

**BY ORDER OF THE
SECRETARY OF THE AIR FORCE**

AIR FORCE INSTRUCTION 91-105

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Safety

CRITICAL COMPONENTS



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This Instruction implements AFPD 91-1, *Nuclear Weapons and Systems Surety*. This publication is consistent with AFPD 13-5, *Air Force Nuclear Enterprise*. It outlines requirements for transporting, storing, handling, and using critical components and explains the process for certifying and decertifying critical components. It applies to all individuals at all levels, including Air Force Reserve and Air National Guard (ANG) units who perform operations, maintenance, security, or logistics movement of critical components. For guidance on other Nuclear Weapons Related Material (NWRM) see AFI 20-110, *Nuclear Weapons-Related Materiel Management*. Send major command (MAJCOM) supplements to this Instruction to AFSEC/SEW at HQAFCSEW@kirtland.af.mil or 9700 G Avenue, Kirtland AFB NM 87117-5670 for coordination before publication. Ensure 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>. Requests for waivers must be submitted through the chain of command to the appropriate Tier waiver approval authority. 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's chain of command.

SUMMARY OF CHANGES

This revision clarified that the Nuclear Weapon System Safety Group can review decisions made by the AF/SE to designate weapon system components as critical components and decisions made to designate split-handling or split-knowledge procedures. Also changed combination lock options for entrance into no-lone zones and made organizational/administrative changes. It also incorporates new AFI 33-360 guidance to include Tier waiver requirements.

Section A—General Information

1. Air Force Goal. To prevent unauthorized activation of critical functions, as specified in AFI 91-107, *Design, Evaluation, Troubleshooting, and Maintenance Criteria for Nuclear Weapon Systems*, the Air Force develops positive measures to protect against inherent risks and threats and to ensure components are compatible with the assembled nuclear weapon system.

1.1. A critical component is a component of a nuclear weapon system that if bypassed, activated, or tampered with could result in or contribute to deliberate or inadvertent authorizing, prearming, arming, or launch of a combat delivery vehicle carrying a nuclear weapon or the targeting of a nuclear weapon to other than its planned target.

Section B—General Responsibilities

2. Air Force Chief of Safety (AF/SE). AF/SE establishes requirements to designate, certify and manage the critical component process and directs AFSEC/SEW to:

2.1. Designate critical components (when not designated by the AF Nuclear Weapon System Safety Group (NWSSG)).

2.2. Designate split-handling or split-knowledge procedures for critical components if not previously determined or if procedures proposed or in use are determined by AFSEC/SEW to be inadequate (when not designated by the AF NWSSG).

2.3. Approve Intercontinental Ballistic Missile (ICBM) Operational Certification (OPCERT)/Operational Decertification (DECERT) and procedural controls for critical components.

2.4. Approve vaults and containers used to store critical components (see paragraph 12).

2.5. Nuclear safety design certify Tamper Detection Indicators (TDI) per AFI 91-103, *Air Force Nuclear Safety Design Certification Program*, and approve their use to protect the certification status of critical components.

3. Air Force Nuclear Weapons Center (AFNWC):

3.1. Commander, AFNWC oversees and manages the Air Force nuclear certification process and grants nuclear certification to critical components upon completion of all required nuclear certification actions IAW AFI 63-125, *Nuclear Certification Program*.

3.2. AFNWC/NCSS supports the AFNWC/CC in fulfilling this nuclear certification responsibility through the AFNWC/NCSC Certification Branch as follows:

3.2.1. Ensures TDI and designated critical components are properly nuclear certified IAW AFI 63-125, as appropriate.

3.2.2. Ensures Nuclear Certification Impact Statements (NCIS) affecting designated critical components and TDIs are coordinated with AFSEC/SEW to determine appropriate nuclear safety design certification requirements.

3.2.3. Ensures designated critical components are properly identified in the Master Nuclear Certification List (MNCL).

4. Air Force Nuclear Weapon System Safety Group. The AF NWSSG reviews nuclear weapon system designs and operations to determine if they meet the DoD Nuclear Weapon System Safety Standards. It proposes safety rules and recommends changes to improve nuclear weapon system surety. Specifically, the AF NWSSG:

4.1. Designates which nuclear weapon system components are critical and reviews those designated by AF/SE.

4.2. Designates which nuclear certified critical components require split-handling or split-knowledge procedures and reviews those designated by AF/SE.

4.3. Designates split-handling or split-knowledge procedures during the lifecycle of the nuclear weapon system critical component and reviews those designated by AF/SE. See AFI 91-101, *Air Force Nuclear Weapons Surety Program*, for definitions of split-handling and split-knowledge.

4.4. Reviews and, if required, updates weapon system safety rules.

5. Operational Commands and Affected Organizations:

5.1. Implement split-handling and split-knowledge control procedures. (T-0).

5.2. Operationally certify critical components as required by approved Technical Order procedures before using them in operational nuclear weapon systems.

5.3. Decertify critical components according to AFI 91-103 and associated Technical Orders.

5.4. Control certified critical components according to Section D of this Instruction. (T-0).

6. Implementing Command or Organization. The command or organization responsible for procuring or modifying a nuclear weapon system must:

6.1. Notify AFSEC/SEW of weapon system modifications that impact current critical components by submitting a NCIS to the AFNWC/NCS.

6.2. Recommend items for critical component status to AFSEC/SEW.

6.3. Recommend OPCERT and DECERT concepts and Technical Order procedures of critical components to AFSEC/SEW. Recommend decertification of critical components when component is no longer part of an assembled nuclear weapon system.

Section C—Designating and Marking Critical Components

7. Designating Critical Components. Critical components must receive nuclear certification IAW AFI 63-125 and be listed in the MNCL.

7.1. All items designated as critical components must pass operational certification procedures before use.

7.2. Items designated as a critical component will be clearly identified as a critical component in the MNCL.

7.3. The National Security Agency (NSA) may request critical component designation for NSA-produced software and hardware used with a nuclear weapon or nuclear weapon system. The NSA-provided software and hardware items receive certification equal to that provided by the Air Force and therefore do not need additional Air Force design certification.

8. Marking Critical Components. A Command using critical components identifies those requiring Two-Person Concept control with designated labels or tags. Use the following guidelines for all other critical components:

8.1. Affix the label (or tag, if the component is too small for a label) to the outside of the critical component or the component's shipping container. (T-0). ICBM units will use tags for all ICBM code components, while outside of shipping containers. (T-0).

8.2. Remove or cover the label or tag when the component is not certified for operational use (T-0).

8.3. Do not use external markings to identify areas, facilities, aircraft, or equipment as containing critical components (e.g. adding identifying paint stripe). (T-0).

Section D—Controlling Critical Components

9. Two-Person Concept. The Two-Person Concept protects a part of each critical component's life cycle. This minimizes the possibility that an unauthorized or inadvertent act could degrade the nuclear surety of a nuclear weapon or nuclear weapon system. Two-Person Concept control for a critical component may begin at the time of production and continue until the critical component's destruction or may occur during any interim period. Complete the following tasks:

9.1. Handle and control the component following the guidelines for operationally certified critical components in AFI 91-104, *Nuclear Surety Tamper Control and Detection Programs*. (T-0).

9.2. Keep a code component or device under Two-Person Concept control or store it according to the methods described in paragraph 12 when an operational code that cannot be overwritten passes through it. (T-0). The Two-Person Concept control applies if the code component or device has no operational decertification procedure and continues until all embedded codes are superseded or IAW controlling authority, per Emergency Action Procedures-Strategic (EAP-STRAT), Volume 16.

10. Operational Use of Critical Components. Protect certified critical components in operational use by keeping them under Two-Person Concept control or in a storage facility as specified in paragraph 12. (T-0).

11. Shipping Requirements. If using a Two-Person Concept team or NSA-approved TDIs to protect the certification status, you may use the Department of Defense Courier Service to transport operationally certified critical components. (T-0).

12. Storage Requirements. These storage requirements apply to certified critical components. Decertified critical components require storage units to meet security classification requirements, IAW CG-W-5, *Joint DoE/DoD Nuclear Weapons Classification Policy Guide*. (T-0).

12.1. Use one of the following methods to store certified critical components that are not under Two-Person Concept control.

12.1.1. **Method 1.** Store components in an approved reinforced concrete vault. Use an intrusion detection system reporting to a remote, continuously staffed location. (T-0).

12.1.2. **Method 2.** Store components in an approved storage container. Use a volumetric motion detector and a door detector for the storage area; both detectors must report independently to a remote, continuously staffed location. (T-0).

12.1.3. **Method 3.** Protect components with TDIs approved IAW AFI 91-104.

12.2. Apply the following for methods 1 and 2.

12.2.1. Store the component in a no-lone zone. (T-0).

12.2.2. Secure every entrance to the no-lone zone with two General Services Administration (GSA) medium-security locks ensuring no individual can open both locks, or a GSA approved combination lock which requires two separate combinations to be dialed out for it to be unlocked ensuring no lone individual can gain access to the no-lone zone. (T-0).

12.2.3. Incorporate a line supervision scheme within the alarm reporting circuits for the storage area that detects tampering and reports it to the remote monitoring facility. (T-0).

12.2.4. Keep at least one person focused on security functions at the alarm monitor location (T-0).

12.3. Unless they are protected by method 3, keep temporarily stored certified critical components (e.g. uncoded Minuteman missile guidance sets remaining overnight at missile alert facilities) in a no-lone zone (T-0). Protect the components as their classification warrants. See EAP-STRAT Volume 16, Chapter 4, paragraph 7 for procedures concerning code components.

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

AFPD 13-5, *Air Force Nuclear Enterprise*, 6 July 2011

AFI 20-110, *Nuclear Weapons-Related Materiel Management*. 18 February 2011

AFPD 91-1, *Nuclear Weapons and Systems Surety*, 13 December 2010

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

AFI 91-103, *Air Force Nuclear Safety Design Certification Program*, 17 November 2010

AFI 91-104, *Nuclear Surety Tamper Control and Detection Programs*, 10 September 2010

AFI 91-107, *Design, Evaluation, Troubleshooting, and Maintenance Criteria for Nuclear Weapon Systems*, 11 December 2012

CG-W-5, *Joint DoE/DoD Nuclear Weapons Classification Policy Guide*, 30 September 1997

EAP – STRAT Volume 16, *ICBM Code Component Control Policy and Procedures*, 1 March 2012

Air Force Records Disposition Schedule (AFRDS),
<https://www.my.af.mil/afirms/afirms/afirms/rims.cfm>

Adopted Forms

AF Form 847, *Recommendation for Change of Publication*

Abbreviations and Acronyms

AF—Air Force

AFB—Air Force Base

AFI—Air Force Instruction

AFNWC—Air Force Nuclear Weapons Center

AFPD—Air Force Policy Directive

AFSEC—Air Force Safety Center

AFSEC/SEW—Air Force Safety Center, Weapons Safety Division

AFSEC/SEWN—AFSEC/SEW, Nuclear Weapon Safety Branch

DECERT—Operational Decertification

DoD—Department of Defense

EAP—STRAT--Emergency Action Procedures-Strategic

GSA— General Services Administration

MAJCOM—Major command

MNCL—Master Nuclear Certification List

NSA—National Security Agency

NCIS—Nuclear Certification Impact Statement

NWRM—Nuclear Weapons Related Material

NWSSG—Nuclear Weapon System Safety Group

OPCERT—Operational Certification

OPR—Office of Primary Responsibility

TDI—Tamper Detection Indicators

USAF/SE—Air Force Chief of Safety