

MPD 1860.2

REVISION L-1

EFFECTIVE DATE: September 18, 2013

EXPIRATION DATE: September 18, 2018

MARSHALL POLICY DIRECTIVE

AS01

RADIATION SAFETY PROGRAM

With Change 1 (6/29/15)

COMPLIANCE IS MANDATORY

DIRECTIVE IS UNCONTROLLED WHEN PRINTED

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DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Revision	F	12/13/99	History log added with this revision; previous history contained in Directives Manager's Reference File. Document rewritten from MM 1860.2E to an MPD.
Revision	G	7/26/01	Page 3, Paragraph 4: added MPG 1860.1 and MWI 8715.15 and NPG 1441.1 to Applicable Documents; Page 3, Paragraph 6.1: added definition for authorized user; Page 5, added paragraph 8.b.2, "Providing a representative to serve as a member of the RSC."; Added to 8.d.2 "and radiation safety procedures"; paragraph 8.d.4 updated calibration requirement; paragraph 8, added "(9) Facility Organizational Work Instructions clearly define procedures for operating ionizing radiation producing equipment, line of radiation safety responsibility, and performing and documenting periodic checks of the facilities safety inspection. (10) Personnel required to work with radioactive material attend radiation safety training provided by the RSO annually in accordance with MWI 3410.1." Added to paragraph 8.e.2 "and provide the RSC with a detailed written report. In addition, provide quarterly status reports to the RSC. Paragraph 9, modified record keeping requirements.
Revision	H	10/28/2004	Changed MPG to MPR and NPG to NPR through document; changed font to Times New Roman; Section 8-changed Management support Office to Integrated Customer Support Department; replaced "will" with "shall" where indicated; Section 5 replaced "Initiator" to "Requisitioner."
Revision	I	1/31/2007	Updated organizational changes, made editorial corrections, and revised records retention schedule.
Revision	J	3/24/2008	Revised 2. Applicability statement to reflect transition of MAF from GOCO to GOGO.
Revision	K	10/17/2008	Revised to include nonionizing radiation. Also reflects minor editorial changes. [On 6/15/11, at the request of the OPRD, administrative changes were made at 1. Purpose for clarification, at 2. Applicability to add MAF, at 3. Authority and 4. Applicable Documents to remove uncited documents, at 7. Policy to clarify, at 8. Responsibilities a., to add (9), at 8.d. (1) to add terms, at 8. 3. (7) and 8. g. (3) to add citations, and at 9. Records to update location.]
Revision	L	9/18/2013	Put MPD in proper format. Updated Applicability Statement. Corrected titles of MWI 8715.15 and NPR 1400.1. Added MPD 1200.3 to Authority documents. Redelegated the Manager of EEOH authority to sign permits and reports. Required EEOH to provide external audit of RSP where practical. Added "or assure the following is performed" to RSO responsibilities. Added NPR 1800.1 and MPR 8730.5 to Applicable Documents. Added requirement for Directors/Managers/Team Leads/Supervisors to provide member of RSC.
Change	1	6/29/2015	On 6/29/15, at the request of the OPRD, administrative changes were made to update titles in 4. Applicable Documents and update link in Attachment D. Records.

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1. POLICY

To establish Center policy (as permitted by NPR 1400.1) for centralized control over the use of ionizing and nonionizing radiation sources to ensure that exposure is ALARA and is adequately controlled so as to prevent adverse effects on the health and safety of employees as mandated by 10 CFR Part 20, ANSI Z136.1-2007, IEEE Standard C95.1, MSFC Nuclear Regulatory Commission (NRC) Materials License 01-06571-10, and American Conference of Governmental Industrial Hygienists.

2. APPLICABILITY

- a. This MPD applies to Center personnel, programs, projects, and activities, including contractors and resident agencies to the extent specified in their respective contracts or agreements. (“Contractors,” for purposes of this paragraph, include contractors, grantees, Cooperative Agreement recipients, Space Act Agreement partners, or other agreement parties.)
- b. This MPD applies to the Michoud Assembly Facility.
- c. This MPD applies the following: all mandatory actions (i.e., requirements) are denoted by statements containing the term “shall.” The terms: “may” or “can” denote discretionary privilege or permission, “should” denotes a good practice and is recommended, but not required, “will” denotes expected outcome, and “are/is” denotes descriptive material.
- d. This MPD applies the following: all document citations are assumed to be the latest version unless otherwise noted.
- e. This MPD is applicable to operations that involve the use of radioactive material or radiation-producing devices.

3. AUTHORITY

- a. 10 CFR Part 20, “Standards for Protection Against Radiation”
- b. ANSI Z136.1-2007, “American Standard for Safe Use of Lasers”
- c. IEEE Standard C95.1, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 GHz”
- d. MSFC NRC Materials License 01-06571-10
- e. American Conference of Governmental Industrial Hygienists (ACGIH), “TLVs and BEIs - Based on the Documentation of Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices”
- f. NPR 1400.1, “NASA Directives and Charters Procedural Requirements”

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4. APPLICABLE DOCUMENTS

- a. NPR 1800.1, “NASA Occupational Health Program Procedures”
- b. MPD 1200.3, “Power and Authority Directive for Marshall Space Flight Center (MSFC) Operations”
- c. MPR 1860.1, “MSFC Radiation Safety Procedural Requirements”
- d. MPR 1860.2, “Nonionizing Radiation Safety”
- e. MPR 8730.5, “Metrology and Calibration”
- f. MWI 5100.1, “Initiating Procurement Requisitions”
- g. MWI 8715.15, “Ground Operations Safety Assessment Program”
- h. Alabama Department of Public Health Rule 420-3-26, Radiation Control

5. RESPONSIBILITIES

- a. The Environmental Engineering and Occupational Health Office (EEOH):
 - (1) Designates a Radiation Safety Officer (RSO) and an alternate to coordinate the Radiation Safety Program (RSP).
 - (2) Conducts pre-assignment medical examinations as required and advises on the assignment of any individual to radiation work.
 - (3) Conducts required medical examinations of personnel working with radiation and arrange for treatment of personnel exposed to excessive radiation.
 - (4) Provides for dosimetry service for measuring personnel exposure to ionizing radiation.
 - (5) Makes special surveys of radiation areas and advise the Radiation Safety Committee (RSC) on the effectiveness of the program.
 - (6) Maintains records of ionizing radiation exposure of each individual and monitors the accumulated exposure. Provides this information annually to all participants in the program as required by the NRC.
 - (7) Provides a physician as an advisory member to the RSC.
 - (8) Coordinates the repair and calibration of portable radiation survey instruments per MPR 8730.5.

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(9) Assures that if an instrument cannot be repaired, it is removed from service and turned in to the Logistics Services Property Management Office.

(10) Where practical, provides for an external review of the RSP per NPR 1800.1.

b. The Facilities Management Office:

(1) Ensures that plans for construction or modification of facilities and equipment that involve storage or use of sources of ionizing radiation have received a safety assessment in accordance with MWI 8715.15 and approval of the RSC before starting construction, demolition, or modification work.

(2) Provides a representative to serve as a member of the RSC.

c. The MSFC Safety and Mission Assurance (S&MA) Directorate:

(1) Is responsible for providing a representative to serve as a member of the RSC.

(2) Reviews and concurs with radiation procedures.

d. The Directors/Managers/Team Leads/Supervisors ensure that:

(1) Per MPR 1860.1 and MPR 1860.2, responsibility for every radioactive source used for research and development is clearly assigned to an Authorized User and that all hazardous ionizing radiation-producing devices and hazardous nonionizing-radiation producing devices are assigned to a Responsible Person.

(2) All Authorized Users, Responsible Persons, and users are trained to understand radiation safety and their responsibilities per MPR 1860.1 and MPR 1860.2.

(3) Other laboratory personnel are aware of the potential radiological hazards and associated regulations within their work area.

(4) All portable radiation survey instruments are calibrated as scheduled and repaired.

(5) All portable radiation survey instruments which have been deemed “unrepairable” are replaced.

(6) All radioactive sources included in the design of their equipment are identified.

(7) Each radioactive source and radiation-producing device is reviewed to establish its necessity and to ensure that the design and procedures optimize safety.

(8) All radioactive material and radiation-producing devices are properly procured, used, and disposed of per MPR 1860.1 and MPR 1860.2.

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(9) Appropriate organizational work instructions clearly define procedures for operating ionizing and nonionizing radiation-producing equipment in a safe manner and that these procedures are reviewed and approved by the RSO.

(10) Ensure personnel working with radiation or radioactive materials have mandatory medical examinations provided by the EEOH.

(11) Responsible for providing a representative to serve as a member of the RSC as required by the RSC Charter.

e. The Radiation Safety Officer performs the following, or assures the following is performed:

(1) Provides or approves annual radiation safety training to personnel in the safe use of radioactive materials and radiation-producing devices.

(2) Performs an annual audit of the RSP and provide the RSC with a detailed written report.

(3) Coordinates the RSP between users and the RSC.

(4) Serves as secretary of the RSC and keeps the RSC informed of the status of the RSP.

(5) Reviews plans of proposed operations involving the use of radiation, in accordance with MWI 8715.15, to ensure that adequate protective measures are incorporated into the layouts and engineering drawings and consults with the RSC on these matters.

(6) Assists user organizations in developing operating procedures for radiological operations.

(7) Makes periodic radiological safety surveys (at least annually) to ensure the degree of radiation protection provided is adequate and the provisions of 10 CFR Part 20, ANSI Z136.1-2007, IEEE Standard C95.1, MSFC Nuclear Regulatory Commission (NRC) Materials License 01-06571-10, American Conference of Governmental Industrial Hygienists, and the provisions of this MPD are conformed to.

(8) Performs leak tests on sealed sources.

(9) Impounds radioactive material and radiation producing devices, as appropriate, and stops unsafe practices.

(10) Seals off contaminated areas.

(11) Requires tests of potentially-contaminated personnel.

(12) Approves all procurements and shipments of radioactive material and associated documentation.

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(13) Approves purchase requests for all radiation-producing devices in accordance with MWI 5100.1.

(14) Performs required inventories of radioactive material.

(15) Provides notification to concerned individuals after any incidents.

f. Office of Procurement:

(1) Ensures that contractors from whom radioactive materials are purchased are required to request shipping instructions from the MSFC RSO prior to shipment.

(2) Ensures proper approval of procurement requests for radioactive materials or radiation-producing devices as required by MWI 5100.1.

g. The Radiation Safety Committee:

(1) Approves the use of radioactive material and/or hazardous radiation-producing devices.

(2) Ensures personnel qualifications, facilities, and user operating procedures are adequate for the use of radioactive material or radiation-producing devices.

(3) Ensures users are aware that provisions of 10 CFR Part 20, ANSI Z136.1-2007, IEEE Standard C95.1, MSFC Nuclear Regulatory Commission (NRC) Materials License 01-06571-10, and American Conference of Governmental Industrial Hygienists are to be followed in all operations involving radiation, whether they be radioactive material or radiation-producing devices.

(4) Maintains oversight of Center-wide radon monitoring status, radiation training efforts, and other activities associated with radiation protection.

6. DELEGATION OF AUTHORITY

The Manager, EE OH Office is redelegated authority to serve as the Environmental Manager for MSFC and its component facilities, unless otherwise designated, with the authority to sign appropriate environmental and occupational health documentation (e.g., permits or reports) by the Center Director. (See MPD 1200.3.)

7. MEASUREMENT/VERIFICATION

None

8. CANCELLATION

MPD 1860.2K, "Radiation Safety Program," dated October 17, 2008.

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Original signed by

Patrick E. Scheuermann
Director

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ATTACHMENT A

DEFINITIONS

As Low As Reasonably Achievable (ALARA). An approach to control or manage radiation exposures (both individual and collective to the workforce and the public) and releases of radioactive material to the environment to as low as is reasonable, taking into account social, technical, economic, practical, and public policy considerations. ALARA is not a dose limit but a process whose objective is to maintain doses as far below the applicable limits as is reasonably achievable.

Authorized User. An individual listed on the MSFC Nuclear Regulatory Commission (NRC) Materials License as being responsible for certain radioactive material and the individuals who use this material.

Hazardous Ionizing Radiation-Producing Device. A device capable of producing electromagnetic or particulate radiation of sufficient energy to cause ionization in human tissue. For the purposes of this procedure, this is a device capable of producing x-radiation with energy greater than 17 keV and requiring registration per the Alabama Department of Public Health Rule 420-3-26, Radiation Control.

Hazardous Nonionizing Radiation-Producing Device. For the purposes of this procedure this includes lasers and any device capable of producing levels of radiofrequency (RF), ultraviolet (UV), infrared (IR) radiation, or optical radiation which can cause biological harm in humans.

Radiation-Producing Device. A device capable of producing electromagnetic or particulate radiation.

Responsible Person. An individual who is responsible for a nonionizing radiation-producing device and the individuals who use it.

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ATTACHMENT B

ACRONYMS

ACGIH: American Conference of Governmental Industrial Hygienists

ALARA: As Low As Reasonably Achievable

ANSI: American National Standards Institute

BEI: Biological Exposure Index

EEOH: Environmental Engineering and Occupational Health

IEEE: Institute of Electrical and Electronics Engineers

IR: Infrared

keV: kilo electron Volt

NRC: Nuclear Regulatory Commission

RF: Radio Frequency

RSC: Radiation Safety Committee

RSO: Radiation Safety Officer

RSP: Radiation Safety Program

TLV: Threshold Limit Value

UV: Ultraviolet

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ATTACHMENT C

(RESERVED FOR VERIFICATION MATRIX)

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ATTACHMENT D

RECORDS

The following records are maintained according to the “List of Occupational Health Records” located at the following link: (<https://explornet.msfc.nasa.gov/community/msfc/office-of-center-operations/as10>).

- a. RSP surveys/audits/reports/forms
 - (1) Personnel exposure records
 - (2) Radioactive source inventory
 - (3) Leak tests of sealed sources
 - (4) Records of receipt, transfer, and disposal of licensed radioactive material
- b. Purchase requisitions
- c. Personnel training records for civil service employees
- d. Personnel training records for contractor employees