# DoD Instruction 6055.11

# Protecting Personnel from Electromagnetic Fields

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| **Originating Component:** | Office of the Under Secretary of Defense for Personnel and Readiness |
| **Effective:** | May 12, 2021 |
| **Releasability:** | Cleared for public release. Available on the Directives Division Website at https://www.esd.whs.mil/DD/. |
| **Reissues and Cancels:** | DoD Instruction 6055.11, "Protecting Personnel from Electromagnetic Fields," August 19, 2009, as amended |
| **Approved by:** | Virginia S. Penrod, Acting Under Secretary of Defense for Personnel and Readiness |

**Purpose:** In accordance with the authority in DoD Directive 5124.02, DoD Instruction (DoDI) 6055.01, and the April 10, 2019 Deputy Secretary of Defense Memorandum, this issuance:

- Establishes policy, assigns responsibilities, and provides procedures for protecting personnel from overexposure to electromagnetic fields (EMFs) between 0 hertz (Hz) and 300 gigahertz (GHz).
- Provides guidance on exposure to EMFs in accordance with the Institute of Electrical and Electronics Engineers (IEEE) Standard C95.1-2345 and military-unique EMF systems that exceed DoD or IEEE standards due to validated operational needs.
- Establishes the Transmitted EMF Radiation Protection Working Group (TERPWG).

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# SECTION 1: GENERAL ISSUANCE INFORMATION

## 1.1. APPLICABILITY.

This issuance:

a. Applies to:

(1) OSD, the Military Departments, the Office of the Chairman of the Joint Chiefs of Staff and the Joint Staff, the Combatant Commands, the Office of Inspector General of the Department of Defense, the Defense Agencies, the DoD Field Activities, and all other organizational entities within the DoD (referred to collectively in this issuance as the "DoD Components").

(2) DoD operations, activities, and installations worldwide, including government-owned, contractor-operated facilities and non-DoD activities operating on DoD installations.

b. Does **not** apply to:

(1) Patients exposed to EMFs as part of a diagnostic or therapeutic medical or dental treatment.

(2) Electromagnetic interference effects on electronic medical devices implanted in personnel (e.g., pacemakers, metal implants, stents, shunts, wires).

(3) Research approved by an institutional review board operating pursuant to Part 219 of Title 32, Code of Federal Regulations, and Section 980 of Title 10, United States Code.

(4) Ionizing and laser radiation from any source. (See DoDI 6055.08 regarding ionizing radiation and DoDI 6055.15 regarding laser safety.)

## 1.2. POLICY.

It is DoD policy to protect:

a. All personnel in the DoD workplace from accidental death, injury, and occupational illness due to EMFs through safety policy and implementation of risk management, when necessary, to minimize occupational exposure.

b. The public from risk of death, injury, or illness because of DoD activities involving EMFs.

c. All DoD personnel from the health hazards of EMFs throughout the entire acquisitions life cycle of military platforms, systems, subsystems, and equipment by including safety and occupational health (SOH) measures early in the acquisitions and requirements process.

# SECTION 2: RESPONSIBILITIES

## 2.1. UNDER SECRETARY OF DEFENSE FOR PERSONNEL AND READINESS (USD(P&R)).

The USD(P&R):

a. Recommends EMF protection principles for DoD acquisitions and strategic planning to the Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)) in accordance with DoDI 5000.02T during all phases of the system life cycle.

b. Approves joint risk management approach (RMA) requests for risk acceptance.

## 2.2. ASSISTANT SECRETARY OF DEFENSE FOR READINESS (ASD(R)).

Under the authority, direction, and control of the USD(P&R), the ASD(R):

a. Develops EMF policy to continually improve EMF health and safety requirements.

b. Monitors the effectiveness of this issuance through:

(1) Annual program reviews in accordance with DoDI 6055.01.

(2) Reviewing special requests for safety information in accordance with DoDI 6055.07.

c. Establishes the TERPWG to:

(1) Perform the functions described in Section 4.

(2) Assess potential impacts to the health and safety of personnel through EMF RMAs.

d. Provides guidance, as necessary, to the TERPWG and approves:

(1) The charter and procedures for selecting and rotating the chair of the TERPWG.

(2) Selection of persons to serve as the TERPWG chair.

## 2.3. USD(A&S).

The USD(A&S) is the principal staff assistant and advisor to the Secretary of Defense for all matters relating to acquisitions and sustainment in the DoD, including the DoD acquisition system. In coordination with the USD(P&R), the USD(A&S) coordinates and manages EMF activities throughout the DoD acquisitions programs.

## 2.4. DOD CHIEF INFORMATION OFFICER (CIO).

As the principal staff assistant and advisor to the Secretary and Deputy Secretary of Defense for electromagnetic environmental effects (E3), in accordance with DoDI 3222.03, the DoD CIO confirms the incorporation of EMF safety requirements into appropriate chief information office acquisitions documents.

## 2.5. DIRECTOR, DEFENSE INFORMATION SYSTEMS AGENCY.

Under the authority, direction, and control of the DoD CIO, in addition to the responsibilities in Paragraph 2.6. of this issuance, and in coordination with the Director, Defense Spectrum Organization, the Director, Defense Information Systems Agency:

a. Coordinates the activities of the DoD E3 program and DoD electromagnetic compatibility standardization program.

b. Incorporates hazard controls of electromagnetic radiation in personnel requirements, standards, and other electromagnetic radiation control considerations, as appropriate.

## 2.6. DOD COMPONENT HEADS.

The DoD Component heads:

a. Establish and maintain an EMF personnel protection program (PPP) that carries out the requirements and procedures in this issuance.

b. Incorporate necessary health and safety requirements into acquisitions documents, capabilities documents, technical orders, handbooks, manuals, and other publications related to operational EMF systems.

c. Appoint subject matter experts on EMF protection issues to the TERPWG to perform the functions described in Section 4 of this issuance.

d. Inform the ASD(R) of the operational impact of national and international EMF exposure standards.

e. Carry out the requirements for exposure incidents meeting the criteria of a mishap in accordance with DoDI 6055.07.

f. Establish a risk-based EMF safety review process that will provide a system safety review of all military-specific EMF systems that expose, or have the potential to expose, personnel to EMFs as described in Paragraph 3.5. of this issuance. Each review process will include procedures to:

(1) Notify and provide documentation to the TERPWG of any military-specific EMF system being considered for procurement or development which exceeds the restricted expert

only (REO) exposure reference levels (ERLs) described in Paragraph 3.3.c. of this issuance or where the EMF system is planned for use by multiple components.

(2) Maintain records of safety reviews. The lead DoD Component, for a system planned for use by more than one DoD Component, will maintain the safety review documentation.

g. Maintain records of personnel exposure assessments, medical exams, and evaluations in accordance with the recordkeeping requirements of DoDI 6055.05.

## 2.7. SECRETARY OF THE AIR FORCE.

In addition to the responsibilities in Paragraph 2.6. of this issuance, the Secretary of the Air Force administers and maintains the:

a. DoD EMF injury hotline to provide expert overexposure guidance and medical advice in the event of an exposure incident or suspected injury from EMF systems.

b. EMF overexposure or injury online reporting database and repository for the DoD Components to access, analyze, and use in EMF PPPs. DoD reporting data will be made available for use and analysis in all DoD EMF protection programs.

# SECTION 3: PROCEDURES

## 3.1. PERSONNEL EXPOSURE GUIDELINES.

Personnel exposure guidelines are provided for risk management and are intended to protect DoD and non-DoD persons against adverse health effects (AHEs) from exposure to electric fields, magnetic fields, EMFs, induced currents, contact currents, and contact (arcing) voltages.

## 3.2. EMF EXPOSURE LIMITS.

DoD Components will follow IEEE Standard C95.1-2345 dosimetric reference levels (DRLs) or ERLs as DoD exposure limits. DRLs and ERLs protect personnel from established AHEs associated with exposure to electric fields, magnetic fields, EMFs, and contact currents in the frequency range of 0 Hz to 300 GHz. No additional safety margins are applied to DRLs and ERLs since adequate safety margins have been incorporated in IEEE Standard C95.1-2345. Descriptions are provided below.

a. DRLs are exposure limits associated with internal electric field strength, specific absorption rate, and incident power density. They protect personnel from exposures leading to AHEs caused by partial-body or whole-body heating. Compliance with DRLs requires the measurement of internal fields or specific absorption rates of exposed personnel, which is difficult, costly, and time consuming, since internal body measurements are difficult to obtain.

b. ERLs are exposure limits associated with external electric and magnetic fields, induced and contact currents, and voltages. They provide a convenient method for assessing exposure to determine compliance with the DRLs. ERLs are conservatively derived from DRLs, and it is possible to exceed an ERL while still complying with the associated DRL.

## 3.3. EMF EXPOSURE ENVIRONMENTS.

The military radiofrequency workplace is divided into three distinct EMF environments: unrestricted exposure environment (UEE), restricted exposure environment (REE), and REO environment.

### a. UEEs.

(1) UEEs are work locations where individuals have no knowledge or control of their EMF exposure. In this environment, all persons are allowed uncontrolled work area access and no individual is exposed to EMF above the established UEE DRLs and ERLs.

(2) No EMF training is required of personnel who conduct work activities in the UEE.

**b. REEs.**

(1) REEs are work locations where employees are aware of a potential EMF exposure. Employees' exposures to EMF in REEs may exceed UEE DRLs or ERLs but cannot exceed the exposure limits established as REE DRLs and ERLs.

(2) DoD Component leaders, managers, and supervisors will provide training and education for workers who are exposed to EMFs above the UEE ERLs and DRLs.

(3) Personnel will follow the guidance in Paragraphs 3.5. and 3.12. of this issuance when accessing work areas that exceed the REE exposure environment DRLs and ERLs.

**c. REOs.**

(1) REOs are work locations where EMF exposures are high enough to warrant restricted entry by only those highly trained EMF experts who are experienced with operating specific EMF-emitting equipment or systems and who have mission-essential access. These are work areas where workers are exposed to EMF levels that exceed REE DRLs and ERLs but whose exposures are below the REO DRLs and ERLs.

(2) DoD Component leaders, managers, and supervisors will permit entry to REO work areas only by personnel who are trained to operate a specific EMF-emitting system in accordance with IEEE Standards C95.1-2345 and C95.7.

(3) Personnel will follow the guidance in Paragraphs 3.5. and 3.12. of this issuance when accessing work areas that exceed the REO exposure environment DRLs and ERLs.

## 3.4. EMF SYSTEM DESIGN.

EMF systems will be designed to prevent exposures above the AHE levels. This does not include systems designated as military-specific EMF systems with an operational requirement to exceed the AHE. EMF systems will be designed to prevent exposures in excess of AHE levels. When compliance with IEEE Standard C95.1-2345 is not possible, EMF systems will be designed to use the lowest exposures possible to achieve the desired operational result and follow the requirements in Paragraph 3.5. of this issuance.

## 3.5. RMA.

When it is not possible to maintain exposures below the REE ERLs because of military operational necessity, these risk management procedures apply:

a. For systems under the configuration control of an acquisitions program office, follow the environment, safety, and occupational health risk management procedures in DoDI 5000.02T for the systems engineering process throughout the system's life cycle. For systems in development or planned for use by multiple DoD Components, the DoD Component head will follow the

requirements of DoDI 5000.69 and use the TERPWG to assist the DoD joint weapon safety working group on joint safety reviews.

b. For systems used in operations and training, and undergoing research, development, test, and evaluation not under the configuration control of an acquisitions program office, follow the procedures of DoDI 6055.01 for event risk management. Research, development, test, and evaluation organizations should acquire a safety release from the program office in accordance with DoDI 5000.02T to assess previously identified hazards for the activity. A new risk assessment will be performed at the frequency prescribed when the system was originally fielded or when conditions associated with the design or operation of the weapon system change.

c. For EMF systems planned for use by multiple DoD Components, the lead DoD Component will coordinate the joint RMA through the TERPWG.

d. The RMA will include:

(1) Bio-Effects Review.

A bio-effects review includes:

(a) Human effects characterization with consideration for reversible and nonreversible AHE thresholds in accordance with DoDI 3200.19.

(b) Subjective thresholds (e.g., sensation, discomfort, and pain).

(c) Performance effects thresholds.

(d) Time to recover from exposure effects.

(2) RMA PPP.

SOH protective measures will be implemented and documented in an RMA PPP that has been coordinated with the DoD Component safety and occupational medicine offices. At a minimum, all RMA PPPs will include:

(a) A description of the exercise, demonstration, or other proposed activity, including a list of responsible staff and personnel positions.

(b) A description of the EMF equipment or system, including mission purpose and operating parameters (e.g., frequency range, output power), for which the RMA will be applied.

(c) Risk analysis and mitigation.

(d) Criteria, procedures, and processes for investigating and reporting incidents, including overexposures and exposures producing any AHEs.

(e) Medical monitoring, any additional medical surveillance requirements in accordance with Paragraph 3.12. of this issuance, and a response plan.

(f) Pre- and post-screening procedures, including current health assessments and health history.

(g) Risk communication briefing and associated materials.

(h) Operating procedures for:

1. Measuring exposures.

2. Conducting dosimetry.

3. Documenting exposures.

4. Operating parameters and conditions of use.

5. Operator training requirements.

(i) System-specific DRLs and ERLs established for each exposure environment and integrated into the operating parameters.

(j) Procedures for sustaining maintenance and retention of surveillance data records, including both medical history and EMF exposure parameters.

## 3.6. EMF PPP.

a. An EMF PPP, in accordance with IEEE Standard C95.7, will be implemented whenever the UEE ERLs could be exceeded, unless it can be shown that the associated DRLs are not exceeded.

b. SOH protective measures will be implemented and documented in an EMF PPP.

c. An EMF PPP will include training, controls, and other mitigating measures to reduce the likelihood of exposure above the ERLs or DRLs, as appropriate. (See Paragraphs 3.8. and 3.9. of this issuance for EMF control and training program requirements, respectively.)

## 3.7. EVALUATION.

### a. Measurement and Evaluation of EMFs.

EMF professionals that the DoD Components designate will evaluate EMF hazards, using the measurement procedures and techniques recommended in IEEE Standards C95.1-2345, C95.3, C95.3.1, and C95.7 as basic guidance.

### b. Records Maintenance.

In accordance with DoDI 6055.05, DoD Components will maintain records of surveys, reports, calculations, and control measures established for each fielded EMF emitter that is capable of exceeding the REE ERLs in accordance with IEEE Standard C95.1-2345.

### c. Multiple EMF Emitters.

Where multiple EMF emitters may be collocated (such as aboard ships or at communication sites), DoD Components will determine the weighted contribution to protect personnel from exposure to EMF levels above the ERLs, in accordance with IEEE Standard C95.1-2345.

### d. Inventory.

For all military environments, the DoD Components will maintain an updated EMF inventory and supporting risk evaluation documentation for every EMF device or emitter type that exceeds the REE ERLs.

## 3.8. CONTROLS.

When eliminating or reducing EMF hazards, the DoD Components will follow the hierarchy of controls that include, in order of priority, elimination and substitution, engineering controls, administrative controls, personal protective equipment (PPE), or a combination thereof.

### a. Elimination and Substitution.

Elimination and substitution, the most effective controls for reducing hazards, involve selecting other feasible, suitable, and acceptable solutions, where available, to mitigate the EMF hazards. Alternative solutions are often not acceptable, so there is a requirement to rely on the other controls discussed in Paragraphs 3.8.b. through 3.8.d. of this issuance.

### b. Engineering Controls.

Whenever feasible, the DoD Components will first implement engineering controls to eliminate or reduce the EMF hazard, including software controls as described in Military Standard MIL-STD 882E.

### c. Administrative Controls.

(1) Administrative controls involve management and employee interventions designed to mitigate EMF hazards when engineering controls are not practicable.

(2) IEEE Standard C95.2 specifies the EMF warning-sign formats.

(a) Variations are authorized if the general layout of the signs remains the same. These may include subdued signs for camouflage or tactical reasons or to provide improved visibility under certain lighting conditions.

1. EMF safety signs are required at all access points to each EMF exposure environment or zone as specified in IEEE Standard C95.1-2345. Access points must use advisory symbols, signal words, specified colors, and instructional or warning statements on the signs as appropriate.

2. Where EMF safety signage creates unacceptable operational risks (e.g., tactical or training environments where posting signage is not feasible, safe, or appropriate), use documented alternative procedures to inform personnel of EMF hazards.

(b) In areas where EMF levels exceed the established REE or REO limit, warning signs alone may not provide adequate protection. Engineering or warning device controls, such as barriers, interlocks or dynamic warning signals (e.g., flashing lights, audible signals) may be required depending on the potential risk of overexposure.

**d. PPE.**

(1) Approved or Acceptable.

PPE, such as frequency-appropriate electrically insulated gloves and shoes for protection against EMF shock and burns or for insulation from the ground plane, is approved to comply with the induced current limits found in IEEE Standard C95.1-2345. All PPE must be inspected and maintained in accordance with IEEE Standard C95.7 to maintain its effectiveness.

(2) Not Approved.

Personal EMF monitors and EMF shielded clothing (e.g., suits) are not approved for personal protection from EMF exposure.

## 3.9. TRAINING.

These training requirements apply to all DoD Components for UEEs, REEs, and REO exposure environments in accordance with IEEE Standard C95.7:

a. No EMF training is required for UEE personnel (e.g., individuals who do not have routine duties near an REE).

b. EMF hazard awareness and site-specific safety training is required for personnel who work within areas where EMF exposures are at or greater than those of an REE. The training must incorporate:

(1) Initial training, including site-specific hazards.

(2) Instruction about the potential hazards of EMF, established safety procedures, and procedures to control EMF exposures.

(3) Any changes to hazards because of changes to workplace conditions of exposure environments.

c. Risk communication training is required for personnel who may be exposed to EMF from DoD sources or from known sources near deployed forces within an REE or REO. The DoD Components will:

(1) Apply current risk communication techniques to describe risk, and the processes of risk assessment and characterization, in accordance with DoDIs 6055.01 and 6055.05.

(2) Also follow the operational risk communication requirements of DoDIs 6490.03 for potential EMF exposures in military deployments.

## 3.10. INSPECTIONS.

Inspections that measure compliance, identify deficiencies, inform commanders, elicit corrective actions, and validate outcomes will:

a. Be scheduled by the DoD Components to determine deficiencies during routine operations.

b. Be completed by the DoD Components to characterize all types of operations in garrison, underway, and deployments.

## 3.11. OVEREXPOSURE INCIDENTS.

a. The DoD Components will investigate and document, in accordance with applicable Military Department and Military Service policies, all suspected overexposure incidents that may exceed the DRLs and ERLs in accordance with IEEE Standard C95.1-2345 by:

(1) Contacting the DoD EMF injury hotline at the Air Force Environment, Safety, and Occupational Health Service Center for additional medical assistance at Defense Switched Network 798-3764 or by calling 937-938-3764 or 888-232-3764.

(2) Including measurement data, medical examinations, a detailed description of the circumstances surrounding the incident to determine root cause, and recommendations for preventing similar incidents. Sample forms for recording data on system operating characteristics and medical outcomes are available in IEEE Standard C95.1-2345. DoD Components should e-mail results to the EMF overexposure repository at esoh.service.center@us.af.mil.

b. For employees experiencing overexposures more than five times the REE DRLs or ERLs, in addition to requirements for suspected overexposure incidents described in Paragraph 3.11.a. of this issuance:

(1) Preserve the state of the system, contact the local safety office, and keep or record the system settings.

(2) Use a trained EMF professional that the DoD Component designates to measure and document the EMF exposure levels.

(3) Direct all affected personnel to report to a medical treatment facility for medical examinations and follow-up, as necessary.

(4) Document the circumstances of the exposure incident, including statements from involved personnel and recommendations for preventing similar incidents.

(5) Maintain a file of all investigations and e-mail findings to the EMF overexposure repository at esoh.service.center@us.af.mil. DoD Components will maintain, keep, and dispose of these investigative records in accordance with DoD Component records management policies.

(6) Maintain personal exposure assessments, medical exams, and evaluations in accordance with the recordkeeping guidelines in DoDIs 6055.05 and 6055.07 and DoD Component records management policies.

c. In addition, refer to the mishap, injury, and occupational illness reporting requirements of DoDI 6055.07 for high-power microwave or directed energy systems.

## 3.12. MEDICAL SURVEILLANCE.

a. The DoD Components will maintain an occupational EMF surveillance program (ESP) in accordance with DoD 6055.05-M and DoD Component records management policies for personnel identified by leaders, managers, and supervisors as at risk from duties or operations involving required, intentional, and recurrent EMF overexposures exceeding five times the REE ERL. ESP members are likely:

(1) Personnel who repair or maintain EMF systems while energized.

(2) Personnel who may be required to carry out mission-essential duties in military-specific environments while EMF systems are energized.

b. A qualified medical professional will determine personnel enrollment in the ESP based on their likelihood of duties or operations involving required, intentional, and recurrent overexposure to EMF. Medical surveillance is not required for other personnel when it is possible, but unlikely, for them to exceed five times the ERL.

c. Medical exam periodicity will be in accordance with:

(1) Baseline.

An exam will take place on identification as an ESP member.

(2) Situational.

Typically, but not all inclusively, an exam will take place when an ESP member reports symptoms associated with EMF exposure.

(3) Termination.

A termination exam is provided when the ESP member is removed from duties involving required, intentional, and recurrent exposures exceeding five times the REE ERL.

d. ESP examinations will include, at a minimum:

(1) Ocular histories emphasizing lens surgery, including a record of the current refraction prescription and the most recent examination date.

(2) Visual acuity for far and near vision.

(3) External ocular and fundus examination.

(4) Audiometric examination for establishing a baseline.

(5) Evaluations of unusual skin sensitivity and skin diseases.

e. If a medical professional finds it necessary, the examinee will be referred to ophthalmology or optometry for additional evaluation. The evaluation may include:

(1) An Amsler grid or other tests of macular function for distortions or scotomas.

(2) Dilated, direct-view ophthalmoscopic examinations of the retina and slit-lamp examinations of the cornea and lens to describe any pathology or deviations from the normal.

(3) Retinal photos to document any lesions or pre-existing conditions.

f. If a medical professional finds it necessary, any additional frequency-dependent examinations will take place based on system-risk assessment.

g. The DoD Components will maintain and control access to personnel exposure and medical surveillance records for the employment duration plus 30 years, except when Occupational Safety and Health Administration or DoD Component standards require longer retention.

h. The DoD Components will protect personal health information obtained from medical or exposure surveillance and use this information only for risk management and occupational illness or injury prevention purposes in accordance with privacy requirements and DoDI 5400.11, DoD 5400.11-R, and DoD Manual 6025.18.

# SECTION 4: TERPWG

## 4.1. TERPWG ELEMENTS.

The TERPWG:

a. Comprises subject matter experts who are full-time Federal employees, or permanent part-time employees, or military personnel on active duty, from the office of the ASD(R) and appropriate OSD Components and the DoD Components.

b. Prepares a working charter to govern the operation of the working group and procedures for selecting and rotating selection of the chair, to be approved by the ASD(R).

c. Meets at the chair's request to share information, discuss items of mutual interest, and recommend policies to the ASD(R).

d. Submits an annual report to the ASD(R) with working-group accomplishments and a work plan for future actions.

## 4.2. TERPWG FUNCTIONS.

The TERPWG:

a. Recommends EMF safety and health guidance and direction to the ASD(R) in accordance with DoDI 6055.01.

b. Provides the ASD(R) with EMF training, research, medical, operational, and standardization recommendations to update policy requirements and procedures.

c. When directed or requested, evaluates potential impacts to the health and safety of personnel for all EMF RMA approval requests. (See Paragraph 3.5. of this issuance for guidance on how to request an EMF RMA.)

d. Coordinates and conducts liaison activities with the:

(1) DoD E3 Integrated Product Team established by DoDI 3222.03.

(2) DoD Lead Standardization Activity for Radio Frequency Exposure to Personnel Safety.

(3) Joint Weapons Safety Working Group.

(4) DoD Lead Standardization Activity for DoD Electromagnetic Compatibility Standardization under the Defense Standardization Executive, Defense Standardization Program Office.

e. Acts as a technical and scientific liaison body to interact with international, Federal, and State regulatory and advisory agencies and nongovernmental standards development organizations on issues related to EMF safety and protection.

f. Provides EMF subject matter expertise, as requested, to assist with E3 environmental impact assessments required by DoDI 5000.02T and Parts 1500-1508 of Title 40, Code of Federal Regulations for EMF systems throughout the system life cycle.

g. Retains all records and information created, received, and collected in support of the TERPWG mission, tasks, and objectives in accordance with Administrative Instruction 15 and OSD records disposition schedules.

# GLOSSARY

## G.1. ACRONYMS.

| ACRONYM | MEANING |
|---|---|
| AHE | adverse health effect |
| ASD(R) | Assistant Secretary of Defense for Readiness |
| CIO | chief information officer |
| DoDI | DoD instruction |
| DRL | dosimetric reference level |
| E3 | electromagnetic environmental effects |
| EMF | electromagnetic field |
| ERL | exposure reference level |
| ESP | EMF surveillance program |
| GHz | gigahertz |
| Hz | hertz |
| IEEE | Institute of Electrical and Electronics Engineers |
| PPE | personal protective equipment |
| PPP | personnel protection program |
| REE | restricted exposure environment |
| REO | restricted expert only |
| RMA | risk management approach |
| SOH | safety and occupational health |
| TERPWG | Transmitted EMF Radiation Protection Working Group |
| UEE | unrestricted exposure environment |
| USD(A&S) | Under Secretary of Defense for Acquisition and Sustainment |
| USD(P&R) | Under Secretary of Defense for Personnel and Readiness |

## G.2. DEFINITIONS.

Unless otherwise noted, these terms and their definitions are for the purpose of this issuance.

| TERM | DEFINITION |
|---|---|
| **AHE** | An effect detrimental to an individual's health and physical well-being due to overexposure to an electric field, magnetic field, EMF, induced current, contact current, induced voltage, or contact voltage. |
| **DRL** | Limits relative to dosimetric thresholds for established AHEs that incorporate appropriate safety factors. DRLs are expressed in terms of *in situ* electric field strength (0 Hz to 5 megahertz), specific absorption rate (100 kilohertz to 3 GHz), or incident power density (3 GHz to 300 GHz) with the associated averaging times. DRLs are equivalent to the quantity referred to as "basic restrictions" in earlier standards. Because of the small penetration depth at frequencies above 3 GHz, the ERLs expressed in terms of power density are also the DRLs. |
| **EMF** | The energy field emanating from a source and containing both electric and magnetic field components. |
| **ERL** | The highest level of an electric field, magnetic field, EMF, induced current, contact current, induced voltage, or contact voltage to which the standard permits exposure and which provides an adequate margin of safety against established AHEs. The ERL may be exceeded if it can be shown that the corresponding DRL is not exceeded as described in IEEE Standard C95.1-2345. |
| **ESP members** | EMF personnel who are identified as at risk from duties regarding activities or operations involving required, intentional, and recurrent overexposures to EMF more than five times the ERL. |
| **military-specific** | Applies to uniquely military equipment, systems, and operations. It includes DoD equipment and systems that are unique to the national defense mission such as military aircrafts, ships, submarines, missiles, missile sites, early warning systems, military space systems, artillery, tanks, and tactical vehicles. It applies to operations that are uniquely military such as field maneuvers, naval operations, military flight operations, associated research test and development activities, and actions required under emergency conditions. It excludes DoD workplaces and operations comparable to those of industry in the private sector, such as vessel, aircraft, and vehicle repair, overhaul, and modification (except for equipment trials); construction; supply services; civil engineering or public works; medical services; and office work. |

| TERM | DEFINITION |
|---|---|
| **mishap** | An unplanned event or series of events that results in occupational illness to DoD personnel; injury to on- or off-duty DoD military personnel; injury to on-duty DoD civilian personnel; or damage to public or private property or injury or illness to non-DoD personnel, caused by DoD activities. |
| **overexposure** | Any exposure of personnel that exceeds the applicable DRLs defined in IEEE Standard C95.1-2345. |
| **qualified medical professional** | A licensed, qualified, and credentialed person who provides occupational medical services (e.g., physician, nurse practitioner, physician's assistant). |
| **recurrent exposures** | Exposures where continued operation at elevated EMF levels is required for safety, force protection, and mission success. Such mission-critical exposures may include radars and communications systems where a reduction in output to meet REE ERLs may be a greater risk factor. |
| **REE** | An environment that is accessible only to personnel who are aware of the potential for AHEs and methods to control their exposure from exceeding the REE ERLs. |
| **REO** | An environment that is restricted to all but highly trained E3 experts experienced with the specific equipment or systems who are permitted mission-essential access to areas where E3 levels exceed the ERLs for the REE but are below the ERLs for the REO. |
| **required, intentional, and recurrent overexposure** | Any EMF exposure where a person is intentionally exposed to incident power density levels that exceed the ERLs or DRLs in IEEE Standard C.95.1-2345. |
| **UEE** | An environment where all persons are allowed access and no individual will be exposed above the UEE ERL. |

# REFERENCES

Administrative Instruction 15, "OSD Records and Information Management Program," May 3, 2013, as amended

Code of Federal Regulations, Title 32, Part 219

Code of Federal Regulations, Title 40, Parts 1500-1508

Deputy Secretary of Defense Memorandum, "Safety and Occupational Health Policy and Oversight Functions," April 10, 2019

DoD 5400.11-R, "Department of Defense Privacy Program," May 14, 2007

DoD 6055.05-M, "Occupational Medical Examinations and Surveillance Manual," May 2, 2007, as amended

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