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SECRETARY OF THE AIR FORCE**

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Safety



**NUCLEAR SURETY TAMPER CONTROL
AND DETECTION PROGRAMS**

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements AFD 91-1, *Nuclear Weapons and Systems Surety*. This publication is consistent with AFD 13-5, *Air Force Nuclear Enterprise*. It provides guidance on setting up procedures for nuclear surety tamper control through the Two-Person Concept and for tamper detection through approved nuclear component sealing methods. It applies to all Air Force units with a mission involving operations, maintenance, security, or logistics movement of nuclear weapons or certified critical components. It also applies to all Air Force units responsible for sealing requirements according to applicable safety rules for nuclear weapon systems or the handling and storage procedures for certified critical components. This Instruction also applies to the Air Force Reserve and Air National Guard performing nuclear duties. This instruction sets forth guidance regarding nuclear surety tamper control and detection programs managed by Air Force civilian and military personnel. Failure to observe prohibitions and mandatory provisions of this directive in paragraphs 1.2., 1.3., 1.4., 3.4. and associated subparagraphs of those stated, by military personnel is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Violations may result in administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions for violations of related laws. **Send major command (MAJCOM) supplements to AMC/A3N, 402 Scott Drive, Unit 3A1, Scott AFB, IL, 62225-5302 or by email to AMC.A3N@amc.af.mil, and AFSEC/SEWN, 9700 G Avenue SE, Kirtland AFB NM 87117-5670, for coordination before publication.** Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located in the Air Force Records Information

Management System (AFRIMS). **The authorities to waive wing/unit level requirements in this publication are identified with a Tier (“T-0, T-1, T-2, T-3”) number following the compliance statement. See Air Force Instruction (AFI) 33-360, *Publications and Forms Management*, Table 1.1 for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the Publication Office of Primary Responsibility (OPR) for non-tiered compliance items. Refer recommended changes and questions about this publication to the OPR using the AF Form 847, *Recommendation for Change of Publication*; route AF IMTs 847 from the field through the appropriate functional’s chain of command.**

SUMMARY OF CHANGES

This interim change revises AFI 91-104 by (1) changing all PRP references to Personal Reliability Assurance Program (PRAP) per DoDM 5210.42_AFMAN 13-501, *Nuclear Weapons Personnel Reliability Program* requirements, (2) updating requirements for Tamper Detection (Seals) and requiring training for personnel to recognize/identify proper sealing requirements, and (3) updating reference dates in Attachment 1. A margin bar (|) indicates newly revised material.

1. Requirements and Procedures.

1.1. Tamper Control Program. The Two-Person Concept (TPC) is central to nuclear surety tamper control measures in the Air Force. It is designed to make sure that a lone individual cannot perform an incorrect act or unauthorized procedure on a nuclear weapon, nuclear weapon system, or certified critical component.

1.2. Concept Enforcement. **(Failure by military personnel to observe mandatory provisions of this paragraph and associated sub-paragraphs, is a violation of Article 92, of the UCMJ.)** Each wing/unit commander with a mission or function involving nuclear weapons, nuclear weapon systems, or certified critical components will:

1.2.1. Clearly mark all no-lone zones. Indicate at all entry control points that two-person concept applies. (T-1).

1.2.2. Enforce the Two-Person Concept. (T-1).

1.2.3. Develop procedures to limit entry to authorized persons who meet the requirements of paragraph 1.3. (T-1).

1.3. Team Requirements. (Refer to paragraph 1.6.1 for criteria on foreign nationals.) (Failure by military personnel to observe mandatory provisions of this paragraph and associated sub-paragraphs, is a violation of Article 92, of the UCMJ.) A Two-Person Concept team consists of at least two individuals authorized by the commander and verified by their supervisor to meet the following requirements: (T-0).

1.3.1. Are certified under the Personnel Reliability Assurance Program (PRAP), as specified in DoDM5210.42_AFMAN 13-501, *Nuclear Weapons Personnel Reliability Program* (PRP) and/or AFI 31-117, *Arming and Use of Force by Air Force Personnel*. (T-0)

- 1.3.2. Know the nuclear surety requirements of the task they perform.
- 1.3.3. Can promptly detect an incorrect act or unauthorized procedure.
- 1.3.4. Have successfully completed nuclear surety training according to AFI 91-101, *Air Force Nuclear Weapons Surety Program*.
- 1.3.5. Are designated to perform the required task.

1.4. Two Person Concept Violations. (Failure by military personnel to observe mandatory provisions of this paragraph is a violation of Article 92, of the UCMJ.) All personnel are required to report a Two-Person Concept 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 certified critical component. Refer to AFMAN 91- 221, *Weapons Safety Investigations and Reports*, for reporting guidance. (T-0).

Note: 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 if the lone individual is in a location that would preclude the ability to perform an incorrect act or unauthorized procedure that could affect the nuclear weapons, the weapon system, or critical components (i.e. There is no violation of the two-person concept). However, the TPC team must maintain awareness of the location and justification for the lone individual to be temporarily out of sight (e.g., an individual whether on PRAP or non-PRAP 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).

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.

1.5. Authorized Deviations. You may deviate from the Two-Person Concept when: (T-0).

- 1.5.1. The nuclear Weapon System Safety Rules (WSSR) specifically authorize a deviation.
- 1.5.2. An emergency presents an immediate threat to the safety of personnel or the security of a nuclear weapon, nuclear weapon system, or certified critical component. War plan exercises are not considered emergencies.

1.6. Additional Conditions: (T-0).

- 1.6.1. Non-US Personnel. Per AFI 91-112, *Safety Rules For US/NATO Strike Fighters*, for US custodial units at allied installations, foreign nationals may be part of a Two-Person Concept, and host nations will implement equivalent personnel reliability programs.
- 1.6.2. Entry Control Personnel. The Two-Person Concept applies to individuals who control entry into a no-lone zone. Entry controllers may not form a Two-Person Concept team with personnel inside the no-lone zone.

1.6.3. Couriers. Couriers ensure that the host installation meets Two-Person Concept requirements and no-lone zones are delineated around nuclear logistics aircraft.

1.6.4. PRAP Interim-Certified Personnel Restrictions. Two interim-certified individuals may not form a Two-Person Concept team. Also, an interim-certified member may not pilot a single-seat aircraft loaded with nuclear weapons.

1.6.5. Nonqualified Personnel. An individual who does not qualify as a member of a Two-Person Concept team may enter a no-lone zone to perform a specific task only if escorted by a Two-Person Concept team. Escorts should be capable of detecting incorrect acts or unauthorized procedures. Escort procedures will be accomplished in accordance with the applicable directive(s) governing the nuclear weapon system or critical component defining the no-lone zone.

1.6.6. Sigma 14. Personnel granted Department of Energy (DOE) Sigma 14 access are prohibited from being part of a two-person concept team that may afford access to a nuclear weapon. For additional information on DOE Sigma categories and requirements, see DoDD 3150.02, DoD Nuclear Weapons Surety Program.

2. Tamper Detection Program.

2.1. Sealing Requirements. Certain items must be sealed because either: (T-0).

2.1.1. Air Force nuclear WSSRs require it, or,

2.1.2. In the case of some certified critical components, seals protect their certification status while in storage or during transportation, as specified in AFI 91-105, *Critical Components*

2.2. Sealing Methods. Authorized sealing methods include: (T-0).

2.2.1. Safety Wiring and Sealing. Two types of seals are authorized using this method. 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. 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 used with safety wire 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.

2.2.2. Tamper Detection Indicators (TDI). In this method, an approved TDI is placed so it will indicate if someone has activated, or had access to the interior of a certified critical component. Once the TDI is installed, evidence of tampering is visible to the naked eye or can be detected using special equipment.

2.2.2.1. TDI and other authorized sealing methods proposed for use in nuclear weapons systems will be properly certified prior to use according to AFI 63-125, *Nuclear Certification Program*.

3. Responsibilities.

3.1. Air Force Chief of Safety (AF/SE) oversees the Air Force Nuclear Surety Tamper Control and Detection Programs. Acting for AF/SE, the Chief of the Weapons Safety

Division manages the programs and certifies the design safety features of sealing methods proposed for use in nuclear weapon systems according to AFI 91-103, *Air Force Nuclear Safety Design Certification Program*.

3.2. Nuclear Weapon System Safety Group (NWSSG) recommends sealing requirements in operational nuclear weapon systems and proposes specific nuclear weapon system safety rules, if necessary. (See AFI 91-102, *Nuclear Weapon System Safety Studies, Operational Safety Reviews, and Safety Rules*.)

3.3. Major Commands:

3.3.1. Develop and publish Field publications, as needed, to implement and enforce the Air Force Nuclear Surety Tamper Control and Detection Programs throughout their commands.

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

3.3.2.1. State when and by whom seals can be applied and removed.

3.3.2.2. Establish controls for the handling, receipt, storage, issue, inventory, and disposal of TDIs (including all residue), controlled dies and self-locking, non-reversible seals (example: roto-seals).

3.3.2.3. Direct that TDIs, controlled dies and self-locking, non-reversible seals are stored and accounted for by individuals not responsible for their installation.

3.3.2.4. Direct personnel to comply with the following steps for malleable seals only:

3.3.2.4.1. Place a distinctive marking (determined locally) on malleable seals using a crimping device and die.

3.3.2.4.2. Be sure to destroy any distinctive markings on malleable seals after you remove them.

3.3.2.5. 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.*

3.3.2.6. Require periodic inspections of seals on nuclear weapon-loaded aircraft, missile systems, and certified critical components in storage or transport.

3.3.2.7. Require that only Two-Person Concept teams install seals and verify they remain intact.

3.3.2.8. Direct training of maintenance personnel, aircrews, missile combat crews, and other involved personnel to recognize distinctive marking or unique identifier on malleable seals and identify singularly unique wing identifier or serial number, as well as a color control system on self-locking, non-reversible seals.

3.3.2.9. Prescribe a course of action when an installed seal is found broken or shows evidence of tampering. At a minimum:

3.3.2.9.1. Investigate the event and send a mishap report according to AFMAN 91-221, *Weapons Safety Investigations and Reports*.

3.3.2.9.2. Establish procedures to maintain control of the system until situation is resolved.

3.3.2.9.3. Check the integrity of the weapon system and reseal if integrity is assured.

3.3.2.9.4. Prescribe a course of action when a seal is accidentally broken during authorized operations.

3.3.2.9.5. Ensure training seals can be easily distinguished from, and are not used as, operational seals.

3.4. Two-Person Concept Team Responsibilities: **(Failure by military personnel to observe mandatory provisions of this paragraph and associated sub-paragraphs, is a violation of Article 92, of the UCMJ.)** Team members must: (T-0).

3.4.1. Enforce the Two-Person Concept while performing a task or operation and continue to enforce it until you are either relieved by authorized personnel or you have secured the nuclear weapon, nuclear weapon system, or certified critical component.

3.4.2. Take immediate, positive steps to prevent or stop an incorrect procedure or unauthorized act.

3.4.3. Report deviations immediately to the appropriate supervisor.

MARGARET H. WOODWARD
Major General, USAF
Chief of Safety

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

- AFI 31-117, *Arming and Use of Force by Air Force Personnel*, 2 February 2016.
- AFI 33-360, *Publications and Forms Management*, 7 February 2013
- AFI 63-125, *Nuclear Certification Program*, 8 August 2012
- AFI 91-101, *Air Force Nuclear Weapons Surety Program*, 13 October 2010
- AFMAN 33-363, *Management of Records*, 1 March 2008
- AFI 91-101, *Air Force Nuclear Weapons Surety Program*, 15 August 2014
- AFI 91-102, *Nuclear Weapon System Safety Studies, Operational Safety Reviews, and Safety Rules*, 24 June 2010
- AFI 91-102, *Nuclear Weapon System Safety Studies, Operational Safety Reviews, and Safety Rules*, 25 February 2014
- AFI 91-103, *Air Force Nuclear Safety Design Certification Program*, 17 November 2010
- AFI 91-103, *Air Force Nuclear Safety Design Certification Program*, 24 March 2016
- AFI 91-105, *Critical Components*, 7 January 2011
- AFI 91-112, *Safety Rules for US/NATO Strike Fighters*, 1 April 2015
- AFI 91-112, *Safety Rules for US/NATO Strike Fighters*, 9 September 2009
- AFI 91-204, *Safety Investigations and Reports*, 24 September 2008
- DoDD 3150.02, *DoD Nuclear Weapons Surety Program*, 24 Apr 13
- DoD S-5210.41M_AFMAN 31-108, *Nuclear Weapons Security Manual*, 13 July 2009
- DoD 5210.42_AFMAN 10-3902, *Nuclear Weapons Personnel Reliability Program*, 13 November 2006
- DoDM 5210.42_AFMAN13-501, *Nuclear Weapons Personnel Reliability Program*, 29 May 2015
- AFMAN 91-221, *Weapons Safety Investigations and Reports*, 8 November 2010
- AFPD 13-5, *Air Force Nuclear Enterprise*, 6 July 2011
- AFPD 91-1, *Nuclear Weapons and Systems Surety*, 13 December 2010
- FF-S-2738A, *Tamper Seals*

Adopted Forms

- AF Form 847, *Recommendation for Change of Publication*

Abbreviations and Acronyms

- AF—Air Force

AFI—Air Force Instruction
AFMAN—Air Force Manual
AFPD—Air Force Policy Directive
AFSEC/SEW—Air Force Safety Center, Weapons Safety Division
AFSEC/SEWN—AFSEC/SEW, Nuclear Weapons Safety Branch
AFSEC—Air Force Safety Center
AF/SE—Air Force Chief of Safety
NWSSG—Nuclear Weapon System Surety Group
PRAP—Personnel Reliability Assurance Program
WSSR—Weapons System Safety Rule
OPR—Office of Primary Responsibility
PRP—Personnel Reliability Program
RDS—Record Disposition Schedule
TDI—Tamper Detection Indicators
TPC—Two Person Concept
UCMJ—Uniform Code of Military Justice