

UNITED STATES NUCLEAR PEGULATORY COMMISSION WASHINGTON, D. C. 20555

NORTHERN STATES POWER COMPANY

DOCKET NO. 50-282

PRAIRIE ISLAND NUCLEAR GENERATING PLANT UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 59 License No. DPR-42

- 1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Northern States Power Company (the licensee) dated June 1, 1979 as revised August 13, 1982, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission:
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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- Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-42 is hereby amended to read as follows:
 - (2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 59, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective on January 1, 1983.

FOR THE NUCLEAR REGULATORY COMMISSION

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Robert A. Clark, Chief Operating Reactors Branch #3 Division of Licensing

Attachment: Changes to the Technical Specifications

Date of Issuance: October 21, 1982



UNITED STATES NUCLEAR REGULATORY COMMISSION WASHINGTON, D. C. 20555

NORTHERN STATES POWER COMPANY

DOCKET NO. 50-306

PRAIRIE ISLAND NUCLEAR GENERATING PLANT UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 53 License No. DPR-60

1. The Nuclear Regulatory Commission (the Commission) has found that:

- A. The application for amendment by Northern States Power Company (the licensee) dated June 1, 1979 as revised August 13, 1982, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
- B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
- C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
- D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
- E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

- Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-60 is hereby amended to read as follows:
 - (2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 53, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective on January 1, 1983.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert A. Clark, Chief Operating Reactors Branch #3 Division of Licensing

Attachment: Changes to the Technical Specifications

Date of Issuance: October 21, 1982

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 59 TO FACILITY OPERATING LICENSE NO. DPR-42

AMENDMENT NO. 53 TO FACILITY OPERATING LICENSE NO. DPR-60

DOCKET NOS. 50-282 AND 50-306

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages as indicated. The revised pages are indentified by amendment number and contain vertical lines indicating the area of change.

Remove	Insert
TS-1	TS-1
TS-111	TS-111
TS-iv	TS-iv
13-14	TS 1-7
이 귀엽이 아파 가지 않는 것이 같이 많이 했다.	TS-1-8
TS 3 9-1	TS 3 9-1
TS 3 0-2	TS 3 0_2
TS 3 9-3	TS 3 9-3
TS 3 0 4	TS 3 0_A
TS 3 0 5	TS 3 0_5
TS 3 0 6	TS 3 9-6
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TC 3 0 9	TS 3 0_8
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TS 3 0 10	TS 3 0 10
TS 2 0 11	TS 3 0 11
15.5.9-11	TC 2 0 12
	TS 2 0 12
Figure TC 2.0.1	13.3.9-13 Figure TS 2.0.1
rigure 15.5.9.1	Figure 15.3.9.1
Table TC 2 0 1 (2 pag)	Table TS 2 0 1 (2 per)
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W. Process Control Program (PCP)

The PCP is the manual containing the current formula, sampling, analysis, test and determinations to be made to ensure that the processing and packaging of solid radioactive wastes based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to assure compliance with 10CFR20, 10CFR71, and Federal and State regulations and other requirements governing the disposal of radioactive wastes.

X. Solidification

Solidification is the conversion of wet radioactive wastes into a form that meets shipping and burial ground requirements.

Z. Offsite Dose Calculation Manual (ODCM)

The ODCM is the manual containing the methodology and parameters to be used in the calculation of offsite doses due to radioactive liquid and gaseous effluents, in the calculation of liquid and gaseous effluent monitoring instrumentation alarm and/or trip setpoints, and in the conduct of environmental radiological environmental monitoring.

A.A. Source Check

A source check is the qualitative assessment of channel response when the channel sensor is exposed to a radioactive source.

A.B. Gaseous Radwaste Treatment System

The Gaseous Radwaste Treatment System is the system designed and installed to reduce radioactive gaseous effluents by collecting primary coolant system offgases from the primary system and providing for delay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.

A.C. Ventilation Exhaust Treatment System

A Ventilation Exhaust Treatment System is any system designed and installed to reduce gaseous radioiodine or radioactive material in particulate form in effluents by passing ventilation or vent exhaust gases through charcoal adsorbers and/or HEPA filters for the purpose of removing iodines or particulates from the gaseous exhaust stream prior to the release to the environment (such a system is not considered to have any effect on noble gas effluents). Engineered safety feature atmospheric cleanup systems are not considered to be Ventilation Exhaust Treatment System Components.

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A.D. Purging

Purging is the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration or other operating condition, in such a manner that replacement air or gas is required.

A.E. Venting

Venting is the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration or other operating condition, in such a manner that replacement air or gas is not provided or required during venting.

A.F. Members of the Public

Means all persons who are not occupationally associated with the plant. This category does not include employees of the utility, its contractors, or its vendors. Also excluded from this category are persons who enter the site to service equipment or to make deliveries. This category does include persons who use portions of the site for recreational occupational, or other purposes not associated with the plant.

A.G. Site Boundary

Means a line within which the land is owned, leased, or otherwise controlled by the licensee. The site boundary for liquid releases of radioactive material is defined in Figure 3.9-1. The site boundary for gaseous releases of radioactive material is defined in Figure 3.9-2.

A.H. Unrestricted Areas

Means any area at or beyond the site boundary to which access is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials or any area within the site boundary used for residential quarters or industrial, commercial, institutional and/or recreational purposes.

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3.9 RADIOACTIVE EFFLUENTS

Applicability

Applies at all times to the liquid and gaseous radioactive effluents from the plant and the solidification and packaging for shipment of solid radioactive waste.

Objective

To implement the requirements of 10CFR20, 10CFR71, 10CFR50 Section 50.36a, Appendix A and Appendix I to 10CFR50, 40CFR141, and 46CFR190 pertaining to radioactive effluents.

Specifications

A. Liquid Effluents

- 1. Concentration
 - a. The concentration of liquid radioactive material released at any time from the site (Figure 3.9-1) shall be limited to the concentrations specified in 10 CFR Part 20, Appendix B, Table II, Column 2, for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2 x 10⁻¹ μ ci/ml total activity.
 - b. When the concentration of radioactive material in liquid released from the site exceeds the limits in (a) above, immediately restore the concentration within acceptable limits and provide prompt notification with written followup to the Commission.
- 2. Dose
 - a. The dose or dose commitment to an individual from radioactive materials in liquid effluents released from the site (Figure 3.9.1) shall be limited:
 - During any calendar quarter to ≤3.0 mrem to the total body and to ≤ 10 mrem to any organ, and
 - 2. During any calendar year to ≤ 6 mrem to the total body and to ≤ 20 mrem to any organ.

Unit 1 - Amendment No. 11,59 Unit 2 - Amendment No. 5,53 b. When the calculated dose from the release of radioactive materials in liquid released from the site to unrestricted areas exceeds the limits in (a) above, in lieu of any other report prepare and submit to the Commission a special report within 30 days which identifies the cause(s) for exceeding the limit(s) and defines the corrective actions taken to reduce the releases and the proposed corrective actions to be taken to assure the subsequent releases will be within the above limits.

3. Liquid Radwaste System

- a. The liquid radwaste treatment system shall be used to reduce the radioactive materials in liquid wastes prior to their discharge when the projected dose due to liquid effluent released from the site (Figure 3.9-1) when averaged over one month would exceed 0.12 mrem to the total body or 0.4 mrem to any organ.
- b. With radioactive liquid waste being discharged without treatment and in excess of the limits in (a) above, within 30 days submit to the Commission a special report which includes the following information:
 - Identification of the inoperable equipment or sub-systems and the reason for inoperability.
 - Action(s) to be taken to restore equipment to operable status, and
 - Summary description of action(s) taken to prevent a recurrence.
- 4. Liquid Storage Tanks
 - a. The quantity of radioactive material contained in each of the following tanks shall be limited to < 10 curies, excluding tritium and dissolved or entrained noble gases:

Condensate storage tanks Outside temporary tanks

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- b. With the quantity of radioactive material in any of the above listed tanks exceeding the limit in (a) above, immediately suspend all additions of radioactive materials to the tank and within 48 hours reduce the tank contents to within the limit.
- B. Gaseous Effluents
 - 1. Dose Rate
 - a. The dose rate at any time due to radioactive materials released in gaseous effluents from the site (Figure 3.9.2) shall be limited to the following values:
 - The dose rate limit for noble gases shall be ≤ 500 mrem/year to the total body and ≤ 3000 mrem/year to the skin, and
 - The dose rate limit for I-131, tritium, and radioactive particulates with half-lives greater than eight days shall be ≤ 1500 mrem/year to any organ
 - b. With the dose rate(s) exceeding the limits in (a) above, immediately decrease the release rate to within acceptable limits and provide prompt notification with written followup to the Commission.
 - 2. Dose from Noble Gases
 - a. The air dose in unrestricted areas due to noble gases released in gaseous effluents from the site (Figure 3.9-2) shall be limited to the following values:
 - During any calendar quarter, to ≤ 10 mrad for gamma radiation and ≤ 20 mrad for beta radiation, and
 - 2. During any calendar year, to ≤ 20 mrad for gamma radiation and ≤ 40 mrad for beta radiation.
 - b. With the calculated air dose from radioactive noble gases in gaseous effluent exceeding any of the above limits, within 30 days submit to the Commission a special report which identifies the cause(s) for exceeding the limit(s) and defines the corrective action(s) taken to reduce the releases and the proposed corrective actions to be taken to assure the subsequent releases will be within the above limits.

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- 3. Dose from I-131, Tritium, and Radioactive Particulates With Half-Lives Greater Than Sight Days
 - a. The dose to any organ of an individual due to I-131, tritium, and radioactive particulates with half-lives greater than eight days released in gaseous effluents from the site (Figure 3.9-2) shall be limited to the following:
 - 1. During any calendar quarter to < 15 mrem, and
 - 2. During any calendar year to <30 mrem
 - b. With the calculated dose from the release of I-131, tritium, and radioactive particulates with half-lives greater than eight days in gaseous effluents exceeding the limit(s) in (a) above, in lieu of any other report prepare and submit to the Commission a special report within 30 days which identifies the cause(s) for exceeding the limit(s) and defines the corrective actions taken to reduce the releases and the proposed corrective actions to be taken to assure the subsequent releases will be within the above limits.
- Gaseous Radwaste Treatment System and Ventilation Exhaust Treatment Systems
 - a. The Gaseous Radwaste Treatment System and Ventilation Exhaust Treatment Systems shall be used to reduce radioactive materials in gaseous waste prior to their discharge when the projected dose due to gaseous effluents released from the site (Figures 3.9-2) when averaged over one month would exceed 0.4 mrad for gamma air dose, 0.3 mrad for beta air dose, or 0.6 mrem organ dose.
 - b. With gaseous waste being discharged without full treatment and in excess of the limits in (a) above, within 30 days submit to the Commission a special report which includes the following information:

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- Identification of the inoperable equipment or subsystems and the reason for inoperability.
- Action(s) taken to restore the inoperable equipment to operable status, and
- Summary description of action(s) taken to prevent a recurrence.
- c. Except as provided for in (d) below, the concentration of oxygen at the outlet of each operating recombiner shall be limited to $\leq 2\%$ by volume.
- d. With the concentration of oxygen measured at the outlet of operating recombiner(s) >2% by volume but $\leq 4\%$ by volume, restore the concentration of oxygen to $\leq 2\%$ by volume within 48 hours.
- e. With the concentration of oxygen at the outlet of operating recombiner(s) >4% by volume, immediately suspend all additions of waste gases to the system and reduce the concentration of oxygen to ≤2% within one hour.
- f. The quantity of radioactivity contained in each gas storage tank shall be limited to ≤78,800 curies of noble gases (considered as dose equivalent Xe-133).
- g. With the quantity of radioactive material in any gas storage tank exceeding the above limit, immediately suspend all additions of radioactive material to the tank and within 48 hours reduce the tank contents to within the limit.
- h. The radioactive gas contained in the waste gas holdup system shall not be deliberately discharged to the environment during unfavorable wind conditions when the cooling towers are in operation. For the purposes of this specification, unfavorable wind conditions are defined as wind from 5° west of north to 45° east of north at 10 miles per hour or less.

5. Containment Purging

- a. Containment purge and vent releases shall be treated during power operation through the charcoal and particulate filters of the in-service purge system or shield building ventilation system.
- b. Prior to purging containment during power operation or immediately after shutdown if the containment is to be purged, the sampling and analysis specified in Table 4.17-4 shall be completed.

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- C. Solid Radioactive Waste
 - 1. A solid radwaste system shall be operable and used, as applicable in accordance with a Process Control Program for the Solidification and packaging of radioactive wastes to ensure meeting the requirements of 10 CFR Part 20 and of 10 CFR Part 71 prior to shipment of radioactive wastes from the site.
 - With the packaging requirements of 10 CFR Part 20 or 10 CFR Part 71 not satisfied, suspend shipments of defectively packaged solid radioacive wastes from the site.

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TS.3.9-7

D. Dose from All Uranium Fuel Cycle Sources

- a. The dose or dose commitment to a member of the general public from all uranium fuel cycle sources is limited to 25 mrem to the total body or any organ (except for the thyroid, which is limited to 75 mrem) over a period of 12 consecutive months.
- b. With the calculated dose from the release of radioactive materials in liquid or gaseous effluents exceeding twice the limits of Specifications 3.9.A.2.a.1, 3.9.A.2.a.2, 3.9.B.2.a.1, 3.9.B.2.a.2, 3.9.B.3.a.1, or 3.9.B.3.a.2, submit within 30 days a special report to the Commission which calculates the highest radiation exposure to any member of the general public from all uranium fuel cycle sources (including all effluent pathways and direct radiation). Unless this report shows that exposures are less than the 40 CFR Part 190 standard, either apply to the Commission for a variance to continue releases which exceed the 40 CFR Part 190 standard or reduce subsequent releases to permit the standard to be met.
- E. Radioactive Liquid Effluent Monitoring Instrumentation
 - a. The radioactive liquid effluent monitoring instrumentation channels shown in Table 3.9-1 shall be operable with their alarm/trip setpoints set to ensure that the limits of Specification 3.9.A.1.a are not exceeded. The alarm/trip setpoints of these channels shall be determined in accordance with the Offsite Dose Calculation Manual (ODCM).
 - b. With a radioactive liquid effluent monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above specification, immediately suspend the release of radioactive liquid effluents monitored by the affected channel or declare the channel inoperable.
 - c. With less than the minimum required radioactive liquid effluent monitoring instrumentation channels operable, take the action shown in Table 3.9-1.

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- F. Radioactive Gaseous Effluent Monitoring Instrumentation
 - a. The radioactive gaseous effluent monitoring instrumentation channels shown in Table 3.9-2 shall be operable with their alarm/trip setpoints set to ensure that the limits of Specification 3.9.8.1.a are not exceeded. The alarm/trip setpoints of these channels shall be determined in accordance with the ODCM.
 - b. With a radioactive gaseous effluent monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above Specification, immediately suspend the release of radioactive gaseous effluents monitored by the affected channel or declare the channel inoperable.
 - c. With less than the minimum required radioactive gaseous effluent monitoring instrumentation channels operable, take the action shown in Table 3.9-2.

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Bases:

A. Liquid Effluents

Specification 3.9.A.1 is provided to ensure that the concentration of radioactive materials released in liquid waste effluents from the site to unrestricted areas will be less than the concentration levels specified in 10CFR Part 20, Appendix B, Table II Column 2. This limitation provides additional assurance that the levels of radioactive materials in bodies of water outside the site will not result in exposures exceeding (1) the Section II.A design objectives of Appendix I, 10 CFR Part 50, to an individual and (2) the limits of 10 CFR Part 20.106(e) to the population. The concentration limit for dissolved or entrained noble gases is based upon the assumption that Xe-135 is the controlling radioisotope and its MPC in air (submersion) was converted to an equivalent concentration in water using the methods described in International Commission on Radiological Protection (ICRP) Publication 2.

Specification 3.9.A.2.a is provided to implement the requirements of Sections II.A, III.A and IV.A of Appendix I, 10 CFR Part 50. The Limiting Condition for Operation implements the guides set forth in Section II.A of Appendix I. Action required by Specification 3.8.A.2.B provides the required operating flexibility and at the same time implements the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive material in liquid effluents will be kept "as low as is reasonably achievable". Considering that the nearest drinking water supply using the river for drinking water is more than 300 miles downstream, there is reasonable assurance that the operation of the facility will not result in radionuclide concentrations in the drinking water that are in excess of the requirements of 40 CFR 141.

Specification 3.9.A.3 provides assurance that the liquid radwaste treatment system will be available for use whenever liquid effluents require treatment prior to release to the environment. The requirements that the appropriate portions of this system be used when specified provides assurance that the releases of radioactive materials in liquid effluents will be kept "as low as is reasonably achievable." This specification implements the requirements of 10 CFR Part 50.36a, General Design Criterion 60 of Appendix A to 10 CFR Part 50 and the design objective given in Section II.D of Appendix I to 10 CFR Part 50. The specified limits governing the use of appropriate portions of the liquid radwaste treatment system were specified as a suitable fraction of the guide set forth in Section II.A of Appendix I, 10 CFR Part 50, for liquid effluents.

The liquid radwaste treatment system is shared by both units. It is not practical to determine the contribution from each unit to liquid radwaste releases. For this reason, liquid radwaste releases will be allocated equally to each unit.

Restricting the quantity of radioactive material contained in the specified tanks provides assurance that in the event of an uncontrolled release of the contents of the tank, the resulting concentrations would be less than the limits of 10 CFR Part 20, Appendix B, Table II, Column 2, in an unrestricted area.

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B. Gaseous Effluents

Specification 3.9.B.l.a is provided to ensure that the dose rate at anytime at the site boundary from gaseous effluents from all units on the site will be within the annual dose limits of 10 CFR Part 20 for unrestricted areas. The annual dose limits are the doses associated with the concentrations of 10 CFR Part 20, Appendix B, Table II Column 1. These limits provide reasonable assurance that radioactive material discharged in gaseous effluents will not result in the exposure of an individual in an unrestricted area, either inside or outside the site boundary, to annual average concentrations exceeding the limits specified in Appendix B, Table II of 10 CFR Part 20 (10 CFR Part 20.106(b)). For individuals who may at times be within the site boundary, the occupancy of the individual will be sufficiently low to compensate for any increase in the atmospheric diffusion factor above that for the site boundary. The specified release rate limits restrict, at all times, the corresponding gamma and beta dose rates above background to an individual at or beyond the site boundary to ≤500 mrem/year to the total body or to ≤3000 mrem/year to the skin. These release rate limits also restrict, at all times, the corresponding thyroid dose rate above background to <1500 mrem/year at the site boundary.

Specification 3.9.8.2.a is provided to implement the requirements of Sections II.B, III.A and IV.A of Appendix I, 10 CFR Part 50. The Limiting Conditions for Operation implement the guides set forth in Section II.B of Appendix I. Action required by Specification 3.9.8.2.b provides the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive material in gaseous effluents will be kept "as low as is reasonably achievable."

Unit 1 - Amendment No. 11,59 Unit 2 - Amendment No. 3,53 Specification 3.9.B.3.a is provided to implement the requirements of Sections II.C, III.A and IV.A of Appendix I, 10 CFR Part 50. The Limiting Conditions for Operation are the guides set forth in Section II.C of Appendix I. The action statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive materials in gaseous effluents will be kept "as low as is reasonably achievable." The release rate specifications for I-131, tritium and radioactive particulates with half-lives greater than eight days are dependent on the existing radionuclide pathways to man in the unrestricted area. The pathways which are examined in the development of these calculations are: 1) individual inhalation of airborne radionuclides, 2) deposition of radionuclides onto green leafy vegetation with subsequent consumption by man, 3) deposition onto grassy areas where milk animals and meat producing animals graze with consumption of the milk and meat by man, and 4) deposition

Specification 3.9.B.4.a provides assurance that the Waste Gas Treatment System and the Ventilation Exhaust Treatment Systems will be available for use whenever gaseous wastes are released to the environment. The requirement that the appropriate portions of the Waste Gas Treatment System be used when specified provides reasonable assurance that the releases of radioactive materials in gaseous effluents will be kept "as low as is reasonably achievable." This specification implements the requirements of 10 CFR 50.36a, General Design Criterion 60 of Appendix A to 10 CFR Part 50, and the design objective given in Section II.D of Appendix I to 10 CFR Part 50. The specified limits governing the use of appropriate portions of the systems were specified as a suitable fraction of the guide set forth in Sections II.B and II.C of Appendix I, 10 CFR Part 50, for gaseous effluents.

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Specification 3.9.B.4.c, 3.9.B.4.d, and 3.9.B.4.e are provided to ensure that the concentration of potentially explosive gas mixtures contained in the waste gas treatment system is maintained below the flammability limits of hydrogen and oxygen. Automatic control features are included in the system to prevent the hydrogen and oxygen concentrations from reaching these flammability limits. Maintaining the concentrations below the flammability limit provides assurance that the releases of radioactive materials will be controlled in conformance with the requirements of General Design Criterion 60 of Appendix A to 10 CFR Part 50.

The waste gas system is a pressurized system with two potential sources of oxygen: 1) oxygen added for recombiner operation, and 2) placing tanks vented for maintenance back on the system. The system is operated with flow through the recombiners and with excess hydrogen in the system. By verifying that oxygen is $\leq 2\%$ at the recombiner outlet, there will be no explosive mixtures in the system. If the required gas analysers are not operable, the oxygen to the recombiner will be isolated to prevent oxygen from entering the system from this source. Tanks that may undergo maintenance are normally purged with nitrogen before placing them in service to eliminate this as a source of oxygen.

Specification 3.9.B.4.f is provided to limit the radioactivity which can be stored in one decay tank. Restricting the quantity of radioactivity contained in each gas storage tank provides assurance that in the event of an uncontrolled release of the tank's contents, the resulting total body exposure to an individual at the nearest exclusion area boundary will not exceed 0.5 rem.

Specification 3.9.B.5.a requires the containment to be purged, during reactor operation, through the inservice purge system. This provides for iodine and particulate removal from the purge release. During outages when the containment is opened for maintenance, the containment ventilation exhaust is directed to the monitored reactor building vent.

The cooling towers at Prairie Island are located to the south of the plant and are within the 50°-arc described in this specification. At low wind, velocities (below 10 mph) the gaseous activity released from the gaseous radwaste system could be at or near ground level near the cooling towers and remain long enough to be drawn into the circulating water in the tower. This specification minimizes the possibility of releases from the gaseous radwaste system from entering the river from tower scrubbing.

The Waste Gas Treatment System, containment purge release vent, and spent fuel pool vent are shared by both units. Experience has also shown that contributions from both units are released from each auxiliary building vent. For this reason, it is not practical to allocate releases to any specific unit. All releases will be allocated equally in determining conformance to the design objectives of 10 CFR Part 50, Appendix I.

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TS.3.9-13 REV

C. Solid Radioactive Waste

The Operability requirements placed on the solid radwaste system ensure that the system will be available for use whenever solid radwastes require processing and packaging prior to being shipped offsite. This specification implements the requirements of 10 CFR Part 50.36a and General Design Criterion 60 of Appendix A to 10 CFR Part 50. The process parameters included in establishing the Process Control Program may include, but are not limited to waste type, waste pH, waste/liquid/solidification agent/catalyst ratios, waste oil content, waste principal chemical constituents, mixing and curing times.

D. Dose from All Uranium Fuel Cycle Sources

This specification is provided to meet the dose limitations of 40 CFR 190. The specification requires the preparation and submittal of a special report whenever the calculated doses from plant radioactive effluents exceed twice the design objective doses of Appendix I. Submittal of the report is considered a timely request, and a variance is granted until NRC staff action or this request is complete. For sites containing up to 4 reactors, it is highly unlikely that the resultant dose to a real individual will exceed 40 CFR 190 if the individual reactors remain within the reporting requirement level. For the purposes of the special report, it may be assumed that the dose commitment to the real individual from other uranium fuel cycle sources is negligible, with the exception that dose contributions from other nuclear fuel cycle facilities at the same site or within a radius of 5 miles must be considered.

E. & F. Effluent Monitoring Instrumentation

These specifications are provided to assure that effluent release points are continuously monitored.

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Unit

NH

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FIGURE TS. 3.9-1





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TABLE TS.3.9-1

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

	INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
1.	Gross Radioactivity Monitors Providing Automatic Termination of Release			
	a. Liquid Radwaste Effluent Line	1	During releases	· 1
	b. Steam Generator Blowdown Effluent Line	1/Unit	During releases	2
2.	Flow Rate Measurement Devices			
	a. Liquid Radwaste Effluent Line	1	During releases requiring throt- tling of flow	4
	b. Steam Generator Blowdown Flow	1/Gen	During releases	4
	c. Discharge Canal Flow	1	At all times	4
3.	Continuous Composite Samplers			
	a. Each Turbine Building Sump Effluent Line	1/Unit	During releases	3
4.	Discharge Canal Monitor	1	At all times	3
5.	Tank Level Monitor			
	a. Condensate Storage Tanks	1/Unit	When tanks are in use	5
	b. Temporary Outdoor Tanks Holding Radioactive Liquid	1/Tank	When tanks are in use	5

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TABLE TS.3.9-1

TABLE NOTATION

- ACTION 1 With the number of channels Operable less than required by the linimum Channels Operable requirement, effluent releases may continue for up to 14 days provided that prior to each release:
 - a. At least two independent samples are analyzed in accordance with Specification 4.17.A.l.d, and
 - b. At least two technically qualified members of the Facility Staff independently verify the release rate calculations and discharge line valving.

Otherwise, suspend release of radioactive effluents via this pathway.

- ACTION 2 With the number of channels Operable less than required by the Minimum Channels Operable requirement, effluent releases via this pathway may continue for up to 30 days provided grab samples are analyzed for gross radioactivity (beta or gamma) at a limit of detection of at least 10 uCi/gram:
 - At least once per 8 hours when the specific activity of the secondary coolant is >0.01 LCi/gram dose equivalent I-131.
 - At least once per 24 hours when the specific activity of the secondary coolant is < 0.01 µCi/gram dose equivalent I-131.
- ACTION 3 With the numbers of channels Operable less than required by the Minimum Channels Operable requirement, effluent releases via this pathway may continue for up to 30 days provided that, at least once per 8 hours, grab samples are collected and saved for weekly compositing and analysis in accordance with Table TS.4.17-3.
- ACTION 4 With the number of channels Operable less than required by the Minimum Channels Operable requirement, effluent releases via this pathway may continue for up to 30 days provided the flow rate is estimated at least once per 4 hours during actual releases. Pump curves may be used to estimate flow.
- ACTION 5 With the number of channels Operable less than required by the Minimum Channels Operable requirement, liquid additions to the tank may continue for up to 30 days provided the tank liquid level is estimated during all liquid additions.

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TABLE TS.3.9-2 (Pg 1 of 2)

TABLE TS.3.9-2

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

	INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
1.	Waste Gas Holdup System Explosive Gas (Oxygen) Monitors	2	During system operation	. 2
2.	Effluent Release Points (Unit No. 1 Reactor Bldg, Unit No. 1 Aux Bldg, Unit No. 2 Reactor Bldg, Unit No. 2 Aux Bldg, Spent Fuel Pool, Radwaste Bldg)			
	a. Noble Gas Activity Monitor*	1	During releases	4, 5, 7
	b. Iodine Sampler Cartridge	1	During releases	3
	c. Particulate Sampler Filter	1	During releases	3
	d. Sampler Flow Monitor	1	During releases	1
3.	Air Ejector Noble Gas Monitors (Each Unit)	1	During power operation	6

*Noble gas activity monitors providing automatic termination of releases (except the Radwaste Building which has no automatic isolation function).

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TABLE TS.3.9-2 (Pg 2 of 2)

TABLE TS.3.9-2

TABLE NOTATION

ACTION 1 With the number of channels Operable less than required by the Minimum Channels Operable requirement, effluent releases via this pathway may continue for up to 30 days provided the flow rate is estimated at least once per 4 hours.

Otherwise, suspend release of radioactive effluents via this pathway.

- ACTION 2 With the number of channels Operable less than required by the Minimum Channels Operable requirement, operating of this system may continue for up to 14 days. With two channels inoperable, manually isolate the oxygen addition line.
- ACTION 3 With the numbers of channels Operable less than required by the Minimum Channels Operable requirement, effluent releases via this pathway may continue for up to 30 days, provided samples are continuously collected with auxiliary sampling equipment as required in Table 4.17-4.
- ACTION 4 With the number of channels Operable less than required by the Minimum Channels Operable requirement, effluent releases via this pathway may continue for up to 30 days provided grab samples are taken at least once per 8 hours and these samples are analyzed for gross activity within 24 hours.
- ACTION 5 With the number of channels Operable less than required by the Minimum Channels Operable requirement, immediately suspend Purging of radioactive effluents via this pathway (applicable to Reactor Building vents).
- ACTION 6 With the number of channels Operable less than required by the Minimum Channels Operable requirement, air ejector operation may continue for up to 30 days provided grab samples are taken at least once per 24 hours and these samples are analyzed for gross activity within 24 hours.
- ACTION 7 With the number of channels operable less than required by the Minimum Channels operable requirement, the contents of the waste gas decay tanks may be released to the environment for up to 14 days provided that prior to initiating the release:
 - At least two independent samples of the tank's contents are analyzed, and
 - At least two technically qualified members of the Facility Staff independently verify the release rate calculations and discharge valve lineup;

Otherwise, suspend release of radioactive effluents via this pathway (applicable to Unit 2 Auxiliary Building Vent).

Unit 1 - Amendment No.59 Unit 2 - Amendment No.53 TABLE TS.4.1-1 (Page 4 of 5)

		Channe 1			Functional	Response	
Uni		Description	Check	Calibrate	Test	Test	Remarks
1-	19.	Deleted					
Ame	20.	Boric Acid Make-up Flow Channel	NA	R	NA	NA	
ndme	21.	Containment Sump Level	NA	R	R	NA	Includes Sumps A, B, and C
nt	22.	Accumulator Level	S	R	R	NA	
N		and Pressure					
•	23.	Steam Generator Pressure	S	R	м	NA	
\$5.5	24.	Turbine First Stage Pressure	S	R	м	NA	
ø	25.	Emergency Plan Radiation Instruments	*M	R	м	NA	Includes those named in the emergency procedure (referenced in Spec. 6.5 A.6.)
	26.	Protection Systems Logic Channel Testing	NA	NA	м	NA	Includes auto load sequencers
	27.	Turbine Overspeed Protection Trip Channel	NA	R	м	NA	
Ur	~ ~						
lit	28.	Deleted					
N	29.	Deleted					
-	30.	Deleted					
mendme	31.	Seismic Monitors	R	R	NA	NA	Includes those reported in Item 4 of Table TS.6.7-1
nt	32.	Coolant Flow - RTD	S	R	м	NA	
Z		Bypass Flowmeter					
•	33.	CRDM Cooling Shroud	S	NA	R	NA	FSAR page 3.2-56
*		Exhaust Air Temperature					
	34.	Reactor Gap Exhaust	S	NA	R	NA	FSAR page 5.4-2
5 3		Air Temperature					

TS.4.10-1

4.10 RADIATION ENVIRONMENTAL MONITORING PROGRAM

Applicability

Applies at all times to the periodic monitoring and recording of radioactive effluents found in the plant environs.

Objective

To provide for measurement of radiation levels and radioactivity in the site environs on a continuing basis.

Specification

- A. Sample Collection and Analysis
 - 1. The Radiation Environmental Monitoring Program described in Table 4.10-1 shall be conducted. Radioanalysis shall be conducted meeting the requirements of Table TS.4.10-2. A map and a table identifying the locations of the sampling shall be provided in the Offsite Dose Calculation Manual (ODCM).
 - 2. Whenever the Radiation Environmental Monitoring Program is not being conducted as specified in Table TS.4.10-1 the Annual Radiation Environmental Monitoring Report shall include a description of the reasons for not conducting the program as required and plans for preventing a recurrence.
 - 3. Deviations are permitted from the required sampling schedule if samples are unobtainable due to hazardous conditions, seasonable unavailability, or to malfunction of automatic sampling equipment. If the latter occurs, every effort shall be made to complete corrective action prior to the end of the next sampling period.
 - 4. With the level of radioactivity in an environmental sampling medium exceeding the reporting levels of Table 4.10-3 when averaged over any calendar quarter, in lieu of any other report, prepare and submit to the Commission within 30 days from the end of the affected calendar quarter a Report pursuant to Specification 6.7.C.2(a). When more than one of the radionuclides in Table 3.12-2 are detected in the sempling medium, this report shall be submitted if:

 $\frac{\text{concentration (1)}}{\text{limit level (1)}} + \frac{\text{concentration (2)}}{\text{limit level (2)}} + \dots > 1.0$

When radionuclides other than those in Table 4.10-2 are detected and are the result of plant effluents, this report shall be submitted if the potential annual dose to an individual is equal to or greater than the calendar year limits of Specifications 3.9.A.2, 3.9.B.2, or 3.9.B.3. This report is not required if the measured level of radioactivity was not the result of plant effluents; however, in such an event, the condition shall be reported and described in the Annual Radiological Environmental Monitoring Report.

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TS.4.10-2

5. Although deviations from the required sampling schedule are permitted under Paragraph 3 above, whenever milk or leafy green vegetables can no longer be obtained from the designated sample locations required by Table 4.10-1, the Semiannual Radioactive Effluent Release Report for this period shall explain why the samples can no longer be obtained and will identify the new locations which will be added to and deleted from the monitoring program as soon as practicable.

B. Land Use Census

- 1. A land use census shall be conducted and shall identify the location of the nearest milk animal, the nearest residence, and the nearest garden of greater than 500 square feet producing fresh leafy vegetables in each of the 16 meteorological sectors within a distance of five miles. This census shall be conducted at least once per 12 months between the dates of May 1 and October 31 by door to door survey, aerial survey, or by consulting local agricultural authorities or associations.
- 2. With a land use census identifying a location(s) which yields a calculated dose or dose commitment (via the same exposure pathway) 20 percent greater than at a location from which samples are currently being obtained in accordance with Specification 4.10-A.1, the Semiannual Radioactive Effluent Release Report for this period shall identify the new location. The new location shall be added to the radiological environmental monitoring program within 30 days. The sampling location, excluding the control station location, having the lowest calculated dose or dose commitments (via the same exposure pathway) may be deleted from this monitoring program after October 31 of the year in which this land use census was conducted.

C. Interlaboratory Comparison Program

- Analyses shall be performed on radioactive materials supplied as part of an NRC approved interlaboratory comparison program as described in the ODCM.
- 2. The results of analyses performed as a part of the above required program shall be included in the Annual Radiation Environmental Monitoring Report. When required analyses are not performed, corrective action shall be reported in the Annual Radiation Environmental Monitoring Report.

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TS.4.10-3

Basis

A. Sample Collection & Analysis

The Radiation Environmental Monitoring Program required by this specification provides measurements of radiation and radioactive materials in those exposure pathways and for those radionuclides which lead to the highest potential radiation exposures of individuals resulting from the plant operation. This program thereby supplements the radiological effluent monitoring by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and modeling of the environmental exposure pathways.

The detection capabilities required by Table 4.10-2 are state-of-the-art for routine environmental measurements in industrial laboratories, and the LLDs for arisking water meet the requirement of 40 CFR 141.

B. Land Use Census

This specification is provided to ensure that changes in the use of off site areas are identified and that modifications to the monitoring program are made if required by the results of this census. The best survey information from door-to-door, aerial or consulting with local agricultural authorities shall be used. This census satisfies the requirements of Section IV.B.3 of Appendix I to 10 CFR Part 50. Restricting the census to gardens of greater than 500 square feet provides assurance that significant exposure pathways via leafy vegetables will be identified and monitored since a garden of this size is the minimum required to produce the quantity (26 kg/year) of leafy vegetables assumed in Regulatory Guide 1.109 for consumption by a child. To determine this minimum garden size, the following assumptions were used, 1) that 20% of the garden was used for growing broad leaf vegetation (i.e., similar to lettuce and cabbage), and 2) a vegetation yield of 2 kg/square meter.

C. Interlaboratory Comparison Program

The requirement for participation in an interlaboratory comparison program is provided to ensure that independent checks on the precision and accuracy of the measurements of radioactive material in environmental sample matrices are performed as a part of a descript assurance program for environmental monitoring in order to demonstrate that the results are reasonably valid.

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TABLE TS.4.10-1 (Page 1 of 4)

PRAIRIE ISLAND NUCLEAR GENERATING PLANT RADIATION ENVIRONMENTAL MONITORING PROGRAM SAMPLE COLLECTION AND ANALYSIS

	Exposure Pathway and/or Sample	Number of Samples and Sample Locations**	Sampling and Collection Frequency	Type and Frequency of Analysis
1.	AIRBORNE Radioiodine and Particulates	Samples from 5 locations: 3 samples from offsite locations (in different sectors) of the highest calculated annual average ground level D/Q, 1 sample from the vicinity of a community having the highest calculated annual average ground-level D/Q, and 1 sample from a control loca- tion 8-20 miles distance and in the least prevalent wind direction	Continuous Sampler operation with sample collection weekly	Radioiodine analysis weekly for I-131 Particulate: Gross beta activity on each filter weekly*. Analyses shall be per- formed more than 24 hours following filter change. Perform gamma isotopic analysis on composite (by location) sample quarterly.
2.	DIRECT RADIATION	32 TLD stations established with duplicate dosimeters placed at the following locations:	Quarterly	Gamma dose quarterly
		 Using the 16 meteoro- logical wind sectors as guidelines, an inner ring of stations in the general area of the site boundary is established and an outer ring of stations in the 4 to 5 mile distance from the plant site is established. Because of inaccessibility, seven sectors in the inner and outer rings are not covered 		

* If Gross beta activity in any indicator sample exceeds 10 times the yearly average of the control sample, a gamma isotopic analysis is required.

Table TS.4.10-1 (Page 1 of 4)

** Sample locations are given on the figure and table in the ODCM.

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TABLE TS.4.10-1 (Page 2 of 4)

PRAIRIE ISLAND NUCLEAR GENERATING PLANT RADIATION ENVIRONMENTAL MONITORING PROCRAM SAMPLE COLLECTION AND ANALYSIS

	Exposure Pathway and/or Sample	Number of Samples and Sample Locations**	Sampling and Collection Frequency	Type and Frequency of Analysis
	DIRECT RADIATION (con't)	 Seven dosimeters are established at special 		
		interest areas and a control station.		
3.	WATERBORNE			
	a. Surface	Upstream & downstream locations	Monthly Composite of weekly samples (water & ice conditions	Gamma isotopic analysis of each monthly composite
			permitting)	Tritium analysis of quarterly composites of monthly composites
	b. Ground	3 samples from wells within 5 miles of the plant site and 1 sample from a well greater than 10 miles from the plant site	Quarterly	Gamma isotopic and tritium analyses of each sample
	c. Drinking	l sample from the City of Red Wing water supply	Monthly Composite of weekly samples	I-131 Analysis and Gross beta and gamma isotopic analyses of each monthly composite
				Tritium analysis of quarterly composites of monthly composites
	•			
44	Cample legations are	aturn on the floure and table in	the ODCM	

* Sample locations are given on the rigure and table in the obort.

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TABLE TS. 4.10-1 (Page 3 of 4)

PRAIRIE ISLAND NUCLEAR GENERATING PLANT RADIATION ENVIRONMENTAL MONITORING PROGRAM SAMPLE COLLECTION AND ANALYSIS

	Exposure Pathway and/or Sample	Number of Samples and Sample Locations**	Sampling and Collection Frequency	Type and Frequency of Analysis
3.	WATERBORNE (continued)			
	d. Sediment and shoreline	One sample upstream of plant, one sample down- stream of plant, and one from shoreline of recreational area.	Semiannually	Gamma isotopic analysis of each sample
4.	INGESTION			
	a. Milk	one sample from dairy farm having higest D/Q, one sample from each of three dairy farms cal- culated to have doses from I-131 >1 mrem/yr, and one sample from 10-20 miles	Monthly or biweekly if animals are on pasture	Gamma isotopic and I-131 analysis of each sample
	b. Fish and Invertebrates	One sample of one game specie of fish located upstream and downstream of the plant site One sample of Invertebrates upstream and downstream of the plant site	Semiannually	Gamma isotopic analysis on each sample (edible portion only on fish)
**	Sample locations are	given on the figure and table in	the ODCM	

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TABLE TS.4.10-1 (Page 4 of 4)

PRAIRIE ISLAND NUCLEAR GENERATING PLANT RADIATION ENVIRONMENTAL MONITORING PROGRAM SAMPLE COLLECTION AND ANALYSIS

Exposure Pathway and/or Sample c. Food Products	Number of Samples and Sample Locations** One sample of corn from highest D/Q farm and one sample from 10-20 miles.	Sampling a <u>Collection F</u> At time of h	nd requency arvest	Type and Frequency of Analysis Gamma isotopic analysis of edible portion of each sample
	One sample of broad leaf vegetation from highest D/Q garden and one sample from 10-20 miles	At time of ha	arvest	I-131 analysis of edible portion of each sample
** Sample locations are ;	given on the figure and tal	ole in the ODCM.		

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TABLE TS.4.10-2

MAXIMUM VALUES FOR THE LOWER LIMITS OF DETECTION (LLD) a,e

Analysis	Water (pCi/1)	Airborne Particulate or Gas (pCi/m ³)	Fish (pCi/kg, wet)	Milk (pCi/l)	Food Products (pCi/kg, wet)	Sediment (pCi/kg, dry)
gross beta	4 ^b	1×10^{-2}				Constant.
3 _ң	2000(1000 ^b)					
54 _{Mn}	15		130			
⁵⁹ Fe	30		260			
58,60 _{Co}	15		130			
65 _{Zn}	30		260			
95Zr-Wb	15 ^c					
1311	1 ^{b,d}	7×10^{-2}		1 ^d	60	
134,137 _{Cs}	15(10 ^b), 18	1×10^{-2}	130	15	80	150
140 _{Ba-La}	15 °			15 c		
					1	4 1 1 1 1 1 1

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TABLE TS.4.10-2

TABLE NOTATION

a - The LLD is the smallest concentration of radioactive material in a sample that will be detected with 95% probability with 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system (which may include radiochemical separation):

$$LLD = \frac{4.66s_b}{E \cdot V \cdot 2.22 \cdot Y \cdot \exp(-\lambda \Delta t)}$$

Where:

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LLD is the apriori lower limit of detection as defined above (as picocurie per unit mass or volume), s, is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute). In calculating the LLD for a radionuclide determined by gamma-ray spectrometry, the background shall include the typical contributing of other radionuclides normally present in the samples (e.g., potassium-40 in milk samples). Typical values of E, V, Y and Δt shall be used in the calculations.

E is the counting efficiency (as counts per transformation),

2.22 is the number of transformation per minute per picocurie,

Y is the fractional radiochemical yield (when applicable),

 λ is the radioactive decay constant for the particular radionuclide, and

At is the elapsed time between sample collection (or end of the sample collection period) and time of counting.

b - LLD for drinking water.

c - Total for parent and daughter

d - Applies to special isotope analysis-not to gamma spectrum analyses

e - Other peaks which are measurable and identifiable, together with the radionuclides in Table 4.10-2 shall be identified and reported.

TABLE TS.4.10-3

REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

nalysis	Water (pCi/1)	Airborne Particulate or Gas (pCi/m ³)	Fish (pCi/kg, wet)	Milk (pCi/l)	Vegetables (pC1/kg, wet)
1-3	$2 \times 10^{4(a)}$				
In-54	1×10^{3}		3×10^4		
e-59	4×10^{2}		1×10^4		1. 1. 1. 1. 1. 1.
0-58	1×10^{3}		3×10^4		
Co-60	3×10^2		1×10^4		
n-65	3×10^2		2×10^4		
r-Nb-95	$4 \times 10^{2(b)}$				
1-131	2	0.9		3	1×10^{2}
Cs-134	30	10	1×10^{3}	60	1 x 10 ³
Cs-137	50	20	2×10^{3}	70	2×10^3
8a-La-140	$2 \times 10^{2(b)}$			3 x 10 ^{2(b)}	

Reporting Levels

a - For drinking water samples

b - Total for parent and daughter

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TS.4.17-1

4.17 RADIOACTIVE EFFLUENTS SURVEILLANCE

Applicability:

Applies at all times to the periodic monitoring and recording of liquid and gaseous radioactive effluents, verification of solidification, and verification of equipment operability.

Objective:

To implement the requirements of 10CFR20, 10CFR71, 10CFR50 Secton 50.36a, Appendix A and Appendix I to 10CFR50, and 40CFR190 pertaining to radioactive effluents.

Specification:

A. Liquid Effluents

- 1. Dose Rate Monitoring and Calculations
 - a. Each radioactive liquid effluent monitoring instrumentation channel shall be demonstrated Operable by performance of the Channel Check, Source Check, Channel Calibration, and Channel Functional Test operations at the frequencies shown in Table 4.17-1.
 - b. Radioactive liquid wastes shall be sampled and analyzed according to the sampling and analysis program of Table 4.17-3.
 - c. The results of radioactive analysis shall be used in accordance with the methods of the ODCM to assure that the concentrations at the point of releases are maintained within the limits of Specification 3.9.A.l.a.
- 2. Dose Calculations
 - a. Cumulative dose contributions for the current calendar quarter and current calendar year shall be determined in accordance with the ODCM monthly.

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- 3. Liquid Radwaste System
 - a. Doses due to liquid releases shall be projected at least once each month in accordance with the ODCM.
- 4. Liquid Storage Tanks
 - a. The quantity of radioactive material contained in each of the tanks listed in Specification 3.9.A.4.a shall be determined to be within the above limit by analyzing a representative sample of the tank's contents at least once per 7 days when radioactive materials are being added to the tank.
- B. Gaseous Effluents
 - 1. Dose Rate Monitoring and Calculations
 - a. Each radioactive gaseous effluent monitoring instrumentation channel shall be demonstrated Operable by performance of the Channel Check, Source Check, Channel Calibration, and Channel Functional Test operations at the frequencies shown in Table 4.17-2.
 - b. The dose rate due to noble gases in gaseous effluents shall be determined to be within the limits of Specification 3.9.B.l.a in accordance with the methods and procedures of the ODCM.
 - c. The dose rate due to radi active materials, other than noble gases, in gaseous effluents shall be determined to be within the limits of Specification 3.9.B.l.a in accordance with the methods and procedures of the ODCM by obtaining representative samples and performing analyses in accordance with the sampling and analysis program, specified in Table 4.17-4.
 - 2. Dose Calculations for Noble Gases
 - a. Cumulative dose contributions for the current calendar quarter and current year shall be determined in accordance with the ODCM monthly.

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- Dose Calculations for Radioiodines, Radioactive Particulates, and Radionuclides Other Than Noble Gases With Half-Lives Greater Than Eight Days.
 - a. Cumulative dose contributions for the current calendar quarter and current calendar year determined in accordance with the ODCM shall be monthly.
- 4. Waste Gas Treatment System
 - a. Doses due to gaseous releases to unrestricted areas shall be projected monthly. Releases considered in the projection should include all potentially radioactive plant gaseous effluents from all gaseous radioactive waste management systems and ventilation exhaust systems that are planned to be operated at the projected capacity and efficiency of each. A projected dose in excess of the limits specified in 3.9.8.4.a indicates that additional components or subsystems of the waste gas treatment system must be placed in service to reduce radioactive materials in gaseous effluents.
 - b. The concentration of oxygen in the waste gas holdup system shall be determined to be within the limits of Specification 3.9.B.4.c by continuously monitoring the waste gases in the waste gas holdup system with the oxygen monitors required Operable by Table 3.9-2.
 - c. The quantity of radioactive material in each gas storage tank in use shall be determined to be within the limit specified in 3.9.8.4.f monthly. If the inventory of any tank exceeds 10,000 Curies, daily sampling when making additions shall be performed.
- 5. Atmospheric Steam Dump Monitoring
 - a. The I-131 activity in the secondary side of each steam generator shall be determined as required by Table TS.4.1-2B.
 - b. Each time the atmospheric steam dump is used with detectable I-131 activity in the secondary coolant, the total amount of I-131 released shall be calculated based on the most recent activity measurements of the secondary water.
 - c. If the total amount of I-131 released in one steam dump is greater than twice the limit of 3.9.B.3.a.2, the milk from dairy cows grazing in the downwind area shall be analyzed for a period of 5 days following the release. The downwind area shall include the 22-1/2-degree sector of a circle having its center at the plant and a 2-mile radius. The I-131 in the milk shall be determined each day following the dump, using instrumentation with a minimum I-131 detection limit of 1.0 pCi/1.

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TS.4.17-4

- C. Solid Radioactive Waste
 - 1. Verification of Solidification
 - a. The Process Control Program (PCP) shall be used to verify the Solidification of at least one representative test specimen from at least every tenth batch of each type of wet radioactive waste (e.g. filter sludges, spent resins, evaporator bottoms, and chemical solutions)
 - b. If any test specimen fails to verify Solidification, the Solidification of the batch under test shall be suspended until such time as additional test specimens can be obtained, alternative Solidification parameters can be determined in accordance with the PCP, and a subsequent test verifies Solidification. Solidification of the batch may then be resumed using the alternative Solidification parameters determined by the PCP.
 - c. If the initial test specimen from a batch of waste fails to verify Schidification, the PCP shall provide for the collection and testing of representative test specimens from each consecutive batch of the same type of wet waste until at least three consecutive initial test specimens demonstrate Solidification. The PCP shall be modified as required, as provided for in Section 6 of the Technical Specifications.
- D. Dose from All Uranium Fuel Cycle Sources
 - a. Cumulative dose contributions from all plant liquid and gaseous effluents shall be determined in accordance with Specifications 4.17.A.2.a, 4.17.B.2.a 4.17.B.3.a, and the methods in the ODCM.

Basis

Radioactive liquid effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in liquid effluents during actual or potential releases of liquid effluents. The alarm setpoints for these instruments are calculated in accordance with the methods in the ODCM to ensure that the alarm will occur prior to exceeding the limits of 10 CFR Part 20. The operability requirements and use of this instrumentation are consistent with the requirements of General Design Criteria 60, 63 and 64 of Appendix A to 10 CFR Part 50.

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Radioactive gaseous effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in gaseous effluents during actual or potential releases of gaseous effluents. The alarm/trip setpoints for these instruments will be calculated in accordance with NRC approved methods in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. The operability requirements for this instrumentation are consistent with the requirements of General Design Criteria 60, 63 and 64 of Appendix A to 10 CFR Part 50.

The dose calculations for liquid effluents in the ODCM implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I be shown by calculational procedures based on models and data such that the actual exposure of an individual through appropriate pathways is unlikely to be substantially underestimated. The equations specified in the ODCM for calculating the doses due to the actual release rates of radioactive materials in liquid effluents are consistent with the methodology provided in Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1, October 1977 and Regulatory Guide 1.113, "Estimating Aquatic Dispersion of Effluents from Accidental and Routine Reactor Releases for the Purpose of Implementing Appendix I", Revision 1, April 1977. NUREG-0133, October, 1978, provides methods for dose calculations consistent with Regulatory Guides 1.109 and 1.113.

The dose calculations for gaseous effluents in the ODCM also implement the requirements of Section III.A that conformance with the guides be shown by calculational procedures based on models and data such that the actual exposure of an individual through the appropriate pathways is unlikely to be substantially underestimated. The dose calculations established in the ODCM for calculating the doses due to the actual release rates of radioactive noble gases in gaseous effluents are consistent with the methodology provided in Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1, October 1977 and Regulatory Guide 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors," Revision 1, July 1977. The ODCM equations provided for determining the air doses at the site boundary will be based upon the historical average atmospheric conditions. NUREG-0133, October, 1978 provides methods for dose calculations consistent with Regulatory Guides 1.109 and 1.111.

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TABLE TS.4.17-1 (Page 1 of 2)

Instrument	Channel Check Frequency (4)	Source Check Frequency	Functional Test Frequency	Calibration Frequency
Liquid Radwaste Effluent Line Gross Radioactivity Monitor	Daily during releases	Prior to Each Release	Quarterly (1)	At least once every 18 months (3)
Liquid Radwaste Effluent Line Flow Instrument	Daily during releases	-	Quarterly	At least once every 18 months
Steam Generator Blowdown Gross Radioactivity Monitors	Daily during releases	Monthly	Quarterly (1)	At least once every 18 months (3)
Steam Generator Blowdown Flow	Daily during Releases	-	Quarterly	At least once every 18 months
Turbine Building Sump Continuous Composite Samplers	Daily during releases	-	Quarterly	At least once every 18 months
Discharge Canal Monitor	Daily during releases	Monthly	Quarterly (2)	At least once every 18 months (3)
Discharge Canal Flow Instruments	Daily during releases	-	Quarterly	At least once every 18 months
Condensate Storage Tank Level Monitors	Daily	-	Quarterly	At least once every 18 months
Level Monitors for Temporary Outdoor Tanks Holding Radioactive Liquid	Daily when in use	-	Quarterly when in use	At least once every 18 months when in use

TABLE TS.4.17-1 - RADIOAL QUID EFFLUENT MONITORING INSTRUMENTATION SURVE _LANCE REQUIREMENTS

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TABLE TS.4.17-1 TABLE NOTATION

- The Channel Functional Test shall also demonstrate that automatic isolation of this pathway and control room alarm annunciation occurs if any of the following conditions exists:
 - 1. Instrument indicates measured levels above the alarm/trip setpoint.
 - 2. Circuit failure (if provided).
 - 3. Instrument indicates a downscale failure (if provided).
 - 4. Instrument controls not set in operate mode (if provided).
- The Channel Functional Test shall also demonstrate that alarm annunciation occurs if any of the following conditions exists:

1. Instrument indicates measured levels above the alarm/trip setpoint.

- 2. Circuit failure (if provided).
- 3. Instrument indicates a downscale failure (if provided).
- 4. Instrument controls not set in operate mode (if provided).
- 3. The initial Channel Calibration shall be performed using one or wore of the reference standards certified by the National Bureau of Standards or using sources traceable to NBS standards. These standards shall permit calibrating the system over its intended range of energy and measurement range. For subsequent Channel Calibrations, sources that have been related to the initial calibration shall be used.
- 4. The Channel Check shall consist of verifying indication of flow during periods of release. A Channel Check shall be made at least once daily on any day on which continuous, periodic, or batch releases are made.

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TABLE TS.4.17-2 (Page 1 of 2)

Instrument	Channel Check Frequency	Source Check Frequency	Functional Test Frequency	Calibration Frequency
Waste Gas Holdup System Explosive Gas (Oxygen) Monitors	Daily During System Operation		Monthly (2)	Quarterly (5)
Effluent Release Points (Unit No. 1 Reactor Bldg, Unit No. 1 Aux Bldg, Unit No. 2 Reactor Bldg, Unit No. 2 Aux Bldg, Spent Fuel Pool, Radwaste Bldg) Noble Gas Activity Monitor (4) (Except Radwaste Building)	Daily During Releases	Monthly*	Quarterly (1)	At least once every 18 months (3)
Noble Gas Activity Monitor Radwaste Building (4)	Daily During Releases	Monthly	Quarterly (2)	At least once every 18 months (3)
Iodine and Particulate Samplers	Weekly			
Sampler Flow Rate Monitor	Weekly		Quarterly	At least once every 18 months
Air Ejector Noble Gas Monitors (Each Unit)	Daily During Releases	Monthly	Quarterly (2)	At least once every 18 months (3)

TABLE TS.4.17-2 - RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

* A source check of the applicable noble gas monitor shall be conducted prior to each waste gas decay tank or containment purge release.

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TABLE TS.4.17-2 TABLE NOTATION

- The Channel Functional Test shall also demonstrate that automatic isolation of this pathway and control room alarm annunciation occurs if any of the following exists.
 - 1. Instrument indicates measured levels above the alarm/trip setpoint.
 - 2. Circuit failure (if provided).
 - 3. Instrument indicates a downscale failure (if provided).
 - 4. Instrument controls not set in operate mode (if provided).
- The Channel Functional Test shall also demonstrate that alarm annunication occurs if any of the following conditions exists:
 - 1. Instrument indicates measured levels above the alarm/trip setpoint.
 - 2. Circuit failure (if provided).
 - 3. Instrument indicates a downscale failure (if provided).
 - 4. Instrument controls not set in operate mode (if provided).
- 3. The initial Channel Calibration shall be performed using one or more of the reference standards certified by the National Bureau of Standards or using sources traceable to NBS standards. These standards shall permit calibrating the system over its intended range of energy and measurement range. For subsequent Channel Calibrations, sources that have been related to the initial calibration shall be used.
- Noble gas monitor in the Radwaste Building vent not provided with automatic isolation trip.
- 5. The Channel Calibration shall include the use of a nitrogen zero gas and an oxygen span gas with a nominal concentration suitable for the range of the instrument.

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Liquid Release Type	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection (LLD) (uCi/ml) ^a ,d
Batch Tank Release ^g	Each Batch (Prior to	Each Batch (Prior to	Principal Gamma Emitters	5 x 10 ⁻⁷
	Release)	Release) ,	I-131	1 x 10 ⁻⁶
	One Batch Each Month	One Batch Each Month	Dissolved and Entrained Gases	1 x 10 ⁻⁵
	Each Batch Monthly b Composite	Monthly Composite	н-3	1 x 10 ⁻⁵
		Gross alpha	1 x 10 ⁻⁷	
	Each Batch Quarterly	Quarterlyb	Sr-89, Sr-90	5 x 10 ⁻⁸
		Composite	Fe-55	1×10^{-6}
Continuous Releases ^e Turbine Building	Continuous Weekly Composite Grab Sample Each Day with >0.5 gpm steam generator leakage	Weekly Compositef	Principal Gamma Emitters	5 x 10 ⁻⁷
Sumps			I-131	1 x 10 ⁻⁶
		Each Sample	Principal Gamma Emitters	5×10^{-7}
			I-131	1 x 10 ⁻⁶
	Grab Sample Each Month	Each Sample	Dissolved and Entrained Gases	1 x 10 ⁻⁵
	Continuous ^e Mo Co Continuous ^e Qu	Monthly Composite	н-3	2 x 10 ⁻⁵
			Gross Alpha	1×10^{-7}
		Quarterlyf	Sr-89, Sr-90	5 x 10 ⁻⁸
		Composite	Fe-55	1 x 10 ⁻⁶

TABLE TS.4.17-3 - RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

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Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection (LLD) (µCi/ml
Weekly Grab Sample Dyring	Each Sample b	Principal Gamma Emitters	5 x 10 ⁻⁷
Releases	Composite	I-131 .	1 x 10 ⁻⁶
Grab Sample Each Month During Releases	Each Sample	Dissolved and Entrained Gases	1 x 10 ⁻⁵
Weekly Grab	Monthly b	H-3	1 x 10 ⁻⁵
Sample During Releases	Composite	Gross Alpha	1 x 10 ⁻⁷
Weekly Grab Quarterly Sample During Composite	Quarterly b Composite	Sr-89, Sr-90	5 x 10 ⁻⁸
Releases		. Fe-55	1 x 10 ⁻⁶
	Sampling Frequency Weekly Grab Sample During Releases Grab Sample Each Month During Releases Weekly Grab Sample During Releases Weekly Grab Sample During Releases	Sampling FrequencyMinimum Analysis FrequencyWeekly Grab Sample During ReleasesEach Sample CompositeGrab Sample Each Month During ReleasesEach Sample CompositeWeekly Grab Sample During ReleasesMonthly CompositeWeekly Grab Sample During ReleasesMonthly CompositeWeekly Grab Sample During ReleasesMonthly Composite	Sampling FrequencyMinimum Analysis FrequencyType of Activity AnalysisWeekly Grab Sample During ReleasesEach Sample CompositePrincipal Gamma EmittersGrab Sample Each Month During ReleasesEach Sample CompositePrincipal Gamma EmittersWeekly Grab Sample During ReleasesEach Sample CompositeDissolved and Entrained GasesWeekly Grab Sample During ReleasesMonthly CompositeH-3Weekly Grab Sample During ReleasesQuarterly CompositeSr-89, Sr-90Weekly Grab Sample During ReleasesQuarterly CompositeSr-89, Sr-90Fe-55Fe-55Fe-55

TABLE TS.4.17-3 - RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

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TABLE TS.4.17-3 TABLE NOTATION

a. The LLD is the smallest concentration of radioactive material in a sample that will be detected with 95% probability with 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system (which may include radiochemical separation):

$$LLD = \frac{4.66 \text{ s}_{b}}{E \cdot V \cdot 2.22 \cdot Y \cdot \exp(-\lambda \Delta t)}$$

Where:

LLD is the a priori lower limit of detection as defined above (as picocurie per unit mass or volume),

s, is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute),

E is the counting efficiency (as counts per transformation),

V is the sample size (in units of mass or volume),

2.22 is the number of transformations per minute per picocurie,

Y is the fractional radiochemical yield (when applicable),

 λ is the radioactive decay constant for the particular radionuclide, and

 Δt is the elapsed time between midpoint of sample collection and time of counting.

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TABLE TS.4.17-3

TABLE NOTATION (Continued)

Notes:
b. A composite sample is one in which the quantity of liquid sampled is proportional to the quantity of liquid waste discharged and in which the method of sampling employed results in a specimen which is representative of the liquids released.
c. The principal gamma emitters for which the LLD specification will apply are exclusively the following radionuclides: Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144. This list does not mean that only these nuclides are to be detected and reported. Other peaks which are measurable and identifiable, together with the above nuclides,

d. Nuclides which are below the LLD for the analyses should not be reported as being present at the LLD level. When unusual circumstances result in LLDs higher than required, the reasons shall be documented in the Semiannual Radioactive Effluent Release Report.

shall also be identified and reported.

- e. A continuous release is the discharge of liquid wastes of a non-discrete volume; e.g., from a volume of system that has an input flow during the continuous release.
- f. To be representative of the quantities and concentrations of radioactive materials in liquid effluents, samples shall be collected continuously in proportion to the rate of flow of the effluent stream. Prior to analyses, all samples taken for the composite shall be thoroughly mixed in order for the composite sample to be representative of the effluent release.
- g. A batch release is the discharge of liquid wastes of a discrete volume. Prior to sampling for analyses, each batch shall be isolated, and then thoroughly mixed. to assure representative sampling.
- h. Daily grap samples from the turbine building sumps shall be collected and analyzed for principal gamma emitters, including I-131, whenever primary to secondary leakage exceeds 0.5 gpm in any steam generator. This sampling is provided in lieu of continuous monitoring with automatic isolation.
- Grab samples shall be collected at least once per 8 hours when steam generator blowdown releases are being made and the specific activity of the secondary coolant is >0.01 uCi/gram dose equivalent I-131 or primary to secondary leakage exceeds 0.5 gpm.

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TABLE TS.4.17-4 - RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS PROGRAM

Gaseous Release Type	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection (LLD) (uCi/ml) ^a , ^e
Waste Gas	Prior to Each Tank Release Grab Sample	Each Sample	Principal Gamma Emitters	1 x 10 ⁻⁴
Storage Tank		(Frior to Release)	H-3	1 x 10 ⁻⁶
Containment Purge	Prior to Each Purge Grab	Each Sample	Principal Gamma Emitters	1×10^{-4}
	Sample	Release)	H-3	1 x 10 ⁻⁶
Effluent Release Points (Unit No. 1 Reactor Bldg, Unit	Monthly ^b Grab Sample	Monthly	Principal Gamma Emitters	1 x 10 ⁻⁴
No. 1 Aux Bidg, Unit No. 2 Reactor Bidg, Unit No. 2	Continuous ^g	Weekly ^{c,h} Charcoal Sample	I-131	1×10^{-12}
Aux Bldg, Spent Fuel Pool, Padwaste Bldg)			I-133	1×10^{-10}
Radwaste brug)	Continuous ^g	Weekly ^{c,h} Particulate Sample	Principal Gamma Emitters	1 x 10 ⁻¹¹
	Continuous ⁸	Monthly ^C , Silica Jel Sample	H-3	1 x 10 ⁻⁶
	Continuous ^g	Monthly ^d Composite Particulate Sample	Gross Alpha	1 x 10 ⁻¹¹
	Continuous ⁸	Quarterly ^d Composite Particulate Sample	Sr-89, Sr-90	1 x 10 ⁻¹¹
	Continuous ^g	Noble Gas Monitor	Noble Gases Gross beta and gamma	1×10^{-4}

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TABLE TS.4.17-4 TABLE NOTATION

a. The LLD is the smallest concentration of radioactive, material in a sample that will be detected with 95% probability with 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system (which may include radiochemical separation):

LLD = $\frac{4.66 \text{ s}_{b}}{\text{E} \cdot \text{V} \cdot 2.22 \cdot \text{Y} \cdot \exp(-\lambda \Delta t)}$

Where:

LLD is the a priori lower limit of detection as defined above (as picocurie per unit mass or volume).

sb is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute),

E is the counting efficiency (as counts per transformation),

V is the sample size (in units of mass or volume),

2.22 is the number of transformation per minute per picocurie,

Y is the fractional radiochemical yield (when applicable),

 λ is the radioactive decay constant for the particular radionuclide, and

∆t is the elapsed time between midpoint of sample collection and time of counting.

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TABLE TS. 4.17-4

TABLE NOTATION (Continued)

- b. Grab samples taken at the ventilation exhausts are generally below minimum detectable levels for most nuclides with existing analytical equipment. If this is the case, PWR GALE Code noble gas isotopic ratios may be assumed.
- c. With >1 uCi/gm Dose Equivalent I-131 in either Unit 1 or Unit 2 reactor coolant system, the iodine and particulate collection devices for all release points shall be removed and analyzed daily until it is shown that a pattern exists which can be used to predict the release rate. Sampling may then revert to weekly. When samples collected for one day are analyzed, the corresponding LLD's may be increased by a factor of 10. Samples shall be analyzed within 48 hours after removal.
- d. To be representative of the average quantities and concentrations of radioactive materials in particulate form in gaseous effluents, samples should be collected in proportion to the rate of flow of the effluent streams.
- e. The principal gamma emitters for which the LLD specification will apply are exclusively the following radionuclides: Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135, and Xe-138 for gaseous emissions and Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144 for particulate emissions. This list does not mean that only these nuclides are to be detected and reported. Other peaks which are measurable and identifiable, together with the above nuclides, shall also be identified and reported.
- f. Nuclides which are below the LLD for the analyses should not be reported as being present at the LLD level for that nuclide. When unusual circumstances result in LLD's higher than reported, the reasons shall be documented in the Semiannual Radioactive Effluent Release Report.
- g. The ratio of the sample flow rate to the sampled stream flow rate shall be known for the time period sampled. Design flow rates may be used for building exhaust vent flow rates.
- h Releases are made via the reactor building vents only during purging, or operation of the shield building ventilation system, or operation of the auxiliary building special ventilation system. In lieu of weekly or monthly removal and analysis of iodine and particulate collection devices, these devices may be removed and analyzed following each release provided that the release lasts less than one week. Removal and analysis of collection devices is not required if releases are not being made.

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- f. Investigation of all events which are required by regulation or technical specifications (Appendix A) to be reported to NRC in writing within 24 hours.
- g. Revisions to the Facility Emergency Plan, Facility Security Plan, and the Fire Protection Program.
- h. Operations Committee minutes to determine if matters considered by that Committee involve unreviewed or unresolved safety questions.
- Other nuclear safety matters referred to the SAC by the Operations Committee, plant management or company management.
- j. All recognized indications of an unanticipated deficiency in some aspect of design or operation of safety-related structures systems, or components.
- Reports of special inspections and audits conducted in accordance with specification 6.3.
- 1. Changes to the Offsite Dose Calculation Manual (ODCM).
- m. Review of investigative reports of unplanned releases of radioactive material to the environs.
- Audit The operation of the nuclear power plant shall be audited formally under the cognizance of the SAC to assure safe facility operation.
 - a. Audits of selected aspects of plant operation, as delineated in Paragraph 4.4 of ANSI N18.7-1972, shall be performed with a frequency commensurate with their nuclear safety significance and in a manner to assure that an audit of all nuclear safety-related activities is completed within a period of two years. The audits shall be performed in accordance with appropriate written instructions and procedures.
 - b. Audits of aspects of plant radioactive effluent treatment and radiological environmental monitoring shall be performed as follows:
 - 1. Implementation of the Offsite Dose Calculation Manual at least once every two years.
 - 2. Implementation of the Process Control Program for solidification of radioactive wastes at least once every two years.
 - 3. The Radiological Environmental Monitoring Program and the results thereof, including quality controls, at least once every year.
 - c. Periodic review of the audit program should be performed by the SAC at least twice a year to assure its adequacy.
 - d. Written reports of the audits shall be reviewed by the Vice President - Power Production, by the SAC at a scheduled meeting, and by members of management having responsibility in the areas audited.

Unit 1 - Amendment No. 49, 59 Unit 2 = Amendment No. 43, 53 7. Authority

The SAC shall be advisory to the Vice President - Power Production

8. Records

Minutes shall be prepared and retained for all scheduled meetings of the Safety Audit Committee. The minutes shall be distributed within one month of the meeting to the Vice President - Power Production, the General Manager Nuclear Plants, each member of the SAC and others designated by the Chairman. There shall be a formal approval of the minutes.

9. Procedures

A written charter for the SAC shall be prepared that contains:

- a. Subjects within the purview of the group.
- b. Responsibility and authority of the group.
- c. Mechanisms for convening meetings.
- d. Provisions for use of specialists or subgroups.
- e. Authority to obtain access to the nuclear power plant operating record files and operating personnel when assigned audit functions.
- f. Requirements for distribution of reports and minutes prepared by the group to others in the NSP organization.

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- All events which are required by regulations or Technical Specifications to be reported to the NRC in writing within 24 hours.
- g. Drills on emergency procedures (including plant evacuation) and adequacy of communication with offsite support groups.
- h. All procedures required by these Technical Specifications, including implementing procedures of the Emergency Plan, and the Security Plan, shall be reviewed initially and periodically with a frequency commensurate with their safety significance but at an interval of not more than two years.
- Special reviews and investigations, as requested by the Safety Audit Committee.
- Review of investigative reports of unplanned releases of radioactive material to the environs.
- k. All changes to the Process Control Program (PCP) and the Offsite Dose Calculation Manual (ODCM).
- 5. Authority

The OC shall be advisory to the Plant Manager. In the event of a disagreement between the recommendations of the OC and the Plant Manager, the course determined by the Plant Manager to be the more conservative will be followed. A written summary of the disagreement will be sent to the General Manager Nuclear Plants and the Chairman of the SAC for review.

6. Records

Minutes shall be recorded for all meetings of the OC and shall identify .all documentary material reviewed. The minutes shall be distributed to each member of the OC, the Chairman and each member of the Safety Audit Committee, the General Manager Nuclear Plants and others designated by the OC Chairman or Vice Chairman.

7. Procedures

A written charter for the OC shall be prepared that contains:

- a. Responsibility and authority of the group
- Content and method of submission of presentations to the Operations Committee
- c. Mechanism for scheduling meetings
- d. Provision for meeting agenda

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6.5 PLANT OPERATING PROCEDURES

Detailed written procedures, including the applicable checkoff lists and instructions, covering areas listed below shall be prepared and followed. These procedures and changes thereto, except as specified in TS 6.5.D., shall be reviewed by the Operations Committee and approved by a member of plant management designated by the Plant Manager.

- A. Plant Operations
 - Integrated and system procedures for normal startup, operation and shutdown of the reactor and all systems and components involving nuclear safety of the facility.
 - 2. Fuel handling operations
 - 3. Actions to be taken to correct specific and foreseen potential or actual malfunction of systems or components including responses to alarms, primary system leaks and abnormal reactivity changes and including follow-up actions required after plant protective system actions have initiated.
 - Surveillance and testing requirements that could have an effect on nuclear safety.
 - 5. Implementing procedures of the security plan.
 - Implementing procedures of the emergency plan, including procedures for coping with emergency conditions involving potential or actual releases of radioactivity.
 - Implementing procedures of emergency plans for coping with earthquakes and floods. The flood emergency plan shall require plant shutdown for water levels at the site higher than 692 feet above MSL.
 - 8. Implementing procedures of the fire protection program.
 - Implementing procedures for the Process Control Program and Offsite Dose Calculation Manual including quality control measures.

Drills on the procedures specified in A.3. above, shall be conducted as a part of the retraining program. Drills on the procedures specified in A.6. above, shall be conducted at least semiannually, including a check of communications with offsite support groups.

B. Radiological

Radiation control procedures shall be maintained and made available to all plant personnel. These procedures shall show permissible radiation exposure and shall be consistent with the requirements of 10CFR20. This radiation protection program shall be organized to meet the requirements of 10CFR20.

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C. Maintenance and Test

The following maintenance and test procedures will be developed to satisfy routine inspection, preventive maintenance programs, and operating license requirements.

- Routine testing of Engineered Safeguards and equipment as required by the facility License and the Technical Specifications.
- 2. Routine testing of standby and redundant equipment.
- Preventive or corrective maintenance of plant equipment and systems that could have an effect on nuclear safety.
- Calibration and preventive maintenance of instrumentation that could affect the nuclear safety of the plant.
- Special testing of equipment for proposed changes to operational procedures or proposed system design changes.
- D. Process Control Program (PCP)

The PCP shall be approved by the Commission prior to initial implementation. Changes to the PCP shall satisfy the following equirements:

- A description of changes shall be submitted to the Commission with the Semi-Annual Radioactive Effluent Release Report for the period in which the change(s) were made. This submittal shall contain:
 - a. sufficiently detailed information to totally support the rationale for the change without benefit of additional or supplemental information;
 - b. a determination that the change dia not reduce the overall conformance of the solidified waste product to existing criteria for solid wastes; and
 - c. documentation of the fact that the change has been reviewed and found acceptable by the Operations Committee.
- Shall become effective upon review and acceptance by the Operations Committee.

Unit 1 - Amendment No. 28, 53 Unit 2 - Amendment No. 19, 53 E. Offsite Dose Calculation Manual (ODCM)

The ODCM shall be approved by the Commission prior to initial implementation. Changes to the ODCM shall satisfy the following requirements:

- Shall be submitted to the Commission with the Semi-Annual Radioactive Effluent Report for the period in which the change(s) were made effective. This submittal shall contain:
 - a. sufficiently detailed information to totally support the rationale for the change without benefit of additional or supplemental information. Information submitted should consist of a package of those pages of the ODCM to be changed with each page numbered and provided with a revision date, together with appropriate analyses or evaluations justifying the change(s).
 - b. a determination that the change will not reduce the accuracy or reliability of dose calculations or setpoint determinations; and
 - c. documentation of the fact that the change has been reviewed and found acceptable by the Operations Committee.
- Shall become effective upon review and acceptance by the Operations Committee.
- F. Temporary Changes to Procedures

Temporary changes to procedures described in A,B,C,D, and E above, which do not change the intent of the original procedure may be made with the concurrence of two individuals holding senior operator licenses. Such changes shall be documented, reviewed by the Operations Committee and approved by a member of plant management designated by the Plant Manager within one month.

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TS.6.7-2

2. Occupational Exposure Report (1) An annual report of occupational exposure covering the previous calendar year shall be submitted prior to March 1 of each year.

The report should tabulate on an annual basis the number of station, utility and other personnel (including contractors) receiving exposures greater than 100 mrem/yr and their associated man-rem exposure according to work and job functions, e.g., reactor operations and surveillance, inservice inspection, routine maintenance, special maintenance (describe maintenance), waste processing, and refueling. The dose assignment to various duty functions may be estimates based on pocket dosimeter, TLD, or film badge measurements. Small exposures totalling less than 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total whole body dose received from external sources shall be assigned to specific major work functions.

- Monthly Operating Report. A monthly report of operating statistics and shutdown experience covering the previous month shall be submitted by the 15th of the following month to the Office of Management and Program Analysis, U. S. Nuclear Regulatory Commission, Washington, DC 20555.
- 4. Steam Generator Tube Inservice Inspection. The results of steam generator tube inservice inspections shall be reported within 90 days of January 1 for all inspections completed during the previous calendar year. These reports shall include: (1) number and extent of tubes inspected, (2) location and percent of wall-thickness penetration for each indication of an imperfection, and (3) identification of tubes plugged.

 This report supplements the requirements of 10 CFR 20, Section 20.407. If 10 CFR 20, Section 20.407 is revised to include such information, this Specification is unnecessary.

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5. <u>Semiannual Radioactive Effluent Release Report</u>. Routine radioactive effluent release reports covering the operation of the unit during the previous six months of operation shall be submitted within 60 days after January 1st and July 1st of each year.

The radioactive effluent release reports shall include a summary of the quantities of radioactive liquid and gaseous effluents as outlined in Appendix B of Regulatory Guide 1.21, Revision 1, June, 1974, with data summarized on a quarterly basis.

The report to be submitted 60 days after January 1 of each year shall include an assessment of the radiation doses from radioactive effluents released from the plant during the previous calendar year. This same report shall also include an assessment of the radiation doses from radioactive liquid and gaseous effluents to individuals due to their activities inside the site boundary (Figures 3.9-1 and 3.9-2) during the report period. All assumptions used in making these assessments (i.e., specific activity, exposure time and location) shall be included in these reports. The assessment of radiation doses shall be performed in accordance with the Offsite Dose Calculation Manual (ODCM) or standard NRC computer codes.

The report to be submitted 60 days after January 1 of each year shall also include an assessment of radiation doses to the likely most exposed member of the general public from reactor releases and other nearby uranium fuel cycle sources (including doses from primary effluent pathways and direct radiation) for the previous 12 consecutive months to show conformance with 40 CFR 190, Environmental Radiation Protection Standards for Nuclear Power Operation.

The radioactive effluent release reports shall include the following information for solid waste shipped offsite during the report period.

- a. container volume,
- b. total curie quantity (specify whether determined by measurement or estimate).
- principal radionuclides (specify whether determined by measurement or estimate),
- d. type of waste (e.g., spent resin, compacted dry waste, evaporator bottoms),
- e. type of container (e.g., LSA, Type A, Type B, Large Quantity), and
- f. solidification agent (e.g., cement, urea formaldehyde).

The radioactive effluent releases reports shall include unplanned releases from the site of radioactive materials in gaseous and liquid effluents on a quarterly basis, changes to the ODCM, a description of changes to the PCP, a report of when milk or vegetable samples cannot be obtained as required by Table 4.16.1, and changes in land use resulting in significant increases in calculated doses.

6. <u>Ar.ual Summaries of Meteorological Data</u>. An annual summary of meteorological data shall be submitted for the previous calendar year in the form of joint frequency distributions of wind speed, wind direction, and atmospheric stability at the request of the Commission.

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B. Reportable Occurrences

Reportable occurrences, including corrective actions and measures to prevent recurrence, shall be reported to the NRC. Supplemental reports may be required to fully describe final resolution of occurrence. In case of corrected or supplemental reports, a licensee event report shall be completed and reference shall be made to the original report date. Unless explicitly stated, the requirements of this section do not apply to the fire protection systems and measures contained in Sections 3.14/4.16, the radiological effluent limitations and measures in Sections 3.9/4.17, or the radiological environmental monitoring program in Section 4.10. Reporting requirements have been separately specified in those Sections.

- 1. Prompt Notification With Written Followup. The types of events listed below shall be reported as expeditiously as possible, but within 24 hours by telephone and confirmed by telegraph, mailgram, or facsimile transmission to the Administrator of the appropriate Regior 1 NRC Office or his designate no later than the first working day following the event, with a written followup report within two weeks. The written followup report shall include, as a minimum, a completed copy of a licensee event report form. Information provided on the licensee event report form shall be supplemented, as needed, by additional narrative material to provide complete explanation of the circumstances surrounding the event.
 - (a) Failure of the reactor protection system or other systems subject to limiting safety system settings to initiate the required protective function by the time a monitored parameter reaches the setpoint specified as the limiting safety system setting in the technical specifications or failure to complete the required protective function.
 - Note: Instrument drift discovered as a result of testing need not be reported under this item but may be reportable under items B.1(e), B.1(f), or B.2(a) below.
 - (b) Operation of the unit or affected systems when any parameter or operation subject to a limiting condition is less conservative than the least conservative aspect of the limiting condition for operation established in the technical specifications.
 - Note: If specified action is taken when a system is found to be operating between the most conservative and the least conservative aspects of a limiting condition for operation listed in the technical specifications, the limiting condition for operation is not considered to have been violated and need not be reported under this item, but it may be reportable under item B.2(b) below.
 - (c) Abnormal degradation discovered in fuel cladding, reactor coolant pressure boundary, or primary containment.
 - Note: Leakage of valve packing or gaskets within the limits for identified leakage set forth in technical specifications need not be reported under this item.

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- (j) Release of radioactive material in liquids from the site to the unrestricted areas in excess of the concentrations specified in 10 CFR Part 20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases or in excess of 2 x 10-4 µci/ml for total dissolved and entrained noble gases.
- (k) Release of radioactive material in gases from the site to unrestricted areas at a rate which exceeds the following dose rates:

For noble gases - 500 mrem/year to the total body or 3000 mrem/year to the skin For radioiodines - 1500 mrem/year to any organ and particulates with half-lives greater than eight days

- (1) Exceeding the limits for the storage of radioactive materials in outside tanks. The written follow-up report shall include a schedule and a description of activities planned and/or taken to reduce the contents to within the specified limits.
- 2. Thirty Day Written Reports. The reportable occurrences discussed below shall be the subject of written reports to the Director of the appropriate Regional Office within thirty days of occurrence of the event. The written report shall include, as a minimum, a completed copy of a licensee event report form. Information provided on the licensee event report shall be supplemented, as needed, by additional narrative material to provide complete explanation of the circumstances surrounding the event.
 - (a) Reactor protection system or engineered safety feature instrument settings which are found to be less conservative than those established by the technical specifications but which do not prevent the fulfillment of the functional requirements of affected systems.
 - (b) Conditions leading to operation in a degraded mode permitted by a limiting condition for operation or plant shutdown required by a limiting condition for operation.
 - Note: Routine surveillance testing, instrument calibration, or preventative maintenance which require system configurations as described in items B.2(a) and B.2(b) need not be reported except where test results themselves reveal a degraded mode as described above.
 - (c) Observed inadequacies in the implementation of administrative or procedural controls which threaten to cause reduction of degree of redundancy provided in reactor protection systems or engineered safety feature systems.

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- (d) Abnormal degradation of systems other than those specified in item B.l(c) above designed to contain radioactive material resulting from the fission process.
- Note: Sealed sources or calibration sources are not included under this item. Leakage of valve packing or gaskets within the limits for identified leakage set forth in technical specifications need not be reported under this item.
 - (e) An unplanned offsite release of 1) more than one curie of radioactive material in liquid effluents, 2) more than 150 curies of noble gas in gaseous effluents, or 3) more than 0.05 curies of radioiodine in gaseous effluents. The report of an unplanned offsite release of radioactive material shall include the following information:
 - 1. A description of the event and equipment involved.
 - 2. Cause(s) for the unplanned release.
 - 3. Actions taken to prevent recurrence.
 - 4. Consequences of the unplanned release.
- C. Environmental Reports

The reports listed below shall be submitted to the Administrator of the appropriate Regional NRC Office or his designate:

- 1. Annual Radiation Environmental Monitoring Report
 - (a) Annual Radiation Environmental Monitoring Reports covering the operation of the program during the previous calendar year shall be submitted prior to May 1 of each year.
 - (b) The Annual Radiation Environmental Monitoring Reports shall include summaries, interpretations, and an analysis of trends of the results of the radiological environmental surveillance activities for the report period, including a comparison with preoperational studies, operational controls (as appropriate), and previous environmental surveillance reports and an assessment of the observed impacts of the plant operation on the environment. The reports shall also include the results of land use censuses required by Specification 4.10.B.1. If harmful effects or evidence of irreversible damage are detected by the monitoring, the report shall provide an analysis of the problem and a planned course of action to alleviate the problem.
 - (c) The Annual Radiation Environmental Monitoring Reports shall include summarized and tabulated results in the format of Regulatory Guide 4.8, December 1975 of all radiological environmental samples taken during the report period. In the event that some results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as possible in a supplementary report.

Unit 1 - Amendment No. \$4,59 Unit 2 - Amendment No. 48,53 (d) The reports shall also include the following: a summary description of the radiological environmental monitoring program; a map of all sampling locations keyed to a table giving distances and directions from one reactor; and the results of licensee participation in the Interlaboratory Comparison Program, required by Specification 4.10.C.1.

2. Special Reports

(a) When radioactivity levels in samples exceed limits specified in Table 4.10-3, a Special Report shall be submitted within 30 days from the end of the affected calendar quarter. For certain cases involving long analysis time, determination of quarterly averages may extend beyond the 30 day period. In these cases the potential for exceeding the quarterly limits will be reported within the 30 day period to be followed by the Special Report as scon as practicable.

3. Other Environmental Reports (non-radiological, non-aquatic)

Written reports for the following items shall be submitted to the appropriate NRC Regional Administrator:

- Environmental events that indicate or could result in a signia. ficant environmental impact causually related to plant operation. The following are examples: excessive bird impaction; onsite plant or animal disease outbreaks; unusual mortality of any species protected by the Endangered Species Act of 1973; or increase in nuisance organisms or conditions. This report shall be submitted within 30 days of the event and shall (a) describe, analyze, and evaluate the event, including extent and magnitude of the impact and plant operating characteristics, (b) describe the probable cause of the event, (c) indicate the action taken to correct the reported event, (d) indicate the corrective action taken to preclude repetition of the event and to prevent si ilar occurrences involving similar components or systems, and (e) indicate the agencies notified and their preliminary responses.
- b. Proposed changes, test or experiments which may result in a significant increase in any adverse environmental impact which was not previously reviewed or evaluated in the Final Environmental Statement or supplements thereto. This report shall include an evaluation of the environmental impact of the proposed activity and shall be submitted 30 days prior to implementing the proposed change, test or experiment.

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