



## DoD INSTRUCTION 6055.08

### OCCUPATIONAL IONIZING RADIATION PROTECTION PROGRAM

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<b>Originating Component:</b>	Office of the Under Secretary of Defense for Personnel and Readiness
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<b>Approved by:</b>	Virginia S. Penrod, Acting Under Secretary of Defense for Personnel and Readiness

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

- Implements the Occupational Safety and Health Administration ionizing radiation standards pursuant to Section 1910.1096 of Title 29, Code of Federal Regulations (CFR), and in accordance with Executive Order 12196; Chapter 15 of Title 29, United States Code, also known as the "Occupational Safety and Health Act of 1970, as amended;" and the U.S. Environmental Protection Agency Radiation Protection Guidance to Federal Agencies for Occupational Exposure.
- Establishes policy, assigns responsibilities, and updates requirements for the Occupational Ionizing Radiation Protection Program for the DoD in DoD workplaces, including military operations and deployments.
- Establishes the DoD Ionizing Radiation Working Group (DoD IRWG) to provide technical guidance and recommend policy on ionizing radiation safety and occupational health matters within the DoD in accordance with DoDI 6055.01.

## TABLE OF CONTENTS

SECTION 1: GENERAL ISSUANCE INFORMATION .....	3
1.1. Applicability. ....	3
1.2. Policy. ....	3
1.3. Information Collections. ....	4
SECTION 2: RESPONSIBILITIES .....	5
2.1. ASD(R). ....	5
2.2. DoD Component Heads. ....	5
SECTION 3: OCCUPATIONAL IONIZING RADIATION PROTECTION PROGRAM REQUIREMENTS .....	6
3.1. General. ....	6
3.2. Dosimetry. ....	6
3.3. Health Risk Management (HRM). ....	6
3.4. Ionizing Radiation Doses to the Unborn Child. ....	7
a. ALARA. ....	7
b. Notifications. ....	7
c. Declaration Statement. ....	7
d. Occupational Exposure Limits. ....	7
3.5. Inspections, Risk Management, and Records. ....	8
a. Inspections. ....	8
b. Risk Management. ....	8
c. Records. ....	8
3.6. Control of Radioactive Material and Devices Capable of Generating Ionizing Radiation. ....	9
3.7. Increased Controls. ....	10
3.8. ALARA Program. ....	10
3.9. Facilities and Installations. ....	10
3.10. Cosmic Radiation. ....	11
SECTION 4: DoD IRWG FUNCTIONS .....	12
GLOSSARY .....	13
G.1. Acronyms. ....	13
G.2. Definitions. ....	13
REFERENCES .....	15
FIGURE	
Figure 1. Equation for Calculating the WLM/yr .....	10

## 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) All DoD civilian and military personnel who are occupationally exposed to ionizing radiation.

b. Does **not** apply to:

(1) Personnel who, as patients, undergo diagnostic or therapeutic radiological procedures in medical or dental treatment facilities.

(2) Personnel exposed to ionizing radiation as a result of nuclear war or detonation of improvised nuclear devices or radiological dispersal devices.

(3) Personnel exposed to ionizing radiation as a result of combat, peacekeeping, or peacemaking operations for which an alternate ionizing radiation protection standard is implemented in accordance with Joint Publication 3-11.

(4) Personnel exposed to natural background radiation except as described in Paragraph 3.10.

(5) Personnel engaged in activities associated with nuclear reactor programs, including the Naval Nuclear Propulsion Program, nuclear weapon systems, and fuel and other material controlled in accordance with Section 5844 of Title 42, United States Code.

(6) DoD contractors, unless required by contract specification.

### 1.2. POLICY.

It is DoD policy to maintain personnel exposures to occupational ionizing radiation associated with DoD operations to a level as low as reasonably achievable (ALARA) with consideration given to efficiency, cost, and mission requirements. Whenever practical, the use of engineering controls will prevail over the use of administrative controls and personal protective equipment.

### **1.3. INFORMATION COLLECTIONS.**

The status update to the Assistant Secretary of Defense for Readiness (ASD(R)), referred to in Paragraph 3.8. of this issuance, is exempt from review and approval in accordance with Paragraph 1.b. of Volume 1 of DoD Manual 8910.01.

## SECTION 2: RESPONSIBILITIES

### 2.1. ASD(R).

Under the authority, direction, and control of the Under Secretary of Defense for Personnel and Readiness, the ASD(R):

- a. Develops policy and provides guidance and coordination on occupational ionizing radiation protection matters within the DoD.
- b. Serves as the principal DoD point of contact for Federal and State agencies that regulate occupational exposure to ionizing radiation.
- c. Establishes the DoD IRWG, consisting of full-time or permanent part-time DoD employees from the DoD Components, and approves the DoD IRWG Charter.
- d. Appoints an OSD representative to the DoD IRWG.

### 2.2. DOD COMPONENT HEADS.

The DoD Component heads that conduct operations in which potential exposure to occupational doses of ionizing radiation exist:

- a. Establish and maintain occupational ionizing radiation protection programs that implement the requirements in Section 3 and ensure that unnecessary exposure is avoided.
- b. Support existing Nuclear Regulatory Commission (NRC) master material licenses and NRC programs to implement this issuance and foster the use of these programs to provide compatibility, continuity, and compliance in joint situations.
- c. Appoint representatives to the DoD IRWG to perform the functions described in Section 4. These representatives must:
  - (1) Possess radiation protection-related expertise, such as the General Schedule (GS)-1306, GS-1311, GS-0840 job series;
  - (2) Possess an advanced degree (e.g., Master of Science, doctorate) in health physics or related field; or
  - (3) Maintain a current professional certification from the American Board of Health Physics or similar professional certification.

## **SECTION 3: OCCUPATIONAL IONIZING RADIATION PROTECTION PROGRAM REQUIREMENTS**

### **3.1. GENERAL.**

The DoD Components that conduct operations in which potential exposures to occupational doses of ionizing radiation exist will implement the requirements in this section and conform to the requirements in Radiation Protection Guidance to Federal Agencies for Occupational Exposure.

### **3.2. DOSIMETRY.**

The DoD Components will process individual dosimetry devices by laboratories accredited by the National Voluntary Laboratory Accreditation Program. Individuals who, in the course of their duties, may be occupationally exposed to any source of ionizing radiation will be provided dosimetry monitoring devices and bioassays, according to the applicable exposure pathways, when:

- a. It is determined that there is a significant chance of receiving more than one-tenth of the limit on annual exposure specified in Part 20.1201 of Title 10, CFR, as specified in Part 20.1502 of Title 10, CFR.
- b. The DoD Component head determines that it benefits their Component to document doses below those specified in Paragraph 3.2.a.
- c. The DoD Component head has reason to believe exposure to ionizing radiation or radioactive material is probable in a wartime or emergency environment, and monitoring will be beneficial in preventive measures, medical treatment, or future inquiries. Commanders have the authority to issue radiation dosimeters when operationally necessary.
- d. It is required by NRC license.
- e. Dose limits for machine-generated radiation will be identical to the NRC dose limits for byproduct-generated radiation.

### **3.3. HEALTH RISK MANAGEMENT (HRM).**

- a. Conduct HRM in accordance with DoDI 6055.05 and DoD Component policies.
- b. Use HRM, documentation, and training to support monitoring efforts.
- c. Use a DoD Component–approved information management system for HRM data.

d. Maintain records of radiological results from HRM activities as well as site characterization and decommissioning activities according to the DoD Component's records disposition schedule.

e. Establish procedures to make data easily retrievable and available for review, on request.

### **3.4. IONIZING RADIATION DOSES TO THE UNBORN CHILD.**

#### **a. ALARA.**

Establish policies and procedures to keep ionizing radiation doses to an embryo or fetus ALARA.

#### **b. Notifications.**

Civilian employees and military members, in order to control occupational exposure to ionizing radiation as discussed in Paragraph 3.4.d., have the option of notifying their supervisor, radiological controls manager, or medical representative of their pregnancy in order to invoke exposure controls for the embryo or fetus.

#### **c. Declaration Statement.**

The DoD Components will document in a declaration statement the notification of pregnancy and the intent to invoke exposure controls. The declaration statement is retained in the individual's occupational health treatment record or ionizing radiation exposure record.

#### **d. Occupational Exposure Limits.**

Limit occupational exposures to an embryo or fetus in accordance with Section 20.1208 of Title 10, CFR, and Paragraphs 3.4.d.(1) and 3.4.d.(2).

(1) Once a declaration of pregnancy is made, immediately take action to limit the occupational exposure to an embryo and fetus of a declared pregnant individual to less than 500 millirems (mrem) (5 millisieverts (mSv)) total effective dose equivalent during the entire gestation period. Exposure should not exceed 50 mrem (0.5 mSv) per month. If the occupational dose to an embryo or fetus is determined to have exceeded 500 mrem (5mSv) before the individual declares pregnancy, limit the individual's occupational exposure to 50 mrem (0.5 mSv) for the remainder of the pregnancy.

(2) For the duration of the pregnancy, offer a declared pregnant individual reassignment from specific tasks if it is determined by a qualified radiation protection expert or professional that there is significant potential for a total effective dose to an embryo or fetus in excess of 500 mrem (5 mSv) for the gestation period. Reassignment will entail no loss of job security or economic penalty to the worker.

### **3.5. INSPECTIONS, RISK MANAGEMENT, AND RECORDS.**

#### **a. Inspections.**

Conduct inspections capable of measuring compliance, identifying deficiencies, informing commanders, eliciting corrective actions, and validating outcomes. These inspections will:

(1) Occur at a frequency and time advantageous to the DoD Components to ascertain deficiencies during routine operations.

(2) Be identified by the DoD Component heads, as appropriate, for garrison, underway, and wartime operations.

#### **b. Risk Management.**

Manage risk to keep exposures to ionizing radiation and radioactive material ALARA in context with military operational demands. Hazard identification is the primary focus of risk management and every military and civilian member will be encouraged to mitigate hazards.

#### **c. Records.**

(1) For each monitored person, maintain cumulative ionizing radiation dose records in a central data repository consistent with the requirements of Section 20.2106 of Title 10, CFR, for doses received by all employees for whom monitoring was required pursuant to Section 20.1502 of Title 10, CFR.

(2) Make external and internal dosimetry data a part of the record even when the results are less than the minimum sensitivity of the dosimeter or analysis method for a specific period of time or event. In addition, identify dosimetry data that is not based on actual measurements (i.e., calculations, estimates).

(3) Make dosimetry records available to monitored individuals on request and annually to those individuals whose occupational dose exceeds 100 mrem (1 mSv), based on established DoD Component policy.

(4) Instruct individuals on how to obtain their cumulative dosimetry records on release from employment in accordance with the privacy requirements in DoDI 5400.11, DoD 5400.11-R, and DoD Manual 6025.18.

(5) Retain HRM and dosimetry data and inspection results at the installation level and archive according to established DoD Component policy.

(6) Archive environmental data pertinent to occupational exposure to ionizing radiation or radioactive material indefinitely on closure of installations or facilities.

(7) Establish procedures to make data easily retrievable and available for review by the DoD Component heads, on request.

### 3.6. CONTROL OF RADIOACTIVE MATERIAL AND DEVICES CAPABLE OF GENERATING IONIZING RADIATION.

a. Establish measures to secure, inventory, and safely use radioactive material within an area of responsibility.

b. Establish procedures to prevent and reconcile the loss of radioactive material within an area of responsibility. Except for HRM and control of individual exposures to contamination, this does **not** apply to depleted uranium munitions unless specifically required by the applicable license or master material license permit.

c. At the installation, licensee, or permittee level, as applicable, develop a complete inventory of radioactive material (above exempt quantities) and devices capable of emitting ionizing radiation. See Part 30 of Title 10, CFR, for exempt quantities.

d. Develop the capability to generate reports for specific or consolidated information when required by OSD or Federal regulatory agencies.

e. To the fullest extent practical, implement the safety and occupational health portions of Nuclear Regulatory Commission technical report (NUREG)-1575, Revision 1; NUREG-1575, Supplement 1; and NUREG-1576 when decontaminating or decommissioning installations, facilities, and equipment.

f. Consult with the DoD Component ionizing radiation safety offices to ensure that appropriate ionizing radiation safety programs are in place before the purchase of any industrial equipment designed to emit ionizing radiation.

g. Establish measures to control contractor use of radioactive material and ionizing radiation-producing devices within DoD facilities and installations in accordance with Subpart 52.223-7 of the Federal Acquisition Regulation, when applicable.

h. Establish measures so that the use and control of generally licensed devices are in accordance with Part 31 of Title 10, CFR.

i. Apply the DoD goal to maintain the average annual concentration of radon gas in occupied workplaces at or below 0.8 working level month per year (WLM/yr) with an occupational exposure limit of 4 WLM/yr. Apply the average annual radon gas concentration of 4 picocuries per liter (pCi/L) as a screening value to meet the goal of 0.8 WLM/yr.

(1) Apply the ALARA principle to exposures greater than this goal, but less than the occupational exposure limit, with consideration given to efficiency, cost, and mission requirements.

(2) Use measurements made in pCi/L to assess WLM/yr exposures if appropriate.

(3) Use this calculation for determining exposures as measured in WLM/yr. To assess the exposures as measured in WLM/yr from the average annual concentration measured as pCi/L, use the appropriate exposure duration and an equilibrium factor (EF). Generally, the

assumed (EF) is 0.4 unless measurements are made that indicate the use of an alternative. Use the equation for calculating the WLM/yr shown in Figure 1.

**Figure 1. Equation for Calculating the WLM/yr**

$$\frac{[(\text{Radon}^{222} \text{ concentration, pCi/L}) \times (\text{EF, unitless}) \times (\text{time, hours/year})]}{(17,000 \text{ pCi} \cdot \text{hours/L} \cdot \text{WLM})}$$

### 3.7. INCREASED CONTROLS.

- a. Implement NRC requirements for protection of quantities of radioactive material exceeding Category 1 or Category 2 thresholds in accordance with Part 37 of Title 10, CFR.
- b. Coordinate efforts to comply with the requirements of Part 37 of Title 10, CFR, among DoD Component security, law enforcement, and force protection officials.
- c. For documents pertinent to control of materials in accordance with Part 37 of Title 10, CFR, and quantities of material meeting controlled unclassified information safeguarding levels:
  - (1) Mark as “Withhold from public disclosure in accordance with Part 2.390 of Title 10, CFR.”
  - (2) Make accessible to individuals with a need to know and determined trustworthy according to NRC criteria.
  - (3) Keep secure at all times.
- d. Transport material subject to the controls in Part 37 of Title 10, CFR, according to the NRC and Department of Transportation requirements.

### 3.8. ALARA PROGRAM.

- a. Establish a means to demonstrate by metrics that exposures of individuals to occupational ionizing radiation are kept ALARA.
- b. Provide a status update to the ASD(R) as part of the safety and occupational health program management review requirements of DoDI 6055.01.

### 3.9. FACILITIES AND INSTALLATIONS.

- a. Develop a list of locations where radioactive materials are or have been used, stored, or disposed. A historical radiological assessment that documents past and current uses of radioactive materials at installations is the best method to accomplish this requirement.
- b. Update the historical radiological assessment as often as specified by the DoD Component heads for active facilities and installations. Chapter 3 of NUREG 1575 provides guidance on

conducting a historical site assessment, which is equivalent to a historical radiological assessment.

c. Manage decontamination and decommissioning activities at DoD Component facilities and installations, including base realignment and closure, using appropriate ionizing radiation safety and occupational health protection protocols.

d. Use signs, postings, and orders issued by commanders in accordance with Federal and State guidelines to designate ionizing radiation areas.

### **3.10. COSMIC RADIATION.**

a. Provide aircrews training on in-flight radiation exposure associated with cosmic radiation using the Federal Aviation Administration training materials as found in the Federal Aviation Administration Advisory Circular 120-61B, where practical.

b. Provide space crews training on space flight radiation exposure and limit radiation doses in accordance with National Aeronautics and Space Administration Technical Standard, NASA-STD-3001.

## **SECTION 4: DoD IRWG FUNCTIONS**

The DoD IRWG will:

- a. Be composed of representatives from the ASD(R) and the DoD Components.
- b. Provide technical advice concerning ionizing radiation safety and occupational health to the ASD(R).
- c. Establish guidelines to govern the operation of the working group and procedures for selecting and rotating the chair.
- d. Meet routinely as specified by the working group charter to share information, discuss items of mutual interest, and recommend policies to the ASD(R).
- e. Submit an annual report with working group accomplishments and a work plan for future actions to the ASD(R).

## GLOSSARY

### G.1. ACRONYMS.

<b>ACRONYM</b>	<b>MEANING</b>
ALARA	as low as reasonably achievable
ASD(R)	Assistant Secretary of Defense for Readiness
CFR	Code of Federal Regulations
DoD IRWG	DoD Ionizing Radiation Working Group
DoDI	DoD instruction
EF	equilibrium factor
GS	General Schedule
HRM	health risk management
mrem	millirems
mSv	millisieverts
NRC	Nuclear Regulatory Commission
NUREG	Nuclear Regulatory Commission technical report
pCi/L	picocuries per liter
WLM/yr	working level month per year

### G.2. DEFINITIONS.

These terms and their definitions are for the purpose of this issuance.

<b>TERM</b>	<b>DEFINITION</b>
<b>embryo or fetus</b>	The developing human organism from conception until time of birth.
<b>ionizing radiation</b>	Electromagnetic waves (photons) or subatomic particles capable of producing ions, directly or indirectly, when passing through matter.

<b>TERM</b>	<b>DEFINITION</b>
<b>occupational dose</b>	Dose received by an individual in the course of employment in which the individual's assigned duties involve exposure to radiation or to radioactive material from licensed and unlicensed sources of radiation, whether in the possession of the licensee or other person. Does not include doses received from background ionizing radiation, from any medical administration the individual has received, from voluntary participation in medical research programs, or as a member of the general public.
<b>WLM</b>	A measurement that quantifies the exposure to radon progeny in air. It is defined as one work level (combination of progeny in a liter of air that results in the emission of $1.3 \times 10^5$ Mega electron-volts of short-lived alpha energy) of exposure for 170 hours (or the equivalent of 100 pCi/L for 170 hours in the artificial condition where all radon progeny are in equilibrium with the concentration of radon).

## REFERENCES

- Code of Federal Regulations, Title 10
- Code of Federal Regulations, Title 29, Section 1910.1096
- Deputy Secretary of Defense Memorandum, “Safety and Occupational Health Policy Oversight Functions,” April 10, 2019
- DoD 5400.11-R, “Department of Defense Privacy Program,” May 14, 2007
- DoD Directive 5124.02, “Under Secretary of Defense for Personnel and Readiness (USD(P&R)),” June 23, 2008
- DoD Instruction 5400.11, “DoD Privacy and Civil Liberties Programs,” January 29, 2019, as amended
- DoD Instruction 6055.01, “DoD Safety and Occupational Health (SOH) Program,” October 14, 2014, as amended
- DoD Instruction 6055.05, “Occupational and Environmental Health (OEH),” November 11, 2008, as amended
- DoD Manual 6025.18, “Implementation of the Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule Compliance in DoD Health Care Programs,” March 13, 2019
- DoD Manual 8910.01, Volume 1, “DoD Information Collections Manual: Procedures for DoD Internal Information Collections,” June 30, 2014, as amended
- Environmental Protection Agency, “Radiation Protection Guidance to Federal Agencies for Occupational Exposure,” January 27, 1987<sup>1</sup>
- Executive Order 12196, “Occupational Safety and Health Programs for Federal Employees,” February 26, 1980, as amended
- Federal Acquisition Regulation, Subpart 52.223-7, “Notice of Radioactive Materials,” January 1997
- Federal Aviation Administration Advisory Circular 120-61B, “In-Flight Radiation Exposure,” November 21, 2014<sup>2</sup>
- Joint Publication 3-11, “Operations in Chemical, Biological, Radiological, and Nuclear Environments,” October 29, 2018<sup>3</sup>
- National Aeronautics and Space Administration Technical Standard, NASA-STD-3001, Volume 1, Revision A with Change 1, “NASA Space Flight Human System Standard Volume 1, Revision A: Crew Health,” July 30, 2014<sup>4</sup>

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<sup>1</sup> Available on the Internet at <https://www.epa.gov/sites/production/files/2015-08/documents/52-fr-2822.pdf>

<sup>2</sup> Available on the Internet at [https://www.faa.gov/regulations\\_policies/advisory\\_circulars/index.cfm/go/document.information/documentID/1026386](https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/1026386)

<sup>3</sup> Available on the Internet at [https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp3\\_11pa.pdf?ver=4F7400hqkp4j4yAlKh91oQ%3d%3d](https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp3_11pa.pdf?ver=4F7400hqkp4j4yAlKh91oQ%3d%3d)

<sup>4</sup> Available on the Internet at <https://standards.nasa.gov/standard/nasa/nasa-std-3001-vol-1>

Nuclear Regulatory Commission Regulation-1576/Environmental Protection Agency 402-B-04-001-A/National Technical Information Service PB2004-105421, “Multi-Agency Radiological Laboratory Analytical Protocols Manual,” July 2004<sup>5</sup>

Nuclear Regulatory Commission Technical Report-1575, Revision 1/Environmental Protection Agency 402-R-97-016/Department of Energy/EH-0624, “Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM),” August 2000<sup>6</sup>

Nuclear Regulatory Commission Technical Report-1575, Supplement 1/Environmental Protection Agency 402-R-09-001/Department of Energy/HS-0004, “Multi-Agency Radiation Survey and Assessment of Materials and Equipment Manual (MARSAME),” January 2009<sup>7</sup>

United States Code, Title 29, Chapter 15 (also known as the “Occupational Safety and Health Act of 1970, as amended”)

United States Code, Title 42, Section 5844

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<sup>5</sup> Available on the Internet at <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1576/initial/#pub-info>

<sup>6</sup> Available on the Internet at <https://www.nrc.gov/docs/ML0037/ML003761445.pdf>

<sup>7</sup> Available on the Internet at <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1575/supplement1/sr1575s1.pdf>