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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 AFPD 91-1, Nuclear Weapons and Systems Surety. This publication is consistent with AFPD 13-5, *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, 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://www.my.af.mil/afirms/afirms/afirms/rims.cfm>. This Instruction requires collecting and maintaining information protected by the Privacy Act of 1974 authorized by 10 U.S.C. 8013. System of records notice (Serious Incident Reports (June 11, 1997, 62 FR 31793) applies. Send supplementing guidance to this Instruction to the Air Force Safety Center (AFSC/SEW, 9700 Avenue G SE, Kirtland AFB NM 87117-5670) for coordination and to AF/SE for review 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.

**(USAFE)** This supplement implements and extends the guidance of Air Force Instruction (AFI) 91-104, *Nuclear Surety Tamper Control and Detection Programs*. This supplement applies to all United States Air Forces in Europe (USAFE) units. When supplemented, send supplement copies for approval to the Weapons Safety Division (HQ USAFE/SEW). Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using Air Force (AF) Form 847, *Recommendation for Change of Publication*; 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 Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located in Air Force Records Information Management System (AFRIMS): <https://www.my.af.mil/gcssaf61a/afirms/afirms/rims.cfm>

## ***SUMMARY OF CHANGES***

This interim change (IC) adds new language in the introductory paragraph, specifically the second sentence, to make this publication consistent with AFD 13-5, *Nuclear Enterprise*. This IC also adds AFD 13-5 in the reference section of Attachment 1.

**(USAFE)** This document is substantially revised. This supplement provides information for the USAFE nuclear surety tamper control program management.

### **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.

1.1.1. **(Added-USAFE)** This program also applies to controlled components and associated Communications Security (COMSEC) of the Weapons Storage and Security System (WS3) as specified in USAFE Instruction 33-201, *Operational Doctrine for*

*Safeguarding and Control of Weapons Storage and Security System (WS3), and Technical Order (TO) 11N-50-1003, Console Group OJ-619/FSQ143(V) and Monitor-Indicator Group OD-203/FSQ-143(V) Weapons Storage and Security System AN/FSQ-143(V), and TO 11N-50-1004, Processor, Vault Control Group OL-398/FSQ-143(V) Weapons Storage and Security System AN/FSQ-143(V).*

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).

1.2.2. Enforces the Two-Person Concept.

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

1.3. 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:

1.3.1. Are certified under the Personnel Reliability Program (PRP), as specified in DoDR 5210.42\_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.

1.3.5. 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 any violations according to AFI 91-204, Safety Investigation and Reports.

**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.

1.4.1. **(Added-USAFE)** Single file entry and exit by a two-person control (TPC) team into an exclusion area is permissible (e.g., into or out of the personnel access door of a Protective Aircraft Shelter (PAS)/Hardened Aircraft Shelter (HAS)).

1.4.2. **(Added-USAFE)** Report Details. Refer to USAFEI 33-201 if a known or suspected TPC violation occurs with WS3 components or related COMSEC material; these components and COMSEC materials are not to be used in an operational WS3 system until they are recertified using TOs 11N-50-1003 and 11N-50-1004 inspection procedures or replaced when re-certification procedures do not exist.

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

1.5.1. The nuclear weapon system safety rules 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.

1.6.1.1. **(Added-USAFE)** A properly constituted TPC team will have at least one United States (U.S.) team member. The U.S. team member may be interim-certified under the U.S. Personnel Reliability Program (PRP) when paired with a non-U.S. person certified under the host nation's equivalent PRP. Non-U.S. personnel may be part of the TPC team at an open WS3 vault. Non-U.S. personnel will not be part of a TPC team in possession of WS3 Key or Code material or perform WS3 vault maintenance.

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.

## 2. Tamper Detection Program.

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

2.1.1. Air Force nuclear weapon system safety rules 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 is seals composed of a malleable material are installed with a crimping device and controlled die in order to form an impressed distinctive mark or unique

identifier. The second method is seals are 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 through the use of special equipment.

2.2.2.1. Tamper Detection Indicators 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 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.

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. Follow guidance in AFI 33-360, Publications and Forms Management, to develop and publish Field publications.

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). Only certified weapons loading personnel are authorized to apply and/or remove seals when flying operations are directed. Document each application of seals in an "INFO NOTE" on the AFTO Form 781A, *Maintenance Discrepancy and Work Document*, by recording the locally determined load crew identifier (not to include the unique impression), signature of the load crew chief, and the date and time of seal application. Upon removal of seals, enter the date, time, load crew identifier in the corrected action block and signature of the load crew chief in the corrected by block in the AFTO Form 781A.

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 (not to include the unique impression), signature of the load crew chief, and the date and time of seal application. Upon removal of seals the U.S. load monitor ensures the date, time, load crew identifier (not to include the unique impression) is documented as removed in the aircraft maintenance AFTO Form 781A or equivalent Host Nation form.

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:

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.

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.

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.

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. Whenever dies or self-locking seals are changed, the Maintenance Group Commander or Host Nation functional equivalent will provide prompt written notification to all concerned parties with knowledge of the codes. Mark and treat this notification "For Official Use Only." This notification is performed by the Maintenance Group Commander, not the Operations Group Commander.

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.

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.

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.

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 regulations.

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.

3.3.2.9.6. **(Added-USAFE)** All DCA Units. For the situations indicated, follow these procedures.

3.3.2.9.6.1. **(Added-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.

3.3.2.9.6.2. **(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:

3.3.2.9.6.2.1. **(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*.

3.3.2.9.6.2.2. **(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.

3.3.2.9.6.2.3. **(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*.

3.3.2.9.7. **(Added-USAFE)** Seals used in training must be easily distinguishable from operational seals and never used as operational.

#### 3.4. Two-Person Concept Team Responsibilities.

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.

#### 3.5. Adopted Forms:

AF Form 847, Recommendation for Change of Publication.

FREDERICK F. ROGGERO, Major General,  
USAF  
Chief of Safety

**(USAFE)**

KENNETH D. MADURA, Colonel, USAF  
Director of Safety

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

AFI 33-360, Publications and Forms Management, 18 May 2006  
AFI 63-125, Nuclear Certification Program, 15 March 2004  
AFI 91-101, Air Force Nuclear Weapons Surety Program, 19 December 2005  
AFI 91-102, Nuclear Weapon System Safety Studies, Operational Safety Reviews, and Safety rules, 28 July 2004  
AFI 91-103, Air Force Nuclear Safety Design Certification Program, 16 September 2005  
AFI 91-105, Critical Components, 10 December 1993  
AFI 91-112, Safety Rules for US/NATO Strike Fighters, 19 September 2009  
AFI 91-204, Safety Investigation and Reports, 24 September 2008  
DoDR 5210.42\_AFMAN 10-3902, Nuclear Weapons Personnel Reliability Program, 13 November 2006  
AFMAN 91-221, Weapons Safety Investigations and Reports, 18 June 2004  
AFPD 13-5, *Nuclear Enterprise*, 6 July 2011  
AFPD 91-1, Nuclear Weapons and Systems Surety, 13 February 2007

***Abbreviations and Acronyms***

**AF**— Air Force  
**AFDPO**— Air Force Digital Publication Office  
**AFI**— Air Force Instruction  
**AFMAN**— Air Force Manual  
**AFSC/SEW**— Air Force Safety Center, Weapons Safety Division  
**AFSC/SEWN**— AFSC/SEW, Nuclear Weapon Safety Branch  
**AFSC**— Air Force Safety Center  
**AF/SE**— Air Force Chief of Safety  
**NWSSG**— Nuclear Weapon System Safety Group  
**PRP**— Personnel Reliability Program  
**TDI**— Tamper Detection Indicators

**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.

USAFEI 33-201, *Operational Doctrine for Safeguarding and Control of Weapon Storage and Security System (WS3)*, 10 January 2005

T.O. 0020-5-1-1, *Engine Material Record*, 1 February 1989

T.O. 11N-50-1003, *Console Group OJ-619/FSQ-143(V) and Monitor-Indicator Group OD-203/FSQ-143(V) Weapons Storage and Security System AN/FSQ-143(V)*, current edition

T.O. 11N-50-1004, *Processor, Vault Control Group OL-398/FSQ-143(V) Weapon Storage and Security System AN/FSQ-143(V)*, current edition

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

**Adopted Forms**

AFTO Form 781A, *Maintenance Discrepancy and Work Document* (prescribing directive T.O. 00-20-1).

**Abbreviations and Acronyms**

**DCA**– Dual Capable Aircraft

**MUNSS**– Munitions Support Squadrons

**NATO**– North Atlantic Treaty Organization

**PRP**– Personnel Reliability Program

**TPC**– Two Person Control

**U.S.**– United States

**USAFE**– United States Air Forces in Europe

**WS3**– Weapons Storage and Security System