

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

AIR FORCE POLICY DIRECTIVE 91-4

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Safety

DIRECTED ENERGY WEAPONS SAFETY



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This Air Force Policy Directive (AFPD) establishes Air Force directed energy weapons (DEW) safety policy. DEW provide unprecedented capabilities and produce a broad spectrum of hazards. These hazards require specific safety measures to prevent DEW mishaps. This AFPD interfaces with and is consistent with Department of Defense Instruction (DoDI) 3200.19, *Non-Lethal Weapons (NLW) Human Effects Characterization*; DoDI 3222.03, *DoD Electromagnetic Environmental Effects (E3)*; DoDI 5000.69, *DoD Joint Services Weapon and Laser System Safety Review Processes*; DoDI 6055.05, *Occupational and Environmental Health (OEH)*; DoDI 6055.11, *Protecting Personnel from Electromagnetic Fields*; 6055.15, *DoD Laser Protection Program*; AFD 48-1, *Aerospace Medicine Enterprise*; and AFD 90-8, *Environment, Safety & Occupational Health Management and Risk Management*. This publication applies to Air Force, Air Force Reserve (AFR), and Air National Guard (ANG) units. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with (IAW) Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of IAW the Air Force Records Disposition Schedule (RDS) in the Air Force Records Information Management System (AFRIMS). 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. This publication may not be supplemented.

SUMMARY OF CHANGES

Added roles and responsibilities for AF/TE. Updated responsibilities of various organizations at Air Staff level and below. Added references to various DoD and AF publications and instructions that are consistent with this publication. Updated formatting.

1. Overview

1.1. The Air Force will ensure DEW receive treatment distinct from conventional or nuclear weapons because of their characteristics, which may include speed-of-light delivery, range, and varied weapons effects. DEW require a scalable approach to safety that is commensurate with the hazard potential of each weapon.

1.1.1. A DEW is a system using a beam of concentrated electromagnetic energy (including but not limited to lasers and high power microwave systems), or atomic or subatomic particles primarily as a direct means to kill, injure, disable, or temporarily incapacitate people or destroy, damage or temporarily incapacitate property or materiel.

1.1.2. Acoustic weapons use sound across the entire frequency spectrum to kill, injure, disable, or temporarily incapacitate people. Acoustic weapons, although outside the Joint definition of DEW, have effects and hazards more similar to DEW than to conventional weapons. Acoustic weapons will follow the same safety policy as DEW.

1.2. The Air Force will ensure protection of personnel, property, operational capability and the environment from undue risk of damage or harm from DEW, consistent with mission requirements.

2. Policy.

2.1. The Air Force Shall:

2.2. Establish and conduct a DEW 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 determine the applicability of Department of Defense (DoD), federal, state, and local laws and regulations, international law and host nation laws, as well as the utility of advisory standards developed or adopted by national or international scientific safety organizations.

2.3. Establish and conduct a safety certification process for DEW systems. DEW systems must have a safety certification from The Air Force Chief of Safety (AF/SE) prior to operational testing, training, or operation by AF personnel.

2.4. Investigate mishaps involving DEW IAW AFPD 91-2, *Safety Programs*, and other directives as appropriate.

3. Responsibilities and Authorities:

3.1. The Assistant Secretary of the Air Force for Installations, Environment and Energy (SAF/IE) is responsible for safety and occupational health policy for DEW.

3.2. The Assistant Secretary of the Air Force for Acquisition (SAF/AQ) is responsible for ensuring inclusion of DEW safety requirements in acquisition policy. SAF/AQ will ensure the Air Force Research Laboratory (AFRL) evaluates effects of DEW on human targets.

3.3. The Air Force Chief of Safety (AF/SE) is responsible for developing DEW safety policy and procedural guidance. AF/SE is responsible for ensuring compliance with safety policy and for developing and maintaining instructions to implement this directive, and is the certification authority for DEW safety. AF/SE is responsible to determine the utility/applicability of advisory standards developed or adopted by national or international scientific safety organizations. AF/SE is responsible for establishing DEW testing and employment proximity restrictions pertaining to nuclear and conventional weapons.

3.4. The Air Force Surgeon General (AF/SG) issues directive policy for the protection of Air Force personnel and the general public from overexposure to noise, nonionizing radiation, and ionizing radiation IAW AFPD 48-1, *Aerospace Medicine Enterprise*.” AF/SG policy includes completing health risk assessments, recommending health risk controls, documenting human exposure, identifying medical monitoring requirements, and identifying diagnostic and therapeutic modalities for injuries and diseases related to DEW operations.

3.5. The Director of Test and Evaluation (AF/TE) provides direction and guidance to ensure test organizations assess safety standards and hazards prior to testing.

3.6. At an early stage of the acquisition process, or a modification of an existing weapon, the Judge Advocate General (AF/JA), or the General Counsel (SAF/GC) for a weapon developed within a Special Access Program, will ensure that a weapon legal review is completed for all DEW and that any such weapon complies with DoD regulations and domestic and international law IAW AFI 51-402, *Legal Reviews of Weapons and Cyber Capabilities*.

3.7. The Deputy Chief of Staff for Operations (AF/A3) is responsible for ensuring DEW safety requirements are implemented in range operations policy.

3.8. Major Commands (MAJCOMs) are responsible for advocating developmental and operational testing of DEW systems IAW AFI 99-103, *Capabilities-Based Test and Evaluation*. Further, each MAJCOM utilizing or having Research, Development, Test and Evaluation (RDT&E) responsibilities for DEW is responsible for advocating funding, RDT&E, and manpower to ensure sufficient resources are available to develop and implement the DEW Safety Program.

3.9. AFMC/CC is responsible for supporting development of safe DEW, evaluating the human target effects of DEW in concert with data produced by AFRL, and conducting medical and health effects consulting, education and training. IAW AFI 48-109, *Electromagnetic Field Radiation (EMFR) Occupational and Environmental Health Program*, and AFI 48-139, *Laser and Optical Radiation Protection Program*, AFMC/CC shall also administer and maintain the DoD EMF Injury Hotline and Tri-Service Laser Injury Hotline to provide immediate expert medical advice in the event of an injury or suspected injury to DoD personnel from EMF and lasers. AFMC/CC shall further administer and maintain the EMF Overexposure Repository for DoD Components to access, analyze, and use in EMF protection programs.

3.10. AETC/CC is responsible for developing directed energy curricula and providing training and education to satisfy career field requirements.

3.11. Commanders at all levels with a mission incorporating DEW are responsible for understanding the capabilities and hazards of DEW systems. Commanders must incorporate

DEW safety and health considerations, consistent with applicable test, training or operational requirements, in their mission planning, decisions and operations.

3.11.1. Outside the United States, its territories or possessions, MAJCOM and Numbered Air Force (NAF) commanders must be aware of safe-use requirements and applicable host nation laws and advise subordinate commanders.

3.11.2. Before fielding any DEW, MAJCOM, NAF, and subordinate echelon Commanders will coordinate their proposed concept of employment with their staff judge advocate (SJA) for a legal review to ensure compliance with DoD regulations and domestic and international law.

4. Implementation Limitations

4.1. MAJCOMs, Field Operating Agencies, and Direct Reporting Units, if applicable, will not issue instructions that implement this policy directive without AF/SE approval.

Heather Wilson
Secretary of the Air Force

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

DoDI 3200.19, *Non-Lethal Weapons (N*

LW) Human Effects Characterization, 17 May 2012

DoDI 3222.03, *DoD Electromagnetic Environmental Effects (E3) Program*, 25 August 2014

DoDI 5000.69, *DoD Joint Services Weapon and Laser System Safety Review Processes*, 9 November 2011

DoDI 6055.01, *DoD Safety and Occupational Health (SOH) Program*, 14 October 2014

DoDI 6055.05, *Occupational and Environmental Health (OEH)*, 11 November 2008

DoDI 6055.08, *Occupational Ionizing Radiation Protection Program*, 15 December 2008

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

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

AFPD 48-1, *Aerospace Medicine Enterprise*, 23 August 2011

AFPD 90-8, *Environment, Safety & Occupational Health Management and Risk Management*, 2 February 2012

AFPD 91-2, *Safety Programs*, 24 July 2012

AFI 48-109, *Electromagnetic Field Radiation (EMFR) Occupational and Environmental Health Program*, 1 August 2014

AFI 48-139, *Laser and Optical Radiation Protection Program*, 30 September 2014

AFI 51-402, *Legal Reviews of Weapons and Cyber Capabilities*, 27 July 2011

AFI 99-103, *Capabilities-Based Test and Evaluation*, 16 October 2013

Adopted Form

AF Form 847, *Recommendation for Change of Publication*.

Abbreviations and Acronyms

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFPD—Air Force Policy Directive

AFR—Air Force Records

AFRIMS—Air Force Records Information Management System

AFRL—Air Force Research Laboratory

ANG—Air National Guard

DEW—Directed Energy Weapon(s)

DoD—Department of Defense

DoDI—Department of Defense Instruction

EMF—Electromagnetic Field

IAW—In Accordance With

MAJCOM—Major Command

NAF—Numbered Air Force

OPR—Office of Primary Responsibility

SJA—Staff Judge Advocate

RDS—Records Disposition Schedule

RDT&E—Research, Development, Test and Evaluation

SOH—Safety and Occupational Health