/Lead Agent Designation and Responsibilities for United States Air Force Weapon Systems, Non-Weapon Systems, and Activities*, or applicable Program Action Directive. This term is not to be confused with that MAJCOM designated by AF/A5R as OPR for authoring a requirements document (i.e., this MAJCOM would be the "Using Command"). Although, in most cases, the MAJCOM designated by AF/A5R to sponsor a requirement becomes the "Lead Command" for a weapon system.

Limited Life Component—A weapon component that deteriorates in some respect over time and must be replaced periodically during weapon stockpile life; principal classes of these components are reservoirs, neutron generators, and parachutes.

Major Maintenance—Any activity where major sub-assemblies are separated, which could result in exposure of the weapon's internal components to electrical energy. Major maintenance does not include permissive action link procedures.

Master Nuclear Certification List—Identifies equipment, hardware, facilities, and software that are certified IAW DAFI 63-125. The Master Nuclear Certification List is the sole source for verifying the nuclear certification status of nuclear certified equipment (system, hardware, software).

Military Characteristics—A DoD document submitted to Department of Energy that specifies performance requirements and physical characteristics for a nuclear warhead, bomb, or basic assembly to be compatible with a specific weapon system or systems.

Navigation Validation—The process that compares the authorized targeting data with the navigation solution to confirm that nuclear weapon kinematics will deliver a nuclear weapon to an authorized target.

No-Lone Zone—An area where the two-person concept must be enforced because it contains a nuclear weapon, nuclear weapon system, or critical component.

Non-Specialized Equipment—Equipment used with nuclear weapons but not specifically designed for that purpose.

Normal Environment—The expected logistical, storage, and operational environments defined in the Stockpile-to-Target Sequence document and the Military Characteristics that the weapon system is required to survive without degradation in operational reliability.

Nuclear Certification Impact Statement—Document issued by the Program Manager to initiate the certification process of an item, software, etc. This statement advises the AFNWC that a new weapon system or a change to an existing weapon system, equipment item, software, facility, or procedure needs to be evaluated for its impact to the nuclear certification status of a weapon system.

Nuclear Certified Equipment—Support equipment that is nuclear certified IAW DAFI 63-125 and identified in the Master Nuclear Certification List. Nuclear Certified Equipment is a subset of Nuclear Certified Items which includes vehicles; aerospace ground equipment; munitions materiel handling equipment; facility lifting and suspension equipment; test equipment; automatic test equipment (when used in a support function); organizational, field, and depot support equipment; and related computer program software.

Nuclear Certified Item—Procedures, equipment, software, facilities, systems, subsystems or components which are nuclear certified IAW the nuclear certification process outlined in DAFI 63-125.

Nuclear Safety Analysis Report—Any report or compilation of reports submitted by a Program for a Nuclear Weapon Systems Surety Group safety study that evaluates a given nuclear weapon system's compliance to nuclear weapons surety requirements. Reference Data Item Description DI-NUOR-81405B.

Nuclear Safety Cross-Check Analysis—Software evaluation process performed by an Independent Verification Organization independent of the Development Organization, focused on ensuring that the software complies with established nuclear safety design criteria as found in DAFMAN 91-119 and that the software does not perform unintended functionality, in particular, malicious actions.

Nuclear Safety Design Certification—A component of design certification that evaluates facilities, hardware, and/or software associated with nuclear weapon systems for compliance with nuclear safety design and evaluation criteria.

Nuclear Safety Design Decertification—Action by AFSEC/SEW to remove a system or component from design certification.

Nuclear Surety Evaluation—An evaluation performed by a nuclear weapons program to document compliance (or lack of compliance) to all the nuclear safety design certification requirements identified in the respective certification requirements plan. Reference Data Item Description DI-NUOR-82401.

Nuclear Surety Procedures—Uniquely coded technical procedures applied to specific steps within technical orders/checklists that must be performed as written to protect against degrading or rendering ineffective, the critical nuclear safety features of the weapon system as determined by Air Force Safety Center's Weapons Safety division.

Nuclear Weapon—Throughout 91-series publications the term nuclear weapon is applied to multiple configurations of weapon components that consist of at least a nuclear explosive subassembly in its simplest form and in its most complex is a complete assembly (i.e., implosion type, gun type, or thermonuclear type), in its intended ultimate configuration which, upon completion of the prescribed arming, fusing, and firing sequence, is capable of producing the intended nuclear reaction and release of energy.

Nuclear Weapon Accident—An unexpected event due to accidental circumstances involving US nuclear weapons or nuclear weapon components that may result in: errors committed in the assembly, testing, loading, or transportation of equipment or the malfunctioning of equipment and materiel that could lead to an unintentional operation of all or part of the weapon arming or firing sequence, or that could lead to a substantial change in yield or increased dud probability; accidental or unauthorized launching, firing, or use by US forces, or US-supported allied forces, of a nuclear-capable weapon system that could create the risk of an outbreak of war; loss or destruction of a nuclear weapon or nuclear weapon component, including jettisoning; an increase of the possibility of, or actual occurrence of, an explosion, a nuclear detonation, or radioactive contamination; non-nuclear detonation or burning of a nuclear weapon or nuclear weapon component; public hazard, actual or implied; or any act of God, unfavorable environment, or condition resulting in damage to the weapon, facility, or component.

Nuclear Weapon System—A nuclear weapon and a means for delivering it to the target, with associated specialized support equipment, facilities, procedures, personnel, and any vehicles peculiar to the system used for weapon transport.

Nuclear Weapons Surety—Policies, procedures, controls, and actions that encompass safety, security, and control measures, which ensure there will be no nuclear weapons accidents, incidents, unauthorized detonation, hazardous exposure of radioactive materials to the environment, or degradation of weapon effectiveness during its Stockpile-to-Target Sequence.

OPCERT—The process of verifying a system or critical component is functioning as design certified and all credible threats and scenarios are mitigated. OPCERT procedures are accomplished on all critical components prior to installation in the operational weapon system or whenever two-person control has been lost, the component has been decertified, or when directed by higher authority. **Note:** This abbreviated term is uniquely distinct from the Operational Certification term without this abbreviation.

Operational Certification—This occurs when the lead/using command qualifies its personnel to perform the mission, certifies them in the Personnel Reliability Assurance Program, trains them in nuclear weapons surety, and assigns a “Ready” rating on an Initial Nuclear Surety Inspection.

Opportunity—In the context of the two-person concept, the time and physical proximity needed to tamper with or damage a nuclear weapon, nuclear weapon system, or critical component.

Permissive Action Link—A device included in or attached to a nuclear weapon system to preclude arming and/or launching until the insertion of a prescribed, discrete code or combination. It may include equipment and cabling external to the weapon or weapon system that can activate components within the weapon or weapon system.

Personnel Reliability Assurance Program—A portion of operational certification within the Air Force Nuclear Weapon Center’s nuclear certification program outlined in DoD Manual 5210.42_DAFMAN 13-501 and DAFI 31-117. This program continuously evaluates individuals working with nuclear weapons with the intention of protecting the nuclear deterrent from insider threats.

Positive Measure—The combination of procedural and administrative actions, physical safeguards, and design features expressly for the purpose of ensuring security, safety, and control of nuclear weapons and systems, including associated personnel.

Pre-arming—Nuclear weapon system operations that configure a nuclear weapon so that arming, launching, or releasing will start the sequence necessary to produce a nuclear detonation.

Prime Nuclear Airlift Force—Those aircrews, aircraft, and other functions provided for peacetime support of logistical airlift of nuclear weapons and nuclear components.

Programmable Logic Device—Electronic component whose circuits can be reconfigured through the use of digital programming files.

Release—The separation of a missile or gravity bomb with a nuclear warhead, for use in its intended mode of operation, from a delivery platform.

Safe Haven—Temporary storage provided to Department of Energy classified shipment transporters at DoD facilities in order to assure safety and security of nuclear material and/or non-nuclear classified material. Also includes parking for commercial vehicles containing Class A or Class B explosives.

Safe/Safing—The act of placing a nuclear weapon in a state, a state such that the receipt of the final irreversible action does not cause a nuclear detonation.

Security—Protection against loss of control, theft, or diversion of a nuclear weapon system; protection against unauthorized access; or protection against unauthorized actions, vandalism, sabotage, and malevolent damage.

Significant Nuclear Yield—The energy released through nuclear fission or fusion that is equivalent to or greater than the energy released by detonation of four pounds of TNT.

Simultaneous Presence—The storage of nuclear weapons and conventional munitions in the same facility.

Software—Sequential instructions used to control a digital processor, or reconfigurable logic implementations.

Specialized Equipment—Equipment designed specifically for use with nuclear weapons.

Split-Handling—A stringent procedure used to maintain a launch function separation that was intentionally designed into two or more different critical components. This procedure prevents a single individual or two-person concept team from having access to the entire launch function.

Split-Knowledge—The separation of information contained in the complete critical component so an individual or two-person concept team is denied knowledge of the total information.

Stockpile-to-Target Sequence—The order of events involved in removing a nuclear weapon from storage and assembling, testing, transporting, and delivering it on the target. Alternatively, a document that defines the logistic and employment concepts and related physical environments involved in the delivery of a nuclear weapon from the stockpile to the target. It may also define the logistic flow involved in moving nuclear weapons to and from the stockpile for quality assurance testing, modification and retrofit, and the recycling of limited life components.

Support Equipment—Includes all equipment required to perform the support function, except that which is an integral part of the mission equipment. It does not include any of the equipment required to perform mission operation functions. Support equipment should be interpreted as tools, test equipment, automatic test equipment (when used in a support function), organizational, field, and depot support equipment, and related computer programs and software.

Tamper—To knowingly perform an incorrect act or unauthorized procedure involving a nuclear weapon, nuclear weapon system, or critical component.

Tamper Detection Indicators—A sealing method that provides evidence in the event a critical component has been tampered with or inadvertently activated.

Targeting—The process of selecting targets and matching the appropriate weapon to them by taking account of operational requirements and capabilities.

Targeting Data—Information that identifies an authorized target and contains the geographical location and target parameters (height of burst, yield, waypoints, lat, long).

Troubleshooting—The tracing and correction of faults in a mechanical or electronic system.

Two-Person Concept—Designed to ensure that a lone individual is denied access to nuclear weapons, nuclear weapon systems or critical components, never allowing the opportunity for tampering, damage, or an unauthorized act to go undetected. The two-person concept requires the presence at all times of at least two authorized persons, each certified under Personnel Reliability Assurance Program, knowledgeable in the task to be performed, familiar with applicable safety and security requirements and each capable of promptly detecting an incorrect act or improper procedure with respect to the task to be performed. Both members must have completed required nuclear weapons surety and Personnel Reliability Assurance Program training.

Unauthorized Launch—A deliberate launching or releasing of a nuclear missile or bomb (except jettisoning) before execution of a valid and authentic emergency war order.

Use Control—The positive measures that allow the authorized use and prevent or delay unauthorized use of nuclear weapons and is accomplished through a combination of weapon system design features, operational procedures, internal security, and system safety rules.

Using Command—The MAJCOM operating a system, subsystem, or item of equipment. Generally, applies to those operational commands or organizations designated by Headquarters, Department of the Air Force to conduct or participate in operations or operational testing (e.g., ACC, AFGSC, USAFE).

Vulnerability—The characteristics of a system that cause it to suffer a definite degradation (incapability to perform the designated mission) as a result of having been subjected to a certain level of effects in an unnatural (man-made) hostile environment.

Weapon Storage Area—A specific location that is used to house nuclear weapons, warheads and nuclear components.

Weapon System Safety Rules—Operational restrictions or requirements designed to assure nuclear weapon systems are compliant with the four DoD nuclear weapons surety standards.