PROPOSED

RADIOLOGICAL EFFLUENT TECHNICAL SPECIFICATIONS

POINT BEACH NUCLEAR PLANT

September 30, 1983

2) Logic Channel

A logic channel is a group of relay contact matrices which operate in response to the analog channels signals to generate a protective action signal.

f. Instrumentation Surveillance

1) Channel Check

Channel check is a qualitative determination of acceptable operability by observation of channel behavior during operation. Where other channels are provided, this determination shall include comparison of the channel indication with indications from other independent instrumentation channels measuring the same parameter.

2) Channel Functional Test

A channel functional test consists of injecting a simulated signal into the channel to verify that it is operable, including alarm and/or trip initiating action.

3) Channel Calibration

Channel calibration consists of the adjustment of channel output such that it responds, with acceptable range and accuracy, to known values of the parameter which the channel measures. Calibration shall encompass the entire channel, including equipment action, alarm, or trip, and shall be deemed to include the channel functional test.

4) Source Check

A source check is an assessment of channel response when the channel detector is exposed to a source of increased radiation.

g. Shutdown

1) Hot Shutdown

The reactor is in the hot shutdown condition when the reactor is subcritical, by an amount greater than or equal to the margin as specified in Technical Specification 15.3.10 and T_{avg} is at or greater than 540°F.

p. Dose Equivalent I-131

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

q. $\bar{E}$ - Average Disintegration Energy

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

r. Radioactive Waste Handling

1) Process Control Program (PCP)

The Process Control Program contains the current formulas, sampling methods, analyses, tests, and determinations to be made to ensure that the processing and packaging of solid radioactive waste will be accomplished in such a way as to assure compliance with 10 CFR 20, 10 CFR 71, and all other Federal and State regulations governing the disposal of the radioactive waste.

2) Solidification

The conversion of wet wastes into a form that meets shipping burial ground requirements.

s. Offsite Dose Calculation Manual (ODCM)

The Offsite Dose Calculation Manual contains the methodology for the determination of gaseous and liquid effluent monitoring trip setpoints, the methodology for determining compliance with release objectives, and the methodology used in the calculation of offsite doses due to radioactive gaseous and liquid effluents.

t. Lower Level of Detection (LLD)

The LLD is defined, for purposes of these specifications, as the smallest concentration of radioactive material in a sample that will yield a net count, above system background, that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal. For a particular measurement system, which may include radiochemical separation:

$$LLD = \frac{4.66Sb}{E \times V \times 2.22 \times 10^{6} \times Y \times \exp(-\lambda\Delta t)}$$

Where:

LLD = the a priori lower limit of detection as defined above, in microcuries per unit volume,

Sb = the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate in counts per minute,

E = the counting efficiency in counts per disintegration,

V = the sample size in units of volume,

2.22×10^6 = the number of disintegrations per minute per microcurie,

Y = the fractional radiochemical yield, when applicable,

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

Δt = the elapsed time between the midpoint of sample collection and time of counting for plant effluents.

Typical values of E, V, Y, and Δt will be used in the calculation. It should be recognized that the LLD is defined as an a priori (before the fact) limit representing the capability of a measurement system and not as an a posteriori (after the fact) limit for a particular measurement.

15.3.9 Radioactive Effluent Releases

Applicability

Applies to the controlled releases of radioactive gases or liquids from the plant(s) on a site basis. The provisions of Specification 15.3.0 are not applicable to these specifications.

Objective

The limits and conditions for the controlled release of radioactive materials in liquid and gaseous effluents to the environs ensure that all releases are as low as is reasonably achievable in conformance with 10 CFR Parts 50.34a and 50.36a and will ensure that these releases result in concentrations of radioactive materials in liquid and gaseous effluents released to unrestricted areas that are within the limits specified in 10 CFR Part 20.

Specifications

A. Radioactive Effluent Monitoring Instrumentation

1) The radioactive effluent monitoring instrumentation channels listed in Table 15.3.9-1 shall be operable and their trip setpoints shall be determined utilizing the methodology given in the ODCM.

2) With less than the minimum number of radioactive effluent monitoring channels operable, the action statement listed in Table 15.3.9-1 opposite the channel shall be taken.

B. Radioactive Liquid Effluent Release Rates

1) The release rate of radioactive liquid effluents shall be such that the annual average concentration of radionuclides in the circulating water discharge does not exceed the limits specified in 10 CFR 20, Appendix B, for unrestricted areas.

2) Prior to release of liquid waste tank contents, a sample shall be taken and analyzed.

3) During release of radioactive liquid effluents, at least one condenser circulating water pump shall be in operation and the service water return header shall be lined up only to the unit whose circulating water pump is operating.

4) The maximum release rate for any eight hour period shall not exceed ten times the yearly average limit.

C. Radioactive Gaseous Effluent Release Rates

1) The annual average release rates of gaseous and airborne particulate wastes shall be limited as follows:

$$1.5 \times 10^{-6} \frac{\text{sec}}{\text{m}^3} \qquad \frac{Qi}{(MPC)_i} \leq 1.0$$

Where Q_i is the annual release rate (Ci/sec) of any radioisotope, i, and $(MPC)_i$ in units of μCi/cc are defined in Column 1, Table II of Appendix B to 10 CFR 20. For purposes of calculating permissible releases by the above formula $(MPC)_i$ for isotopes of iodine and particulates with half-lives longer than eight days shall be reduced by a factor of 700 from the listed value in 10 CFR 20, Appendix B, December 30, 1982, edition.

2) The maximum release rate for any 60 minute period shall not exceed ten times the yearly average limit.

3) Prior to release of radioactive gaseous effluents from the gas decay tanks, they shall be sampled and analyzed to determine compliance with Nos. 1 and 2 above.

4) During release of radioactive gaseous effluents through the auxiliary building vent, at least one auxiliary building exhaust fan shall be in operation.

D. Annual Design Objective Release Quantities

1.) Definition

An equivalent curie quantity is that amount of a reference isotope that would produce the same dose as the actual amount of the particular isotope in question. The methodology for converting actual activity to equivalent activity is provided in the ODCM and is based on dose conversion factors contained in Regulatory Guide 1.109, Revision 1, October 1977.

2.) Annual Release Objectives for Liquid Effluents

Tritium:	≦2.15E+03 curies
Radioiodines:	≦2.82E+01 equivalent curies as I-131
Others:	≦3.49E+01 equivalent curies as Co-60

3. Annual Release Objectives for Gaseous Effluents

Tritium:	≦2.90E+04 curies
Noble Gases:	≦9.21E+05 equivalent curies as Xe-133
Radioiodines:	≦3.72E-01 equivalent curies as I-131
Others:	≦1.80E+00 equivalent curies as Co-60

4) Tritium Adjustment

The design objective release for tritium in liquid effluents may be increased, provided it is accompanied by a proportional decrease in the design objective release for tritium in gaseous effluents. Similarly, the design objective release for tritium in gaseous effluents may be increased, provided it is accompanied by a proportional decrease in the design objective release for tritium in liquid effluents.

E. Quarterly Summary

1) A summary of radioactive effluent releases shall be made on a quarterly basis as described in the ODCM to demonstrate compliance with this section.

2) If the quantity of radioactive material actually released in effluents during any calendar quarter is such that the resulting radiation exposure, calculated on the same basis as the design objective exposure, would exceed one-half the design objective annual exposure, actual doses will be calculated as described in the ODCM, and a special report will be prepared and submitted per Section 15.6.9.3h of these specifications.

3) Corrective actions will be taken to ensure radioactive liquid (or gaseous) effluent releases during subsequent calendar quarters do not exceed the 10 CFR 50 Appendix I annual limits.

4) If the quarterly releases exceed the quarterly release objectives per calculational methods in the ODCM, release and dose calculations shall be made monthly until the releases are within the annual limits.

F. Radioactive Effluent Waste Treatment

1) Portions of the radioactive liquid radwaste treatment system shall be used to reduce the radioactive materials in liquid wastes prior to their discharge whenever such effluents require treatment to meet the design objectives set forth in Appendix I to 10 CFR 50.

2) Portions of the gaseous radwaste treatment and ventilation exhaust treatment systems shall be used to reduce radioactive materials in gaseous wastes prior to their discharge, whenever such effluents require treatment to meet the design objectives set forth in Appendix I to 10 CFR 50.

G. Solid Radioactive Waste

The solid radwaste system shall be used in accordance with the Process Control Program to process wet radioactive wastes to meet all shipping and burial ground requirements. If the provisions of the Process Control Program are not satisfied, shipments of defectively processed or defectively packaged solid radioactive waste from the site will be suspended.

H. Explosive Gas Mixture

The concentration of oxygen in the waste gas vent and holdup system shall be limited to less than or equal to 2% by volume.

1) If the concentration of oxygen in the waste gas vent and holdup system is greater than 2% by volume but less than 4%, the concentration of oxygen will be restored to less than or equal to 2%.

2) If the concentration of oxygen is greater than 4% by volume, additions to the waste gas vent and holdup system will be suspended until concentrations are less than or equal to 2% by volume.

Bases:

Liquid wastes from the radioactive waste disposal system are diluted by the circulating water system prior to release to Lake Michigan[1]. With two pumps operating per unit, the rated flow of the circulating water system is approximately 356,000 gpm per unit. Operation of a single circulating water pump per unit reduces the nominal flow rate by about 40%. Liquid waste from the waste disposal system may be discharged to the circulating water system of either unit via the service water return header. Because of the low radioactivity levels in the circulating water discharge, the concentrations of liquid radioactive effluents at this point are not measured directly. The concentrations in the circulating water discharge are calculated from the measured concentration of the liquid effluent, the discharge flow rate of the effluent and the nominal flow in the circulating water system.

If the annual average concentration of liquid wastes in the circulating water discharge should equal MPC as specified in B-1, the average concentration at the intake of the nearest public water supply would be well below the MPC values of 10 CFR 20, Appendix B[2]. Thus, discharge of liquid wastes at the specified annual average concentrations would not result in significant exposure to members of the public as a result of consumption of drinking water from the lake, even if the effect of potable water treatment systems on reducing radioactive concentrations of the water supply is neglected.

Prior to release to the atmosphere, gaseous wastes are mixed in the auxiliary building vent with the flow from at least one of two auxiliary building exhaust fans. Further dilution then occurs in the atmosphere.

The formulae prescribed in these Specifications take atmospheric dilution into account and ensure that at the point of maximum ground concentration (site boundary) the requirements of 10 CFR 20 will not be exceeded at any time and that the design objectives of Appendix I to 10 CFR 50 will not be exceed on an annual basis. The limit and objectives are based on the highest long term values of X/Q, which occur at the nearest portion of the site boundary.

The release of radioactive materials in liquid effluents to unrestricted areas will not exceed the limits set forth in Section 15.3.9 and will be as low as is reasonably achievable in accordance with the requirements of 10 CFR Part 50.34a and 50.36a. These Specifications provide reasonable assurance that the resulting average annual dose or dose commitment from liquid effluents from each unit of the Point Beach Nuclear Plant for any individual in an unrestricted area from all pathways of exposure will not exceed 3 mrem to the total body or 10 mrem to any organ. Further, these Specifications provide reasonable assurance that the resulting annual air dose from noble gases will not exceed 10 mrad from gamma radiation or 20 mrad from beta radiation in the gaseous waste effluents from each radioactive waste producing reactor at the site. These Specifications also provide reasonable assurance that no individual in an unrestricted area will receive an annual dose to the total body greater than 5 mrem or an annual dose to the skin greater than 15 mrem from these gaseous effluents, and that the annual dose to any organ of an individual from radioiodines and radioactive material in particulate form will not exceed 15 mrem from each unit at the site.

At the same time, these Specifications permit the flexibility of operation, compatible with considerations of health and safety, to assure that the public is provided with a dependable source of power even under unusual operating conditions which may temporarily result in releases higher than such numerical guides for design objectives but still within levels that assure that the average population exposure is equivalent to small fractions of doses from natural background radiation.

The design objective releases set forth in this Specification are derived from the dose evaluation performed in accordance with Appendix I to 10 CFR Part 50. In the evaluation, certain maximum calculated doses to an individual result from the calculated effluent releases. Design objective releases are defined by scaling calculated releases upward to the point at which corresponding doses reach the applicable limit specified in Appendix I to 10 CFR Part 50.

The radioactive liquid and gaseous effluent instrumentation is provided to monitor and control as applicable, the releases of radioactive materials in liquid and gaseous effluents during actual or potential releases of these effluents. The trip setpoints for these instruments shall be calculated utilizing the methodology in the Offsite Dose Calculation Manual.

The requirement that the appropriate portions of the liquid and gaseous radwaste treatment systems be used when specified provides assurance that the releases of radioactive materials in liquid and gaseous effluents will be kept "as low as is reasonably achievable".

Compliance with the provisions of Appendix I to 10 CFR Part 50 is adequate demonstration of conformance to the standards set forth in 40 CFR Part 190 regarding the dose commitment to individuals from the uranium fuel cycle. The Specifications direct that if actual quantities of radioactive materials released exceed twice the quantities associated with the design dose objective of Appendix I to 10 CFR Part 50, actual doses will be calculated and a special report will be submitted.

References:

(1) FSAR, Section 10.2
(2) FSAR, Section 2, Appendix 2A
(3) FSAR, Sections 2.6 and 2.7

TABLE 15.3.9-1

RADIOACTIVE EFFLUENT MONITORING INSTRUMENTATION

Instrument	Minimum Channels Operable	Action
a. Radioactive Liquid Effluent Monitoring		
1. Liquid Radwaste System		
a. RE-223, Waste Distillate Tank Discharge	1	Note 1
b. RE-218, Waste Condensate Tank Discharge	1	Note 1
c. Waste Condensate Tank Discharge Flow Meter	1	Note 4
2. Steam Generator Blowdown System		
a. RE-219, Unit 1 Steam Generator Blowdown Liquid Discharge (1 per unit) or RE-222, Blowdown Tank Monitor (1 per unit)	1	Note 2
b. Steam Generator Blowdown Flow Indicators (1 per steam generator)	1	Note 4
3. Service Water System		
a. RE-229, Service Water Discharge (1 per unit)	1	Note 3
b. RE-216, Containment Cooling Fan Service Water Return (1 per unit)	1	Note 3
c. RE-220, Spent Fuel Pool Heat Exchanger Service Water Outlet	1	Note 3
4. Retention Pond Discharge System		
a. RE-230, Retention Pond Discharge	1	Note 3
b. Retention Pond Discharge Composite Sampler	1	Note 3
b. Radioactive Gaseous Effluent Monitoring		
1. Gas Decay Tank System		
a. RE-214, Noble Gas (Auxiliary Building Vent Stack)	1	Note 1
b. Gas Decay Tank Flow Measuring Device	1	Note 4

Instrument	Minimum Channels Operable	Action
c. Iodine and Particulate - Continuous Air Sampler	1	Note 5
d. Sampler Flow Rate Measuring Device	1	Note 4
2. Auxiliary Building Ventilation System		
a. RE-214, Noble Gas (Auxiliary Building Vent Stack) or RE-315, Noble Gas (Auxiliary Building Vent SPING)	1	Note 6
b. Iodine and Particulate - Continuous Air Sampler	1	Note 5
c. Sampler Flow Rate Measuring Device	1	Note 4
3. Condenser Air Ejector System		
a. RE-225, Noble Gas (Combined Air Ejector Discharge Monitor); or RE-215, Noble Gas (Air Ejector Monitors - 1 per unit); or RE-214, Noble Gas (Auxiliary Building Vent Stack); or RE-315, Noble Gas (Auxiliary Building Vent SPING)	1	Note 6
b. Flow Rate Monitor - Air Ejectors	1	Note 4
4. Containment Purge and Continuous Vent System		
a. RE-212, Noble Gas Monitors (1 per unit); or RE-305, Noble Gas (Purge Exhaust SPING 1 per unit)	1	Notes 6 & 7
b. 30 CFM Vent Path Flow Indicators	1	Note 4
c. Iodine and Particulate - Continuous Air Samplers	1	Note 5
d. Sampler Flow Rate Measuring Device	1	Note 4

Instrument	Minimum Channels Operable	Action
5. Fuel Storage and Drumming Area Ventilation System		
a. RE-221, Noble Gas (Drumming Area Stack); or RE-325, Noble Gas (Drumming Area SPING)	1	Note 6
b. Iodine and Particulate - Continuous Air Sampler	1	Note 5
c. Sampler Flow Rate Measuring Device	1	Note 4
6. Gas Stripper Building Ventilation		
a. RE-224, Noble Gas (Gas Stripper Building); or RE-305 (Unit 2 Purge Exhaust SPING)	1	Note 6
b. Iodine and Particulate - Continuous Air Sampler	1	Note 5
c. Sampler Flow Rate Measuring Device	1	Note 4

Note 1: With the number of channels operable less than required by the minimum channels operable requirements, effluent releases; e.g., from a tank, may continue provided that prior to initiating a release, two separate samples will be analyzed by two technically qualified people in accordance with the applicable part of 15.4.17.B or C and the release rate is reviewed by two technically qualified people.

Note 2: With the number of channels operable less than required by the minimum channels operable requirements, effluent releases via this pathway may continue for up to 30 days provided grab samples are analyzed for gamma radioactivity per Table 15.4.17-2 at least once every 24 hours when the secondary coolant specific activity is less than 0.01 μCi/cc dose equivalent I-131 and once every 12 hours when the activity is greater than 0.01 μCi/cc dose equivalent I-131.

Note 3: With the number of channels operable less than required by the minimum channels operable requirements, and the downstream monitor is not operable (if one exists), effluent releases via this pathway may continue for up to 30 days provided that at least once every 12 hours grab samples are collected and analyzed for gamma radioactivity at a lower limit of detection specified in Table 15.4.17-2.

Note 4: With the number of channels operable less than required by the minimum channels operable requirements, effluent releases via this pathway may continue for up to 30 days provided the flow rate is estimated at least once per four hours during actual liquid batch releases or determined with auxiliary indication for gaseous releases once per four hours.

Note 5: With the number of channels operable less than required by the minimum channels operable requirements, effluent releases via the affected pathway may continue for up to 30 days provided samples are continuously collected with auxiliary sampling equipment.

Note 6: With the number of channels operable less than required by the minimum channels operable requirements, effluent releases via this pathway may continue for up to 30 days provided grab samples are taken at least once per 12 hours and these samples are analyzed for gamma radioactivity within 24 hours.

Note 7: Containment purge will be terminated upon the loss of this monitor.

TABLE 15.4.1-1 (2 of 4)

	Channel Description	Check	Calibrate	Test	Remarks
10.	Rod Position Bank Counters	S (1)**	N.A.	N.A.	1) With analog rod position
11.	Steam Generator Level	S **	R	M**	
12.	Steam Generator Flow Mismatch	S **	R	M**	
13.	Charging Flow	N.A.	R	N.A.	
14.	Residual Heat Removal Pump Flow	N.A.	R	N.A.	
15.	Boric Acid Tank Level	D	R	N.A.	
16.	Refueling Water Storage Tank Level	N.A.	R	N.A.	
17.	Volume Control Tank Level	N.A.	R	N.A.	
18.	Reactor Containment Pressure	D	R	B/W (1)**	1) Isolation Valve signal
19.	Radiation Monitoring System	D	R	Q	1) Radioactive Effluent Monitor Instrumentation Requirements are covered in 15.4.17.
20.	Boric Acid Control	N.A.	R	N.A.	
21.	Containment Sump Level	N.A.	R	N.A.	
22.	Turbine Overspeed Trip*	N.A.	R	M (1)**	1) Block trip
23.	Accumulator Level and Pressure	S	R	N.A.	

* Overspeed Trip Mechanism, and Independent Turbine Speed Detection and Valve Trip System.

** Not required during periods of refueling shutdown, but must be performed prior to starting up if it has not been performed during the previous surveillance period.

Unit 1 Amendment 15 July 1975
Unit 2 Amendment 21 November 1975

TABLE 15.4.1-1 (4 of 4)

S - Each Shft
D - Daily
W - Weekly
Q - Quarterly
B/W - Biweekly
M - Monthly
P - Prior to each startup if not done previous week
R - Each Refueling Interval (but not to exceed 18 months)
N.A. - Not applicable

** - Not required during periods of refueling shutdown, but must be performed prior to starting up if it has not been performed during the previous surveillance period.

*** - Not required during periods of refueling shutdown if steam generator vessel temperature is greater than 70°F.

**** - When used for the overpressure mitigating system, each PORV shall be demonstrated operable by:

a. Performance of a channel functional test on the PORV actuation channel, but excluding valve operation, within 31 days prior to entering a condition in which the PORV is required operable and at least once per 31 days thereafter when the PORV is required operable.

b. Testing valve operation in accordance with the inservice test requirements of the ASME Boiler and Pressure Vessel Code, Section IX.

TABLE 15.4.1-2 (Continued)

		Test	Frequency
24.	Integrity of Post-Accident Recovery Systems Outside Containment	Evaluate	Yearly
25.	Containment Purge Supply and Exhaust Isolation Valves	Verify valves are locked closed	Monthly(9)
26.	Waste Gas Holdup System Gas Decay Tanks	Oxygen concentration by volume of the inservice gas decay tank	Weekly

(1) Required only during periods of power operation.
(2) $\bar{E}$ determination will be started when the gross activity analysis of a filtered sample indicates $\geq$10 µc/cc and will be redetermined if the primary coolant gross radioactivity of a filtered sample increases by more than 10 µc/cc.
(3) Drop tests shall be conducted at rated reactor coolant flow. Rods shall be dropped under both cold and hot conditions, but cold drop tests need not be timed.
(4) Drop tests will be conducted in the hot condition for rods on which maintenance was performed.
(5) As accessible without disassembly of rotor.
(6) Not required during periods of refueling shutdown.
(7) At least once per week during periods of refueling shutdown.
(8) At least three times per week (with maximum time of 72 hours between samples) during periods of refueling shutdown.
(9) Not required during periods of cold or refueling shutdown.
(10) During end-of-cycle period of operation when boron concentration is less than 100 ppm, this test may be waived due to operational limitations.
(11) Sample to be taken after a minimum of 2 EFPD and 20 days power operation since the reactor was last subcritical for 48 hours or longer.

15.4.10 OPERATIONAL ENVIRONMENTAL MONITORING

Applicability

This section applies to operational environmental radioactivity monitoring and sampling.

Objective

To verify that plant operations have no significant radiological effect on the environment.

Specification

1. Environmental samples shall be taken at locations shown in the Environmental Manual according to the schedule given in Table 15.4.10-1 and the analytical criteria given in Table 15.4.10-2.
2. The milk sampling program shall be reviewed annually, including a visual verification of animals grazing in the vicinity of the site boundary, to ensure that sampling locations remain as conservative as practicable.
3. If a measured level of radioactivity in any environmental medium exceeds the "notification level" shown in Table 15.4.10-2, resampling and/or reanalysis for confirmation shall be completed within 30 days of the determination of the anomalous result. If the confirmed measured level of radioactivity remains above the notification level, a written report shall be submitted to the NRC in accordance with Section 15.6.9.3.B within thirty (30) days of the confirmation. However, levels of radioactivity less than 10 times those for similar sample types obtained from the reference location shall not be included in this requirement. Additionally, naturally occurring nuclides, such as Be-7, K-40, radium and its daughters, and thorium and its daughters, shall not be included in this requirement.

TABLE 15.4.10-2 - RADIOLOGICAL ENVIRONMENTAL MONITORING ANALYSES

Sample Type	Analysis	Approximate LLD[a]	Notification Level
Vegetation	Gross Beta	0.5 pCi/gm wet	250 pCi/gm dry
	Gamma Scan	0.06 pCi/gm wet for I-131, Cs-134, Cs-137	0.1 pCi/gm wet for I-131 1 pCi/gm wet for Cs-134 and Cs-137
Shoreline Silt	Gross Beta	2 pCi/gm dry	500 pCi/gm dry
	Gamma Scan	0.15 pCi/gm dry for Cs-134, Cs-137 1 pCi/gm dry for others	50 pCi/gm dry
Soil	Gross Beta	2 pCi/gm dry	500 pCi/gm dry
	Gamma Scan	0.15 pCi/gm dry for Cs-134, Cs-137 1 pCi/gm dry for others	50 pCi/gm dry
TLD's	Gamma Dose	1 mrem/TLD	20 mrem/wk
Lake Water	Gross Beta-T.S.[b]	4 pCi/l	250 pCi/l
	Gamma Scan-T.S.	15 pCi/l for Mn-54, Co-58, Co-60, Zr-Nb-95, Cs-134, Cs-137, Ba-La-140, 30 pCi/l for Fe-59, Zn-65	100 pCi/l for all isotopes listed under LLD
	Tritium	2 pCi/ml	20 pCi/ml
	Strontium-89	5 pCi/l	100 pCi/l
	Strontium-90	1 pCi/l	100 pCi/l
Air Filters	Gross Beta	0.01 pCi/m^3	1.0 pCi/m^3
	Radioiodine	0.03 pCi/m^3	0.9 pCi/m^3
	Gamma Scan	0.05 pCi/m^3 for Cs-134, Cs-137	10 pCi/m^3 for Cs-134, Cs-137
Well Water	Gross Beta-T.S.	4 pCi/l	250 pCi/l
	Gamma Scan-T.S.	15 pCi/l for Mn-54, Co-58, Co-60, Zr-Nb-95, Cs-134, Cs-137, Ba-La-140 30 pCi/l for Fe-59, Zn-65	100 pCi/l for all isotopes listed under LLD
	Tritium	2 pCi/ml	20 pCi/ml
	Strontium-89	5 pCi/l	100 pCi/l
	Strontium-90	1 pCi/l	100 pCi/l
Milk	Gamma Scan	15 pCi/l for Cs-134, Cs-137, Ba-La-140[c]	60 pCi/l for Cs-134, Cs-137 300 pCi/l for Ba-La-140
	Radiodione	0.5 pCi/l	3 pCi/l
	Strontium-89	5 pCi/l	100 pCi/l
	Strontium-90	1 pCi/l	100 pCi/l

TABLE 15.4.10-2 (CONTINUED)

Sample Type	Analysis	Approximate LLD[(a)]	Notification Level
Algae	Gross Beta	5 pCi/gm dry	250 pCi/gm dry
	Gamma Scan	5 pCi/gm dry	25 pCi/gm dry
Fish	Gross Beta	0.5 pCi/gm wet	250 pCi/gm dry
	Gamma Scan	0.13 pCi/gm wet for Mn-54, Co-58, Co-60, Cs-134, Cs-137 0.26 pCi/gm wet for Fe-59 and Zn-65	10 pCi/gm wet for all isotopes listed under LLD

(a) LLD - Lower limit of detection; for gamma scans, the stated LLD is nominal and applies to typical common nuclides, unless otherwise stated.

(b) T.S. - Total Solids

(c) LLD for radioiodine in milk applies at the time of sample collection.

FIGURE 15.4.10-1

SAMPLING LOCATIONS

has been deleted.

15.4.17 RADIOACTIVE EFFLUENT MONITORING AND CONTROL SYSTEMS

Applicability

Applies to the periodic inspection, testing calibration and verification of operability requirements for the radioactive liquid and gaseous effluent monitoring instrumentation and waste processing systems.

Objective

To verify that radioactive liquid and gaseous effluent monitoring instrumentation channels and liquid and gaseous radwaste treatment systems are periodically demonstrated to be operable and to verify that the concentrations of radioactive material released from the site do not exceed the limits specified in Specification 15.3.9.

Specifications

A. Radioactive Effluent Monitoring Instrumentation Channel Surveillance Requirements

Each radioactive liquid effluent monitoring instrumentation channel and 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 15.4.17-1.

B. Radioactive Liquid Waste Sampling and Analysis

1. The radioactivity content of each batch of radioactive liquid waste shall be determined prior to release by sampling and analysis in accordance with Table 15.4.17-2 using the methods described in the PCP. The results of pre-release analyses shall be used to assure that the concentration at the point of release is maintained within the limits of Specification 15.3.9.

2. Post-release analyses of samples composited from batch releases shall be performed in accordance with Table 15.4.17-2. The results of the previous post-release analyses shall be used to assure that the concentrations at the point of release were maintained within the limits of Specification 15.3.9.

3. The radioactivity concentration of liquids discharged from continuous release points shall be determined by collection and analysis of samples in accordance with Table 15.4.17-2. The results of the analyses shall be used to assure that the concentrations at the point of release are maintained within the limits of Specification 15.3.9.

C. Radioactive Gaseous Waste Sampling and Analysis

1. The radioactivity concentration of radioactive gaseous wastes shall be determined by sampling and analyses in accordance with Table 15.4.17-3. The results of the analyses shall be used to assure that concentrations are maintained within the limits of Specification 15.3.9.

TABLE 15.4.17-1

RADIOACTIVE EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

Channel Description	Channel Check	Calibrate	Functional Test	Source Check	Remarks
a. Radioactive Liquid Effluent Monitoring					
1. Liquid Radwaste System					
a. RE-223, Waste Distillate Tank Discharge	D	A	Q	P	
b. RE-218, Waste Condensate Tank Discharge	D	A	Q	P	
c. Waste Condensate Tank Discharge Flow Meter	P/D	A	NA	NA	
2. Steam Generator Blowdown System					
a. RE-219, Steam Generator Blowdown Liquid Discharge (1 per unit)	D	A	Q	M	
b. RE-222, Blowdown Tank Monitor (1 per unit)	D	A	Q	M	
c. Steam Generator Blowdown Flow Indicator (1 per steam generator)	W	A	NA	NA	
3. Service Water System					
a. RE-229, Service Water Discharge (1 per unit)	D	A	Q	M	
b. RE-216, Containment Cooling Fan Service Water Return (1 per unit)	D	A	Q	M	
c. RE-220, Spent Fuel Pool Heat Exchanger Service Water Outlet	D	A	Q	M	
4. Retention Pond Discharge System					
a. RE-230, Retention Pond Discharge	D	A	Q	M	
b. Retention Pond Discharge Effluent Sump Pumps	W	A	NA	NA	

Channel Description	Channel Check	Calibrate	Functional Test	Source Check	Remarks
b. Radioactive Gaseous Effluent Monitoring					
1. Gas Decay Tank System					
a. RE-214, Noble Gas (Auxiliary Building Vent Stack)	D	A	Q	M	
b. Gas Decay Tank Flow Measuring Device	P	A	NA	NA	
c. Iodine and Particulate Continuous Air Sampler	P/W	NA	NA	NA	
d. Sampler Flow Rate Measuring Device	W	A	NA	NA	
2. Auxiliary Building Ventilation System					
a. RE-214, Noble Gas (Auxiliary Building Vent Stack)	D	A	Q	M	
b. RE-315, Noble Gas (Auxiliary Building SPING)	D	A	Q	M	
c. Iodine and Particulate Continuous Air Sampler	P/W	NA	NA	NA	
d. Sampler Flow Rate Measuring Device	W	A	NA	NA	
3. Condenser Air Ejector System					
a. RE-225, Noble Gas (Combined Air Ejector Discharge)	D	A	Q	M	
b. RE-215, Noble Gas (Air Ejectors - 1 per unit)	D	A	Q	M	
c. Flow Rate Measuring Device - Air Ejectors (1 per unit)	D	A	NA	NA	
4. Containment Purge and Continuous Vent System					
a. RE-212, Noble Gas (1 per unit)	D	A	Q	M*	

Channel Description	Channel Check	Calibrate	Functional Test	Source Check	Remarks
b. 30 cfm Vent Path Flow Indicator					
c. RE-305, Noble Gas (Purge Exhaust SPING - 1 per unit)	D	A	Q	M*	
d. Iodine and Particulate Continuous Air Sampler	P/W	NA	NA	NA	
e. Sampler Flow Rate Measuring Device	P/W	A	NA	NA	
5. Fuel Storage and Drumming Area Ventilation Stack					
a. RE-221, Noble Gas (Drumming Area Vent Stack)	D	A	Q	M	
b. RE-325, Noble Gas (Drumming Area SPING)	D	A	Q	M	
c. Iodine and Particulate Continuous Air Sampler	W	NA	NA	NA	
d. Sampler Flow Rate Measuring Device	W	A	NA	NA	
6. Gas Stripper Building Ventilation System					
a. RE-224 Noble Gas	D	A	Q	M	
b. Iodine and Particulate Continuous Air Sampler	W	NA	NA	NA	
c. Sampler Flow Rate Measuring Device	W	A	NA	NA	

NOTES FOR TABLE 15.4.17-1

D = Daily

W = Weekly

M = Monthly

Q = Quarterly

A = Annually

P/D = Prior to or immediately upon initiation of a release or daily if a release continues for more than one day

P/W = Prior to or immediately upon initiation of a release or weekly if a release continues for more than one week

P = Prior to or immediately upon initiation of a release

* = Source check required prior to containment purge

TABLE 15.4.17-2

RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

Liquid Release Type	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Level of Detection* (μCi/cc)
1. Waste Condensate Tank Waste Distillate Tank	Prior to Release	Prior to Release	Gamma Emitters Tritium	5×10^{-7} 1×10^{-5}
		Monthly on Batch Composites	Gross Alpha	1×10^{-7}
		Quarterly on Batch Composites	Sr-89/90 Fe-55	5×10^{-8} 1×10^{-6}
2. Continuous Releases**				
a. Steam Generator Blowdown	Grab Samples Twice Weekly	Twice Weekly	Gamma Emitters Tritium	5×10^{-7} 1×10^{-5}
b. Service Water		Monthly on Grab Composites	Gross Alpha	1×10^{-7}
		Quarterly on Grab Composites	Sr-89/90 Fe-55	5×10^{-8} 1×10^{-6}
c. Retention Pond	Continuous Composite***	Weekly	Gamma Emitters Tritium	5×10^{-7} 1×10^{-5}
		Monthly on Weekly Composite	Gross Alpha	1×10^{-7}
		Quarterly on Monthly Comp.	Sr-89/90 Fe-55	5×10^{-8} 1×10^{-6}

NOTES FOR TABLE 15.4.17-2

* The principal gamma emitter for which the LLD specification applies is Cs-137. This does not mean that only Cs-137 is to be considered. Other gamma peaks that are identifiable are to be included in the semi-annual report.

** A continuous release is the discharge of liquid wastes of a non-discrete volume; e.g., from a volume of a system that has an input flow during the continuous release.

*** A composite sample is one in which the method of sampling employed results in a specimen that is representative of the liquids released.

TABLE 15.4.17-3

RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS PROGRAM

Liquid Release Type	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Level of Detection**** (μCi/cc)
1. Gas Decay Tank	Prior to Release	Prior to Release	Gamma Emitter	1×10^{-4}
2. Containment Purge or Continuous Vent	Prior to Purge or Vent*	Prior to Purge or Vent	Gamma Emitters	1×10^{-4}
			Tritium	3×10^{-6}
3. Continuous Releases Including:	Continuous***	Weekly Analysis of Charcoal and Particulate Samples	Gamma Emitters I-131 & I-133	1×10^{-11}
a. Unit 1 Containment Vent b. Unit 2 Containment Vent c. Drumming Area Vent** d. Gas Stripper Building Vent e. Auxiliary Building Vent		Monthly Composite of Particulate Sample	Gross Alpha	1×10^{-11}
		Quarterly Composite of Particulate Sample	Sr-89/90	1×10^{-11}
	Weekly (Grab)	Weekly	Noble Gases	1×10^{-6}
		Weekly	Tritium	3×10^{-6}

* Tritium grab samples will be taken every 24 hours when the refueling cavity is flooded.

** Tritium grab samples will be taken every seven days from the drumming area ventilation exhaust/spent fuel pool area whenever there is spent fuel in the spent fuel pool.

*** The ratio of the sample flow rate to the sampled flow rate should be known for the time period covered by each sampling interval.

**** The principal gamma emitters for which the LLD specification applies are Cs-137 in particulates and Xe-133 in gases. This does not mean that only Cs-137 and Xe-133 will be considered. Other peaks that are identifiable will be included in the semi-annual report.

15.5 DESIGN FEATURES

15.5.1 SITE

Applicability

Applies to the location and extent of the reactor site.

Objective

To define those aspects of the site which affect the overall safety of the installation.

Specification

The Point Beach Nuclear Plant is located on property owned by the Wisconsin Electric Power Company at a site on the shore of Lake Michigan, approximately 30 miles southeast of the city of Green Bay. The minimum distance from the reactor containment center line to the property line as defined in 10 CFR 100.3 is 1,200 meters. The property line is identified on Figure 15.5.1-1.

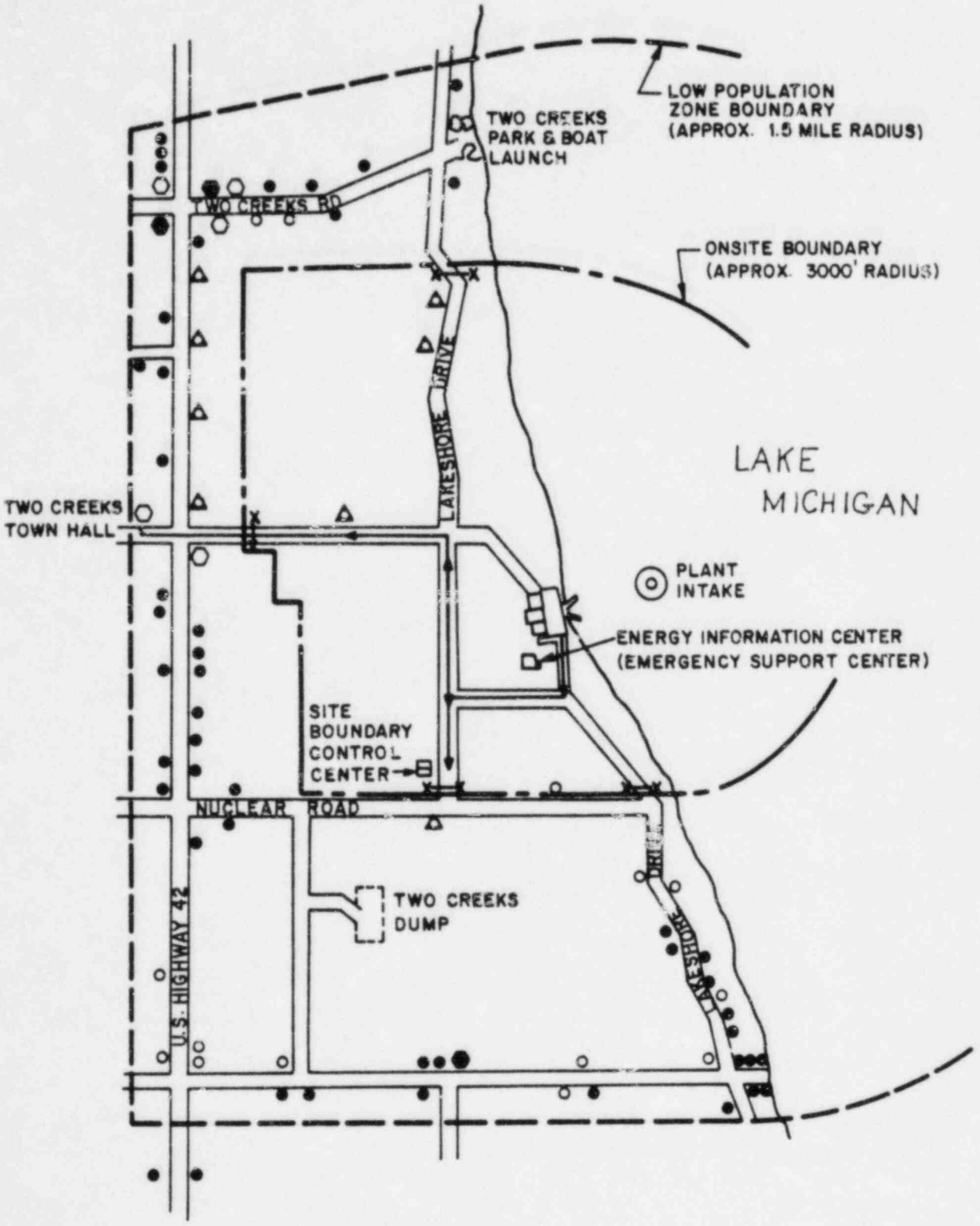

FIGURE 15.5.1-1

MAP OF POINT BEACH NUCLEAR PLANT AND IMMEDIATE SURROUNDING AREA

b) Review all proposed tests and experiments related to safety and the results thereof when applicable.

c) Review all proposed changes to Technical Specifications.

d) Review all proposed changes or modifications to plant systems or equipment where changes would require a change in operating or emergency procedures or that affect nuclear safety.

e) Periodically review plant operations for industrial and nuclear safety hazards.

f) Investigate violations or suspected violations of Technical Specifications, such investigations to include reports, evaluations, and recommendations to prevent recurrence, to the Vice President - Nuclear Plant and to the Chairman of the Offsite Review Committee.

g) Perform special reviews and investigations and prepare reports thereon as requested by the Chairman of the Offsite Review Committee.

h) Investigate, review, and report on all reportable occurrences.

i) Cause to be conducted periodic drills on emergency procedures, including evacuation (partial or complete) of the site and check adequacy of communications with offsite support groups.

j) Review the Facility Fire Protection Program and implementing procedures at least once per 24 months.

k) Review every onsite release of radioactive material to the environs in excess of the levels calculated using the methodology of the ODCM. Such review will include a summary of evaluation, recommendation and disposition of corrective action to prevent recurrence.

l) Review all proposed changes to the PCP and ODCM.

AUTHORITY

15.6.5.2.7

a) The Supervisory Staff shall serve as advisory to the Manager-Nuclear Operations.

b) The Supervisory Staff shall recommend to the Manager approval or disapproval of proposals under items a) through d) above. In the event of disagreement between a majority of the Supervisory Staff and decisions by the Manager, the course of action will be determined by the Manager and the disagreement recorded in the Staff minutes. Records of the disagreement will be included in the minutes sent for review to the Off-Site Review Committee and the Executive Vice President.

c) The Supervisory Staff shall make tentative recommendations as to whether or not proposals considered by the Staff involve unreviewed safety questions. These recommendations shall be subject to review and further recommendations by the Off-Site Review Committee. Minutes shall be kept of all meetings of the Staff and copies shall be sent to the Executive Vice President and to the Chairman of the Off-Site Review Committee.

d) The Supervisory Staff shall review and approve the contents of a report for each reportable occurrence. This report shall include an evaluation of the cause of the occurrence and recommendations for appropriate action to prevent or reduce the probability of a recurrence. Copies of all such reports shall be submitted to the Executive Vice President and to the Off-Site Review Committee.

RECORDS

15.6.2.8

The Manager's Supervisory Staff shall maintain written minutes of each meeting and copies shall be provided to the Executive Vice President and Chairman, Off-Site Review Committee.

h) Any indication of an unanticipated deficiency in some aspects of design or operation of safety-related structures, systems, or components.

i) Reports and meeting minutes of the Manager's Supervisory Staff.

AUDITS

15.6.5.3.8

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

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

b) The performance, training and qualifications of the licensed operating staff at least once per year.

c) The results of actions taken to correct deficiencies occurring in facility equipment, structures, systems, or method of operation that affect nuclear safety at least twice per year at approximately six-month intervals.

d) The results of quarterly audits by the Quality Assurance Division on the performance of activities required by the Quality Assurance Program to meet the criteria of Appendix "B", 10 CFR 50, at least once per two years.

e) The Offsite Dose Calculation Manual and Process Control Program together with their implementing procedures at least once per two years.

f) Any other area of facility operation considered appropriate by the Executive Vice President.

AUTHORITY

15.6.5.3.9

The OSRC shall report to and advise the Executive Vice President on those areas of responsibility specified in Section 15.6.5.3.7 and 15.6.5.3.8.

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 engincered safety feature systems.

4. Abnormal degradation of systems other than those specified in 15.6.8.2.A.3 above designed to contain radioactive material resulting from the fission process.

15.6.9.3 UNIQUE REPORTING REQUIREMENTS

The following written reports shall be submitted to the Director, Office of Nuclear Reactor Regulation, USNRC:

A. Each integrated leak test shall be the subject of a summary technical report, including results of the locak leak rate tests and isolation valve leak rate tests since the last report. The report shall include analysis and interpretations of the results which demonstrate compliance with specified leak rate limits.

B. If the confirmed measured level of radioactivity remains above the notification levels specified in Table 15.4.10-2 of Specification 15.4.10, "Operational Environmental Monitoring", a written report describing the circumstance shall be submitted to the NRC Regional Administrator, copy to the above Director, within thirty days of the confirmation.

C. Submission of a report within sixty days after January 1 and after July 1 each year for the six-month period of fraction thereof, ending June 30 and December 31 containing:

(1) The number and types of samples taken and the types of analytical measurements made on the samples.

(2) Any changes made in sample types or locations during the reporting period and criteria for these changes.

b. A summary of survey results during the reporting period including a comment on any significant portion of the Operational Environmental Monitoring Program not conducted.

4. Leak Testing of Source

Results of required leak tests performed on seal sources if the tests reveal the presence of 0.005 microcuries or more of removable contamination.

5. Meterological Data

The summary of required meterological data shall be kept in a file on site and will be provided to the NRC upon request. The 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. The meterological data will be available following the installation and operation of the new plant process computer and software (approximately 1985).

D. Poison Assembly Removal From Spent Fuel Storage Racks

Plans for removal of any poison assemblies from the spent fuel storage racks shall be reported and described at least 14 days prior to the

planned activity. Such report shall describe neutron attenuation testing for any replacement poison assemblies, if applicable, to confirm the presence of boron material.

E. Overpressure Mitigating System Operation

In the event the overpressure mitigating system is operated to relieve a pressure transient which, by licensee's evaluation, could have resulted in an overpressurization incident had the system not been operable, a special report shall be prepared and submitted to the Commission within thirty days. The report shall describe the circumstances initiating the transient, the effect of the system on the transient and any corrective action necessary to prevent recurrence.

F. Dose Equivalent I-131

With total cumulative operating time at a primary coolant specific activity greater than 1.0 microcurie per gram dose equivalent I-131 exceeding 500 hours in any consecutive six-month period, submit a report within thirty days indicating the number of hours above this limit.

G. Radioactive Liquid Effluent Waste Treatment

If the radioactive liquid waste treatment system is inoperable and liquid radwaste is being discharged for 31 days without the treatment required to meet the design objectives set forth in 10 CFR 50, Appendix I, a special report shall be prepared and submitted to the Commission within thirty days which includes the following information:

1. Identification of the inoperable equipment or subsystem and the reason for inoperability.

2. Actions taken to restore the inoperable equipment to operable status.

3. Summary description of actions taken to prevent a recurrence.

H. Radioactive Gaseous Effluent Waste Treatment

If the radioactive gaseous waste treatment system and the ventilation exhaust treatment system are inoperable and gaseous radwaste is being discharged for 31 days without the treatment required to meet the design objectives set forth in 10 CFR 50, Appendix I, a special report shall be prepared and submitted to the Commission within thirty days which includes the following information:

1. Identification of the inoperable equipment or subsystems and the reason for inoperability.

2. Actions taken to restore the inoperable equipment to operable status.

3. Summary description of actions taken to prevent a recurrence.

I. Radioactive Effluent Releases

If the quantity of radioactive material actually released in effluents during any calendar quarter is such that the resulting radiation exposure, calculated on the same basis as the design objective exposure, would exceed one-half the design objective annual exposure, a special report shall be prepared and submitted to the Commission within thirty days of the analysis.

M. Test results, in units of microcuries, for leak tests performed pursuant to Specification 15.4.12.

N. Record of annual physical inventory verifying accountability of sources subject to Specification 15.4.12.

O. *Records of training and qualification for current plant NRC licensed staff and key personnel.

P. *Records of inservice inspections performed pursuant to these Technical Specifications.

Q. *Records of Quality Assurance activities required by the QA Manual.

R. *Records of reviews performed pursuant to 10 CFR 50.59.

S. *Records of meetings of the Manager's Supervisory Staff and the Offsite Review Committee.

T. *Records of Environmental Qualification which are covered under the provisions of paragraph 15.6.12.

U. *Records of the service life of all snubbers in accordance with Specification 15.4.13.4.

V. *Record of analyses for radiological environmental monitoring.

*Items will be permanently retained.