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Safety

**NUCLEAR SURETY TAMPER CONTROL AND
DETECTION PROGRAMS**

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(Maj Richard D. Tinkler)
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(Brig Gen James L. Cole, Jr.)

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This instruction implements AFR 91-1, *Nuclear Weapons and Systems Surety*. 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 critical components. It does not apply to US Air Force Reserve and Air National Guard units and members. Send MAJCOM supplements to this instruction to the Air Force Safety Agency (HQ AFSA/SENS, 9700 Avenue G SE, Kirtland AFB NM 87117-5670) for coordination and to HQ USAF/SE for approval before publication. See AFI 91-101 (formerly AFR 122-1), *Air Force Nuclear Weapons Surety Program*, for definitions of the terms used in this instruction.

SUMMARY OF REVISIONS

This is the initial publication of AFI 91-104, aligning the instruction with AFR 91-1. It incorporates the requirements and procedures formerly in AFR 122-4 and outlines the responsibilities of the Air Force Chief of Safety (paragraph 2.1.).

1. Requirements and Procedures.

1.1. Tamper Control Program. The Two-Person Concept 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:

- Identifies no-lone zones (where at least two authorized persons must be present during any operation or task).
- Enforces the Two-Person Concept.
- Develops procedures to limit entry to authorized persons who meet the requirements of paragraph 1.3.

1.3. Team Requirements. (Refer to paragraph 1.1.6.1 for criteria on foreign nationals.) A Two-Person Concept team consists of at least two individuals who:

- Are certified under the Personnel Reliability Program (PRP), as specified in AFI 36-2104, *Nuclear Weapons Personnel Reliability Program*(formerly AFR 35-99 and AFR 40-925).
- Know the nuclear surety requirements of the task they perform.
- Can promptly detect an incorrect act or unauthorized procedure.
- Have successfully completed nuclear surety training according to AFI 91-101.
- Are designated to perform the required task.

1.4. Violations to Report. Declare 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. Report violations according to AFI 91-204, *Investigating and Reporting US Air Force Mishaps* (formerly AFR 127-4).

NOTE:

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:

- The nuclear weapon system safety rules specifically authorize a deviation.
- 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. For US custodial units at allied installations, foreign nationals may be part of a Two-Person Concept team if they are authorized in applicable nuclear weapon system safety rules. In these cases, standards for personnel reliability and training must be agreed upon between the US and host nation.

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. PRP Interim-Certified Personnel Restrictions. Two interim-certified individuals may not form a Two-Person Concept team. Also, do not allow an interim-certified member to 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.

2. Tamper Detection Program. Seals help to verify that no one has tampered with or accidentally activated a certified critical component.

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

- Air Force nuclear weapon system safety rules require it, or,
- 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* (formerly AFR 122-17).

2.2. Sealing Methods. Authorized sealing methods include:

2.2.1. Safety Wiring and Lead Seals. In this method, you place a lead seal on a safety wire connected to certain switches, covers, handles, or levers and impress the lead seal with a distinctive mark using a crimping device and controlled die. An unauthorized act breaks or alters the wire connection so that you can detect activation. Use this method only in no-lone zones.

2.2.2. Tamper Detection Indicators (TDI). In this method you place an approved TDI so that it will indicate when 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 through the use of special equipment.

3. Responsibilities.

3.1. Air Force Chief of Safety (HQ USAF/SE) oversees the Air Force Nuclear Surety Tamper Control and Detection Programs. Acting for HQ USAF/SE, the Commander of the Air Force Safety Agency manages the programs and directs the Director of Nuclear Surety to certify the design safety features of sealing methods proposed for use in nuclear weapon systems according to AFI 91-103, *Air Force Nuclear Safety Certification Program* (formerly AFR 122-3).

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.

3.3. Major Commands:

3.3.1. Develop and publish supplements, 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. As a minimum, these procedural directives:

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) and controlled dies.

3.3.2.3. Ensure TDIs and controlled dies are stored and accounted for by individuals not responsible for their installation.

3.3.2.4. Ensure personnel comply with the following steps for lead seals only:

- Be sure to place a distinctive marking (determined locally) on lead seals using a crimping device and die.
- Be sure to erase distinctive markings on lead seals after you remove them.

3.3.2.5. Make sure that personnel 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. Make sure that only Two-Person Concept teams install seals and verify they remain intact.

3.3.2.8. Teach maintenance personnel, aircrews, missile combat crews, and other involved personnel to recognize the distinctive markings 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:

- Investigate the event and send a mishap report according to AFI 91-204.
- Establish procedures to maintain control of the system until the situation is resolved.
- Check the integrity of the weapon system and reseal if integrity is assured.
- Prescribe a course of action when a seal is accidentally broken during authorized operations.
- Ensure training seals can be easily distinguished from, and are not used as, operational seals.

3.4. Two-Person Concept Team Responsibilities.

- 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.
- Take immediate, positive steps to prevent or stop an incorrect procedure or unauthorized act.
- Report deviations immediately to the appropriate supervisor.

JAMES L. COLE, JR., Brig Gen, USAF
Chief of Safety