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

ARKANSAS POWER & LIGHT COMPANY

DOCKET NO. 50-313

ARKANSAS NUCLEAR ONE, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 88
License No. DPR-51

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

   A. The application for amendment by Arkansas Power and Light Company (the licensee) dated April 13, 1984 as supplemented by letter dated April 26, 1984, 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.

2. 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-51 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 88 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment becomes effective on January 1, 1985.

FOR THE NUCLEAR REGULATORY COMMISSION

John F. Stolz, Chief
Operating Reactors Branch No. 4
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 14, 1984

ATTACHMENT TO LICENSE AMENDMENT NO. 88

FACILITY OPERATING LICENSE NO. DPR-51

DOCKET NO. 50-313

Revise Appendix A as follows:

Remove Pages	Insert Pages
i	i
ii	ii
-	iia
v	v
-	5a
-	5b
-	53f
-	53g
-	53h
-	53i
-	53j
-	53k
-	53l
-	66u
-	66v
-	66w
-	66x
-	66y
-	66z
-	66aa
-	66bb
-	66cc
-	66dd
-	66ee
-	66ff
-	110bb
-	110cc
-	110dd
-	110ee
-	110ff
-	110gg
-	110hh
-	110ii
-	110jj
-	110kk
-	110ll
-	110mm
-	110nn
-	110oo
-	110pp
-	110qq
-	110rr
-	110rra
-	110ss

Remove	Insert
-	110tt
-	110uu
-	110vv
-	110ww
-	110xx
-	110yy
-	110zz
-	110aaa
-	110bbb
111	111*
-	111a
112	112*
122	122
124	124
125	125
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-	141a
-	141b
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* No change. Page provided for document completeness.

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Amendment No. 23, 24, 30, 34, 44, 82, 88, 86, 84, 88

1.10 RADIOLOGICAL EFFLUENT TECHNICAL SPECIFICATIONS (RETS) DEFINITIONS

1.10.1 Dose Equivalent I-131

The Dose Equivalent I-131 shall be the concentration of I-131 (microcurie/gram) which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134 and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in Table III of TID-14844, "Calculation of Distance Factors for Power and Test Reactor Sites."

1.10.2 Source Check

A Source Check shall be the qualitative assessment of channel response when the channel sensor is exposed to a radioactive source.

1.10.3 Offsite Dose Calculation Manual (ODCM)

The Offsite Dose Calculation Manual shall contain the methodology and parameters used in the calculation of offsite doses due to radioactive gaseous and liquid effluents, and in the calculation of gaseous and liquid effluent monitoring alarm/trip setpoints, and in the conduct of the Environmental Radiological Monitoring Program.

1.10.4 Liquid Radwaste Treatment System

A Liquid Radwaste Treatment System is a system designed and used for holdup, filtration, and/or demineralization of radioactive liquid effluents prior to their release to the environment.

1.10.5 Gaseous Radwaste Treatment System

A Gaseous Radwaste Treatment System is any system designed and installed to reduce radioactive gaseous effluents by collecting gases from radioactive systems and providing for decay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.

1.10.6 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 absorbers and/or HEPA filters for the purpose of removing iodines or particulates from the gaseous exhaust stream prior to release to the environment (such a system is not considered to have any effect on noble gas effluents). Engineered Safety Feature (ESF) atmospheric cleanup systems are not considered to be Ventilation Exhaust Treatment Systems.

1.10.7 Purge - Purging

Purge or Purging is the controlled process of discharging air or gas from a confinement to reduce the airborne radioactivity concentration in such a manner that replacement air or gas is required to purify the confinement.

1.10.8 Member(s) of the Public

Member(s) of the Public shall include all persons who are not occupationally associated with the plant. This category does not include employees of the utility, its contractors or 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.

1.10.9 Exclusion Area

The exclusion area is that area surrounding ANO within a minimum radius of .65 miles of the reactor buildings and controlled to the extent necessary by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials.

1.10.10 Unrestricted Area

An unrestricted area shall be any area beyond the exclusion area boundary.

3.5.6 Radioactive Liquid Effluent Instrumentation

Applicability: During releases via this pathway.

Objective: To provide instrumentation for radioactive liquid releases.

Specification:

3.5.6.1 The radioactive liquid effluent monitoring instrumentation shown in Table 3.5.6-1 shall be operable with their alarm/trip setpoints set to ensure that the limits of specification 3.25.1.1 are not exceeded.

3.5.6.2 With alarm/trip setpoints less conservative than required by the above specification, immediately suspend the release of radioactive liquid effluents monitored by the affected channel, until the setpoint is changed to an acceptably conservative value.

3.5.6.3 With less than the minimum number of channels operable, take the action shown in Table 3.5.6-1. Return the instruments to operable status within 30 days or, in lieu of any other report, explain in the next Semiannual Radioactive Effluent Release Report why the inoperability was not corrected.

3.5.6.4 Specifications 3.0.3, 3.0.4, and 6.12.3 are not applicable.

Bases:

The 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. The alarm/trip setpoints for these instruments shall be calculated in accordance with the methods in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20.

Table 3.5.6-1

Radioactive Liquid Monitoring Instrumentation

	Instrument	Minimum Operable Channels	Applicability	Action
1.	Liquid radwaste effluent monitor (automatic termination)	1	During releases via this pathway	A
2.	Liquid radwaste effluent flow monitor	1	During releases via this pathway	B

Table 3.5.6-1 (Continued)

Table Notation

Action	Description
A.	With the number of channels operable less than required, effluent releases may be resumed provided that prior to initiating a release: 1. At least two independent samples of the tank's contents are analyzed in accordance with Specification 4.29.1.1; 2. At least two technically qualified members of the facility staff independently verify that the computer input data is correct and; 3. At least 2 members of the facility staff independently verify the discharge valve lineup. Otherwise, suspend release of radioactive effluents via this pathway.
B.	With the number of channels operable less than required, effluent releases via this pathway may continue provided the flow rate is estimated at least once per 4 hours during actual releases. Pump curves may be used to estimate flow.

3.5.7 Radioactive Gaseous Effluent Instrumentation

Applicability: As shown in Table 3.5.7-1.

Objective: To provide instrumentation for radioactive gaseous releases.

Specification:

3.5.7.1 The radioactive gaseous effluent monitoring instrumentation shown in Table 3.5.7-1 shall be operable with their alarm/trip setpoints set to ensure that the limits of Specification 3.25.2.1 are not exceeded.

3.5.7.2 With a channel alarm/trip setpoint less conservative than required, declare the channel inoperable.

3.5.7.3 With less than the minimum number of channels operable, take the action shown in Table 3.5.7-1. Return the instruments to operable status within 30 days or, in lieu of any other report, explain in the next Semiannual Radioactive Effluent Release Report why the inoperability was not corrected.

3.5.7.4 Specifications 3.0.3, 3.0.4, and 6.12.3 are not applicable.

Bases:

The 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. The alarm/trip setpoints for these instruments shall be calculated in accordance with methods in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20.105.

Table 3.5.7-1

Radioactive Gas Effluent Monitoring Instrumentation

	Instrument	Operable	Applicability	Parameter	Action
1.	Waste Gas Holdup System				
	Noble gas activity monitor (provides alarm and automatic termination of release)	1	During releases via this pathway (DRVTP)	Radioactivity	A
	Effluent flow monitor	1	DRVTP	System flow	B
2.	Auxiliary Building Ventilation System				
	a) Noble gas activity monitor	1	DRVTP	Radioactivity	C
	b) Iodine sampler	1	DRVTP		D
	c) Particulate sampler	1	DRVTP		D
	d) Effluent flow monitor	1	DRVTP	System flow	B
	e) Sampler flow monitor	1	DRVTP	Sample flow	B
3.	Spent Fuel Pool Area Ventilation System		When the system is in operation		
	a) Noble gas activity monitor	1		Radioactivity	C
	b) Iodine sampler	1			D

Table 3.5.7-1 (Continued)
Radioactive Gaseous Effluent Monitoring Instrumentation

	Instrument	Operable	Applicability	Parameter	Action
c)	Particulate sampler	1			D
d)	Effluent flow monitor	1		System flow	B
e)	Sampler flow monitor	1		Sample flow	B
4.	Reactor Building Purge and Ventilation System		When the system is in the operation		
a)	Noble gas activity monitor	1		Radioactivity	C, E
b)	Iodine sampler	1			D
c)	Particulate sampler	1			D
d)	Effluent flow monitor	1		System flow	B
e)	Sampler flow monitor	1		Sample flow	B

Table 3.5.7-1 (Continued)

Table Notation

Action	Description
A.	With the number of channels operable less than required, the contents of the tank may be released to the environment provided that prior to initiating the release: 1. At least two independent samples of the tank's contents are analyzed, and 2. At least two technically qualified members of the facility staff independently verify the computer input data, and 3. At least 2 members of the facility staff independently verify the correct discharge valve lineup. Otherwise, suspend release of radioactive effluents via this pathway.
B.	With the number of channels operable less than required, effluent releases via this pathway may continue provided the flow rate is estimated at least once per 4 hours.
C.	With the number of channels operable less than required, effluent releases via this pathway may continue provided grab samples are taken at least once per 12 hours and these samples are analyzed for gross activity within 24 hours.
D.	With the number of channels operable less than required, effluent releases via the affected pathway may continue provided samples are continuously collected with auxiliary sampling equipment as required in Table 4.29-3.
E.	When purging the reactor building, immediately suspend purging if less than the required number of monitoring channels are operable. Purging may be resumed provided that prior to initiating the purge: 1. At least two independent samples of the reactor building atmosphere are analyzed, and 2. At least two technically qualified members of the facility staff independently verify the computer input data.

This page is reserved
for Section 3.24, Explosive Gas Mixture

3.25 RADIOACTIVE EFFLUENTS

3.25.1 Radioactive Liquid Effluents

3.25.1.1 Concentration

Applicability: At all times

Objective: To ensure that the limits of 10 CFR 20 are met.

Specifications:

3.25.1.1 A. The concentration of radioactive material released to the discharge canal shall be limited to the concentration 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 total concentration released shall be limited to 2×10^{-4} μCi/ml.

B. With the concentration of radioactive material released exceeding the above limits, immediately initiate action to restore concentration to within limits and provide notification to the Commission within 24 hours. In lieu of any other report, prepare and submit a special report within 30 days pursuant to specification 6.12.5.

C. Specifications 3.0.3, 3.0.4 and 6.12.3 are not applicable.

Bases:

This specification 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 10 CFR Part 20, Appendix B, Table II. This limitation provides additional assurance that the levels of radioactive materials in bodies of water outside the site will not result in exposures greater than the Section II A design objectives of Appendix I, 10 CFR Part 50, to a member of the public. The concentration limit for noble gases is based upon the assumption that Xe-133 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.

Radioactive Liquid Effluents

3.25.1.2 Dose

Applicability: At all times

Objective: To ensure that the dose limits of 10 CFR 50, Appendix I, Section IV A, are met.

Specifications:

3.25.1.2 A. The dose commitment to a member of the public from radioactive material in liquid effluents released from ANO-1 to the discharge canal shall be:

1) During any calendar quarter less than or equal to 1.5 mrem to the total body and less than or equal to 5 mrem to any organ, and

2) During any calendar year less than or equal to 3 mrem to the total body and less than or equal to 10 mrem to any organ.

B. With the calculated dose from the release of radioactive materials in liquid effluents exceeding any of the above limits, in lieu of any other report, prepare and submit a special report to the Commission within 30 days, pursuant to specification 6.12.5.

C. The provisions of specifications 3.0.3, 3.0.4, and 6.12.3 are not applicable.

Bases:

Specification 3.25.1.2 provides assurance that releases of liquid effluents will result in concentrations far below the limits of 10CFR20. The specification provides the required operating flexibility and at the same time assures that the release of radioactive material in liquid effluents will be kept "as low as reasonably achievable".

Radioactive Liquid Effluents

3.25.1.3 Waste Treatment

Applicability: At all times

Objective: To assure that the amount of radioactive material in liquid effluents will be "as low as reasonably achievable."

Specifications:

3.25.1.3 A. The appropriate parts of the liquid radwaste treatment system shall be used to reduce the radioactive materials in liquid waste prior to their discharge when it is projected that the cumulative dose during a calendar quarter due to liquid effluent releases would exceed 0.18 mrem to the total body or 0.625 mrem to any organ.

B. The provisions of this specification do not apply to the laundry tanks due to their incompatibility with the radwaste system.

C. With radioactive liquid waste being discharged without treatment and in excess of the above limits, in lieu of any other report, prepare and submit a special report to the Commission within 30 days per specification 6.12.5.

D. The provisions of Specifications 3.0.3, 3.0.4 and 6.12.3 are not applicable.

Bases:

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." 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 values of 0.18 mrem and 0.625 mrem are approximately 25% of the yearly design objectives on a quarterly basis. The yearly design objectives are given in 10 CFR 50, Appendix I, Section II.

3.25.1.4 Liquid Holdup Tanks

Applicability: At all times.

Objective: To ensure that the limits of 10 CFR 20 are not exceeded.

Specifications:

3.25.1.4 A. The quantity of radioactive material contained in each unprotected* outside temporary radioactive liquid storage tank shall be limited to less than or equal to 10 curies, excluding tritium and dissolved or entrained noble gases.

B. With the quantity of radioactive material exceeding the above limit, immediately suspend all additions of radioactive material to the affected tank and within 48 hours reduce the tank contents to within the limit.

C. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

Bases:

This specification is provided to ensure 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, at the nearest potable water supply and the nearest surface water supply in the unrestricted area.

*Tanks included in this specification are those outdoor temporary tanks that 1) are not surrounded by liners, dikes, or walls capable of holding the tank contents, and 2) do not have overflows and surrounding area drains connected to the liquid radwaste treatment system.

3.25.2 Radioactive Gaseous Effluents

3.25.2.1 Dose Rate

Applicability: At all times

Objective: To ensure that the dose rate in unrestricted areas from gaseous effluents will be within the limits of 10 CFR 20.

Specifications:

3.25.2.1 A. The dose rate in unrestricted areas (see Figure 5.1-1) due to radioactive materials released in gaseous effluents from the site shall be:

1) For noble gases: Less than or equal to 500 mrem/yr to the total body and less than or equal to 3000 mrem/yr to the skin.

2) For iodine-131, for tritium and for all radionuclides in particulate form with half lives greater than 8 days: Less than or equal to 1500 mrem/yr to any organ.

During periods of reactor building purging the dose rate may be averaged over a one hour interval.

B. With the dose rate(s) exceeding the above limits, without delay restore the release rate to within the above limit(s)

C. Specifications 3.0.3, 3.0.4 and 6.12.3 are not applicable.

Bases:

This specification is provided to ensure that, at any time, the dose rate due to gaseous effluents from all units on the site will be within the limits of 10 CFR 20 for unrestricted areas.

This specification applies to the release of gaseous effluents from all reactors at the site.

3.25.2.2 Dose - Noble Gases

Applicability: At all times

Objective: To ensure that the design objective doses of 10 CFR 50, Appendix I, Section IV A, are not exceeded.

Specifications:

3.25.2.2. A. The dose due to noble gases released in gaseous effluents from ANO-1 to unrestricted areas (see Figure 5.1-1) shall be:

1) During any calendar quarter, less than or equal to 5 mrads for gamma radiation and less than or equal to 10 mrads for beta radiation, and

2) During any calendar year, less than or equal to 10 mrads for gamma radiation and less than or equal to 20 mrads for beta radiation.

B. With the calculated dose from radioactive noble gases in gaseous effluents exceeding any of the above limits, in lieu of any other report, prepare and submit a special report to the Commission within 30 days, pursuant to Specification 6.12.5.

C. The provisions of Specifications 3.0.3, 3.0.4, and 6.12.3 are not applicable.

Bases:

Specification 3.25.2.2 implements the design guides specified in 10 CFR 50, Appendix I, Section II, and the limiting condition for operation as set forth in Section IV A of Appendix I.

The specifications provide the required operating flexibility and at the same time implement the guides set forth in Section IV A, Appendix I, to assure that the releases of radioactive material in gaseous effluents will be kept "as low as is reasonably achievable".

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, 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 exclusion area boundary, the occupancy of the individual will be sufficiently low to compensate for any increase in the atmospheric diffusion factor above that for the exclusion area boundary.

3.25.2.3 Dose - Iodine-131, Tritium, and Radionuclides in Particulate Form

Applicability: At all times

Objective: To ensure that the dose limits of 10 CFR 50, Appendix I, Section IV A, are met.

Specifications:

3.25.2.3 A. The dose to a member of the public from iodine-131, from tritium, and from all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released from ANO-1 to unrestricted areas (see Figure 5.1-1) shall be:

1) During any calendar quarter, less than or equal to 7.5 mrems to any organ, and

2) During any calendar year, less than or equal to 15 mrems to any organ.

B. With the calculated dose from the release of iodine-131, tritium, and radionuclides in particulate form with half-lives greater than 8 days, in gaseous effluents exceeding any of the above limits, in lieu of any other report, prepare and submit a special report to the Commission within 30 days, pursuant to Specification 6.12.5.

C. The provisions of Specifications 3.0.3, 3.0.4, and 6.12.3 are not applicable.

Bases:

Specification 3.25.2.3 implements the design guides set forth in 10 CFR 50, Appendix I, Section II C, and the limiting conditions for operation as set forth in Appendix I, Section IV A.

The specifications 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 reasonably achievable".

3.25.2.4 Gaseous Radwaste Treatment

Applicability: At all times

Objective: To assure that the amount of radioactive material in gaseous effluents is "as low as reasonably achievable."

Specifications:

3.25.2.4 A. Ventilation exhaust treatment systems shall be used to reduce radioactive materials in gaseous waste prior to discharge when the projected doses due to gaseous effluent releases from ANO-1 to unrestricted areas (see Figure 5.1-1) would exceed 0.625 mrad for gamma radiation and 1.25 mrad for beta radiation over a calendar quarter; or when the projected doses due to iodine-131, tritium, and radionuclides in particulate form with half-lives greater than 8 days would exceed 1.0 mrem to any organ over a calendar quarter.

B. When degasifying the reactor coolant system, the gaseous radwaste treatment system shall be utilized to process the degassing effluent to reduce the concentration of radioactive materials prior to discharge when the projected doses due to gaseous effluent releases from ANO-1 to unrestricted areas (see Figure 5.1-1) would exceed 0.625 mrad for gamma radiation and 1.25 mrad for beta radiation over a calendar quarter.

C. With gaseous waste being discharged without treatment and in excess of the above limits, in lieu of any other report, prepare and submit to the Commission within 30 days a special report, per Specification 6.12.5.

D. The provisions of Specification 3.0.3, 3.0.4 and 6.12.3 are not applicable.

Bases:

The requirement that the appropriate portions of these systems be used when specified provides reasonable assurance that the releases of radioactive materials in gaseous effluents will be kept "as low as reasonably achievable." 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. The values 0.625 mrad, 1.25 mrad, and 1.0 mrem are approximately 25% of the yearly design objectives on a quarterly basis. The yearly design objectives are given in Specifications 3.25.2.2 and 3.25.2.3.

3.25.2.5 Gas Storage Tanks

Applicability: At all times

Objective: To restrict the amount of activity in a radioactive gas holdup tank.

Specifications:

3.25.2.5 A. The quantity of radioactivity contained in each gas storage tank shall be limited to 300,000 curies noble gases (Xe-133 equivalent).

B. 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.

C. The provisions of Specification 3.0.3 and 3.0.4 are not applicable.

Bases:

The value of 300,000 curies is a suitable fraction of the quantity of radioactive material which if released over a 2-hour period, would result in a total body exposure to a member of the public at the exclusion area boundary of 500 mrem. This is consistent with Branch Technical Position ETSB 11-5 in NUREG-0800, July 1981.

3.25.3 Total Dose

Applicability: At all times

Objective: To ensure that the limits of 40 CFR 190 are not exceeded.

Specifications:

3.25.3.1 The calculated doses from the release of radioactive materials in liquid or gaseous effluents shall not exceed twice the limits of Specification 3.25.1.2, 3.25.2.2, or 3.25.2.3.

3.25.3.2 With the calculated doses exceeding the above limits, prepare and submit a Special Report pursuant to 10CFR Part 20.405C.

3.25.3.3 If the limits of 40CFR190 have been exceeded, obtain a variance from the Commission to permit further releases in excess of 40CFR190 limits. A variance is granted until staff action on the request is complete.

3.25.3.4 The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

Bases:

This specification is provided to meet the dose limitations of 40 CFR 190 that have now been incorporated into 10 CFR Part 20. 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. For sites containing up to 4 reactors, it is highly unlikely that the resultant dose to a member of the public will exceed the dose limits of 40 CFR 190 if the individual reactors remain within the reporting requirement level. The Special Report will describe a course of action that should result in the limitation of the annual dose to a member of the public to within the 40 CFR 190 limits. For the purposes of the Special Report, it may be assumed that the dose commitment to the member of the public from other uranium fuel cycle sources is negligible, with the exception that dose contributions from other nuclear fuel cycle facilities within a radius of 8 km must be considered. If the dose to any member of the public is estimated to exceed the requirements of 40 CFR 190, the Special Report with a request for a variance (provided the release conditions resulting in violation of 40 CFR 190 have not already been corrected), in accordance with the provisions of 40 CFR 190.11 and 10 CFR 20.405c, is considered to be a timely request and fulfills the requirements of 40 CFR 190 until NRC staff action is completed. The variance only relates to the limits of 40 CFR 190, and does not apply in any way to the other requirements for dose limitation of 10 CFR 20, as addressed in Specifications 3.25.1 and 3.25.2. An individual is not considered to be a member of the public during any period in which he/she is engaged in carrying out any operation that is part of the nuclear fuel cycle.

3.25.4 Solid Radioactive Waste

Applicability. At all times

Objective: To ensure solid radwaste is processed in accordance with the Process Control Program to meet shipping and burial ground requirements.

Specifications:

3.25.4.1 With the provisions of the Process Control Program not satisfied, suspend shipments of defectively processed or defectively packaged solid radioactive waste from the site.

3.25.4.2 The provisions of Specifications 3.0.3, 3.0.4 and 6.12.3.2.b are not applicable.

Bases: This specification implements the requirements of 10CFR50.36a and General Design Criterion 60 of Appendix A to 10CFR50.

This page is reserved for
Section 4.28, Explosive Gas Mixture

4.29 RADIOACTIVE EFFLUENTS

4.29.1 Radioactive Liquid Effluents

4.29.1.1 Concentration

Applicability: At all times

Objective: To ensure that the limits of Specification 3.25.1.1 are met.

Specifications:

4.29.1.1 A. Radioactive liquid wastes shall be sampled and analyzed according to the sampling and analyses program of Table 4.29-1.

B. The results of the radioactivity analyses shall be used in accordance with the ODCM to assure that the concentrations at point of release are maintained within the limits of Specification 3.25.1.1.

Bases:

This specification 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 10 CFR Part 20, Appendix B, Table II. This limitation provides additional assurance that the levels of radioactive materials in bodies of water outside the site will not result in exposures greater than the Section II A design objectives of Appendix I, 10 CFR Part 50, to an individual. The concentration limit for noble gases is based upon the assumption that Xe-133 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.

TABLE 4.29-1

RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSES PROGRAM

Liquid Release Type	Sampling Frequency	Minimum Analyses Frequency	Type of Activity Analyses	Lower Limit of Detection (LLD) (uCi/ml) (a)
A. Batch Waste Release (d)	P Each Batch	P Each Batch	Isotopic(e)	5×10^{-7} (b)
			I-131	1×10^{-6}
	P One Batch/M	M	Dissolved and Entrained Gases (Gamma Emitters)	1×10^{-5}
	P Each Batch	M Composite(c)	H-3	1×10^{-5}
			Gross Alpha	1×10^{-7}
	P Each Batch	Q Composite(c)	Sr-89, Sr-90	5×10^{-8}
			Fe-55	1×10^{-6}

TABLE 4.29-1 (Continued)

TABLE NOTATION

a. The Lower Limit of Detection (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 radio-chemical separation):

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

where

LLD is the lower limit of detection as defined above (as pCi per unit mass or volume)

s_b is the standard deviation of the background counting rate or of the counting rate of a blank sample (in 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

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

Typical values of E, V, Y, and Δt should be used in the calculation.

It should be recognized that the LLD is an a Priori (before the fact) limit representing the capability of a measurement system and not an a Posteriori (after the fact) limit for a particular measurement.

TABLE 4.29-1 (Continued)

TABLE NOTATION

b. For certain mixtures of gamma emitters, it may not be possible to measure radionuclides in concentrations near their sensitivity limits when other nuclides are present in the sample in much greater concentrations. Under these circumstances, it will be more appropriate to calculate the concentration of such radionuclides using observed ratios with those radionuclides which are measurable.

c. 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.

d. A batch release is the discharge of liquid wastes of a discrete volume. Prior to sampling, each batch shall be isolated and mixed to ensure representative sampling.

e. The principal gamma emitters for which the LLD specification will apply are exclusively the following radionuclides: Mn54, Fe59, Co58, Co60, Zn65, Mo99, Cs134, Cs137, Ce141, and Ce144. 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. 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 LLD's higher than required, the reasons shall be documented in the Semiannual Radioactive Effluent Release Report.

D Daily
P Prior to Release
M Monthly
Q Quarterly
R Every 18 months

4.29.1.2 Liquid Holdup Tanks

Applicability: At all times.

Objective: To ensure that the limits of 10 CFR 20 are not exceeded.

Specifications:

4.29.1.2 The quantity of radioactive material contained in an outside temporary radioactive liquid storage tank shall be determined to be within the limit of Specification 3.25.1.4 by analyzing a representative sample of the contents of the tank at least once per 7 days when radioactive materials are being added to the tank.

Bases:

This specification is provided to ensure 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, at the nearest potable water supply and the nearest surface water supply in the unrestricted area.

4.29.1.3 Liquid Radioactive Effluent Instrumentation

Applicability: Applies to the instrumentation in the liquid radwaste system that is used to limit the amount of radioactivity released to the environs.

Objective: To provide surveillance specifications for the instruments required in Specification 3.5.6.

Specifications:

4.29.1.3 Each radioactive liquid effluent monitoring instrumentation channel shall be demonstrated operable by performance of the channel check, source check, channel calibration, and channel test at the frequencies shown in Table 4.29-2.

Bases:

To ensure that the instrumentation for the liquid radwaste system is operable.

The channel test demonstrates that automatic isolation of this pathway and control room alarm annunciation occur if the instrument indicates measured levels above the trip setpoint. The channel test also demonstrates that alarm annunciation occurs if any of the following conditions exist:

1. Power to the detector is lost.
2. The instrument indicates a downscale failure.
3. Instrument controls are not set in the operate mode.

The initial channel calibration is performed using one or more of the reference standards certified by the National Bureau of Standards or using standards that have been obtained from suppliers that participate in measurement assurance activities with NBS. These standards permit calibrating the system over its intended range of energy and measurement range. For subsequent channel calibration, sources that have been related to the initial calibration are used.

Table 4.29-2

Radioactive Liquid Effluent Monitoring Instrumentation Surveillance Requirement

Instrument	Channel Check	Source Check	Channel Calibration	Channel Test
Liquid radwaste effluent line				
Radiation monitor (automatic termination)	D*	P**	R	Q
Flow monitor	D*	NA	R	NA

Notation

*During releases via this pathway

**A check source is not required if the background activity is greater than the activity of the check source.

D Daily
P Prior to release
M Monthly
Q Quarterly
R Every 18 months

4.29.2 Radioactive Gaseous Effluents

4.29.2.1 Dose Rate

Applicability: At all times

Objective: To ensure that the dose rate, at any time, in unrestricted areas from gaseous effluents will be within the dose limits of 10 CFR 20.

Specifications:

4.29.2.1 A. The dose rate, due to noble gases in gaseous effluents shall be determined in accordance with the ODCM to be within the limits of Specification 3.25.2.1.

B. The dose rate in unrestricted areas, due to iodine-131, tritium, and all radionuclides in particulate form with half-lives greater than 8 days released in gaseous effluents, shall be determined in accordance with the ODCM to be within the required limits by using the results of the sampling and analyses program, specified in Table 4.29-3.

Bases:

This specification provides for sampling and analyses to ensure that Specification 3.25.2.1 is met.

TABLE 4.29-3

RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSES PROGRAM

Gaseous Release Type	Sampling Frequency	Minimum Analyses Frequency	Type of Activity Analyses	Lower Limit of Detection (LLD) (uCi/ml) (a)
A. Waste Gas Storage Tank	P Each Tank Grab Sample	P Each Tank	Principal Gamma Emitters (b)	1×10^{-4} (g)
B. Reactor Bldg. Purge	P Each Purge Grab Sample	P Each Purge	Principal Gamma Emitters (b) H-3	1×10^{-4} (g) 1×10^{-6}
C. Unit Vents (Auxiliary Bldg.) (Spent Fuel Pool Area Ventilation) (Rx Bldg. Ventilation)	M (c) (d) Grab Sample	M	Principal Gamma Emitters (b) H-3	1×10^{-4} (g) 1×10^{-6}
	Continuous (e)	W (f) Charcoal Sample	I-131	1×10^{-12}
	Continuous (e)	W (f) Particulate Sample	Principal Gamma Emitters (b) (I-131, Others)	1×10^{-11}
	Continuous (e)	M Particulate Sample	Gross Alpha	1×10^{-11}
	Continuous (e)	Q Composite Particulate Sample	Sr-89, Sr-90	1×10^{-11}
	Continuous (e)	Noble Gas Monitor	Noble Gases Gross Beta or Gamma	1×10^{-6} (Xe-133 equiv.)

TABLE 4.29-3 (Continued)

TABLE NOTATION

a. See definition in Table 4.29-1, Table Notation.

b. 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. 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 required, the reasons shall be documented in the semiannual effluent report.

c. Tritium grab samples shall be taken from the Reactor Building ventilation exhaust at least once per 24 hours when the refueling canal is flooded.

d. Tritium grab samples shall be taken at least once per 7 days from the ventilation exhaust from the spent fuel area, whenever spent fuel is in the spent fuel pool.

e. The ratio of the sample flow rate to the sampled stream flow rate shall be known for the time period covered by each dose or dose rate calculation made in accordance with Specification 3.25.2.1, 3.25.2.2, and 3.25.2.3.

f. Samples shall be changed at least once per 7 days and analyses shall be completed within 48 hours after changing (or after removal from the sampler).

g. For certain radionuclides with low gamma yield or low energies, or for certain radionuclide mixtures, it may not be possible to measure radionuclides in concentrations near the LLD. Under these circumstances, the LLD may be increased inversely proportional to the magnitude of the gamma yeld (i.e., (1E-4/I), where I is the photon abundance expressed as a decimal fraction), but in no case shall the LLD, as calculated in this manner for a specific radionuclide, be greater than 10% of the MPC value specified in 10 CFR 20, Appendix B, Table II, Column 1.

D	Daily
P	Prior to Release
W	Weekly
M	Monthly
Q	Quarterly
R	Every 18 months

Radioactive Gaseous Effluents

4.29.2.2 Gas Storage Tanks

Applicability: At all times

Objective: To ensure meeting the requirements of Specification 3.25.2.5.

Specifications:

4.29.2.2 The quantity of radioactive material contained in each gas storage tank shall be determined to be within the limits of Specification 3.25.2.5 at least once per 24 hours when radioactive materials are being added to the tank and the reactor coolant activity exceeds the limits of Specification 3.1.4.1.b.

Bases:

This specification is provided so that the requirements of Specification 3.25.2.5 are met.

4.29.2.3 Radioactive Gaseous Effluent Monitoring Instrumentation

Applicability: Applies to the instrumentation in the gaseous radwaste system that is used to limit the amount of activity released to the environs.

Objective: To provide surveillance specifications for the instruments listed in Specification 3.5.7.

Specifications:

4.29.2.3 Each radioactive gaseous effluent monitoring instrumentation channel shall be demonstrated operable by performance of the channel check, source check, channel calibration, and channel test at the frequencies shown in Table 4.29-4.

Bases:

To ensure that the instrumentation for the gaseous radwaste system is operable.

The channel test demonstrates that control room alarm annunciation occurs if any of the following conditions exist:

1. The instrument indicates measured levels above the alarm/trip setpoint.
2. Power to the detector is lost.
3. The instrument indicates a downscale failure.
4. Instrument controls are not set in the operate mode.

For the waste gas holdup system noble gas activity monitor, the channel test also demonstrates that automatic isolation of the release pathway occurs if the instrument indicates above the trip setpoint.

The initial channel calibration is performed using one or more of the reference standards certified by the National Bureau of Standards or using standards that have been obtained from suppliers that participate in measurement assurance activities with NBS. These standards permit calibrating the system over its intended range of energy and measurement range. For subsequent channel calibration, sources that have been related to the initial calibration are used.

Table 4.29-4

Radioactive Gaseous Effluent Monitoring Instrumentation Surveillance Requirements

Instrument	Channel Check	Source** Check	Channel Calibration	Channel Functional Test
1. Waste Gas Holdup System				
a. Noble Gas Activity monitor (provides automatic termination of release	D*	P	R	Q
b. Effluent Flow Monitor	D*	N/A	R	N/A
2. Auxiliary Building Ventilation System				
a. Noble Gas Activity Monitor	D*	M	R	Q
b. Effluent Flow Monitor	D*	N/A	R	N/A
c. Sampler Flow Monitor	D*	N/A	R	N/A
d. Iodine Sampler Cartridge	W*(1)	N/A	N/A	N/A
e. Particulate Sampler Filter	W*(1)	N/A	N/A	N/A

Table 4.29-4 (Continued)

Radioactive Gaseous Effluent Monitoring Instrumentation Surveillance Requirements

Instrument	Channel Check	Source** Check	Channel Calibration	Channel Functional Test
3. Spent Fuel Pool Area Ventilation System				
a. Noble Gas Activity Monitor	D*	M	R	Q
b. Effluent Flow Monitor	D*	N/A	R	N/A
c. Sampler Flow Monitor	D*	N/A	R	N/A
d. Iodine Sampler Filter	W*(1)	N/A	N/A	N/A
e. Particulate Sampler Filter	W*(1)	N/A	N/A	N/A
4. Reactor Building Purge System				
a. Noble Gas Activity Monitor	D*	M	R	P
b. Effluent Flow Monitor	D*	N/A	R	N/A
c. Sampler Flow Monitor	D*	N/A	R	N/A
d. Iodine Sampler Filter	W*(1)	N/A	N/A	N/A
e. Particulate Sampler Filter	W*(1)	N/A	N/A	N/A

Table 4.29-4 (Continued)

Table Notation

*During releases via this pathway.
**A check source is not required if the background activity is greater than the activity of the check source.

P	Prior to release
W	Weekly
D	Daily
M	Monthly
Q	Quarterly
R	Once per 18 months
NA	Not applicable
(1)	Verify presence of cartridge or filter only.

4.29.3 Dose Calculations for Radioactive Effluents

Applicability: At all times

Objective: To ensure that the requirements of 10CFR50, Appendix I, Section IIIA are met.

Specifications:

4.29.3 Cumulative dose contributions and dose projections for liquid effluents and for gaseous effluents shall be determined in accordance with the Offsite Dose Calculation Manual at least once per 31 days.

Bases:

These calculations provide the dose values to be compared to the limits of Specifications 3.25.1.2, 3.25.1.3, 3.25.2.2, 3.25.2.3, 3.25.2.4 and 3.25.3.

4.29.4 Solid Radioactive Waste

Applicability: At all times

Objective: To ensure solid radioactive waste is processed in accordance with the Process Control Program to meet shipping and burial ground requirements.

Specification:

4.29.4 Proper solidification of wet radioactive waste shall be verified in accordance with the surveillance requirements of the Process Control Program.

Bases: This specification provides for surveillance of radioactive waste solidification processes to ensure compliance with Specification 3.25.4.

4.30 RADIOLOGICAL ENVIRONMENTAL MONITORING

4.30.1 Radiological Environmental Monitoring Program Description

Applicability: Applies at all times.

Objective: To provide information on the radiological effects of station operation on the environment.

Specifications:

4.30.1.1 The radiological environmental monitoring samples shall be collected pursuant to Table 4.30-1 and shall be analyzed pursuant to the requirements of Tables 4.30-1 and 4.30-2. The sample locations shall be shown in Table 4-1 in the ODCM.

4.30.1.2

a. With the radiological environmental monitoring program not being conducted as specified in Table 4.30-1, prepare and submit to the Commission in the Annual Radiological Environmental Report a description of the reasons for not conducting the program as required and the plans for preventing a recurrence. (Deviations are permitted from the required sampling schedule if specimens are not obtainable due to hazardous conditions, seasonal unavailability, or to malfunction of sampling equipment. If the latter, every effort shall be made to complete corrective action prior to the end of the next sampling period).

b. With the level of radioactivity as the result of plant effluents in an environmental sampling medium at one or more of the locations specified in Table 4.30-1 exceeding the limits of Table 4.30-3 when averaged over any calendar quarter, prepare and submit to the Commission, within 30 days from the end of the affected quarter, a report which includes an evaluation of any release conditions, environmental factors or other aspects which caused the limits of Table 4.30-3 to be exceeded, and defines the actions taken to reduce radioactive effluents so that the potential annual dose to a member of the public is less than the calendar year limits of Specifications 3.25.1.2 and 3.25.2.2. When more than one of the radionuclides in Table 4.30-3 are detected in the sampling medium, this report shall be submitted if:

$$\frac{\text{Concentration (1)}}{\text{reporting level (1)}} + \frac{\text{Concentration (2)}}{\text{reporting level (2)}} + \ldots \geq 1.0$$

When radionuclides other than those in Table 4.30-3 are detected and are the result of plant effluents, this report shall be submitted if the potential annual dose to a member of the public is equal to or

greater than the calendar year limits of Specifications 3.25.1.2 and 3.25.2.2. 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 Report.

c. With milk or fresh leafy vegetable samples unavailable from any of the sample locations required by Table 4.29-1, identify locations for obtaining replacement samples and add them to the radiological environmental monitoring program within 30 days. The specific locations from which samples were unavailable may then be deleted from the monitoring program. Identify the causes of the unavailability of samples and identify the new location(s) for obtaining replacement samples in the next Semiannual Radioactive Effluent Release Report and also include in the report a revised table for the ODCM reflecting the new location(s).

d. The provisions of Specifications 3.0.3, 3.0.4, and 6.12.3 are not applicable.

4.30.1.3 The results of analyses performed on the radiological environmental monitoring samples shall be summarized in the Annual Radiological Environmental Report.

Bases:

The radiological monitoring program required by this specification provides measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides which lead to the highest potential radiation exposures of individuals resulting from the station operation. This monitoring program thereby supplements the radiological effluents monitoring program 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 initially specified monitoring program will be effective for at least the first three years of commercial operation. Following this period, program changes may be initiated based on operational experience.

The detection capabilities required by Table 4.30-2 are state-of-the-art for routine environmental measurements in industrial laboratories. The LLD's for drinking water meet the requirements of 40 CFR 141.

TABLE 4.30-1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Number of Sample Locations*	Sampling and Collection Frequency	Type of Frequency of Analyses
1. AIRBORNE			
a. Radioiodine and Particulates	5 Locations	Continuous operation of sampler with sample collection as required by dust loading but at least once per 7 days.	Radioiodine canister. Analyze at least once per 7 days for I-131. Particulate sampler. Analyze for gross beta radioactivity > 24 hours following filter change. Perform gamma isotopic analysis on each sample when gross beta activity is > 10 times the mean of control sample. Perform gamma isotopic analysis on composite (by location) sample at least once every 92 days.
2. DIRECT RADIATION	40 Locations 2 dosimeter per location	At least once per 92 days.	Gamma dose. At least once per 92 days.

*Sample locations are shown in the Offsite Dose Calculation Manual (ODCM).

TABLE 4.30-1 (Continued)

Exposure Pathway and/or Sample	Number of Sample Locations*	Sampling and Collection Frequency	Type of Frequency of Analyses
3. WATERBORNE			
a. Surface	2 Locations	Composite** sample collected over a period ≤ 31 days.	Gamma isotopic analysis of each sample by location. Tritium analysis of composite sample at least once every 92 days.
b. Ground	2 Locations	At least once per 92 days.	Gamma isotopic and tritium analyses of each sample.
c. Drinking	1 Location	Monthly grab sample	I-131 analysis of each sample; and Gross beta and gamma isotopic analyses of each sample. Tritium analysis of composite sample at least once every 92 days.
d. Sediment from Shoreline	2 Locations	At least once per 184 days	Gamma isotopic analysis of each sample

*Sample locations are shown in the ODCM.
**Composite samples shall be collected by an aliquot at intervals not exceeding 24 hours.

TABLE 4.30-1 (Continued)

Exposure Pathway and/or Sample	Number of Sample Locations*	Sampling and Collection Frequency	Type of Frequency of Analyses
4. INGESTION			
a. Milk	4 Locations	At least once per 31 days when animals are on pasture.	Gamma isotopic and I-131 analyses of each sample.
b. Fish	2 Locations	One sample in season, or at least once per 184 days if not seasonal. One sample of each of the following species: 1. Catfish 2. Crappie or Bass	Gamma isotopic analysis on edible portions.
c. Food Products**	3 Locations	At time of harvest. One sample of each of the following classes of food products: 1. Fruits 2. Flowering Vegetable 3. Tubular Vegetable	Gamma isotopic analysis on edible portions.
	1 Location	At time of harvest. One sample of broad leaf vegetation.	I-131 analysis.

*Sample locations are shown in the ODCM.
**If these food products are available.

TABLE 4.30-2

MAXIMUM VALUES OF THE LOWER LIMITS OF DETECTION (LLD[(a)])

Analyses	Water (pCi/l)	Airborne Particulate or Gas (pCi/m³)	Fish (pCi/kg,wet)	Milk (pCi/l)	Food Products (pCi/kg,wet)	Sediment (pCi/kg,dry)
gross beta	4[(b)]	1×10^{-2}				
^{3}H	(1000[(b)])					
^{54}Mn	15		130			
^{59}Fe	30		260			
$^{58,60}Co$	15		130			
^{65}Zn	30		260			
^{95}Zr-Nb	15					
^{131}I	1*[(b)]	7×10^{-2}		1	60[(c)]	
$^{134,137}Cs$	15(10[(b)]),18	1×10^{-2}	130,150	15,18	60,80	150,180
^{140}Ba-La	15			15		

*For Monthly grab samples

(a) See definition of LLD in table notation of Table 4.29-1.
(b) LLD for drinking water
(c) LLD for leafy vegetables.

TABLE 4.30-3

REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

Analyses	Water (pCi/l)	Airborne Particulate or Gases (pCi/m^3)	Fish (pCi/kg,wet)	Milk (pCi/l)	Food Products (pCi/kg,wet)
H-3	3×10^4(a)				
Mn-54	1×10^3		3×10^4		
Fe-59	4×10^2		1×10^4		
Co-58	1×10^3		3×10^4		
Co-60	3×10^2		1×10^4		
Zn-65	3×10^2		2×10^4		
Zr-Nb-95	4×10^2(b)				
I-131	2	0.9		3	1×10^2
Cs-134	30	10	1×10^3	60	1×10^3
CS-137	50	20	2×10^3	70	2×10^3
Ba-La-140	2×10^2(b)			3×10^2(b)	

(a) For drinking water samples
(b) Total for parent and daughter

4.30.2 Land Use Census

Applicability: Applies at all times.

Objectives: This specification will identify changes in use of the unrestricted areas.

Specifications:

4.30.2.1 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 from the ANO-1 reactor building.

4.30.2.2 The land use census shall be conducted at least once per 12 months between the dates of June 1 and October 1, by door-to-door survey, aerial survey, or by consulting local agricultural authorities.

4.30.2.3. a. With a land use census identifying a location(s) which yields a calculated dose commitment due to I-131, tritium, and radionuclides in particulate form greater than the values currently being calculated in Unit 1 Specification 4.29.3 and Unit 2 Specification 4.11.2.3, submit location description in the Semiannual Radioactive Effluent Release Report per Specification 6.12.2.6.

b. With a land use census identifying a location(s) which yields a calculated dose commitment (via the same exposure pathway) greater than at a location from which samples are currently being obtained in accordance with Specification 4.30.1.1, identify the new location in the Semiannual Radioactive Effluent Release Report per Specification 6.12.2.6. The new location shall be added to the radiological environmental monitoring program within 30 days, if possible. The sampling location having the lowest calculated dose commitment (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.

4.30.2.4 The results of the land use census shall be included in the Annual Radiological Environmental Report.

4.30.2.5 The provisions of Specifications 3.0.3, 3.0.4 and 6.12.3 are not applicable.

*Broad Leaf vegetation sampling may be performed at the site boundary in the direction sector with the highest D/Q in lieu of the garden census.

Bases:

This specification is provided to ensure that changes in the use of unrestricted areas are identified and that modifications to the monitoring program are made if required by the results of this census. 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 pathway via leafy vegetables will be identified and monitored since a garden of this size is the minimum required to produce the quantity (26kg/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.

4.30.3 Interlaboratory Comparison Program

Applicability: Applies to the off-site radiochemistry laboratory

Objective: To provide independent checks on the accuracy of the measurements of radioactive material in environmental samples.

Specifications:

4.30.3.1 Analyses shall be performed on radioactive materials supplied as part of Interlaboratory Comparison Program which has been approved by NRC.

4.30.3.2 With analyses not being performed as required above, report the corrective actions taken to prevent a recurrence to the Commission in the Annual Radiological Environmental Report.

4.30.3.3 The results of analyses performed as part of the above required Interlaboratory Comparison Program shall be included in the Annual Radiological Environmental Report pursuant to Specification 6.12.2.5.

4.30.3.4 The provisions of Specifications 3.0.3, 3.0.4 and 6.12.3 are not applicable.

Bases:

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 part of a quality assurance program for environmental monitoring in order to demonstrate that the results are reasonably valid.

5 DESIGN FEATURES

Specifications for design features are intended to cover characteristics of importance to each of the physical barriers, and to the maintenance of safety margins in the design.

5.1 SITE

Applicability

Applies to the location and extent of the exclusion area.

Objective

To define the location and the size of the site area as pertains to safety.

Specification

Arkansas Nuclear One-Unit 1 is located on a site consisting of approximately 1100 acres which provides for 0.65 statute mile exclusion radius from the reactor building. This exclusion area includes certain portions of the bed and banks of the Dardanelle Reservoir which are owned by the Federal Government. An easement authorizes AP&L to exclude all persons from these areas during periods of emergency. The site is approximately 6 statute miles WNW from the City of Russellville (Latitude 35°-18'-36" N, Longitude 93°-13'-53"W) in an area characterized by remoteness from population centers.

REFERENCES

FSAR, Section 2.2

FIGURE 5.1-1

MAXIMUM AREA BOUNDARY FOR RADIOACTIVE RELEASE CALCULATION
(EXCLUSION AREAS)

(Gases - 1046 Meter Radius)
(Liquids - End of Discharge Canal (Point A))

5.2 REACTOR BUILDING

Applicability

Applies to those design features of the reactor building relating to operational and public safety.

Objective

To define the significant design features of the reactor building structure, reactor building isolation system, and penetration room ventilation system.

Specification

5.2.1 Reactor Building Structure

The reactor building completely encloses the reactor and the associated reactor coolant system. It is a fully continuous reinforced concrete structure in the shape of a cylinder with a shallow domed roof and a flat foundation slab. The cylindrical portion is prestressed by a post tensioning system consisting of horizontal and vertical tendons. The dome has a three-way post tensioning system. The foundation slab is conventionally reinforced with high strength reinforcing steel. The entire structure is lined with 1/4" welded steel plate to provide vapor tightness.

The internal volume of the reactor building is approximately 1.91×10^6 cu. ft. The approximate inside dimensions are: diameter--116'; height--207'. The approximate thickness of the concrete forming the buildings are: cylindrical wall--3 3/4'; dome--3 1/4'; and the foundation slab--9'.

The concrete reactor building structure provides adequate shielding for both normal operation and accident situations. Design pressure and temperature are 59 psig and 286 F, respectively.

The reactor building is designed for an external atmospheric pressure of 3.0 psi greater than the internal pressure. This corresponds to a margin of 0.5 psi above the differential pressure that could be developed if the building is sealed with an internal temperature of 110 F and it is subsequently cooled to an internal temperature of less than 50 F. Since the building is designed for this pressure differential, vacuum breakers are not required.

The principal design basis for the structure is that it be capable of withstanding the internal pressure resulting from a loss of coolant accident, as defined in FSAR Section 14 with no loss of integrity. In this event the total energy contained in the water of the reactor coolant system is

g. Review of facility operations to detect potential nuclear safety hazards.

h. Performance of special reviews, investigations and reports thereon as requested by the ANO General Manager.

i. Review of the Plant Security Plan and implementing procedures and shall submit recommended changes to the ANO General Manager.

j. Review of the Emergency Plan and implementing procedures and shall submit recommended changes to the ANO General Manager.

k. Review of all changes to the Offsite Dose Calculation Manual and the Process Control Program.

AUTHORITY

6.5.1.7.1 The Plant Safety Committee shall:

a. Recommend to the ANO General Manager written approval or disapproval of items considered under 6.5.1.6(a) through (d) above.

b. Render determinations in writing with regard to whether or not each item considered under 6.5.1.6(a) through (e) above constitutes an unreviewed safety question.

c. Provide written notification within 24 hours to the Assistant Vice-President, Nuclear Operations and the Safety Review Committee of disagreement between the PSC and the ANO General Manager: however, the ANO General Manager shall have responsibility for resolution of such disagreements pursuant to 6.1.1 above.

RECORDS

6.5.1.8 The Plant Safety Committee shall maintain written minutes of each PSC meeting that, at a minimum, document the results of all PSC activities performed under the responsibility and authority provisions of these technical specifications. Copies shall be provided to the ANO General Manager and Chairman of the Safety Review Committee.

6.5.2 Safety Review Committee (SRC)

FUNCTION

6.5.2.1 The Safety Review Committee shall function to provide independent review and audit of designated activities in the areas of:

a. nuclear power plant operations
b. nuclear engineering
c. chemistry and radiochemistry

REVIEW

6.5.2.7 The SRC shall review:

a. The safety evaluations for 1) changes to procedures, equipment or systems and 2) tests or experiments completed under the provision of Section 50.59, 10 CFR, to verify that such actions did not constitute an unreviewed safety question.

b. Proposed changes to procedures, equipment or systems which involve an unreviewed safety question as defined in Section 50.59, 10 CFR.

c. Proposed tests or experiments which involve an unreviewed safety question as defined in Section 50.59, 10 CFR.

d. Proposed changes in Technical Specifications or licenses.

e. Violations of applicable statutes, codes, regulations, orders, Technical Specifications, license requirements, or of internal procedures or instructions having nuclear safety significance.

f. Significant operating abnormalities or deviation from normal and expected performance of unit equipment that affect nuclear safety.

g. Events requiring 24-hour notification to the Commission.

h. All recognized indications of an unanticipated deficiency in some aspects of design or operation of structures, systems, or components that could affect nuclear safety.

i. Reports and meeting minutes of the Plant Safety Committee.

j. Changes to the ODCM and PCP.

AUDITS

6.5.2.8 Audits of facility activities shall be performed under the cognizance of the SRC. These audits shall encompass:

a. The conformance of facility operation to provisions contained within the Technical Specifications and applicable license conditions at least once per year.

b. The performance and retraining of all members of the plant management and operations staff, and the performance, training, and qualifications of new members of the entire plant staff at least once per year.

c. The results of all actions taken to correct deficiencies occurring in facility equipment, structures, systems or method of operation that affect nuclear safety at least once per six months.

d. The Facility Emergency Plan and implementing procedures at least once per 12 months.

e. The Facility Fire Protection Program and implementing procedures at least once per 24 months.

f. The Facility Security Plan and implementing procedures at least once per 12 months.

g. Any other area of facility operation considered appropriate by the SRC or the Vice President, Nuclear Operations.

h. An independent fire protection and loss prevention program inspection and audit shall be performed at least once per 12 months utilizing either qualified off-site licensee personnel or an outside fire protection firm.

i. The radiological environmental monitoring program and the results thereof at least once per 12 months.

j. The Offsite Dose Calculation Manual and Process Control Program and implementing procedures at least once per 24 months.

k. The performance of activities required by the Operational Quality Assurance Program to meet the criteria of 10 CFR 50 Appendix "B", at least once per 24 months.

AUTHORITY

6.5.2.9 The SRC shall report to and advise the Vice President, Nuclear Operations on those areas of responsibility specified in Sections 6.5.2.7 and 6.5.2.8.

RECORDS

6.5.2.10 Records of SRC activites shall be prepared, approved and distributed as indicated below:

a. Minutes of each SRC meeting shall be prepared, approved and forwarded to the Vice President, Nuclear Operations, within 14 days following each meeting.

b. Reports of reviews encompassed by Section 6.5.2.7 above, shall be prepared, approved and forwarded to the Vice President, Nuclear Operations, within 14 days following completion of the review.

c. Audit reports encompassed by Section 6.5.2.8 above shall be forwarded to the Vice President, Nuclear Operations, and to the management positions responsible for the areas audited within 30 days after completion of the audit.

a. The facility shall be placed in at least hot shutdown within one hour.

b. The Nuclear Regulatory Commission shall be notified and a report submitted pursuant to the requirements of 10 CFR 50.36 and Specification 6.12.3.1.

6.8 PROCEDURES

6.8.1 Written procedures shall be established, implemented and maintained covering the activities referenced below.

a. The applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, November, 1972.

b. Refueling operations.

c. Surveillance and test activities of safety related equipment.

d. Security Plan implementation.

e. Emergency Plan implementation.

f. Fire Protection Program implementation.

g. New and spent fuel storage

h. Offsite Dose Calculation Manual and Process Control Program implementation at the site.

6.8.2 Each procedure of 6.8.1 above, and changes thereto, shall be reviewed by the PSC and approved by the ANO General Manager prior to implementation and reviewed periodically as set forth in administrative procedures.

6.8.3 Temporary changes to procedures of 6.8.1 above may be made provided:

a. The intent of the original procedure is not altered.

b. The change is approved by two members of the plant staff, at least one of whom holds a Senior Reactor Operator's License on the unit affected.

c. The change is documented, reviewed by the PSC and approved by the ANO General Manager within 14 days of implementation.

h. Records of in-service inspections performed pursuant to these Technical Specifications.

i. Records of Quality Assurance activities required by Section 17 of the Quality Assurance Manual for Operations.

j. Records of reviews performed for changes made to procedures or equipment or reviews of tests and experiments pursuant to 10CFR50.59.

k. Records of meetings of the PSC and the SRC.

l. Records for Environmental Qualification which are covered under the provisions of paragraph 6.13.

m. Records of the service lives of the seals of all hydraulic snubbers listed on Table 3.16-1 including the date at which the service life commences and associated installation and maintenance records.

n. Records of the analyses required by the Radiological Environmental Monitoring Program.

6.10 RADIATION PROTECTION PROGRAM

Procedures for personnel radiation protection shall be prepared consistent with the requirements of 10CFR Part 20 and shall be approved, maintained and adhered to for all operations involving personnel radiation exposure.

6.11 HIGH RADIATION AREA

6.11.1 In lieu of the "control device" or "alarm signal" required by paragraph 20.203(c)(2) of 10CFR20, each high radiation area (as defined in 20.202(b)(3) of 10CFR20) in which the intensity of radiation is 1000 mrem/hr or less shall be barricaded and conspicuously posted as a high radiation area and shall be controlled by requiring the issuance of a radiation work permit. Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

a. A radiation monitoring device which continuously indicates the radiation dose rate in the area.

b. A radiation monitoring device which continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate level in the area has been established and personnel have been made knowledgeable of them.

c. An individual qualified in radiation protection procedures who is equipped with a radiation dose rate monitoring device. This individual shall be responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified in the radiation work permit.

The dose assignments 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.

6.12.2.3 Monthly Operating Report

Routine reports of operating statistics which include:

(1) Average Daily Unit Power Level
(2) Operating Data Report
(3) Unit Shutdowns and Power Reductions
(4) Narrative Summary of Operating Experience

shall be submitted on a monthly basis to the Director, Office of Management and Program Analysis, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, with a copy to the appropriate Regional Office by the fifteenth of each month following the calendar month covered by the report.

6.12.2.4 Annual Report

All challenges to the pressurizer electromatic relief valve (ERV) and pressurizer safety valves shall be reported annually.

6.12.2.5 Annual Radiological Environmental Report+

(a) Routine radiological environmental reports covering the operation of the unit during the previous calendar year shall be submitted prior to May 1 of each year.

(b) The annual radiological environmental reports shall include summaries, interpretations, and statistical evaluation 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 impact of the plant operation on the environment. The report shall also include the results of the land use census required by Specification 4.30.2. 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.

+A single submittal may be made for ANO-1 and ANO-2. The submittal should combine those sections that are common to both units at the station.

The annual radiological environmental reports shall include summarized and tabulated results 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.

The report shall also include the following: a summary description of the radiological environmental monitoring program including sampling methods for each sample type, size and physical characteristics of each sample type, sample preparation methods, analytical methods, and measuring equipment used; a map of all sampling locations keyed to a table giving distances and directions from one reactor; the result of Land Use Census required by the Specification 4.30.2, and the results of licensee participation in the Interlaboratory Comparison Program required by Specification 4.30.3.

6.12.2.6 Semiannual Radioactive Effluent Release Report**

(a) Routine radioactive effluent release reports covering the operation of the unit during the previous 6 months of operation shall be submitted within 60 days after January 1 and July 1 of each year.

(b) The radioactive effluent release reports shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste release from the unit. The data will be summarized on a quarterly basis following the format of Regulatory Guide 1.21, Rev. 0, Appendix A.

(c) The radioactive effluent release report shall include the following information for all unplanned releases to unrestricted areas of radioactive material in gaseous and liquid effluents:

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.

(d) This report shall contain a description of any changes to the ODCM and PCP made during the period of the report.

**A single submittal may be made for ANO-1 and ANO-2.

(e) The first report filed each year shall contain:

1. A summary of the hourly meteorological data collected over the previous calendar year. In lieu of including this summary in the report, the data may be retained by the Licensee for NRC review and noted as such in the report.

2. A summary of radiation doses due to radiological effluents during the previous calendar year calculated in accordance with the methodology specified in the OFFSITE DOSE CALCULATION MANUAL.

3. The radiation dose to members of the public due to their activities inside the site boundary. This calculated dose shall include only those dose contributions directly attributed to operation of the unit and shall be compared to the limits specified in 40CFR190.

(f) The first report filed each year shall include a description of licensee initiated major changes to the radioactive waste systems (liquid, gaseous and solid) during the previous calendar year.***

***This information may be included in the annual FSAR update in lieu of inclusion in this report.

6.12.3 Reportable Occurrences

Reportable occurrences, including corrective actions and measures to prevent recurrence, shall be reported to the NRC as required below. 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.

6.12.3.1 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 Regional Office, or his designate no later than the first working day following the event, with a written followup report within two weeks. A copy of the confirmation and a written followup report shall also be sent to the Director, Office of Management and Program Analysis, USNRC. The written 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 (e), (f), or 6.12.3.2(a).

(d) Abnormal degradation of systems other than those specified in item 6.12.3.1(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 during any one hour period of 1) more than 1 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.

6.12.5 Special Report

Special reports shall be submitted to the Administrator of the appropriate Regional Office within the time period specified for each report. These reports shall be submitted covering the activities identified in the applicable reference specification.

a. Radioactive Liquid Effluents, Specification 3.25.1.

b. Radioactive Gaseous Effluents, Specifications 3.25.2.

This report shall include:

1) a description of the occurrence,

2) the cause(s) for exceeding the limit(s),

3) corrective action taken to mitigate the consequences of the occurrence,

4) action taken to prevent recurrence, and

5) a summary of the consequences of the occurrence.

6.14 OFFSITE DOSE CALCULATION MANUAL (ODCM)

6.14.1 The ODCM shall describe the methodology and parameters to be used in the calculation of offsite doses due to radioactive gaseous and liquid effluents and in the calculation of gaseous and liquid effluent monitoring instrumentation alarm/trip setpoints consistent with the applicable LCO's contained in these Technical Specifications.

6.14.2 Any change to the ODCM made by the licensee shall:

1. be reviewed and found acceptable by the PSC and SRC,*

2. be submitted to the Commission** by inclusion in the Semiannual Radioactive Effluent Release Report (Specification 6.12.2.6) for the period during which the change was made effective,

3. become effective upon a date specified and agreed to by both the PSC and SRC following their review and acceptance of the change.

*Changes to the locations of environmental sampling stations, required by Specification 4.30.1, shall not require review by the PSC and SRC prior to implementation.

**This submittal shall include:

a) sufficiently detailed information to totally support the rationale for the change. Information submitted should consist of a package of those pages of the ODCM to be changed with each page numbered and provided together with appropriate analyses or evaluations justifying the change;

b. a determination that the change will not reduce the accuracy or reliability of dose calculations or setpoint determinations.

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

ARKANSAS POWER & LIGHT COMPANY

DOCKET NO. 50-368

ARKANSAS NUCLEAR ONE, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 60
License No. NPF-6

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

   A. The application for amendment by Arkansas Power & Light Company (the licensee) dated April 13, 1984 as supplemented by letter dated April 26, 1984, 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.

2. 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. NPF-6 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 60 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications, except where otherwise stated in specific license conditions.

3. This license amendment becomes effective on January 1, 1985.

FOR THE NUCLEAR REGULATORY COMMISSION

James R. Miller, Chief
Operating Reactors Branch #3
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 14, 1984

ATTACHMENT TO LICENSE AMENDMENT NO. 60

FACILTIY OPERATING LICENSE NO. NPF-6

DOCKET NO. 50-368

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are provided to maintain document completeness.

Remove	Insert
Index pages II through XV	Index pages II through XVII
1-6	1-6
1-7	1-7
1-8	1-8
1-9	1-9
3/4 3-45	3/4 3-45
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	3/4 3-51
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	3/4 3-57
	3/4 3-58
	3/4 3-59
	3/4 11-1 through 3/4 11-16
	3/4 12-1 through 3/4 12-9
B 3/4 3-3	B 3/4 3-3
	B 3/4 3-4
	B 3/4 3-5
	B 3/4 11-1
	B 3/4 11-2
	B 3/4 11-3
	B 3/4 11-4
	B 3/4 12-1
	5-3a
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ADMINISTRATIVE CONTROLS

$\bar{E}$ - AVERAGE DISINTEGRATION ENERGY

1.19 $\bar{E}$ shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration (in MEV) for isotopes, other than iodines, with half lives greater than 15 minutes, making up at least 95% of the total non-iodine activity in the coolant.

STAGGERED TEST BASIS

1.20 A STAGGERED TEST BASIS shall consist of:

a. A test schedule for n systems, subsystems, trains or other designated components obtained by dividing the specified test interval into n equal subintervals, and

b. The testing of one system, subsystem, train or other designated component at the beginning of each subinterval.

FREQUENCY NOTATION

1.21 The FREQUENCY NOTATION specified for the performance of Surveillance Requirements shall correspond to the intervals defined in Table 1.2.

AXIAL SHAPE INDEX

1.22 The AXIAL SHAPE INDEX shall be the power generated in the lower half of the core less the power generated in the upper half of the core divided by the sum of these powers.

REACTOR TRIP SYSTEM RESPONSE TIME

1.23 The REACTOR TRIP SYSTEM RESPONSE TIME shall be the time interval from when the monitored parameter exceeds its trip setpoint at the channel sensor until electrical power is interrupted to the CEA drive mechanism.

ENGINEERED SAFETY FEATURE RESPONSE TIME

1.24 The ENGINEERED SAFETY FEATURE RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays where applicable.

PHYSICS TESTS

1.25 PHYSICS TESTS shall be those tests performed to measure the fundamental nuclear characteristics of the reactor core and related instrumentation and 1) described in Chapter 14.0 of the FSAR, 2) authorized under the provisions of 10 CFR 50.59, or 3) otherwise approved by the Commission.

SOFTWARE

1.26 The digital computer SOFTWARE for the reactor protection system shall be the program codes including their associated data, documentation and procedures.

PLANAR RADIAL PEAKING FACTOR - F_{xy}

1.27 The PLANAR RADIAL PEAKING FACTOR is the ratio of the peak to plane average power density of the individual fuel rods in a given horizontal plane, excluding the effects of azimuthal tilt.

SOURCE CHECK

1.28 A SOURCE CHECK shall be the qualitative assessment of channel response when the channel sensor is exposed to the radioactive source.

OFFSITE DOSE CALCULATION MANUAL (ODCM)

1.29 An OFFSITE DOSE CALCULATION MANUAL (ODCM) shall be a manual containing the methodology and parameters to be used in the calculation of offsite doses due to radioactive gaseous and liquid effluents and in the calculation of gaseous and liquid effluent monitoring instrumentation alarm/trip setpoints.

LIQUID RADWASTE TREATMENT SYSTEM

1.30 A LIQUID RADWASTE TREATMENT SYSTEM is a system designed and installed to reduce radioactive liquid effluents from the unit. This is accomplished by providing for holdup, filtration, and/or demineralization of radioactive liquid effluents prior to their release to the environment.

GASEOUS RADWASTE TREATMENT SYSTEM

1.31 A GASEOUS RADWASTE TREATMENT SYSTEM is any system designed and installed to reduce radioactive gaseous effluents from the plant by collecting offgases from radioactive systems and providing for decay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.

VENTILATION EXHAUST TREATMENT SYSTEM

1.32 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. Atmospheric cleanup systems that are Engineered Safety Feature (ESF) actuated are not considered to be VENTILATION EXHAUST TREATMENT SYSTEMS.

MEMBER(S) OF THE PUBLIC

1.33 MEMBER(S) OF THE PUBLIC shall include all persons who are not occupationally associated with the plant. This category does not include employees of the utility, its contractors or 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.

PURGE-PURGING

1.34 PURGE or PURGING is the controlled process of discharging air or gas from a confinement to reduce airborne radioactive concentrations in such a manner that replacement air or gas is required to purify the confinement.

EXCLUSION AREA

1.36 The EXCLUSION AREA is that area surrounding ANO within a minimum radius of .65 miles of the reactor buildings and controlled to the extent necessary by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials.

UNRESTRICTED AREA

1.37 An UNRESTRICTED AREA shall be any area at or beyond the exclusion area boundary.

TABLE 1.1

OPERATIONAL MODES

MODE	REACTIVITY CONDITION, K_{eff}	%RATED THERMAL POWER*	AVERAGE COOLANT TEMPERATURE
1. POWER OPERATION	$\geq$ 0.99	> 5%	$\geq$ 300°F
2. STARTUP	$\geq$ 0.99	$\leq$ 5%	$\geq$ 300°F
3. HOT STANDBY	< 0.99	0	$\geq$ 300°F
4. HOT SHUTDOWN	< 0.99	0	300°F > T_{avg} > 200°F
5. COLD SHUTDOWN	< 0.99	0	$\leq$ 200°F
6. REFUELING**	$\leq$ 0.95	0	$\leq$ 140°F

*Excluding decay heat.

**Reactor vessel head unbolted or removed and fuel in the vessel.

TABLE 1.2

FREQUENCY NOTATION

NOTATION	FREQUENCY
S	At least once per 12 hours.
D	At least once per 24 hours.
W	At least once per 7 days.
M	At least once per 31 days.
Q	At least once per 92 days.
SA	At least once per 184 days.
R	At least once per 18 months.
S/U	Prior to each reactor startup.
P	Completed prior to each release
N.A.	Not applicable.

INSTRUMENTATION

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.9 The radioactive gaseous effluent monitoring instrumentation channels shown in Table 3.3-12 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Specification 3.11.2.1 are not exceeded.

APPLICABILITY: During releases via this pathway.

ACTION:

a. With the following gaseous effluent monitoring instrumentation channels alarm/trip setpoint less conservative than required by the above specification, immediately suspend the release of radioactive gaseous effluents monitored by the affected channel.

1. Waste Gas Holdup System Noble Gas Activity Monitor. (during periods of gaseous releases.)

2. Containment Purge and Ventilation System Noble Gas Activity Monitor. (during periods of containment building PURGE.)

b. With less than the minimum number of monitoring instrumentation channels OPERABLE, take the action shown in Table 3.3-12.

c. Return the instruments to OPERABLE status within 30 days or, in lieu of any other report, explain in the next Semiannual Radioactive Effluent Release Report why the inoperability was not corrected.

d. The provisions of Specifications 3.0.3, 3.0.4, 4.0.4 and 6.9.1.7 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.9 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 at the frequencies shown in Table 4.3-12.

TABLE 3.3-12

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

	INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	PARAMETER	ACTION
1.	Waste Gas Holdup System				
	a. Noble Gas Activity Monitor (provides alarm and automatic termination of release)	1	*	Radioactivity	25
	b. Effluent System Flow Monitor	1	*	System Flow	26
2.	Containment Purge and Ventilation System				
	a. Noble Gas Activity Monitor	1	*	Radioactivity	27,29
	b. Iodine Sampler Cartridge	1	*	Verify Presence of Cartridge	28
	c. Particulate Sampler Filter	1	*	Verify Presence of Filter	28
	d. Effluent System Flow Monitor	1	*	System Flow	26
	e. Sampler Flow Monitor	1	*	Sampler Flow	26

TABLE 3.3-12 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

	INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	PARAMETER	ACTION
3.	Spent Fuel Area Ventilation System				
	a. Noble Gas Activity Monitor	1	*	Radioactivity	27
	b. Iodine Sampler Cartridge	1	*	Verify Presence of Cartridge	28
	c. Particulate Sampler Filter	1	*	Verify Presence of Filter	28
	d. Effluent System Flow Monitor	1	*	System Flow	26
	e. Sampler Flow Monitor	1	*	Sampler Flow	26
4.	Auxiliary Building Area Ventilation System				
	a. Noble Gas Activity Monitor	1	*	Radioactivity	27
	b. Iodine Sampler Cartridge	1	*	Verify Presence of Cartridge	28
	c. Particulate Sampler Filter	1	*	Verify Presence of Filter	28
	d. Effluent System Flow Monitor	1	*	System Flow	26
	e. Sampler Flow Monitor	1	*	Sampler Flow	26

TABLE 3.3-12 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

	INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	PARAMETER	ACTION
5.	Auxiliary Building Extension Ventilation System				
	a. Noble Gas Activity Monitor	1	*	Radioactivity	27
	b. Iodine Sample Cartridge	1	*	Verify Presence of Cartridge	28
	c. Particulate Sampler Filter	1	*	Verify Presence of Filter	28
	d. Effluent System Flow Monitor	1	*	System Flow	26
	e. Sampler Flow Monitor	1	*	Sampler Flow	26

TABLE 3.3-12 (Continued)

TABLE NOTATION

*During releases via this pathway.

ACTION 25 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, the contents of the tank may be released to the environment provided that prior to initiating the release:

1. At least two independent samples of the tank's contents are analyzed; and

2. At least two technically qualified members of the Facility Staff independently verify the computer input data; and

3. At least two technically qualified members of the Facility Staff independently verify the discharge valve lineup.

Otherwise, suspend release of radioactive effluents via this pathway.

ACTION 26 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided the flow rate is estimated at least once per 4 hours.

ACTION 27 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided grab samples are taken at least once per 12 hours and these samples are analyzed for gross activity within 24 hours.

ACTION 28 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided samples are collected with auxiliary sampling equipment. Iodine sample cartridges and particulate sample filters shall be changed at least once per 7 days and analyses shall be completed within 48 hours after changing in accordance with Table 4.11-2.

ACTION 29 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, suspend all operations involving movement of fuel assemblies or CEAs within the pressure vessel.

TABLE 4.3-12

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

	INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST
1.	Waste Gas Holdup System				
	a. Gas Activity Monitor (provides alarm and automatic termination of release)	D*	P**	R	Q
	b. System Effluent Flow Monitor	D*	N/A	R	N/A
2.	Containment Purge and Ventilation System				
	a. Gas Activity Monitor	D*	P**	R	M (1), P
	b. Iodine Sampler Cartridge	W*(2)	N/A	N/A	N/A
	c. Particulate Sampler Filter	W*(2)	N/A	N/A	N/A
	d. System Effluent Flow Monitor	D*	N/A	R	N/A
	e. Sampler Flow Monitor	D*	N/A	R	N/A

TABLE 4.3-12 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

	INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST
3.	Spent Fuel Area Ventilation System				
	a. Gas Activity Monitor	D*	M**	R	Q
	b. Iodine Sampler Cartridge	W*(2)	N/A	N/A	N/A
	c. Particulate Sampler Filter	W*(2)	N/A	N/A	N/A
	d. System Effluent Flow Monitor	D*	N/A	R	N/A
	e. Sampler Flow Monitor	D*	N/A	R	N/A
4.	Auxiliary Building Area Ventilation System				
	a. Gas Activity Monitor	D*	M**	R	Q
	b. Iodine Sampler Cartridge	W*(2)	N/A	N/A	N/A
	c. Particulate Sampler Filter	W*(2)	N/A	N/A	N/A
	d. System Effluent Flow Monitor	D*	N/A	R	N/A
	e. Sampler Flow Monitor	D*	N/A	R	N/A

TABLE 4.3-12 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST
5. Auxiliary Building Extension Ventilation System				
a. Gas Activity Monitor	D*	M**	R	Q
b. Iodine Sampler Cartridge	W*(2)	N/A	N/A	N/A
c. Particulate Sampler Filter	W*(2)	N/A	N/A	N/A
d. System Effluent Flow Monitor	D*	N/A	R	N/A
e. Sampler Flow Monitor	D*	N/A	R	N/A

TABLE 4.3-12 (Continued)

TABLE NOTATION

*During releases via this pathway.

**A SOURCE CHECK is not required if the background activity is greater than the activity of the check source.

(1) During Containment Building ventilation operations.

(2) Verify presence of cartridge or filter only.

INSTRUMENTATION

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.10 The radioactive liquid effluent monitoring instrumentation channels shown in Table 3.3-13 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Specification 3.11.1.1 are not exceeded.

APPLICABILITY: During releases via this pathway.

ACTION:

a. 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 monitoried by the affected channel, until the setpoint is changed to an acceptable conservative value.

b. With less than the minimum number of monitoring instrumentation channels OPERABLE, take the action shown in Table 3.3-13.

c. Return the instruments to OPERABLE status within 30 days or, in lieu of any other report, explain in the next Semiannual Radioactive Effluent Release Report why the inoperability was not corrected.

d. The provisions of Specifications 3.0.3, 3.0.4, 4.0.4 and 6.9.1.7 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.10 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 at the frequencies shown in Table 4.3-13.

TABLE 3.3-13

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

	INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
1.	Gross Radioactivity Monitor(s) (provides alarm and automatic termination of release)			
	a. Liquid Radwaste Effluent Line	1	During releases via this pathway	18
2.	Flow Monitor(s)			
	a. Liquid Radwaste Effluent Line	1	During releases via this pathway	19

TABLE 3.3-13 (Continued)

TABLE NOTATION

ACTION 18 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases may be resumed provided that prior to initiating a release:

1. At least two independent samples are analyzed; and

2. At least two technically qualified members of the Facility Staff independently verify the release rate computer input data; and

3. At least two technically qualified members of the Facility Staff independently verify the discharge valve lineup.

Otherwise, suspend release of radioactive effluents via this pathway.

ACTION 19 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided the flow rate is estimated at least once per 4 hours during actual releases. Pump curves may be used to estimate flow.

TABLE 4.3-13

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST
1. Gross Radioactivity Monitor(s) (provides alarm and automatic isolation)				
a. Liquid Radwaste Effluents Line	D*	P**	R	Q
2. Flow Monitor(s)				
a. Liquid Radwaste Effluent Line	D*	N/A	R	N/A

* During releases via this pathway

** A SOURCE CHECK is not required if the background activity is greater than the activity of the check source.

3/4.3.4 TURBINE OVERSPEED PROTECTION

LIMITING CONDITION FOR OPERATION

3.3.4.1 At least one turbine overspeed protection system shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

a. With one stop valve and/or one control valve inoperable, within 4 hours either restore the inoperable valve(s) to OPERABLE status or close the inoperable valve(s); otherwise, isolate the turbine from the steam supply within the next 6 hours.

b. With one combined stop and intercept valve inoperable, within 4 hours either restore the inoperable valve to OPERABLE status or close the inoperable valve; otherwise, isolate the turbine from the steam supply within the next 6 hours.

c. With the above required turbine overspeed protection system otherwise inoperable, within 6 hours either restore the system to OPERABLE status or isolate the turbine from the steam supply.

SURVEILLANCE REQUIREMENTS

4.3.4.1.1 The provisions of Specification 4.0.4 are not applicable.

4.3.4.1.2 The above required turbine overspeed protection system shall be demonstrated OPERABLE:

a. At least once per 7 days by cycling each of the following valves through at least one complete cycle from the running position.

   1. Four high pressure turbine stop valves.

   2. Four low pressure turbine combined stop and intercept valves.

SURVEILLANCE REQUIREMENTS (Continued)

b. At least once per 31 days by direct observation of the movement of each of the four high pressure turbine stop valves, the four high pressure turbine control valves, and the four low pressure turbine combined stop and intercept valves through one complete cycle from the running position.

c. At least once per 18 months by performance of a CHANNEL CALIBRATION on the turbine overspeed protection systems.

d. At least once per 40 months by disassembling at least one of each of the above valves and performing a visual and surface inspection of valve seats, disks and stems and verifying no unacceptable flaws or corrosion.

3/4.11 RADIOACTIVE EFFLUENTS

3/4.11.1 LIQUID EFFLUENTS

CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.11.1.1 The concentration of radioactive material released from the site in liquid effluents to the discharge canal 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 released shall be limited to 2×10^{-4} μCi/ml.

APPLICABILITY: At all times.

ACTION:

a. With the concentration of radioactive material released exceeding the above limits, immediately initiate actions to restore concentrations to within the above limits. Provide notification to the Commission within 24 hours and in lieu of any other report, submit a Special Report pursuant to Specification 6.9.2.h within 30 days.

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.1.1.1 Radioactive liquid wastes shall be sampled and analyzed according to the sampling and analyses program of Table 4.11-1.

4.11.1.1.2 The results of the radioactivity analyses shall be used in accordance with the methods in the ODCM to assure that the concentrations at the point of release are maintained within the limits of Specification 3.11.1.1.

TABLE 4.11-1

RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSES PROGRAM

Liquid Release Type	Sampling Frequency	Minimum Analyses Frequency	Type of Activity Analyses	Lower Limit of Detection (LLD) (uCi/ml) (a)
A. Batch Waste Release (d)	P Each Batch	P Each Batch	γ isotopic(e)	5×10^{-7} (b)
			I-131	1×10^{-6}
	P One Batch/M	M	Dissolved and Entrained Gases (Gamma Emmitters)	1×10^{-5}
	P Each Batch	M Composite (c)	H-3	1×10^{-5}
			Gross Alpha	1×10^{-7}
	P Each Batch	Q Composite (c)	Sr-89, Sr-90	5×10^{-8}
			Fe-55	1×10^{-6}

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):

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

Where:

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

s_b 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 (for plant effluents, not environmental samples).

Typical values of E, V, Y, and Δt shall be used in the calculation.

It should be recognized that the LLD is an a priori (before the fact) limit representing the capability of a measurement system and not an a posteriori (after the fact) limit for a particular measurement.

b. For certain mixtures of gamma emitters, it may not be possible to measure radionuclides in concentrations near their sensitivity limits when other nuclides are present in the sample in much greater concentrations. Under these circumstances, it will be more appropriate to calculate the concentration of such radionuclides using observed ratios with those radionuclides which are measurable.

c. 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.

d. A batch release is the discharge of liquid wastes of a discrete volume. Prior to sampling, each batch shall be isolated and mixed to assure representative sampling.

e. The principal gamma emitters for which the LLD specification will apply are exclusively the following radionuclides: Mn54, Fe59, Co58, Co60, Zn65, Mo99, Cs134, Cs137, Ce141, and Ce144. 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. 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 LLD's higher than required, the reasons shall be documented in the Semiannual Radioactive Effluent Release Report.

RADIOACTIVE EFFLUENTS

DOSE

LIMITING CONDITION FOR OPERATION

3.11.1.2 The dose commitment to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released from ANO-2 to the discharge canal shall be limited:

a. During any calendar quarter to less than or equal to 1.5 mrem to the total body and to less than or equal to 5 mrem to any organ, and

b. During any calendar year to less than or equal to 3 mrem to the total body and to less than or equal to 10 mrem to any organ.

APPLICABILITY: At all times.

ACTION:

a. With the calculated dose from the release of radioactive materials in liquid effluents exceeding any of the above limits, in lieu of any other report submit a Special Report pursuant to Specification 6.9.2.h within 30 days.

b. The provisions of specifications 3.0.3, 3.0.4 and 6.9.1.7 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.1.2 Dose Calculations. Cumulative dose contributions from liquid effluents shall be determined in accordance with the ODCM at least once per 31 days.

RADIOACTIVE EFFLUENTS

LIQUID RADWASTE TREATMENT

LIMITING CONDITION FOR OPERATION

3.11.1.3 The LIQUID RADWASTE TREATMENT SYSTEM shall be used to reduce the radioactive materials in liquid wastes prior to their discharge when the projected doses due to the liquid effluent, from ANO-2 to the discharge canal, would exceed .18 mrem to the total body or .625 mrem to any organ in any calendar quarter.

APPLICABILITY: At all times.

ACTION:

a. With radioactive liquid waste being discharged without treatment and in excess of the above limits, in lieu of any other report, submit a Special Report pursuant to Specification 6.9.2.h within 30 days.

b. The provisions of Specifications 3.0.3, 3.0.4 and 6.9.1.7 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.1.3.1 Doses due to liquid releases shall be projected at least once per 31 days in accordance with the ODCM.

RADIOACTIVE EFFLUENTS

LIQUID HOLDUP TANKS*

LIMITING CONDITION FOR OPERATION

3.11.1.4 The quantity of radioactive material contained in each unprotected outside temporary radioactive liquid storage tank shall be limited to less than or equal to 10 curies, excluding tritium and dissolved or entrained noble gases.

APPLICABILITY: At all times.

ACTION:

a. With the quantity of radioactive material exceeding the above limit, immediately suspend all additions of radioactive material to the affected tank and within 48 hours reduce the tank contents to within the limit.

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.1.4 The quantity of radioactive material contained in each unprotected outside temporary radioactive liquid storage tank shall be determined to be within the above limit by analyzing a representative sample of the contents of the tank at least once per 7 days when radioactive materials are being added to the tank.

*Tanks included in this Specification are those outdoor temporary tanks that do not have 1) liners, dikes or walls capable of holding the tank contents, or 2) tank overflows and surrounding area drains connected to the LIQUID RADWASTE TREATMENT SYSTEM.

RADIOACTIVE EFFLUENTS

3/4.11.2 GASEOUS EFFLUENTS

DOSE RATE

LIMITING CONDITION FOR OPERATION

3.11.2.1 The dose rate due to radioactive materials released in gaseous effluents from the site to UNRESTRICTED AREAS (see Figure 5.1-3) shall be limited to the following:

a. For noble gases: Less than or equal to the 500 mrem/yr to the total body and less than or equal to 3000 mrem/yr to the skin.

b. For iodine-131, for tritium and for all radionuclides in particulate form with half lives greater than 8 days: Less than or equal to 1500 mrem/yr to any organ.

During periods of containment purging the dose rate may be averaged over a one hour interval.

APPLICABILITY: At all times.

ACTION:

a. With the dose rate(s) exceeding the above limits, without delay restore the release rate to comply with the above limit(s).

b. The provisions of Specifications 3.0.3, 3.0.4 and 6.9.1.7 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.2.1.1 The dose rate due to noble gases in gaseous effluents shall be determined to be within the above limits in accordance with the methods and procedures of the ODCM.

4.11.2.1.2 The dose rate due to iodine-131, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents shall be determined to be within the above limits 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 4.11-2.

TABLE 4.11-2

RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSES PROGRAM

Gaseous Release Type	Sampling Frequency	Minimum Analyses Frequency	Type of Activity Analyses	Lower Limit of Detection (LLD) (uCi/ml)[a]
A. Waste Gas Storage Tank	P Each Tank Grab Sample	P Each Tank	Principal Gamma Emitters[b]	1×10^{-4} (g)
B. Reactor Bldg. Purge	P Each Purge Grab Sample	P Each Purge	Principal Gamma Emitters[b] H-3	1×10^{-4} (g) 1×10^{-6}
C. Unit Vents (Auxiliary Bldg.Ext.) (Spent Fuel Pool Area Ventilation) (Rx Bldg.Ventilation) (Radwaste Area Ventilation)	M (c) (d) Grab Sample	M	Principal Gamma Emitters[b] H-3	1×10^{-4} (g) 1×10^{-6}
	Continuous[e]	W (f) Charcoal Sample	I-131	1×10^{-12}
	Continuous[e]	W (f) Particulate Sample	Principal Gamma Emitters[b] (I-131, Others)	1×10^{-11}
	Continuous[e]	M Particulate Sample	Gross alpha	1×10^{-11}
	Continuous[e]	Q Composite Particulate Sample	Sr-89, Sr-90	1×10^{-11}
	Continuous[e]	Noble Gas Monitor	Noble Gases Gross Beta or Gamma	1×10^{-6} (Xe-133 equiv.)

TABLE 4.11-2 (Continued)

TABLE NOTATION

a. The Lower Limit of Detection (LLD) is defined in Table Notation a. of Table 4.11-1 of Specification 3.11.1.1.

b. 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. 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 required, the reasons shall be documented in the semiannual effluent report.

c. Tritium grab samples shall be taken from the Reactor Building ventilation exhaust at least once per 24 hours when the refueling canal is flooded.

d. Tritium grab samples shall be taken at least once per 7 days from the ventilation exhaust from the spent fuel area, whenever spent fuel is in the spent fuel pool.

e. The ratio of the sample flow rate to the sampled stream flow rate shall be known for the time period covered by each dose or dose rate calculation made in accordance with Specification 3.11.2.1, 3.11.2.2, and 3.11.2.3.

f. Samples shall be changed at least once per 7 days and analyses shall be completed within 48 hours after changing (or after removal from the sampler).

g. For certain radionuclides with low gamma yield or low energies, or for certain radionuclide mixtures, it may not be possible to measure radionuclides in concentrations near the LLD. Under these circumstances, the LLD may be increased inversely proportional to the magnitude of the gamma yield (i.e., 1 x E-4/I, where I is the photon abundance expressed as a decimal fraction), but in no case shall the LLD, as calculated in this manner for a specific radionuclide, be greater than 10% of the MPC value specified in 10 CFR 20, Appendix B, Table II, Column I.

RADIOACTIVE EFFLUENTS

DOSE - NOBLE GASES

LIMITING CONDITION FOR OPERATION

3.11.2.2 The dose due to noble gases released in gaseous effluents from ANO-2 to UNRESTRICTED AREAS (See Figure 5.1-3) shall be:

a. During any calendar quarter, less than or equal to 5 mrads for gamma radiation and less than or equal to 10 mrads for beta radiation, and

b. During any calendar year, less than or equal to 10 mrads for gamma radiation and less than or equal to 20 mrads for beta radiation.

APPLICABILITY: At all times.

ACTION:

a. With the calculated dose from radioactive noble gases in gaseous effluents exceeding any of the above limits, in lieu of any other report, submit a Special Report pursuant to Specification 6.9.2.h within 30 days.

b. The provisions of Specifications 3.0.3, 3.0.4 and 6.9.1.7 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.2.2 Dose Calculations. Cumulative dose contributions for noble gases for the current calendar quarter and current calendar year shall be determined in accordance with the ODCM at least once per 31 days.

RADIOACTIVE EFFLUENTS

DOSE - IODINE-131, TRITIUM, AND RADIONUCLIDES IN PARTICULATE FORM

LIMITING CONDITION FOR OPERATION

3.11.2.3 The dose to a MEMBER OF THE PUBLIC from iodine-131, from tritium, and from all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released from ANO-2 to UNRESTRICTED AREAS (see Figure 5.1-1) shall be:

a. During any calendar quarter, less than or equal to 7.5 mrems to any organ, and

b. During any calendar year, less than or equal to 15 mrems to any organ.

APPLICABILITY: At all times.

ACTION:

a. With the calculated dose from the release of iodine-131, tritium, and radionuclides in particulate form with half-lives greater than 8 days, in gaseous effluents exceeding any of the above limits, in lieu of any other report, submit a Special Report pursuant to Specification 6.9.2.h within 30 days.

b. The provisions of Specifications 3.0.3, 3.0.4 and 6.9.1.7 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.2.3 Dose Calculations. Cumulative dose contributions for the current calendar quarter and current calendar year for iodine-131, tritium, and radionuclides in particulate form with half-lives greater than 8 days shall be determined in accordance with the ODCM at least once per 31 days.

RADIOACTIVE EFFLUENTS

GASEOUS RADWASTE TREATMENT

LIMITING CONDITION FOR OPERATION

3.11.2.4 The VENTILATION EXHAUST TREATMENT SYSTEMS shall be used to reduce radioactive materials in gaseous waste prior to their discharge when the projected gaseous effluent doses from ANO-2 to UNRESTRICTED AREAS (see Figure 5.1-1) would exceed .625 mrad for gamma radiation and 1.25 mrad for beta radiation in any calendar quarter; or when the projected doses due to iodine-131, tritium, and radionuclides in particulate form with half-lives greater than 8 days would exceed 1.0 mrem to any organ over a calendar quarter.

APPLICABILITY: At all times.

ACTION:

a. With gaseous waste being discharged without treatment and in excess of the above limits, in lieu of any other report, submit a Special Report pursuant to Specification 6.9.2.h within 30 days.

b. The provisions of Specifications 3.0.3, 3.0.4, and 6.9.1.7 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.2.4.1 Doses due to gaseous releases from the site shall be projected at least once per 31 days in accordance with the ODCM.

RADIOACTIVE EFFLUENTS

GASEOUS RADWASTE TREATMENT

LIMITING CONDITION FOR OPERATION

3.11.2.5 When degasifying the reactor coolant system, the GASEOUS RADWASTE TREATMENT SYSTEM shall be used to reduce radioactive material in gaseous waste prior to their discharge when the projected gaseous effluent doses from ANO-2 to UNRESTRICTED AREAS (see Figure 5.1-1) would exceed .625 mrad for gamma radiation and 1.25 mrad for beta radiation in any calendar quarter.

APPLICABILITY: At all times.

ACTION:

a. With gaseous waste being discharged without treatment and in excess of the above limits, in lieu of any other report, submit a Special Report pursuant to Specification 6.9.2.h within 30 days.

b. The provisions of Specifications 3.0.3, 3.0.4 and 6.9.1.7 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.2.5.1 Doses due to gaseous releases from the site shall be projected at least once per 31 days in accordance with the ODCM.

RADIOACTIVE EFFLUENTS

GAS STORAGE TANKS

LIMITING CONDITION FOR OPERATION

3.11.2.6 The quantity of radioactivity contained in each gas storage tank shall be limited to less than or equal to 300,000 curies noble gases (considered as Xe-133).

APPLICABILITY: At all times.

ACTION:

a. 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.

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.2.6 The quantity of radioactive material contained in each gas storage tank shall be determined to be within the above limit at least once per 24 hours when radioactive materials are being added to the tank and the reactor coolant activity exceeds the limits of Specification 3.4.8.

RADIOACTIVE EFFLUENTS

3/4.11.3 TOTAL DOSE

LIMITING CONDITION FOR OPERATION

3.11.3 The calculated doses from the release of radioactive materials in liquid or gaseous effluents shall not exceed twice the limits of Specifications 3.11.1.2.a, 3.11.1.2.b, 3.11.2.2.a, 3.11.2.2.b, 3.11.2.3.a, or 3.11.2.3.b.

APPLICABILITY: At all times.

ACTION:

a. With the calculated doses exceeding the above limits, prepare and submit a Special Report pursuant to 10 CFR Part 20.405c.

b. If the limits of 40 CFR 190 have been exceeded, obtain a variance from the Commission to permit further releases in excess of 40 CFR 190 limits. A variance is granted until staff action on the request is complete.

SURVEILLANCE REQUIREMENTS

4.11.3. Dose Calculations. Cumulative dose contributions from liquid and gaseous effluents shall be determined in accordance with Specifications 4.11.1.2, 4.11.2.2, and 4.11.2.3, and in accordance with the ODCM.

RADIOACTIVE EFFLUENTS

3/4.11.4 SOLID RADIOACTIVE WASTE

LIMITING CONDITION FOR OPERATION

3.11.4 The solid radwaste system shall be used in accordance with a PROCESS CONTROL PROGRAM to process wet radioactive wastes to meet shipping and burial ground requirements.

APPLICABILITY: At all times.

ACTION:

a. With the provisions of the PROCESS CONTROL PROGRAM not satisfied, suspend shipments of defectively processed or defectively packages solid radioactive wastes from the site.

b. The provisions of Specifications 3.0.3, 3.0.4, and 6.9.1.9.b are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.4 Proper solidification of wet radioactive waste shall be verified in accordance with the surveillance requirements of the Process Control Program.

3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING

3/4.12.1 MONITORING PROGRAM

LIMITING CONDITION FOR OPERATION

3.12.1 The radiological environmental monitoring samples shall be collected pursuant to Table 3.12-1 and shall be analyzed pursuant to the requirements of Tables 3.12-1 and 3.12-2. The sample locations shall be shown in Table 4-1 in the ODCM.

APPLICABILITY: At all times.

ACTION:

a. With the radiological environmental monitoring program not being conducted as specified in Table 3.12-1, prepare and submit to the Commission in the Annual Radiological Environmental Report a description of the reasons for not conducting the program as required and the plans for preventing a recurrence. (Deviations are permitted from the required sampling schedule if specimens are not obtainable due to hazardous conditions, seasonal unavailability, or to malfunction of sampling equipment. If the latter, every effort shall be made to complete corrective action prior to the end of the next sampling period).

b. With the level of radioactivity as the result of plant effluents in an environmental sampling medium at one or more of the locations specified in Table 3.12-1 exceeding the limits of Table 3.12-3 when averaged over any calendar quarter, prepare and submit to the Commission, within 30 days from the end of the affected quarter, a report which includes an evaluation of any release conditions, environmental factors or other aspects which caused the limits of Table 3.12-3 to be exceeded, and defines the actions taken to reduce radioactive effluents so that the potential annual dose to a member of the public is less than the calendar year limits of Specifications 3.11.1.2, 3.11.2.2 and 3.11.2.3. When more than one of the radionuclides in Table 3.12-3 are detected in the sampling medium, this report shall be submitted if:

$$\frac{\text{Concentration (1)}}{\text{reporting level (1)}} + \frac{\text{Concentration (2)}}{\text{reporting level (2)}} + \ldots. \geq 1.0$$

When radionuclides other than those in Table 3.12-3 are detected and are the result of plant effluents, this report shall be submitted if the potential annual dose to a MEMBER OF THE PUBLIC is equal to or greater than the calendar year limits of Specifications 3.11.1.2, 3.11.2.2 and 3.11.2.3. 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 Report.

3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING

LIMITING CONDITION FOR OPERATION (Continued)

c. With milk or fresh leafy vegetable samples unavailable from any of the sample locations required by Table 3.12-1, identify locations for obtaining replacement samples and add them to the radiological environmental monitoring program within 30 days. The specific locations from which samples were unavailable may then be deleted from the monitoring program. Identify the causes of the unavailability of samples and identify the new location(s) for obtaining replacement samples in the next Semiannual Radioactive Effluent Release Report and also include in the report a revised table for the ODCM reflecting the new location(s).

d. The provisions of Specifications 3.0.3, 3.0.4 and 6.9.1.7 are not applicable.

SURVEILLANCE REQUIREMENTS

4.12.1 The results of analyses performed on the radiological environmental monitoring samples shall be summarized in the Annual Radiological Environmental Report.

TABLE 3.12-1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Number of Sample Locations*	Sampling and Collection Frequency	Type and Frequency of Analyses
1. AIRBORNE			
a. Radioiodine and Particulates	5 locations	Continuous operation of sampler with sample collection as required by dust loading but at least once per 7 days.	Radioiodine canister. Analyze at least once per 7 days for I-131. Particulate sampler. Analyze for gross beta radioactivity $\geq$ 24 hours following filter change. Perform gamma isotopic analysis on each sample when gross beta activity is > 10 times the mean of control sample. Perform gamma isotopic analysis on composite (by location) sample at least every 92 days.
2. DIRECT RADIATION	40 locations 2 dosimeter per location	At least once per 92 days.	Gamma dose. At least once 92 days.

*Sample locations are shown in the Offsite Dose Calculation Manual (ODCM).

TABLE 3.12-1 (Continued)

Exposure Pathway and/or Sample	Number of Sample Locations*	Sampling and Collection Frequency	Type and Frequency of Analyses
3. WATERBORNE			
a. Surface	2 Locations	Composite** sample collected over a period ≤ 31 days.	Gamma isotopic analysis of each sample by location. Tritium analysis of composite sample at least once every 92 days.
b. Ground	2 Locations	At least once per 92 days.	Gamma isotopic and tritium analyses of each sample.
c. Drinking	1 Location	Monthly grab sample	I-131 analysis of each sample; and Gross beta and gamma isotopic analyses of each sample. Tritium analysis of composite sample at least once every 92 days.
d. Sediment from Shoreline	2 Locations	At least once per 184 days	Gamma isotopic analysis of each sample.

*Sample locations are shown in the ODCM.

**Composite samples shall be collected by an aliquot at intervals not exceeding 24 hours.

TABLE 3.12-1 (Continued)

Exposure Pathway and/or Sample	Number of Sample Locations*	Sampling and Collection Frequency	Type and Frequency of Analyses
4. INGESTION			
a. Milk	4 Locations	At least once per 31 days when animals are on pasture.	Gamma isotopic and I-131 analyses of each sample.
b. Fish	2 Locations	One sample in season, or at least once per 184 days if not seasonal. One sample of each of the following species: 1. Catfish 2. Crappie or Bass	Gamma isotopic analysis on edible portions.
c. Food Products**	3 Locations	At time of harvest. One sample of each of the following classes of food products: 1. Fruits 2. Flowering Vegetable 3. Tubular Vegetable	Gamma isotopic analysis on edible portions.
	1 Location	At time of harvest. One sample of broad leaf vegetation.	I-131 analysis.

*Sample locations are shown in the ODCM.
**If these food products are available.

TABLE 3.12-2

MAXIMUM VALUES FOR THE LOWER LIMITS OF DETECTION (LLD[a])

Analyses	Water (pCi/l)	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}				
H-3	1000[b]					
Mn-56	15		130			
Fe-59	30		260			
Co-58, 60	15		130			
Zn-65	30		260			
Zr-Nb-95	15					
I-131	1*[b]	7×10^{-2}		1	60[c]	
Cs-134, 137	15(10[b]), 18	1×10^{-2}	130, 150	15, 18	60, 80	150, 180
Ba-La-140	15			15		

*For monthly grap samples

(a) See definition of LLD in table notation of Table 4.11-1.
(b) LLD for drinking water.
(c) LLD for leafy vegetables.

TABLE 3.12-3

REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

Analyses	Water (pCi/l)	Airborne Particulate or Gases (pCi/m^3)	Fish (pCi/kg, wet)	Milk (pCi/l)	Food Products (pCi/kg, wet)
H-3	3×10^4 (a)				
Mn-54	1×10^3		3×10^4		
Fe-59	4×10^2		1×10^4		
Co-58	1×10^3		3×10^4		
Co-60	3×10^2		1×10^4		
Zn-65	3×10^2		2×10^4		
Zr-Nb-95	4×10^2 (b)				
I-131	2	0.9		3	1×10^2
Cs-134	30	10	1×10^3	60	1×10^3
Cs-137	50	20	2×10^3	70	2×10^3
Ba-La-140	2×10^2 (b)			3×10^2 (b)	

(a) For drinking water samples.
(b) Total for parent and daughter.

RADIOLOGICAL ENVIRONMENTAL MONITORING

3/4.12.2 LAND USE CENSUS

LIMITING CONDITION FOR OPERATION

3.12.2 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.

APPLICABILITY: At all times.

ACTION:

a. With a land use census identifying a location(s) which yields a calculated dose commitment due to I-131, tritium, and radionuclides in particulate form greater than the values currently being calculated in Unit 2 Specification 4.11.2.3, submit location description in the Semiannual Radioactive Effluent Release Report per Specification 6.9.3.

b. With a land use census identifying a location(s) which yields a calculated dose commitment (via the same exposure pathway) greater than at a location from which samples are currently being obtained in accordance with Specification 3.12.1, identify the new location in the Semiannual Radioactive Effluent Release Report per Specification 6.9.3. The new location shall be added to the radiological environmental monitoring program within 30 days, if possible. The sampling location having the lowest calculated dose commitment (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. The provisions of Specifications 3.0.3, 3.0.4 and 6.9.1.7 are not applicable.

SURVEILLANCE REQUIREMENTS

4.12.2 The land use census shall be conducted at least once per 12 months between the dates of June 1 and October 1 by door-to-door survey, aerial survey, or by consulting local agricultural authorities. The results of the land use census shall be included in the Annual Radiological Environmental Report.

RADIOLOGICAL ENVIRONMENTAL MONITORING

3/4.12.3 INTERLABORATORY COMPARISON PROGRAM

LIMITING CONDITION FOR OPERATION

3.12.3 Analyses shall be performed on radioactive materials supplied as part of the Interlaboratory Comparison Program which has been approved by NRC.

APPLICABILITY: At all times.

ACTION:

a. With analyses not being performed as required above, report the corrective actions taken to prevent a recurrence to the Commission in the Annual Radiological Environmental Report.

b. The provisions of Specifications 3.0.3, 3.0.4 and 6.9.1.7 are not applicable.

SURVEILLANCE REQUIREMENTS

4.12.3 The results of analyses performed as part of the above required Interlaboratory Comparison Program shall be included in the Annual Radiological Environmental Report.

3/4.3.3.6 POST-ACCIDENT INSTRUMENTATION

The OPERABILITY of the post-accident instrumentation ensures that sufficient information is available on selected plant parameters to monitor and assess these variables following an accident. This capability is consistent with the recommendations of Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Plants to Assess Plant Conditions During and Following an Accident," December 1975 and NUREG-0578, "TMI-2 Lessons Learned Task Force Status Report and Short Term Recommendations."

3/4.3.3.7 CHLORINE DETECTION SYSTEMS

The OPERABILITY of the chlorine detection system ensures that sufficient capability is available to promptly detect and initiate protective action in the event of an accidental chlorine release. This capability is required to protect control room personnel and is consistent with the recommendations of Regulatory Guide 1.95, "Protection of Nuclear Power Plant Control Room Operators Against an Accidental Chlorine Release," February 1975.

3/4.3.3.8 FIRE DETECTION INSTRUMENTATION

OPERABILITY of the fire detection instrumentation ensures that adequate warning capability is available for the prompt detection of fires. This capability is required in order to detect and locate fires in their early stages. Prompt detection of fires will reduce the potential for damage to safety related equipment and is an integral element in the overall facility fire protection program.

In the event that a portion of the fire detection instrumentation is inoperable, except for detectors located in the containment during Modes 1 and 2, the establishment of frequent fire patrols in the affected areas is required to provide detection capability until the inoperable instrumentation is restored to OPERABILITY.

3/4.3.3.9 RADIOACTIVE GASEOUS EFFLUENT INSTRUMENTATION

The 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 shall be calculated in accordance with the procedures in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20.

For the radioactive gaseous effluent instrumentation surveillance requirements, the CHANNEL FUNCTIONAL TEST demonstrates that control room alarm annunciation occurs if any of the following conditions exist:

1. The instrument indicates measured levels above the alarm/trip setpoint.

2. Power to the detector is lost.

3. The instrument indicates a downscale failure.

For the containment purge and the waste gas goldup system noble gas activity monitors, the CHANNEL FUNCTIONAL TEST also demonstrates that automatic isolation of the release pathway occurs if the instrument indicates above the trip setpoint.

The initial CHANNEL CALIBRATION is performed using one or more of the reference standards certified by the National Bureau of Standards or using standards that have been obtained from suppliers that participate in measurement assurance activities with NBS. These standards permit calibrating the system over its intended range of energy and measurement range. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration are used.

3.4.3.3.10 RADIOACTIVE LIQUID EFFLUENT INSTRUMENTATION

The 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/trip setpoints for these instruments shall be calculated in accordance with the procedures in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20.

For the radioactive liquid effluent instrumentation surveillance requirements, the channel test demonstrates that automatic isolation of this pathway and control room alarm annunciation occur if the instrument indicates measured levels above the trip setpoint. The channel test demonstrates that alarm annunciation occurs if any of the following conditions exist:

1. Power to the detector is lost.

2. The instrument indicates a downscale failure.

3. Instrument controls are not set in the operate mode.

The initial CHANNEL CALIBRATION is performed using one or more of the reference standards certified by the National Bureau of Standards or using standards that have been obtained from suppliers that participate in

measurement assurance activities with NBS. These standards permit calibrating the system over its intended range of energy and measurement range. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration are used.

3/4.3.4 TURBINE OVERSPEED PROTECTION

This specification is provided to ensure that the turbine overspeed protection instrumentation and the turbine speed control valves are OPERABLE and will protect the turbine from excessive overspeed. Protection from turbine excessive overspeed is required since excessive overspeed of the turbine could generate potentially damaging missiles which could impact and damage safety related components, equipment or structures.

3/4.11 RADIOACTIVE EFFLUENTS

BASES

This specification applies to the release of liquid effluents from each reactor at the site. For units with shared radwaste treatment systems, the liquid effluents from the shared system are proportioned among the units sharing that system.

3/4.11.1 LIQUID EFFLUENTS

3/4.11.1.1 CONCENTRATION

This specification is provided to ensure that the concentration of radioactive materials released in liquid waste effluents in unrestricted areas will be less than the concentration levels specified in 10 CFR Part 20, Appendix B, Table II, Column 2. This limitation provides additional assurance that the levels of radioactive materials in bodies of water in UNRESTRICTED AREAS will result in exposures within (1) the Section II.A design objectives of Appendix I, 10 CFR Part 50, to a MEMBER OF THE PUBLIC, 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-133 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.

3/4.11.1.2 DOSE

Provides assurance that releases of liquid effluents will result in concentrations below the limits of 10 CFR 20. The specification provides the required operating flexibility and at the same time assures that the release of radioactive material in liquid effluents will be kept "as low as is reasonably achievable." 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", April 1977.

3/4.11.1.3 LIQUID RADWASTE TREATMENT

The requirement 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." The specified limits governing the use of appropriate portions of the LIQUID RADWASTE TREATMENT SYSTEM were specified as a suitable fraction of the dose design objectives set forth in Section II.A of Appendix I, 10 CFR Part 50, for liquid effluents.

The values of .18 mrem and .625 mrem are approximately 25% of the yearly design objectives on a quarterly basis. The yearly design objectives are given in 10 CFR 50, Appendix I, Section II.

3/4.11.1.4 LIQUID HOLDUP TANKS

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 tanks, the resulting concentrations would be less than the limits of 10 CFR Part 20, Appendix B, Table II, Column 2, at the nearest potable water supply and the nearest surface water supply in an UNRESTRICTED AREA.

3/4.11.2 GASEOUS EFFLUENTS

3/4.11.2.1 DOSE RATE

This specification is provided to ensure that the dose at any time in UNRESTRICTED AREAS from gaseous effluents from all units on the site will be within the limits of 10 CFR Part 20.105(b). This specification applies to the release of gaseous effluents from all reactors at the site.

3/4.11.2.2 DOSE-NOBLE GASES

This specification is provided to implement the requirements of Sections II.B, 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.B 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 material in gaseous effluents will be kept "as low as is reasonably achievable." The Surveillance Requirements 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 a MEMBER OF THE PUBLIC through 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 and beyond the site boundary are based upon the historical average atmospheric conditions.

3/4.11.2.3 DOSE - IODINE-131, TRITIUM, AND RADIONUCLIDES IN PARTICULATE FORM

This specification 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 tne 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 ODCM calculational methods specified in the Surveillance Requirements 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 a MEMBER OF THE PUBLIC through appropriate pathways is unlikely to be substantially underestimated. The ODCM calculational methods for calculating the doses due to the actual release rates of the subject materials 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. These equations also provide for determining the actual doses based upon the historical average atmospheric conditions. The release rate specifications for iodine-131, tritium, and radionuclides in particulate form with half-lives greater than 8 days are dependent on the existing radionuclide pathways to man in the areas at or beyond the site boundary. The pathways that were examined in the development of these calculations were: 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 on the ground with subsequent exposure of man.

3/4.11.2.4 and 5 GASEOUS RADWASTE TREATMENT

The requirement that the appropriate portions of these systems 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 Part 50.36a, General Design Criterion 60 of Appendix A to 10 CFR Part 50, and the design objectives 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 dose design objectives set forth in Sections II.B and II.C of Appendix I, 10 CFR Part 50, for gaseous effluents. This specification applies to gaseous radwaste from Arkansas Nuclear One, Unit No. 2.

3/4.11.2.6 GAS STORAGE TANKS

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 a MEMBER OF THE PUBLIC at the nearest EXCLUSION AREA boundary will not exceed 0.5 rem. This is consistent with Branch Technical Position ETSB 11-5 in NUREG-0800, July 1981.

3/4.11.3 TOTAL DOSE

This specification is provided to meet the dose limitations of 40 CFR Part 190 that have now been incorporated into 10 CFR Part 20 by 46 FR 18525. 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. For sites containing up to four reactors, it is highly unlikely that the resultant dose to a MEMBER OF THE PUBLIC will exceed the dose limits of 40 CFR Part 190 if the individual reactors remain within the reporting requirment level. The Special Report will describe a course of action that should result in the limitation of the annual dose to a MEMBER OF THE PUBLIC to within the 40 CFR Part 190 limits. For the purposes of the Special Report, it may be assumed that the dose commitment to the MEMBER OF THE PUBLIC 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 8 km must be considered. If the dose to any MEMBER OF THE PUBLIC is estimated to exceed the requirements of 40 CFR Part 190, the Special Report with a request for a variance (provided the release conditions resulting in violation of 40 CFR Part 190 have not already been corrected), in accordance with the provisions of 40 CFR Part 190.11 and 10 CFR Part 20.405c, is considered to be a timely request and fulfills the requirements of 40 CFR Part 190 until NRC staff action is completed. The variance only relates to the limits of 40 CFR Part 190, and does not apply in any way to the other requirements for dose limitation of 10 CFR Part 20, as addressed in Specifications 3.11.1 and 3.11.2. An individual is not considered a MEMBER OF THE PUBLIC during any period in which he/she is engaged in carrying out any operation that is part of the nuclear fuel cycle.

3/4.11.4 SOLID RADIOACTIVE WASTE

This specification implements the requirements of 10 CFR 50.36a and General Design Criterion 60 of Appendix A to 10 CFR 50.

3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING

BASES

3/4.12.1 MONITORING PROGRAM

The radiological monitoring program required by this specification provides measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides which lead to the highest potential radiation exposures of individuals resulting from the station operation. This monitoring program thereby supplements the radiological effluents monitoring program 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 initially specified monitoring program will be effective for at least the first three years of commercial operation. Following this period, program changes may be initiated based on operational experience.

The detection capabilities required by Table 3.12-2 are state-of-the-art for routine environmental measurements in industrial laboratories. The LLDs for drinking water meet the requirements of 40 CFR 141.

3/4.12.2 LAND USE CENSUS

This specification is provided to ensure that changes in the use of unrestricted areas are identified and that modifications to the monitoring program are made if required by the results of this census. 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 pathway 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.

3/4.12.3 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 part of a quality assurance program for environmental monitoring in order to demonstrate that the results are reasonably valid.

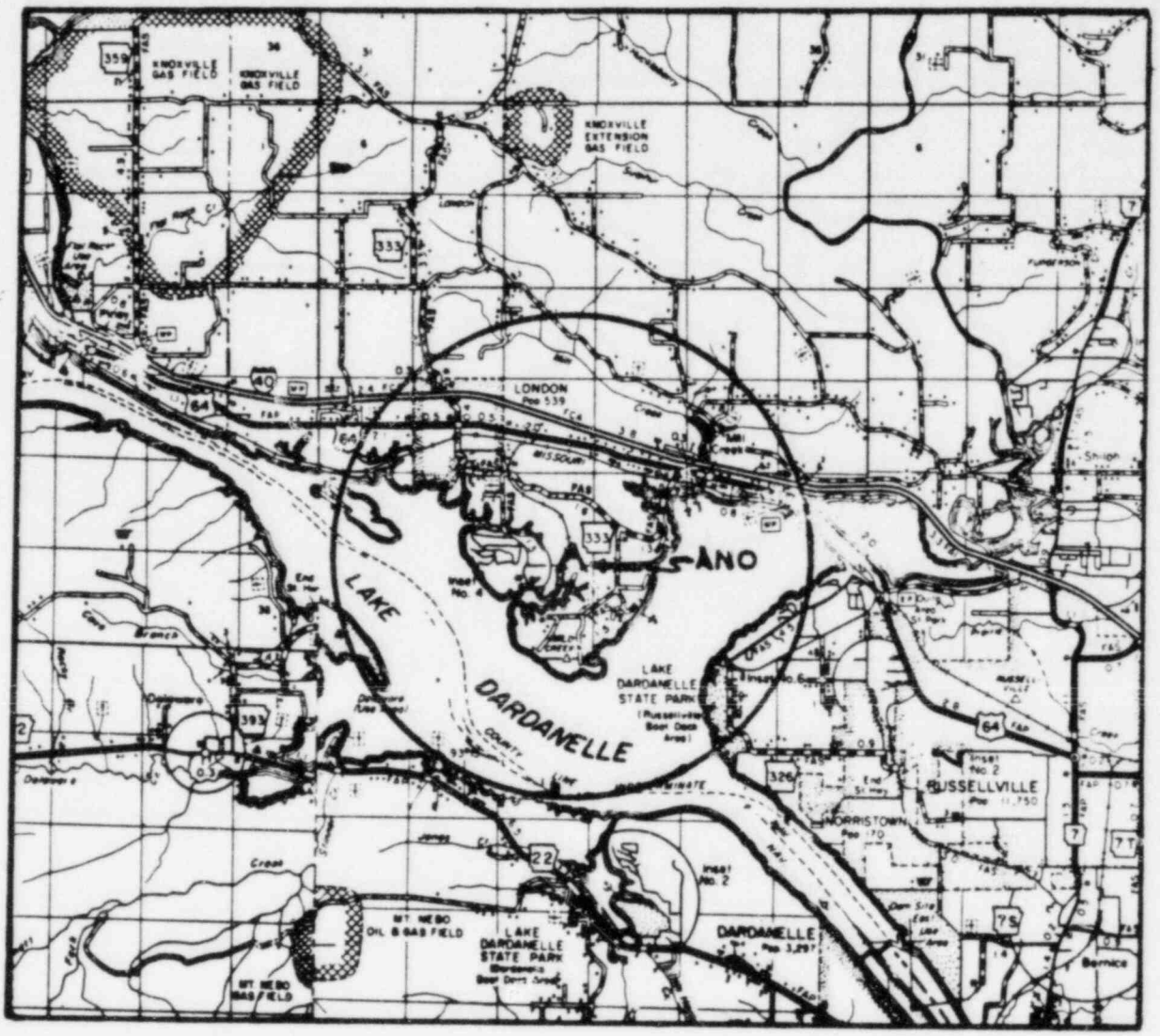

FIGURE 5.1-2

LOW POPULATION ZONE
(2.6 MILE RADIUS)

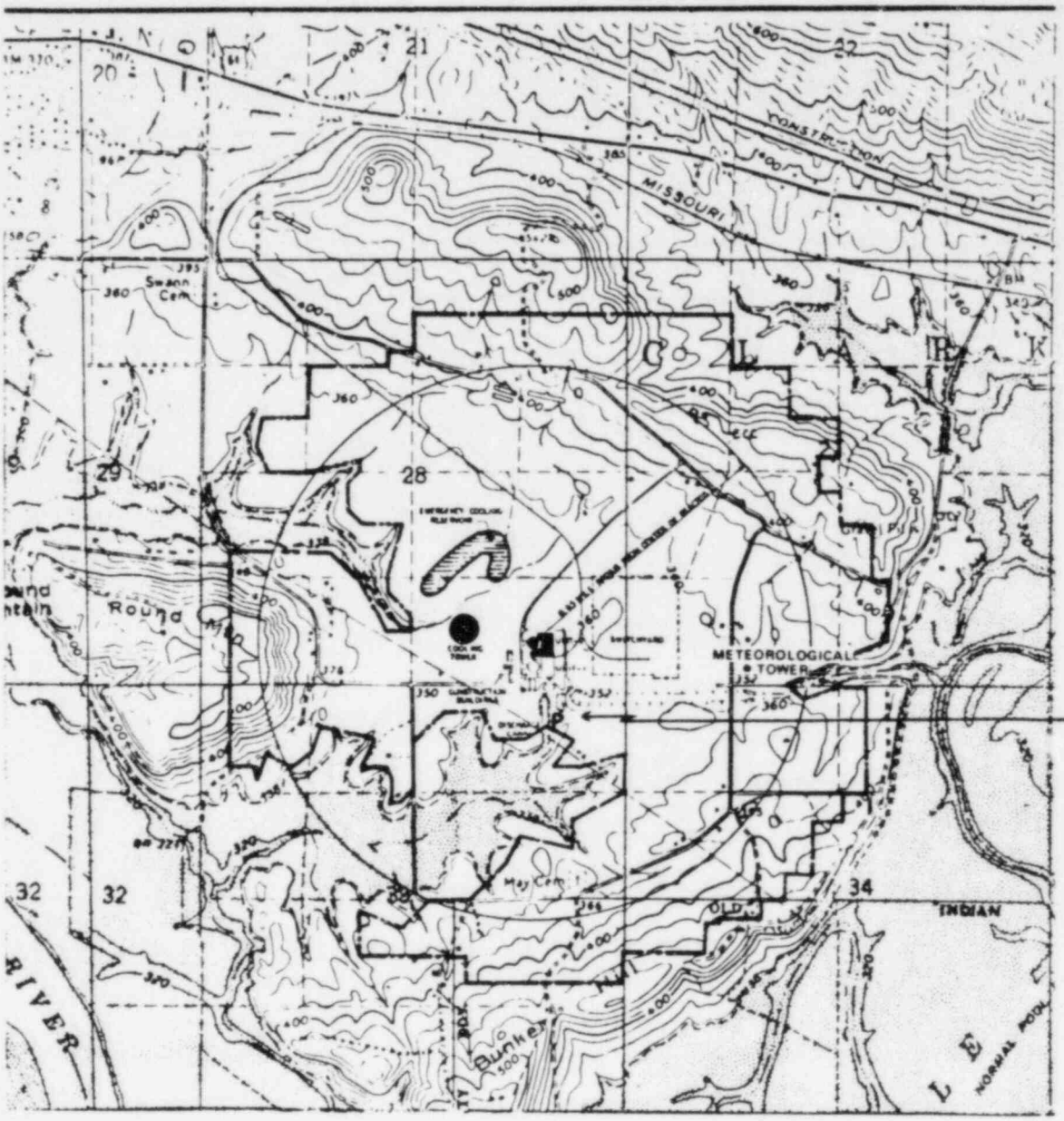

FIGURE 5.1-3

MAXIMUM AREA BOUNDARY FOR RADIOACTIVE RELEASE CALCULATION
(EXCLUSION AREAS)
1046 METER RADIUS FOR GASES
AT END OF DISCHARGE CANAL FOR LIQUIDS (POINT P)

f. Review of events requiring 24 hour written notification to the Commission.

g. Review of facility operations to detect potential nuclear safety hazards.

h. Performance of special reviews, investigations or analyses and reports thereon as requested by the ANO General Manager or the Safety Review Committee.

i. Review of the Plant Security Plan and implementing procedures and shall submit recommended changes to the ANO General Manager and the Safety Review Committee.

j. Review of the Emergency Plan and implementing procedures and shall submit recommended changes to the ANO General Manager and the Safety Review Committee.

k. Review of proposed changes to the ODCM and PCP.

AUTHORITY

6.5.1.7 The Plant Safety Committee shall:

a. Recommend in writing to the ANO General Manager approval or disapproval of items considered under 6.5.1.6(a) through (d) above.

b. Render determinations in writing with regard to whether or not each item considered under 6.5.1.6(a) through (e) above consitutes an unreviewed safety question.

c. Provide written notification within 24 hours to the Vice President, Nuclear Operations and the Safety Review Committee of disagreement between the PSC and the ANO General Manager; however, the ANO General Manager shall have responsibility for resolution of such disagreements pursuant to 6.1.1 above.

RECORDS

6.5.1.8 The Plant Safety Committee shall maintain written minutes of each PSC meeting that, at a minimum, document the results of all PSC activities performed under the responsibility and authority provisions of these technical specifications. Copies shall be provided to the ANO General Manager and Chairman of the Safety Review Committee.

6.5.2 SAFETY REVIEW COMMITTEE (SRC)

FUNCTION

6.5.2.1 The Safety Review Committee shall function to provide independent review and audit of designated activities in the areas of:

a. nuclear power plant operations

b. nuclear engineering

c. chemistry and radiochemistry

d. metallurgy

e. instrumentation and control

f. radiological safety

g. mechanical and electrical engineering

h. quality assurance practices

COMPOSITION

6.5.2.2 The SRC shall be composed of the:

Chairman:	Manager, Quality Assurance
Member:	General Manager, E.S. Administrative Services
Member:	General Manager, Technical Services
Member:	Manager, Nuclear Services
Member:	Manager, Technical Analysis
Member:	Manager, I&C Engineering
Member:	Corporate Health Physicist
Member:	Arkansas Nuclear One Plant Safety Committee Chairman
Member:	Nuclear Safety Oversight Engineer*

The Chairman shall designate in writing the alternate chairman in the absence of the SRC Chairman.

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* Middle South Services

ALTERNATES

6.5.2.3 All alternate members shall be appointed in writing by the SRC Chairman to serve on a temporary basis; however, no more than two alternates shall participate as voting members in SRC activities at any one time.

CONSULTANTS

6.5.2.4 Consultants shall be utilized as determined by the SRC Chairman to provide expert advice to the SRC.

MEETING FREQUENCY

6.5.2.5 The SRC shall meet at least once per calendar quarter during the initial year of unit operation following fuel loading and at least once per six months thereafter.

QUORUM

6.5.2.6 The minimum quorum of the SRC necessary for the performance of the SRC review and audit functions of these technical specifications shall consist of the Chairman or his designated alternate and at least 4 SRC members including alternates. No more than a minority of the quorum shall have line responsibility for operation of the unit.

REVIEW

6.5.2.7 The SRC shall review:

a. The safety evaluations for 1) changes to procedures, equipment or systems and 2) tests or experiments completed under the provision of Section 50.59, 10 CFR, to verify that such actions did not constitute an unreviewed safety question.

b. Proposed changes to procedures, equipment or systems which involve an unreviewed safety question as defined in Section 50.59, 10 CFR.

c. Proposed tests or experiments which involve an unreviewed safety question as defined in Section 50.59, 10 CFR.

d. Proposed changes to Technical Specifications or this Operating License.

e. Violations of codes, regulations, orders, Technical Specifications, license requirements, or of internal procedures or instructions having nuclear safety significance.

f. Significant operating abnormalities or deviations from normal and expected performance of unit equipment that affect nuclear safety.

g. Events requiring 24 hour written notification to the Commission.

h. All recognized indications of an unanticipated deficiency in some aspect of design or operation of structures, systems, or components that could affect nuclear safety.

i. Reports and meetings minutes of the Plant Safety Committee.

j. Proposed changes to the ODCM and PCP.

AUDITS

6.5.2.8 Audits of unit activities shall be performed under the cognizance of the SRC. These audits shall encompass:

a. The conformance of unit operation to provisions contained within the Technical Specifications and applicable license conditions at least once per 12 months.

b. The performance, training, and qualifications of the entire unit staff at least once per 12 months.

c. The results of actions taken to correct deficiencies occurring in unit equipment, structures, systems, or methods of operation that affect nuclear safety at least once per 6 months.

d. The performance of activities required by the Operational Quality Assurance Program to meet the criteria of Appendix "B", 10 CFR 50, at least once per 24 months.

e. The Facility Emergency Plan and implementing procedures at least once per 12 months.

f. The Facility Security Plan and implementing procedures at least once per 12 months.

g. Any other area of unit operation considered appropriate by the SRC or the Vice President, Nuclear Operations.

h. The Facility Fire Protection Program and implementing procedures at least once per 24 months.

i. An independent fire protection and loss prevention program inspection and audit shall be performed at least once per 12 months utilizing either qualified offsite licensee personnel or an outside fire protection firm.

j. An inspection and audit of the fire protection and loss prevention program shall be performed by a qualified outside fire consultant at least once per 26 months.

k. The ODCM, PCP and implementing procedures at least once per 24 months.

AUTHORITY

6.5.2.9 The SRC shall report to and advise the Vice President, Nuclear Operations on those areas of responsibility specified in Sections 6.5.2.7 and 6.5.2.8.

RECORDS

6.5.2.10 Records of SRC activities shall be prepared, approved and distributed as indicated below:

a. Minutes of each SRC meeting shall be prepared, approved and forwarded to the Vice President, Nuclear Operations within 14 days following each meeting.

b. Reports of reviews encompassed by Section 6.5.2.7 above, shall be prepared, approved and forwarded to the Vice President, Nuclear Operations within 14 days following completion of the review.

c. Audit reports encompassed by Section 6.5.2.8 above, shall be forwarded to the Vice President, Nuclear Operations and to the management positions responsible for the areas audited within 30 days after completion of the audit.

6.6 REPORTABLE OCCURRENCE ACTION

6.6.1 The following actions shall be taken for REPORTABLE OCCURRENCES:

a. The Commission shall be notified and/or a report submitted pursuant to the requirements of Specification 6.9.

b. Each REPORTABLE OCCURRENCE requiring 24 hour notification to the Commission shall be reviewed by the PSC and submitted to the SRC and the Vice President, Nuclear Operations.

6.7 SAFETY LIMIT VIOLATION

6.7.1 The following actions shall be taken in the event a Safety Limit is violated:

a. The unit shall be placed in at least HOT STANDBY within one hour.

b. The Safety Limit violation shall be reported to the Commission, the Vice President, Nuclear Operations and to the SRC within 24 hours.

c. A Safety Limit Violation Report shall be prepared. The report shall be reviewed by the PSC. This report shall describe (1) applicable circumstances preceding the violation, (2) effects of the violation upon facility components, systems or structures, and (3) corrective action taken to prevent recurrence.

d. The Safety Limit Violation Report shall be submitted to the Commission, the SRC and the Vice-President, Nuclear Operations within 14 days of the violation.

6.8 PROCEDURES

6.8.1 Written procedures shall be established, implemented and maintained covering the activities referenced below:

a. The applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, Revision 2, February 1978.

b. Refueling operations.

c. Surveillance and test activities of safety related equipment.

d. Security Plan implementation.

e. Emergency Plan implementation.

f. Fire Protection Program implementation.

g. Modification of Core Protection Calculator (CPC) Addressable Constants
NOTE: Modification to the CPC addressable constants based on information obtained through the Plant Computer - CPC data link shall not be made without prior approval of the Plant Safety Committee.

h. New and spent fuel storage.

i. ODCM and PCP implementation.

6.8.2 Each procedure of 6.8.1 above, and changes thereto, shall be reviewed by the PSC and approved by the ANO General Manager prior to implementation and reviewed periodically as set forth in administrative procedures.

6.8.3 Temporary changes to procedures of 6.8.1 above may be made provided:

a. The intent of the original procedure is not altered.

b. The change is approved by two members of the plant management staff, at least one of whom holds a Senior Reactor Operator's License on the unit affected.

c. The change is documented, reviewed by the PSC and approved by the ANO General Manager within 14 days of implementation.

6.9 REPORTING REQUIREMENTS

ROUTINE REPORTS AND REPORTABLE OCCURRENCES

6.9.1 In addition to the applicable reporting requirements of Title 10, Code of Federal Regulations, the following reports shall be submitted to the Administrator of the Regional Office unless otherwise noted.

STARTUP REPORT

6.9.1.1 A summary report of plant startup and power escalation testing shall be submitted following (1) receipt of an operating license, (2) amendment to the license involving a planned increase in power level, (3) installation of fuel that has a different design or has been manufactured by a different fuel supplier, and (4) modifications that may have significantly altered the nuclear, thermal, or hydraulic performance of the plant.

6.9.1.2 The startup report shall address each of the tests identified in the FSAR and shall include a description of the measured values of the operating conditions or characteristics obtained during the test program and a comparison of these values with design predictions and specifications. Any corrective actions that were required to obtain satisfactory operation shall also be described. Any additional specific details required in license conditions based on other commitments shall be included in this report.

6.9.1.3 Startup reports shall be submitted within (1) 90 days following completion of the startup test program, (2) 90 days following resumption or commencement of commercial power operation, or (3) 9 months following initial criticality, whichever is earliest. If the Startup Report does not cover all three events (i.e., initial criticality, completion of startup test program, and resumption or commencement of commercial power operation), supplementary reports shall be submitted at least every three months until all three events have been completed.

d. Reactivity anomalies involving disagreement with the predicted value of reactivity balance under steady state conditions during power operation greater than or equal to 1% Δk/k; a calculated reactivity balance indicating a SHUTDOWN MARGIN less conservative than specified in the technical specifications; short-term reactivity increases that correspond to a reactor period of less than 5 seconds or, if subcritical, an unplanned reactivity insertion of more than 0.5% Δk/k; or occurrence of any unplanned criticality.

e. Failure or malfunction of one or more components which prevents or could prevent, by itself, the fulfillment of the functional requirements of system(s) used to cope with accidents analyzed in the SAR.

f. Personnel error or procedural inadequacy which prevents or could prevent, by itself, the fulfillment of the functional requirements of systems required to cope with accidents analyzed in the SAR.

g. Conditions arising from natural or man-made events that, as a direct result of the event require unit shutdown, operation of safety systems, or other protective measures required by technical specifications.

h. Errors discovered in the transient or accident analyses or in the methods used for such analyses as described in the safety analysis report or in the bases for the technical specifications that have or could have permitted reactor operation in a manner less conservative than assumed in the analyses.

i. Performance of structures, systems, or components that requires remedial action or corrective measures to prevent operation in a manner less conservative than assumed in the accident analyses in the safety analysis report or technical specifications bases; or discovery during unit life of conditions not specifically considered in the safety analysis report or technical specifications that require remedial action or corrective measures to prevent the existence or development of an unsafe condition.

THIRTY DAY WRITTEN REPORTS

6.9.1.9 The types of events listed below shall be the subject of written reports to the Administrator of the 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 form 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.

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.

d. Abnormal degradation of systems other than those specified in 6.9.1.8.c above designed to contain radioactive material resulting from the fission process.

e. An unplanned offsite release of 1) more than 1 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. This report shall include the following information:

   1. Description of the occurrence.

   2. Identify the cause(s) of exceeding the limit(s).

   3. Explain corrective action(s) taken to mitigate occurrence.

   4. Define action(s) taken to prevent recurrence.

   5. Summary of the consequence(s) of occurrence.

SPECIAL REPORTS

6.9.2 Special reports shall be submitted to the Administrator of the Regional Office within the time period specified for each report. These reports shall be submitted covering the activities identified below pursuant to the requirements of the applicable reference specification:

a. ECCS Actuation, Specifications 3.5.2 and 3.5.3.

b. Inoperable Seismic Monitoring Instrumentation, Specification 3.3.3.3.

c. Inoperable Meteorological Monitoring Instrumentation, Specification 3.3.3.4.

d. Seismic event analysis, Specification 4.3.3.3.2.

e. Inoperable Fire Detection Instrumentation, Specification 3.3.3.8.

f. Inoperable Fire Suppression Systems, Specifications 3.7.10.1 and 3.7.10.2.

g. Primary Coolant Specific Activity, Specification 3.4.8.

h. Radioactive Effluents, Specifications 3.11.1.1, 3.11.1.2, 3.11.1.3, 3.11.2.1, 3.11.2.2, 3.11.2.3, and 3.11.2.4 and 3.11.2.5.

This report shall include the following:

1) Description of the occurrence.

2) Identify the cause(s) for exceeding the limit(s).

3) Explain corrective action(s) taken to mitigate occurrence.

4) Define action(s) taken to prevent recurrence.

5) Summary of consequence(s) of occurrence.

SEMIANNUAL RADIOLOGICAL EFFLUENT RELEASE REPORT*

6.9.3 Routine radioactive effluent release reports covering the operating of the unit during the previous 6 months of operations shall be submitted within 60 days after January 1 and July 1 of each year.

*A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station; however, for units with separate radwaste system, the submittal shall specify the releases of radioactive material from each unit.

6.9.3.1 The radioactive effluent release report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste release from the unit. The data will be summarized on a quarterly basis following the format of Regulatory Guide 1.21, Revision 0, Appendix A.

6.9.3.2 Any changes in the OFFSITE DOSE CALCULATION MANUAL and PCP shall be included in the semiannual report for the period in which the change(s) was made effective.

6.9.3.3 The radioactive effluent release reports shall include the following information for all unplanned releases to UNRESTRICTED AREAS of radioactive materials in gaseous and liquid effluents:

1. Description of the occurrence.
2. Identify the cause(s) for exceeding the limit(s).
3. Explain corrective actions taken to mitigate occurrence.
4. Define action(s) taken to prevent recurrence.
5. Summary of consequence(s) of occurrence.

6.9.3.4 The first report filed each year shall contain:

1. A summary of the hourly meteorological data collected over the previous calendar year. In lieu of including this summary in the report, the data may be retained by the licensee for NRC review and noted as such in the report.
2. A summary of radiation doses due to radiological effluent during the previous calendar year calculated in accordance with the methodology specified in the OFFSITE DOSE CALCULATION MANUAL.
3. The radiation dose to members of the public due to their activities inside the site boundary. This calculated dose shall include only those dose contributions directly attributed to operation of the unit and shall be compared to the limits specified in 40 CFR 190.

6.9.3.5 The first report filed each year shall contain description of licensee initiated major changes to the radioactive waste systems (liquid, gaseous and solid) during the previous calendar year.*

*This information may be included in the annual FSAR update in lieu of inclusion in this report.

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT*

6.9.4 Routine radiological environmental operating reports covering the operation of the unit during the previous calendar year shall be submitted prior to May 1 of each year.

a. The annual radiological environmental operating 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 3.12.2. If harmful effects or evidence or 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.

b. The annual radiological environmental operating reports shall include summarized and tabulated results 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.

c. 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 3.12.3.

*A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station; however, for units with separate radwaste systems, the submittal shall specify the releases of radioactive material from each unit.

6.10 RECORD RETENTION

In addition to the applicable record retention requirements of Title 10, Code of Federal Regulations, the following records shall be retained for at least the minimum period indicated.

6.10.1 The following records shall be retained for at least five years:

a. Records and logs of unit operation covering time interval at each power level.

b. Records and logs of principal maintenance activities, inspections, repair and replacement of principal items of equipment related to nuclear safety.

c. ALL REPORTABLE OCCURRENCES submitted to the Commission.

d. Records of surveillance activities, inspections and calibrations required by these Technical Specifications.

e. Records of changes made to the procedures required by Specification 6.8.1.

f. Records of radioactive shipments.

g. Records of sealed source and fission detector leak tests and results.

h. Records of annual physical inventory of all sealed source material of record.

6.10.2 The following records shall be retained for the duration of the Facility Operating License:

a. Records and drawing changes reflecting unit design modifications made to systems and equipment described in the Final Safety Analysis Report.

b. Records of new and irradiated fuel inventory, fuel transfers and assembly burnup histories.

c. Records of radiation exposure for all individuals entering radiation control areas.

d. Records of gaseous and liquid radioactive material released to the environs.

e. Records of transient of operational cycles for those unit components identified in Table 5.7-1.

f. Records of reactor tests and experiments.

g. Records of training and qualification for current members of the unit staff.

h. Records of in-service inspections performed pursuant to these Technical Specifications.

i. Records of Quality Assurance activities required by the QA Manual.

j. Records of reviews performed for changes made to procedures or equipment or reviews of tests and experiments pursuant to 10 CFR 50.59.

k. Records of meetings of the PSC and the SRC.

l. Records of changes to the Core Protection Calculator System (CPCS) SOFTWARE. Changes to the CPCS SOFTWARE shall be made in accordance with methods approved by the NRC. These records shall include the following:

   1. Purpose of change.

   2. Detailed description of change including algorithms, changes to the assembly listings, checksums and disk identification numbers.

   3. Summary of validation test results.

m. Records of Environmental Qualification which are covered under the provisions of paragraph 6.12.

6.11 RADIATION PROTECTION PROGRAM

Procedures for personnel radiation protection shall be prepared consistent with the requirements of 10 CFR Part 20 and shall be approved, maintained and adhered to for all operations involving personnel radiation exposure.

6.12 ENVIRONMENTAL QUALIFICATION

6.12.1 By no later than June 30, 1982 all safety-related electrical equipment in the facility shall be qualified in accordance with the provisions of: Division of Operating Reactors "Guidelines for Evaluating Environmental Qualification of Class IE Electrical Equipment in Operating Reactors" (DOR Guidelines); or NUREG-0588 "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment", December 1979. Copies of these documents are attached to Order for Modification of License NPF-6 dated October 24, 1980.

6.12.2 By no later than December 1, 1980, complete and auditable records must be available and maintained at a central location which describe the environmental qualification method used for all safety-related electrical equipment in sufficient detail to document the degree of compliance with the DOR Guidelines or NUREG-0588. Thereafter, such records should be updated and maintained current as equipment is replaced, further tested, or otherwise further qualified.

6.13 HIGH RADIATION AREA

6.13.1 In lieu of the "control device" or "alarm signal" required by paragraph 20.203(c)(2) of 10 CFR 20, each high radiation area (as defined in 20.202(b)(3) of 10 CFR 20) in which the intensity of radiation is 1000 mrem/hr or less shall be barricaded and conspicuously posted as a high radiation area and entrance thereto shall be controlled by requiring the issuance of a radiation work permit. Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

a. A radiation monitoring device which continuously indicates the radiation dose rate in the area.

b. A radiation monitoring device which continuously integrates the radiation dose rate in the area and alarms when a present integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate level in the area has been established and personnel have been made knowledgeable of them.

c. An individual qualified in radiation protection procedures who is equipped with a radiation dose rate monitoring device. This individual shall be responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified in the radiation work permit.

6.13.2 The requirements of 6.13.1, above, shall also apply to each high radiation area in which the intensity of radiation is greater than 1000 mrem/hr. In addition, locked doors shall be provided to prevent unauthorized entry into such areas and access to these areas shall be maintained under the administrative control of the Shift Supervisor on duty and/or the Health Physics Superintendent.

6.14 OFFSITE DOSE CALCULATION MANUAL* (ODCM)

FUNCTION

6.14.1 The ODCM shall describe the methodology and parameters to be used in the calculation of offsite doses due to radioactive gaseous and liquid effluents and in the calculation of gaseous and liquid effluent monitoring instrumentation alarm/trip setpoints consistent with the applicable LCOs contained in these Technical Specifications.

6.14.2 Changes to the ODCM made by the licensee shall:

1. Be reviewed and found acceptable by the PSC and SRC.

2. Be submitted to the Commission by inclusion in the Semiannual Radiological Effluent Release Report pursuant to Specification 6.9.3 for the period in which the change(s) was made effective and shall contain:

   a. Sufficiently detailed information to totally support the rationale for the change. Information submitted should consist of a package of those pages of the ODCM to be changed with each page numbered and provided 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.

3. Shall become effective upon a date specified and agreed to by both the PSC and SRC following their review and acceptance of the change(s).

*This document is the same document as the ODCM required in the ANO-1 Technical Specifications.