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1.6 INSTRUMENTATION SURVEILLANCE

1.6.1 Channel Calibration

Adjustment of channel output such that it responds, with acceptable range and accuracy, to known value of the parameter which the channel monitors. Calibration shall encompass the entire channel, including the sensor and alarm or trip function, and shall be deemed to include the channel functional test.

1.6.2 Channel Check

A qualitative determination of acceptable operability by observation of channel behavior during operation. This determination will include, whenever possible, comparison of the channel with other independent channels measuring the same variable.

1.6.3 Channel Functional Test

Injection of a simulated signal into the channel to verify that it is operable, including alarm and/or trip initiating action.

1.6.4 Source Check

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

1.7 CONTAINMENT INTEGRITY

Containment integrity is defined to exist when:

- a. All non-automatic containment isolation valves not required for normal operation are closed and blind flanges are properly installed where required.
- b. The equipment door is properly closed and sealed.

- c. At least one door in the personnel air lock is properly closed and sealed.
- d. All automatic containment isolation trip valves required to be closed during accident conditions are operable or are secured closed except as stated in Specification 3.6.3. Manual valves qualifying as automatic containment isolation valves are secured closed.
- e. The uncontrolled containment leakage satisfies Specification 4.4.

1.8 QUADRANT POWER TILT

The quadrant power tilt is defined as the ratio of maximum to average of the upper excore detector currents or the lower excore detector currents, whichever is greater. If one excore is out of service, the three in-service units are used in computing the average.

1.9 FIRE SUPPRESSION WATER SYSTEM

A fire suppression water system shall consist of : a water source; pumps; and distribution piping with associated sectionalizing control or isolation valves.

1.10 STAGGERED TEST BASIS

A Staggered Test Basis shall consist of:

- a. A test schedule for n systems, subsystems, trains or designated components obtained by dividing the specified test interval into n equal subintervals.
- b. The testing of one system, subsystem, train or designated components at the beginning of each subinterval.

1.11 GASEOUS RADWASTE TREATMENT SYSTEM

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

1.12 VENTILATION EXHAUST TREATMENT SYSTEM

The Ventilation Exhaust Treatment System is the 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 prior to their release to the environment. Engineered Safety Feature (ESF) atmospheric cleanup systems are not considered to be Ventilation Exhaust Treatment System components.

1.13 OFFSITE DOSE CALCULATION MANUAL (ODCM)

The Offsite Dose Calculation Manual shall contain the current methodology and parameters used in the calculation of offsite doses due to radioactive gaseous and liquid effluents and the methodology to calculate gaseous and liquid effluent monitoring alarm/trip setpoints; and, the requirements of the environmental radiological monitoring program.

1.14 DOSE EQUIVALENT I-131

The Dose Equivalent I-131 shall be that 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 NRC Regulatory Guide 1.109, Revision 1, October 1977.

1.15 PROCESS CONTROL PROGRAM (PCP)

The PROCESS CONTROL PROGRAM (PCP) shall contain the current formulae, sampling, analyses, tests and determinations to be made to ensure that the processing and packaging of solid radioactive wastes based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to assure compliance with 10 CFR Part 20, 10 CFR Part 71, and Federal and State regulations and other requirements governing the disposal of the radioactive waste.

1.16 SOLIDIFICATION

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

1.17 PURGE - PURGING

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

1.18 VENTING

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

1.19 SITE BOUNDARY

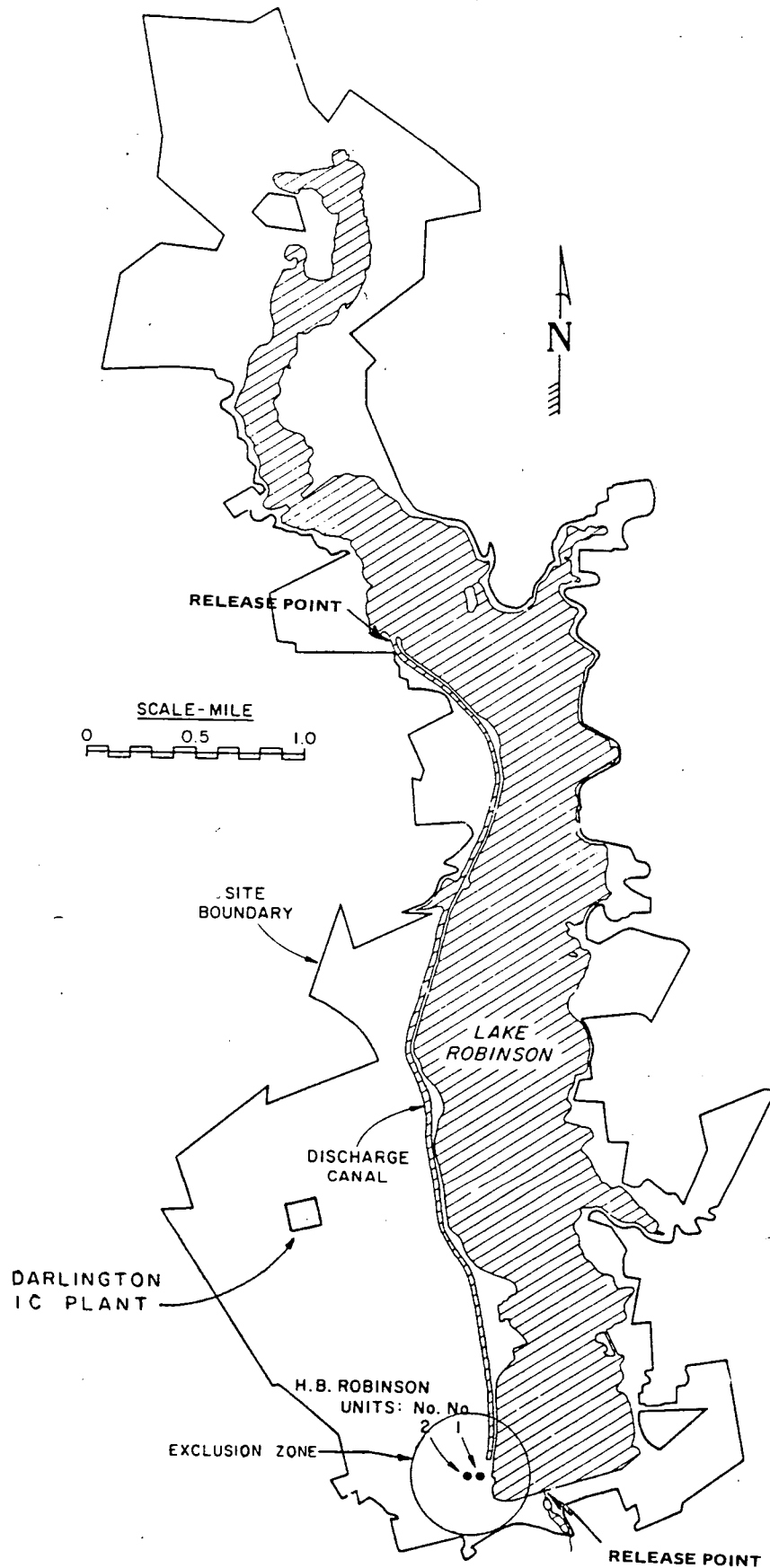
The site boundary shall be that line beyond which the land is not owned, leased, or otherwise controlled by the licensee, as defined by Figure 1.1-1.

1.20 MEMBER(S) OF THE PUBLIC

Member(s) of the public shall include all individuals who by virtue of their occupational status have no formal association with the plant. This category shall include non-employees of the licensee who are permitted to use portions of the site for recreational, occupational or other purposes not associated with plant functions. This category shall not include non-employees such as vending machine servicemen, or postmen who, as part of their formal job function, occasionally enter an area that is controlled by the licensee for the purposes of protection of individuals from exposure to radiation and radioactive materials.

1.21 UNRESTRICTED AREA

Any area beyond the site boundary.



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UNIT 2
Carolina Power & Light Company

PLANT SITE BOUNDARY
AND EXCLUSION ZONE

FIGURE
1.1-1

3.5 INSTRUMENTATION SYSTEMS

3.5.1 Operational Safety Instrumentation

Applicability

Applies to plant operational safety instrumentation systems.

Objective

To provide for automatic initiation of the Engineered Safety Features in the event that principal process variable limits are exceeded, and to delineate the conditions of the plant instrumentation and safety circuits necessary to ensure reactor safety.

Specification

- 3.5.1.1 The Engineered Safety Features initiation instrumentation setting limits shall be as stated in Table 3.5-1.
- 3.5.1.2 For on-line testing or in the event of a subsystem instrumentation channel failure, plant operation at rated power shall be permitted to continue in accordance with Tables 3.5-2 through 3.5-5.
- 3.5.1.3 In the event the number of channels of a particular subsystem in service falls below the limits given in the column entitled Minimum Operable Channels, or Minimum Degree of Redundancy cannot be achieved, operation shall be limited according to the requirement shown in Column 3 of Tables 3.5-2 through 3.5-4 and Column 2 of Table 3.5-5.

3.5.2 Radioactive Liquid Effluent Instrumentation

Applicability

Applies to the radioactive liquid effluent instrumentation system.

Objective

To define the operating requirements for the radioactive liquid effluent instrumentation system.

Specification

- 3.5.2.1 The radioactive liquid effluent monitoring instrumentation channels shown in Table 3.5-6 shall be operable with their alarm/trip setpoints set to ensure that the limits of Specification 3.9.1.1 are not exceeded. The alarm/trip setpoints shall be determined in accordance with the ODCM.
- 3.5.2.2 With a radioactive liquid monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above specification, immediately suspend the release of radioactive liquid effluent monitored by the affected channel, change the setpoint so it is acceptably conservative, or declare the channel not operable.
- 3.5.2.3 With less than the minimum number of radioactive liquid effluent monitoring instrumentation operable, take the action shown in Table 3.5-6
- 3.5.3 Radioactive Gaseous Effluent Instrumentation

Applicability

Applies to the radioactive gaseous effluent instrumentation system.

Objective

To define the operating requirements for the radioactive gaseous effluent instrumentation system.

Specification

- 3.5.3.1 The radioactive gaseous effluent monitoring instrumentation channels shown in Table 3.5-7 shall be operable with their alarm/trip setpoints set to ensure that the limits of Specification 3.9.3.1 are not exceeded. The alarm/trip setpoints of these channels shall be determined in accordance with the ODCM.
- 3.5.3.2 With a radioactive effluent monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above specification, immediately suspend the release of radioactive gaseous effluents, change the setpoint so it is acceptably conservative, or declare the channel not operable.
- 3.5.3.3 With less than the minimum number of radioactive effluent monitoring instrumentation channels operable take the action shown in Table 3.5-7.

Basis

Operational Safety Instrumentation

Instrumentation has been provided to sense accident conditions and to initiate operation of the Engineered Safety Features.⁽¹⁾

Safety Injection System Actuation

Protection against a Loss-of-Coolant or Steam Break accident is brought about by automatic actuation of the Safety Injection System which provides emergency cooling and reduction of reactivity.

The Loss-of-Coolant Accident is characterized by depressurization of the Reactor Coolant System and rapid loss of reactor coolant to the containment. The Engineered Safety Features have been designed to sense these effects of the Loss-of-Coolant Accident by detecting low pressurizer pressure and generate signals actuating the SIS active phase.

The SIS active phase is also actuated by a high containment pressure signal (Hi-Level) brought about by loss of high enthalpy coolant to the containment. This actuation signal acts as a backup to the low pressurizer pressure signal actuation of the SIS and also adds diversity to protection against loss of coolant.

Signals are also provided to actuate the SIS upon sensing the effects of a steam line break accident. Therefore, SIS actuation following a steam line break is designed to occur upon sensing high differential steam pressure between the steam header and steam generator line or upon sensing high steam line flow in coincidence with low reactor coolant average temperature or low steam line pressure.

The increase in the extraction of RCS heat following a steam line break results in reactor coolant temperature and pressure reduction. For this reason, protection against a steam line break accident is also provided by low pressurizer pressure signals actuating safety injection.

Protection is also provided for a steam line break in the containment by actuation if SIS upon high containment pressure.

SIS actuation injects highly borated fluid into the Reactor Coolant System in order to counter the reactivity insertion brought about by cooldown of the reactor coolant which occurs during a steam line break accident.

Containment Spray

The Engineered Safety Features also initiate containment spray upon sensing a high containment pressure signal (Hi-Hi Level). The containment spray acts to reduce containment pressure in the event of a loss of coolant or steam line break accident inside the containment, in order to reduce containment pressure. The containment spray cools the containment directly and limits the release of fission products by absorbing iodine should it be released to the containment.

Containment spray is designed to be actuated at a higher containment pressure (approximately 50% of design containment pressure) than the SIS (10% of design). Since spurious actuation of containment spray is to be avoided, it is initiated only on coincidence of Hi-Hi Level containment pressure sensed by both of the two sets of containment pressure signals provided for its actuation.

Steam Line Isolation

Steam line isolation signals are initiated by the Engineered Safety Features closing all steam line stop valves. In the event of a steam line break, this action prevents continuous, uncontrolled steam release from more than one steam generator by isolating the steam lines on high containment pressure (Hi-Hi-Level) or high steam line flow. Protection is afforded for breaks inside or outside the containment even when it is assumed that there is a single failure in the steam line isolation system.

Feedwater Line Isolation

The feedwater lines are isolated upon actuation of the Safety Injection System in order to prevent excessive cooldown of the reactor coolant system. This mitigates the effect of an accident such as a steam break which, in itself, causes excessive coolant temperature cooldown.

Feedwater line isolation also reduces the consequences of a steam line break inside the containment, by stopping the entry of feedwater.

Setting Limits

- a. The Hi-Level containment pressure limit is set at about 10% of design containment pressure. Initiation of Safety Injection protects against Loss-of-Coolant⁽²⁾ or steam line break⁽³⁾ accidents as discussed in the safety analysis.

- b. The Hi-Hi Level containment pressure limit is set at about 50% of design containment pressure. Initiation of Containment Spray and Steam Line Isolation protects against large Loss-of-Coolant⁽²⁾ or steam line break accidents,⁽³⁾ as discussed in the safety analysis.
- c. The pressurizer low pressure limit is set substantially below system operating pressure limits. However it is sufficiently high to protect against a Loss-of-Coolant Accident as shown in the safety analysis.⁽²⁾
- d. The steam line high differential pressure limit is set in the event of a large steam line break accident, as shown in the safety analysis.⁽³⁾
- e. The high steam line flow limit is set at approximately 40% of the steam flow from no load to 20% and at 110% of full steam flow at full load, with the steam flow differential pressure measurement linearly programmed between 20% load and 100% load in order to protect against large steam line break accidents.⁽⁴⁾ The coincident low T_{avg} setting limit for SIS and steam line isolation initiation is set below its hot shutdown value. The coincident steam line pressure setting limit is set below the full load operating pressure. The safety analysis shows that these settings provide protection in the event of a large steam line break.⁽³⁾

Instrument Operating Conditions

During plant operations, the complete instrumentation systems will normally be in service. Reactor safety is provided by the Reactor Protection System, which automatically initiates appropriate action to prevent exceeding

established limits. Safety is not compromised, however, by continuing operation with certain instrumentation channels out of service since provisions were made for this in the plant design. This specification outlines limiting conditions for operation necessary to preserve the effectiveness of the Reactor Control and Protection System when any one or more of the channels is out of service.

Almost all reactor protection channels are supplied with sufficient redundancy to provide the capability for channel calibration and test at power. Exceptions are backup channels such as reactor coolant pump breakers. The removal of one trip channel on process control equipment is accomplished by placing that channel bistable in a tripped mode; e.g., a two-out-of-three circuit becomes a one-out-of-two circuit. The nuclear instrumentation system channels are not intentionally placed in a tripped mode since the test signal is superimposed on the normal detector signal to test at power. Testing of the NIS power range channel requires (a) bypassing the Dropped Rod protection from NIS, for the channel being tested, (b) defeating the $\Delta T/T_{avg}$ protection CHANNEL SET that is being fed from the NIS channel, and (c) defeating the power mismatch section of T_{avg} control channels when the appropriate NIS channel is being tested. However, the Rod Position System and remaining NIS channels still provide the dropped-rod protection. Testing does not trip the system unless a trip condition exists in a concurrent channel.

Instrumentation to Assess Plant Conditions During and Following an Accident

The OPERABILITY of the accident monitoring instrumentation ensures that sufficient information is available on selected plant parameters to monitor and assess these variables during and following an accident. This capability is consistent with the recommendations of Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power 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," July 1979.

Radioactive Liquid Effluent Instrumentation

The radioactive liquid effluent monitoring 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. The operability and use of this instrumentation are consistent with the requirements of General Design Criteria 60, 63, and 64 of Appendix A to 10 CFR Part 50.

Radioactive Gaseous Effluent Instrumentation

The radioactive gaseous effluent monitoring 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. The operability and use of this instrumentation are consistent with the requirements of General Design Criteria 60, 63, and 64 of Appendix A to 10 CFR Part 50.

References

- (1) FSAR Section 7.5
- (2) FSAR Section 14.3
- (3) FSAR Section 14.2.5
- (4) CP&L Letter to the Directorate of Licensing dated October 23, 1973.

TABLE 3.5-1

ENGINEERED SAFETY FEATURE SYSTEM INITIATION INSTRUMENT SETTING LIMITS

<u>NO.</u>	<u>FUNCTIONAL UNIT</u>	<u>CHANNEL ACTION</u>	<u>SETTING LIMIT</u>
1.	High Containment Pressure (HI Level)	Safety Injection*	\leq 5 psig
2.	High Containment Pressure (HI-HI Level)	a. Containment Spray** b. Steam Line Isolation	\leq 25 psig
3.	Pressurizer Low Pressure	Safety Injection*	\geq 1700 psig
4.	High Differential Pressure Between any Steam Line and the Steam Line Header	Safety Injection*	\leq 150 psi
5.	High Steam Flow in 2/3 Steam Lines***	a. Safety Injection* b. Steam Line Isolation	\leq 40% (at zero load) of full steam flow \leq 40% (at 20% load) of full steam flow \leq 110% (at full load) of full steam flow
	Coincident with Low T_{avg} or Low Steam Line Pressure		\geq 541°F T_{avg} **** \geq 600 psig T_{avg} Steam line pressure****
6.	Loss of Power		
	a. 480 V Emerg. Bus Undervoltage (Loss of Voltage) Time Delay	Trip Normal Supply Breaker	328 Volts \pm 1 Volt .75 \pm .25 sec.

TABLES 3.5-1 (Continued)

ENGINEERED SAFETY FEATURE SYSTEM INITIATION INSTRUMENT SETTING LIMITS

<u>NO.</u>	<u>FUNCTIONAL UNIT</u>	<u>CHANNEL ACTION</u>	<u>SETTING LIMIT</u>
6. (Cont'd)	b. 480V Emerg. Bus Undervoltage (Degraded Voltage) Time Delay	Trip Normal Supply Breaker 10.0 second delay + 0.5 sec.	412 Volts <u>+</u> 1 Volt
7.	Containment Radioactivity High	Ventilation Isolation the alarm is set with known plant conditions	<u><</u> 2 X reading at the time

* Initiates also containment isolation (Phase A), feedwater line isolation, and starting of all containment fans.

** Initiates also containment isolation (Phase B).

*** Derived from equivalent ΔP measurements.

**** These setting limits shall be greater than or equal to 524°F and 450 psig when operating under reduced temperature conditions described in the November 11, 1981 license submittal.

TABLE 3.5-2

REACTOR TRIP INSTRUMENTATION LIMITING OPERATING CONDITIONS

<u>NO.</u>	<u>FUNCTIONAL UNIT</u>	<u>1</u> <u>MINIMUM</u> <u>OPERABLE</u> <u>CHANNELS</u>	<u>2</u> <u>MINIMUM</u> <u>DEGREE</u> <u>OF</u> <u>REDUNDANCY</u>	<u>3</u> <u>OPERATOR ACTION</u> <u>IF CONDITIONS OF</u> <u>COLUMN 1 OR 2</u> <u>CANNOT BE MET</u>
1.	Manual	1	0	Maintain hot shutdown
2.	Nuclear Flux Power Range*	3	2	Maintain hot shutdown
3.	Nuclear Flux Intermediate Range	1	0	Maintain hot shutdown**
4.	Nuclear Flux Source Range	1	0	Maintain hot shutdown***
5.	Overtemperature ΔT	2	1	Maintain hot shutdown
6.	Overpower ΔT	2	1	Maintain hot shutdown
7.	Low Pressurizer Pressure	2	1	Maintain hot shutdown
8.	Hi Pressurizer Pressure	2	1	Maintain hot shutdown
9.	Pressurizer-Hi Water Level	2	1	Maintain hot shutdown
10.	Low Reactor Coolant Flow	2/operable loop	1/operable loop	Maintain hot shutdown
11.	Turbine Trip	2	1	Maintain less than 10% R.P.

TABLE 3.5-2 (Cont'd)

REACTOR TRIP INSTRUMENTATION LIMITING OPERATING CONDITIONS

<u>NO.</u>	<u>FUNCTIONAL UNIT</u>	<u>1</u> <u>MINIMUM</u> <u>OPERABLE</u> <u>CHANNELS</u>	<u>2</u> <u>MINIMUM</u> <u>DEGREE</u> <u>OF</u> <u>REDUNDANCY</u>	<u>3</u> <u>OPERATOR ACTION</u> <u>IF CONDITIONS OF</u> <u>COLUMN 1 OR 2</u> <u>CANNOT BE MET</u>
12.	Lo Lo Steam Generator Water Level	2	1	Maintain Hot Shutdown
13.	Underfrequency 4 KV System	2	1	Maintain Hot Shutdown
14.	Undervoltage on 4 KV System	2	1	Maintain Hot Shutdown
15.	Control Rod Misalignment Monitor****			
	a. Rod Position Deviation	1	0	Log individual rod position once/hour, and after a load change >10% or after >30 inches of control rod motion
	b. Quadrant Power Tilt Monitor (upper and lower ex-core neutron detectors)	1	0	Log individual upper and lower ion chamber currents once/hour and after a load change >10% or after >30 inches of control rod motion

* For zero power physics testing, it is permissible to take one channel out of service.

** When two of four power channels are greater than 10% full power, hot shutdown is not required.

*** When one of two intermediate range channels is greater than 1E-10 amps, hot shutdown is not required.

**** If both rod misalignment monitors (a and b) are inoperable for two hours or more, the nuclear overpower trip shall be reset to 93 percent of rated power in addition to the increased surveillance noted.

R.P. = Rated Power

TABLE 3.5-3

INSTRUMENTATION OPERATING CONDITIONS FOR ENGINEERED SAFETY FEATURES

<u>NO.</u>	<u>FUNCTIONAL UNIT</u>	<u>1</u> MINIMUM CHANNELS OPERABLE	<u>2</u> MINIMUM DEGREE OF REDUNDANCY	<u>3</u> OPERATOR ACTION IF CONDITIONS OF COLUMN 1 OR 2 CANNOT BE MET
1	SAFETY INJECTION			
	a. Manual	1	0	Cold Shutdown
	b. High Containment Pressure (Hi Level)	2	1	Cold Shutdown
	c. High Differential Pressure between any Steam and the Steam Line Header	2	1	Cold Shutdown***
	d. Pressurizer Low Pressure	2	1	Cold Shutdown***
	e. High Steam Flow in 2/3 Steam Lines Coincident with Low T_{avg} or Low Steam Pressure	1/Steam Line 2 T_{avg} Signals 2 Pressure Signals	***** 1 1	Cold Shutdown***

TABLE 3.5-3 (Continued)

INSTRUMENTATION OPERATING CONDITIONS FOR ENGINEERED SAFETY FEATURES

<u>NO.</u>	<u>FUNCTIONAL UNIT</u>	<u>1 MINIMUM CHANNELS OPERABLE</u>	<u>2 MINIMUM DEGREE OF REDUNDANCY</u>	<u>3 OPERATOR ACTION IF CONDITIONS OF COLUMN 1 OR 2 CANNOT BE MET</u>
2.	CONTAINMENT SPRAY			
	a. Manual*	2	0**	Cold Shutdown
	b. High Containment Pressure* (Hi-Hi Level)	2/set	1/set	Cold Shutdown
3.	LOSS OF POWER			
	a. 480V Emerg. Bus Undervoltage (Loss of Voltage)	2/bus ^(a)	1/bus ^(b)	Maintain Hot Shutdown
	b. 480V Emerg. Bus Undervoltage (Degraded Voltage)	2/bus	1/bus	Maintain Hot Shutdown ^(c)

* Also initiates a Phase B containment isolation.

** Must actuate two switches simultaneously.

*** When primary pressure is less than 2000 psig, channels may be blocked.

**** When primary temperature is less than 547°F, channels may be blocked.^(d)

***** In this case, the 2/3 high steam flow is already in the trip mode.

(a) During testing and maintenance of one channel, may be reduced to 1/bus.

(b) During testing and maintenance of one channel, may be reduced to 0/bus.

(c) The reactor may remain critical below the power operating conditions with this feature inhibited for the purpose of starting reactor coolant Pumps.

(d) When operating under the reduced temperature conditions described in the November 11, 1981 license submittal, the channels may be blocked when primary temperature is less than 530°F.

TABLE 3.5-4

INSTRUMENT OPERATING CONDITIONS FOR ISOLATION FUNCTIONS

<u>NO.</u>	<u>FUNCTIONAL UNIT</u>	<u>1</u> MINIMUM OPERABLE CHANNELS	<u>2</u> MINIMUM DEGREE OF REDUNDANCY	<u>3</u> OPERATOR ACTION IF CONDITIONS OF COLUMN 1 OR 2 CANNOT BE MET
1.	CONTAINMENT ISOLATION			
	a. Phase A			
	i. Safety Injection	See Item No. 1 of Table 3.5-3		Cold Shutdown
	ii. Manual	1	0	Hot Shutdown
	b. Phase B	See Item No. 2 of Table 3.5-3		
	c. Ventilation Isolation			
	i. High Containment Activity	1	0	Containment shall not be purged.
	ii. Phase A	See Item No. 1.a of Table 3.5-4		

TABLE 3.5-4 (Continued)

INSTRUMENT OPERATING CONDITIONS FOR ISOLATION FUNCTIONS

<u>NO.</u>	<u>FUNCTIONAL UNIT</u>	<u>1</u> MINIMUM OPERABLE CHANNELS	<u>2</u> MINIMUM DEGREE OF REDUNDANCY	<u>3</u> OPERATOR ACTION IF CONDITIONS OF COLUMN 1 OR 2 CANNOT BE MET
2.	STEAM LINE ISOLATION			
	a. High Steam Flow in 2/3 Steam Lines Coincident with Low T_{avg} or Low Steam Pressure	See Item No. 1 of Table 3.5-3		Cold Shutdown
	b. High Containment Pressure	See Item No. 1 of Table 3.5-3		Cold Shutdown
	c. Manual	1/Line	0	Hot Shutdown
3.	FEEDWATER LINE ISOLATION			
	a. Safety Injection	See Item No. 1 of Table 3.5-3		Cold Shutdown

TABLE 3.5-5

(THIS TABLE APPLIES WHEN THE RCS IS $> 350^{\circ}\text{F}$)INSTRUMENTATION TO FOLLOW THE COURSE OF AN ACCIDENT

NO.	INSTRUMENT	1	2
		MINIMUM CHANNELS OPERABLE	OPERATOR ACTION IF CONDITIONS OF COLUMN 1 CANNOT BE MET
1	Pressurizer Level	2	See Item 9 Table 3.5-2
2	Auxiliary Feedwater Flow Indication (Primary Indication)		Note 1
	SD AFW Pump	1 per S/G	
	MD AFW Pump	1 per S/G	
3	Reactor Coolant System Subcooling Monitor	1	Note 2
4	PORV Position Indicator (Primary)	1	Note 3
5	PORV Blocking Valve Position Indicator (Primary)	1	Note 3
6	Safety Valve Position Indicator (Primary)	1	Note 3

Note 1: The three AFW lines from the MD AFW pumps and the three AFW lines from the SD AFW pump each contain one primary flow indicator (2 AFW flow paths per steam generator for a total of 6 AFW lines). These primary indicators are backed up by the narrow range steam generator level indications. If one or more of the direct AFW flow indicators becomes inoperable when the RCS is $> 350^{\circ}\text{F}$, restore the indicator(s) to an operable status within 7 days, or prepare and submit a special report to the NRC within the following 14 days detailing the cause(s) of the inoperable indicator(s), the actions being taken to restore the indicator(s) to an operating status, the estimated date for completion of the repairs, and any compensatory action being taken while the indicator(s) is inoperable. The action required when any of the backup indications of AFW flow are inoperable, is described in Table 3.5-2.

(Notes 2 & 3 — see next page)

TABLE 3.5-5 (Continued)

INSTRUMENTATION TO FOLLOW THE COURSE OF AN ACCIDENT

- Note 2 If both channels of the RCS subcooling monitor become inoperable when the RCS is $>350^{\circ}\text{F}$, restore at least one channel to an operable status within 7 days, or prepare and submit a special report to the NRC within the following 14 days detailing the cause(s) of the inoperable channels, the actions being taken to restore at least one channel to an operable status, the estimated date for completion of the repairs, and any compensatory action being taken while both channels are inoperable.
- Note: 3 The Pzr PORVs and Pzr PORV blocking valves both incorporate limit switches for the direct (primary) means of position indication. The backup method of position indication consists of PRT pressure and a temperature element in a common line downstream of the valves. The Pzr safety relief valves incorporate a vibration monitoring system as the primary method of valve position indication. The backup method of position indication consists of a temperature element downstream of each valve and PRT pressure. If the primary method of position indication for either the Pzr PORVs, Pzr PORV blocking valves, or Pzr safety relief valves becomes inoperable when the RCS is $>350^{\circ}\text{F}$, restore the primary method to an operable status within 7 days, or prepare and submit a special report to the NRC within the following 14 days detailing the cause of the inoperable primary position indication method, the actions being taken to restore it to an operable status, the estimated date for completion of the repairs, and any compensatory action being taken while the primary position indication method is inoperable. If any of the backup methods of position indication for these valves becomes inoperable, it is to be repaired as soon as plant conditions permit.

TABLE 3.5-6

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

Release Pathway/Instrumentation	MCO*	Required Action
1. Liquid Radwaste Effluent Discharge Line		
a. Monitor (RMS-18) provides automatic termination of release upon exceeding alarm/trip setpoint	1	<p>With the number of channels operable less than the MCO requirements:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent releases via this pathway may continue provided that prior to initiating a release:</p> <ol style="list-style-type: none"> 1. Two independent samples are analyzed in accordance with the Surveillance Requirements of Specification 3.9.1.1 and; 2. Two members of the facility staff independently verify the release rate calculations and the discharge line valving.
b. Flow rate measurement device (FI-1064)	1	<p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent releases via this pathway may be continued, provided that the flow rate is estimated at least once per 4 hours during actual releases. Pump performance curves generated "in situ" and tank volumes may be used to estimate flow.</p>

*MCO - Minimum Channels Operable

TABLE 3.5-6 (Continued)

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

Release Pathway/Instrumentation	MCO*	Required Action
2. Steam Generator Blowdown Effluent Line		
a. Monitor (RMS-19) provides automatic termination of blowdown from all three Steam Generators upon exceeding alarm/trip setpoint.	1	<p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent releases via this pathway may continue provided that grab samples are analyzed for gross radioactivity (beta or gamma) with a lower limit of detection of at least $1.0E-07$ $\mu\text{Ci/ml}$ or are analyzed for principle gamma emitters consistent with Table 4.10-1;</p> <p>1. Once per 12 hours when the specific activity of the secondary coolant is > 0.01 $\mu\text{Ci/ml}$ Dose Equivalent I-131, or;</p> <p>2. Once per 24 hours when the specific activity of the secondary coolant is ≤ 0.01 $\mu\text{Ci/ml}$ Dose Equivalent I-131.</p>
b. Flow rate measurement devices - each Steam Generator has its own blowdown flow rate measuring device.	1 per S/G	<p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent releases via this pathway may continue provided that the flow rate for the affected blowdown line(s) is estimated at least once per 24 hours.</p>

*MCO - Minimum Channels Operable

TABLE 3.5-6 (Continued)

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

Release Pathway/Instrumentation	MCO*	Required Action
3. Discharge Canal Flow	Note 1	With the number of channels operable less than the MCO requirement suspend effluent release via this pathway
4. Tank Level Indicating Devices		With the number of channels operable less than the MCO requirement:
a. Refueling Water Storage Tank (LI-948)	1	a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,
b. Monitor Tanks Tank A - (LI-182) Tank B - (LI-183)	1	b. Liquid additions to the affected tank(s) may continue provided that the liquid level for the affected tanks is estimated during all liquid additions to the affected tank(s).
c. Waste Condensate Tanks		
Tank C - (LI-603)	1	
Tank D - (LI-604)	1	
Tank E - (LI-605)	1	
d. Temporary Tanks (Note 2)	1 per Tank	

TABLE 3.5-6 (Continued)

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

Release Pathway/Instrumentation	MCO*	Required Action
5. Containment Fan Cooling Water Monitor		
a. Monitor (RMS-16) does not provide automatic termination of release upon exceeding alarm setpoint.	1	<p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent releases via this pathway may continue provided that, once per 24 hours, grab samples are collected and analyzed for gross radioactivity (beta or gamma) with a lower limit of detection of at least $1.0\text{E}-07$ $\mu\text{Ci/ml}$ or are analyzed for principal gamma emitters consistent with Table 4.10-1.</p>

*MCO - Minimum Channels Operable

NOTE TO TABLE 3.5-6

Note 1 - Pump curves for Unit 2 operating circulating water pumps may be used to satisfy this MCO. If no Unit 2 circulating water pumps are operating the pump curves for circulating water pumps operating in Unit 1 may be used to satisfy this MCO.

Note 2 - A temporary tank is defined as any tank having a capacity of ≥ 100 gallons used for the receipt or transfer of radioactive liquids.

TABLE 3.5-7

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

Release Pathway/ Instrumentation	MCO*	Required Action
1. Plant Vent		
a. Radionoble gas monitor (RMS-14) provides automatic termination of Waste Gas Decay Tank releases upon exceeding alarm/trip setpoint.	1	<p>With the number of channels operable less than the MCO requirements:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent releases via this pathway may continue provided that prior to initiating a release:</p> <ol style="list-style-type: none"> Two independent samples are analyzed in accordance with the Surveillance Requirements of Specification 3.9.3.1 and; Two members of the facility staff independently verify the release rate calculations and the discharge line valving.
b. Radionoble gas monitors RMS-14 and RMS-34 monitor all effluents from Auxiliary Building Ventilation System without providing automatic termination of release upon exceeding their respective alarm setpoints.	1 of the two monitors	<p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semiannual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent releases via this pathway may continue provided that grab samples are collected and are analyzed for radionoble gases once per 24 hours.</p>

*MCO - Minimum Channels Operable

TABLE 3.5-7 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

Release Pathway/Instrumentation	MCO*	Required Action
1. Plant Vent (Continued)		
c. Radioiodine Sampler (RMS-34)	1	<p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent release via this pathway may continue provided that a continuous sample is collected utilizing auxiliary sampling equipment as provided by Table 4.10-2.</p>
d. Particulate Sampler (RMS-34)	1	<p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent releases via this pathway may continue provided that a continuous sample is collected utilizing auxiliary sampling equipment as required by Table 4.10-2.</p>
e. Sampler flow rate monitor (RMS-34) and Vacuum gauge (RMS-34)	1 of the two moni- tors	<p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent releases via this pathway may continue provided the flow rate is estimated once per 4 hours.</p>

TABLE 3.5-7 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

Release Pathway/Instrumentation	MCO*	Required Action
1. Plant Vent (Continued)		
f. Plant Vent flow rate monitor	1	<p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent releases via this pathway may continue provided that flow rate is estimated once per 4 hours.</p>
2. Waste Gas Holdup System Explosive Gas Monitoring System	1	<p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. When continuous monitoring is out of service daily grab samples will be taken and analyzed during normal operations and once per 4 hours during degassing operations.</p>
3. Containment Vessel via Plant Vent		
a. Radionoble gas monitor (RMS-12) provides automatic termination of Containment Vessel releases upon exceeding alarm/trip Setpoint.	1	<p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p>

TABLE 3.5-7 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

Release Pathway/Instrumentation	MCO*	Required Action
3. Containment Vessel Via Plant Vent (Continued)		
b. Radioparticulate Monitor (RMS-11) provides automatic termination of containment vessel releases exceeding alarm/trip setpoints	1	<p>b. Effluent releases via this pathway may continue provided that either of the Plant Vent Radionoble Gas Monitors (RMS-14 or RMS-34) is operable; otherwise, suspend all releases via this pathway.</p> <p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent releases via this pathway may continue provided that either of the Plant Vent Radionoble Gas Monitors (RMS-14 or RMS-34) is operable; otherwise, suspend all releases via this pathway.</p>
c. Sampler flow rate monitor (RMS-11)	1	<p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent releases via this pathway may continue provided that the flow rate is estimated once per 4 hours.</p>
4. Condenser Vacuum Pump Vent		
a. Radionoble gas monitor (RMS-15) diverts effluents from Condenser Vacuum Pump Vent to the Plant Vent upon exceeding alarm/trip setpoint.	1	<p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p>

TABLE 3.5-7 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

Release Pathway/Instrumentation	MCO*	Required Action
4. Condenser Vacuum Pump Vent (Continued)		
b. Flow rate measuring devices (one for each Vacuum Pump).	1 for each pump in service	<p>b. Effluent releases via this pathway may continue provided that;</p> <p>1. Grab samples are collected once per 24 hours and are analyzed for radionoble gases, or;</p> <p>2. The effluent is diverted to the Plant Vent and RMS-14 is operable.</p> <p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent releases via this pathway may continue provided the flow rate is estimated once per 4 hours.</p>
5. Fuel Handling Building Lower Level Exhaust Vent		
a. Radionoble gas monitor (RMS-20) trips the exhaust and supply fans for the lower level of the Fuel Handling Building upon exceeding alarm/trip setpoint.	1	<p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent releases via this pathway may continue provided that grab samples are taken once per 12 hours and analyzed for gross activity within 24 hours.</p>

TABLE 3.5-7 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

Release Pathway/Instrumentation	MCO*	Required Action
5. Fuel Handling Building Lower Level Exhaust Vent (Continued)		
b. Sampler flow rate monitor (RMS-20)	1	<p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent releases via this pathway may continue provided the flow rate is estimated once per 4 hours.</p>
6. Fuel Handling Building Upper Level Exhaust Vent		
a. Radionoble gas monitor (RMS-21) trips the exhaust and supply fans for the upper level of the Fuel Handling Building upon exceeding alarm/trip setpoint.	1	<p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent releases via this pathway may continue provided that:</p> <ol style="list-style-type: none"> 1. The Plant Vent Radionoble Gas Monitor (RMS-14) is operable, or; 2. Grab samples are collected once per 24 hours and are analyzed for radionoble gases.

*MCO - Minimum Channels Operable

TABLE 3.5-7 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

Release Pathway/Instrumentation	MCO*	Required Action
6. Fuel Handling Building Upper Level Exhaust Vent (Continued)		
b. Sampler flow rate monitor (RMS-21)	1	<p>With the number of channels operable less than the MCO requirement:</p> <p>a. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Semi-annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner in accordance with Specification 6.9.1.d.4 and,</p> <p>b. Effluent releases via this pathway may continue provided the flow rate is estimated once per 4 hours.</p>

*MCO - Minimum Channels Operable

3.9 RADIOACTIVE EFFLUENTS

3.9.1 Compliance With 10 CFR Part 20 - Radioactive Materials in Liquid Effluents

Applicability

Applies to radioactive material in liquid effluents released from the site to unrestricted areas.

Objective

To define the concentration limits of 10CFR20 for radioactive material in liquid effluents released to unrestricted areas.

Specification

- 3.9.1.1 The concentration of radioactive material in liquid effluents released at any time from the site to unrestricted areas (see Figure 1.1-1) shall be limited to the concentrations specified in 10CFR20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2×10^{-4} $\mu\text{Ci/ml}$ total activity.
- 3.9.1.2 With the concentration of radioactive material in liquid effluents released from the site to unrestricted areas exceeding the above limits, immediately restore the concentration to within the above limits. In addition, a prompt notification must be made to the Commission in accordance with Specification 6.9.2(a)(10).

3.9.1.3 In the event that the immediate action required by 3.9.1.2 above cannot be satisfied, the facility shall be placed in hot shutdown within 12 hours and in cold shutdown within the next 30 hours, and entry into the power operating condition shall not be made unless Specification 3.9.1.1 is met.

3.9.2 Compliance With 10 CFR Part 50 - Radioactive Materials in Liquid Effluents

Applicability

Applies to radioactive materials in liquid effluents released from the site to unrestricted areas.

Objective

To define the calculated dose limits of 10CFR50 for radioactive materials in liquid effluents released to unrestricted areas.

Specification

- 3.9.2.1 The dose commitment at all times to an individual from radioactive materials in liquid effluents released to unrestricted areas (See Figure 1.1-1) shall be limited:
- a. During any calendar quarter to ≤ 1.5 mrem to the total body and to ≤ 5 mrem to any organ, and
 - b. During any calendar year to ≤ 3 mrem to the total body and to ≤ 10 mrem to any organ.
- 3.9.2.2 With the calculated dose commitment from the release of radioactive materials in liquid effluents exceeding any of the limits prescribed by Specification 3.9.2.1 above, prepare and submit a report to the Commission in accordance with Specification 6.9.4(a).

3.9.3 Compliance With 10 CFR Part 20 - Radioactive Materials in Gaseous Effluents

Applicability

Applies to radioactive materials in gaseous effluents released from the site to unrestricted areas.

Objective

To define the dose rate limits for radioactive materials in gaseous effluents released to unrestricted areas.

Specification

3.9.3.1 The dose rate due to radioactive materials in gaseous effluents released from the site (see Figure 1.1-1) shall be limited to the following:

- a. for radionoble gases: <500 mrem/yr to the total body, <3000 mrem/yr to the skin, and
- b. for all I-131, and tritium, and for all radioactive materials in particulate form, inhalation pathway only, with half lives greater than 8 days: <1500 mrem/yr to any organ.

3.9.3.2 With the dose rate(s) exceeding the above limits, immediately decrease the release rate to within the above limits. In addition, a prompt notification must be made to the Commission in accordance with Specification 6.9.2(a)(10).

3.9.3.3 In the event that the immediate action required by 3.9.3.2 above cannot be satisfied, the facility shall be placed in hot shutdown within 12 hours and in cold shutdown within the next 30 hours, and entry into the power operating condition shall not be made until Specification 3.9.3.1 is met.

3.9.4 Compliance With 10 CFR Part 50 - Radionoble Gases

Applicability

Applies to radionoble gases released in gaseous effluents to unrestricted areas.

Objective

To define the air dose limits of 10CFR50 for radionoble gases released in gaseous effluents to unrestricted areas.

Specification

- 3.9.4.1 The air dose commitment due to radionoble gases released in gaseous effluents to unrestricted areas (See Figure 1.1-1) shall be limited, at all times, to the following:
- a. During any calendar quarter, to <5 mrem for gamma radiation and <10 mrem for beta radiation;
 - b. During any calendar year, to <10 mrem for gamma radiation and <20 mrem for beta radiation.

3.9.4.2 With the calculated air dose commitment from radioactive noble gases in gaseous effluents exceeding any of the limits, prescribed by Specification 3.9.4.1 above, prepare and submit a report to the Commission in accordance with Specification 6.9.4(a).

3.9.5 Compliance With 10 CFR Part 50 - Radioiodines, Radioactive Materials in Particulate Form, and Radionuclides Other Than Radionoble Gases

Applicability

Applies to radioiodines, radioactive materials in particulate form, and radionuclides other than radionoble gases released from the site to unrestricted areas.

Objective

To define the dose limits of 10CFR50 for radioiodines, radioactive materials in particulate form, and radionuclides other than radionoble gases released from the site to unrestricted areas.

Specification

3.9.5.1 The dose to an individual from I-131, tritium and radioactive materials in particulate form, with half-lives greater than 8 days in gaseous effluents released to unrestricted areas (See Figure 1.1-1), inhalation pathway only, shall be limited, at all times, to the following:

- a. During any calendar quarter, ≤ 7.5 mrem to any organ and,
- b. During any calendar year, ≤ 15 mrem to any organ.

3.9.5.2 With the calculated dose commitment from the release of I-131, tritium and radioactive materials in particulated form, with half lives greater than 8 days, in gaseous effluents exceeding any of the limits prescribed by Specification 3.9.5.1 above, prepare and submit a report to the Commission in accordance with Specification 6.9.4(a).

3.9.6 Compliance With 40 CFR Part 190 - Radioactive Effluents From Uranium Fuel Cycle Sources

Applicability

Applies to radioactive effluents from uranium fuel cycle sources.

Objective

To define the dose limits of 40CFR190 for radioactive effluents from uranium fuel cycle sources.

Specifications

3.9.6.1 The dose commitment to any member of the general public, due to releases of licensed materials and radiation, from uranium fuel cycle sources shall be limited to ≤ 25 mrem to the total body or any organ (except the thyroid, which shall be limited to ≤ 75 mrem) over 12 consecutive months. This specification is applicable to Robinson Unit 2 only for the area within a five mile radius around the Robinson Plant.

3.9.6.2 With the calculated dose commitment from the release of licensed materials in liquid or gaseous effluents exceeding any of the limits of Specification 3.9.6.1 above, prepare and submit a report the Commission in accordance with Specification 6.9.4(d). Submittal of this report is considered a timely

request, and a variance is granted until Commission action on the request is complete. This variance only relates to the limits of 40CFR190, and does not apply in any way to the requirements for dose limitation of 10CFR20, as addressed in other sections of this Appendix.

Basis

Compliance With 10 CFR Part 20 - Radioactive Materials in Liquid Effluents

This specification is provided to ensure that the concentration of radioactive materials in liquid effluents released from the site to unrestricted areas will be less than the concentrations specified in 10 CFR Part 20, Appendix B, Table II. This limitation provides the additional assurance that the concentrations of radioactive materials in bodies of water outside the site will result in exposures within the limits of 10 CFR Part 20.106(e) to the population. The concentration limit for dissolved or entrained noble gases is based upon the assumption that Xe-135 is the controlling radionuclide 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.

Compliance With 10 CFR Part 50 - Radioactive Materials in Liquid Effluents

This specification is provided to implement the requirements of Sections II.A, and III.A and IV.A of Appendix I, 10 CFR Part 50. The Limiting Condition for Operation implements the guides set forth in Section II.A of Appendix I. The action statement provides the required operating flexibility and at the same time implements the guides set forth in Section IV.A of Appendix I of 10 CFR Part 50 to assure that the release of radioactive material in liquid effluents will be kept "as low as is reasonably achievable." The dose calculations in the ODCM implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I be shown by calculative procedures

based on models and data, such that the actual exposure of an individual through appropriate pathways is unlikely to be substantially underestimated. The equations specified in the ODCM for calculating the doses due to the actual release rates of radioactive materials in liquid effluents are consistent with the methodology provided in the 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.

Compliance With 10 CFR Part 20 - Radioactive Materials in Gaseous Effluents

This specification is provided to ensure that the dose rate at any time at the site boundary from gaseous effluents from H. B. Robinson Unit No. 2 will be within the annual dose limits of 10 CFR Part 20 for unrestricted areas. The annual dose limits are the doses associated with the concentrations of 10 CFR Part 20 Appendix B, Table II, Column 1. These limits provide reasonable assurance that radioactive material discharged in gaseous effluents will result in the exposure of individuals outside the site boundary, to annual average concentrations within the limits specified in Appendix B Table II of 10 CFR Part 20, (10 CFR Part 20.106(b)). For individuals who may at times be within the site boundary, the occupancy of the individual will be sufficiently low to compensate for any increase in the atmospheric diffusion factor above that for the site boundary unrestricted area. The specified release rate limits restrict, at all times, the corresponding gamma and beta dose rate equivalents above background to an individual in unrestricted areas to ≤ 500 mrem/year to the total body or to ≤ 3000 mrem/year to the skin.

Compliance With 10 CFR Part 50 - Radionoble Gases

This specification is provided to implement the requirements of Section II.B, III.A and IV.A of Appendix I, 10 CFR Part 50. The limiting condition for operation implementing the guides provides the required operating flexibility

and at the same time implements the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive material in 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 calculative procedures based on models and data such that the actual exposure of an individual through appropriate pathways is unlikely to be substantially underestimated. The methods 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 the 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 dose commitments at the site boundary are based upon historical average atmospheric conditions.

Compliance With 10 CFR Part 50 - Radioiodines, Radioactive Materials in Particulate Form, and Radionuclides Other Than Radionoble Gases

This specification is provided to implement the requirements of Section II.C, 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.C of Appendix I. The action statement provides the required operating flexibility and at the same time implements the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive materials as gaseous effluents will be kept "as low as 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 calculative procedures based on models and data, such that the actual exposure of an individual through appropriate pathways is unlikely to be substantially underestimated. The methods established in the ODCM 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. The ODCM equations provided for determining the commitment are based upon historical average atmospheric conditions.

Compliance With 40 CFR Part 190 - Radioactive Effluents From Uranium Fuel Cycle Sources

This specification is provided to meet the dose limitations of 40CFR190. The specification requires the preparation and submittal of a Special Report whenever the calculated doses from plant radioactive effluents exceed the limits of 40CFR190. The Special Report will describe a course of action which should result in the limitation of dose to a member of the public for 12 consecutive months to within the 40CFR190 limits.

3.16 RADIOACTIVE WASTE SYSTEMS

3.16.1 Liquid Radwaste Treatment System

Applicability

Applies to the liquid radwaste treatment system.

Objective

To define the operating requirements for the liquid radwaste treatment system.

Specification

3.16.1.1 The appropriate portions of the Liquid Radwaste Treatment System shall be maintained and used to reduce the concentrations of radioactive materials in liquid wastes prior to their discharge when the projected dose commitments, due to the release of radioactive liquid effluents to unrestricted areas (See Figure 1.1-1) when averaged over a calendar quarter, would exceed 0.2 mrem to the total body or 0.6 mrem to any organ.

3.16.1.2 With radioactive liquid wastes being discharged without treatment while in excess of the limits of Specification 3.16.1.1 above, prepare and submit a report to the Commission in accordance with Specification 6.9.4(b).

3.16.2 Liquid Holdup Tanks*

Applicability

Applies to the liquid holdup tanks.

*Tanks included in this Specification are those outdoor tanks that are not surrounded by liners, dykes, or walls capable of holding the tank contents and that do not have tank overflows and surrounding area drains connected to the liquid radwaste treatment system. Tanks classed as "Seismic Class 1" are excluded from this Specification.

Objective

To define the operating requirements for the liquid holdup tanks.

Specification

- 3.16.2.1 The quantity of radioactive material contained in each of the following tanks shall at all times be limited to ≤ 10 curies, excluding tritium and dissolved or entrained noble gases.
- a. A monitor tank
 - b. B monitor tank
 - c. C Waste Condensate tank
 - d. D Waste Condensate tank
 - e. E Waste Condensate tank
 - f. Any Outside temporary tank*
- 3.16.2.2 With the quantity of radioactive material in any of the above listed tanks 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.
- 3.16.2.3 If Specification 3.16.2.2 is not completed within 48 hours a prompt notification with written followup is required as per Specification 6.9.2.a(10).

* A temporary tank is defined as any tank having a capacity of ≥ 100 gallons used for the receipt or transfer of radioactive liquids.

3.16.3 Gaseous Radwaste and Ventilation Exhaust Treatment Systems

Applicability

Applies to the gaseous radwaste and ventilation exhaust treatment systems.

Objective

To define the operating requirements for the gaseous radwaste and ventilation exhaust treatment systems.

Specification

- 3.16.3.1 The appropriate portions of the Gaseous Radwaste Treatment System and the Ventilation Exhaust Treatment System shall be maintained and used to reduce the concentrations of radioactive materials in gaseous wastes prior to their discharge when the projected dose commitments due to the release of gaseous effluents to unrestricted areas (See Figure 1.1-1) when averaged over a calendar quarter would exceed:
- a. 0.6 mrem for gamma radiation and 1.3 mrem for beta radiation due to radionoble gases or,
 - b. 1.0 mrem to any organ due to radioiodines, radioactive materials in particulate form, and radionuclides other than radionoble gases.
- 3.16.3.2 With the Gaseous Radwaste Treatment System and/or the Ventilation Exhaust Treatment System not operable and with radioactive gaseous wastes being discharged without treatment while in excess of the limits of Specification 3.16.3.1 above, prepare and submit a report to the Commission in accordance with Specification 6.9.4(b).

3.16.4 Waste Gas Decay Tanks (Hydrogen and Oxygen)

Applicability

Applies to the volumetric hydrogen and oxygen concentration limits for the four Waste Gas Decay Tanks.

Objective

To define operating requirements for the Waste Gas Decay Tanks.

Specification

- 3.16.4.1 The oxygen concentration in the four Waste Gas Decay Tanks should be limited to $\leq 4\%$ by volume when the hydrogen concentration in the same tank exceeds 4% by volume. The hydrogen concentration in the four Waste Gas Decay Tanks should be limited to $\leq 4\%$ by volume when the oxygen concentration in the same tank exceeds 4% by volume.
- 3.16.4.1.a When the concentration of oxygen in a Waste Gas Decay Tank is $> 4\%$ but $\leq 6\%$ by volume and the hydrogen concentration in the same tank is $> 4\%$ by volume, or the concentration of hydrogen in a Waste Gas Decay Tank is $> 4\%$ but $\leq 6\%$ by volume and the oxygen concentration in the same tank is $> 4\%$ by volume, restore one or both to $\leq 4\%$ by volume within 48 hrs.
- 3.16.4.1.b When the concentration of oxygen in a Waste Gas Decay Tank is $> 6\%$ by volume and the hydrogen concentration in the same tank is $> 4\%$ by volume, or the concentration of hydrogen in a Waste Gas Decay Tank is $> 6\%$ by volume and the oxygen concentration in the same tank is $> 4\%$ by volume, immediately suspend all additions of waste gas to the affected tank and immediately commence efforts to lower the concentration of one or both to $\leq 4\%$ by volume.

- 3.16.4.2 If the requirements of paragraph 3.16.4.1.a cannot be met within the 48 hour limit, submit a special report to the NRC within the following 14 days which outlines the cause of the occurrence, corrective actions taken to date, corrective actions which will be taken, and any compensatory actions being taken to minimize the potential hazard.
- 3.16.4.3 If the actions taken to comply with paragraph 3.16.4.1.b do not reduce the concentration of hydrogen and/or oxygen in the affected tank to $\leq 6\%$ by volume within 24 hours, a prompt notification with written followup is required per specification 6.9.2.a(10). Once the concentration of hydrogen and/or oxygen in the affected tank is $\leq 6\%$ by volume, paragraphs 3.16.4.1.a and 3.16.4.2 apply.

3.16.5 Waste Gas Decay Tanks (Radioactive Materials)

Applicability

Applies to the four Waste Gas Decay Tanks.

Objective

To define the operating requirements for the Waste Gas Decay Tanks.

Specification

- 3.16.5.1 The quantity of radioactivity contained in each Waste Gas Decay Tank shall at all times be limited to $\leq 6.0E5$ curies noble gases (considered as Xe-133).
- 3.16.5.2 With the quantity of radioactive materials in any Waste Gas Decay 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.

3.16.5.3 If Specification 3.16.5.2 is not completed within 48 hours, a prompt notification with written follow-up is required as per Specification 6.9.2.a(10).

3.16.6 Solidification of Wet Radioactive Waste

Applicability

Applies to the solidification of wet radioactive waste.

Objective

To define the requirements for the solidification of wet radioactive waste.

Specification

- 3.16.6.1 Wet radioactive wastes shall be solidified in accordance with the Process Control Program (PCP).
- 3.16.6.2 If any test specimen, as required by the PCP, fails to verify solidification, the solidification of the batch under test shall be suspended until such time as additional test specimens can be obtained, alternative solidification parameters can be determined in accordance with the PCP, and a subsequent test verifies solidification. The PCP shall be modified as required in accordance with Section 6, Administrative Controls, and solidification of the batch may then be resumed using alternative solidification parameters as determined by the PCP.

Bases

Liquid Radwaste Treatment System

The requirements that the appropriate portions of this system be maintained and used when specified provides assurance that the releases of radioactive materials in liquid effluents will be kept "as low as reasonably achievable". This specification implements the requirements of 10 CFR Part

50.36a, General Design Criterion 60 of Appendix A to 10 CFR Part 50 and the design objective given in Section II.D of Appendix I to 10 CFR Part 50. The specified limits governing the use of appropriate portions of the Liquid Radwaste Treatment System were specified as the dose design objective set forth in Section II.A of Appendix I, 10 CFR Part 50, for liquid effluents.

Gaseous Radwaste and Ventilation Exhaust Treatment Systems

The requirements that the appropriate portions of these systems be maintained and used when specified provides reasonable assurance that the releases of radioactive materials in gaseous effluents will be kept "as low as 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 the dose design objectives set forth in Section II.B and II.C of Appendix I, 10 CFR Part 50, for gaseous effluents.

Solidification of Wet Radioactive Waste

This specification ensures that the packaging of wet radioactive wastes meets the requirements of 10 CFR Part 20 and 10 CFR Part 71 prior to their shipment from the site for disposal.

3.17 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

3.17.1 Monitoring Program

Applicability

Applies to the radiological environmental monitoring program.

Objective

To define the requirements for implementation of the radiological environmental monitoring program.

- 3.17.1.1 The Radiological Environmental Monitoring Program shall be conducted in accordance with the ODCM. The ODCM shall include a map of all sampling locations keyed to a table giving distances and directions from the plant.
- 3.17.1.2 With the radiological environmental monitoring program not being conducted as specified in Table 3.17-1, prepare and submit to the Commission, in the Annual Radiological Operating 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 unobtainable due to hazardous conditions, seasonal unavailability, or to malfunction of automatic sampling equipment. If the latter, every effort shall be made to complete corrective action prior to the end of the next sampling period.)
- 3.17.1.3 With the confirmed level of radioactivity in an environmental sampling medium at one or more of the locations specified in the ODCM exceeding the limits of Table 3.17-2 when averaged over any calendar quarter sampling period, prepare and submit a report to the Commission in accordance with Specification 6.9.4(c). This

report is not required if additional sampling of the medium does not confirm the initial results or 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 Operating Report.

- 3.17.1.4 When more than one of the radionuclides in Table 3.17-2 are detected in a sampling medium, or if a sample is unavailable a report must be submitted to the Commission in accordance with Specification 6.9.4(c) if:

$$\frac{\text{concentration (1)}}{\text{reporting level (1)}} + \frac{\text{concentration (2)}}{\text{reporting level (2)}} + \dots \geq 1.0$$

The 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 Operating Report.

- 3.17.1.5 When licensed materials other than those in Table 3.17-2 are detected and are the result of plant effluents, a report must be submitted to the Commission in accordance with Specification 6.9.4(d) if the projected calendar year dose commitment to an individual exceeds the following limits:

1. 3 mrem to the total body or 10 mrem to any organ from liquid radionuclides.
2. 15 mrem to any organ from airborne radionuclides or radioparticulates.

If the measured level of radioactivity is not a result of plant effluent, this report is not required; however, the condition shall be reported and described in the Annual Radiological Environmental Operating Report.

3.17.2 Land Use Census

Applicability

Applies to the land use census.

Objective

To define the requirements for the conduct of the land use census.

Specification

- 3.17.2.1 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.

Action

- 3.17.2.2 With the land use census identifying a location which yields an annual calculated dose or dose commitment of a specific pathway which is 20% greater than that at a current sampling location:
- (a) add the new location(s) to the radiological environmental monitoring program within 30 days and,
 - (b) if desired, delete the sampling location having the lowest calculated dose or dose commitments via the same exposure pathway, excluding the control station location, from the monitoring program after October 31 of the year in which the land use census was conducted, and
 - (c) identify the new location(s) in the next Radiological Environmental Operating Report, Specification 6.9.1.d.4,

including a revised figure(s) and table for the ODCM reflecting the new location(s).

Basis

Monitoring Program

The radiological monitoring program required by this specification provides measurements of radiation and of the 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 effluent monitoring program by verifying that the measureable concentration 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.

Land Use Census

This specification is provided to ensure that changes in the use of areas at and beyond the Site Boundary are identified and that modifications to the monitoring program are made if required by the results of the 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 pathways via leafy vegetables will be identified and monitored since a garden of this size is the minimum required to produce the quantity (26 kg/year) of leafy vegetables assumed in Regulatory Guide 1.109, Revision 1 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.

TABLE 3.17-1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Minimum Number of Sample Stations	Sampling and Collection Frequency	Type and Frequency of Analysis
1. AIRBORNE	5	Continuous operation of sampler with sample collection as required by dust loading once per 7 days.	Radioiodine canister. Analyze once per 7 days for I-131.
a. Radioiodine and Particulates			Particulate sampler. Analyze for gross beta radioactivity >24 hours follow- ing filter change. Perform gamma isotopic analysis on each sample when gross beta activity is >10 times the yearly mean of control sample. Perform gamma isotopic analysis on composite (by location) sample once per 92 days.
2. DIRECT RADIATION	33	Once per 92 days	. Gamma dose. Once per 92 days.
	>2 dosimeters or >1 instrument for continuously measuring and recording dose rate at each location, (each TLD chip is considered a dosimeter)		

TABLE 3.17-1 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Minimum Number of Sample Stations	Sampling Collection Frequency	Type and Frequency of Analysis
3. WATERBORNE			
a. Surface	2	Sample collected over a period of <u><31</u> days	Gamma isotopic analysis of each composite sample by location. Tritium analysis of composite sample once per 92 days.
b. Ground	2	Once per 92 days	Gamma isotopic and tritium analyses of each sample.
c. Sediment from Shoreline	1	Once per 184 days	Gamma isotopic analysis of each sample.
4. INGESTION			
a. Milk	2	Once per 31 days	Gamma isotopic and I-131 analysis of each sample.
b. Fish	2	Once per 184 days. One sample of each of the following: 1. Free Swimmers 2. Bottom Feeders	Gamma isotopic analysis on edible portions.

TABLE 3.17-1 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Minimum Number of Sample Stations	Sampling and Collection Frequency	Type and Frequency of Analysis
c. Food Products	1	At time of harvest. Green leafy Vegetables	Gamma isotopic analysis on edible portions.
	1	At time of harvest. One sample of broad leaf vegetation.	I-131 analysis
d. Broad leaf vegetation	3	Samples of 3 different kinds of broad leaf vegetation grown nearest each of two different offsite locations of highest predicted annual aver- age groundlevel D/Q if milk sampling is not performed.	Gamma isotopic and I-131 analysis
	1	Sample of each of the similar broad leaf vegetation grown 15-30 km distant in the least prevalent wind direction if milk sampling is not performed.	Gamma isotopic and I-131 analyses

TABLE 3.17-2

REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

<u>Radionuclide</u>	<u>Water (pCi/l)</u>	<u>Airborne (pCi/m³)</u>	<u>Fish (pCi/Kg, wet)</u>	<u>Milk (pCi/l)</u>	<u>Food Products (pCi/Kg, wet)</u>
H-3	3E+04				
Mn-54	1E+03		3E+04		
Fe-59	4E+02		1E+04		
Co-58	1E+03		3E+04		
Co-60	3E+02		1E+04		
Zn-65	3E+02		2E+04		
Zr-Nb-95	4E+02				
I-131	2E+00	9E-01		3E+00	1E+02
Cs-134	3E+01	1E+01	1E+03	6E+01	1E+03
Cs-137	5E+01	2E+01	2E+03	7E+01	2E+03
Ba-La-140	2E+02			3E+02	

TABLE 3.17-3

MAXIMUM VALUES FOR THE LOWER LIMITS OF DETECTION (LLD)

<u>Analysis</u>	<u>Water (pCi/l)</u>	<u>Airborne (pCi/m³)</u>	<u>Fish (pCi/Kg,wet)</u>	<u>Milk (pCi/l)</u>	<u>Food Products (pCi/Kg,wet)</u>	<u>Sediment (pCi/Kg,dry)</u>
gross beta	4E+00	1E+02				
H-3	3E+03					
Mn-54	1.5E+01		1.3E+02			
Fe-59	3E+01		2.6E+02			
Co-58,60	1.5E+01		1.3E+02			
Zn-65	3E+01		2.6E+02			
Zr-Nb-95	1.5E+01					
I-131	1E+00	7E-02		1E+00	6E+01	
Cs-134	1.5E+01	5E-02	1.3E+02	1.5E+01	6E+01	1.5E+02
Cs-137	1.8E+01	6E-02	1.5E+02	1.8E+01	8E+01	1.8E+02
Ba-La-140	1.5E+01			1.5E+01		

TABLE 4.1-1 (Continued)

	<u>Channel Description</u>	<u>Check</u>	<u>Calibrate</u>	<u>Test</u>	<u>Remarks</u>
9.	Analog Rod Position	S (1,2)	R	M	(1) With step counters (2) Following rod motion in excess of six inches when the computer is out of service
10.	Rod Position Bank Counters	S (1,2)	N.A.	N.A.	(1) Following rod motion in excess of six inches when the computer is out of service (2) With analog rod position
11.	Steam Generator Level	S	R	M	
12.	Charging Flow	N.A.	R	N.A.	
13.	Residual Heat Removal Pump Flow	N.A.	R	N.A.	
14.	Boric Acid Tank Level	D (1)	R	N.A.	(1) Bubbler tube rodded weekly
15.	Refueling Water Storage Tank Level	W	R	N.A.	
16.	Boron Injection Tank Level	W	R	N.A.	
17.	Volume Control Tank Level	N.A.	R	N.A.	
18.	Containment Pressure	D	R	B/W (1)	(1) Containment isolation valve signal
19.	Boric Acid Makeup Flow Channel	N.A.	R	N.A.	

4.10 RADIOACTIVE EFFLUENTS

4.10.1 Radioactive Liquid Effluents

Applicability

Applies to the monitoring of radioactive liquid effluents.

Objective

To ascertain that radioactive liquid effluent releases are being maintained as low as reasonably achievable and within allowable limits.

Specification

- 4.10.1.1 The radioactivity content of each batch of radioactive liquid waste to be discharged shall be determined prior to release by sampling and analysis in accordance with Table 4.10-1. The results of pre-release analyses shall be used with the calculative methods in the ODCM to assure that the concentration at the point of release to the unrestricted area is maintained within the limits of Specification 3.9.1.1.
- 4.10.1.2 Analyses of samples composited from batch releases shall be performed in accordance with Table 4.10-1. The results of the post-release analyses shall be used with the calculative methods in the ODCM to assure that the concentrations at the point of release were maintained within the limits of Specification 3.9.1.1.
- 4.10.1.3 The concentration of radioactive materials in liquid effluents discharged from continuous release points shall be determined by collection and analysis of samples in accordance with Table 4.10-1. The results of the analyses shall be used with the calculative methods in the ODCM to assure that the concentrations at the point of release are maintained within the limits of Specification 3.9.1.1.

4.10.1.4 Dose Calculations: Cumulative dose commitments for the current calendar quarter and calendar year from liquid effluents shall be determined in accordance with the ODCM once per 31 days.

4.10.2 Radioactive Gaseous Effluents

Applicability

Applies to the monitoring of radioactive gaseous effluents.

Objective

To ascertain that radioactive gaseous effluent release are being maintained as low as reasonably achievable and within allowable limits.

Specifications

4.10.2.1 The dose rate due to radioactive materials in gaseous effluents shall be determined to be within the limits of Specification 3.9.3.1 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 4.10-2.

4.10.3 Radionoble Gases

Applicability

Applies to the determination of cumulative doses from radionoble gases.

Objective

To ascertain that cumulative doses from radionoble gases are being maintained as low as reasonably achievable and within allowable limits.

Specification

4.10.3.1 Cumulative dose commitments for the current calendar quarter and current calendar year shall be determined in accordance with the ODCM once per 31 days.

4.10.4 Radioiodines, Radioactive Materials in Particulate Form, and Radionuclides Other Than Radionoble Gases

Applicability

Applies to the determination of cumulative doses from radioiodines, radioactive materials in particulate form, and radionuclides other than radionoble gases.

Objective

To ascertain that cumulative doses from radioiodines, radioactive materials in particulate form, and radionuclides other than radionoble gases are maintained as low as reasonably achievable and within allowable limits.

4.10.4.1 Cumulative dose commitments for the current calendar quarter and current calendar year shall be determined in accordance with the ODCM once per 31 days.

4.10.5 Radioactive Effluents From Uranium Fuel Cycle Sources

Applicability

Applies to the determination of cumulative doses from radioactive effluents from uranium fuel cycle sources.

Objective

To ascertain that cumulative doses from radioactive effluents from uranium fuel cycle sources are maintained as low as reasonably achievable and within allowable limits.

Specification

- 4.10.5.1 Cumulative dose contributions from liquid and gaseous effluents shall be determined in accordance with the Surveillance Requirements for Specifications 3.9.2.1, 3.9.4.1, or 3.9.5.1. For the purposes of this Surveillance Requirement, it may be assumed that fuel cycle sources are negligible, with the exception that dose contributions from other nuclear fuel cycle facilities at the same site or within a radius of 5 miles must be considered. In addition, an individual is not considered a member of the public during any period in which he/she is engaged in carrying out any operation which is part of the nuclear fuel cycle.

TABLE 4.10-1

RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

Type of Release	Sampling Frequency	Minimum Analysis Frequency	Required Activity Analysis	Required LLD ^a $\mu\text{Ci/ml}$
<u>Batch Waste Releases^b</u> 1. Monitor Tanks 2. Waste Condensate Tanks 3. Drainage of Systems	P Grab Sample	P on Grab Sample	Principal Gamma Emitters ^c	5E-07
			I-131	1E-06
	P Grab Sample One Batch/M	M on Grab Sample	Dissolved and Entrained Gases (gamma emitters)	1E-05
			Tritium	1E-05
	P Grab Sample Each Batch and Composit ^d	M on Composite	Gross Alpha	1E-07
			Sr-89, Sr-90	5E-08
	P Grab Sample Each Batch and Composit ^d	Q on Composite	Fe-55	1E-6
	D Grab Sample	W on Grab Sample	Principal Gamma Emitters ^c	5E-07
			I-131	1E-06
<u>Continuous Releases^e</u> 1. Steam Generator Blowdown	M Grab Sample	M on Grab Sample	Dissolved and Entrained Gases (gamma emitters)	1E-05
	D Grab Sample and Composit ^{d,f}	M on Composite	Tritium	1E-05
			Gross Alpha	1E-07
	D Grab Sample and Composit ^{d,f}	Q on Composite	Sr-89, Sr-90	5E-08
			Fe-55	1E-6

NOTES TO TABLE 4.10-1

- a. Lower Limit of Detection (LLD) is an "a priori" limit representing the capability of a measurement system. LLD is calculated in accordance with methodology established in ODCM.
- b. A batch release is the discharge of liquid wastes of a discrete volume. Prior to sampling for analyses each batch shall be isolated and thoroughly mixed whenever possible, to assure representative sampling. Residual liquids in systems such as feedwater heaters and lines cannot be thoroughly mixed for representative samples of their respective system. Grab samples from these systems will be accepted as representative of their respective system.
- c. The principal gamma emitters for which the LLD specification applies exclusively are the following radionuclides: Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144. This list does not mean that only these nuclides are to be detected and reported. Other peaks which are measurable and identifiable, together with the above nuclides, shall also be identified and reported.
- d. 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.
- e. A continuous release is the discharge of liquid wastes of a nondiscrete volume; e.g., from a system that has an input flow during the continuous release.
- f. Grab sample of continuous flows taken for compositing purposes will be taken in volumes proportional to the existing flow rate of the system in a manner described in the ODCM.

TABLE 4.10-2

RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS PROGRAM

Type of Release	Sampling Frequency	Minimum Analysis Frequency	Required Activity Analysis	Required LLD ^a μCi/ml
Waste Gas Decay Tanks	P	P	Principal Gamma Emitters ^c	1E-04
Containment Pressure Reliefs and Containment Purges	W Grab Sample ^b	W ^e on Grab Sample	Principal Gamma Emitters ^c	1E-04
			Tritium	1E-06
<u>Continuous Releases</u>				
1. Plant Vent	M ^e Grab Sample for Radionoble Gases and Tritium	M ^e on Grab Sample	Principal Gamma Emitters ^c	1E-04
			Tritium	1E-06
2. Condenser Vacuum Pump Vent if S/G Activity is $>1 \times 10^{-4}$ μCi/cc condenser off-gas is routed to plant vent	Continuous ^d Radiiodine Sample	W ^f	I-131 on Sample	1E-12
	Continuous ^d Particulate Sample	W ^f on Sample	Principal Gamma Emitters ^c	1E-11
	Continuous ^d Particulate Samples to be Composited	Q on Composite	Sr-89, Sr-90	1E-11
		M on Composite	Alpha	1E-11
	Continuous	Noble Gas Monitor	Noble Gases Gross Beta and Gamma	1×10^{-4} μc/cc

NOTES TO TABLE 4.10-2

- a. Lower Limit of Detection (LLD) is an "a priori" limit representing the capability of a measurement system. LLD is calculated in accordance with methodology established in the ODCM.
- b. Containment pressure reliefs and purges can be made during the week without sampling by correcting the weekly sample analysis results with the ratio of the Containment Radionoble Gas Monitor (RMS-12) and the Containment Particulate Monitor (RMS-11) readings at the time of sampling to the desired time of the pressure relief.
- c. The principal gamma emitters for which the LLD specification applies exclusively are the following radionuclides: Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135, and Xe-138 for gaseous emissions, I-131 for halogen 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 measureable and identifiable, together with the above nuclides, shall also be identified and reported.
- d. 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. In addition, these continuous samples are not required for the Condenser Vacuum Pump Vent.
- e. Analyses shall also be performed following shutdown, startup, or similar operational occurrence which could alter the mixture of radionuclides.
- f. Samples shall be changed once per 7 days and analyses shall be completed within 48 hours after changing (or after removal from sampler). Sampling and analyses shall also be performed once per 24 hours for 7 days following shutdown, start-up or thermal power level change exceeding 15% of RATED THERMAL POWER in one hour and if I-131 Dose Equivalent in the RCS is greater than 0.1 $\mu\text{Ci/cc}$. When samples collected for 24 hours are analyzed, the corresponding LLD's may be increased by a factor of 10.

4.18 RADIOACTIVE EFFLUENT INSTRUMENTATION

4.18.1 Radioactive Liquid Effluent Instrumentation

Applicability

Applies to the radioactive liquid effluent instrumentation system.

Objective

To ascertain that the radioactive liquid effluent instrumentation system is functioning properly in order to accurately monitor radioactive liquid effluent releases.

Specification

- 4.18.1.1 Each radioactive liquid effluent monitoring instrumentation channel shall be demonstrated operable by performance of the channel check, source check, channel calibration, and channel functional test operations at the frequencies shown in Table 4.18-1.

4.18.2 Radioactive Gaseous Effluent Instrumentation

Applicability

Applies to the radioactive gaseous effluent instrumentation system.

Objective

To ascertain that the radioactive gaseous effluent instrumentation system is functioning properly in order to accurately monitor radioactive gaseous effluent releases.

Specification

- 4.18.2.1 Each radioactive gaseous effluent monitoring instrumentation channel shall be demonstrated operable by performance of the channel check, source check, channel calibration, and channel functional test operations at the frequencies shown in Table 4.18-2.

TABLE 4.18-1

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

Pathway/Instruments	Channel Check	Source Check	Channel Calibration	Channel Functional Test
1. Liquid Radwaste Effluent Line				
a. Monitor (RMS-18)	D	D	R (Note 3)	Q
b. Flow rate measurement device (FT-1064)	(Note 1)	N.A.	R	N.A.
2. Steam Generator Blowdown Effluent Line				
a. Monitor (RMS-19)	D	M	R (Note 3)	Q
b. Flow rate measurement devices for measuring flow of sample to RMS-19	(Note 2)	N.A.	N.A.	N.A.
c. Flow rate measuring devices for blowdown lines	(Note 2)	N.A.	R	N.A.
3. Service Water Effluent Line				
a. Monitor (RMS-16)	N.A.	M	R (Note 3)	Q
4. Tank Level Indicating Devices				
a. Refueling Water Storage Tank (LT-948)	D	N.A.	R	R
b. Monitor Tanks A(LT-182) & B(LT-183)	D	N.A.	R	R
c. Waste Condensate Tanks C(LT-603), D(LT-604), & E(LT-605)	D	N.A.	R	R

- Note 1 - The channel check shall consist of verifying indication of flow at least once during each batch type release or shall consist of verifying indication of flow at least once per 24 hours for continuous type releases.
- Note 2 - The channel check shall consist of verifying indication of flow at least once during each batch type release or shall consist of verifying indication of flow at least once per 24 hours for continuous releases, except during steam generator drain at cold shutdown.
- Note 3 - The CHANNEL CALIBRATION shall be performed using one or more of the reference standards certified by the National Bureau of Standards (NBS) or using standards that have been obtained from suppliers that participate in measurement assurance activities or otherwise NBS traceable.

NOTATION

Reference Footnotes, Table 4.1-2, Appendix A

P	Completed prior to making a radioactive materials release
D	At least once per 24 hours
N.A.	Not applicable
M	At least once per 31 days
R	At least once per 18 months
Q	At least once per 92 days

TABLE 4.18-2

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

Pathway/Instruments	Channel Check	Source Check	Channel Calibration	Channel Functional Test
1. Plant Vent				
a. Radionoble gas monitor (RMS-14)	D	D	R	Q
b. Radionoble gas monitor (RMS-34)	D	R	R(Note 2)	R
c. Radioiodine monitor (RMS-34)	R	R	R(Note 3)	R
d. Sampler flow rate monitor (RMS-34)	D(Note 1)	N.A.	N.A.	N.A.
e. Plant Vent flow rate monitor	D(Note 1)	N.A.	N.A.	N.A.
2. Containment Vessel via Plant Vent				
a. Radioparticulate Monitor (RMS-11)	D	D	R(Note 2)	Q
b. Radionoble gas monitor (RMS-12)	D	D	R(Note 2)	Q
c. Sampler flow rate monitor (RMS-12)	D	N.A.	N.A.	N.A.
3. Condenser Vacuum Pump Vent				
a. Radionoble gas monitor (RMS-15)	D	M	R(Note 2)	Q
b. Flow rate measuring devices - one for each Vacuum Pump	D(Note 1)	N.A.	N.A.	N.A.
4. Fuel Handling Building Lower Level Exhaust Vent				
a. Radionoble gas monitor (RMS-20)	D	M	R(Note 2)	Q
b. Sampler flow rate monitor (RMS-20)	D(Note 1)	N.A.	N.A.	N.A.

TABLE 4.18-2 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

Pathway/Instruments	Channel Check	Source Check	Channel Calibration	Channel Functional Test
5. Fuel Handling Building Upper Level Exhaust Vent				
a. Radionoble gas monitor (RMS-21)	D	M	R(Note 2)	Q
b. Sampler flow rate monitor (RMS-21)	D(Note 1)	N.A.	N.A.	N.A.

NOTES TO TABLE 4.18-2

- Note 1 - The channel check shall consist of verifying indication of flow whenever plant conditions dictate that flow is supposed to be present.
- Note 2 - The CHANNEL CALIBRATION shall be performed using one or more of the reference standards certified by the National Bureau of Standards (NBS) or using standards that have been obtained from suppliers that participate in measurement assurance activities or otherwise NBS traceable.
- Note 3 - The CHANNEL CALIBRATION shall consist of changing the filter and cartridge at the frequency indicated and performing appropriate analyses with NBS traceable calibrated analytical equipment.

4.19 RADIOACTIVE WASTE SYSTEMS

4.19.1 Liquid Radwaste Treatment System

Applicability

Applies to the liquid waste treatment system.

Objective

To ascertain that the concentration of radioactive materials in the liquid waste treatment system is maintained as low as reasonably achievable and within allowable limits.

Specification

- 4.19.1.1 Dose commitments from liquid releases shall be projected at least once per 31 days, in accordance with the ODCM to ensure the provisions of Specification 3.16.1.1 are satisfied when the Liquid Radwaste Treatment System is not in use.

4.19.2 Liquid Holdup Tanks*

Applicability

Applies to liquid holdup tanks.

Objective

To ascertain that the quantity of radioactive material contained in the liquid holdup tanks is maintained as low as reasonably achievable and within allowable limits.

*Tanks included in this Specification are those outdoor tanks that are not surrounded by liners, dykes, or walls capable of holding the tank contents and that do not have tank overflows and surrounding area drains connected to the liquid radwaste treatment system. Tanks classed as "Seismic Class 1" are excluded from this Specification.

Specification

- 4.19.2.1 The quantity of radioactive material contained in each of the tanks listed in Specification 3.16.2.1 shall be determined to be within the limits specified in Specification 3.16.2.1 by either analyzing a representative sample of the tank's content at least once per 7 days when radioactive materials are being added to the tank or sampling the evaporator output when adding it to the tank.

4.19.3 Gaseous Radwaste and Ventilation Exhaust Treatment System

Applicability

Applies to the gaseous radwaste and ventilation exhaust treatment system.

Objective

To ascertain that the concentration of radioactive materials in the gaseous radwaste and ventilation exhaust treatment systems is maintained as low as reasonably achievable and within allowable limits.

Specification

- 4.19.3.1 Dose commitments due to gaseous releases shall be projected at least once per 31 days, in accordance with the ODCM to ensure the provisions of Specification 3.16.3.1 are satisfied when the radwaste treatment system is inoperable.

4.19.4 Waste Gas Decay Tanks (Hydrogen and Oxygen)

Applicability

Applies to the Waste Gas Decay Tanks.

Objective

To ascertain that the concentration of hydrogen and oxygen in the Waste Gas Decay Tanks is maintained as low as reasonably achievable and within allowable limits.

Specification

- 4.19.4.1 The concentration of hydrogen and oxygen in the Waste Gas Decay Tanks shall be determined to be within the limits specified in Specification 3.16.4.1 by monitoring the waste gases in the Waste Gas Decay Tanks with the hydrogen and oxygen monitors or monitoring procedures required OPERABLE by Table 3.5-7 of Specification 3.5.3.1.

4.19.5 Waste Gas Decay Tanks (Radioactive Material)

Applicability

Applies to the Waste Gas Decay Tanks.

Objective

To ascertain that the quantity of radioactive material in the Waste Gas Decay Tanks is maintained as low as reasonably achievable and within allowable limits.

Specification

- 4.19.5.1 With the primary coolant activity ≥ 100 $\mu\text{Ci/ml}$ the quantity of radioactive material contained in each Waste Gas Decay Tank shall be determined to be within the limit specified in Specification 3.16.5.1 once per 24 hours when radioactive materials are being added to the tank.

4.19.6 Solidification of Wet Radioactive Waste

Applicability

Applies to the solidification of wet radioactive waste.

Objective

To ascertain that wet radioactive waste is solidified to meet the requirements of 10CFR20 and 10CFR71.

Specification

- 4.19.6.1 The PCP shall be used to verify the solidification of one representative test specimen from every tenth batch of wet radioactive waste.

4.20 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

4.20.1 Monitoring Program

Applicability

Applies to the radiological environmental monitoring program.

Objective

To ascertain that radiological environmental monitoring samples are collected and analyzed in accordance with the radiological environmental monitoring program.

Specification

- 4.20.1.1 The radiological environmental monitoring samples shall be collected pursuant to Table 3.17-1 from the locations defined in the ODCM and shall be analyzed pursuant to the requirements of Tables 3.17-2 and 3.17-3.

4.20.2 Land Use Census

Applicability

Applies to the land use census.

Objective

To ascertain that the land use census is conducted in accordance with the radiological environmental monitoring program.

Specification

- 4.20.2.1 The land use census shall be conducted once per 12 months during the growing season, by door-to-door survey, aerial survey, by consulting local agriculture authorities or by broad leaf vegetation sampling of at least three different kinds of vegetation. This sampling may be performed at the site boundary in each of two different direction sectors with the highest predicted D/Qs in lieu of the garden census. Specifications for broad leaf vegetation sampling in Table 3.17-1.4c shall be followed, including analysis of control samples.

6.5 REVIEW AND AUDIT

6.5.1 The license organization's review and approval process shall assure that the nuclear safety of the facility is maintained.

6.5.1.1 Procedures, Tests, and Experiments

6.5.1.1.1 Written procedures shall be established, implemented, and maintained covering the activities references below:

- a. The applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, Rev. 2, February 1978.
- b. Refueling operations.
- c. Surveillance and test activities of safety-related equipment.
- d. Security Plan implementing procedures.
- e. Emergency Plan implementing procedures.
- f. Fire Protection Program implementing procedures.
- g. Radiological Environmental Monitoring Program implementing procedures.
- h. Offsite Dose Calculation Manual implementing procedures.
- i. Process Control Program implementation procedure.
- j. Quality Assurance Program for effluent and environmental monitoring (using the guidance in Regulatory Guide 4.15, December 1977).

6.5.1.1.2 A safety analysis shall be prepared for all procedures, tests, and experiments covering the activities identified in 6.5.1.1.1 and procedures that affect nuclear safety. The analysis shall include a written determination of whether or not the procedure, test, or experiment is a change in the facility as described in the FSAR, involves a change to the Technical Specification, or constitutes an unreviewed safety question as defined in 10CFR50.59(a)(2). This analysis constitutes a first party safety review and may be accomplished by the individual who prepared the document.

- 6.5.1.6.5 A quorum of the PNSC shall consist of the Chairman, and three members, of which two may be alternates.
- 6.5.1.6.6 The PNSC activities shall include the following:
- a. Perform an overview of Specifications 6.5.1.1, and 6.5.1.2 to assure that processes are effectively maintained.
 - b. Performance of special reviews, investigations, and reports thereon requested by the Manager - Corporate Nuclear Safety.
 - c. Annual review of the Security Plan and Emergency Plan.
 - d. Perform reviews of Specifications 6.5.1.1.6, 6.5.1.2.4, 6.5.1.3.1, and 6.5.1.4.1.
 - e. Perform review of all events requiring 24 hour notification to the NRC.
 - f. Review of facility operations to detect potential nuclear safety hazards.
 - g. Review of every unplanned onsite release of radioactive material to the environs including the preparation and forwarding of reports covering evaluation, recommendations and disposition of the corrective action to prevent recurrences to the Vice President - Nuclear Operations, Manager - Corporate Nuclear Safety and the Manager - Corporate Quality Assurance.
 - h. Review of changes to the Process Control Program and the Offsite Dose Calculation Manual.
- 6.5.1.6.7 In the event of disagreement between the recommendations of the Plant Nuclear Safety Committee and the actions contemplated by the General Manager, the course determined by the General Manager to be more conservative will be followed. The Vice President - Nuclear Operations and the Manager - Corporate Nuclear Safety will be notified within the 24 hours of the disagreement and subsequent actions.
- 6.5.1.6.8 The PNSC shall maintain written minutes of each meeting that, at a minimum, document the results of all PNSC activities performed under the provisions of these Technical Specifications; and copies shall be provided to the Vice President - Nuclear Operations, and to the Manager - Corporate Nuclear Safety.

- (4) The verification of compliance and implementation of the requirements of the Quality Assurance Program to meet the criteria of Appendix B, 10CFR50, at least once per 24 months.
- (5) The Emergency Plan and implementing procedures at least once per 12 months.
- (6) The Security Plan and implementing procedures at least once per 12 months.
- (7) The Facility Fire Protection Program and implementing procedures at least once per 24 months.
- (8) Any other area of facility operation considered appropriate by the Corporate Quality Assurance Performance Evaluation Unit; the Executive Vice President - Power Supply and Engineering & Construction; or the Senior Vice President - Power Supply.
- (9) The Radiological Environmental Monitoring Program and the results thereof at least once per 12 months.
- (10) The Offsite Dose Calculation Manual and implementing procedure at least once per 24 months.
- (11) The Process Control Program and implementing procedures for solidification of radioactive wastes at least once per 24 months.
- (12) The performance of activities required by the Quality Assurance Program to meet the criteria of Regulatory Guide 4.15, December 1977 at least once per 12 months.

e. Distribute reports and other records to appropriate managers.

6.5.3.3

- a. Audit personnel shall be independent of the area audited. Selection for auditing assignments is based on experience or training that establishes that their qualifications are commensurate with the complexity or special nature of the activities to be audited. In selecting auditing personnel, consideration shall be given to special abilities, specialized technical training, prior pertinent experience, personal characteristics, and education.

c. Monthly Operating Report

Routine reports of operating statistics and shutdown experience shall be submitted on a monthly basis. The report formats set forth in Appendices B, C, and D to Regulatory Guide 1.16 shall be completed in accordance with the instructions provided. The completed forms should be submitted by the tenth of the month following the calendar month covered by the report to the Director, Office of Management and Program Analysis, U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, with a copy to the appropriate NRC regional Office.

d. Semiannual Radioactive Effluent Release Report

Routine radioactive effluent release reports covering the operation of the unit during the previous 6 months shall be submitted within 60 days after January 1 and July 1 of each year. Those portions of the report due within 60 days of January 1, and July 1, shall include:

1. A summary of the quantities of radioactive liquid and gaseous effluent and solid waste released from the Unit as outlined in Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants" (Revision 1, June, 1974) with data summarized on a quarterly basis following the format of Appendix B thereof.
2. The radioactive effluent release report shall include unplanned releases from the site to unrestricted areas of radioactive materials in gaseous and liquid effluents made during the reporting period.
3. The radioactive effluent release reports shall identify all failures to satisfy (within 30 days) the Minimum Channels Operable requirements for radioactive effluent monitoring instrumentation specified in Tables 3.5-6 and 3.5-7. This report shall include the following information:

- a. The identity of the affected monitoring instrumentation and the cause(s) for not meeting the Minimum Channels Operable requirements within the specified time interval.
 - b. A description of the corrective actions that were or will be taken to meet the Minimum Channels Operable requirements for the affected monitoring instrumentation.
 - c. The date by which the corrective action(s) were or will be completed and the Minimum Channels Operable requirement for the affected monitoring instrumentation satisfied.
 - d. A summary description for corrective action(s) taken to prevent a similar recurrence.
4. Any changes made during the reporting period to the Process Control Program (PCP) and to the Offsite Dose Calculation Manual (ODCM), as well as a listing of new locations for dose calculations and/or environmental monitoring identified by the land use census pursuant to Specification 3.17.2.1.
- e. Annual Supplement to the Radioactive Effluent Release Report

Those portions of the Radioactive Effluent Release Report to be submitted as a supplemental to 6.9.1.(d) within 120 days as a after January 1 of each year shall include:

1. An annual summary of hourly meteorological data collected over the previous calendar year. This annual summary may be either in the form of an hour-by-hour listing on magnetic tape of wind speed, wind direction, atmospheric stability, and precipitation (if measured), or in the form of joint frequency distributions of wind speed, wind direction, and atmospheric stability,* and

*In lieu of submission with the Radioactive Effluent Release Report, the licensee has the option of retaining this summary of required meteorological data in a file that shall be provided to the NRC upon request.

2. An assessment of the radiation doses due to the radioactive liquid and gaseous effluents released from the station during the previous calendar year.

f. Annual Radiological Environmental Operating Report

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.

The annual radiological environmental operating reports shall include summaries, interpretations, and 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 operations on the environment.

The annual radiological environmental operating reports shall include summarized and tabulated results in the format of Regulatory Guide 4.8, December 1975, of all radiological environmental samples taken during the report period. In the event that some results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as possible in a supplementary report.

The reports shall also include the following: a summary description of the radiological environmental monitoring program; at least two legible maps* covering all sampling locations keyed to a table giving distances and directions from the centerline of the reactor.

*One map shall cover stations near the site boundary; a second shall be the more distant stations.

6.9.2 Reportable Occurrences

The Reportable Occurrences of Specifications 6.9.2.a and 6.9.2.b below, including corrective actions and measures to prevent recurrence, shall be reported to the NRC. Supplemental reports may be required to fully describe final resolution of the occurrence. In case of corrected or supplemental reports, a Licensee Event Report (LER) shall be completed and reference made to the original report date.

a. Prompt Notification With Written Followup

The types of events listed below shall be reported within 24 hours by telephone and confirmed by telegraph, mailgram, or facsimile transmission to the Regional Administrator of the NRC Regional Office or his designee no later than the first working day following the event, with a written followup report within 14 days. The written followup report shall include as a minimum, a completed copy of the LER form.

Information provided on the LER shall be supplemented, as needed, by additional narrative material to provide complete explanation of the circumstances surrounding the event.

- (1) 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 protection function.

Note: Instrument drift discovered as a result of testing need not be reported under this item (but see 6.9.2.a(5), 6.9.2.a(6), and 6.9.2.b(1) below.

- (2) Operation of the unit or affected systems when any parameter or operation subject to a LCO is less conservative than the least conservative aspect of the LCO established in the Technical Specifications.

Note: If specified action is taken when a system is found to be operating between the most conservative and least conservative aspects of a LCO listed in the Technical Specifications, the LCO is not considered to have been violated and no report need be submitted under this section (but see 6.9.2.b(2) below).

- (3) Abnormal degradation discovered in fuel cladding, reactor coolant pressure boundary or primary containment.

Note: Leakage of valve packing or gaskets within the limits for identified leakage set forth in Technical Specifications need not be reported under this section.

- (4) Reactivity anomalies involving disagreement with predicted value of reactivity balance under steady state conditions during power operation greater than or equal to $1\% \Delta k/k$; 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 startup rate greater than 5 dpm, or if subcritical, an unplanned reactivity insertion of more than $0.5\% \Delta k/k$; or any unplanned criticality.
- (5) Failure or malfunction of one or more components which prevents or could prevent, by itself, the fulfillment of the functional requirements of systems required to cope with accidents analyzed in the SAR.

- (6) 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.

Note: For 6.9.2.a(5) and 6.9.2.a(6) reduced redundancy that does not result in loss of system function need not be reported under this section (but see 6.9.2.b(2) and 6.9.2.b(3) below).

- (7) Conditions arising from natural or man-made events that, as a direct result of the event, require plant shutdown, operation of safety systems, or other protective measures required by Technical Specifications.
- (8) Errors discovered in the transient or accident analyses or in the methods used for such analyses as described in the SAR 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.
- (9) Performance of structures, systems or components that require remedial action or corrective measures to prevent operation in a manner less conservative than assumed in the accident analyses in the FSAR or Technical Specifications bases or discovery during plant life of conditions not specifically considered in the FSAR or Technical Specifications that require remedial action or corrective measures to prevent the existence of development of an unsafe condition.

Note: This item is intended to provide for reporting of potentially generic problems.

- (10) Offsite releases of radioactive materials in liquid and gaseous effluents which exceed the limits of Specifications 3.9.1.1, 3.9.3.1, and for tank contents which exceed the limits of Specification 3.16.2.1 and 3.16.4.3.

b. Thirty-day Written Reports. The reportable occurrences discussed below shall be the subject of written reports to the Regional Administrator of the NRC Regional Office within thirty days of occurrence of the event. The written report shall include, as a minimum, a completed copy of the LER form, used for entering data into the NRC's computer-based file of information concerning licensee events. Information provided on the LER form shall be supplemented, as needed, by additional narrative material to provide complete explanation of the circumstances surrounding the event.

- (1) 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 (but see 6.9.2.a(1) and 6.9.2.a(2) above).
- (2) 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 (but see 6.9.2.a.(2) above).

Note: Routine surveillance testing, instrument calibration or preventive maintenance which require system configurations described in 6.9.2.b(1) and 6.9.2.b(2) above need not be reported except where test results themselves reveal a degraded mode as described above.

- (3) 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 system (but see 6.9.2.a(6) above).
- (4) Abnormal degradation of systems other than those specified in 6.9.2a(3) 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.

6.9.3 Special Reports

Special reports shall be submitted to the Regional Administrator of the NRC Regional Office of 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:

<u>Area</u>	<u>Reference</u>	<u>Submittal Date</u>
a. Containment Leak Rate	4.4	Upon completion of each test
b. Containment Sample Tendon Surveillance	4.4	Upon completion of the inspection at 25 years of operation
c. Post-operational Containment Structural Test	4.4	Upon completion of the test at 20 years of operation
d. Fire Protection System	3.14	As specified by limiting condition for operation
e. Overpressure Protection System Operation	3.1.2.1.e	Within 30 days of operation
f. Auxiliary Feedwater Pumps	3.4	Within 30 days after becoming INOPERABLE

6.9.4 Special Radiological Effluent Reports

The special radiological effluent reports discussed below shall be the subject of written reports to the Regional Administrator of the

NRC Regional Office within thirty days of the occurrence of the event in lieu of a Licensee Event Report (LER).

- a. Exceeding any of the limits prescribed by Specification 3.9.2.1, 3.9.4.1, and/or 3.9.5.1. This report shall include the following information(1):
 1. The cause for exceeding the limit(s)
 2. The corrective action(s) to be taken to reduce the releases of radioactive materials in the affected effluents (i.e. liquid, radionoble gas, and/or radioiodines, particulates, etc.) within the Specification during the remainder of the current calendar quarter and during the subsequent three calendar quarters, such that the calculated dose commitment to an individual is within the annual dose limits prescribed by the specification(s) that was/were exceeded.
 3. If any of the limits of Specification 3.9.2.1 were exceeded the report must include a statement that no drinking water source exists that could be affected or include the results of radiological impact on finished drinking water supplied with regards to the requirements of 40CFR141 Safe Drinking Water Act.
- b. Exceeding any of the limits prescribed by Specification 3.16.1.1 and/or 3.16.3.1. This report shall include the following information:
 1. Identification of equipment or subsystem that rendered the affected radwaste treatment system not operable.

2. The corrective action(s) taken to restore the affected radwaste treatment system to an operable status.
 3. A summary description of the action(s) taken to prevent a similar recurrence.
- c. Exceeding the reporting level for environmental sample media as specified in Specifications 3.17.1.3, 3.17.1.4, or 3.17.1.5. This report shall include the following information:
1. An evaluation of any environmental factor, release condition or other aspect which may have caused the reporting level to be exceeded.
 2. A description of action(s) taken or planned to reduce the levels of licensed materials in the affected environmental media to below the reporting level.
- d. Exceeding the limits prescribed by Specification 3.9.6.1. This report shall be made in lieu of any other report and shall include the following information:
1. The corrective action(s) to be taken to reduce subsequent releases to prevent recurrence of exceeding the limits prescribed by Specification 3.9.6.1.
 2. An analysis which estimates the dose commitment to a member of the general public from uranium fuel cycle source including all effluent pathways and direct radiation, for a 12 month period that includes releases covered by this report.
 3. If the release conditions resulting in violation of 40CFR190 has not already been corrected, include a request for a variance in accordance with the provisions of 40CFR190 and include the specified information of 40CFR190.11(b).

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 radiiodines 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.

- b. Records of new and irradiated fuel inventory, fuel transfers and assembly burnup histories.
- c. Records of facility radiation and contamination surveys.
- d. Records of radiation exposure for all individuals entering radiation control areas.
- e. Records of gaseous and liquid radioactive material released to the environs.
- f. Records of transient or operational cycles for those facility components designed for a limited number of transients or cycles.
- g. Records of training and qualification for current members of the plant staff.
- h. Records of in-service inspections performed pursuant to these Technical Specifications.
- i. Records of Quality Assurance activities required by the QA program.
- j. Records of review performed for changes made to procedures or equipment or reviews of tests and experiments pursuant to 10CFR50.59.
- k. Records of meetings of the PNSC and of the independent reviews performed by the Corporate Nuclear Safety Section.
- l. Records of data results required by the radiological environmental monitoring program.

6.14 ENVIRONMENTAL QUALIFICATION

6.14.1 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 1E 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 the Order for Modification of License No. DPR-23 dated October 24, 1980.

6.14.2 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.

6.15 PROCESS CONTROL PROGRAM (PCP)

6.15.1 The PCP shall be approved by the Commission prior to implementation.

6.15.2 Licensee initiated changes to the PCP:

A. Shall be submitted to the Commission in the Annual Report for the period in which the change(s) was/were made. This submittal shall contain:

1. Sufficiently detailed information to totally support the rationale for the change without benefit of additional or supplemental information;
2. A determination that the change did not reduce the overall conformance of the solidified waste product to existing criteria for solid wastes.

6.16 OFFSITE DOSE CALCULATION MANUAL

6.16.1 The ODCM shall be approved by the Commission prior to implementation.

6.16.2 Licensee initiated changes to the ODCM:

A. Shall be submitted to the Commission in the Annual Report for the period in which change(s) was/were made effective. This submittal shall contain:

1. Sufficiently detailed information to totally support the rationale for the change without benefit of additional or supplement information.
2. A determination that the change will not reduce the accuracy of reliability of dose calculations or setpoint determinations.