THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

PERRY NUCLEAR POWER PLANT OPERATIONS MANUAL

TITLE: RADIOLOGICAL CONTROLLED AREAS

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Radiological Controlled Areas

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SCOPE OF REVISION:

RADIOLOGICAL CONTROLLED AREAS

1.0 PURPOSE

This procedure shall define the Radiological Controlled Area (RCA) and describe the area posting in addition to the requirements for entering and working within an RCA.

2.0 SCOPE

This procedure shall apply to all individuals entering an RCA.

3.0 RESPONSIBILITY

3.1 The Managers, Perry Plant Technical Department (PPTD) and Perry Plant Operations Department (PPOD) are responsible for ensuring that all personnel entering and working within an RCA follow the requirements of this procedure.

3.2 The Plant Health Physicist is responsible for ensuring that the radiological controls at PNPP are established in accordance with this procedure.

3.3 Each individual entering and working within an RCA shall comply with the requirements of this procedure.

4.0 REFERENCES

4.1 10CFR20, Standards for Protection Against Radiation

4.2 PAP-0512, Radiation Work Permits

5.0 DEFINITIONS

5.1 Radiological Controlled Area

Any area to which access is controlled by PNPP for the purposes of protection of individuals from exposure to radiation and radioactive materials at such levels that a major portion of the body could receive in any one hour a dose of 0.5 mrem.

5.2 Uncontrolled Area

Any area to which access is not controlled by PNPP for purposes of protection of individuals from exposure to radiation and radioactive materials (all areas with doserates less than 0.5 mrem per hour).

5.3 High Radiation Area

Any area, accessible to personnel, in which there exists radiation at such levels that a major portion of the body could receive in any one hour a dose in excess of 100 mrem.

5.4 Radiation Area

Any area, accessible to personnel, in which there exists radiation at such levels that a major portion of the body could receive in any one hour a dose in excess of 5 mrem, or in any 5 consecutive days a dose in excess of 100 mrem.

5.5 Airborne Radioactivity Area

Any room, enclosure, or operating area in which airborne radioactive material exceeds 25% of the amounts specified in Appendix B, Table 1, Column 1 of 10CFR20.

5.6 Neutron Radiation Area

Any area accessible to personnel in which there exists neutron radiation at such levels that a major portion of the body could receive in any one hour a dose in excess of 2.5 mrem.

5.7 Contaminated Area

Any material or area accessible to personnel with loose surface contamination greater than or equal to 1000 dpm/100 cm^2 beta-gamma and/or 100 dpm/100 cm^2 alpha.

5.8 Maximum Permissible Concentrations (MPC)

The concentrations of airborne radionuclides as listed in Appendix B, Table 1, Column 1 of 10CFR20.

5.9 Radioactive Material(s) Area

Any room or area in which licensed material is used or stored and which contains natural uranium and thorium in excess of 100 times the quantities specified in Appendix C of 10CFR20 or any other radioactive material in excess of 10 times the quantities specified in Appendix C of 10CFR20.

5.10 Hot Spot

Any isolated area on contact that is 4 times background in areas where the background is 25 mrem/hour or greater.

6.0 DETAILS

6.1 Posting

6.1.1 An RCA shall encompass areas of the plant where one or more of the following areas may be encountered: radiation areas, high radiation areas, contaminated areas, airborne radioactivity areas, neutron radiation, or radioactive material(s) areas.

1. All entrances to an RCA should be conspicuously posted with signs bearing the radiation caution symbol (magenta or purple on a yellow background) and the words:

CAUTION

RADIATION AREA
RADIOACTIVE MATERIAL(S) AREA
PERSONNEL MONITORING REQUIRED FOR ENTRY

6.1.2 All entrances to areas used solely for storage of radioactive material shall be posted with signs bearing the radiation caution symbol and the words:

CAUTION

RADIOACTIVE MATERIAL(S) AREA

6.1.3 All entrances to Radiation Areas shall be posted with signs bearing the radiation caution symbol and the words:

CAUTION

RADIATION AREA

6.1.4 All entrances to High Radiation Areas with general area dose rates, greater than 100 mrem/hour shall be barricaded and posted with signs bearing the radiation caution symbol and the words:

CAUTION

HIGH RADIATION AREA
RWP REQUIRED FOR ENTRY

1. In addition to the above posting, High Radiation Areas with general area dose rates greater than 1000 mrem/hr shall have all entrances locked or shall be continuously guarded to prevent unauthorized entry or for large areas, such as containment, where no enclosure exists for the purposes of locking, and no enclosure can be reasonably constructed, a flashing blue light shall be activated as a warning device.

2. The keys shall be maintained under the administrative control of the Plant Health Physicist.

6.1.5 All entrances to Airborne Radioactivity Areas shall be posted with signs bearing the radiation caution symbol and words in accordance with the following:

1. Airborne concentrations greater than 25% of MPC but less than the MPC including noble gases, the words shall read:

CAUTION

AIRBORNE RADIOACTIVITY AREAS

2. Airborne concentrations equal to or greater than the MPC excluding noble gases, the words shall read:

CAUTION

AIRBORNE RADIOACTIVITY AREAS
RWP REQUIRED FOR ENTRY

6.1.6 All entrances to Neutron Radiation Areas should be posted with signs bearing the radiation caution symbol and the words:

CAUTION

NEUTRON RADIATION AREA
RWP REQUIRED FOR ENTRY

6.1.7 All entrances to Contaminated Areas should be posted with signs bearing the radiation caution symbol and the words:

CAUTION

CONTAMINATED AREA
RWP REQUIRED FOR ENTRY

6.1.8 All equipment, piping, etc. meeting the Hot Spot criteria should have Hot Spot sticker affixed to the component with the contact dose rate written on the sticker.

6.1.9 The entrances to the inclined fuel transfer tube maintenance areas shall be posted with a sign stating "Potentially Lethal Radiation Fields Possible During Transfer of Irradiated Fuel". All entrances shall be locked to prevent unauthorized entry.

6.2 RCA Entry

6.2.1 All individuals entering an RCA shall have personnel monitoring. Personnel monitoring shall be issued per PAP-0514, External Exposure Control.

6.2.2 Step Off Pads (SOPs) should be used at the entrances and exits of contaminated areas to minimize the spread of contamination. Normally, SOPs will be divided into two sections; 1) non-contaminated or clean, and 2) contaminated. Multiple SOPs may be used as necessary by Health Physics to minimize the spread of high contamination to an area of lower contamination.

6.2.3 All personnel entering an RCA shall adhere to all area posting and RWP requirements.

6.2.4 Eating, drinking or smoking is prohibited within an RCA unless authorized by the Plant Health Physicist.

6.3 Protective Clothing

6.3.1 Selection of Protective Clothing

1. The protective clothing required for any radiclogical work will be dependent on existing or potential radiological hazards, the physical properties of the hazard (dry or wet), and the nature of work to be performed.

   a. All physical work in contaminated areas with contamination levels greater than or equal to 1000 dpm/100 cm^2 beta-gamma or 100 dpm/100 cm^2 alpha, requires a minimum of full protective clothing. Health Physics Supervision may specify alternate/additional protective clothing as appropriate.
   b. Contaminated area entries for inspections, routine rounds, tagging, etc. (no climbing, crawling, or kneeling) may be accomplished in lab coats, plastic shoe covers, rubber shoe covers, rubber gloves, and cotton glove liners, if the general contamination levels are 50,000 dpm/100 cm^2 beta-gamma or less. If another activity is being accomplished in the area being entered, the individual should be in the same protective equipment for the activity in progress.

c. Consideration should be given to multiple layers of protective clothing, i.e., double P.C.s or a plastic suit, including respiratory protection when contamination levels exceed 100,000 dpm/100 cm^2.

2. Health Physics shall prescribe the protective clothing to be worn on the RWP. Only the protective clothing on the RWP shall be worn by the individual.

6.3.2 Use of Protective Clothing

1. Protective clothing should be donned as follows:

a. All outer personal clothing should be removed. Only underclothing, socks and shoes should be worn under protective clothing. Any personal items such as watches, rings, etc. found to be contaminated shall be confiscated if unable to be decontaminated.
b. Don plastic shoe covers.
c. Don cotton glove liners.
d. Don coveralls and tape to plastic shoe covers.
e. Place TLD and pocket dosimeter in the pocket provided on the upper chest area of the coveralls unless otherwise specified by Health Physics.
f. Don rubber shoe covers or boots over plastic shoe covers.
g. Don rubber gloves and pull cuffs over the cuffs of the coverall. Tape rubber gloves to coveralls.

NOTE: When taping, fold the exposed end back on to itself leaving a tab to facilitate removal.

h. Don respirator if required.
i. Don hood.
j. If multiple or additional protective clothing is required, the individual will be instructed on the proper method of donning by Health Physics.

2. Protective Clothing should be removed as follows:

a. Upon approaching the contaminated portion of the SOP, remove any designated outer protective clothing, i.e., second set of cloth coveralls, plastic rain suit, etc., and then the rubber boots/shoe covers one at a time stepping onto the SOP with each foot after each rubber boot/shoe cover is removed. Place the rubber boots/shoe covers in the proper receptacle.

NOTE: All highly contaminated outer clothing should be removed prior to stepping on the contaminated portion of SOP.

b. Remove all tape and rubber gloves. Care should be taken not to remove the cotton glove liners along with the rubber gloves. Place the tape and rubber gloves in the proper receptacles.
c. Remove hood and place in the proper receptacles.
d. Remove respirator and spectacle kits if worn and place in a clean yellow poly bag. Set the yellow poly bag in the clean area.
e. Remove all dosimetry and read the dosimeter. Place the dosimetry in the clean area.
f. Remove the coveralls by unzipping/loosening and turning the coveralls inside out as it is removed. Place the coveralls in the proper receptacle.
g. Remove the plastic shoe covers one at a time before stepping onto the clean area of the SOP as each plastic shoe cover is removed. Place the plastic shoe covers in the proper receptacle.
h. Remove one cotton glove liner inside out and place in the proper receptacle. Pick up dosimetry in the cotton gloved hand.
i. Proceed with the dosimetry and respirator if worn to the nearest frisking area. Frisk dosimetry and remove cotton glove. Perform a whole body frisk.
j. Return the respirator to the respirator issue point.

6.4 Monitoring Personnel for Contamination

6.4.1 All personnel should perform a whole body frisk with a RM120/HP-210 or equivalent when exiting a contaminated area.

1. Individuals should frisk themselves for contamination with a RM120/HP210 or equivalent as follows:

a. Check the frisker is on with the range selector switch on the X1 scale. The meter should be responding to background radiation showing it is functioning.

NOTE: Personnel frisking should be done in areas where the background is less than 300 cpm unless authorized by the Plant Health Physicist or his alternate.

b. Slowly pass the palms of the hands under the detector, repeating for the back of the hands. Particular attention should be given to all the finger tips.

NOTE: Listen for an increase in the audible count rate and watch the meter response. An increasing count rate will be an indication of contamination. Resurvey the area if an increase in the count rate is noted. The alarm or an indication of greater than 100 cpm above background will be an indication of contamination greater than acceptable levels.

c. Pass the detector probe slowly (1 to 2 inches per second) over the surface of the body at a distance of 1/4 to 1/2 an inch.

d. If the hands are free of contamination, pick up the detector by the handle and slowly monitor the head, face and neck areas. Particular attention should be given to the areas around the nose and mouth and the sealing areas of a respirator if worn.

e. Continue to monitor the arms and the trunk of the body checking both the front and back.

f. Using the same method, proceed to the legs and feet. Particular attention should be given to the soles of the shoes.

g. If the frisker indicates less than 100 cpm above background, the individual is allowed to proceed. If contamination greater than 100 cpm above background is discovered, notify Health Physics for assistance.

6.4.2 All personnel should monitor themselves prior to exiting an RCA with portal and/or a RM20/HP-210 or equivalent.

6.4.3 All personnel shall monitor themselves in a portal monitor or RM20/HP-210 or equivalent prior to leaving the protected area.

6.5 Records

None

7.0 ATTACHMENTS

None