Attachment B

Replacement Pages

3.6 RADIATION MONITORING SYSTEM

3.6.1 Radiation Monitoring Equipment

Applicability. This specification applies to the radiation monitoring information which must be available to the reactor operator during reactor operation.

Objective. The objective is to assure that sufficient radiation monitoring information is available to the opertor to assure safe operation of the reactor.

Specification. The reactor shall not be operated unless the radiation monitoring channels listed in the following table are operable. Each channel shall have a readout in the control room and be capable of sounding an audible alarm which can be heard in the reactor control room.

Radiation Monitoring Channels*	Number
Area Radiation Monitor	1
Continuous Air Particulate Radiation Monitor	1
Exhaust Gas Radiation Monitor	1
Exhaust Particulate Radiation Monitor	1

* When maintenance to the radiation monitoring channels is required, the intent of this specification will be satisfied if they are replaced with portable instruments of appropriate sensitivity having their own alarms, or which shall be kept under visual observation.

Basis. The radiation monitors provide information to operating personnel regarding routine releases of radioactivity and any impending or existing danger from radiation. Their operation will provide sufficient time to evacuate the facility or take the necessary steps to prevent the spread of radioactivity to the surroundings.

3.6.2 Radiation Release Limits

Applicability. This specification applies to the release rate of argon-41 from the Oregon State TRIGA reactor facility.

Objective. The objective is to ensure that the concentration of the argon-41 in the unrestricted areas is consistently well below the applicable effluent concentration value in 10 CFR 20.

Specification. The annual average concentration of argon-41 discharged into the unrestricted area shall not exceed 4×10^{-6} microcuries per milliliter at the point of discharge.

Basis. If argon-41 is continuously discharged at 4×10^{-6} μCi/ml, calculations using the current guidance show that the maximum annual average ground concentration of argon-41 in unrestricted areas would be only 3% of the applicable effluent concentration value of 1×10^{-8} μCi/ml found in 10 CFR 20. Consequently, the annual total effective dose equivalent to an individual exposed to this concentration would be less than 3 mrem. This is significantly less than the annual public dose limit of 100 mrem. Similarly, if argon-41 is discharged at 4×10^{-6} μCi/ml under the worst-case short-term weather conditions, the maximum total effective dose equivalent rate would be less than 0.02 mrem/h. Therefore, a person exposed under these conditions would receive a dose much less than the public limit of 2 mrem in one hour.

3.7 ENGINEERED SAFETY FEATURES

3.7.1 Ventilation System

Applicability. This specification applies to the operation of the facility ventilation system.

Objective. The objective is to assure that the ventilation system is in operation to mitigate the consequences of possible releases of radioactive materials resulting from reactor operation.

Specification. The reactor shall not be operated unless the facility ventilation system is operating. In the event of a substantial release of airborne radioactivity, the ventilation system will be secured automatically.

Basis. During normal operation of the ventilation system, the annual average ground concentration of argon-41 in unrestricted areas is well below the applicable effluent concentration limit in 10 CFR 20. In addition, the worst-case maximum total effective dose equivalent rate is well below the limit for individual members of the public. In the event of a substantial release of airborne radioactive material, the ventilation system will be secured automatically. Therefore, limiting the operation of the reactor to only those items when the ventilation system is operating ensures the maximum designed control over releases of airborne r. ›active material.

3.7.2 Reactor Pool Water.

Applicability. This specification applies to the level and bulk water temperature of the reactor pool.

Objective. The objective is to assure that there is an adequate amount of water in the reactor tank for fuel cooling and shielding purposes, and that the bul:: temperature of the reactor pool water remains sufficiently low to guarantee reactor tank integrity.

Specification. The reactor shall not be operated if:

a. The pool water level is less than 14 feet above the core.

b. The bulk pool water temperature exceeds 120°F (49°C).

Basis. The minimum height of 14 feet of water above the core guarantees that there is sufficient water for effective cooling of the fuel and that the radiation levels at the top of the reactor are within acceptable levels (SAR). The bulk water temperature limit is necessary, according to the reactor manufacturer, to ensure that the aluminum reactor tank maintains its integrity and is not degraded.

3.8 LIMITATIONS ON EXPERIMENTS

Applicability. This specification applies to experiments installed in the reactor and its experimental facilities.

Objective. The objective is to prevent damage to the reactor or excessive release of radioactive materials in the event of an experiment failure.

Specifications. The reactor shall not be operated unless the following conditions governing experiments exist:

a. Non-secured experiments shall have reactivity worths less than 1 dollar.

b. The reactivity worth of any single experiment will be less than 2.55 dollars.

c. Total experiment worth of all experiments will not exceed 3.00 dollars.

d. Explosive materials, such as gunpowder, TNT, nitroglycerin, or PETN, in quantities greater than 25 milligrams shall not be irradiated in the reactor or experimental facilities. Explosive materials in quantities less than 25 milligrams may be irradiated provided the pressure produced upon detonation of the explosive has been calculated and/or experimentally demonstrated to be less than the design pressure of the container. EXCEPTION: Explosive materials not exceeding 0.014 lbs. equivalent of TNT may be irradiated in the laboratory area adjacent to the end of the OSTR tangential beamport for the purpose of neutron radiography.

e. Where the possibility exists that the failure of an experiment (except fueled experiments) under (1) normal operating conditions of the experiment or reactor, (2) credible accident conditions in the reactor, or (3) possible accident conditions in the experiment, could release radioactive gases or aerosols to the reactor bay or the unrestricted area, the quantity and type of material in the experiment shall be limited such that the airborne concentration of radioactivity in the reactor bay and the unrestricted area will not exceed the applicable regulatory concentration limits in 10 CFR 20, assuming 100% of the gases or aerosols escape from the experiment.

f. In calculations pursuant to e., above, the following assumptions shall be used:

5. A brief description, including a summary of the safety evaluations of changes in the facility or in procedures and of tests and experiments carried out pursuant to Section 50.59 of 10 CFR Part 50.

6. A summary of the nature and amount of radioactive effluents released or discharged to the environs beyond the effective control of the licensee as measured at or prior to the point of such release or discharge.

Liquid Waste (summarized on a monthly basis)

(a) Radioactivity discharged during the reporting period

(1) Total estimated quantity of radioactivity released (in curies).

(2) An estimation of the specific activity for each detectable radionuclide present if the specific activity of the released material after dilution is greater than 1×10^{-7} microcuries/ml.

(3) Summary of the total release in curies of each nuclide determined in (2) above for the reporting period based on representative isotopic analysis.

(4) Estimated average concentration of the released radioactive material at the point of release for each month in which a release occurs, in terms of microcuries/ml and fraction of the applicable concentration in 10 CFR 20.

(b) Total volume (in gallons) of effluent water (including diluent) released during each period of release.

Gaseous Waste (summarized on a monthly basis)

(a) Radioactive discharged during the reporting period (in curies)

(1) Total estimated quantity of radioactivity released (in curies) determined by an appropriate sampling and counting method.

(2) Total estimated quantity (in curies) of argon-41 released during the reporting period based on data from an appropriate monitoring system.

(3) Estimated average atmospheric diluted concentration of argon-41 at the point of release for the reporting period, in terms of microcuries/ml and fraction of the applicable effluent concentration value.

(4) Total estimated quantity of radioactivity in particulate form with half lives greater than eight days (in curies) released during the reporting period as determined by an appropriate particulate monitoring system.

(5) Average concentration of radioactive particulates with half lives greater than eight days released in microcuries/ml during the reporting period.

(6) An estimate of the average concentration of other significant radionuclides present in the gaseous effluent discharge in terms of microcuries/ml and fraction of the applicable effluent concentration value for the reporting period if the estimated release is greater than 20% of the applicable effluent concentration.

Solid Waste (summarized on an annual basis)

(a) Total amount of sold waste packaged (in cubic feet).

(b) Total activity in solid waste (in curies)

(c) The dates of shipment and disposition (if shipped off site)

7. An annual summary of the radiation exposure received by facility personnel and visitors in terms of the average radiation exposure per individual and greatest exposure per individual in the two groups. Each significant exposure in excess of the limits of 10 CFR 20 shall be reported including the time and date of the exposure as well as the name of the individual and the circumstances leading up to the exposure.

8. An annual summary of the radiation levels and levels of contamination observed during routine surveys performed at the facility in terms of the average and highest levels.

9. An annual summary of any environmental surveys performed outside the facility.