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**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 of the United States performing nuclear duties. This Instruction sets forth guidance regarding nuclear surety tamper control and detection programs managed by Air Force civilian and military personnel, including the Air Force Reserve

and Air National Guard. Failure to observe prohibitions and mandatory provisions of this directive in paragraphs 1.2., 1.3., 1.4., 3.4. and associated sub-paragraphs 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. 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 at <https://my.af.mil/afrims/afrims/afrims/rims/cfm>. This Instruction requires collecting and maintaining information protected by the *Privacy Act of 1974* authorized by 10 U.S.C. 8013. The applicable Privacy Act System Notice, Serious Incident Reports (June 11, 1997, 62 FR 31793), is available online at: <http://www.defenselink.mil/privacy/notices/usaf>. Send major command (MAJCOM) supplements to this instruction to AFSEC/SEW, 9700 G Avenue, Kirtland AFB NM 87117-5670 for coordination before publication. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*; route AF Form 847s from the field through the appropriate functional chain of command.

(ACC) AFI 91-104, *Nuclear Surety Tamper Control and Detection Programs*, is supplemented to provide command unique requirements as follows. This supplement applies to members of the Air National Guard (ANG) or Air Force Reserve Command (AFRC) who are serving on Title 10 active duty orders performing an ACC mission. The authority to waive wing/unit level requirements in this publication is identified as a Tier-1. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with (IAW) Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of IAW the Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS). Contact supporting records managers as required. Send NAF/Wing supplements to this instruction to OPR for coordination before publication. Send comments and suggested changes on AF Form 847, *Recommendation for Change of Publication*, to the Air Combat Command (ACC) Weapons Safety Branch, HQ ACC/SEW, 220 Sweeney Blvd, Joint Base Langley-Eustis, VA 23665-2714.

SUMMARY OF CHANGES

This publication has been revised to make administrative changes and to reflect organizational changes since the last publication of this Instruction. This publication must be completely reviewed.

(ACC) This IC is to re-align paragraph numbers with the recently released IC to the parent instruction. Paragraph 1.6.6. was changed to 1.6.7. 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. Each organization with a mission or function involving nuclear weapons, nuclear weapon systems, or certified critical components:

1.2.1. Identifies no-lone zones (where at least two authorized persons must be present during any operation or task).

1.2.1.1. **(Added-ACC)** Before entering a no-lone zone, brief personnel that the Two-Person Concept applies. Supervisors must ensure that individuals are aware of the location of all no-lone zones, location of critical components (as defined in AFI 91-105) within the no-lone zone where they will perform their duties, emergency procedures, and methods for reporting violations and hazards. **(T-1)**

1.2.2. Enforces the Two-Person Concept.

1.2.3. Develops procedures to limit entry to authorized persons who meet the requirements of paragraph 1.3.

1.2.3. **(ACC)** The Sole Vouching Authority (SVA) identifies individuals wishing to gain entry to a no-lone zone, verifies authorization for entry to the no-lone zone, and validates need for entry into the no-lone zone. The team must be knowledgeable of the task the individual will perform and is capable of monitoring performance, or the individual is to assist the team in the task they are performing. **(T-1)**Note: SVA is the maintenance or operations representative identified to the entry controller as having responsibility of deciding who will enter the no-lone zone. Normally, this is the senior member of the first team entering the area. SVA may transfer between individuals, provided the two individuals jointly identify the change to the entry controller. There will be only one SVA at a time in any exclusion area.

1.3. Team Requirements. (Refer to paragraph 1.6.1 for criteria on foreign nationals.) A Two-Person Concept team consists of at least two individuals who:

1.3. **(ACC)** Unit inspectors or evaluators who meet the requirements of this paragraph may form their own Two-Person Concept team in the performance of their duties.

1.3.1. Are certified under the Personnel Reliability Program (PRP), as specified in DoD 5210.42-R_AFMAN 10-3902, *Nuclear Weapons Personnel Reliability Program*.

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. Report a Two-Person Concept violation when a lone individual in a no-lone zone has 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. 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 PRP or non-PRP 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.

1.4. **(ACC)** Report violations of the Two-Person Concept, including emergency response through the unit command post to the commander. A Two-Person Concept team will ascertain if unauthorized acts were performed, inspect involved certified critical components, verify their status, and reestablish the integrity of the system. Accomplish applicable visual and functional checks for components that have such procedures established. **(T-1)**

1.5. Authorized Deviations. You may deviate from the Two-Person Concept when:

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:

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.

1.6.2. **(ACC)** Entry controllers will not be the SVA. **(T-1)**

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. PRP 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. (ACC) DELETED

1.6.7. (Added-ACC) After entry into a no-lone zone, the supervisor of each authorized team controls individual team members within the no-lone zone.

2. Tamper Detection Program.

2.1. Sealing Requirements. Certain items must be sealed because either:

2.1. (ACC) OPLAN tasked units will comply with any additional sealing requirements of the augmented-MAJCOM supplements to this instruction.

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:

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 serial number/alpha, 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.

3.3.1. (ACC) Where ACC directives do not cover a particular local situation, wings will develop local standard publications or checklists to ensure adequate control of certified critical components or nuclear weapon systems and application of the Tamper Control and Detection Programs.

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 serial numbers of the 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.

3.4. (ACC) It may be necessary to withdraw the Two-Person Concept team or change the original composition to meet the requirements of new or additional tasks. Coordinate changes with the team chief. **Note:** Keep the number of personnel authorized in a no-lone zone to a minimum consistent with the tasks.

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.

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Chief of Safety

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Director of Safety (ACC)

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

(Added-ACC) AF Form 847, Recommendation for Change of Publication

(Added-ACC) AFI 31-101, *Integrated Defense (FOUO)*, 15 February 2011

AFI 33-360, *Publications and Forms Management*, 7 February 2013

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AFI 91-105, *Critical Components*, 7 January 2011

AFI 91-112, *Safety Rules for US/NATO Strike Fighters*, 9 September 2009

AFI 91-204, *Safety Investigations and Reports*, 24 September 2008

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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

(Added-ACC) ACC—Air Combat Command

AF— Air Force

AFI— Air Force Instruction

AFMAN— Air Force Manual

(Added-ACC) AFOSI—Office of Special Investigations

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

(Added-ACC) MAJCOM—Major Command

NWSSG— Nuclear Weapon System Safety Group

(Added-ACC) OPLAN—Operational Plan

(Added-ACC) SVA—Sole Vouching Authority

(Added-ACC) UCNI—Unclassified Controlled Nuclear Information

WSSR—Weapons System Safety Rule

OPR—Office of Primary Responsibility

PRP— Personnel Reliability Program

RDS—Record Disposition Schedule

TDI— Tamper Detection Indicators

(ACC) TDI—Tamper Detection Indicator

TPC—Two Person Concept

UCMJ—Uniform Code of Military Justice