

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

**AIR FORCE POLICY DIRECTIVE 91-4**

**17 JANUARY 2020**

**Safety**

**DIRECTED ENERGY SYSTEM SAFETY**



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This Air Force Policy Directive (AFPD) establishes Air Force military-specific directed energy system safety policy. Directed energy systems provide unique capabilities and produce a broad spectrum of hazards. This AFPD implements the applicable portions of Department of Defense (DoD) Instruction (DoDI) 3200.19, *Non-Lethal Weapons (NLW) Human Effects Characterization*; DoDI 6055.15, *DoD Laser Protection Program*; and DoDI 6055.11, *Protecting Personnel from Electromagnetic Fields*. This publication applies to Regular Air Force, Air Force Reserve, and Air National Guard units and personnel. Ensure 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 located in the Air Force Records Information Management System. Refer recommended changes and questions about this publication to the Office of Primary Responsibility using the AF Form 847, *Recommendation for Change of Publication*; route AF Form 847 from the field through the appropriate functional chain of command. This publication may not be supplemented. Major commands, field operating agencies, and direct reporting units, if applicable, will not issue instructions that implement this policy directive without Air Force Chief of Safety (AF/SE) approval.

### **SUMMARY OF CHANGES**

This document has been substantially revised and needs to be completely reviewed. Major changes include incorporation of military-specific directed energy systems into policy, updated definitions, clarified military-specific acoustic system policy, and minimized acronym use.

## 1. Overview.

1.1. The Air Force will ensure military-specific directed energy systems receive treatment distinct from conventional or nuclear systems because of their characteristics which may include speed-of-light delivery, range, and varied effects. Directed energy systems require a scalable, risk-based approach to safety that is commensurate with the hazard potential of each system.

1.1.1. A directed energy system may be a weapon or device used to achieve a desired effect. Military-specific directed energy systems are defined as those systems used for combat, combat training, or are classified in the interests of national security. Directed energy weapons are designed to kill, injure, disable or temporarily incapacitate people or destroy, damage, disable or temporarily incapacitate property or materiel. Devices, as non-weapon systems, use directed energy primarily for a purpose other than as a weapon.

1.1.2. Military-specific acoustic systems use sound across the entire frequency spectrum to kill, injure, disable or temporarily incapacitate people or destroy, damage, disable, or temporarily incapacitate property or materiel. A military-specific acoustic system may be a weapon or a device. Military-specific acoustic systems, although outside the joint definition of directed energy systems, have effects and hazards more similar to directed energy systems than to conventional weapons. Military-specific acoustic systems will follow the same safety policy as military-specific directed energy systems.

1.2. The Air Force will ensure protection of personnel, property, operational capability and the environment from undue risk of damage or harm from military-specific directed energy systems, consistent with mission requirements.

## 2. Policy. The Air Force shall:

2.1. Establish and conduct a military-specific directed energy safety program to ensure the safe research, development, testing, operation, training, maintenance, storage, decommissioning, and disposal of these systems. As an element of this program, the Air Force will use applicable DoD regulations, and federal laws and regulations, as well as appropriate standards developed or adopted by national or international engineering, science, and safety organizations.

2.2. Establish and conduct a safety certification process for military-specific directed energy systems. Directed energy systems must have a safety certification from the AF/SE prior to fielding or operational testing, training, or operation by non-developmental personnel. Non-developmental personnel are individuals who are typical operators that validate that the system under test can effectively execute its mission in a realistic operational environment when operated against representative threats. These personnel verify that the system is built correctly in accordance with the specification and contract to validate that the system can successfully accomplish its mission in a realistic operational environment

2.3. Investigate mishaps involving military-specific directed energy systems in accordance with AFPD 91-2, *Safety Programs*, and other directives as appropriate.

## 3. Roles and Responsibilities.

3.1. The Assistant Secretary of the Air Force for Installations, Environment and Energy (SAF/IE):

- 3.1.1. Provides guidance, direction and oversight for safety and occupational health policy for military-specific directed energy systems.
- 3.2. The Assistant Secretary of the Air Force (Acquisition, Technology & Logistics) (SAF/AQ):
  - 3.2.1. Ensures inclusion of military-specific directed energy systems safety requirements in acquisition policy.
  - 3.2.2. Ensures military-specific directed energy systems are evaluated by the Air Force Research Laboratory or an Air Force Safety Center and Air Force Research Laboratory acceptable third party for the effects of directed energy on human targets.
- 3.3. The Air Force Chief of Safety (AF/SE):
  - 3.3.1. Develops military-specific directed energy systems safety policy and procedural guidance.
  - 3.3.2. Ensures compliance with safety policy and development by maintaining instructions to implement this directive, and is the certification authority for directed energy system safety.
  - 3.3.3. Determines the utility/applicability of standards developed or adopted by national or international scientific safety organizations.
  - 3.3.4. Establishes military-specific directed energy systems testing and employment proximity restrictions pertaining to nuclear and conventional weapons.
  - 3.3.5. Appoints subject matter and technical experts as appropriate to support the Human Effects Review Board specified in DoDI 3200.16 and the working groups specified in DoDI 6055.11 and DoDI 6055.15.
- 3.4. The Air Force Surgeon General (AF/SG):
  - 3.4.1. Issues directive policy for the protection of Air Force personnel and the general public from overexposure to noise, nonionizing radiation, and ionizing radiation in accordance with AFPD 48-1, *Aerospace and Operational Medicine Enterprise (AOME)*, to include:
    - 3.4.2. Completing health risk assessments.
    - 3.4.3. Recommending health risk controls.
    - 3.4.4. Documenting human exposure.
    - 3.4.5. Identifying medical monitoring requirements, and identifying diagnostic and therapeutic modalities for injuries and diseases related to military-specific directed energy systems operations.
    - 3.4.6. Appointing subject matter and technical experts as appropriate to support the Human Effects Review Board specified in DoDI 3200.16 and the working groups specified in DoDI 6055.11 and DoDI 6055.15.
- 3.5. The Director of Test and Evaluation (AF/TE):
  - 3.5.1. Provides direction and guidance to ensure test organizations assess safety standards and hazards prior to testing.

3.6. The Deputy Chief of Staff for Operations (AF/A3):

3.6.1. Ensures military-specific directed energy systems safety requirements are implemented in military range and operations policy.

3.7. Major Commands:

3.7.1. Advocate for developmental and operational testing of military-specific directed energy systems.

3.7.2. Advocate for funding, research, development, test and evaluation, and manpower to ensure sufficient resources are available to develop and implement the military-specific directed energy system safety program.

3.8. Air Force Materiel Command (AFMC), in addition to the roles and responsibilities in paragraph 3.7:

3.8.1. Supports development of safe military-specific directed energy systems.

3.8.2. Evaluates the human target effects of directed energy systems in concert with data produced by the Air Force Research Laboratory.

3.8.3. Conducts medical and health effects consulting, education and training.

3.9. Air Education and Training Command (AETC) commander, in addition to the roles and responsibilities in paragraph 3.7:

3.9.1. Develops directed energy curricula and provides training and education to satisfy career field requirements.

3.10. Commanders at all levels:

3.10.1. Understand the capabilities and hazards of directed energy systems as applicable to their mission.

3.10.2. Incorporate military-specific directed energy system safety and health considerations, consistent with applicable test, training, or operational requirements in their mission planning, decisions, and operations.

3.10.3. Be aware of safe-use requirements and applicable host nation laws and advise subordinate commanders when outside the United States, its territories, or possessions.

Barbara Barrett  
Secretary of the Air Force

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

DoDI 3200.19, *Non-Lethal Weapons (NLW) Human Effects Characterization*, 17 May 2012

DoDI 6055.11, *Protecting Personnel from Electromagnetic Fields*, 19 August 2009

DoDI 6055.15, *DoD Laser Protection Program*, 4 May 2007

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

AFPD 48-1, *Aerospace & Operational Medicine Enterprise (AOME)*, 7 June 2019

AFPD 91-2, *Safety Programs*, 3 September 2019

FDA Exemption No. 76EL-01, *Department of Defense Exemption from the FDA Performance Standard for Laser Products*, 1976

***Adopted Forms***

AF Form 847, *Recommendation for Change of Publication*

***Abbreviations and Acronyms***

**AETC**—Air Education and Training Command

**AF/A3**—Deputy Chief of Staff for Operations

**AF/SE**—Air Force Chief of Safety

**AF/SG**—Air Force Surgeon General

**AF/TE**—Director of Test and Evaluation

**AFMAN**—Air Force Manual

**AFMC**—Air Force Materiel Command

**AFPD**—Air Force Policy Directive

**DoD**—Department of Defense

**DoDI**—Department of Defense Instruction

**NLW**—Non-Lethal Weapons

**SAF/AQ**—Assistance Secretary of the Air Force for Acquisition

**SAF/IE**—Assistant Secretary of the Air Force for Installations, Environment and Energy