



DoD Nuclear Weapon System Safety Program Manual



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Assistant to the Secretary of Defense for
Nuclear and Chemical and Biological Defense Programs



ATOMIC ENERGY

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FOREWORD

This Manual is issued under the authority of DoD Directive 3150.2, "DoD Nuclear Weapon System Safety Program," December 23, 1996. It prescribes procedures for implementation of the Department of Defense Nuclear Weapon System Safety Program.

This Manual applies to the Office of the Secretary of Defense (OSD), the Military Departments, the Chairman of the Joint Chiefs of Staff, the Combatant Commands, and the Defense Agencies (hereafter referred to collectively as "the DoD Components"). It applies to all nuclear weapons and nuclear weapons systems for which the DoD Components have developmental, custodial, or operational responsibilities. It is essential that the users of this Manual consult the referenced source documents, as appropriate.

This Manual is effective immediately and is mandatory for use by all the DoD Components.

Send recommended changes to the Manual, through appropriate channels, to the following:

Office of the Assistant to the Secretary of Defense for Nuclear and Chemical
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Harold P. Smith, Jr.



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REFERENCES

- (a) DoD Directive 4540.5, "Movement of Nuclear Weapons by Noncombat Delivery Vehicles," June 14, 1978
- (b) DoD Directive 5210.41, "Security Policy for Protecting Nuclear Weapons," September 23, 1988
- (c) DoD Directive 3150.2, "DoD Nuclear Weapon System Safety Program," December 23, 1996
- (d) DoD Directive 5210.42, "Nuclear Weapon Personnel Reliability Program (PRP)," May 25, 1994
- (e) DoD Directive 5134.8, "Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs (ATSD(NCB))," June 8, 1994
- (g) DoD C-521 0.41-M, "Nuclear Weapon Security Manual (U)," April 1994, authorized by DoD Directive 5210.41, September 23, 1988
- (g) DoD Directive 5100.52, "DoD Response to an Accident or Significant Incident Involving Radioactive Materials," December 21, 1989
- (h) DoD 5100.52-M, "Nuclear Weapon Accident Response Procedures (NARP)," September 1990, authorized by DoD Directive 5100.52, December 21, 1989
- (i) Technical Publication 25-1, "DoD Nuclear Weapons Technical Inspection System," January 1, 1986
- (j) DoD 8910. I-M, DoD Procedures for Management of Information Requirements, November 1986, authorized by DoD Directive 8910.1, "Management and Control of Information Requirements," June 11, 1993
- (k) DoD Directive S-5200. 16, "Objectives and Minimum Standards for Communications Security Measures Used in Nuclear Command and Control Communications (U)," September 22, 1970
- (l) DoD Directive S-521 0.8l, "United States Nuclear Weapons Command and Control (U)," June 18, 1991
- (m) DoD Directive S-31 50.7, "Controlling the Use of Nuclear Weapons," June 20, 1994
- (n) Section 179 of title 10, United States Code
- (o) Memorandum of Agreement between the Department of Defense and the Department of Energy, March 21, 1953, and as supplemented, September 5, 1984
- (p) DoD Directive 3150.1, "Joint Nuclear Weapons Development Studies and Engineering Projects," December 27, 1983
- (q) DoD Instruction 5030.55, "Joint AEC-DoD Nuclear Weapons Development Procedures," January 21, 1974
- (r) DoD Directive 5000.1, "Defense Acquisition," March 15, 1996
- (s) DoD Instruction 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," March 1996, authorized by DoD Directive 5000.1, March 15, 1996
- (t) Memorandum of Understanding Between the Department of Defense and the Department of Energy," March 17, 1992
- (u) Technical Publication O-1, "Numerical Index to Joint Nuclear Weapons Publications (Including Related Publications)," January 1, 1995¹
- (v) Technical Publication 20-5, "Plutonium Contamination Standards," February 7, 1977¹
- (w) Technical Publication 20-7, "Nuclear Safety Criteria," September 1, 1986
- (x) Technical Publication 20-11, "General Firefighting Guidance," September 20, 1991
- (Y) Technical Publication 5-1, "Unsatisfactory Report System," December 1, 1993¹

¹ Available from the Defense Special Weapons Agency; FCDSWA Attn: FCPSP, 1680 Texas Street, SE, Kirtland AFB, NM 87117-5669

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DEFINITIONS

1. **Abnormal Environments.** Environments as defined in a weapon's stockpile-to-target sequence (STS) and military characteristics (MCs) in which a nuclear weapon or a nuclear weapon system is not expected to retain full operational reliability.
2. **Access.** Close physical or electrical proximity to a nuclear weapon in such a manner as to allow the opportunity to tamper with or damage a nuclear weapon. For example, a person would not be considered to have access if an escort or a guard were provided for either the person or the weapon when the person is in close proximity to the weapon.
3. **Arming.** Readyng a nuclear weapon so that a fuzing signal will operate the firing system; includes operation or reversal of safing items.
4. **Certification.** A determination by the applicable Service that procedures, personnel, equipment, facilities, and organizations are capable of safely performing assigned nuclear weapon functions and missions.
5. **Custody.** Responsibility for the control of, transfer and movement of, and access to nuclear weapons. Custody may include accountability.
6. **DoD Nuclear Weapon System Safety Program.** A program integrating safety policy, organizational responsibilities, and formalized procedures throughout a nuclear weapon system's life-cycle to protect nuclear weapon systems. The program involves identifying, evaluating, controlling, and reducing risks related to nuclear weapons. Positive measures are used to enhance the safety of nuclear weapon systems.
7. **Emergency.** An unexpected occurrence or set of circumstances in which personnel or equipment unavailability, due to accident, natural event, or combat, may demand immediate action that may require extraordinary measures to protect, handle, service, transport, jettison, or employ a nuclear weapon.
8. **Inadvertent Launch Analysis (ILA).** Methodology for analyzing technical malfunctions, acts of God, and human errors that could result in an inadvertent use of a nuclear weapon.
9. **Jettison.** The intentional separation of an unarmed weapon from its delivery system or transport carrier in response to an emergency.
10. **Launching.** Propulsion of a missile with a nuclear warhead into flight beyond the immediate area of the launching site. Specific definitions for each nuclear weapon or nuclear weapon system will be provided in the concept of operations, as appropriate.
11. **Life-Cycle Process.** The breadth of activities applicable to a nuclear weapon throughout its lifetime, which includes development, testing, production, transportation, acceptance, storage, maintenance, upgrades, retirement, and dismantlement, as well as approved operations.
12. **Normal Environments.** The expected logistical, storage, and operational environments defined in the STS document and the MCS which the weapon system is required to survive without degradation in operational reliability.

13. Nuclear Weapon. A device in which the explosion results from the energy released by reactions involving fission or fusion (of atomic nuclei).

14. Nuclear Weapon System. A nuclear weapon and a means for delivering it to the target, with associated support equipment, facilities, procedures, personnel, and any vehicles peculiar to the system used for weapon transport.

15. Nuclear Weapon System Safety. The application of engineering and management principles, criteria, and techniques to protect nuclear weapons against the risks and threats inherent in their environments within the constraints of operational effectiveness, time, and cost throughout all phases of their life cycle.

16. One-Point Safe. A nuclear weapon is one-point safe if, when the high explosive (HE) is initiated and detonated at any single point, the probability of producing a nuclear yield exceeding 4 pounds of trinitrotoluene (TNT) equivalent is less than one in 10.

17. Positive Measures. Design features, safety rules, procedures, accident prevention or mitigation measures, or other controls including physical security and coded systems, used collectively or individually, to enhance safety and to reduce the likelihood, severity, or consequences of an accident, unauthorized act, or deliberate threat.

18. Prearming. Nuclear weapon system operations that configure a nuclear weapon so that arming, launching, or releasing will start the sequence necessary to produce a nuclear detonation.

19. Prevent. As used in the DoD nuclear weapon system safety standards, “prevent” means to minimize the possibility of occurrence of an undesired event. It does not imply absolute assurance that the event will not occur.

20. Releasing. The separation of a missile or gravity bomb with a nuclear warhead, for use in its intended mode of operation, from a delivery aircraft.

21. Security. Protection against loss of custody, theft, or diversion of a nuclear weapon system; protection against unauthorized access; or protection against unauthorized actions, vandalism, sabotage, and malevolent damage.

22. Stockpile-to-Target Sequence (STS). A DoD developed document that delineates the logistic and employment concepts and normal and credible abnormal environments involved in the delivery of a nuclear weapon from the stockpile to the target.

23. Survivability. The capability of the nuclear weapon and supporting systems to endure and to maintain the ability to perform assigned nuclear missions.

24. Unauthorized Launch Analysis (ULA). Methodology for analyzing elements that can lead to an unauthorized use of a nuclear weapon.

25. Use Control. The positive measures that allow the authorized use and prevent or delay unauthorized use of nuclear weapons, and is accomplished through a combination of weapon system design features, operational procedures, security, and system safety rules.

ABBREVIATIONS AND/OR ACRONYMS

AEC	Atomic Energy Commission
ATSD(NCB)	Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs
DNSI	Defense Nuclear Surety Inspections
DNWS	Defense Nuclear Weapons School
DoD	Department of Defense
DoE	Department of Energy
DRAAG	Design Review and Acceptance Group
DSWA	Defense Special Weapons Agency
EAM	Emergency Action Message
EC	Emergency Capability
FAD	First Assets Delivered
HE	High Explosive
ILA	Inadvertent Launch Analysis
INSS	Interim Safety Study
IOC	Initial Operational Capability
ISS	Initial Safety Study
JNWPS	Joint Nuclear Weapons Publication System
JTA	Joint Test Assembly
LPO	Lead Project Officer
MAIS	Major Automated Information System
MAR	Major Assembly Release
MCS	Military Characteristics
MDAP	Major Defense Acquisition Program
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NARP	Nuclear Accident Response Procedures
NATO	North Atlantic Treaty Organization
NNAP	Non-Nuclear Assurance Program
NWC	Nuclear Weapons Council
NWCSSC	Nuclear Weapons Council Standing and Safety Committee
NWSP	Nuclear Weapon Stockpile Plan
NWSSG	Nuclear Weapons System Safety Group
NWSSR	Nuclear Weapons System Safety Report
NWTI	Nuclear Weapons Technical Inspection
OSD	Office of the Secretary of Defense
OSR	Operational Safety Review
PAL	Permissive Action Link
PNAF	Prime Nuclear Airlift Force
POG	Project Officer Group
Poss	Pre-Operational Safety Study
PRA	Probabilistic Risk Assessment
PRP	Personnel Reliability Program
Pss	Preliminary Safety Study
QART	Quality Assurance and Reliability Test Program
S ²	Safety and Security

Sss	Special Safety Study
STS	Stockpile-to-Target Sequence
TNT	Trinitrotoluene
TP	Technical Publication
TSS	Transportation Safety Study
ULA	Unauthorized Launch Analysis
UR	Unsatisfactory Report
Us.	United States
U.S.C.	United States Code
USSTRATCOM	U.S. Strategic Command