

JSC Safety and Health Requirements	JPR No.	1700.1L
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Chapter 7.3 Ionizing Radiation Protection

This could be you . . .

A researcher ingested radioactive dust. He made notes on his work and then held his pencil, which had dust on it from his hands, in his mouth.

7.3.1 Applicability of this chapter

You are required to follow this chapter if you handle radioactive materials or ionizing radiation-producing equipment.

7.3.2 What this chapter covers

This chapter covers the minimum requirements for handling and using radioactive materials and ionizing radiation-producing equipment.

7.3.3 Ionizing radiation and why it is harmful

Ionizing radiation is harmful because it alters the cells of the human body and could produce cancer and other chromosome damage. Ionizing radiation is any of the following: alpha particles, beta particles, gamma rays, X rays, neutrons, high-speed electrons, protons, and other atomic particles. Ionizing radiation doesn't include lasers, sound waves, microwaves, radio waves, or visible, infrared, or ultraviolet light. These are covered in Chapter 7.5, Non-Ionizing Radiation Protection.

7.3.4 Approval for using ionizing radiation and equipment

7.3.4.1 Before purchasing, bringing on site, using, or modifying any radioactive material or ionizing radiation-producing devices, employees shall contact Occupational Health at x36726 for a radiation hazard evaluation. The JSC Radiation Safety Officer (RSO) or designee will determine any documentation, approvals, additional safety requirements and training necessary for purchase, receipt, use, or modification of ionizing radiation sources. At WSTF, contact the Alternate RSO at x5320. The JSC Radiation Safety Committee authorizes the use and users of radioactive materials and ionizing radiation-producing equipment as follows:

a. User fills out appropriate approval forms listed below from the JSC Forms Website:

- (1) JF1942 Radioactive Material Use Authorization.
- (2) JF1943 Radioactive Machine Use Authorization.
- (3) JF1944 Radiation User Approval.

b. RSO measures and evaluates the x-ray hazard posed by all equipment with voltages over 15,000 V.

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7.3.5 Controlling radioactive materials and ionizing radiation-producing equipment

7.3.5.1 Control radioactive materials and ionizing radiation-producing equipment by tracking when and where it comes on site, where and how it is stored and used, how it is transferred, and how it is disposed of. Follow these precautions:

a. The JSC RSO or designee shall:

- (1) Be a required approver on all purchase requests for or any evaluations of radioactive material or ionizing radiation-producing equipment.
- (2) Survey new packages containing radioactive material promptly (usually at logistics receiving) for contamination and radiation levels.
- (3) Approve all storage and use areas for radioactive material.
- (4) Document all transfers of licensed material, making sure the material is properly identified and the radiation levels are controlled.
- (5) Approve and keep a record of all radioactive material shipments to ensure they are not in violation of the JSC NRC radioactive material license.
- (6) Certify materials are properly classified, described, packaged, marked, and labeled under applicable regulations (both NRC and DOT).
- (7) Arrange for radioactive waste disposal.

b. Users shall:

- (1) Mark each room or area in which radioactive material is used or stored as containing radioactive material, as recommended by the JSC RSO.
- (2) Label each container of radioactive material as required by the JSC RSO.
- (3) Request disposal of radioactive material through the JSC RSO.
- (4) Never release radioactive gases or particulate radioactive material into the air. Control the release of these materials through the use of a RSO-approved procedure.

7.3.6 Special requirements for off-site contractors doing radiographic work on site

7.3.6.1 Seventy-two (72) hours before performing any type of radiographic work with radioactive material or radiation-producing devices, employees shall contact the Occupational Health at x36726 for a radiation hazard evaluation. At WSTF, contact the Alternate RSO at x5320. The JSC RSO or their designee will determine any documentation, approvals, additional safety requirements and training necessary for approval. Use the approval forms listed below from the JSC Forms website:

- a. JF1013 Temporary Radiological Work Permit – JSC, EF, SCTF
- b. JF1014 Temporary Radiological Work Permit - WSTF

7.3.7 For more information on radiation protection

- a. 10 CFR, "U.S. Nuclear Regulatory Commission Rules and Regulations"
- b. 29 CFR 1910.1096, "Ionizing Radiation"

Verify correct version before use at [Center Directives Management System](#).
JSC Form JF2420B (Revised April 3, 2012) (MS Word August 28, 2006)

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- c. 49 CFR 177, "Carriage by Public Highway"
- d. NPR 1800.1, NASA Occupational Health Program Procedures, Chapter 4
- e. JPR 1860.2, "Radiological Health Manual"
- f. Presidential Guidelines for Diagnostic X-Rays at Federal Installations, approved January 16, 1978

7.3.8 Responsibilities for radiation safety

- a. As a **supervisor**, you are responsible for:
 - (1) Making sure that your employees participate in JSC's Radiation Protection Program
 - (2) Providing training to your employees in their radiation tasks and procedures
 - (3) Assuring all JSC-issued personal radiation dosimetry devices are returned to the Radiation Safety Office in conjunction with all employment termination
- b. As the **JSC RSO**, you are responsible for:
 - (1) Implementing JSC's radiation protection program
 - (2) Supervising the Radiation Safety Office
 - (3) Answering to the JSC Radiation Safety Committee
 - (4) Following your specific JSC RSO responsibilities, as described in Part 2.4 of JPR 1860.2.
- c. The **Director of Human Health and Performance** is responsible for:
 - (1) Appointing the JSC RSO.
 - (2) Making sure the Radiation Protection Program is developed and carried out.
 - (3) Securing licenses or permits where required.
 - (4) Establishing a Radiation Safety Committee.
- d. The **Radiation Safety Committee** is responsible for:
 - (1) Coordinating the requirements for controlling radiation among the various agencies that regulate radiation.
 - (2) Approving all uses of radiation on site.
- e. The **Radiation Safety Office** is responsible for:
 - (1) Reviewing procedures.
 - (2) Monitoring operations.
 - (3) Educating personnel in radiation protection and in the safe handling of radioactive materials and ionizing radiation-producing equipment.
 - (4) Providing radiation dosimetry equipment, such as thermo-luminescent dosimeters, pocket dosimeters, warning signs, and labels for radiation or radioactive materials.
 - (5) Making sure all operations meet NRC requirements.

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7.3.9 Safety and health records for radiation protection

Center-level –Occupational Health shall keep records on NRC licenses and radiation exposure.

NOTE: See Appendix F, Attachment 1.1A for details on records required by this Chapter.