

Radiological Postings

Nuclear Secured / Radiation Safety

NS-RS-PR-202, 0

Date Effective: 06 September 2019

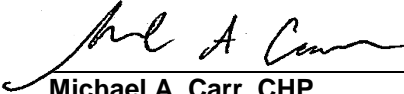
Nuclear Secured / Radiation Safety		Radiological Postings	
Doc. No.: NS-RS-PR-202	Revision 0	Page 2 of 9	

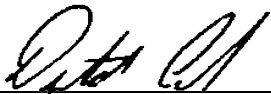
History and Approvals

History

Revision	Intent Y/N	Purpose description
0	Y	For Issue (Rebrand CS-FO-PR-007)

Approvals

Preparer:  9/4/2019
 Michael A. Carr, CHP
 Radiation Safety Officer Date

Approver:  9/5/2019
 Dutch Conrad Date
 Senior Vice President Field Services

Nuclear Secured / Radiation Safety		Radiological Postings	
Doc. No.: NS-RS-PR-202		Revision 0	Page 3 of 9

Table of Contents

Chapter	Page
1. Purpose and Scope	4
1.1. Purpose	4
1.2. Scope	4
2. References	4
3. General	4
3.1. Definitions	4
3.2. Responsibilities	5
3.3. Precautions and Limitations	6
4. Pre-Requisites / Requirements	7
5. Procedure	7
5.1. General Posting Requirements	7
5.2. Controlled Areas	7
5.3. Restricted Area Radiological Postings	8
5.4. Posting Exceptions	9
6. Records	9
7. Appendices and Forms	9

Nuclear Secured / Radiation Safety	Radiological Postings	
Doc. No.: NS-RS-PR-202	Revision 0	Page 4 of 9

1. Purpose and Scope

1.1. Purpose

This procedure provides the guidelines and requirements for the posting of Restricted Areas to ensure proper radiological controls and personnel safety.

1.2. Scope

This procedure applies to all Nuclear Secured (NS) personnel and subcontractors where the NS Radiation Protection Plan (RPP) has been implemented for the management of radioactive materials and the project site Restricted Areas.

2. References

- 2.1. 10CFR20 Subpart J, *Standards for Protection Against Radiation – Precautionary Procedures*
- 2.2. NS-RS-PG-001, *Radiation Protection Program*
- 2.3. NS-RS-PR-300, *Performance of Radiological Surveys*
- 2.4. NS-RS-PR-207, *Radioactive Materials Control*
- 2.5. NS-RS-PR-208, *HRA / VHRA Access and Control*

3. General

3.1. Definitions

- 3.1.1. *Airborne Radioactivity Area (ARA)* – A room, enclosure or area in which airborne radioactive materials composed wholly or partially of licensed material exist in concentrations in excess of the Derived Airborne Concentration as specified in 10CFR20 Appendix B Table 1 OR such that an individual present in the area without respiratory protection equipment, during the hours an individual is present in a week, could exceed an intake of 0.6 percent of the Annual Limit on Intake or 12 DAC-hours.
- 3.1.2. *Contamination Area (CA)* - Any area accessible to personnel with loose surface contamination greater than 1,000 dpm per 100 cm² β-γ, 20 dpm per 100 cm² α, or greater than or equal to the site's contamination limits.
- 3.1.3. *Controlled Area* – An area, outside of a restricted area but inside the site boundary, to which access can be limited by the licensee for any reason.
- 3.1.4. *Controlled Surface Contamination Area (CSCA)* – DOE equivalent to a Contamination Area.

Nuclear Secured / Radiation Safety	Radiological Postings	
Doc. No.: NS-RS-PR-202	Revision 0	Page 5 of 9

- 3.1.5. *Control Point (CP)* – An access point to a Restricted Area.
- 3.1.6. *High Contamination Area* – Any CA in which the removable surface contamination exceeds an administrative limit requiring increased controls; typically, 10,000 dpm/100 cm² α and 100,000 dpm/100 cm² β/γ .
- 3.1.7. *High Radiation Area (HRA)* – An area, accessible to an individual, in which radiation levels could result in the individual receiving a dose equivalent in excess of 100 mrem (1 mSv) in one (1) hour at 30 centimeters from the radiation source or 30 centimeters from any surface that the radiation penetrates.
- 3.1.8. *Hot Spot* – A localized area in in which the contact (i.e., 2-inches) dose rate exceeds 10 times the general area dose rates and 100 mrem/hr.
- 3.1.9. *Radiation Area (RA)* - An area accessible to an individual, in which radiation levels could result in the individual receiving a dose equivalent in excess of 5 mrem (0.05 mSv) per hour at 30 cm from the radiation source or from any surface that the radiation penetrates.
- 3.1.10. *Radioactive Materials Area (RMA)* - An area or room in which licensed material is used or stored which contains radioactive material in an amount exceeding 10 times the quantity specified in 10CFR20 Appendix C.
- 3.1.11. *Restricted Area* – An area, access to which is limited by the licensee for the purpose of protecting individuals against undue risk from exposure to radiation and radioactive materials.
- 3.1.12. *Site boundary* – The line or physical boundary beyond which the land or property is not owned, leased, or otherwise controlled by the licensee.
- 3.1.13. *Very High Radiation Area* - An area accessible to an individual in which radiation levels from radiation sources external to the body could result in an individual receiving an absorbed dose in excess of 500 rad/hr or 5 Gy/hr at 1 meter from the source or any accessible surface.

3.2. Responsibilities

Depending on personnel qualifications and the size of the project, project personnel may be assigned multiple roles and/or responsibilities.

3.2.1. NS Radiation Safety Officer

The NS Radiation Safety Officer (RSO) maintains and oversees the implementation of the NS RPP. The RSO shall ensure that radiation safety, radioactive materials management, and radiological operations procedures and programs are kept up to date such that they comply with current regulations and incorporate current and relevant industry practices and regulatory guidance.

Nuclear Secured / Radiation Safety	Radiological Postings	
Doc. No.: NS-RS-PR-202	Revision 0	Page 6 of 9

3.2.2. Project Manager

The Project Manager (PM) is responsible for ensuring that the proper program procedures and programs are implemented on the project site as required by customer agreements and contracts. The PM is responsible for ensuring that these programs and procedures are properly incorporated into project specific plans and procedures. The PM is responsible for ensuring that the NS RPP and client programs and procedures, as applicable, are available for use by project personnel.

3.2.3. Project Health Physicist

The Project Health Physicist (PHP) is responsible for assisting the RSO in providing health physics support to the PM and Radiation Protection Supervisor (RPS). This includes technical support to ensure procedural and regulatory compliance and to ensure that the project-specific Data Quality Objectives (DQOs) are met.

3.2.4. Radiation Protection Supervisor

The Radiation Protection Supervisor (RPS) is responsible for implementing the NS RPP at the project location. The RPS manages and oversees the project personnel in regards to radiation safety and is specifically responsible for establishing the Restricted Areas on-site to ensure the proper control of radioactive materials and contamination to ensure the health and safety of project personnel and the public.

3.2.5. Health Physics Technicians

The project Health Physics Technicians are responsible for ensuring that all restricted areas and properly posted.

3.3. Precautions and Limitations

3.3.1. Health Physics personnel should routinely perform and review surveys in accordance with NS-RS-PR-300, *Performance of Radiological Surveys* to ensure proper radiological postings.

3.3.2. Existing physical boundaries should be used where applicable for establishing boundaries to Restricted Areas; however, for areas where physical boundaries cannot be used, roped boundaries should be utilized or other methods to identify the area. Examples include chain link or temporary fencing, snow fence, yellow and magenta rope, tape on the floor or stanchions.

3.3.3. Requirements for the labeling or radioactive materials is addressed in NS-RS-PR-207, *Radioactive Materials Control*.

Nuclear Secured / Radiation Safety	Radiological Postings	
Doc. No.: NS-RS-PR-202	Revision 0	Page 7 of 9

4. Pre-Requisites / Requirements

- 4.1. All radiological postings shall be established and removed at the direction of Health Physics personnel. Movement or removal of radiological postings, signs, labels, tags, or boundary markers without the approval from Health Physics personnel is prohibited.
- 4.2. Ensure postings are current, accurate and legible in appearance and that temporary boundaries are periodically inspected.

5. Procedure

5.1. General Posting Requirements

- 5.1.1. Radiological postings and signs shall either be in black or magenta with a yellow background.
- 5.1.2. Radiological postings and signs shall be posted so they are clearly visible at each Restricted Area access location.
- 5.1.3. Post Restricted Areas for all radiological hazards as applicable (e.g., an area may need to be posted as a “Controlled Surface Contamination Area”, “Radiation Area” and “Airborne Radioactivity Area” if all conditions apply).
- 5.1.4. Areas may be posted due to the actual or the anticipated/potential conditions (e.g., a highly contaminated area may become an airborne radioactivity area when work is performed in the area and may be posted as an “Airborne Radioactivity Area” based on potential).

5.2. Controlled Areas

- 5.2.1. Controlled areas should be established using physical barriers such as fencing to limit access prior to reaching a Restricted Areas.
- 5.2.2. Uncontrolled areas shall be maintained such that the maximum exposure to an individual member of the public will not exceed 100 mrem/year and not exceed 2 mrem in any one hour.
- 5.2.3. Areas outside Restricted Area boundaries (i.e., radiologically posted areas) and within Controlled Areas where annual exposure limits may potentially be exceeded shall be posted as “no loitering” areas.
- 5.2.4. Discretionary postings such as “Low Dose Waiting Area” may be utilized at the discretion of the RPS.

Nuclear Secured / Radiation Safety	Radiological Postings	
Doc. No.: NS-RS-PR-202	Revision 0	Page 8 of 9

5.3. Restricted Area Radiological Postings

- 5.3.1. Each radiation area shall be posted with a conspicuous sign or signs bearing the radiation symbol and the words "Caution, Radiation Area".
- 5.3.2. Each high radiation area shall be posted with a conspicuous sign or signs bearing the radiation symbol and the words "Caution, High Radiation Area" or "Danger, High Radiation Area". Additional access and control requirements for HRAs is provided in NS-RS-PR-208, *HRA / VHRA Access and Control*
- 5.3.3. Each very high radiation area shall be posted with a conspicuous sign or signs bearing the radiation symbol and the words "Grave Danger, Very High Radiation Area". Additional access and control requirements for VHRAs is provided in NS-RS-PR-208, *HRA / VHRA Access and Control*.
- 5.3.4. Areas which have airborne radioactivity in excess of the derived air concentrations specified in the NRC regulations shall be posted with a conspicuous sign or signs bearing the radiation symbol and the words "Caution, Airborne Radioactivity Area" or "Danger, Airborne Radioactivity Area". The requirement to wear respiratory protection equipment should also be included on a nearby sign.
- 5.3.5. Entrances to areas or rooms where radioactive materials are stored or handled in amounts exceeding 10 times the quantities in Appendix C to 10 CFR 20 shall be posted with a conspicuous sign or signs bearing the radiation symbol and the words "Caution, Radioactive Materials Area" or "Danger, Radioactive Materials Area".
- 5.3.6. Each area or room where surface contamination exceeds 1,000 dpm/100cm² β/γ, 20 dpm/100cm² α, or activity greater than or equal to the site's contamination limits shall be posted as a "Controlled Surface Contamination Area" (CSCA), "Contaminated Area" or "Contamination Area", unless the contamination is covered or fixed to prevent personnel exposures.
- 5.3.7. Hot Spot identification may be used at the discretion of the RPS in order to help maintain individual exposures as low as reasonably achievable (ALARA). Hot Spot postings or marking should be considered for localized areas where dose rates exceed 10 times the general area dose rate and are greater than 100 mrem/hr.
- 5.3.8. Additional signage may be utilized to provide supplemental information in addition to the required postings as directed by the RSO. These may include:
 - TLD Required
 - Respiratory Protection Required
 - RWP Required

Nuclear Secured / Radiation Safety		Radiological Postings	
Doc. No.: NS-RS-PR-202		Revision 0	Page 9 of 9

5.4. Posting Exceptions

- 5.4.1. Areas not normally accessible by personnel, such as overhead areas or roofs with no ladder, are not required to be posted; however, access will be restricted noting to contact Health Physics personnel prior to entry such that surveys may be performed, and the proper postings established.
- 5.4.2. A room or area under NS control containing radioactive materials for less than 8 hours is exempted from postings if the materials are constantly attended by an individual who takes the precautions necessary to prevent the exposure of individuals to radiation or radioactive material in excess of established dose limits.
- 5.4.3. A room or area is exempted from posting as “Caution, Radioactive Material” if the only radioactive material present is a sealed source and the radiation level at 30 cm from the surface of the source container does not exceed 5.0 mrem per hour.

6. Records

- 6.1. Radiological Surveys

7. Appendices and Forms

None