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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 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 in the Air Force Records Information Management System (AFRIMS). 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>.

(USAFE) This supplement implements and extends the guidance of Air Force Instruction (AFI) 91-104, *Nuclear Surety Tamper Control and Detection Programs*. It describes Headquarters, United States Air Forces in Europe (HQ USAFE), wing, and unit responsibilities for management of tamper control and detection programs. It applies to HQ USAFE and subordinate units who deal with nuclear weapon system surety, including AFRC personnel. This supplement does not apply to the ANG. When supplemented, send supplement copies for approval to HQ USAFE Weapons Safety Division (HQ USAFE/SEW). 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 AFI 33-360, *Publications and Forms Management*, Table 1.1 for a description of the authorities associated with the Tier numbers. Refer recommended changes and questions about this supplement to HQ USAFE/SEW using the AF Form 847; route AF Forms 847 from the field through the appropriate functional’s chain of command. 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).

SUMMARY OF CHANGES

This interim change revises AFI 91-104 by formalizing that MAJCOMs are not required to supplement AFI 91-104 to list no-lone zones. MAJCOMs are only required to clearly mark all no-lone zones and indicate at all entry control points that two-person concept applies. A margin bar (I) indicates newly revised material.

(USAFE) This document has been updated to comply with AFI 33-360, *Publications and Forms Management* tiering requirements. Procedures for documenting an informational note on the AFTO Form 781A has been aligned with T.O. 00-20-1, *Aerospace Equipment Maintenance Inspection, Documentation, Policies, and Procedures*. Procedures for personnel performing seal removal clarified to include aircrews during mission execution.

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

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

1.2.3. Develops 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.) A Two-Person Concept team consists of at least two individuals who: (T-0).

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. (T-0).

Note: If TPC is maintained by more than two persons, a lone individual maybe 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.

1.5. 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. 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. 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 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.

3.3.2. 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.

3.3.2.1. (USAFE) Requirements for Units Supporting Dual Capable Aircraft (DCA) are:

3.3.2.1.1. **(Added-USAFE)** U.S. Main Operating Bases (MOB). Certified weapons loading personnel are authorized to apply and/or remove seals when flying operations are directed. Document each application of seals in an informational note on the AFTO Form 781A, *Maintenance Discrepancy and Work Document*, by recording the locally determined load crew identifier (do not include unique seal impressions), signature of the load crew chief, and the date and time of seal application. Upon removal of seals, line through the invalid INFO NOTE information. Aircrews are authorized to remove seals to meet mission requirements. (T-2)

3.3.2.1.2. **(Added-USAFE)** Munitions Support Squadrons (MUNSS). The U.S. load monitor element will maintain a current list of non-U.S. personnel designated by the non-U.S. North Atlantic Treaty Organization (NATO) strike

unit commander or designated representatives who are authorized to apply and remove seals. The U.S. load monitor element ensures only authorized personnel apply and remove seals when flying operations are directed. The U.S. load monitor ensures documentation of each application of seals is documented in the aircraft maintenance AFTO Form 781A or equivalent Host Nation form by recording the locally determined load crew identifier (do not include unique seal impressions), signature of the load crew chief, and the date and time of seal application. The U.S. load monitor will ensure the date, time, load crew identifier is documented in the aircraft maintenance AFTO Form 781A or equivalent Host Nation form when seals are removed. Aircrews are authorized to remove seals to meet mission requirements. (T-2)

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).

3.3.2.2. (USAFE) Requirements for Units Supporting DCA are:

3.3.2.2.1. (Added-USAFE) Develop local written procedures detailing handling, receipt, storage, issue, inventory and disposal of operational dies and self-locking seals. Ensure local written procedures address the following: (T-2)

3.3.2.2.1.1. (Added-USAFE) Operational dies and self-locking seals are controlled and accountable at all times. Conduct inventories each time the dies or self-locking seals are accessed. Conduct inventories and inspections for serviceability on a monthly basis. All issues, receipts, inventories and inspections will be documented and documentation will be maintained for two years. The commander will designate in writing personnel authorized access to dies or self-locking seals for issue and receipt as well as conducting inventories and inspections. Personnel designated for access to dies or self-locking seals will not be authorized to install seals. Procedures will detail die replacement actions in the event a die becomes damaged or unserviceable, or if positive control of die or self-locking seals are lost. (T-2)

3.3.2.2.1.2. (Added-USAFE) Dies will be marked with a unique impression and a load crew identifier, e.g., "AB1," "AB2," "1A" or "2A." The unique impression and load crew identifier markings impressed by the die may be on the same or opposite side of the seal. Self-locking seals will be marked with a unique identifier and a load crew identifier or serial number. Additional dies or self-locking seals may be procured prior to need or assignment to load crews. Procedures will include how the unique impression on malleable seal or self-locking seals will be rendered indistinguishable after a seal is removed or die or self-locking seal is damaged or unserviceable. (T-2)

3.3.2.2.1.3. (Added-USAFE) One set of dies or sufficient quantities of self-locking seals are available for each assigned load crew. Ensure one crimper (Part # GGG-S-735 or equivalent) is available for each assigned load crew. Do not use consolidated tool kits (CTK) for control

or storage of operational dies or self-locking seals. (T-2)

3.3.2.2.1.4. **(Added-USAFE)** Ensure applicable personnel, to include aircrew, load crews, load monitors, and other personnel required to check seals, are taught to recognize seal specific characteristics through briefings or as part of training sessions. Documentation as a specific training item is not required. For malleable seals, these characteristics are the locally developed unique impression and load crew identifier. For self-locking seals, these characteristics are the unit unique identifier and serial number or crew identifier. (T-2)

3.3.2.2.1.4.1. **(Added-USAFE)** Whenever dies or self-locking seals are changed, the Maintenance Group Commander or Host Nation functional equivalent will provide updates to all concerned parties via written notification. Mark and treat this notification "For Official Use Only." This notification is performed by the Maintenance Group Commander, not the Operations Group Commander. (T-2)

3.3.2.2.1.5. **(Added-USAFE)** MUNSS. The non-U.S. NATO DCA unit controls receipt, storage, issue and disposal of dies and seals. Additionally:

3.3.2.2.1.5.1. **(Added-USAFE)** The U.S. load monitor element must ensure that non-U.S. NATO DCA units maintain a viable seal program. (T-2)

3.3.2.2.1.5.2. **(Added-USAFE)** The U.S. load monitor section will assess the host nation seal and die program monthly by conducting an inventory and serviceability inspection as well as reviewing issue and receipt paperwork. These assessments may be performed in conjunction with the host nation's monthly inventory/serviceability inspection. (T-2)

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.

3.3.2.3. (USAFE) Store TDIs, controlled dies and self-locking, non-reversible seals in a secured storage container with access limited to issuing authorities. (T-2)

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.

3.3.2.5.1. **(Added-USAFE)** The immediate area is considered anywhere within the cockpit(s). Ensure both seals are checked, forward and aft, in two seat aircraft.

3.3.2.5.2. **(Added-USAFE)** MUNSS. When upload is complete and the U.S. load monitor has verified seal integrity, they will inform the entry controller that the load is complete and provide the entry controller with the code of the seal applied on the aircraft. The seal checker, together with the aircraft commander, will verify seal integrity. Following download, the U.S. load monitor will verify removed malleable seals have been rendered unserviceable or used roto-seals are turned in for destruction IAW locally developed procedures. (T-2)

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.

3.3.2.9.4. **(USAFE)** When an installed seal is accidentally broken during authorized operations and all circumstances are witnessed by an authorized TPC team, replacement of seal is authorized by personnel authorized to install seals. Reporting of this circumstance outside of local unit requirements is not required. When an installed seal is accidentally broken during authorized operations and an authorized TPC team does not witness all circumstances, the reliability of the weapons system will be deemed questionable until determined otherwise. Reporting outside of the unit will be based on known circumstances of the breakage and any findings during recertification actions. (T-2)

3.3.2.9.4.1. **(Added-USAFE)** When an installed seal is found broken and circumstances of breaking are unknown, or the seal shows evidence of tampering, maintain control of the system and perform the following:

3.3.2.9.4.1.1. **(Added-USAFE)** Investigate the event and submit appropriate AVOID AMBER or AVOID RED report according to ACO Directive 80-6/EUCOM Instruction 6801.01, *Nuclear Surety Management for the WS3*. Additionally, when it has been determined that a tamper control (Two-Person Control) violation occurred, the violation requires reporting according to AFI 91-204, *Safety Investigations and Reports* and AFMAN 91-221, *Weapons Safety Investigation and Reports*. (T-2)

3.3.2.9.4.1.2. **(Added-USAFE)** Perform weapon systems inspection and Nuclear System Functional checks according to technical orders when authorized or required by applicable weapons system safety rules. (T-2)

3.3.2.9.4.1.3. **(Added-USAFE)** Perform a weapon status check according to procedures in United States European Command Emergency Action Procedures Volume IV (EAP Volume IV), *Authentication and Permissive Action Link Systems*. (T-2)

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: (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
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(USAFE)

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Director of Safety

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

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

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AFI 91-101, *Air Force Nuclear Weapons Surety Program*, 13 October 2010

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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

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

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 Safety Group

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

Attachment 1 (USAFE)**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFMAN 33-363, *Management of Records*, 1 March 2008

AFI 91-204, *Safety Investigations and Reports*, 14 February 2006

AFMAN 91-221, *Weapons Safety Investigation and Reports*, 8 November 2010.

United States European Command Emergency Action Procedures Volume IV (EAP Volume IV), *Authentication and Permissive Action Link Systems*, current edition

ACO Directive 80-6/EUCOM Instruction 6801.01, *Nuclear Surety Management for the WS3*, current edition

T.O.00-20-1, *Aerospace Equipment Maintenance Inspection, Documentation, Policies, and Procedures*, 15 June 2013

Adopted Forms:

AF847, *Recommendation for Change of Publication*

AFTO781A, *Maintenance Discrepancy and Work Document*