ATTACHMENT D

Marked-Up Current Technical Specification Pages

9506290281 950616
PDR ADOCK 05000237
P PDR

3.5 LIMITING CONDITION FOR OPERATION (Cont'd.)

B. Containment Cooling Subsystem

TSUP 3.8.A LCO

1. Except as specified in 3.5.B.2, 3.5.B.3, and 3.5.F.3 through 3.5.F.6 below, both containment cooling subsystem loops shall be operable whenever irradiated fuel is in the reactor vessel and reactor coolant temperature is greater than 212°F.

TSUP 3.8.A Applicability

4.5 SURVEILLANCE REQUIREMENT (Cont'd.)

B. Surveillance of the Containment Cooling Subsystem shall be performed as follows:

1. Containment Cooling Service Water Subsystem Testing:

Item	Frequency
a. Pump & Valve Operability	Once/3 months
b. Flow Rate Test. Each containment cooling water pump shall deliver at least 3500 gpm against a pressure of 180 psig.	After pump maintenance and every 3 months
c. Each manual, power operated or automatic valve, in the flow path that is not locked, sealed or otherwise secured in its position, must be verified to be in its correct position.	Every 31 days

Relocated - to IST Program

Relocated - to IST Program

TSUP 4.8.A

TSUP 3.8.A, Action 1.2

2. From and after the date that one of the containment cooling service water subsystem pumps is made or found to be inoperable for

3.5 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.5 SURVEILLANCE REQUIREMENT (Cont'd.)

any reason, reactor operation is permissible only during the succeeding ~~thirty~~ days unless such pump is sooner made operable, provided that during such thirty days all other active components of the containment cooling subsystem are operable.

TSUP 3.8.A, Action 1.a

3. From and after the date that one containment cooling subsystem is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding seven days unless such subsystem is sooner made operable, provided that all active components of the other containment cooling subsystem, both core spray subsystems and both diesel generators required for operation of such components if no external source of power were available, shall be operable.

TSUP 3.8.A, Action 1.c

TSUP 72hrs

TSUP 3.9, 3.5

4. If the requirements of 3.5.B cannot be met, an orderly shutdown shall be initiated and the reactor shall be in a Cold Shutdown condition within 24 hours.

TS UP 3.8.A Actions

FOR INFORMATION ONLY

3.5 LIMITING CONDITION FOR OPERATION (Cont'd.)

shall be initiated within 15 minutes to restore operation to within the prescribed limits. If the steady state MCPR is not returned to within the prescribed limits within two (2) hours, the reactor shall be brought to the Cold Shutdown condition within 36 hours. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits.

M. Condensate Pump Room Flood Protection

1. The system is installed to prevent or mitigate the consequences of flooding of the condensate pump room. The system shall be operable prior to startup of the reactor.

Deleted Admin Controls

4.5 SURVEILLANCE REQUIREMENT (Cont'd.)

Deleted Admin Controls

M. Condensate Pump Room Flood Protection

1. The following surveillance requirements shall be observed to assure that the condensate pump room flood protection is operable.

a. The testable penetrations through the walls of CCSW pump vaults shall be checked during each operating cycle by pressurizing to 15 plus or minus 2 psig and checking for leaks using a soap bubble solution. The criteria for acceptance should be no visible leakage through the soap bubble solution. The bulkhead door shall be checked during each operating cycle by hydrostatically testing the door at 15 plus or minus 2 psig and checking to verify that leakage around the door is less than one gallon per hour.

Deleted - Admin Controls

Figure 3.5-2 (sheets 1 and 2)

Deleted

3.5 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.5 SURVEILLANCE REQUIREMENT (Cont'd.)

b. The CCSW Vault Floor drain shall be checked during each operating cycle by assuring that water can be run through the drain line and actuating the air operated valves by operation of the following sensor:

i. loss of air

ii. high level in the condensate pump room (5'0")

Deleted - Admin Controls

c. The condenser pit five foot trip shall have a trip setting of less than or equal to five feet zero inches. The five foot trip circuit for each channel shall be checked once every three months. The 3 and 1 foot alarms shall have a setting of less than or equal to three feet zero inches and less than or equal to 1 foot 0 inches. A logic system functional test, including all alarms, shall be performed during the refueling outage.

Deleted - Admin Controls

3.5 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.5 SURVEILLANCE REQUIREMENT (Cont'd.)

2. The condenser pit water level switches shall trip the condenser circulating water pumps and alarm in the control room if water level in the condenser pit exceeds a level of 5 feet above the pit floor. If a failure occurs in one of these trip and alarm circuits, the failed circuit shall be immediately placed in a trip condition and reactor operation shall be permissible for the following seven days unless the circuit is sooner made operable.

Deleted - Admin Controls

3. If Specification 3.5.M.1 and 2 cannot be met, reactor startup shall not commence or if operating, an orderly shutdown shall be initiated and the reactor shall be in a cold shutdown condition within 24 hours.

Deleted - Admin Controls

LIMITING CONDITION FOR OPERATION (Cont'd.)

g. The MAPLHGR Operating Limit shall be reduced by the appropriate multiplicative factor from the Core Operating Limits Report (Specification 3.5.I). If, concurrently, one Automatic Pressure Relief Subsystem relief valve is out-of-service, the MAPLHGR Operating Limit shall be reduced by the appropriate multiplicative factor from the Core Operating Limits Report.

4. With no reactor coolant system recirculation loops in operation, reduce core thermal power to less than 25% of rated within 2 hours and place the unit in hot shutdown within the following 12 hours.

5. Idle Recirculation Loop Startup

An idle recirculation pump shall not be started unless the temperature differential between the reactor vessel steam space coolant and the bottom head drain line coolant is less than or equal to 145°F*, and:

a. When both pumps have been idle, unless the temperature differential between the reactor coolant within the idle loop to be started up and the coolant in the reactor pressure vessel is less than or equal to 50°F, or

b. When only one loop has been idle, unless the temperature differential between the reactor coolant within the idle and operating recirculation loops is less than or equal to 50°F and the speed of the operating pump is less than or equal to 43% of rated pump speed.

I. Snubbers (Shock Suppressors)

4.6 SURVEILLANCE REQUIREMENT (Cont'd.)

5. Idle Recirculation Loop Startup

The temperature differentials and flow rates shall be determined to be within the limits within 15 minutes prior to startup of an idle recirculation loop.

T_{sup} 3.8.F

T_{sup} 4.8.F

I. Snubbers (Shock Suppressors)

The following surveillance requirements apply to safety related snubbers.

*Only applicable with reactor pressure vessel steam space pressure ≥ 25 psig.

3.6 LIMITING CONDITION FOR OPERATION (Cont'd.)	4.6 SURVEILLANCE REQUIREMENT (Cont'd.)
1. During all modes of operation except cold shutdown and refuel, all safety related snubbers shall be operable except as noted in Specification 3.6.I.2 through 3.6.I.4.	1. Visual Inspection An independent visual inspection shall be performed on the safety related hydraulic and mechanical snubbers in accordance with the schedule below.
	a. All hydraulic snubbers whose seal material has been demonstrated by operating experience, lab testing or analysis to be compatible with the operating environment shall be visually inspected. This inspection shall include, but not necessarily be limited to, inspection of the hydraulic fluid reservoir, fluid connections, and linkage connection to the piping and anchor to verify snubber operability.
	b. All mechanical snubbers shall be visually inspected. This inspection shall consist of, but not necessarily be limited to, inspection of the snubber and attachments to the piping and anchor for indications of damage or impaired operability.

TS UP 3.8.F, Applicability

TS UP 4.8.F.2

FOR INFORMATION ONLY

3.6 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.6 SURVEILLANCE REQUIREMENT (Cont'd.)

FOR INFORMATION ONLY

TSUP Table 4.8.F-1

No. of Snubbers Found Inoperable During Inspection Interval	Next Required Inspection Interval
0	18 months plus or minus 25%
1	12 months plus or minus 25%
2	6 months plus or minus 25%
3,4	124 days plus or minus 25%
5,6,7	62 days plus or minus 25%
8 or more	31 days plus or minus 25%

TSUP Table 4.8.F-1 Notation

The required inspection interval shall not be lengthened more than one step at a time.

TSUP Table 4.8.F-1, Note a & 4.8.F.2

Snubbers may be categorized in two groups, "accessible" or "inaccessible," based on their accessibility for inspection during reactor operation. These two groups may be inspected independently according to the above schedule.

TSUP 3.8.F, Actions

2. From and after the time a snubber is determined to be inoperable, continued reactor operation is permissible only during the succeeding 72 hours unless the snubber is sooner made operable or replaced.

2. Functional Testing

a. Once each refueling cycle, a representative sample of approximately 10% of the hydraulic snubbers shall be functionally tested for operability, including:

TSUP 4.8.F.5

3688a
3123A

3.6 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.6 SURVEILLANCE REQUIREMENT (Cont'd.)

FOR INFORMATION ONLY

TSUP 4.8.F

(i) Activation (restraining action) is achieved within the specified range of velocity or acceleration in both tension and compression.

TSUP 4.8.F

(ii) Snubber bleed, or release rate, where required, is within the specified range in compression or tension.

For each unit and subsequent unit found inoperable, an additional 10% of the hydraulic snubbers shall be tested until no more failures are found or all units have been tested.

TSUP 4.8.F

b. Once each refueling cycle, a representative sample of approximately 10% of the mechanical snubbers shall be functionally tested for operability. The test shall consist of two parts:

3688a
3123A

FOR INFORMATION ONLY

3.6 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.6 SURVEILLANCE REQUIREMENT (Cont'd.)

BWD 4.8.F

(i) Verification that the force that initiates free movement of the snubber in either tension or compression is less than the specified maximum breakaway friction force.

TSWD 4.8.F

(ii) Verify that the activation (restraining action) is achieved within the specified range of acceleration or velocity, as applicable based on snubber design in both tension and compression.

TSWD 4.8.F

For each unit and subsequent unit found inoperable, an additional 10% of the mechanical snubbers shall be so tested until no more failures are found or all units have been tested.

TSWD 4.8.F

c. In addition to the regular sample, snubbers which failed the previous functional test shall be retested during the next test period. If a spare snubber has been installed in place of a failed snubber, then both the failed snubber (if it is repaired and installed in another position) and the spare snubber shall be retested. Test results of these snubbers may not be included for the resampling.

3688a
3123A

3.6 LIMITING CONDITION FOR OPERATION (Cont'd.)	4.6 SURVEILLANCE REQUIREMENT (Cont'd.)
3. If the requirements of 3.6.I.1 and 3.6.I.2 cannot be met, an orderly shutdown shall be initiated and the reactor shall be in cold shutdown or refuel condition within 36 hours.	3. When a snubber is deemed inoperable, a review of all pertinent facts shall be conducted to determine the snubber mode of failure and to decide if an engineering evaluation should be performed on the supported system or components. If said evaluation is deemed necessary, it will determine whether or not the snubber mode of failure has imparted a significant effect or degradation on the supported component or system.
4. If a snubber is determined to be inoperable while the reactor is in the cold shutdown or refuel mode, the snubber shall be made operable or replaced prior to reactor startup.	4. If any snubber selected for functional testing either fails to lock up or fails to move, i.e., frozen in place, the cause will be evaluated and, if determined to be a generic deficiency, all snubbers of the same design subject to the same defect shall be functionally tested.

BWP 3.8.F Actions

BWP 4.8.F

BWP 3.8.F Applicability

BWP 4.8.F

FOR INFORMATION ONLY

3.6 LIMITING CONDITION FOR OPERATION
(Cont'd.)

5. Snubbers may be added or removed from safety related systems without prior license amendment.

Bul 3/4.8.F

4.6 SURVEILLANCE REQUIREMENT
(Cont'd.)

5. Snubber service life monitoring shall be followed by existing station record systems, including the central filing system, maintenance files, safety related work packages, and snubber inspection records. The above record retention methods shall be used to prevent the hydraulic snubbers from exceeding a service life of 10 years and the mechanical snubbers from exceeding a service life of 40 years (lifetime of the plant).

Bul 4.8.F

3688a
3123A

FOR INFORMATION ONLY

3.8 LIMITING CONDITION FOR OPERATION

Applicability:

Applies to the radioactive effluents from the plant.

Specifications:

A. Gaseous Effluents

1. The dose rate in unrestricted areas at or beyond the site boundary (Figures 4.8.1 and 4.8.2) due to radioactive materials released in gaseous effluents from the site shall be limited to the following:

   a. For Noble Gases:

      (1) Less than 500 mrem/year to the whole body.

      (2) Less than 3000 mrem/year to the skin.

   b. For iodine-131, for iodine-133, and for all radionuclides in particulate form with half-lives greater than 8 days, less than 1500 mrem/year.

   c. If the dose rates exceed the above limits, without delay decrease the release rates to bring the dose rates within the limits, and provide prompt notification to the Commission (6.6.B.1.)

GL 89-01 - relocated to ODCM

4.8 SURVEILLANCE REQUIREMENTS

Applicability:

Applies to the periodic measurements of radioactive effluents.

Specifications:

A. Gaseous Effluents

1. The dose rates due to radioactive materials released in gaseous effluents from the site shall be determined to be within the prescribed limits by obtaining representative samples in accordance with the sampling and analysis program specified in Table 4.8.1. The dose rates are calculated using methods prescribed in the Off-Site Dose Calculation Manual (ODCM).

GL 89-01 RETS/ODCM

3817a
3843A

FOR INFORMATION ONLY

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)

2. The air dose in unrestricted areas at or beyond the site boundary due to noble gases released in gaseous effluents from the unit shall be limited to the following:

   a. For Gamma Radiation
      (1) Less than or equal to 5 mrad during any calendar quarter.

      (2) Less than or equal to 10 mrad during any calendar year.

   b. For Beta Radiation

      (1) Less than or equal to 10 mrad during any calendar quarter.

      (2) Less than or equal to 20 mrad during any calendar year.

   c. With the calculated air dose from radioactive noble gases in gaseous effluents exceeding any of the above limits, prepare and submit to the Commission within 30 days, a Special Report which identifies the cause(s) for exceeding the limit(s)

GL 89-01 RETS/ODCM

4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)

2. The air dose due to releases of radioactive noble gases in gaseous effluents shall be determined to be within the prescribed limits by obtaining representative samples in accordance with the sampling and analysis program specified in Sections A and B of Table 4.8.1. The allocation of effluents between units having shared effluent control systems and the air doses are determined using methods prescribed in the ODCM at least once every 31 days.

GL 89-01 RETS/ODCM

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)

and defines the corrective actions to be taken to ensure that future releases are in compliance with Specifications 3.8.A.2.a and b. This is in lieu of a Licensee Event Report.

GL 89-01 RETS/ODCM

d. With the calculated air dose from radioactive noble gases in gaseous effluents exceeding the limits of Specifications 3.8.A.2.a or 3.8.A.2.b, prepare and submit a Special Report to the Commission within 30 days and limit the subsequent releases such that the doses or dose commitment to a member of the public from all uranium fuel cycle sources is limited to less than or equal to 25 mrem to the total body or any organ (except thyroid, which is limited to less than or equal to 75 mrem) over 12 consecutive months. This Special Report shall include an analysis which demonstrates that radiation exposures to all members of the public

GL 89-01 RETS/ODCM

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)

from all uranium fuel cycle sources (including all effluent pathways and direct radiation) are less than 40 CFR Part 190 Standard. Otherwise, obtain a variance from the Commission to permit releases which exceed the 40 CFR Part 190 Standard. The radiation exposure analysis contained in the Special Report shall use the methods prescribed in the ODCM. This report is in lieu of a Licensee Event Report.

GL 89-01 RETS/ODCM

GL 89-01 RETS/ODCM

GL 89-01 RETS/ODCM

3. The dose to a member of the public in unrestricted areas at or beyond the site boundary from iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released from the unit shall be limited to the following:

a. Less than or equal to 7.5 mrem to any organ during any calendar quarter.

b. Less than or equal to 15 mrem to any organ during any calendar year.

3. The dose to a member of the public due to releases of iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days shall be determined to be within the prescribed limits by obtaining representative samples in accordance with the sampling and analysis program specified in Table 4.8.1.

For radionuclides not determined in each batch or weekly composite, the

dose contribution to the current calendar quarter cumulative sum-

3817a
3843A

3.8 LIMITING CONDITION FOR OPERATION
(Cont'd.)

c. With the calculated dose from the release of iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents exceeding any of the above limits, prepare and submit to the Commission within 30 days, a Special Report which identifies the cause(s) for exceeding the limit and defines the corrective actions taken to ensure that future releases are in compliance with Specifications 3.8.A.3.a. and b. This is in lieu of a Licensee Event Report.

GL 89-01 RETS/ODCM

d. With the calculated dose from the release of iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents exceeding the limits of Specifications 3.8.A.3.a. or 3.8.A.3.b., prepare and submit a Special Report to the Commission within 30 days and limit subsequent releases such that the dose or dose commitment to a member of the public

GL 89-01 RETS/ODCM

4.8 SURVEILLANCE REQUIREMENTS
(Cont'd.)

mation may be estimated by assuming an average monthly concentration based on the previous monthly or quarterly composite analyses. However, for reporting purposes, the calculated dose contributions shall be based on the actual composite analyses when possible.

The allocation of effluents between units having shared effluent control systems and the doses are determined using the methods prescribed in the ODCM at least once every 31 days.

GL 89-01 RETS/ODCM

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)

from all uranium fuel sources is limited to less than or equal to 25 mrem to the total body or organ (except the thyroid, which is limited to less than or equal to 75 mrem) over 12 consecutive months. This Special Report shall include an analysis which demonstrates that radiation exposures to all members of the public from all uranium fuel cycle sources (including all effluent pathways and direct radiation) are less than the 40 CFR Part 190 Standard. Otherwise, obtain a variance from the Commission to permit releases which exceed the 40 CFR Part 190 Standard. The radiation exposure analysis contained in the Special Report shall use the methods prescribed in the ODCM. This report is in lieu of a Licensee Event Report.

GL 89-01 RETS/ODCM

GL 89-01 RETS/ODCM

4. Off-Gas Treatment System

a. At all times during processing for discharge to the environs, process and control equipment provided to reduce the amount of concentration

4. Off-Gas Treatment System

Doses due to treated gases released to unrestricted areas at or beyond the site boundary shall be projected at least once per 31 days

3817a
3843A

FEBRUARY 2 5

FOR INFORMATION ONLY

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)

of radioactive materials shall be operated.

b. The above specifications shall not apply for the Off-Gas Charcoal Adsorber Beds below 30 percent of rated thermal power.

c. The recombiner shall be operable whenever the reactor is operating at a pressure greater than 900 psig.

d. The recombiner may be inoperable for 48 hours.

GL 89-01 RETS/ODCM

5. Explosive Gas Mixture

a. During power operation there will be an operable hydrogen monitor in the off-gas hold-up system. If this is inoperable, operation shall be limited according to Specification 3.8.A.5.b.

TSuP 3.2.H, 3.8.H

b. The concentration of hydrogen in the off-gas hold-up system, downstream of the recombiner shall be limited by verification every 8 hours that the recombiner is operating within the allowable band of the baseline plot of recombiner outlet temperature vs. reactor power.

4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)

in accordance with the ODCM.

GL 89-01 RETS/ODCM

5. Explosive Gas Mixture

The instrument response of the hydrogen monitor shall be tested once per day.

TSuP Table 4.8.H-1 & 4.8.4

3817a
3843A

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)

FOR INFORMATION ONLY

6. With either the recombiners inoperable, or all charcoal beds by-passed for more than 7 days in a calendar quarter while operating above 30 percent of the rated thermal power, prepare and submit to the Commission within 30 days a Special Report which includes the following information.

GL 89-01
RETS/ODCM

a. Identification of the defective equipment.

b. Cause of the defect in the equipment.

c. Action(s) taken to restore the equipment to an operating status.

d. Length of time the above requirements were not satisfied.

e. Volume and curie content of the waste discharged which was not processed by the inoperable equipment but which required processing.

f. Action(s) taken to prevent a recurrence of equipment failures.

This report is in lieu of a Licensee Event Report.

7. The release rate of the sum of the activities from the noble gases measured at

7. The radioactivity rate of noble gases at (near) the outlet of the main

3/4.8-8

TSUP 3.8.I

TSUP 4.8.I

3844a
3845A

FOR INFORMATION ONLY

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)

the main condenser air ejector shall be limited to 100 microcuries/sec per MWt (after 30 minutes decay) at all times. With the release rate of the sum of the activities from noble gases at the main condenser air ejector exceeding 100 microcuries/sec per MWt (after 30 minutes decay), restore the release rate to within its limits within 72 hours, or be in at least HOT STANDBY within the next 12 hours.

TSUP 3.8.I

4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)

condenser air ejector shall be continuously monitored in accordance with Specification 3.2.G. The release rate of the sum of the activities from noble gases from the main condenser air ejector shall be determined to be within the limits of Specification 3.8.A at the following frequencies by performing an isotopic analysis of a representative sample of gases taken at the recombiner outlet, or at the air ejector outlet if the recombiner is by-passed.

a. At least once per 31 days.

b. Within 4 hours following an increase, as indicated by the main condenser air ejector noble gas activity monitor, of greater than 50%, after factoring out increases due to changes in thermal power level and off-gas flow, in the nominal steady-state fission gas release from the primary coolant.

TSUP 3.8.I

GL 89-01 RETS/ODCM

B. Liquid Effluents

1. The concentration of radioactive material

B. Liquid Effluents

1. The concentration of radioactive material in

GL 89-01 RETS/ODCM

3844a
3845A

FOR INFORMATION ONLY

FEBRUARY 28

DRESDEN II DPR-19
Amendment No. ~~82~~, 83
Corrected February , 1985

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)

released from the site to unrestricted areas (at or beyond the site boundary, Figures 4.8.1 and 4.8.2) shall be limited to the concentrations specified in 10 CFR Part 20, Appendix B, Table II, Column 2 with the Table 4.8.2 values representing the MPC's for noble gases.

With the concentration of radioactive material released from the site to unrestricted areas exceeding the above limits, without delay decrease the release rate of radioactive materials and/or increase the dilution flow rate to restore the concentration to within the above limits.

2. The dose or dose commitment above background to a member of the public from radioactive materials in liquid effluents released to unrestricted areas (at or beyond the site boundary) from the site shall be limited to the following:

a. During Any Calendar Quarter:
(1) Less than or equal to 3 mrem to the whole body.

(2) Less than or equal to 10 mrem to any organ.

GL 89-01 RETS/ODCM

4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)

unrestricted areas shall be determined to be within the prescribed limits by obtaining representative samples in accordance with the sampling and analysis program specified in Table 4.8.3. The sample analysis results will be used with the calculational methods in the ODCM to determine that the concentrations are within the limits of Specification 3.8.B.1.

GL 89-01 RETS/ODCM

2a. The dose contribution from measured quantities of radioactive material shall be determined by calculation at least once per 31 days and cumulative summation of these total body and organ doses shall be maintained for each calendar quarter.

GL 89-01 RETS/ODCM

3817a
3843A

FOR INFORMATION ONLY

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)

b. During any Calendar Year:

(1) Less than or equal to 6 mrem to the whole body.

(2) Less than or equal to 20 mrem to any organ.

c. With the calculated dose from the release of radioactive materials in liquid effluents exceeding any of the above limits, prepare and submit to the Commission within 30 days a Special Report which identifies the cause(s) for exceeding the limit(s) and defines the corrective actions taken and the proposed actions to be taken to ensure that future releases are in compliance with Specifications 3.8.B.2.a. and b. This is in lieu of a Licensee Event Report.

d. With the calculated dose from the release of radioactive materials in liquid effluents exceeding the limits of Specifications 3.8.B.2.a. or 3.8.B.2.b., prepare and submit a Special Report to the Commission within 30

3/4.8-11

4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)

b. Doses computed at the nearest community water system will consider only the drinking water pathway and shall be projected using the methods prescribed in the ODCM at least once per 92 days.

GL 89-01 RETS/ODCM

GL 89-01 RETS/ODCM

3817a
3843A

FOR INFORMATION ONLY

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)

days and limit the subsequent releases such that the dose or dose commitment to a member of the public from all uranium fuel cycle sources is limited to less than or equal to 25 mrem to the total body or any organ (except thyroid, which is limited to less than or equal to 75 mrem) over 12 consecutive months. This Special Report shall include an analysis which demonstrates that radiation exposures to all real individuals from all uranium fuel cycle sources (including all effluent pathways and direct radiation) are less than the 40 CFR Part 190 Standard. Otherwise obtain a variance from the Commission to permit releases which exceed the 40 CFR Part 190 Standard. The radiation exposure analysis contained in the Special Report shall use methods prescribed in the ODCM. This report is in lieu of a Licensee Event Report.

GL 89-01 RETS/ODCM

e. When the projected annual whole body or

FOR INFORMATION ONLY

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)

any internal organ dose computed at the nearest downstream community water system is equal to or exceeds 2 mrem from all radioactive materials released in liquid effluents from the Station, prepare and submit a Special Report within 30 days to the operator of the community water system. The report is prepared to assist the operator in meeting the requirements of 40 CFR 141: EPA Primary Drinking Water Standards. A copy of this report will be sent to the NRC. This is in lieu of a Licensee Event Report.

GL 89-01 RETS/ODCM

3. At all times during processing prior to discharge to the environs, process and control equipment provided to reduce the amount or concentration of radioactive materials shall be operated when the projected dose due to liquid effluent releases to unrestricted areas (see Figure 4.8.1), when averaged over 31 days, exceeds 0.13 mrem to the total body or 0.42 mrem to any organ.

GL 89-01 RETS/ODCM

3. Doses due to liquid releases to unrestricted areas (at or beyond the site boundary) shall be projected at least once per 31 days in accordance with the ODCM.

GL 89-01 RETS/ODCM

4. If liquid waste has to be or is being discharged

GL 89-01 RETS/ODCM

3817a
3843A

FOR INFORMATION ONLY

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)

without treatment as required above, prepare and submit to the Commission within 30 days, a report which includes the following information.

a. Identification of the defective equipment.

b. Cause of the defect in the equipment.

c. Action(s) taken to restore the equipment to an operating status.

d. Length of time the above requirements were not satisfied.

e. Volume and curie content of the waste discharged which was not processed by the appropriate equipment but which required processing.

f. Action(s) taken to prevent a recurrence of equipment failures.

This is in lieu of a Licensee Event Report.

GL 89-01 RETS/ODCM

C. Mechanical Vacuum Pump

The mechanical vacuum pump shall be capable of being isolated and secured on a signal of main steam high radiation or shall be isolated and secured

TSUP 3.2.A-1

moved to TSUP Table 4.2.A-1

C. Mechanical Vacuum Pump

At least once during each operating cycle, automatic securing and isolation of the mechanical vacuum pump shall be verified.

3817a
3843A

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)	4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)
whenever the main steam isolation valves are open.	moved to TSUP 3.7.A.
D. Radioactive Waste Storage The maximum amount of radioactivity in liquid storage in the Waste Sample Tanks, the Floor Drain Sample Tanks and the Waste Surge Tank shall not exceed 3.0 curies and the maximum amount of radioactivity in any tank shall not exceed 0.7 curies. If these conditions cannot be met, the stored liquid shall be recycled within 24 hours to the Waste Collector Tanks or the Waste Neutralizer Tanks until the condition is met.	D. Radioactive Waste Storage A sample from each of the Waste Sample Tanks, Floor Drain Tanks, and Waste Surge Tank shall be taken, analyzed and recorded every 72 hours. If no additions to a tank have occurred since the last sample, the tank need not be sampled until the next addition.
moved to TSUP 3.7.J.	moved to TSUP 4.8.J.
E. Radiological Environmental Monitoring Program 1. The radiological environmental monitoring program given in Table 4.8.4 shall be conducted except as specified below: 2. With the radiological environmental monitoring program not being conducted as specified in Table 4.8.4, prepare and submit to the Commission, in the Annual Radiological Operating Report, a description of	E. Radiological Environmental Monitoring Program 1. The radiological environmental monitoring samples shall be collected pursuant to Table 4.8.4 from the locations specified in the ODCM, and shall be analyzed pursuant to the requirements of Table 4.8.6. 2. The results of analyses performed on radiological environmental monitoring samples shall be summarized in the Annual Radiological Environmental Operating Report.
GL 89-01 RETS/ODCM	GL 89-01 RETS/ODCM

3817a
3843A

FOR INFORMATION ONLY

FEBRUARY

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)

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, contractor omission which is corrected as soon as discovered, malfunction of sampling equipment, or if a person who participates in the program goes out of business. If the equipment malfunctions, corrective actions shall be completed as soon as practical. If a person supplying samples goes out of business, a replacement supplier will be found as soon as possible. All deviations from the sampling schedule shall be described in the Annual Report.

GL 89-01 RETS/ODCM

3. When the level of radioactivity in an environmental sampling medium at one or more of the locations specified in the ODCM exceeds the limits of Table 4.8.5 when averaged over any calendar quarter, prepare and submit to the Commission within 30 days from the end of the affected calendar quarter, a Special Report which

GL 89-01 RETS/ODCM

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

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)

includes an evaluation of any release conditions, environmental factors or other aspects which caused the limits of Table 4.8.5 to be exceeded. This report is not required if the measured level of radioactivity was not the result of plant effluents; however in such an event the condition shall be reported and described in the Annual Radiological Environmental Operating Report.

GL 89-01 RETS/ODCM

4. With milk samples unavailable from one or more of the sample locations required by Table 4.8.4, identify locations for obtaining replacement samples and add them to the radiological environmental monitoring program within 30 days. The locations from which samples were unavailable may then be deleted from the monitoring program. In lieu of a Licensee Event Report, identify the cause of the unavailability of samples and identify the new location(s) for obtaining replacement samples in the Annual Radiological Environmental Operating Report and also include in the report a revised figure(s) and table for the ODCM reflecting the new location(s).

GL 89-01 RETS/ODCM

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

3817a
3843A

FOR INFORMATION ONLY

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)

5. A census of nearest residences and of animals producing milk for human consumption shall be conducted annually (during the grazing season for animals) to determine their location and number with respect to the site. The nearest residence in each of the 16 meteorological sectors shall also be determined within a distance of five miles. The census shall be conducted under the following conditions:

   a. Within a 2-mile radius from the plant site, enumeration of animals and nearest residences by a door-to-door or equivalent counting technique.

   b. Within a 5-mile radius, enumeration of animals by using referenced information from country agricultural agents or other reliable sources.

6. With a land use census identifying location(s) of animals which yield(s) an ODCM calculated dose or dose commitment greater than the values currently being calculated in Specification 4.8.A.3, the new location(s) shall be added to

GL 89-01 RETS/ODCM

3817a
3843A

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)

the radiological environmental monitoring program within 30 days, if possible.

The sampling location, having the lowest calculated dose or dose commitment (via the same exposure pathway) may be deleted from this monitoring program after October 31 of the year in which this land use census was conducted.

GL 89-01 RETS/ODCM

7. Radiological analyses shall be performed on samples representative of those in Table 4.8.4, supplied as a part of the Interlaboratory Comparison Program which has been approved by the NRC.

GL 89-01 RETS/ODCM

7. The results of the analyses performed as part of the required crosscheck program shall be included in the Annual Radiological Environmental Operating Report. The analyses shall be done in accordance with the ODCM.

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

F. Solid Radioactive Waste

1. The solid radwaste system shall be used as applicable in accordance with the Process Control Program (PCP) to process wet radioactive wastes to meet shipping and burial ground requirements.

F. Solid Radioactive Waste

1. The PCP shall specify the method and frequency to verify solidification of radioactive waste. Actions to be taken if solidification is not verified shall also be specified in the PCP.

3817a
3843A

GL 89-01 PCP

GL 89-01 PCP

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)	4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)
2. With the provisions of the PCP not satisfied, suspend shipments of defectively processed or defectively packaged solid radioactive waste from the site.	GL 89-01 PCP
G. Miscellaneous Radioactive Materials Sources	G. Miscellaneous Radioactive Materials Sources
Source Leakage Test	Source Leakage Test
Specifications:	Specifications:
Each sealed source containing radioactive material in excess of 100 microcuries of beta and/or gamma emitting material or 5 microcuries of alpha emitting material shall be free of greater than or equal to 0.005 microcuries of removable contamination.	Each sealed source shall be tested for leakage and/or contamination by the licensee or by other persons specifically authorized by the Commission or an Agreement state. The test method shall have a detection sensitivity of at least 0.005 microcuries per test sample.
Each sealed source with removable contamination in excess of the above limit shall be immediately withdrawn from use and either decontaminated and repaired or disposed of in accordance with Commission Regulations.	Each category of sealed sources shall be tested at the frequency described below: 1. Sources in use (excluding startup previously subjected to core flux) - At least once per 6 months for all sealed sources containing radioactive material: a. With a half-life greater than 30 days (excluding Hydrogen 3), and

TSUP 3.8.G.

TSUP 4.8.G.1

Moved to TSUP 3.8.G.

TSUP 4.8.G.2

TSUP 4.8.G.2

FEBRUAR[illegible]

FOR INFORMATION ONLY

DRESDEN II DPR-19
Amendment No. 82, 83
Corrected February , 1985

3.8 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.8 SURVEILLANCE REQUIREMENTS (Cont'd.)

TSUP 4.8.G.2

b. In any form other than gas.

2. Stored sources not in use - Each sealed source shall be tested prior to the use or transfer to another licensee unless tested within the previous 6 months. Sealed sources transferred without a certificate indicating the last test case shall be tested prior to being placed into use.

TSUP 4.8.G.2

TSUP 3.8.C

A complete inventory of radioactive materials in the licensee's possession shall be maintained current at all times.

A Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.6.B. if source leakage tests reveal the presence of greater than or equal to 0.005 microcuries of removable contamination.

TSUP 3.8.G. Actions

H. In the event a limiting condition for operation and/or associated action requirements identified in Sections 3.8.A through 3.8.E and 4.8.A through 4.8.E cannot be satisfied because of circumstances in excess of those addressed in the Specifications, no changes are required in the operational condition of the plant, and this does not prevent the plant from entry into an operational mode.

GL 89-01 RETS/ODCM

3817a
3843A

GL-88-01 RETS/ODCM

Table 4.8.1
RADIOACTIVE GASEOUS WASTE SAMPLING
AND ANALYSIS PROGRAM

GASEOUS RELEASE TYPE	SAMPLING FREQUENCY (7)	MINIMUM ANALYSIS FREQUENCY (7)	TYPE OF ACTIVITY ANALYSIS	LOWER LIMIT OF DETECTION (LLD) (μCi/ml) (1)
A. Main Chimney Reactor Bldg. Vent Stack	M	M(2)	Principal Gamma Emmitters(5)	1×10^{-4}
	Grab Sample	M	Tritium	1×10^{-6}
B. All Release Types as Listed in A above	Continuous(4)	W(3) Iodine Sample	I-131	1×10^{-12}
			I-133	1×10^{-10}
	Continuous(4)	W(3) Particulate Sample	Principal Gamma Emitters(5) (I-131, others)	1×10^{-11}
	Continuous(4)	Q Composite Particulate Sample	Sr-89	1×10^{-11}
			Sr-90	1×10^{-11}
	Continuous(4)	Q Composite Particulate Sample	Gross Alpha	1×10^{-11}
C. Main Chimney	Continuous(4)	Noble Gas Monitor	Noble Gases	1×10^{-6}
D. Reactor Bldg. Vent Stack	Continuous(4)	Noble Gas Monitor	Noble Gases	1×10^{-4}
E. MVRS Process Exhaust Sampler	Continuous(4)	W(6) Iodine Sample	I-131	1×10^{-12}
			I-133	1×10^{-10}
	Continuous(4)	W(6) Particulate Sample	Principal Gamma Emitters(5) (I-131, others)	1×10^{-11}
F. MVRS HVAC Exhaust Sampler	Continuous(4)	W(6) Iodine Sample	I-131	1×10^{-12}
			I-133	1×10^{-10}
	Continuous(4)	W(6) Particulate Sample	Principal Gamma Emitters(5) (I-131, others)	1×10^{-11}

RELOCATED

3817a
3843A

GL 89-01 RETS/ODCM

TABLE 4.8.1 (Continued)
TABLE NOTATION

1. The lower limit of detection (LLD) is defined in notation A of Table 4.8.6.

2. Sampling and analyses shall also be performed following shutdown, startup, or a thermal power change exceeding 20 percent of rated thermal power in 1 hour unless (1) analysis shows that the DOSE EQUIVALENT I-131 concentration in the primary coolant has not increased more than a factor of 5, and (2) the noble gas activity monitor shows that effluent activity has not increased by more than a factor of 3.

3. Samples shall be changed at least once per 7 days and the analyses completed within 48 hours after removal from the sampler. Sampling shall also be performed within 24 hours following each shutdown, startup, or thermal power level change exceeding 20% of rated thermal power in one hour. This requirement does not apply if 1) analysis shows that the DOSE EQUIVALENT I-131 concentration in the primary coolant has not increased more than a factor of 5, and 2) the noble gas activity monitor shows that effluent activity has not increased by more than a factor of 3. When samples collected for 24 hours are analyzed, the corresponding LLD's may be increased by a factor of 10.

4. The ratio of sample flow rate to the sampled stream flow rate shall be known.

5. 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, and Mn-54, Fe-59, Co-60, Zn-65, Co-58, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144 for particulate emissions. Other peaks which are measurable and identifiable by gamma ray spectrometry, together with the above nuclides, shall be also identified and reported when an actual analysis is performed on a sample. Nuclides which are below the LLD for the analyses shall not be reported as being present at the LLD level for that nuclide.

GL 89-01 RETS/ODCM

6. Sampler shall be changed at least once per 7 days or whenever the Mobile Volume Reduction System (MVRS) is shutdown for at least 4 hours and the analyses completed within 48 hours after removal from the sampler.

7. W = once per week

   M = once per 31 days

   Q = once per 92 days

GL 89-01 RETS/ODCM

3817a
3843A

FOR INFORMATION ONLY

CC 89-01 REVISED ODCM

TABLE 4.8.2

MAXIMUM PERMISSIBLE CONCENTRATION OF DISSOLVED OR ENTRAINED NOBLE GASES RELEASED FROM THE SITE TO UNRESTRICTED AREAS IN LIQUID WASTE

NUCLIDE	MPC(uCi/ml)*
Kr-85m	2×10^{-4}
Kr-85	5×10^{-4}
Kr-87	4×10^{-5}
Kr-88	9×10^{-5}
Ar-41	7×10^{-5}
Xe-131m	7×10^{-4}
Xe-133m	5×10^{-4}
Xe-133	6×10^{-4}
Xe-135m	2×10^{-4}
Xe-135	2×10^{-4}

RELOCATED

* Computed from Equation 20 of ICRP Publication 2 (1959), adjusted for infinite cloud submersion in water, and R = 0.0. rem/week, density = 1.0 g/cc abd Pw/Pt = 1.0.

FOR INFORMATION ONLY

GL 89-01 RETS/ODCM

TABLE 4.8.3

RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

LIQUID RELEASE TYPE	SAMPLING FREQUENCY (6)	MINIMUM ANALYSIS FREQUENCY (6)	TYPE OF ACTIVITY ANALYSIS	LOWER LIMIT OF DETECTION (LLD) (uCi/ml) (1)
A. Batch Waste Release Tanks	Prior to Each Batch	Prior to Each Batch	Principal Gamma Emitters(5)	5×10^{-7}
			I-131	1×10^{-6}
	Prior to Each Batch	M Composite(2)	Gross Alpha	1×10^{-7}
			H-3	1×10^{-5}
	Prior to Each Batch	Q Composite(2)	Fe-55	1×10^{-6}
			Sr-89, Sr-90	5×10^{-8}
	Prior to One Batch/M	M	Dissolved & Entrained Gases(6) (Gamma Emitters)	1×10^{-5}
B. Plant Continuous Releases(4)	M(3) (Grab Sample)	M(3)	I-131	1×10^{-6}
			Principal Gamma Emitters(5)	5×10^{-7}
			Dissolved & Entrained Gases(6) Gamma Emitters(5)	1×10^{-5}
			H-3	1×10^{-5}
			Gross Alpha	1×10^{-7}
	Q(3) (Grab Sample)	Q(3)	Sr-89, Sr-90	5×10^{-8}
			Fe-55	1×10^{-6}
			(Gamma Emitters)	

RELOCATED

3817a
3843A

GL 89-01 RETS/ODCM

TABLE 4.8.3 (Continued)
TABLE NOTATION

1. The LLD is defined in Notation A. of Table 4.8.6.

2. A composite sample is one in which the quantity of liquid samples 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.

3. If the alarm setpoint of the service water effluent monitor as determined in the ODCM is exceeded, the frequency of analysis shall be increased to daily until the condition no longer exists.

4. A batch release is the discharge of liquid wastes of a discrete volume. Prior to sampling for analyses, each batch shall be isolated and then thoroughly mixed to assure representative sampling. A continuous release is the discharge of liquid wastes of a nondiscrete volume; e.g., from a volume or system that has an input flow during the release.

5. The principal gamma emitters for which the LLD specification applies exclusively are the following radionuclides: Mn-54, Fe-59, Co-60, Zn-65, Co-58, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144. Other peaks which are measurable and identifiable by gamma ray spectrometry together with the above nuclides, shall be also identified and reported when the actual analysis is performed on a sample. Nuclides which are below the LLD for the analyses shall not be reported as being present at the LLD level for that nuclide.

6. The dissolved and entrained gases (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. Other dissolved and entrained gases (gamma emitters) which are measurable and identifiable by gamma-ray spectrometry, together with the above nuclides, shall also be identified and reported when an actual analysis is performed on a sample. Nuclides which are below the LLD for the analyses shall not be reported as being present at the LLD level for that nuclide.

3817a
3843A

FOR INFORMATION ONLY

GL 89-01 RETS/ODCM

TABLE 4.8.4
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	MINIMUM NUMBER OF SAMPLES AND SAMPLE LOCATIONS*	SAMPLING AND COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
1. AIRBORNE			
A. Particulates	17 locations	Continuous operation of sampler for a week	Gross beta and gamma isotopic as specified in ODCM.
B. Radioiodine	17 locations	Continuous operation of sampler for two weeks	I-131 as specified in ODCM.
2. DIRECT RADIATION	42 locations (Minimum of two TLDs per packet)	Quarterly	
3. WATERBORNE			
A. Surface Water	2 locations	Monthly composite of weekly collected samples	Gamma Isotopic analysis of each composite sample
B. Sediment	1 downstream location in receiving body of water	Annually	Gamma Isotopic analysis of each sample
C. Plant Cooling Water	Intake, Discharge	Weekly Composite	Gross Beta analysis of each sample
4. INJECTION			
A. Milk	2 locations	At least once weekly when animals are on pasture; at least once per month at other times	I-131 analysis of each sample
B. Fish	1 location in receiving body of water	Semi-Annually	Gamma Isotopic analysis on edible portions

*Sample locations are described in the ODCM.

RELOCATE

3817a
3843A

FEBRUARY 8 8

FOR INFORMATION ONLY

DRESDEN II DPR-19
Amendment No. 82, 83
Corrected February , 1985

GC 89-01
RETS/ODCM

TABLE 4.8.5
REPORTING LEVELS FOR RADIOACTIVITY
CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

Reporting Levels

ANALYSIS	WATER (pCi/l)	AIRBORNE PARTICULATE OR GASES (pCi/m3)	FISH (pCi/Kg, wet)	MILK (pCi/l)	FOOD PRODUCTS (pCi/Kg, wet)
H-3	2×10^4 (see note 1)				
Mn-54	1×10^3		3×10^4		
Fe-59	4×10^2		1×10^4		
Co-58	1×10^3		3×10^4		
Co-60	3×10^2		2×10^4		
Zn-65	3×10^2		2×10^4		
Zr-Nb-95	4×10^2				
I-131	2	0.9		3	1×10^2
Cs-134	30	10	1×10^3	60	2×10^3
Cs-137	50	20	1×10^3	70	2×10^3
Ba-La-140	2×10^2			3×10^2	

RELOCATED

Notes: 1) For drinking water samples. This is 40 CFR Part 141 value.

3817a
3843A

FOR INFORMATION ONLY

GL 89-01 RETS/ODCM

TABLE 4.8.6

PRACTICAL LOWER LIMITS OF DETECTION (LLD) FOR STANDARD RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE MEDIA	ANALYSIS	LLD(D,E) (4.66 σ)	UNITS
Airborne "Particulate"	Gross Beta(B)	0.01	pCi/m^3(C)
	Gamma Isotopic	0.01	pCi/m^3(C)
Airborne I-131	Iodine-131	0.10	pCi/m^3(C)
Milk/Public Water	I-131	5(A)	pci/1
	Cs-134	10	pCi/1
	Cs-137	10(C)	pCi/1
	Tritium	200	pCi/1
	Gross Beta(B)	5	pCi/1
	Gamma Isotopic	20	pCi/1/nuclide
Sediment	Gross Beta(B)	2	pCi/g dry
	Gamma Isotopic	0.2	pCi/g dry
Fish Tissue	I-131-Thyroid	0.1	pCi/g wet
	Cs-134, 137	0.1	pCi/g wet
	Gross Beta(B)	1.0	pCi/g wet
	Isotopic	0.2	pCi/g wet

RELOCATE

Notes:

A. 0.5 pCi/1 on milk samples collected during the pasture season.

B. Referenced to Cs-137

C. 5.0 pCi/1 on milk samples

(Notes Continued next two pages)

3817a
3843A

FOR INFORMATION ONLY

FEBRUARY
GL 89-01
RETS/ODCM

TABLE 4.8.6 NOTES (Continued)
TABLE NOTATION

D. The LLD is the smallest concentration of radioactive material in a sample that will be detected with 95 percent 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)

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

Where:

LLD is the "A priori" lower limit of detection for a blank sample or background analysis as defined above (as pCi per unit mass or volume).

S_b is the square root of the background count or of a blank sample count; is the estimated standard error of a background count or a blank sample count as appropriate (in units of counts).

E is the counting efficiency (as counts per disintegration).

A is the number of gamma-rays emitted per disintegration for gamma-ray radio-nuclide analysis (A = 1.0 for gross alpha and tritium measurements).

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

2.22 is the number of disintegrations per minute per picocurie.

Y is the fractional radio-chemical yield when applicable (otherwise Y=1.0).

Lambda is the radioactive decay constant for the particular radionuclide (in units of reciprocal minutes).

Delta t is the elapsed time between the midpoint of sample collection and the start time of counting. (t = 0.0 for environmental samples and for gross alpha measurements).

t is the duration of the count (in units of minutes).

The value of "S_b" used in the calculation of the LLD for a detection system shall be based on an actual observed background count or a blank sample count (as appropriate) rather than on an unverified theoretically predicted value. Typical values of "E", "V", "Y", "t", and "delta t" shall be used in the calculation.

FOR INFORMATION ONLY

GL 89-01
RETS/ODCM

TABLE NOTATION

TABLE 4.8.6 NOTES (Continued)

For gamma-ray radionuclide analyses the background counts are determined from the total counts in the channels which are within plus or minus one FWHM (Full Width at Half Maximum) of the gamma-ray photopeak energy normally used for the quantative analysis for that radionuclide. Typical values of the FWHM shall be used in the calculation.

The LLD for all measurements 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 sample measurement.

E. Other radionuclides which are measureable and identifiable by gamma-ray spectrometry, together with the nuclides indicated in Table 4.8.6., shall also be identified and reported when an actual analysis is performed on a sample. Nuclides which are below the LLD for the analyses shall not be reported as being present at the LLD level for that nuclide.

RELOCATED

3817a
3843A

FOR INFORMATION ONLY

continued reactor operation is permissible only during the succeeding 7 days unless it is sooner made operable, provided that during such 7 days all active components of both core spray subsystems, the containment cooling mode of the RHR (including two RHR pumps), and the diesel generators required for operation of such components if no external source of power were available shall be operable.

6. If the requirements of Specification 3.5.A cannot be met, an orderly shutdown of the reactor shall be initiated, and the reactor shall be in the cold shutdown condition within 24 hours.

B. Containment Cooling Mode of the RHR System

1. a. Both loops of the containment cooling mode of the RHR system, as defined in the bases for Specification 3.5.B, shall be operable whenever irradiated fuel is in the reactor vessel and prior to reactor startup from a cold condition.

1. b. From the effective date of this amendment until Nov. 1, 1989, the "B" loop of the containment cooling mode of the RHR system for each reactor may share the Unit 1 "C" and "D" RHR service water pumps using cross tie line 1/2-10509-16"-D. Consequently, the requirements of Specifications 3.5.B.2 and 3.5.B.3 will impose the corresponding surveillance testing of equipment associated with both reactors if the shared RHR service water pump or pumps, or the cross tie line, are made or found to be inoperable.

2. From and after the date that one of the RHR service water pumps is made or found to be inoperable for any reason, continued reactor operation is permissible only during the succeeding 30 days unless such pump is sooner made operable, provided that during such 30 days all other active components of the containment cooling mode of

B. Containment Cooling Mode of the RHR System

Surveillance of the containment cooling mode of the RHR system shall be performed as follows:

1. RHR service water subsystem testing:

	Item	Frequency
a.	Pump and valve operability	Once/3 months
b.	Flow rate test - each RHR service water pump shall deliver at least 3500 gpm against a pressure of 198 psig	After pump maintenance and every 3 months
c.	A logic system functional test	Each refueling outage

FOR INFORMATION ONLY

the RHR system are operable.

3. From and after the date that one loop of the containment cooling mode of the RHR system is made or found to be inoperable for any reason, continued reactor operation is permissible only during the succeeding 7 days unless such subsystem is sooner made operable, provided that all active components of the other loop of the containment cooling mode of the RHR system, both core spray subsystems, and both diesel generators required for operation of such components if no external source of power were available, shall be operable.

BWP 3.8.A Action 1.c

TSUP 3.9, 3.5

7 days

During the time period from April 17, 1978 through April 30, 1978 while the 2A Containment Cooling Loop of the RHR System is made inoperable for heat exchanger repair, continued reactor operation is permissible beyond the above 7-day limitation, unless such loop is sooner made operable, provided that during the time the 7-day limit is exceeded, a visual inspection is performed daily to assure that proper valve alignment and system integrity is maintained in the "B" RHR loop.

DELETED

TSUP 4.7.L.2

2. During each 5-year period, an air test shall be performed on the drywell spray headers and nozzles and a water spray test performed on the torus spray header and nozzles.

4. Containment cooling spray loops are required to be operable when the reactor water temperature is greater than 212°F and prior to reactor startup from a cold condition. Continued reactor operation is permitted provided that a maximum of one drywell spray loop may be inoperable for 30 days when the reactor water temperature is greater than 212°F.

7 days

TSUP 3.7.L

5. If the requirements of 3.5.B cannot be met, an orderly shutdown shall be initiated, and the reactor shall be in a cold shutdown condition within 24 hours.

BWP 3.8.A, Actions

FOR INFORMATION ONLY

2. The discharge pipe pressure for Core Spray and LPCI mode of RHR shall be maintained at greater than 40 psig and less than 90 psig. If pressure in any of these systems is less than 40 psig or greater than 90 psig, this condition shall be alarmed in the control room and immediate corrective action taken. If the discharge pipe pressure is not within these limits in 12 hours after the occurrence, an orderly shutdown shall be initiated, and the reactor shall be in a cold shutdown condition within 24 hours after initiation.

3. Filled discharge piping for HPCI and RCIC systems is ensured by maintaining the level in the Contaminated Condensate Storage Tanks (CCST's) at or above 9.5 feet. If the CCST level falls below 9.5 feet, restore the level within 12 hours or line up both HPCI and RCIC to take a suction from the torus per 4.5.G.3.

H. Condensate Pump Room Flood Protection

1. The systems installed to prevent or mitigate the consequences of flooding of the condensate pump room shall be operable prior to startup of the reactor.

2. The condenser pit water level switches shall trip the condenser circulating water pumps and alarm in the control room if water level in the condenser pit exceeds a level of 5 feet above the pit floor. If a failure occurs in one of these trip and alarm circuits, the failed circuit shall be immediately placed in a trip condition and reactor operation shall be permissible for the following 7 days unless the circuit is sooner made operable.

DELETED - ADMIN CONTROLS

2. Following any period where HPCI, RCIC, LPCI mode of the RHR or core spray have been out of service and drained for maintenance, the discharge piping of the inoperable system shall be vented from the high point prior to the return of the system to service.

3. Whenever the HPCI or RCIC system is lined up to take suction from the torus, the discharge piping of the HPCI and RCIC shall be vented from the high point of the system and water flow observed every 24 hours.

4. The pressure switches which monitor the discharge lines and the discharge of the fill system pump to ensure that they are full shall be functionally tested every month and calibrated every 3 months. The pressure switches shall be set to alarm at a decreasing pressure of $\geq$ 40 psig and an increasing pressure of $\leq$ 90 psig.

H. Condensate Pump Room Flood Protection

1. The following surveillance requirements shall be observed to assure that the condensate pump room flood protection is operable.

a. The piping and electrical penetrations, bulkhead doors, and submerine doors for the vaults containing the RHR service water pumps and diesel generator cooling pumps shall be checked during each operating cycle by pressurizing to 15 $\pm$ 2 psig and checking for leaks using a soap bubble solution. The criteria for acceptance shall be no visible leakage through the soap bubble solution.

DELETED - ADMIN CONTROLS

3. If Specification 3.5.H.1 and 2 cannot be met, reactor startup shall not commence or if operating an orderly shutdown shall be initiated and the reactor shall be in a cold shutdown condition within 24 hours.

Deleted Admin Controls

FOR INFORMATION ONLY

Deleted - Admin Controls

b. During each operating cycle, the following flood protection level switches shall be functionally tested to give the following control room alarms:

1) turbine building equipment drain sump high level

2) vault high level

c. The RHR service water vault sump pump discharge check valves outside the vault shall be tested for integrity, using clean demineralized water, at least once per operating cycle.

d. The condenser pit 5-foot trip circuits for each channel shall be checked once a month. A logic system functional test shall be performed during each refueling outage.

I. Average Planar LHGR

During steady-state power operation, the average linear heat generation rate (APLHGR) of all the rods in any fuel assembly, as a function of average planar exposure, at any axial location, shall not exceed the maximum average planar LHGR specified in the CORE OPERATING LIMITS REPORT. If at any time during operation it is determined by normal surveillance that the limiting value for APLHGR is being exceeded, action shall be initiated within 15 minutes to restore operation to within the prescribed limits. If the APLHGR is not returned in within the prescribed limits within 2 hours, the reactor shall be brought to the cold shutdown condition within 36 hours. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits.

I. Average Planar LHGR

Daily during steady-state operation above 25% rated thermal power, the average planar LHGR shall be determined.

I. Shock Suppressors (Snubbers)

1. During all modes of operation except Shutdown and Refuel, all snubbers on safety related piping systems shall be operable except as noted in 3.6.I.2 following.

2. From and after the time that a snubber is determined to be inoperable, continued reactor operation is permissible during the succeeding 72 hours only if the snubber is sooner made operable.

3. If the requirements of 3.6.I.1 and 3.6.I.2 cannot be met, an orderly shutdown shall be initiated and the reactor shall be in a cold shutdown condition within 36 hours.

4. If a snubber is determined to be inoperable while the reactor is in the Shutdown or Refuel mode, the snubber shall be made operable prior to reactor startup.

TSup 3.8.F

I. Shock Suppressors (Snubbers)

The following surveillance requirements apply to all snubbers on safety related piping systems.

1. Visual inspections shall be performed in accordance with the following schedule utilizing the acceptance criteria given by Specification 4.6.I.2.

Number of Snubbers Found Inoperable During Inspection or During Inspection Interval	Next Required Inspection Interval
0	18 months ±25%
1	12 months ±25%
2	6 months ±25%
3,4	124 days ±25%
5,6,7	62 days ±25%
≥8	31 days ±25%

The required inspection interval shall not be lengthened more than one step at a time.

Snubbers may be categorized in two groups, 'accessible' or 'inaccessible' based on their accessibility for inspection during reactor operation. These two groups may be inspected independently according to the above schedule.

TSup 4.8.P

FOR INFORMATION ONLY

Snubber service life monitoring shall be followed by the snubber surveillance inspection records and maintenance history records. The above record retention method shall be used to prevent the snubbers from exceeding a service life.

2. Visual inspections shall verify:

   a. There are no visible indications of damage or impaired operability, and

   b. Attachments to the foundation or supporting structure are secure.

3. Once each refueling cycle a representative sample of 10% of the total of each type of snubber in use in the plant shall be functionally tested either in place or in a bench test. For each snubber that does not meet the functional test criteria, an additional 10% of that type of snubber shall be functionally tested.

4. The mechanical snubber functional tests shall verify:

   a. That the breakaway force that initiates free movement of the snubber rod in either tension or compression is less than the specified maximum force.

   b. That the activation (restraining action) is achieved within the specified range of acceleration in both tension and compression.

TSCR 4.8.F

FOR INFORMATION ONLY

5. When a snubber is deemed inoperable, a review shall be conducted to determine the mode of failure and to decide if an engineering evaluation should be performed. If the engineering evaluation is deemed necessary, it will determine whether or not the snubber mode of failure has imparted a significant effect or degradation on the supported component or system.

6. If any snubber selected for functional testing either fails to lockup or fails to move, i.e., frozen in place, the cause will be evaluated and if determined to be generically deficient all snubbers of the same design, subject to the same defect shall be functionally tested.

7. In addition to the regular sample, snubbers which failed the previous functional test shall be retested during the next test period. If a spare snubber has been installed in place of a failed snubber, then both the failed snubber (if it is repaired and installed in another position) and the spare snubber shall be retested. Test results of these snubbers may not be included for the resampling.

TSUP 4.8.F

QUAD-CITIES
DPR-30

FOR INFORMATION ONLY

3.8/4.8 RADIOACTIVE EFFLUENTS

Limiting Conditions for Operation	Surveillance Requirements
Applicability:	Applicability:
Applies to the radioactive effluents from the plant.	Applies to the periodic measurements radioactive effluents.

GL 89-01 RETS/ODCM

GL 89-01 RETS/ODCM

Specifications

A. Gaseous Effluents

1. The dose rate in unrestricted areas (at or beyond the site boundary, Figure 4.8-1) due to radioactive materials released in gaseous effluents from the site shall be limited to the following:

   a. For Noble Gases:

      (1) Less than 500 mrem/ year to the whole body.

      (2) Less than 3000 mrem/ year to the skin.

   b. For iodine-131, for iodine -133, and for all radionuclides in particulate form with half-lives greater than 8 days less than 1500 mrem/year.

   c. If the dose rates exceed the above limits, without delay decrease the release rates to bring the dose rates within the limits, and provide prompt notification to the Commission (6.6.B.1.)

2. The air dose in unrestricted areas (at or beyond the site boundary) due to Noble Gases released in gaseous effluents from the unit shall be limited to the following:

   a. For gamma radiation:

      (1) Less than or equal to 5 mrad during any calendar quarter.

A. Gaseous Effluents

1. The dose rates due to radioactive materials released in gaseous effluents from the site shall be determined to be within the prescribed limits by obtaining representative samples in accordance with the sampling and analysis program specified in Table 4.8-1 The dose rates are calculated using methods prescribed in the Off-Site Dose Calculation Manual (ODCM).

GL 89-01 RETS/ODCM

2. The air dose due to releases of radioactive noble gases in gaseous effluents shall be determined to be within the prescribed limits by obtaining representative samples in accordance with the sampling and analysis program specified in sections A and B of Table 4.8-1. The allocation of effluents between units having shared effluent control systems and the air doses are determined using methods prescribed in the ODCM at least once every 31 days.

FOR INFORMATION ONLY

(2) Less then or equal to 10 mrad during any calendar year.

b. For Beta radiation:

(1) Less than or equal to 10 mrad during any calendar quarter

(2) Less than or equal to 20 mrad during any calendar year.

c. With the calculated air dose from radioactive noble gases in gaseous effluents exceeding any of the above limits, prepare and submit to the Commission within 30 days, a Special Report which identifies the cause(s) for exceeding the limit(s) and defines the corrective actions to be taken to ensure that future releases are in compliance with 3.8.A.2.a. & b. This is in lieu of a Licensee Event Report.

d. With the calculated air dose from radioactive noble gases in gaseous effluents exceeding the limits of Specification 3.8.A.2.a. or 3.8.A.2.b., prepare and submit a Special Report to the Commission within 30 days and limit the subsequent releases such that the doses or dose commitment to a member of the public from all uranium fuel cycle sources is limited to less than or equal to 25 mrem to the total body or any organ (except thyroid, which is limited to less than or equal to 75 mrem) over 12 consecutive months. This Special Report shall include an analysis which demonstrates that radiation exposures to all members of the public from all uranium fuel cycle sources (including all effluent pathways and direct radiation) are less than the 40 CFR Part 190 Standard. Otherwise, obtain a

GL 89-01 RETS/ODCM

FOR INFORMATION ONLY

variance from the Commission to permit releases which exceed the 40 CFR Part 190 Standard. The radiation exposure analysis contained in the Special Report shall use the methods prescribed in the ODCM. This report is in lieu of a Licensee Event Report.

GL 89-01 RETS/ODCM

3. The dose to a member of the public in unrestricted areas (at or beyond the site boundary) from iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released from the unit shall be limited to the following:

   a. Less than or equal to 7.5 mrem to any organ during any calendar quarter.

   b. Less than or equal to 15 mrem to any organ during any calendar year.

   c. With the calculated dose from the release of iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents exceeding any of the above limits, prepare and submit to the Commission within 30 days, a Special Report which identifies the cause(s) for exceeding the limit and defines the corrective actions taken and the proposed actions to be taken to ensure that future releases are in compliance with 3.8.A.3. a. & b. This is in lieu of a Licensee Event Report.

GL 89-01 RETS/ODCM

3. The dose to a member of the public due to releases of iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days shall be determined to be within the prescribed limits by obtaining representative samples in accordance with the sampling and analysis program specified Table 4.8-1.

   For radionuclides not determined in each batch or weekly composite, the dose contribution to the current calendar quarter cumulative summation may be estimated by assuming an average monthly concentration based on the previous monthly or quarterly composite analyses. However, for reporting purposes, the calculated dose contributions shall be based on the actual composite analyses when possible.

   The allocation of effluents between units having shared effluent control systems and the doses are determined using the methods prescribed in the ODCM at least once every 31 days.

GL 89-01 RETS/ODCM

FOR INFORMATION ONLY

d. With the calculated dose from the release of iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents exceeding the limits of Specification 3.8.A.3.a. or 3.8.A.3.b., prepare and submit a Special Report to the Commission within 30 days and limit subsequent releases such that the dose or dose commitment to a member of the public from all uranium fuel cycle sources is limited to less than or equal to 25 mrem to the total body or organ (except the thyroid, which is limited to less than or equal to 75 mrem) over 12 consecutive months. This Special Report shall include an analysis which demonstrates that radiation exposures to all members of the public from all uranium fuel cycle sources (including all effluent pathways and direct radiation) are less than the 40 CFR Part 190 Standard. Otherwise, obtain a variance from the Commission to permit releases which exceed the 40 CFR Part 190 Standard. The radiation exposure analysis contained in the Special Report shall use the methods prescribed in the ODCM. This report is in lieu of a Licensee Event Report.

GL 89-01
RETS/ODCM

FOR INFORMATION ONLY

GL 89-01 RETS/ODCM

4. Off-Gas System

a. At all times during processing for discharge to the environs, process and control equipment provided to reduce the amount or concentration of radioactive materials shall be operated.

b. The above specification shall not apply for the Off-Gas Charcoal Absorber Beds below 30 percent of rated thermal power.

4. Off-Gas System

Doses due to treated gases released to unrestricted areas at or beyond the site boundary shall be projected at least once per 31 days in accordance with the ODCM.

GL 89-01 RETS/ODCM

5. Explosive Gas Mixture

a. The concentration of hydrogen in the off-gas hold up system, downstream of the recombiner shall be limited by having a recombiner operable within the allowable band of the base-line plot of recombiner outlet temperature vs. reactor power, whenever the reactor is operating at a pressure greater than 900 psig.

b. The recombiner may be inoperable for 48 hours.

TSUP 3.2.H.2 3.8.H

5. Explosive Gas Mixture

Once per 8 hours verification will be made that the unit is operating within the allowable band of the base-line plot of recombiner outlet temperature vs. reactor power.

TSUP 3.2.H.

6. With either the recombiners inoperable, or all charcoal beds bypassed for more than 7 days in a calendar quarter while operating above 30 percent of rated thermal power, prepare and submit to the Commission within 30 days a special report which includes the following information:

TSUP 3.2.H.2

FOR INFORMATION ONLY

a. Identification of the defective equipment.

b. Cause of the defective equipment

c. Action(s) taken to restore the equipment to an operating status.

d. Length of time the above requirements were not satisfied.

e. Volume and curie content of the waste discharged which was not processed by the inoperable equipment but which required processing.

f. Action(s) taken to prevent a recurrence of equipment failures.

This is in lieu of a Licensee Event Report.

TSuP 3.2.H

7. The release rate of the sum of the activities from the noble gases measured at the main condenser air ejector shall be limited to less than or equal to 100 microcuries/sec per MWt (after 30 minutes decay) at all times. With the release rate of the sum of the activities from noble gases at the main condenser air ejector exceeding 100 microcuries/sec per MWt (after 30 minutes decay), restore the release rate to within its limits within 72 hours, or be in at least HOT STANDBY within the next 12 hours.

TSuP 3.8I

TSuP 3.8.J

7. The radioactivity rate of nobles ga at (near) the outlet of the main co denser air ejector shall be contin ously monitored in accordance with Soecification 3.2.H. The release rate of the sum of the activities from noble gases from the main condenser air ejector shall be dete mined to be within the limits of Specification 3.8.H. at the followi frequencies by performing an isotop analysis of a representative sample of gases taken at the recombiner ou let, or at the air ejector outlet i the recombiner is bypassed.

a. At least once per 31 days.

b. Within 4 hours following an in- crease, as indicated by the mai condenser air ejector noble gas activity monitor, of greater th 50%, after factoring out increa due to changes in thermal power level and off-gas flow, in the nominal steady-state fission ga release from the primary coolan

FOR INFORMATION ONLY

Liquid Effluents

1. The concentration of radioactive material released from the site to unrestricted areas (at or beyond the site boundary, figure 4.8-1) shall be limited to the concentrations specified in 10 CFR Part 20, Appendix B, Table II, Column 2 with the Table 4.8-2 values representing the MPC's for noble gases.

   With the concentration of radioactive material released from the site to unrestricted areas exceeding the above limits, without delay decrease the release rate of radioactive materials and/or increase the dilution flow rate to restore the concentration to within the above limits.

GL 89-01 RETS/ODCM

B. Liquid Effluents

1. The concentration of radioactive material in unrestricted areas shall be determined to be within the prescribed limits by obtaining representative samples in accordance with the sampling and analysis program specified in Table 4.8-3. The sample analysis results will be used with the calculational methods in the ODCM to determine that the concentrations are within the limits of Specification 3.8.B.1.

GL 89-01 RETS/ODCM

FOR INFORMATION ONLY

2. The dose or dose commitment above background to a member of the public from radioactive materials in liquid effluents released to unrestricted areas (at or beyond the site boundary) from the site shall be limited to the following:

   a. During any calendar quarter:

      (1) Less than or equal to 3 mrem to the whole body.

      (2) Less than or equal to 10 mrem to any organ.

   b. During any calendar year:

      (1) Less than or equal to 6 mrem to the whole body.

      (2) Less than or equal to 20 mrem to any organ.

   c. With the calculated dose from the release of radioactive materials in liquid effluents exceeding any of the above limits, prepare and submit to the Commission within 30 days a Special Report which identifies the cause(s) for exceeding the limit(s) and defines the corrective actions taken and the proposed actions to be taken to ensure that future releases are in compliance with 3.8.B.2.a. & b. This is in lieu of a Licensee Event Report.

   d. With the calculated dose from the release of radioactive materials in liquid effluents exceeding the limits of Specification 3.8.B.2.a. or 3.8.B.2.b., prepare and submit a Special Report to the Commission within 30 days and limit the subsequent releases such that the dose or dose commitment to a member of the public from all uranium fuel cycle sources is limited to less than or

2. 'a. The dose contributions from measured quantities of radioactive material shall be determined by calculation at least once per 31 days and a cumulative summation of these total body and any organ doses shall be maintained for each calendar quarter.

   b. Doses computed at the nearest community water system will consider only the drinking water pathway and shall be projected using the methods prescribed in the ODCM at least once per 92 days.

GL 89-01 RETS/ODCM

GL 89-01 RETS/ODCM

FOR INFORMATION ONLY

equal to 25 mrem to the total body or any organ (except thyroid, which is limited to less than or equal to 75 mrem) over 12 consecutive months. This Special Report shall include an analysis which demonstrates that radiation exposures to all members of the public from all uranium fuel cycle sources (including all effluent pathways and direct radiation) are less than the 40 CFR Part 190 Standard. Otherwise obtain a variance from the Commission to permit releases which exceed the 40 CFR Part 190 Standard. The radiation exposure analysis contained in the Special Report shall use methods prescribed in the ODCM. This report is in lieu of a Licensee Event Report.

GL 89-01
RETS/ODCM

e. With the projected annual whole body or any internal organ dose computed at the nearest downstream community water system is equal to or exceeds 2 mrem from all radioactive materials released in liquid effluents from the Station, prepare and submit a Special Report within 30 days to the operator of the community water system. The report is prepared to assist the operator in meeting the requirements of 40 CFR 141: EPA Primary Drinking Water Standards. A copy of this report will be sent to the NRC. This is in lieu of a Licensee Event Report.

FOR INFORMATION ONLY

3. At all times during processing prior to discharge to the environs, process and control equipment provided to reduce the amount or concentration of radioactive materials shall be operated when the projected dose due to liquid effluent releases to unrestricted areas (see Figure 4.8-1), when averaged over 31 days, exceeds 0.13 mrem to the total body or 0.42 mrem to any organ.

4. If liquid waste has to be or is being discharged without treatment as required above, prepare and submit to the Commission within 30 days, a report which includes the following information:

   a. Identification of the defective equipment.

   b. Cause of the defective equipment.

   c. Action(s) taken to restore the equipment to an operating status.

   d. Length of time the above requirements were not satisfied.

   e. Volume and curie content of the waste discharged which was not processed by the appropriate equipment but which required processing.

   f. Action(s) taken to prevent a recurrence of equipment failures.

   This is in lieu of a Licensee Event Report.

3. Liquid Waste Treatment

   a. Doses due to liquid releases to unrestricted areas (at or beyond the site boundary) shall be projected at least once per 31 days in accordance with the ODCM.

GL 89-01 RETS/ODCM

GL 89-01 RETS/ODCM

FOR INFORMATION ONLY

Mechanical Vacuum Pump

1. The mechanical vacuum shall be capable of being isolated and secured on a signal of main steam high radiation or shall be isolated and secured whenever the main steam isolation valves are open.

TSUP 3.2.A.

C. Mechanical Vacuum Pump

At least once during each operating cycle, automatic securing and isolation of the mechanical vacuum pump shall be verified.

TSUP 4.2.A.

FOR INFORMATION ONLY

D. Environmental Monitoring Program

1. The environmental monitoring program given in Table 4.8-4 shall be conducted except as specified below.

2. With the radiological environmental monitoring program not being conducted as specified in Table 4.8-4, 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, contractor omission which is corrected as soon as discovered, malfunction of sampling equipment, or if a person who participates in the program goes out of business. If the equipment malfunctions, corrective actions shall be completed as soon as practical. If a person supplying samples goes out of business, a replacement will be found as soon as possible. All deviations from the sampling schedule shall be described in the annual report.

3. With the level of radioactivity in an environmental sampling medium at one or more of the locations specified in the ODCM exceeding the limits of Table 4.8-5 when averaged over any calendar quarter, prepare and submit to the Commission within 30 days from the end of the affected calendar quarter, a Special Report which includes an evaluation of any release conditions, environmental

D. Environmental Monitoring Program

1. The radiological environmental monitoring samples shall be collected pursuant to Table 4.8-3/4 from the locations specified in the ODCM, and shall be analyzed pursuant to the requirements of Table 4.8-6.

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

GL 89-01 RETS/ODCM

GL 89-01 RETS/ODCM

GL 89-01 RETS/ODCM

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

FOR INFORMATION ONLY

factors or other aspects which caused the limits of Table 4.8-5 to be exceeded. This report is not required if the measured level of radioactivity was not the result of plant effluents; however, in such an event the condition shall be reported and described in the Annual Radiological Environmental Operating Report.

GL 89-01 RETS/ODCM

4. With milk samples unavailable from one or more of the sample locations required by Table 4.8-4, identify locations for obtaining replacement samples and add them to the radiological environmental monitoring program within 30 days. The locations from which samples were unavailable may then be deleted from the monitoring program. In lieu of a Licensee Event Report, identify the cause of the unavailability of samples and identify the new location(s) for obtaining replacement samples in the Annual Radiological Environmental Operating report and also include in the report a revised figure(s) and table for the ODCM reflecting the new location(s).

5. A census of nearest residences and of animals producing milk for human consumption shall be conducted annually (during the grazing season for animals) to determine their location and number with respect to the site. The nearest residence in each of the 16 meteorological sectors shall also be determined within a distance of five miles. The census shall be conducted under the following conditions:

   a. Within a 2-mile radius from the plant site, enumeration of animals and nearest residences by a door-to-door or equivalent counting technique.

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

5. The results of the analyses performed as part of the required crosscheck program shall be included in the Annual Radiological Environmental Operating Report. The analyses shall be done in accordance with the ODCM.

GL 89-01 RETS/ODCM

FOR INFORMATION ONLY

b. Within a 5-mile radius, enumeration of animals by using referenced information from county agricultural agents or other reliable sources.

6. With a land use census identifying location(s) of animals which yield(s) an ODCM calculated dose or dose commitment greater than the values currently being calculated in Specification 4.8.A.3, the new location(s) shall be added to the radiological environmental monitoring program with 30 days, if possible.

   The sampling location, having the lowest calculated dose or dose commitment (via the same exposure pathway) may be deleted from this monitoring program after October 31 of the year in which this land use census was conducted.

7. Radiological analyses shall be performed on samples representative of those in Table 4.8-4, supplied as a part of the Inter-laboratory Comparison Program which has been approved by the NRC.

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

GL 89-01 RETS/ODCM

FOR INFORMATION ONLY

Solid Radioactive Waste

1. The solid radwaste system shall be used as applicable in accordance with the PCP to process wet radioactive wastes to meet shipping and burial ground requirements.

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

GL89-01
PCP

E. Solid Radioactive Waste

1. The PCP shall specify the method and frquency to verify solidification of radioactive waste. Actions to be taken if solidification is not verified shall also be specified in the PCP.

GL89-01
PCP

FOR INFORMATION ONLY

F. Miscellaneous Radioactive Materials Sources

Source Leakage Test

Specification

Each sealed source containing radioactive material in excess of 100 microcuries of beta and/or gamma emitting material or 5 microcuries of alpha emitting material shall be free of ≥ 0.005 microcuries of removable contamination.

Each sealed source with removable contamination in excess of the above limit shall be immediately withdrawn from use and either decontaminated and repaired or disposed of in accordance with Commission Regulations.

A complete inventory of radioactive materials in the licensee's possession shall be maintained current at all times.

TSuP 3.8.G.LCO

F. Miscellaneous Radioactive Materials Sources

TSuP 4.8.G.1

Each sealed source shall be tested for leakage and/or contamination by the licensee or by other persons specifically authorized by the Commission or an Agreement state. The test method shall have a detection sensitivity of at least 0.005 microcuries per test sample.

TSuP 4.8.G.1

Each category of sealed sources shall be tested at the frequency described below:

TSuP 4.8.G.2.a

1. Sources in use (excluding startup previously subjected to core flux) - At least once per 6 months for all sealed sources containing radioactive material:

   a. With a half-life greater than 30 days (excluding Hydrogen 3), and

   b. In any form other than gas.

TSuP 4.8.G.2.b

2. Stored sources not in use - Each sealed source shall be tested prior to the use or transfer to another licensee unless tested within the previous 6 months. Sealed sources transferred without a certificate indicating the last test date shall be tested prior to being placed into use.

A Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.6.C.3 if source leakage tests reveal the presence of ≥ 0.005 microcuries of removable contamination.

TSuP 3.8.G.Action

G. In the event a limiting condition for operation and/or associated action requirements identified in sections 3.8.A. through 3.8.E., and 4.8.A. through 4.8.E. cannot be satisfied because of circumstances in excess of those addressed in the specifications, no changes are required in the operational condition of the plant, and this does not prevent the plant from entry into an operational mode.

GL89-01 ODCM

FOR INFORMATION ONLY

H. Control Room Emergency Filtration System

1. The control room emergency filtration system, including at least one booster fan shall be operable at all times when secondary containment integrity is required, except as specified in Sections 3.8.H.1.a. and b.

a. After the control room emergency filtration system is made or found to be inoperable for any reason, reactor operation and fuel handling are permissible only during the succeeding 14 days. Within 36 hours following the 14 days, the reactor shall be placed in a condition for which the control room emergency filtration system is not required in accordance with Specification 3.7.C.1.a. through d.

b. Specification 3.8.H.1.a. above does not apply during performance or post-maintenance testing, or during removal of the charcoal test canister.

2. Periodic Performance Requirements

a. The results of the in-place DOP tests at 2000 cfm (±10%) on HEPA filters shall show ≤ 1% DOP penetration.

b. The results of in-place halogenated hydrocarbon tests at 2000 cfm (±10%) on the charcoal banks shall show ≤ 1% penetration.

c. The results of laboratory carbon sample analysis shall show ≥ 90% methyl iodide removal efficiency when tested at 130°C and 95% R.H.

H. Control Room Emergency Filtration System

1. At least once per month, initiate 2000 cfm (±10%) flow through the control room emergency filtration system for at least 10 hours with the heaters operable.

2. Performance Requirement Tests

a. At least once per operating cycle but not to exceed 18 months, or following painting, fire, or toxic chemical release in any ventilation zone communicating with the intake of the system while the system is operating that could contaminate the HEPA filters of charcoal absorbers, perform the following:

1) In-place DOP test the HEPA filter banks to verify leaktight integrity.

2. In-place test the charcoal absorber banks with halogenated hydrocarbon tracer to verify leaktight integrity.

TSUP 3,8.D, LCO

TSUP 3,8.D, ACTION 1

TSUP HSD-12, CSD-24h

TSUP 4,8.D,2

TSUP 4,8.D.3

TSUP 4.8.D.3.a & b

FOR INFORMATION ONLY

TSUP 4.8.D.4

3) Remove one carbon test canister from the charcoal absorber. Subject this sample to a laboratory analysis to verify methyl iodine removal efficiency.

TSUP 4.8.D.5.a

b. At least once per operating cycle, but not to exceed 18 months, the following conditions shall be demonstrated:

1) Pressure drop across the combined filters is less than 6 inches of water at 2000 cfm (±10%) flow rate.

TSUP 4.8.D.5.d

2) Operability of inlet heater demonstrates heater ΔT determined by the following formula:
$\Delta T \geq 28.5-(0.0075F)$;
where ΔT is the differential temperature and F is the flow (cfm) at which the test is performed.

TSUP 4.8.D.6

3. Postmaintenance Requirements

a. After any maintenance or heating that could affect the HEPA filter or HEPA filter mounting frame leak-tight integrity, the results of the in-place DOP tests at 2000 cfm (± 10%) on HEPA filters shall show ≤ 1% DOP penetration.

b. After any maintenance or testing that could affect the charcoal absorber leaktight integrity, the results of in-place halogenated hydrocarbon tests at 2000 cfm (± 10%) shall show ≤ 1% penetration.

3. Postmaintenance Testing

a. After any maintenance or testing that could affect the leaktight integrity of the HEPA filters, perform in-place DOP tests on the HEPA filters in accordance with Specification 3.8.H.2.a.

TSUP 4.8.D.7

b. After any maintenance or testing that could affect the leaktight integrity of the charcoal absorber banks, perform halogenated hydrocarbon tests on the charcoal absorbers in accordance with Specification 3.8.H.2.b.

FOR INFORMATION ONLY

3.8/4.8.A.1 GASEOUS EFFLUENTS - DOSE

This specification is provided to ensure that the dose at the unrestricted area boundary from gaseous effluents from the units on the site will be within the annual dose limits of 10 CFR Part 20 for unrestricted areas. The annual dose limits are the doses associated with the concentrations of 10 CFR Part 20, Appendix B, Table II. These limits provide reasonable assurance that radioactive material discharged in gaseous effluents will not result in the exposure of an individual in an unrestricted area to annual average concentrations exceeding the limits specified in Appendix B, Table II of 10 CFR Part 20 (10 CFR Part 20.106(b)). The specified release rate limits restrict, at all times, the corresponding gamma and beta dose rates above background to an individual at or beyond the unrestricted area boundary to less than or equal to 500 mrem/year to the total body or to not less than or equal to 3000 mrem/year to the skin. These release rate limits also restrict, at all times, the corresponding thyroid dose rate above background to a child via the inhalation pathway to less than or equal to 1500 mrem/year. For purposes of calculating doses resulting from airborne releases the main chimney is considered to be an elevated release point, and the reactor vent stack is considered to be a mixed mode release point.

3.8/4.8.A.2 DOSE, NOBLE GASES

This specification is provided to implement the requirements of Sections II.B, III.A and IV.A of Appendix I, 10 CFR Part 50. The Limiting Condition for Operation implements the guides set forth in Section II.B of Appendix I. The statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive material in gaseous effluents will be kept "as low as is reasonably achievable." The Surveillance Requirements implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I is to be shown by calculational procedures based on models and data such that the actual exposure of an individual through the appropriate pathways is unlikely to be substantially underestimated. The dose calculations established in the ODCM for calculating the doses due to the actual release rates of radioactive noble gases in gaseous effluents will be 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 provide for determining the air doses at the unrestricted boundary based upon the historical average atmospheric conditions. NUREG-0133 provides methods for dose calculations consistent with Regulatory Guides 1.109 and 1.111.

3.8/4.8.A.3 DOSE, RADIOIODINES, RADIOACTIVE MATERIAL IN PARTICULATE FORM AND RADIONUCLIDES OTHER THAN NOBLE GASES

This specification is provided to implement the requirements of Sections II.C, III.A and IV.A of Appendix I, 10 CFR Part 50. The Limiting Conditions for Operation are the guides set forth in Section II.C of Appendix I. The statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive materials in gaseous effluents will be kept "as low as is reasonably achievable." The ODCM calculational methods specified in the surveillance requirements implements the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I be shown by calculational procedures based on models and data such that the actual exposure of an individual through appropriate pathways is unlikely to be substantially underestimated. The ODCM calculational methods approved by NRC for calculating the doses due to the actual release rates of the subject materials are required to be consistent with the methodology provided in Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I", Revision 1, October 1977 and Regulatory Guide 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors," Revision 1, July 1977. These equations also provide for determining the actual doses based upon the historical average atmospheric conditions. The release rate specifications for radioiodines, radioactive material in particulate form and radionuclides other than noble gases are dependent on the existing radionuclide pathways to man, in the unrestricted area. The pathways which were examined in the development of these specifications were: 1) individual inhalation of airborne radionuclides, 2) deposition of radionuclides onto green leafy vegetation with subsequent consumption by man and 3) deposition onto grassy areas where milk animals graze with consumption of the milk by man.

3.8/4.8.A.4 GASEOUS WASTE TREATMENT

The OPERABILITY of the gaseous waste treatment which reduces amounts or concentrations of radioactive materials ensures that the system will be available for use whenever gaseous effluents require treatment prior to release to the environment. The requirement that the appropriate portions of this system be operable when specified provides reasonable assurance that the releases of radioactive materials in gaseous effluents will be kept "as low as is reasonably achievable". This specification implements the requirements of 10 CFR Part 50.36a, General Design Criterion 60 of Appendix A to 10 CFR Part 50, and design objective Section II.D of Appendix I to 10 CFR Part 50.

3.8/4.8.A.5. EXPLOSIVE GAS MIXTURE

This specification is provided to ensure that the concentration of potentially explosive gas mixtures contained in the off gas system is minimized in conformance with the requirements of General Design Criterion 60 of Appendix A to 10 CFR Part 50.

FOR INFORMATION ONLY

FOR INFORMATION ONLY

QUID EFFLUENTS

3.8/4.8.B.1 CONCENTRATION

This specification is provided to ensure that the concentration of radioactive materials released in liquid waste effluents from the site to unrestricted areas will be less than the concentration levels specified in 10 CFR Part 20, Appendix B, Table II, column 2. The concentration limit for noble gases, MPC in air (submersion), was converted to an equivalent concentration in water using the International Commission on Radiological Protection (ICRP) Publication 2.

3.8/4.8.B.2. DOSE

This specification is provided to implement the requirements of Sections IIA, 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 statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive material in 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 calculational procedures based on models and data such that the actual exposure of an individual through appropriate pathways is not likely 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 will be consistent with the methodology provided in Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I", Revision 1, October 1977 and Regulatory Guide 1.113, "Estimating Aquatic Dispersion of Effluents from Accidental and Routine Reactor Releases for the Purpose of Implementing Appendix I", April 1977. NUREG-0113 provides methods for dose calculations consistent with Reg Guide 1.109 and 1.113.

3.8/4.8.B.3 LIQUID WASTE TREATMENT

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

FOR INFORMATION ONLY

3/4.8.D.1 MONITORING PROGRAM

The radiological monitoring program required by this specification provides measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides, which lead to the highest potential radiation exposures of individuals resulting from the station operation. This monitoring program thereby supplements the radiological effluent monitoring program by verifying that the measureable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and modeling of the environmental exposure pathways. Program changes may be initiated based on operational experience.

The detection capabilities required by Table 4.8-6 are state-of-the-art for routine environmental measurements in industrial laboratories. The specified lower limits of detection for I-131 in water, milk and other food products correspond to approximately one-quarter of the Appendix I to 10 CFR Part 50 design objective dose-equivalent of 15 mrem/year for atmospheric releases and 10 mrem/year for liquid releases to the most sensitive organ and individual. They are based on the assumptions given 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", October 1977, except the change for an infant consuming 330 liter/year of drinking water instead of 510 liters/year.

3/4.8.D.6 LAND USE CENSUS

This specification is provided to ensure that changes in the use of unrestricted areas are identified and that modifications to the monitoring program are made if required by the results of this census. This census satisfies the requirements of Section IV.B.3 of Appendix I to 10 CFR Part 50.

3.8/4.8.D.7 CROSSCHECK PROGRAM

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

FOR INFORMATION ONLY

3.8/4.8.C. MECHANICAL VACUUM PUMP

The purpose of isolating the mechanical vacuum line is to limit release of activity from the main condenser. During an accident, fission products would be transported from the reactor through the main steamline to the main condenser. The fission product radioactivity would be sensed by the main steamline radioactivity monitors which initiate isolation.

3.8/4.8.F. MISCELLANEOUS RADIOACTIVE MATERIALS SOURCES

The objective of this specification is to assure that leakage from byproduct, source and special nuclear material sources does not exceed allowable limits. The limitations on removable contamination for sources requiring leak testing, including alpha emitters, is based on 10 CFR 70.39 (c) limits for plutonium.

3.8/4.8.E. SOLID RADIOACTIVE WASTE

The operability of the solid radioactive waste system ensures that the system will be available for use whenever solid radwastes require processing and packaging prior to being shipped off-site. This specification implements the requirements of 10 CFR 50.36a. and General Design Criteria 60 of Appendix A to 10 CFR Part 50.

3.8/4.8.H CONTROL ROOM AIR FILTRATION

The purpose of these specifications is to assure availability of the control room emergency air filtrations unit that has been installed in response to NUREG-0737 Item III D.3.4. Operation of this unit is described in the "Control Room Habitability Study" for Quad-Cities Station which was submitted to the NRC in December 1981.

FOR INFORMATION ONLY

GL 89-01 Rev 5 ODCM

TABLE 4.8-1
RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS PROGRAM

GASEOUS RELEASE TYPE	SAMPLING FREQUENCY	MINIMUM ANALYSIS FREQUENCY	TYPE OF ACTIVITY ANALYSIS	LOWER LIMIT OF DETECTION (LLD) (uci/ml)
A. Main Chimney Reactor Bldg. Vent Stack	M Grab Sample	M[b]	Principal Gamma Emitters[e]	1×10^{-4}
		M	Tritium	1×10^{-6}
B. All Release Types as Listed in A Above	Continuous[d]	W[c] Charcoal Sample	I-131	1×10^{-12}
			I-133	1×10^{-10}
	Continuous[d]	W[c] Particulate Sample	Principal Gamma Emitters[e] (I-131, others)	1×10^{-11}
	Continuous[d]	Q Composite Particulate Sample	SR-89	1×10^{-11}
			SR-90	1×10^{-11}
	Continuous[d]	M Composite Particulate Sample	Gross Alpha	1×10^{-11}
C. Main Chimney	Continuous[d]	Noble Gas Monitor	Noble Gases	1×10^{-6}
D. Reactor Bldg Vent Stack	Continuous[d]	Noble Gas Monitor	Noble Gases	1×10^{-4}

RELOCATED

FOR INFORMATION ONLY
GL 89-01
RETS/ODCM

TABLE 4.8-1 (Continued)
TABLE NOTATION

a. The lower limit of detection (LLD) is defined in table notation A. of Table 4.8-6.

b. Sampling and analyses shall also be performed following shutdown, startup, or a thermal power change exceeding 20 percent of rated thermal power in 1 hour unless (1) analysis shows that the DOSE EQUIVALENT I-131 concentration in the primary coolant has not increased more than a factor of 5, and (2) the noble gas activity monitor shows that effluent activity has not increased by more than a factor of 3.

c. Samples shall be changed at least once per 7 days and the analyses completed within 48 hours after removal from the sampler. Sampling shall also be performed within 24 hours following each shutdown, startup, or thermal power level change exceeding 20% of rated thermal power in one hour. This requirement does not apply if (1) analysis shows that the DOSE EQUIVALENT I-131 concentration in the primary coolant has not increased more than a factor of 5, and (2) the noble gas activity monitor shows that effluent activity has not increased by more than a factor of 3. When samples collected for 24 hours are analyzed, the corresponding LLD's may be increased by a factor of 10.

d. The ratio of sample flow rate to the sampled stream flow rate shall be known.

e. 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, and Mn-54, Fe-59, Co-60, Zn-65, Co-58, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144 for particulate emissions. Other peaks which are measurable and identifiable by gamma ray spectrometry, together with the above nuclides, shall be also identified and reported when an actual analysis is performed on a sample. Nuclides which are below the LLD for the analyses shall not be reported as being present at the LLD level for that nuclide.

FOR INFORMATION ONLY

TABLE 4.8-2

MAXIMUM PERMISSIBLE CONCENTRATION OF DISSOLVED OR ENTRAINED NOBLE GASES RELEASED FROM THE SITE TO UNRESTRICTED AREAS IN LIQUID WASTE

GL 89-01 RETS/ODCM

RELOCATED

NUCLIDE	MPC (uCi/ml)*
Kr-58m	2×10^{-4}
Kr-85	5×10^{-4}
Kr-87	4×10^{-5}
Kr-88	9×10^{-5}
Ar-41	7×10^{-5}
Xe-131m	7×10^{-4}
Xe-133m	5×10^{-4}
Xe-133	6×10^{-4}
Xe-135m	2×10^{-4}
Xe-135	2×10^{-4}

* Computed from Equation 20 of ICRP Publication 2 (1959), adjusted for infinite cloud submersion in water, and R = 0.01 rem/week, density = 1.0 g/cc abd Pw/Pt = 1.0.

FOR INFORMATION ONLY

GL 89-01 RETS/ODCM

TABLE 4.8-3

RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

Liquid Release Type	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection (LLD) (uci/ml)
A. Batch Waste Release Tanks	Prior to Each Batch	Prior to Each Batch	Principal Gamma Emitters[e]	5×10^{-7}
			I-131	1×10^{-6}
	Prior to Each Batch	M Composite[b]	Gross Alpha	1×10^{-7}
			H-3	1×10^{-5}
	Prior to Each Batch	Q Composite[b]	Fe-55	1×10^{-6}
			Sr-89, Sr-90	5×10^{-8}
	Prior to One Batch/M	M	Dissolved & Entrained Gases[f] (Gamma Emitters)	1×10^{-5}
B. Plant Continuous Releases[d]	M^c (Grab Sample)	M^c	I-131	1×10^{-6}
			Principal Gamma Emitters[e]	5×10^{-7}
			Dissolved & Entrained Gases[f] (Gamma emmiters)	1×10^{-5}
			H-3	1×10^{-5}
			Gross Alpha	1×10^{-7}
	Q^c (Grab Sample)	Q^c	Sr-89, Sr-90	5×10^{-8}
			Fe-55	1×10^{-6}

FOR INFORMATION ONLY

GL 89-01
RETS/ODCM

TABLE 4.8-3 (Continued)
TABLE NOTATION

a. The LLD is defined in Notation A of Table 4.8-6.

b. A composite sample is one in which the quantity of liquid samples is proportional to the quantity of liquid waste discharged and in which the method of sampling employed results in a specimen which is representative of the liquids released.

c. If the alarm setpoint of the service water effluent monitor as determined in the ODCM is exceeded, the frequency of analysis shall be increased to daily until the condition no longer exists.

d. A batch release is the discharge of liquid wastes of a discrete volume. Prior to sampling for analyses, each batch shall be isolated and then thoroughly mixed to assure representative sampling. A continuous release is the discharge of liquid wastes of a nondiscrete volume; e.g., from a volume or system that has an input flow during the release.

e. The principal gamma emitters for which the LLD specification applies exclusively are the following radionuclides: Mn-54, Fe-59, Co-60, Zn-65, Co-58, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144. Other peaks which are measurable and identifiable by gamma ray spectrometry together with the above nuclides, shall be also identified and reported when the actual analysis is performed on a sample. Nuclides which are below the LLD for the analyses shall not be reported as being present at the LLD level for that nuclide.

f. The dissolved and entrained gases (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. Other dissolved and entrained gases (gamma emitters) which are measurable and identifiable by gamma-ray spectrometry, together with the above nuclides, shall also be identified and reported when an actual analysis is performed on a sample. Nuclides which are below the LLD for the analyses shall not be reported as being present at the LLD level for that nuclide.

QUAD-CITIES DPR-30

TABLE 4.8-4

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Minimum Number of Samples and Sample Locations*	Sampling and Collection Frequency	Type and Frequency of Analysis
1. AIRBORNE			
a. Particulates	16 locations	Continuous operation of sampler for a week	Gross beta and gamma isotopic as specified in ODCM.
b. Radioiodine	16 locations	Continuous operation of sampler for two weeks	I-131 as specified in ODCM.
2. DIRECT RADIATION	Forty Locations (Minimum of two TLDs per packet)	Quarterly	

*Sample locations are described in the ODCM.

RELOCATED

GL 89-01 Rev 1 ODCM

Amendment No. 84

3.8/4.8-24

FOR INFORMATION ONLY

TABLE 4.8-4 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Minimum Number of Samples and Sample Locations*	Sampling and Collection Frequency	Type and Frequency of Analysis
3. WATERBORNE			
a. Public Water	2 Locations	Monthly composite of weekly collected samples	Gamma isotopic analysis of each composite sample
b. Sediment	1 downstream location in receiving body of water	Annually	Gamma isotopic analysis of each sample
c. Plant Cooling Water	Intake, Discharge	Weekly composite	Gross Beta analysis of each sample

*Sample locations are described in the ODCM

RELOCATED

GL 89-01
RETS/ODCM

FOR INFORMATION ONLY

TABLE 4.8-4 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Minimum Number of Samples and Sample Locations*	Sampling and Collection Frequency	Type and Frequency of Analysis
4. INJESTION			
a. Milk	2 Locations	At least once weekly when animals are on pasture; at least once per month at other times.	I-131 analysis of each sample
b. Fish	1 location in receiving body of water	Semi-annually	Gamma isotopic analysis on edible portions

*Sample locations are described in the ODCM

RELOCATED

GL 89-01
RETS/ODCM

FOR INFORMATION ONLY

FOR INFORMATION ONLY

TABLE 4.8-5

REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

GC 89-01 RETS/ODCM

alysis	Water	Airborne Particulate or Gases (pCi/m^3)	Fish (pCi/Kg,wet)	Milk (pCi/l)	Food Products (pCi/Kg,wet)
	Reporting Levels				
3	2×10^4(a)				
-54	1×10^3		3×10^4		
-59	4×10^2		1×10^4		
-58	1×10^3		3×10^4		
-60	3×10^2		1×10^4		
-65	3×10^2		2×10^4		
-[illegible]	4×10^2				
1[illegible]	2	0.9		3	1×10^2
-134	30	10	1×10^3	60	1×10^3
-137	50	20	1×10^3	70	2×10^3
-La-140	2×10^2			3×10^2	

RELOCATED

) for drinking water samples. This is 40 CFR Part 141 value.

FOR INFORMATION ONLY

GC89-01
RETS/ODCM

TABLE 4.8-6

PRACTICAL LOWER LIMITS OF DETECTION (LLD)
FOR STANDARD ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM

Sample Media	Analysis	LLD[A,B] (4.66σ)	Units
Airborne "Particulate"	Gross Beta +	0.01	pCi/m^3
	Gamma Isotopic	0.01	pCi/m^3
Airborne I-131	Iodine-131	0.10	pCi/m^3
Milk/Public Water	I-131	5°	pCi/l
	Cs-134	10	pCi/l
	Cs-137	10△	pCi/l
	Tritium	200	pCi/l
	Gross Beta +	5	pCi/l
	Gamma Isotopic	20	pCi/l/nuclide
Sediment	Gross Beta +	2	pCi/g dry
	Gamma Isotopic	0.2	pCi/g dry
Fish Tissue	I-131 - Thyroid	0.1	pCi/g wet
	Cs-134, 137	0.1	pCi/g wet
	Gross Beta +	1.0	pCi/g wet
	γ Isotopic	0.2	pCi/g wet

° 0.5 pCi/l on milk samples collected during the pasture season.

\+ Referenced to Cs-137

△ 5.0 pCi/l on milk samples

RELOCATED

FOR INFORMATION ONLY
GL 89-01
RETS/ODCM

TABLE 4.8-6 (Continued)
TABLE NOTATION

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

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

$$LLD = \frac{4.55 \cdot s_b}{A \cdot E \cdot V \cdot 2.22 \cdot Y \cdot \exp(-\lambda \Delta t) \cdot t}$$

Where:

LLD is the "a priori" lower limit of detection for a blank sample or background analysis as defined above (as pCi per unit mass or volume).

s_b is the square root of the background count or of a blank sample count; is the estimated standard error of a background count or a blank sample count as appropriate (in units of counts).

E is the counting efficiency (as counts per disintegration).

A is the number of gamma-rays emitted per disintegration for gamma-ray radionuclide analysis (A = 1.0 for gross alpha and tritium measurements).

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

2.22 is the number of disintegrations per minute per picocurie.

Y is the fractional radio-chemical yield when applicable (otherwise Y = 1.0).

λ is the radioactive decay constant for the particular radionuclide (in units of reciprocal minutes).

Δt is the elapsed time between the midpoint of sample collection and the start time of counting. (Δt = 0.0 for environmental samples and for gross alpha measurements).

t is the duration of the count (in units of minutes).

The value of "Sb" used in the calculation of the LLD for a detection system shall be based on an actual observed background count or a blank sample count (as appropriate) rather than on an unverified theoretically predicted value. Typical values of "E", "V", "Y", "t", and "Δt" shall be used in the calculation.

For gamma-ray radionuclide analyses the background counts are determined from the total counts in the channels which are within plus or minus one FWHM (Full Width at Half Maximum) of the gamma-ray photopeak energy normally used for the quantitative analysis for that radionuclide. Typical values of the FWHM shall be used in the calculation.

FOR INFORMATION ONLY

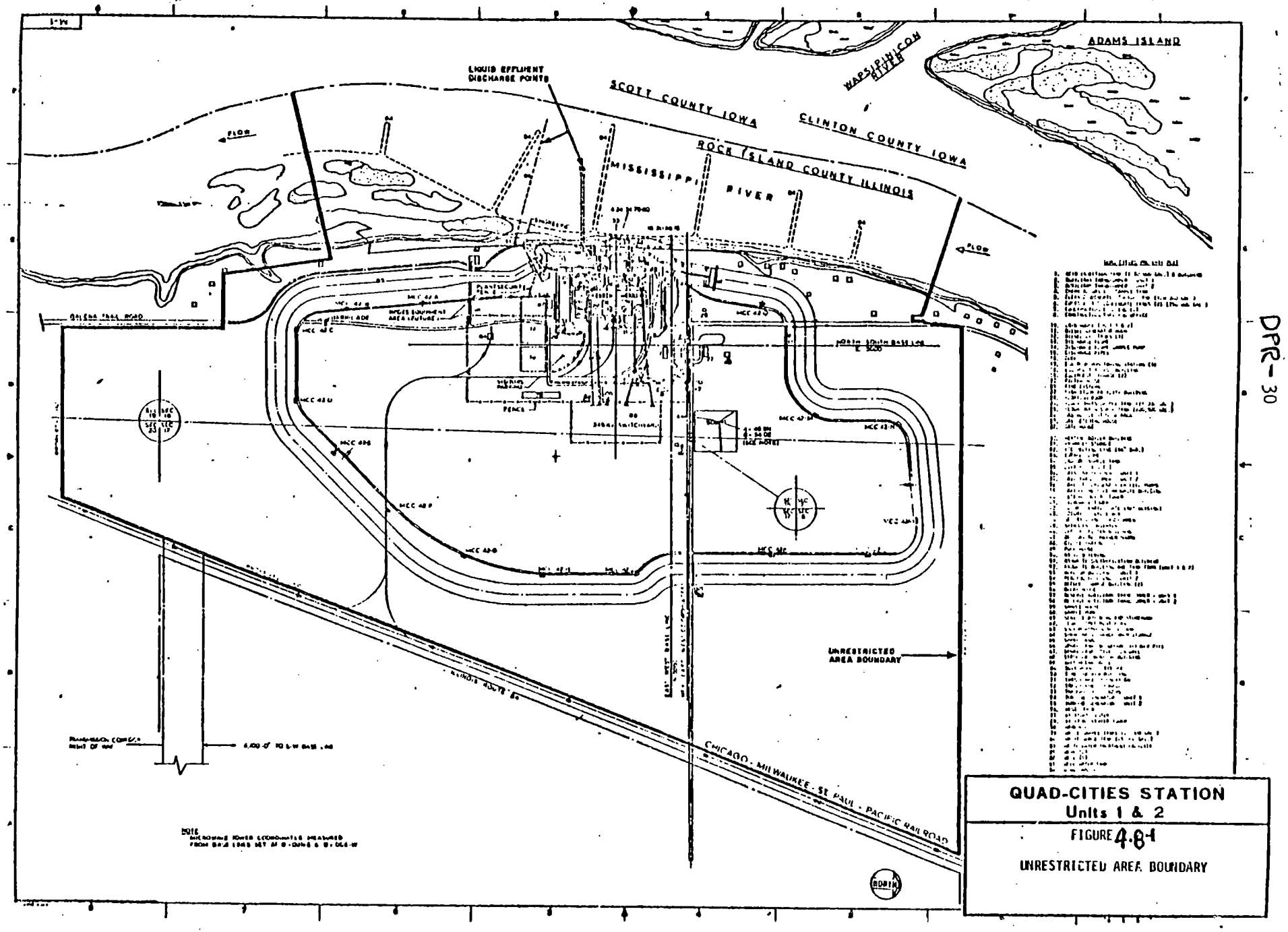
GL 89-01
RETS/ODCM

TABLE 4.8-6 (Continued)
TABLE NOTATION

The LLD for all measurements 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 sample measurement.

B. Other radionuclides which are measureable and identifiable by gamma-ray spectrometry, together with the nuclides indicated in Table 4.8-6, shall also be identified and reported when an actual analysis is performed on a sample. Nuclides which are below the LLD for the analyses shall not be reported as being present at the LLD level for that nuclide.

RELOCATED



QUAD-CITIES STATION
Units 1 & 2

FIGURE 4.8-1

UNRESTRICTED AREA BOUNDARY

Amendment No. 84

3.8/4.8-30

DPR-30

FOR INFORMATION ONLY

ATTACHMENT E

Marked-Up BWR/4 STS Pages

DRESDEN ONLY

(8)

CONTAINMENT COOLING

3/4.7 PLANT SYSTEMS

(8.A)

3/4.7.1 SERVICE WATER SYSTEMS

RESIDUAL HEAT REMOVAL SERVICE WATER SYSTEM

FOR INFORMATION ONLY

LIMITING CONDITION FOR OPERATION

3.7.1.1 At least the following independent residual heat removal service water (RHRSW) system subsystems, with each subsystem comprised of:

(CCSW)

1. ~~a.~~ Two OPERABLE RHRSW (CCSW) pumps, and
2. ~~b.~~ An OPERABLE flow path capable of taking suction from the (ultimate heat sink) and transferring the water through one RHR heat exchanger (a) (LPCI) and separately to the associated safety related equipment

~~shall be OPERABLE:~~

1. ~~a.~~ In OPERATIONAL ~~CONDITION~~ (MODE(S)) 1, 2 and 3, two subsystems.
2. ~~b.~~ In OPERATIONAL ~~CONDITION~~ (MODE(S)) 4 and 5 (and *), the subsystem(s) associated with systems (subsystems/loops) and components required OPERABLE by Specification 3.4.9.1, 3.4.9.2, (3.5.2), 3.9.11.1 and 3.9.11.2. (3.8.D)

APPLICABILITY: OPERATIONAL ~~CONDITIONS~~ (MODE(S)) 1, 2, 3, 4 ~~and~~ 5 (and *).

ACTION:

1. ~~a.~~ In OPERATIONAL ~~CONDITION~~ (MODE(S)) 1, 2, or 3:
   a. ~~1.~~ With one RHRSW (CCSW) pump inoperable, restore the inoperable pump to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
   b. ~~2.~~ With one RHRSW (CCSW) pump in each subsystem inoperable, restore at least one inoperable pump to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
   c. ~~3.~~ With one RHRSW (CCSW) subsystem inoperable, restore the inoperable subsystem to OPERABLE status with at least one OPERABLE pump within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
   d ~~4.~~ With both RHRSW (CCSW) subsystems inoperable, restore at least one subsystem to OPERABLE status within 8 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN* within the following 24 hours.
2. ~~b.~~ In OPERATIONAL ~~CONDITION~~ (MODE(S)) ~~3 or~~ 4 (5 or *) with the RHRSW (CCSW) subsystem(s), which is associated with an RHR loop required OPERABLE by Specification 3.4.9.1 or 3.4.9.2, inoperable, declare the associated RHR loop (the safety related equipment) inoperable and take the ACTION required by Specification 3.4.9.1 or 3.4.9.2, as applicable. (3.8.D) (safety related equipment)

*Whenever both RHRSW subsystems are inoperable, if unable to attain COLD SHUTDOWN as required by this ACTION, maintain reactor coolant temperature as low as practical by use of alternate heat removal methods.

(a) the LPCI heat exchanger is not required to support operation of the CREFS.

* When handling irradiated fuel in the secondary containment, during CORE ALTERATIONS, and operations with a potential for draining the vessel.

DRESDEN ONLY

FOR INFORMATION ONLY

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

c. In OPERATIONAL CONDITION 4 or 5 with the RHRSW subsystem(s), which is associated with an (ECCS pump) required OPERABLE by Specification(s) (3.5.2), inoperable, declare the associated (ECCS pump) inoperable and take the ACTION required by Specification(s) (3.5.2).

d. In OPERATIONAL CONDITION 5 with the RHRSW subsystem(s), which is associated with an RHR loop required OPERABLE by Specification 3.9.11.1 or 3.9.11.2, inoperable, declare the associated RHR system inoperable and take the ACTION required by Specification 3.9.11.1 or 3.9.11.2, as applicable.

SURVEILLANCE REQUIREMENTS

4.8.A ~~4.7.1.1~~ Each of the At least the above required residual heat removal service water system CCSW subsystem(s) shall be demonstrated OPERABLE:

, manual, power operated or automatic

a. At least once per 31 days by verifying that each valve in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position.

b. At least once per 18 months during shutdown by verifying that each automatic valve servicing safety-related equipment actuates to its correct position on a _____ test signal.

QUAD-CITIES ONLY

8

3/4.7 PLANT SYSTEMS

8.A

3/4.7.1 SERVICE WATER SYSTEMS

FOR INFORMATION ONLY

RESIDUAL HEAT REMOVAL SERVICE WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.8.A

3.7.1.1 At least the following independent residual heat removal service water (RHRSW) system subsystems, with each subsystem comprised of:

a. Two OPERABLE RHRSW pumps, and

b. An OPERABLE flow path capable of taking suction from the ultimate heat sink and transferring the water through one RHR heat exchanger,*

and separately to the associated safety related equipment

~~shall be OPERABLE:~~

a. In OPERATIONAL ~~CONDITION~~ MODE(S) 1, 2 and 3, two subsystems.

b. In OPERATIONAL ~~CONDITION~~ MODE(S) 4 ~~and~~ 5, and * the subsystem(s) associated with systems and components required OPERABLE by Specification 3.4.9.1, 3.4.9.2, (3.5.2), 3.9.11.1 and 3.9.11.2.

subsystems/loops

APPLICABILITY: OPERATIONAL ~~CONDITIONS~~ MODE(S) 1, 2, 3, 4 and * 5.

ACTION:

~~a.~~ 1. In OPERATIONAL ~~CONDITION~~ MODE 1, 2, or 3:

~~a.~~ 1. With one RHRSW pump inoperable, restore the inoperable pump to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

~~b.~~ 2. With one RHRSW pump in each subsystem inoperable, restore at least one inoperable pump to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

~~c.~~ 3. With one RHRSW subsystem inoperable, restore the inoperable subsystem to OPERABLE status with at least one OPERABLE pump within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

7 days

~~d.~~ 4. With both RHRSW subsystems inoperable, restore at least one subsystem to OPERABLE status within 8 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN* within the following 24 hours.

~~b.~~ 2. In OPERATIONAL ~~CONDITION~~ MODE 3 or 4 with the RHRSW subsystem(s) which is associated with an RHR loop required OPERABLE by Specification 3.4.9.1 or 3.4.9.2, inoperable, declare the associated RHR loop inoperable and take the ACTION required by Specification 3.4.9.1 or 3.4.9.2, as applicable.

subsystem

3.6.0 3.6.P 3.6.P 3.6.0 subsystem

~~a.~~ Whenever both RHRSW subsystems are inoperable, if unable to attain COLD SHUTDOWN as required by this ACTION, maintain reactor coolant temperature as low as practical by use of alternate heat removal methods.

* When handling irradiated fuel in the secondary containment, during CORE ALTERATION(S), and operations with a potential for draining the reactor vessel.

QUAD CITIES ONLY

PLANT SYSTEMS

FOR INFORMATION ONLY

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

3. In OPERATIONAL CONDITION 4 or 5 with the RHRSW subsystem(s) which is associated with an (ECCS pump) required OPERABLE by Specification(s) (3.5.2), inoperable, declare the associated (ECCS pump) inoperable and take the ACTION required by Specification(s) (3.5.2).

d. In OPERATIONAL CONDITION 5 with the RHRSW subsystem(s), which is associated with an RHR loop required OPERABLE by Specification 3.9.11.1 or 3.9.11.2, inoperable, declare the associated RHR system inoperable and take the ACTION required by Specification 3.9.11.1 or 3.9.11.2, as applicable.

SURVEILLANCE REQUIREMENTS

4.7.1 At least the above required residual heat removal service water system subsystem(s) shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position.

b. At least once per 18 months during shutdown by verifying that each automatic valve servicing safety-related equipment actuates to its correct position on a _____ test signal.

In OPERATIONAL MODE * with both unit RHRSW subsystem(s) inoperable, declare the control room emergency filtration system, Train B, inoperable and take the ACTION required by Specification 3.8.D.

PLANT SYSTEMS

Diesel Generator Cooling

PLANT SERVICE WATER SYSTEM

FOR INFORMATION ONLY

LIMITING CONDITION FOR OPERATION

A diesel generator cooling water (DGCW) shall be OPERABLE for each required diesel generator

3.8.B

3.7.1.2 At least the following independent plant service water system loops, with each loop comprised of:

One Subsystem DGCW

a. Two OPERABLE plant service water pumps, and

b. An OPERABLE flow path capable of taking suction from the ultimate heat sink and transferring the water to the associated safety related equipment,

diesel generator

shall be OPERABLE:

a. In OPERATIONAL CONDITION 1, 2 and 3, two loops.

b. In OPERATIONAL CONDITION 4, 5 and *, one loop.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, 3, 4, 5 and *

When the diesel generator is required to be OPERABLE

ACTION:

a. In OPERATIONAL CONDITION 1, 2, or 3:

1. With one plant service water pump inoperable, restore the inoperable pump to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

2. With one plant service water pump in each loop inoperable, restore at least one inoperable pump to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

3. With one plant service water system loop inoperable, restore the inoperable loop to OPERABLE status with at least one OPERABLE pump within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

b. With only one plant service water pump and its associated flowpath OPERABLE, restore at least two pumps with at least one flow path to OPERABLE status within 72 hours or:

1. In OPERATIONAL CONDITION 4 or 5, declare the associated safety related equipment inoperable and take the ACTION required by Specifications (3.5.2 and 3.8.1.2).

2. In Operational Condition *, declare the associated diesel generator(s) inoperable and take the ACTION required by Specification 3.8.1.2. The provisions of Specification 3.0.3 are not applicable.

With one or more DGCW subsystem inoperable, declare the associated diesel generator inoperable and take ACTION required by Specification 3.9.A or 3.9.B, as applicable.

*When handling irradiated fuel in the secondary containment.

FOR INFORMATION ONLY

SURVEILLANCE REQUIREMENTS

4.8.B → 4.7.1.2 At least the above required plant service water system loop(s) shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve, manual, power operated or automatic, servicing safety related equipment that is not locked, sealed or otherwise secured in position, is in its correct position.

b. At least once per 18 months during shutdown, by verifying that:

1. Each automatic valve servicing non-safety related equipment actuates to its isolation position on an isolation test signal.

2. Each pump starts automatically to maintain service water pressure greater than or equal to (60) psig.

upon receipt of a start signal for the associated diesel generator.

ULTIMATE HEAT SINK (Optional)

FOR INFORMATION ONLY

LIMITING CONDITION FOR OPERATION

3.7.1.3 The ultimate heat sink shall be OPERABLE with:

a. A minimum (basin) water level at or above elevation 590 ft Mean Sea Level, ~~USGS datum~~, and

b. An average (basin) water temperature of less than or equal to 95 °F.

(c. (At least) (Two) OPERABLE cooling tower fans.)

APPLICABILITY: OPERATIONAL ~~CONDITIONS~~ MODE(S) 1, 2, 3, 4, 5 and *.

ACTION:

With the requirements of the above specification not satisfied:

1. ~~a.~~ In OPERATIONAL ~~CONDITIONS~~ MODE(S) 1, 2 or 3, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

2. ~~b.~~ In OPERATIONAL ~~CONDITIONS~~ MODE(S) 4 or 5, declare the RHRSW (DGCW) system ~~and the~~ plant service water system inoperable and take the ACTION required by Specification 3.7.1.1 and 3.7.1.2. (3.8.B)

3. ~~c.~~ In Operational ~~Condition~~ MODE *, declare the plant service water system (DGCW system) inoperable and take the ACTION required by Specification 3.7.1.2 (3.8.B). The provisions of Specification 3.0.3 (3.0.C) are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.1.3 The ultimate heat sink shall be determined OPERABLE at least once per: (4.8.C)

a. 24 hours by verifying the average (basin) water temperature and water level to be within their limits.

(b. 31 days by starting each cooling tower fan from the control room and operating the fan for at least 15 minutes.)

(c. 18 months by verifying that each (plant service water) cooling tower fan starts automatically when the associated (plant service water) loop is initiated.)

*When handling irradiated fuel in the secondary containment, during CORE ALTERATION(S) and operations with a potential to drain the vessel.

FOR INFORMATION ONLY

PLANT SYSTEMS

3/4.7.2 CONTROL ROOM EMERGENCY FILTRATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.2 Two independent control room emergency filtration system subsystems shall be OPERABLE.

APPLICABILITY: All OPERATIONAL ~~CONDITIONS~~ MODE(S) and *.

ACTION:

a. In OPERATIONAL ~~CONDITION~~ MODE(S) 1, 2 or 3 with one control room emergency filtration subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

b. In OPERATIONAL CONDITION 4, 5 or *:

1. With one control room emergency filtration subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 7 days or initiate and maintain operation of the OPERABLE subsystem in the (isolation) mode of operation.

2. With both control room emergency filtration subsystems inoperable, suspend CORE ALTERATIONS, handling of irradiated fuel in the secondary containment and operations with a potential for draining the reactor vessel.

c. The provisions of Specification 3.0.3 are not applicable in Operational ~~Condition~~ MODE *.

SURVEILLANCE REQUIREMENTS

4.7.2 Each control room emergency filtration subsystem shall be demonstrated OPERABLE:

a. At least once per 12 hours by verifying that the control room air temperature is less than or equal to (120) °F. 80 95

b. At least once per 31 days on a STAGGERED TEST BASIS by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the subsystem operates for at least 10 hours with the heaters OPERABLE operating

*When irradiated fuel is being handled in the secondary containment during CORE ALTERATION(S), and operations with a potential for draining the reactor vessel.

SURVEILLANCE REQUIREMENTS (Continued)

c. At least once per 18 months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the subsystem by:

1. Verifying that the subsystem satisfies the in-place penetration and bypass leakage in testing acceptance criteria of less than (*)% and uses the test procedure guidance in Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, and the system flow rate is (2000) cfm ± 10%.

2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978, for a methyl iodide penetration of less than (**)%; and

3. Verifying a subsystem flow rate of (2000) cfm ± 10% during subsystem operation when tested in accordance with ANSI N510-1975.

d. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978, for a methyl iodide penetration of less than (**)%.

e. At least once per 18 months by:

1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than (6) inches Water Gauge while operating the subsystem at a flow rate of (2000) cfm ± 10%.

2. Verifying that on each of the below (isolation) mode actuation test signals, the subsystem automatically switches to the (isolation) mode of operation and the isolation valves close within ( ) seconds:

a) (Chlorine detection),
b) ~~(Ammonia detection),~~
c) _____, and
d) _____.

0.05 (*)% 5 (2000) cfm ± 10%. ASTM-D-3803-89 Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978, for a methyl iodide penetration of less than (**)%; and 0.50 when tested at 30°C and 70% relative humidity. 1440 720 1980 ASTM-D-3803-89 0.50 filter train (isolation) The filter train starts and associated isolation dampers close on manual initiation from the control room.

FOR INFORMATION ONLY

SURVEILLANCE REQUIREMENTS (Continued)

3. Verifying that on each of the below (pressurization) mode actuation test signals, the subsystem automatically switches to the (pressurization) mode of operation and the control room is maintained at a positive pressure of (1/8 inch W.G.) relative to the outside atmosphere during subsystem operation at a flow rate less than or equal to (2,000) cfm.

   a) (Smoke detection)
   b) Air intake radiation monitors, and
   c) _____.

4. Verifying that the heaters dissipate (7.5) ± (0.75) Kw when tested in accordance with ANSI N510-1975.

f. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter bank satisfies the inplace penetration and bypass leakage testing acceptance criteria of less than (*)% in accordance with ANSI N510-1975 while operating the system at a flow rate of (2000) scfm ± 10%.

g. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorber bank satisfies the inplace penetration and bypass leakage testing acceptance criteria of less than (*)% in accordance with ANSI N510-1975 for a halogenated hydrocarbon refrigerant test gas while operating the system at a flow rate of (2000) scfm ± 10%.

_____

(* 0.05% value applicable when a HEPA filter or charcoal adsorber efficiency of 99% is assumed, or 1% when a HEPA filter or charcoal adsorber efficiency of 95% or less is assumed in the NRC staff's safety evaluation. (Use the value assumed for the charcoal adsorber efficiency if the value for the HEPA filter is different from the charcoal adsorber efficiency in the NRC staff's safety evaluation.))

(** 0.175% value applicable when a charcoal adsorber efficiency of 99% is assumed, or 1% value applicable when a charcoal adsorber efficiency of 95% is assumed, or 10% value applicable when a charcoal adsorber efficiency of 90% is assumed in the NRC staff's safety evaluation.)

FOR INFORMATION ONLY

3/4 7.3 FLOOD PROTECTION (OPTIONAL*)

LIMITING CONDITION FOR OPERATION

3.7.3 Flood protection shall be provided for all safety related systems, components and structures when the water level of the ( ) exceeds ( ) Mean Sea Level USGS datum at ( ).

APPLICABILITY: At all times.

ACTION:

With the water level at ( ) above elevation ( ) Mean Sea Level USGS datum:

a. Be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours, and

b. Initiate and complete within ( ) hours the following flood protection measures:

1. _____,
2. _____, and
3. _____.

SURVEILLANCE REQUIREMENTS

4.7.3 The water level at ( ) shall be determined to be within the limit by:

a. Measurement at least once per 24 hours when the water level is below elevation ( ) Mean Sea Level USGS datum, and

b. Measurement at least once per 2 hours when the water level is equal to or above elevation ( ) Mean Sea Level USGS datum.

(*This specification not required if the facility design has adequate passive flood control protection features sufficient to accommodate the Design Basis Flood identified in Regulatory Guide 1.59, August 1973.)

FOR INFORMATION ONLY
PLANT SYSTEMS

MOVED TO TSUP 3/4.5 FOR ECCS - QUAD CITIES ONLY

3/4.7.4 REACTOR CORE ISOLATION COOLING SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4 The reactor core isolation cooling (RCIC) system shall be OPERABLE with an OPERABLE flow path capable of (automatically) taking suction from the suppression pool and transferring the water to the reactor pressure vessel.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3 with reactor steam dome pressure greater than (100) psig.

ACTION:
With the RCIC system inoperable, operation may continue provided the HPCI system is OPERABLE; restore the RCIC system to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to less than or equal to (100) psig within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.7.4 The RCIC system shall be demonstrated OPERABLE:

a. At least once per 31 days by:

1. Verifying by venting at the high point vents that the system piping from the pump discharge valve to the system isolation valve is filled with water.

2. Verifying that each valve, (manual, power operated or automatic) in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position.

3. Verifying that the pump flow controller is in the correct position.

b. (At least once per 92 days) ~~(When tested pursuant to Specification 4.0.5)~~ by verifying that the RCIC pump develops a flow of greater than or equal to (600) gpm in the test flow path with a system head corresponding to reactor vessel operating pressure when steam is being supplied to the turbine at (1000 + 20, - 80) psig.*

*The provisions of Specification 4.0.4 are not applicable provided the surveillance is performed within 12 hours after reactor steam pressure is adequate to perform the test.

MOVED TO TSUP 3/4.5 FOR ECCS-QUAD CITIES ONLY

FOR INFORMATION ONLY

c. At least once per 18 months by:

1. Performing a system functional test which includes simulated automatic actuation (and restart) and verifying that each automatic valve in the flow path actuates to its correct position. Actual injection of coolant into the reactor vessel may be excluded.

2. Verifying that the system will develop a flow of greater than or equal to (600) gpm in the test flow path when steam is supplied to the turbine at a pressure of (150) ± (15) psig.*

3. Verifying that the suction for the RCIC system is automatically transferred from the condensate storage tank to the suppression pool on a condensate storage tank water level-low signal (and on a suppression pool water level - high signal).

*The provisions of Specification 4.0.4 are not applicable provided the surveillance is performed within 12 hours after reactor steam pressure is adequate to perform the tests.

FOR INFORMATION ONLY

PLANT SYSTEMS

3/4.7.4 SNUBBERS

LIMITING CONDITION FOR OPERATION

3.7.4 All snubbers shall be OPERABLE.

APPLICABILITY: OPERATIONAL ~~CONDITIONS~~ MODE(S) 1, 2, and 3. OPERATIONAL ~~CONDITIONS~~ MODE(S) 4 and 5 for snubbers located on systems required OPERABLE in those OPERATIONAL CONDITIONS.

ACTION:

With one or more snubbers inoperable, within 72 hours replace or restore the inoperable snubber(s) to OPERABLE status and perform an engineering evaluation per Specification 4.7.4.g on the attached component or declare the attached system inoperable and follow the appropriate ACTION statement for that system.

TSPS 0070

SURVEILLANCE REQUIREMENTS

4.7.4 Each snubber shall be demonstrated OPERABLE by performance of the following augmented inservice inspection program and the requirements of Specification 4.0.5.

~~a.~~ Inspection Types

As used in this specification, "type of snubber" shall mean snubbers of the same design and manufacturer, irrespective of capacity.

~~b.~~ Visual Inspections

Snubbers are categorized as inaccessible or accessible during reactor operation. Each of these groups (inaccessible and accessible) may be inspected independently according to the schedule below. The first inservice visual inspection of each type of snubber shall be performed after 4 months but within 10 months of commencing POWER OPERATION and shall include all snubbers. If all snubbers of each type are found OPERABLE during the first inservice visual inspection, the second inservice visual inspection shall be performed at the first refueling outage. Otherwise, subsequent visual inspections shall be performed in accordance with the following schedule:

The only snubbers excluded from this requirement are those installed on non-safety-related systems and then only if their failure or fallure of the system on which they are installed, would have no adverse effect on any safety-related system. GL 84-13

The visual inspection interval for each type of snubber shall be determined based upon the criteria provided in Table 4.8.F-1 (2)

(a) the first inspection interval determined using this criteria shall be based upon the previous inspection interval as established by the requirements in effect before amendment ( ).

GL 90-09 categories determined by Table 4.8.F-1

FOR INFORMATION ONLY

SURVEILLANCE REQUIREMENTS (Continued)

No. Inoperable Snubbers of Each Type per Inspection Period	Subsequent Visual Inspection Period*#
0	18 months ± 25%
1	12 months ± 25%
2	6 months ± 25%
3,4	124 days ± 25%
5,6,7	62 days ± 25%
8 or more	31 days ± 25%

3. ~~d.~~ Visual Inspection Acceptance Criteria

Visual inspections shall verify (1) that there are no visible indications of damage or impaired OPERABILITY, (2) attachments to the foundation or supporting structure are secure, and (3) fasteners for attachment of the snubber to the component and to the snubber anchorage are secure. Snubbers which appear inoperable as a result of visual inspections may be determined OPERABLE for the purpose of establishing the next visual inspection interval, providing that: (1) the cause of the rejection is clearly established and remedied for that particular snubber and for other snubbers irrespective of type on that system that may be generically susceptible; and/or (2) the affected snubber is functionally tested in the as-found condition and determined OPERABLE per Specifications 4.7.4.f. For those snubbers common to more than one system, the OPERABILITY of such snubbers shall be considered in assessing the surveillance schedule for each of the related systems.

4. ~~e.~~ Transient Event Inspection

An inspection shall be performed of all snubbers attached to sections of systems that have experienced unexpected, potentially damaging transients, as determined from a review of operational data or a visual inspection of the systems, within 72 hours for accessible systems and 6 months for inaccessible systems following this determination. In addition to satisfying the visual inspection acceptance criteria, freedom-of-motion of mechanical snubbers shall be verified using at least one of the following: (1) manually induced snubber movement; or (2) evaluation of in-place snubber piston setting; or (3) stroking the mechanical snubber through its full range of travel.

*The inspection interval for each type of snubber shall not be lengthened more than one step at a time unless a generic problem has been identified and corrected; in that event the inspection interval may be lengthened one step the first time and two steps thereafter if no inoperable snubbers of that type are found.

#The provisions of Specification 4.0.2 are not applicable.

FOR INFORMATION ONLY

5. Functional Tests

During the first refueling shutdown and at least once per 18 months thereafter during shutdown, a representative sample of snubbers shall be tested using one of the following sample plans for each type of snubber. The sample plan shall be selected prior to the test period and cannot be changed during the test period. The NRC Regional Administrator shall be notified in writing of the sample plan selected prior to the test period or the sample plan used in the prior test period shall be implemented:

a. 1) At least 10% of the total of each type of snubber shall be functionally tested either in-place or in a bench test. For each snubber of a type that does not meet the functional test acceptance criteria of Specification 4.7.4.f., an additional 5% of that type of snubber shall be functionally tested until no more failures are found or until all snubbers of that type have been functionally tested; or

b. 2) A representative sample of each type of snubber shall be functionally tested in accordance with Figure 4.7.4-1. "C" is the total number of snubbers of a type found not meeting the acceptance requirements of Specification 4.7.4.f. The cumulative number of snubbers of a type tested is denoted by "N". At the end of each day's testing, the new values of "N" and "C" (previous day's total plus current day's increments) shall be plotted on Figure 4.7.4-1. If at any time the point plotted falls on or above the "Reject" line all snubbers of that type shall be functionally tested. If at any time the point plotted falls on or below the "Accept" line, testing of snubbers of that type may be terminated. When the point plotted lies in the "Continue Testing" region, additional snubbers of that type shall be tested until the point falls in the "Accept" region or the "Reject" region, or all the snubbers of that type have been tested. Testing equipment failure during functional testing may invalidate that day's testing and allow that day's testing to resume anew at a later time, providing all snubbers tested with the failed equipment during the day of equipment failure are retested; or

c. 3) An initial representative sample of 55 snubbers of each type shall be functionally tested. For each snubber type which does not meet the functional test acceptance criteria, another sample of at least one-half the size of the initial sample shall be tested until the total number tested is equal to the initial sample size multiplied by the factor, 1 + C/2, where "C" is the number of snubbers found which do not meet the functional test acceptance criteria. The results from this sample plan shall be plotted using an "Accept" line which follows the equation N = 55(1 + C/2). Each snubber point should be plotted as soon as the snubber is tested. If the point plotted falls on or below the "Accept" line, testing of that type of snubber may be terminated. If the point plotted falls above the "Accept" line, testing must continue until the point falls on or below the "Accept" line or all the snubbers of that type have been tested.

FOR INFORMATION ONLY

SURVEILLANCE REQUIREMENTS (Continued)

The representative sample selected for the function test sample plans shall be randomly selected from the snubbers of each type and reviewed before beginning the testing. The review shall ensure as far as practical that they are representative of the various configurations, operating environments, range of size, and capacity of snubbers of each type. Snubbers placed in the same locations as snubbers which failed the previous functional test shall be retested at the time of the next functional test but shall not be included in the sample plan, and failure of this functional test shall not be the sole cause for increasing the sample size under the sample plan. If during the functional testing, additional sampling is required due to failure of only one type of snubber, the functional testing results shall be reviewed at the time to determine if additional samples should be limited to the type of snubber which has failed the functional testing.

6. f. Functional Test Acceptance Criteria

The snubber functional test shall verify that:

a. 1) Activation (restraining action) is achieved within the specified range in both tension and compression;

2) Snubber bleed, or release rate where required, is present in both tension and compression, within the specified range (hydraulic snubbers only);

b. 3) For mechanical snubbers, the force required to initiate or maintain motion of the snubber is within the specified range in both directions of travel; and

c. 4) For snubbers specifically required not to displace under continuous load, the ability of the snubber to withstand load without displacement.

Testing methods may be used to measure parameters indirectly or parameters other than those specified if those results can be correlated to the specified parameters through established methods.

7. g. Functional Test Failure Analysis

An engineering evaluation shall be made of each failure to meet the functional test acceptance criteria to determine the cause of the failure. The results of this evaluation shall be used, if applicable, in selecting snubbers to be tested in an effort to determine the OPERABILITY of other snubbers irrespective of type which may be subject to the same failure mode.

For the snubbers found inoperable, an engineering evaluation shall be performed on the components to which the inoperable snubbers are attached. The purpose of this engineering evaluation shall be to determine if the components to which the inoperable snubbers are attached were adversely affected by the inoperability of the snubbers in order to ensure that the component remains capable of meeting the designed service.

FOR INFORMATION ONLY

SURVEILLANCE REQUIREMENTS (Continued)

If any snubber selected for functional testing either fails to lock up or fails to move, i.e., frozen-in-place, the cause will be evaluated and if caused by manufacturer or design deficiency all snubbers of the same type subject to the same defect shall be functionally tested. This testing requirement shall be independent of the requirements stated in Specification 4.7.4.e, for snubbers not meeting the functional test acceptance criteria. 4.8.F.5

h. Functional Testing of Repaired and Replaced Snubbers

Snubbers which fail the visual inspection or the functional test acceptance criteria shall be repaired or replaced. Replacement snubbers and snubbers which have repairs which might affect the functional test result shall be tested to meet the functional test criteria before installation in the unit. Mechanical snubbers shall have met the acceptance criteria subsequent to their most recent service, and the freedom-of-motion test must have been performed within 12 months before being installed in the unit.

i. Snubber Service Life Replacement Program

The service life of all snubbers shall be monitored to ensure that the service life is not exceeded between surveillance inspections. The maximum expected service life for various seals, springs, and other critical parts shall be extended or shortened based on monitored test results and failure history. Critical parts shall be replaced so that the maximum service life will not be exceeded during a period when the snubber is required to be OPERABLE. The parts replacements shall be documented and the documentation shall be retained in accordance with Specification 6.10.3. 6.5.B

MAY 1 4 REC'D

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

May 3, 1984

FOR INFORMATION ONLY

To All Power Reactor Licensees (Except SEP Licensees) And
All Applicants For Licenses To Operate Power Reactors

Subject: Technical Specification For Snubbers (Generic Letter 84-13)

For several years a technical specification for snubbers has been included in the technical specifications for new facility operating licenses. A model specification was transmitted to power reactor licensees as Revision 1 of the Surveillance Requirements for snubbers by an enclosure to my Generic Letter of November 20, 1980.

During the last several years, a large number of license amendments have been required to add, delete or modify the snubber listing within the technical specifications. We have reassessed the inclusion of snubber listings within the technical specifications and conclude that such listings are not necessary provided the snubber technical specification is modified to specify which snubbers are required to be operable. You should also note that the record-keeping requirements of paragraph 4.9.7.f. of the snubber technical specification are not altered by this revision. Paragraph 4.9.7.f. requires that the plant records contain a record of the service life, installation date, etc. of each snubber. Since any changes in snubber quantities, types, or locations would be a change to the facility, such changes would be subject to the provisions of 10 CFR Part 50.59 and, of course, these changes would have to be reflected in the records required by paragraph 4.7.9.f.

Enclosed is a revision to Revision 1 of the Surveillance Requirements which was attached to my Generic Letter of November 20, 1980. This revision is limited to a modification to Specification 3.7.9 to specify which snubbers are subject to the requirements of this technical specification and to the elimination of Tables 3.7-4a and 3.7-4b. Specification 3.7.9 now includes as part of the Limiting Condition for Operation the same criterion as was in the bases section of my November 20, 1980 Generic Letter. This criterion states that all snubbers other than specified exceptions are required to be operable. The requirement in Specification 3.7.9 of Revision 1, that snubbers be listed in Tables 3.7-4a and 3.7-4b is no longer necessary and is eliminated by this revision.

8405040043

FOR INFORMATION ONLY

No change in existing technical specifications that include a list of snubbers is required. However, a licensee may choose to request a license amendment to delete the tabular listing of snubbers from its technical specifications. Unless and until deleted, the list of snubbers shall be maintained in accordance with the requirements of Revision 1 of the Surveillance Requirements for snubbers that was enclosed with my Generic Letter of November 20, 1980.

A few recently issued licenses have included technical specifications without tabular listings of snubbers. This revision will be applied to future operating licenses and the technical specifications will not include lists of snubbers.

Sincerely,

Darrell G. Eisenhut, Director
Division of Licensing

Enclosure:
Revised Model Technical
Specification for
Snubbers

cc: w/enclosure

ENCLOSURE

PLANT SYSTEMS
3/4.7.9 SNUBBERS

FOR INFORMATION ONLY

LIMITING CONDITION FOR OPERATION

3.7.9 All snubbers shall be OPERABLE. The only snubbers excluded from this requirement are those installed on nonsafety-related systems and then only if their failure or failure of the system on which they are installed, would have no adverse effect on any safety-related system.

APPLICABILITY: MODES 1, 2, 3 and 4 (MODES 5 and 6 for snubbers located in systems required OPERABLE in those MODES).

ACTION:

With one or more snubbers inoperable, within 72 hours replace or restore the inoperable snubber(s) to OPERABLE status and perform an engineering evaluation per Specification 4.7.9.c on the supported component or declare the supported system inoperable and follow the appropriate ACTION statement for that system.

SURVEILLANCE REQUIREMENTS

4.7.9 Each snubber shall be demonstrated OPERABLE by performance of the following augmented inservice inspection program and the requirements of Specification 4.0.5.

a. Visual Inspections

The first inservice visual inspection of snubbers shall be performed after four months but within 10 months of commencing POWER OPERATION and shall include all snubbers. If less than two (2) snubbers are found inoperable during the first inservice visual inspection, the second inservice visual inspection shall be performed 12 months ± 25% from the date of the first inspection. Otherwise, subsequent visual inspections shall be performed in accordance with the following schedule:

No. Inoperable Snubbers per Inspection Period	Subsequent Visual Inspection Period*#
0	18 months ± 25%
1	12 months ± 25%
2	6 months ± 25%
3,4	124 days ± 25%
5,6,7	62 days ± 25%
8 or more	31 days ± 25%

The snubbers may be categorized into two groups: Those accessible and those inaccessible during reactor operation. Each group may be inspected independently in accordance with the above schedule.

*The inspection interval shall not be lengthened more than one step at a time.
#The provisions of Specification 4.0.2 are not applicable.

FOR INFORMATION ONLY

SURVEILLANCE REQUIREMENTS (Continued)

b. Visual Inspection Acceptance Criteria

Visual inspections shall verify (1) that there are no visible indications of damage or impaired OPERABILITY, (2) attachments to the foundation or supporting structure are secure, and (3) in those locations where snubber movement can be manually induced without disconnecting the snubber, that the snubber has freedom of movement and is not frozen up. Snubbers which appear inoperable as a result of visual inspections may be determined OPERABLE for the purpose of establishing the next visual inspection interval, providing that (1) the cause of the rejection is clearly established and remedied for that particular snubber and for other snubbers that may be generically susceptible; and (2) the affected snubber is functionally tested in the as found condition and determined OPERABLE per Specifications 4.7.9.d or 4.7.9.e, as applicable. However, when the fluid port of a hydraulic snubber is found to be uncovered, the snubber shall be determined inoperable and cannot be determined OPERABLE via functional testing for the purpose of establishing the next visual inspection interval. All snubbers connected to an inoperable common hydraulic fluid reservoir shall be counted as inoperable snubbers.

c. Functional Tests

At least once per 18 months during shutdown, a representative sample (10% of the total of each type of snubber in use in the plant shall be functionally tested either in place or in a bench test. For each snubber that does not meet the functional test acceptance criteria of Specification 4.7.9.d or 4.7.9.e, an additional 10% of that type of snubber shall be functionally tested).
or
(that number of snubbers which follows the expression $35\left[1 + \frac{c}{2}\right]$, where c* is the allowable number of snubbers not meeting the

* The value c will be arbitrarily chosen by the applicant and incorporated into the expressions for the representative sample and for the resample prior to the issuance of the Technical Specifications. The expressions are intended for use in plants with larger numbers of safety-related snubbers (>500) and provide a confidence level of approximately 95% that 90% to 100% of the snubbers in the plant will be OPERABLE within acceptable limits. That is, the confidence level will be provided no matter what value is chosen for c. It is advised, however, that discretion be used when initially choosing the value for c because the lower the value of c (the lower the amount of snubbers in the representative sample), the higher the amount of snubbers required in the re-sample will be. To illustrate: If c = 2 and 3 snubbers are found not to meet the functional test acceptance criteria, there will be 70 snubbers in the representative sample and 31 snubbers required for testing in the re-sample; If c = 2 and 4 snubbers fail the functional test, there will be 70 snubbers in the representative sample and 62 snubbers required for testing in the re-sample; If c = 0 and 1 snubber fails the functional test, there will be 35 snubbers in the representative sample and 140 snubbers required for testing in the re-sample; If c = 0 and 2 snubbers fail the functions test, there will be 35 snubbers in the representative sample and 280 snubbers required for testing in the re-sample.

FOR INFORMATION ONLY

acceptance criteria selected by the operator, shall be functionally tested either in-place or in a bench test. For each number of snubbers above c which does not meet the functional test acceptance criteria of Specifications 4.7.9.d. or 4.7.9.e, an additional sample selected according to the expression $35\ (1 + \frac{c}{2})\ (\frac{2}{c + 1})^2\ (a - c)$ shall be functionally tested, where a is the total number of snubbers found inoperable during the functional testing of the representative sample.

Functional testing shall continue according to the expression $b\ [35(1 + \frac{c}{2})\ (\frac{2}{c + 1})^2]$ where b is the number of snubbers found inoperable in the previous re-sample, until no additional inoperable snubbers are found within a sample or until all snubbers have been functionally tested).

The representative sample selected for functional testing shall include the various configurations, operating environments and the range of size and capacity of snubbers. At least 25% of the snubbers in the representative sample shall include snubbers from the following three categories:

1. The first snubber away from each reactor vessel nozzle
2. Snubbers within 5 feet of heavy equipment (valve, pump, turbine, motor, etc.)
3. Snubbers within 10 feet of the discharge from a safety relief valve

Snubbers that are especially difficult to remove or in high radiation zones during shutdown shall also be included in the representative sample.*

In addition to the regular sample, snubbers which failed the previous functional test shall be retested during the next test period. If a spare snubber has been installed in place of a failed snubber, then both the failed snubber (if it is repaired and installed in another position) and the spare snubber shall be retested. Test results of these snubbers may not be included for the re-sampling.

* Permanent or other exemptions from functional testing for individual snubbers in these categories may be granted by the Commission only if a justifiable basis for exemption is presented and/or snubber life destructive testing was performed to qualify snubber operability for all design conditions at either the completion of their fabrication or at a subsequent date.

FOR INFORMATION ONLY

SURVEILLANCE REQUIREMENTS (Continued)

If any snubber selected for functional testing either fails to lockup or fails to move, i.e., frozen in place, the cause will be evaluated and if caused by manufacturer or design deficiency all snubbers of the same design subject to the same defect shall be functionally tested. This testing requirement shall be independent of the requirements stated above for snubbers not meeting the functional test acceptance criteria.

For the snubber(s) found inoperable, an engineering evaluation shall be performed on the components which are supported by the snubber(s). The purpose of this engineering evaluation shall be to determine if the components supported by the snubber(s) were adversely affected by the inoperability of the snubber(s) in order to ensure that the supported component remains capable of meeting the designed service.

d. Hydraulic Snubbers Functional Test Acceptance Criteria

The hydraulic snubber functional test shall verify that:

1. Activation (restraining action) is achieved within the specified range of velocity or acceleration in both tension and compression.

2. Snubber bleed, or release rate, where required, is within the specified range in compression or tension. For snubbers specifically required to not displace under continuous load, the ability of the snubber to withstand load without displacement shall be verified.

e. Mechanical Snubbers Functional Test Acceptance Criteria

The mechanical snubber functional test shall verify that:

1. The force that initiates free movement of the snubber rod in either tension or compression is less than the specified maximum drag force. Drag force shall not have increased more than 50% since the last functional test.

2. Activation (restraining action) is achieved within the specified range of velocity or acceleration in both tension and compression.

3. Snubber release rate, where required, is within the specified range in compression or tension. For snubbers specifically required not to displace under continuous load, the ability of the snubber to withstand load without displacement shall be verified.

FOR INFORMATION ONLY

f. Snubber Service Life Monitoring

A record of the service life of each snubber, the date at which the designated service life commences and the installation and maintenance records on which the designated service life is based shall be maintained as required by Specification 6.10.2.1.

Concurrent with the first inservice visual inspection and at least once per 18 months thereafter, the installation and maintenance records for each snubber shall be reviewed to verify that the indicated service life has not been exceeded or will not be exceeded prior to the next scheduled snubber service life review. If the indicated service life will be exceeded prior to the next scheduled snubber service life review, the snubber service life shall be reevaluated or the snubber shall be replaced or reconditioned so as to extend its service life beyond the date of the next scheduled service life review. This reevaluation, replacement or reconditioning shall be indicated in the records.

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

December 11, 1990

FOR INFORMATION ONLY

DEC 26 REC'D

TO: ALL LIGHT-WATER REACTOR LICENSEES AND APPLICANTS

SUBJECT: ALTERNATIVE REQUIREMENTS FOR SNUBBER VISUAL INSPECTION INTERVALS AND CORRECTIVE ACTIONS (GENERIC LETTER 90-09)

Technical Specifications (TS) impose surveillance requirements for visual inspection and functional testing of all safety-related snubbers. A visual inspection is the observation of the condition of installed snubbers to identify those that are damaged, degraded, or inoperable as caused by physical means, leakage, corrosion, or environmental exposure. To verify that a snubber can operate within specific performance limits, the licensees perform functional testing that typically involves removing the snubber and testing it on a specially-designed test stand. Functional testing provides a 95 percent confidence level that 90 percent to 100 percent of the snubbers operate within the specified acceptance limits. The performance of visual examinations is a separate process that complements the functional testing program and provides additional confidence in snubber operability.

The TS specifies a schedule for snubber visual inspections that is based on the number of inoperable snubbers found during the previous visual inspection. The schedules for visual inspections and for the functional testing assume that refueling intervals will not exceed 18 months. Because the current schedule for snubber visual inspections is based only on the number of inoperable snubbers found during the previous visual inspection, irrespective of the size of the snubber population, licensees having a large number of snubbers find that the visual inspection schedule is excessively restrictive. Some licensees have spent a significant amount of resources and have subjected plant personnel to unnecessary radiological exposure to comply with the visual examination requirements.

To alleviate this situation, the staff has developed an alternate schedule for visual inspections that maintains the same confidence level as the existing schedule and generally will allow the licensee to perform visual inspections and corrective actions during plant outages. Because this line-item TS improvement will reduce future occupational radiation exposure and is highly cost effective, the alternative inspection schedule is consistent with the Commission's policy statement on TS Improvements.

The alternative inspection schedule is based on the number of unacceptable snubbers found during the previous inspection in proportion to the sizes of the various snubber populations or categories. A snubber is considered unacceptable if it fails the acceptance criteria of the visual inspection. The alternative inspection interval is based on a fuel cycle of up to 24 months and may

9012050300

be as long as two fuel cycles, or 48 months for plants with other fuel cycles, depending on the number of unacceptable snubbers found during the previous visual inspection.

Guidance on implementing the alternative TS requirements for visual inspection intervals is provided in Enclosures A and B. Licensees and applicants are encouraged to propose changes to their TS that are consistent with this guidance. The NRC project manager will expeditiously review conforming amendment requests for the facility. Questions on this matter should be addressed to the contact listed below or to the project manager.

This request is covered by Office of Management and Budget Clearance Number 3150-0011, which expires January 31, 1991. The estimated average number of burden hours is 40 person hours per licensee response, including searching data sources, gathering and analyzing the information, and writing the requested reports. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Information and Records Management Branch, Division of Information Support Services, Office of Information and Resources Management, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555; and to the Paperwork Reduction Project (3150-0011), Office of Management and Budget, Washington, DC 20503.

Sincerely,

James G. Partlow
Associate Director for Projects
Office of Nuclear Reactor Regulation

Enclosure:
As stated

Contact: Jai Rajan (301) 492-0788

FOR INFORMATION ONLY

Enclosure A

ALTERNATIVE REQUIREMENTS FOR DETERMINING THE INTERVAL FOR THE VISUAL INSPECTION OF SNUBBERS

An alternate method for determining the next interval for the visual inspection of snubbers is provided based upon the number of unacceptable snubbers found during the previous inspection, the total population or category size for each snubber type, and the previous inspection interval. A snubber is considered unacceptable if it fails to satisfy the acceptance criteria of the visual inspection. Snubbers may be categorized, based upon their accessibility during power operation, as accessible or inaccessible. These categories may be examined separately or jointly. However, the licensee must make and document that decision before any inspection and shall use that decision as the basis upon which to determine the next inspection interval for that category.

If a licensee's review and evaluation can not justify continued operation with an unacceptable snubber, the licensee shall declare the snubber inoperable and shall meet the applicable action requirements. To determine the next surveillance interval, the licensee may reclassify an unacceptable snubber as acceptable if it can be demonstrated that the snubber is operable in its as-found condition by the performance of a functional test and if it satisfies the acceptance criteria for functional testing.

The next visual inspection interval may be twice, the same, or reduced by as much as two-thirds of the previous inspection interval. This interval depends on the number of unacceptable snubbers found in proportion to the size of the population or category for each type of snubber included in the previous inspection. Table 4.7-2 in Enclosure B replaces the existing TS requirements for determining the next visual inspection interval. Generally, the existing TS requirements establish inspection intervals of 18 months (the length of a nominal fuel cycle) or a fraction thereof based on the number of inoperable snubbers of each type for the previous inspection period.

The alternative provided herein allows inspection intervals to be compatible with a 24-month fuel cycle. Also, the interval may be increased to every other refueling outage for plants on a 24-month fuel cycle or up to 48 months for plants with other fuel cycles if few unacceptable snubbers were found from the previous inspection. Table 4.7-2 establishes three limits for determining the next visual inspection interval corresponding to the population or category size for a given type of snubber. The three limits are listed in Columns A, B, and C of Table 4.7-2 for representative sizes of snubber populations or categories. For a population or category that differs from the representative size provided, the values for the limits may be found by interpolation from the limits provided in Columns A, B, and C for determining the next inspection interval. Where the limit for unacceptable snubbers in Columns A, B, or C is determined by interpolation and includes a fractional value, the limit may be reduced to the next lower integer.

The limits in columns A, B, and C of Table 4.7-2 are applied as follows to determine the next inspection interval. If the number of unacceptable snubbers is less than or equal to the number in Column A, the next inspection interval may be twice the previous interval but not greater than 48 months, excluding the TS provisions to extend surveillance intervals. If the number of unacceptable snubbers is greater than the number in Column A but less than or equal to

FOR-INFORMATION ONLY

the number in Column B, the next inspection interval shall be the same as the previous interval. If the number of unacceptable snubbers is equal to or greater than the number in Column C, the next inspection interval shall be reduced to two-thirds of the previous interval. However, if the number of unacceptable snubbers is less than the number in Column C and greater than the number in Column B, the next inspection interval shall be reduced proportionally by a factor that is one-third of the ratio of the difference between the number of unacceptable snubbers and the number in Column B to the difference between the numbers of Columns B and C.

Enclosure B is a sample of the changes that should be proposed for TS that are based upon the format of the current Standard Technical Specifications (STS). For plants that have TS in a format different from the STS, proposed TS changes should be consistent with the changes provided in Enclosure B. The changes for this alternative are underlined, and Table 4.7-2 has been added.

FOR INFORMATION ONLY

Enclosure B

MODEL TECHNICAL SPECIFICATION CHANGES

SURVEILLANCE REQUIREMENTS

4.7.9 Each snubber shall be demonstrated OPERABLE by the performance of the following augmented inservice inspection program in addition to the requirements of Specification 4.0.5.

a. Inspection Types
As used in this specification, "type of snubber" shall mean snubbers of the same design and manufacturer, irrespective of capacity.

b. Visual Inspections
Snubbers are categorized as inaccessible or accessible during reactor operation. Each of these categories (inaccessible and accessible) may be inspected independently according to the schedule determined by Table 4.7-2. The visual inspection interval for each type of snubber shall be determined based upon the criteria provided in Table 4.7-2 and the first inspection interval determined using this criteria shall be based upon the previous inspection interval as established by the requirements in effect before amendment (*).

c. Visual Inspection Acceptance Criteria

Visual inspections shall verify that (1) the snubber has no visible indications of damage or impaired OPERABILITY, (2) attachments to the foundation or supporting structure are functional, and (3) fasteners for the attachment of the snubber to the component and to the snubber anchorage are functional. Snubbers which appear inoperable as a result of visual inspections shall be classified as unacceptable and may be reclassified acceptable for the purpose of establishing the next visual inspection interval, provided that (1) the cause of the rejection is clearly established and remedied for that particular snubber and for other snubbers irrespective of type that may be generically susceptible; and (2) the affected snubber is functionally tested in the as-found condition and determined OPERABLE per Specification 4.7.9f. All snubbers found connected to an inoperable common hydraulic fluid reservoir shall be counted as unacceptable for determining the next inspection interval. A review and evaluation shall be performed and documented to justify continued operation with an unacceptable snubber. If continued operation cannot be justified, the snubber shall be declared inoperable and the ACTION requirements shall be met.

*NRC will include the number of the license amendment that implements this change.

FOR INFORMATION ONLY

TABLE 4.7-2
SNUBBER VISUAL INSPECTION INTERVAL

Population or Category (Notes 1 and 2)	NUMBER OF UNACCEPTABLE SNUBBERS		
	Column A Extend Interval (Notes 3 and 6)	Column B Repeat Interval (Notes 4 and 6)	Column C Reduce Interval (Notes 5 and 6)
1	0	0	1
80	0	0	2
100	0	1	4
150	0	3	8
200	2	5	13
300	5	12	25
400	8	18	36
500	12	24	48
750	20	40	78
1000 or greater	29	56	109

Note 1: The next visual inspection interval for a snubber population or category size shall be determined based upon the previous inspection interval and the number of unacceptable snubbers found during that interval. Snubbers may be categorized, based upon their accessibility during power operation, as accessible or inaccessible. These categories may be examined separately or jointly. However, the licensee must make and document that decision before any inspection and shall use that decision as the basis upon which to determine the next inspection interval for that category.

Note 2: Interpolation between population or category sizes and the number of unacceptable snubbers is permissible. Use next lower integer for the value of the limit for Columns A, B, or C if that integer includes a fractional value of unacceptable snubbers as determined by interpolation.

Note 3: If the number of unacceptable snubbers is equal to or less than the number in Column A, the next inspection interval may be twice the previous interval but not greater than 48 months.

Note 4: If the number of unacceptable snubbers is equal to or less than the number in Column B but greater that the number in Column A, the next inspection interval shall be the same as the previous interval.

FOR INFORMATION ONLY

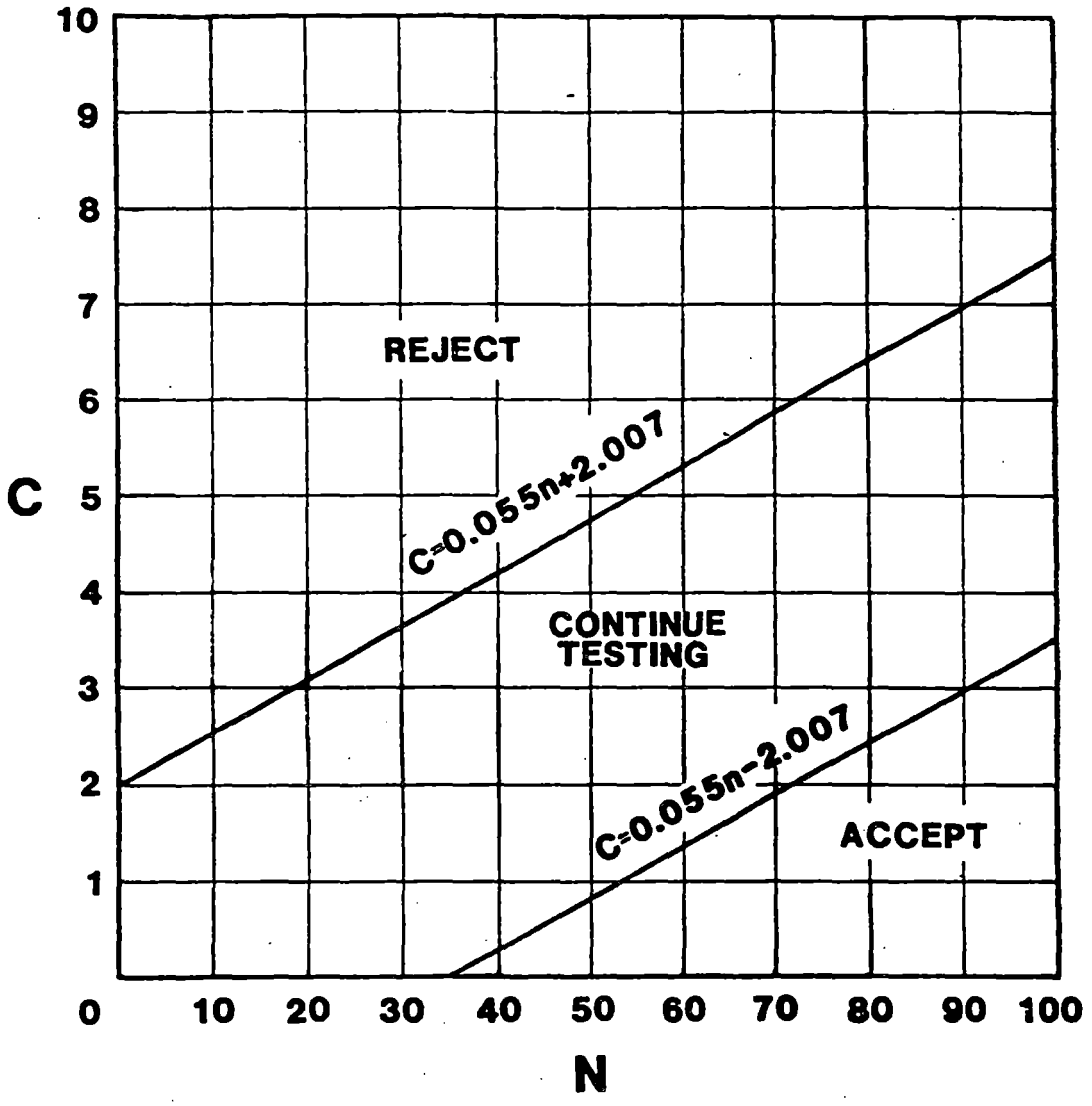
Note 5: If the number of unacceptable snubbers is equal to or greater than the number in Column C, the next inspection interval shall be two-thirds of the previous interval. However, if the number of unacceptable snubbers is less than the number in Column C but greater than the number in Column B, the next interval shall be reduced proportionally by interpolation, that is, the previous interval shall be reduced by a factor that is one-third of the ratio of the difference between the number of unacceptable snubbers found during the previous interval and the number in Column B to the difference in the numbers in Columns B and C.

Note 6: The provisions of Specification 4.0.2 are applicable for all inspection intervals up to and including 48 months.

LIST OF RECENTLY ISSUED GENERIC LETTERS

Generic Letter No.	Subject	Date of Issuance	Issued To
89-10 SUPP. 3	CONSIDERATION OF THE RESULTS OF NRC-SPONSORED TESTS OF MOTOR-OPERATED VALVES	10/25/90	ALL LICENSEES OF OPERATING NUCLEAR POWER PLANTS AND HOLDERS OF CONSTRUCTION PERMITS FOR NUCLEAR POWER PLANTS
90-08	SIMULATION FACILITY EXEMPTIONS	08/10/90	ALL HOLDERS OF OPERATING LICENSES OR CONSTRUCTION PERMITS FOR NUCLEAR POWER REACTORS
90-07	OPERATOR LICENSING NATIONAL EXAMINATION SCHEDULE	08/10/90	ALL POWER REACTOR LICENSEES AND APPLICANTS FOR AN OPERATING LICENSE
89-10 SUPP. 2	AVAILABILITY OF PROGRAM DESCRIPTIONS	08/03/90	ALL LICENSEES OF OPERATING NPPs AND HOLDERS OF CPs FOR NPPs
88-20 SUPP. 3	COMPLETION OF CONTAINMENT PERFORMANCE IMPROVEMENT PROGRAM AND FORWARDING OF INSIGHTS FOR USE IN THE INDIVIDUAL PLANT EXAMINATION FOR SEVERE ACCIDENT VULNERABILITIES	07/06/90	ALL LICENSEES HOLDING OLs AND CPs FOR NPP FACILITIES EXCEPT LICENSEES FOR BWRs WITH MARK I CONTAINMENTS
90-06	RESOLUTION OF GI 70, "POWER-OPERATED RELIEF VALVE AND BLOCK VALVE RELIABILITY," AND GI 94, "ADDITIONAL LOW-TEMPERATURE OVERPRESSURE PROTECTION FOR LIGHT-WATER REACTORS," PURSUANT TO 10CFR50.54(f)	06/28/90	ALL PRESSURIZED WATER REACTOR LICENSEES AND CONSTRUCTION PERMIT HOLDERS
90-05	GUIDANCE FOR PERFORMING TEMPORARY NON-CODE REPAIR OF ASME CODE CLASS 1,2,&3 PIPING	06/15/90	ALL HOLDERS OF OPERATING LICENSES FOR NPPs
89-10 SUPP. 1	RESULTS OF THE PUBLIC WORKSHOP	06/13/90	ALL LICENSEES OF OPERATING NPPs AND HOLDERS OF CPs

FOR INFORMATION ONLY



SAMPLE PLAN (2) FOR SNUBBER FUNCTIONAL TEST IN O

Figure 4.7.4-1

4.4.8.F-1

N = Cumulative number of snubbers of a type tested
C = Total number of snubbers of a type not meeting acceptance requirements

3/4.7.6 SEALED SOURCE CONTAMINATION

FOR INFORMATION ONLY

LIMITING CONDITION FOR OPERATION

3.7.6 Each sealed source containing radioactive material either in excess of 100 microcuries of beta and/or gamma emitting material or 5 microcuries of alpha emitting material shall be free of greater than or equal to 0.005 microcuries of removable contamination.

APPLICABILITY: At all times.

ACTION:

1. a. With a sealed source having removable contamination in excess of the above limit, withdraw the sealed source from use and either:
   a. 1. Decontaminate and repair the sealed source, or
   b. 2. Dispose of the sealed source in accordance with Commission Regulations.
3. b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.6.1 Test Requirements - Each sealed source shall be tested for leakage and/or contamination by:

a. The licensee, or

b. Other persons specifically authorized by the Commission or an Agreement State.

The test method shall have a detection sensitivity of at least 0.005 microcuries per test sample.

4.7.6.2 Test Frequencies - Each category of sealed sources, excluding startup sources and fission detectors previously subjected to core flux, shall be tested at the frequency described below.

a. Sources in use - At least once per six months for all sealed sources containing radioactive material:

1. With a half-life greater than 30 days, excluding Hydrogen 3, and

2. In any form other than gas.

FOR INFORMATION ONLY

SURVEILLANCE REQUIREMENTS (Continued)

b. Stored sources not in use - Each sealed source and fission detector shall be tested prior to use or transfer to another licensee unless tested within the previous six months. Sealed sources and fission detectors transferred without a certificate indicating the last test date shall be tested prior to being placed into use.

c. Startup sources and fission detectors - Each sealed startup source and fission detector shall be tested within 31 days prior to being subjected to core flux or installed in the core and following repair or maintenance to the source.

4.7.6.3 Reports - A report shall be prepared and submitted to the Commission on an annual basis if sealed source or fission detector leakage tests reveal the presence of greater than or equal to 0.005 microcuries of removable contamination.

DRESDEN ONLY

3/4.11 RADIOACTIVE EFFLUENTS

PLANT SYSTEMS

8.5

3/4.11.1 LIQUID ~~EFFLUENTS~~ HOLDUP TANKS

FOR INFORMATION ONLY

LIQUID HOLDUP TANKS

LIMITING CONDITION FOR OPERATION

3.8.5

3.11.1.1 The quantity of radioactive material contained in any outside temporary tanks shall be limited to less than or equal to the limits calculated in the ODCM.

a. Waste sample tanks,
b. Floor drain sample tanks,
c. waste surge tank, and
d. Any outside temporary tank used for storage of radioactive liquids.

each of the following tanks shall be limited to ≤ 0.7 curie and the total of all tanks shall not exceed 3.0 curies

APPLICABILITY: At all times.

ACTION:

identified

a. 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.

b. The provisions of Specification 3.0.3 are not applicable.

c

SURVEILLANCE REQUIREMENTS

4.8.5

4.11.1.1 The quantity of radioactive material contained in each of the above ~~listed~~ tanks shall be determined to be within the above limit by analyzing a representative sample of the tank's contents at least once per 7 days when radioactive materials are being added to the tank.

identified

and within 7 days of completion of the addition of radioactive materials to the tank.

FOR INFORMATION ONLY

RADIOACTIVE EFFLUENTS

3/4 11.2 GASEOUS EFFLUENTS

EXPLOSIVE GAS MIXTURE

LIMITING CONDITION FOR OPERATION

3.11.2.1 The concentration of hydrogen in the main condenser offgas treatment system shall be limited to less than or equal to 4% by volume.

APPLICABILITY: Whenever the main condenser air ejector system is in operation.

ACTION:

a. With the concentration of hydrogen in the main condenser offgas treatment system exceeding the limit, restore the concentration to within the limit within 48 hours.

b. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.2.1 The concentration of hydrogen in the main condenser offgas treatment system shall be determined to be within the above limits as required by Table 3.3.7.11-1 of Specification 3.3.7.11.

RADIOACTIVE EFFLUENTS — PLANT SYSTEMS

MAIN CONDENSER — OFFGAS ACTIVITY

FOR INFORMATION ONLY

LIMITING CONDITION FOR OPERATION

3.8.I

3.11.2.2 The release rate of the sum of the activities from the noble gases measured prior to the holdup line shall be limited to less than or equal to 3.4×10^5 microcuries/second. (100 μCi/sec/MWt, after 30 minutes decay.)

APPLICABILITY: OPERATIONAL ~~CONDITIONS~~ MODE(s) 1, 2 and 3. (a)

ACTION: (> 100 μCi/sec/MWt, after 30 minutes decay)

With the release rate of the sum of the activities of the noble gases (as measured prior to the holdup line) exceeding 3.4×10^5 microcuries/second restore the release rate to within its limit within 72 hours or be in at least STARTUP with the main steam isolation valves closed within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.8.I.1

4.11.2.2.1 The radioactivity rate of noble gases prior to the holdup line shall be continuously monitored in accordance with the ODCM.

4.8.I.2

4.11.2.2.2 The release rate of the sum of the activities from noble gases prior to the holdup line shall be determined to be within the limits of Specification 3.11.2.2 at the following frequencies by performing an isotopic analysis of a representative sample of gases taken prior to the holdup line.

a. At least once per 31 days.

b. Within 4 hours following an increase, as indicated by the off gas pre-treatment Noble Gas Activity Monitor, of greater than 50%, after factoring out increases due to changes in THERMAL POWER level, in the nominal steady state fission gas release from the primary coolant.

(a) When the main condenser air ejector is in operation.

(b) The provisions of Specification 4.0.D are not applicable.

ATTACHMENT F

Chapter 12 of Dresden and Quad Cities ODCM
and Process Control Program (PCP)

FOR INFORMATION ONLY

CHAPTER 12.0

SPECIAL NOTE

Until the Unit 2 & 3 Radiological Effluent Technical Specifications have been approved by the Nuclear Regulatory Commission, the requirements of the Technical Specifications shall take precedence over this chapter, should any differences occur.

9506290284 950616
PDR ADOCK 05000237
P PDR

DRESDEN ANNEX INDEX

CHAPTER 12
RADIOACTIVE EFFLUENT TECHNICAL STANDARDS
(RETS)
TABLE OF CONTENTS

CHAPTER 12

RADIOACTIVE EFFLUENT TECHNICAL STANDARDS
(RETS)
TABLE OF CONTENTS
CONTINUED

FOR INFORMATION ONLY

CHAPTER 12

RADIOACTIVE EFFLUENT TECHNICAL STANDARDS (RETS)
LIST OF TABLES

12.0 RADIOLOGICAL EFFLUENT TECHNICAL STANDARDS

12.1 DEFINITIONS

1. Channel Functional Test (Radiation Monitor) - Shall be the injection of a simulated signal into the channel as close to the sensor as practicable to verify operability including alarm and/or trip functions.

2. Dose Equivalent I-131 - 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 Table III of TID -14844, "Calculation of Distance Factors for Power and Test Reactor Sites".

3. Hot Standby - Hot standby means operation with the reactor critical, system pressure less than 600 psig, the main steam isolation valves closed.

4. Immediate - Immediate means that the required action will be initiated as soon as practicable considering the safe operation of the unit and the importance of the required action.

5. Instrument Calibration - An instrument calibration means the adjustment of an instrument signal output so that it corresponds, within acceptable range and accuracy, to a known value(s) of the parameter which the instrument monitors. Calibration shall encompass the entire instrument, including actuation, alarm, or trip.

6. Instrument Check - An instrument check is qualitative determination of acceptable operability by observation of instrument behavior during operation. This determination shall include, where possible, comparison of the instrument with other independent instruments measuring the same variable.

7. Instrument Functional Test - An instrument functional test means the injection of a simulated signal into the instrument primary sensor to verify the proper instrument response alarm and/or initiating action.

8. Member of the Public - an individual in a controlled or unrestricted area. However, an individual is not a member of the public during any period in which the individual receives an occupational dose.

9. Mode - The reactor mode is that which is established by the mode-selector-switch.

10. The Offsite Dose Calculation Manual (ODCM) shall contain the methodology and parameters used in the calculation of offsite doses regulating from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring Alarm/Trip Setpoints, and in the conduct of the Environmental Radiological Monitoring Program. The ODCM

12.1 DEFINITIONS (Cont'd)

shall also contain (1) the Radioactive Effluent Controls and Radiological Environmental Monitoring Programs described in Section 12.5 and (2) descriptions of the information that should be included in the Annual Radiological Environmental Operating and Radioactive Effluent Release Reports required by Sections 12.6.2.2.1 and 12.6.2.1.

11. Operable - A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s). Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, a normal and an emergency electrical power source, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component or device to perform its function(s) are also capable of performing their related support function(s).

12. Operating - Operating means that a system, subsystem, train, component or device is performing its intended function in its required manner.

13. Operating Cycle - Interval between the end of one refueling outage and the end of the subsequent refueling outage.

14. The Process Control Program (PCP) shall contain the current formulas, sampling, analyses, test, and determinations to be made to ensure that 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 Parts 20, 61, and 71, State regulations, burial ground requirements, and other requirements governing the disposal of solid radioactive waste.

15. Rated Thermal Power - Rated thermal power means a steady-state power level of 2527 thermal megawatts.

16. Reactor Power Operation - Reactor power operation is any operation with the mode switch in the "Startup/Hot Standby" or "Run" position with the reactor critical and above 1% rated thermal power.

    1. Startup/Hot Standby Mode - In this mode, the reactor protection scram trips, initiated by condenser low vacuum and main steamline isolation valve closure, and by-passed when reactor pressure is less than 600 psig; the low pressure main steamline isolation valve closure trip is bypassed, the reactor protection system is energized with IRM neutron-monitoring system trips and control rod withdrawal interlocks in service.

    2. Run Mode - In this mode, the reactor protection is energized with APRM protection and RBM interlocks in service.

12.1 DEFINITIONS (Cont'd)

17. Reactor Vessel Pressure - Unless otherwise indicated, reactor vessel pressures listed in the RETS are those measured by the reactor vessel steam space detector.

18. Refueling Outage - Refueling outage is the period of time between the shutdown of the unit prior to a refueling and the startup of the plant subsequent to that refueling. For the purpose of designating frequency of testing and surveillance, a refueling outage shall mean a regularly scheduled refueling outage; however, where such outages occur within 8 months of the completion of the previous refueling outage, the required surveillance testing need not be performed until the next regularly scheduled outage.

19. Shutdown - The reactor is in a shutdown condition when the reactor mode switch is in the shutdown mode position and no core alterations are being performed. When the mode switch is placed in the shutdown position a reactor scram is initiated, power to the control rod drives is removed, and the reactor protection system trip systems are de-energized.

    1. Hot Shutdown means conditions as above with reactor coolant temperature greater than 212°F.

    2. Cold Shutdown means conditions as above with reactor coolant temperature equal to or less than 212° F.

20. Source Check - The qualitative assessment of instrument response when the sensor is exposed to a radioactive source.

21. Surveillance Interval - Each surveillance requirement shall be performed within the specified surveillance interval with a maximum allowable extension not to exceed 25% of the surveillance interval.

22. Definitions Related to Estimating Dose to the Public Using the ODCM Computer Program:

    1. Actual - Refers to using known release data to project the dose to the public for the previous month. These data are stored in the database and used to demonstrate compliance with the reporting requirements of Chapter 12.

    2. Projected - Refers to using known release data from the previous month or estimated release data to forecast a future dose to the public. These data are NOT incorporated into the database.

TABLE 12.1-1

SURVEILLANCE FREQUENCY NOTATION

NOTATION	FREQUENCY
S	At least once per 8 hours
D	At least once per 24 hours
T	At least once per 72 hours
W	At least once per 7 days
M	At least once per 31 days
Q	At least once per 92 days
SA	At least once per 184 days
A	At least once per 366 days
R	At least once per refuel outage
S/U	Prior to each reactor startup
N.A.	Not applicable
E	At least once per 550 days (Units 2 & 3) and 18 months for Unit 1

FOR INFORMATION ONLY

12.2 INSTRUMENTATION

A. Radioactive Liquid Effluent Instrumentation

1. Radioactive Liquid Effluent Instrumentation Operability

1. The effluent monitoring instrumentation shown in Table 12.2-1 shall be operable with alarm trip setpoints set to insure that the limits of Section 12.3.A are not exceeded. The alarm setpoints shall be determined in accordance with the ODCM.

2. With a radioactive liquid effluent monitoring instrument alarm/trip setpoint less conservative than required, without delay suspend the release of radioactive liquid effluents monitored by the affected instrument, or declare the instrument inoperable, or change the setpoint so it is acceptably conservative.

3. With one or more radioactive liquid effluent monitoring instruments inoperable, take the action shown in Table 12.2-1. Return the instrument to operable status within 30 days and, if unsuccessful, explain in the next Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner. This is in lieu of an LER.

4. In the event operability requirements and associated action requirements cannot be satisfied because of circumstances in excess of those addressed in the specifications, provide a 30-day written report to the NRC and no changes are required in the operational condition of the plant, and this does not prevent the plant from entry into any operational mode.

2. Radioactive Liquid Effluent Instrumentation Surveillance

1. Each radioactive liquid effluent monitoring instrument shown in Table 12.2-2 shall be demonstrated operable by performance of the given source check, instrument check, calibration, and functional test operations at the frequencies shown in Table 12.2-2.

B. Radioactive Gaseous Effluent Instrumentation

1. Radioactive Gaseous Effluent Instrumentation Operability

1. The effluent monitoring instrumentation shown in Table 12.2-3 shall be operable with alarm/trip setpoints set to ensure that the limits of Section 12.4.A are not exceeded. The alarm/trip setpoints shall be determined in accordance with the ODCM.

2. With a radioactive gaseous effluent monitoring instruments alarm/trip set point less conservative than required, without delay suspend the release of radioactive gaseous effluents monitored by the affected instrument, or declare the instrument inoperable, or change the setpoint so it is acceptably conservative.

12.2.B.1 Radioactive Gaseous Effluent Instrumentation Operability (Cont'd)

3. With one or more radioactive gaseous effluent monitoring instruments inoperable, take the action shown in Table 12.2-3. Return the instrument to operable status within 30 days and, if unsuccessful, explain in the next Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner. This is in lieu of an LER.

4. The unit 2/3 plant chimney gas sampling system may be out of service for 48 hours for the purpose of servicing the high range noble gas monitor as long as the following conditions are satisfied:

   1. Both units are at steady state conditions with the recombiners and charcoal absorbers in service for the operating unit(s).

   2. The dose rate in unrestricted areas must be shown by calculation to be less than the limits of 12.4.A assuming the charcoal absorbers are bypassed on both units.

   3. Both offgas monitors on Unit 2 and Unit 3 must be operational and the monitor reading correlated to the chimney release rate based on the conservative assumption of both units' charcoal absorbers being bypassed.

   4. If the provisions of 12.4.A.1.1, 12.4.A.1.2, or 12.4.A.1.3 cannot be met, an orderly load reduction of the unit(s) shall be initiated immediately.

5. In the event operability requirements and associated action requirements cannot be satisfied because of circumstances in excess of those addressed in this Section, provide a 30-day written report to the NRC and no changes are required in the operational condition of the plant, and this does not prevent the plant from entry into any operation mode.

2. Radioactive Gaseous Effluent Instrumentation Surveillance

Each radioactive gaseous radiation monitoring instrument in Table 12.2-4 shall be demonstrated operable by performance of the given source check, instrument check, calibration, and functional test operations at the frequency shown in Table 12.2-4.

FOR INFORMATION ONLY

TABLE 12.2-1

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

UNIT 1

Instrument		Operable	Minimum Channels Channels	Total No. of Action
1.	Service Water Effluent Gross Activity Monitor	1	1	10
2.	Discharge Canal Sampler	1	1	12

ACTIONS

ACTION 10 - With less than the minimum number of operable channels, releases via this pathway may continue, provided that at least once per 24 hours grab samples are collected and analyzed for beta or gamma activity at an LLD of less than or equal to 10^{-7} µCi/ml.

ACTION 12 - Operability is verified prior to performing and once a day during planned discharge.

TABLE 12.2-1

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

UNITS 2 & 3

	Instrument	Minimum Channels Operable	Total No. of Channels	Action
1.	Service Water Effluent Gross Activity Monitor	1	1	10
2.	Liquid Radwaste Effluent Gross Activity Monitor	1	1	11

ACTIONS

ACTION 10 - With less than the minimum number of operable channels, releases via this pathway may continue, provided that at least once per 12 hours grab samples are collected and analyzed for beta or gamma activity at an LLD of less than or equal to 10^{-7} uCi/ml.

ACTION 11 - With less than a minimum number of operable channels, effluent releases via this pathway may continue, provided that prior to initiating a release, at least 2 independent samples are analyzed, and at least 2 members of the facility staff independently verify the release calculation and discharge valving. Otherwise, suspend release of radioactive effluent via this pathway.

FOR INFORMATION ONLY

TABLE 12.2-2

RADIOACTIVE LIQUID EFFLUENT MONITORING
INSTRUMENTATION SURVEILLANCE REQUIREMENTS

UNIT 1

Instrument		Functional Test	Calibration (b)(f)	Instrument Check (f)	Source Check
1.	Service Water Effluent Gross Activity Monitor	Q (a,f,e)	E (c)	D	E
2.	Discharge Canal Sampler	(g)			

TABLE 12.2-2

RADIOACTIVE LIQUID EFFLUENT MONITORING
INSTRUMENTATION SURVEILLANCE REQUIREMENTS

UNITS 2 & 3

Instrument		Functional Test(a)(f)	Calibration (b)(f)	Instrument Check (f)	Source Check
1.	Liquid Radwaste Effluent Gross Activity Monitor	Q (e)	E (c)	D	E(d)
2.	Service Water Effluent Gross Activity Monitor	Q (e)	E (c)	D	E

TABLE 12.2-2 (Cont'd)

RADIOACTIVE LIQUID EFFLUENT MONITORING
INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TABLE NOTATIONS

(a) The Instrument Functional Test shall also demonstrate that control room alarm annunciation occurs, if any of the following conditions exist, where applicable.

1. Instrument indicated levels above the alarm setpoint.
2. Circuit failure.
3. Instrument indicates a downscale failure.
4. Instrument controls not set in OPERATE mode.

(b) Calibration shall include performance of a functional test.

(c) Calibration shall include performance of a source check.

(d) Source check shall consist of observing instrument response during a discharge.

(e) Functional tests may be performed by using trip check and test circuitry associated with the monitor chassis.

(f) Functional tests, calibrations, and instrument checks are not required when these instruments are not required to be operable or are tripped. Calibration is not required to be performed more than once every 18 months.

(g) Operability is verified prior to performing discharge and once a day during planned discharge.

TABLE 12.2-3

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

UNIT 1

Instrument	Minimum Channels Operable	Total No. of Channels	Applicable Operational Modes	Action
1. Main Chimney SPING Noble Gas Monitors	1	3	*	28
2. Main Chimney Particulate Samplers	1	1	*	27
3. Main Chimney Iodine Samplers	1	1	*	27

FOR INFORMATION ONLY

TABLE 12.2-3

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

UNITS 2 & 3

Instrument	Minimum Channels Operable	Total No. of Channels	Applicable Operational Modes	Action
1. Main Chimney Noble Gas/SPING/ GE Low Range Activity Monitor	1	3	*	20
2. Main Chimney SPING Noble Gas Monitors Mid, Hi Range	1	1	*	26
3. Main Chimney Iodine Sampler	1	1	*	22
4. Main Chimney Particulate Sampler	1	1	*	22
5. Main Chimney Flow Rate Monitor	1	1	*	21
6. Main Chimney Sampler Flow Rate Monitor	1	1	*	21
7. Reactor Building Vent Exhaust Duct Radiation Monitor	1	2	*	24
8. Reactor Building Vent SPING Noble Gas Monitor Low, Mid, High Range	1	1	*	25
9. Reactor Building Vent Flow Rate Monitor	1	1	*	21
10. Reactor Building Vent Sampler Flow Rate Monitor	1	1	*	21
11. Reactor Building Vent Iodine Sampler	1	1	*	22
12. Reactor Building Vent Particulate Sampler	1	1	*	22

TABLE 12.2-3 (Cont'd)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION
ACTIONS AND TABLE NOTATIONS

ACTION 20 - With less than the minimum channels operable, effluent releases via this pathway may continue for up to 30 days provided grab samples are taken at least once every 8 hours and analyzed for noble gas within 24 hours. In addition, restore the inoperable equipment to operable status within 7 days, or prepare and submit a report to the commission within the next 30 days outlining the plans, actions taken and procedures to be used to provide for the loss of sampling capability.

ACTION 21 - With the number of operable channels less than the minimum required, effluent releases via this pathway may continue provided that the flow rate is estimated at least once per 4 hours.

ACTION 22 - With less than the minimum channels operable, effluent releases via this pathway may continue provided samples are continuously collected with auxiliary sampling equipment, as required in Table 12.4-1.

ACTION 24 - With less than the minimum channels operable, immediately suspend release of radioactive effluents via this pathway.

ACTION 25 - With less than the minimum channels operable, effluent releases via this pathway may continue provided that the minimum number of operable channels for the Reactor Building Vent Exhaust Duct Radiation Monitor are operable.

ACTION 26- With less than the minimum channels operable, effluent releases via this pathway may continue provided the low range monitor is operable and on scale. Restore the inoperable equipment to operable status within 21 days, or prepare and submit a report to the commission pursuant to Technical Specification 6.6.B (Section 6.6.A in Upgraded Technical Specifications) within the next 30 days outlining the plans, actions taken and procedures to be used to provide for the loss of sampling capability of the system.

ACTION 27- The main chimney SPING monitor may be out-of-service for calibration and maintenance provided that particulate and iodine samples are taken and analyzed. The samples shall be collected using alternate filter holders and pumps connected to the main chimney sample stream.

ACTION 28 - With less than the minimum channels operable, effluent releases via this pathway may continue provided daily noble gas samples are taken and analyzed daily. Restore the inoperable equipment to operable status within 30 days. If service can not be returned, document equipment availability difficulties within the Radioactive Effluent Release Report for the period including actions taken in response to the equipment and procedures used to provide for the loss of sampling capability of the system.

* At all times

FOR INFORMATION ONLY

TABLE 12.2-4

RADIOACTIVE GASEOUS EFFLUENT MONITORING
INSTRUMENTATION SURVEILLANCE REQUIREMENTS

UNIT 1

	Instrument	Functional Test(a)(e)	Calibration (b)	Instrument Check	Source Check	Applicable Operational Modes
1.	Main Chimney SPING Noble Gas Monitor Low Range	Q	E	D	M	*

TABLE 12.2-4

RADIOACTIVE GASEOUS EFFLUENT MONITORING
INSTRUMENTATION SURVEILLANCE REQUIREMENTS

UNITS 2 & 3

Instrument		Functional Test(a)(e)	Calibration (b)(e)	Instrument Check (e)	Source Check	Applicable Operational Modes
1.	Main Chimney Noble Gas Activity Monitor	Q	E	D	M	*
2.	Main Chimney SPING Noble Gas Monitor Lo, Mid, High Range	Q	E	D	M	*
3.	Main Chimney Particulate and Iodine Sampler	N.A.	N.A.	D(c)	N.A.	*
4.	Main Chimney Flow Rate Monitor	Q	E	D	N.A.	*
5.	Main Chimney Sampler Flow Rate Monitor	Q(d)	E	D	N.A.	*
6.	Reactor Bldg Vent Exhaust Duct Radiation Monitor	Q	E	D	Q	*
7.	Reactor Bldg Vent SPING Noble Gas Monitor Lo, Mid, High Range	Q	E	D	M	*
8.	Reactor Bldg Vent Flow Rate Monitor	Q	E	D	N.A.	*
9.	Reactor Bldg Sampler Flow Rate Monitor	Q(d)	E	D	N.A.	*
10.	Reactor Bldg Vent Particulate and Iodine Sampler	N.A.	N.A.	D(c)	N.A.	*

FOR INFORMATION ONLY

TABLE 12.2-4 (Cont'd)

RADIOACTIVE GASEOUS EFFLUENT MONITORING
INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TABLE NOTATIONS

(a) The Instrument Functional Test shall also demonstrate that control room alarm annunciation occurs, if any of the following conditions exist, where applicable.

1. Instrument indicates levels above the alarm setpoint.
2. Circuit failure.
3. Instrument indicates a downscale failure.
4. Instrument controls not set in OPERATE mode.

(b) Calibration shall include performance of a functional test.

(c) Instrument check to verify operability of sampler; that the sampler is in place and functioning properly.

(d) Functional test shall be performed on local switches providing low flow alarm.

(e) Functional tests, calibrations, and instrument checks are not required when these instruments are not required to be operable or are tripped. Calibration is not required to be performed more than once every 18 months.

* At all times.

12.2.C Liquid And Gaseous Effluents Instrumentation Bases

1. The radioactive liquid and gaseous effluent instrumentation is provided to monitor the release of radioactive materials in liquid and gaseous effluents during releases. The alarm setpoints for the instruments are provided to ensure that the alarms will occur prior to exceeding the limits of RETS.

FOR INFORMATION ONLY

12.3 LIQUID EFFLUENTS

12.3.A Liquid Effluents Limits and Reporting Operability

1. Concentration in Unrestricted Areas

The concentration of radioactive material released from the site to unrestricted areas (at or beyond the site boundary, Dresden Station ODCM Annex, Appendix F, Figure F-1) shall be limited to the concentrations specified in Appendix B, Table 2, Column 2 to 10CFR20.1001-20.2402[1], with the Table 12.3-1 values for noble gases.

With the concentration of radioactive material released from the site to unrestricted areas exceeding the above limits, without delay decrease the release rate of radioactive materials and/or increase the dilution flow rate to restore the concentration to within the above limits.

2. Dose from Liquid Effluents

The dose or dose commitment above background to a member of the public from radioactive materials in liquid effluents released to unrestricted areas (at or beyond the site boundary) from the site shall be limited to the following:

1. During any Calendar Quarter:

   (1) Less than or equal to 3 mrem to the whole body.
   (2) Less than or equal to 10 mrem to any organ.

2. During any Calendar Year:

   (1) Less than or equal to 6 mrem to the whole body.
   (2) Less than or equal to 20 mrem to any organ.

3. With the calculated dose from the release of radioactive materials in liquid effluents exceeding any of the above limits, prepare and submit to the Commission within 30 days a Special Report which identifies the cause(s) and defines the corrective actions taken and the proposed actions to be taken to ensure that future releases are in compliance with Sections 12.3.A.2.1 and 12.3.A.2.2. This is in lieu of a Licensee Event Report.

---

[1]Upon technical specification approval, ten (10) times the Appendix B value may be used to determine the maximum instantaneous liquid release.

12.3.A Liquid Effluents Limits and Reporting Operability
(Cont'd)

4. With the calculated dose from the release of radioactive materials in liquid effluents exceeding the limits of Sections 12.3.A.2.1 or 12.3.A.2.2., prepare and submit a Special Report to the Commission within 30 days and limit the subsequent releases such that the dose or dose commitment to a member of the public from all uranium fuel cycle sources is limited to less than or equal to 25 mrem to the total body or any organ (except thyroid, which is limited to less than or equal to 75 mrem) over 12 consecutive months. This Special Report shall include an analysis which demonstrates that radiation exposures to all real individuals from all uranium fuel cycle sources (including all effluent pathways and direct radiation) are less than the 40 CFR Part 190 Standard. Otherwise obtain a variance from the Commission to permit releases which exceed the 40 CFR Part 190 Standard. The radiation exposure analysis contained in the Special Report shall use methods prescribed in the ODCM. This report is in lieu of a Licensee Event Report.

5. When the projected annual whole body or any internal organ dose computed at the nearest downstream community water system is equal to or exceeds 2 mrem from all radioactive materials released in liquid effluents from the Station, prepare and submit a Special Report within 30 days to the operator of the community water system. The report is prepared to assist the operator in meeting the requirements of 40 CFR Part 141, EPA Primary Drinking Water Standards. A copy of this report will be sent to the NRC. This is in lieu of a Licensee Event Report.

3. Dose Projections

At all times during processing prior to discharge to the environs, process and control equipment provided to reduce the amount or concentration of radioactive materials shall be operated when the projected dose due to liquid effluent releases to unrestricted areas (Dresden Station ODCM Annex, Appendix F, Figure F-1), when averaged over 31 days, exceeds 0.13 mrem to the total body or 0.42 mrem to any organ.

FOR INFORMATION ONLY

12.3.A Liquid Effluents Limits and Reporting Operability (Cont'd)

4. Liquid Radioactive Waste Treatment System

If liquid waste has to be or is being discharged without treatment as required above, prepare and submit to the Commission with 30 days, a report which includes the following information.

1. Identification of the defective equipment.

2. Cause of the defect in the equipment.

3. Action(s) taken to restore the equipment to an operating status.

4. Length of time the above requirements were not satisfied.

5. Volume and curie content of the waste discharged which was not processed by the appropriate equipment but which required processing.

6. Action(s) taken to prevent a recurrence of equipment failures.

This is in lieu of a Licensee Event Report.

5. System Operability and Plant Operations

In the event a limit and/or associated action requirements identified in Sections 12.3.A and 12.3.B cannot be satisfied because of circumstances in excess of those addressed in this Section, no changes are required in the operational condition of the plant, and this does not prevent the plant from entry into any operational mode.

12.3.B Liquid Effluents Surveillance

1. Concentration in Unrestricted Areas

The concentration of radioactive material in unrestricted areas shall be determined to be within the prescribed limits by obtaining representative samples in accordance with the sampling and analysis program specified in Table 12.3-2. The sample analysis results will be used with the calculational methods in the ODCM to determine that the concentrations are within the limits of Section 12.3.A.1.

FOR INFORMATION ONLY

12.3.B Liquid Effluents Surveillance (Cont'd)

2. Dose from Liquid Effluents

The dose contribution from measured quantities of radioactive material shall be determined by calculation at least once per 31 days and cumulative summation of these total body and organ dosed shall be maintained for each calendar quarter.

Doses computed at the nearest community water system will consider only the drinking water pathway and shall be projected using the methods prescribed in ODCM, at least once per 92 days.

3. Dose Projections

Doses due to liquid releases to unrestricted areas (at or beyond the site boundary) shall be projected at least once per 31 days in accordance with the ODCM.

FOR INFORMATION ONLY

TABLE 12.3-1

ALLOWABLE CONCENTRATION OF DISSOLVED OR ENTRAINED NOBLE GASES RELEASED FROM THE SITE TO UNRESTRICTED AREAS IN LIQUID WASTE

NUCLIDE	AC(μCi/ml)*
Kr-85m	2×10^{-4}
Kr-85	5×10^{-4}
Kr-87	4×10^{-5}
Kr-88	9×10^{-5}
Ar-41	7×10^{-5}
Xe-131m	7×10^{-4}
Xe-133m	5×10^{-4}
Xe-133	6×10^{-4}
Xe-135m	2×10^{-4}
Xe-135	2×10^{-4}

* Computed from Equation 20 of ICRP Publication 2 (1959), adjusted for infinite cloud submersion in water, and R = 0.01 rem/week, density = 1.0 g/cc and Pw/Pt = 1.0.

TABLE 12.3-2

RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

UNIT 1

LIQUID RELEASE TYPE	SAMPLING FREQUENCY(6)	MINIMUM ANALYSIS FREQUENCY(6)	TYPE OF ACTIVITY ANALYSIS	LOWER LIMIT OF DETECTION (LLD)[1] (μCi/ml)
A. Service Water Releases (4)	M	M	I-131	$1x10^{-6}$
	M (Grab Sample)	M	Principal Gamma Emitters[5]	$5x10^{-7}$
	M (Grab Sample)	M	Dissolved & Entrained Gases[6] Gamma Emmitters[5]	$1x10^{-5}$
	M (Grab Sample)	M (Composite)	H-3	$1x10^{-5}$
			Gross Alpha	$1x10^{-7}$
	Q (Grab Sample)	Q	Sr-89, Sr-90 Fe-55	$5x10^{-8}$
			(Gamma Emitters)	$1x10^{-6}$

LIQUID RELEASE TYPE	SAMPLING FREQUENCY(6)	MINIMUM ANALYSIS FREQUENCY(6)	TYPE OF ACTIVITY ANALYSIS	LOWER LIMIT OF DETECTION (LLD)[1] (μCi/ml)
B. Above Ground Liquid Storage Tanks (7)	T	T	Principal Gamma Emitters[5]	$5x10^{-7}$
			Dissolved & Entrained Gases[6] Gamma Emmitters[5]	$1x10^{-5}$

TABLE 12.3-2
RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM
UNITS 2 & 3

LIQUID RELEASE TYPE	SAMPLING FREQUENCY(6)	MINIMUM ANALYSIS FREQUENCY(6)	TYPE OF ACTIVITY ANALYSIS	LOWER LIMIT OF DETECTION (LLD)[1] (µCi/ml)
A. Batch Release Tanks	Prior to Each Batch	Prior to Each Batch	Principal Gamma Emitters[5] I-131	$5x10^{-7}$ $1x10^{-6}$
	Prior to Each Batch	M Composite[2]	Gross Alpha H-3	$1x10^{-7}$ $1x10^{-5}$
	Prior to Each Batch	Q Composite [2]	Fe-55 Sr-89, Sr-90	$1x10^{-6}$ $5x10^{-8}$
	Prior to One Batch/M	M	Dissolved Entrained Gases [6] (Gamma Emmitters)	$1x10^{-5}$
B. Plant Continuous Releases (4)	M[3] (Grab Sample)	M[3]	I-131	$1x10^{-6}$
	M[3] (Grab Sample)	M[3]	Principal Gamma Emitters [5]	$5x10^{-7}$
	M[3] (Grab Sample)	M[3]	Dissolved & Entrained Gases[6] Gamma Emmitters[5]	$1x10^{-5}$
	M[3] (Grab Sample)	M[3]	H-3	$1x10^{-5}$
			Gross Alpha	$1x10^{-7}$
	Q[3] (Grab Sample)	Q[3]	Sr-89, Sr-90	$5x10^{-8}$
			Fe-55 (Gamma Emitters)	$1x10^{-6}$

LIQUID RELEASE TYPE	SAMPLING FREQUENCY(6)	MINIMUM ANALYSIS FREQUENCY(6)	TYPE OF ACTIVITY ANALYSIS	LOWER LIMIT OF DETECTION (LLD)[1] (µCi/ml)
C. Above Ground Liquid Storage Tanks (7)	T	T	Principal Gamma Emitters [5]	$5x10^{-7}$
			Dissolved & Entrained Gases[6] Gamma Emmitters[5]	$1x10^{-5}$

TABLE 12.3-2 (Cont'd)
TABLE NOTATION

1. The LLD is defined in the ODCM.

2. A composite sample is one in which the quantity of liquid samples 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.

3. If the alarm setpoint of the service water effluent monitor as determined in the ODCM is exceeded, the frequency of analysis shall be increased to daily until the condition no longer exists.

4. A batch release is the discharge of liquid wastes of a discrete volume. Prior to sampling for analyses, each batch shall be isolated and then thoroughly mixed to assure representative sampling. A continuous release is the discharge of liquid wastes of a nondiscrete volume; e.g., from a volume or system that has an input flow during the release.

5. The principal gamma emitters for which the LLD specification applies exclusively are the following radionuclides: Mn-54, Fe-59, Co-60, Zn-65, Co-58, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144. Other peaks which are measurable and identifiable by gamma ray spectrometry together with the above nuclides, shall be also identified and reported when the actual analysis is performed on a sample. Nuclides which are below the LLD for the analyses shall not be reported as being present at the LLD level for that nuclide.

6. The dissolved and entrained gases (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. Other dissolved and entrained gases (gamma emitters) which are measurable and identifiable by gamma ray spectrometry, together with the above nuclides, shall also be identified and reported when an actual analysis is performed on a sample. Nuclides which are below the LLD for the analyses shall not be reported as being present at the LLD level for that nuclide.

7. A sample(s) from:
   Unit 1: Each of the above-grade liquid waste tanks,
   Units 2 & 3: The Waste Sample Tanks, Floor Drain Sample Tanks and the Waste Surge Tanks, shall be taken, analyzed, and recorded every 72 hours. If no additions to a tank have been made since the last sample, the tank need not be sampled until the next addition.

FOR INFORMATION ONLY

12.3.C LIQUID EFFLUENTS BASES

1. Concentration

This specification is provided to ensure that the concentration of radioactive materials released in liquid waste effluents from the site to unrestricted areas will be less than the concentration levels specified in Appendix B, Table 2, Column 2 to 10CFR20.1001-20.2402.

2. Dose

This specification is provided to implement the requirements of Sections II.A, III.A and IV.A of Appendix I, 10 CFR Part 50. The operational requirements implements the guides set forth in Section II.A of Appendix I. The statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive material in liquid effluents will be kept "as low as 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 calculational procedures based on models and data such that the actual exposure of an individual through appropriate pathways is unlikely to be substantially underestimated. The equations specified in the ODCM for calculating the doses due to the actual release rates of radioactive materials in liquid effluents will be consistent with the methodology provided in Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I", Revision 1, October 1977 and Regulatory Guide 1.113, "Estimating Aquatic Dispersion of Effluents from Accidental and Routine Reactor Releases for the Purpose of Implementing Appendix I", April 1977. NUREG-0113 provides methods for dose calculations consistent with Reg Guide 1.109 and 1.113.

3. Liquid Waste Treatment

The operability of the liquid radwaste treatment system ensures that this system will be available for use whenever liquid effluents require treatment prior to release to the environment. The requirement that the appropriate portions of this system be used when specified provides assurance that the releases of radioactive materials in liquid effluents will be kept "as low as 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 design objective Section 11.D of Appendix I to 10 CFR Part 50.

FOR INFORMATION ONLY

12.3.C LIQUID EFFLUENTS BASES - (Continued)

4. Mechanical Vacuum Pump

The purpose of isolating the mechanical vacuum line is to limit release of activity from the main condensor. During an accident, fission products would be transported from the reactor through the main steam line to the main condenser. The fission product radioactivity would be sensed by the main steamline radioactivity monitors which initiate isolation.

FOR INFORMATION ONLY

12.4 GASEOUS EFFLUENTS

A. Gaseous Effluents Limits and Reporting Operability

1. Dose Rate

The dose rate in unrestricted areas at or beyond the site boundary (Dresden Station ODCM Annex, Appendix F, Figure F-1) due to radioactive materials released in gaseous effluents from the site shall be limited to the following.

1. For Noble Gases:

   (1) Less than a dose rate of 500 mrem/year to the whole body.
   (2) Less than a dose rate of 3000 mrem/year to the skin.

2. For iodine-131, for iodine-133, tritium and for all radionuclides in particulate form with half-lives greater than 8 days, less than a dose rate of 1500 mrem/year.

3. If the dose rates exceed the above limits, without delay decrease the release rates to bring the dose rates within the limits, and provide notification to the Commission (per 10 CFR Part 20.2203).

2. Noble Gas Dose

The air dose in unrestricted areas at or beyond the site boundary due to noble gases released in gaseous effluents from the unit shall be limited to the following:

1. For Gamma Radiation

   (1) Less than or equal to 5 mrad during any calendar quarter.
   (2) Less than or equal to 10 mrad during any calendar year.

2. For Beta Radiation

   (1) Less than or equal to 10 mrad during any calendar quarter.
   (2) Less than or equal to 20 mrad during any calendar year.

3. With the calculated air dose from radioactive noble gases in gaseous effluents exceeding any of the above limits, prepare and submit to the Commission within 30 days, a Special Report which identifies the cause(s) for exceeding the limit(s) and defines the corrective actions to be taken to ensure that future releases are in compliance with Sections 12.4.A.2.1 and 12.4.A.2.2. This is in lieu of a Licensee Event Report.

FOR INFORMATION ONLY

12.4.A Gaseous Effluents Limits and Reporting Operability (Cont'd)

4. With the calculated air dose from radioactive noble gases in gaseous effluents exceeding the limits of Sections 12.4.A.2.1 or 12.4.A.2.2, prepare and submit a Special Report to the Commission within 30 days and limit the subsequent releases such that the doses or dose commitment to a member of the public from all uranium fuel cycle sources is limited to less than or equal to 25 mrem to the total body or any organ (except thyroid, which is limited to less than or equal to 75 mrem) over 12 consecutive months. This Special Report shall include an analysis which demonstrates that radiation exposures to all members of the public from all uranium fuel cycle sources (including all effluent pathways and direct radiation) are less than 40 CFR Part 190 Standard. Otherwise, obtain a variance from the Commission to permit releases which exceed the 40CFR Part 190 Standard. The radiation exposure analysis contained in the Special Report shall use the methods prescribed in the ODCM. This report is in lieu of a Licensee Event Report.

3. Iodine-131, Iodine-133, Tritium, and Particulate Dose

The dose to a member of the public in unrestricted areas at or beyond the site boundary from iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released from the unit shall be limited to the following.

1. Less than or equal to 7.5 mrem to any organ during any calendar quarter.

2. Less than or equal to 15 mrem to any organ during any calendar year.

3. With the calculated dose from the release of iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents exceeding any of the above limits, prepare and submit to the Commission within 30 days, a Special Report which identifies the cause(s) for exceeding the limit and defines the corrective actions taken to ensure that future releases are in compliance with Section 12.4.A.3.1 and 12.4.A.3.2. This is in lieu of a Licensee Event Report.

4. With the calculated dose from the release of iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents exceeding the limits of Sections 12.4.A.3.1. or 12.4.A.3.2., prepare and submit a Special Report to the Commission within 30 days and limit subsequent releases such that the dose or dose commitment to a

FOR INFORMATION ONLY

12.4.A Gaseous Effluents Limits and Reporting Operability (Cont'd)

member of the public from all uranium fuel sources is limited to less than or equal to 25 mrem to the total body or organ (except the thyroid, which is limited to less than or equal to 75 mrem) over 12 consecutive months. This Special Report shall include an analysis which demonstrates that radiation exposures to all members of the public from all uranium fuel cycle sources (including all effluent pathways and direct radiation) are less than the 40 CFR Part 190 Standard. Otherwise, obtain a variance from the Commission to permit releases which exceed the 40 CFR Part 190 Standard. The radiation exposure analysis contained in the Special Report shall use the methods prescribed in the ODCM. This report is in lieu of a Licensee Event Report.

4. Off-Gas Treatment

1. At all times during processing for discharge to the environs, process and control equipment provided to reduce the amount of concentration of radioactive materials shall be operated.

2. The above specification shall not apply for the Off-Gas Charcoal Adsorber Beds below 30 percent of rated thermal power.

3. The recombiner shall be operable whenver the reactor is operating at a pressure greater than 900 psig.

4. The recombiner may be inoperable for 48 hours.

5. With either the recombiners inoperable, or all charcoal beds by-passed for more than 7 days in a calendar quarter while operating above 30 percent of the rated thermal power, prepare and submit to the Commission within 30 days a Special Report which includes the following information.

   a. Identification of the defective equipment.

   b. Cause of the defect in the equipment.

   c. Action(s) taken to restore the equipment to an operating status.

   d. Length of time the above requirements were not satisfied.

   e. Volume and curie content of the waste discharged which was not processed by the inoperable equipment but which required processing.

FOR INFORMATION ONLY

12.4.A Gaseous Effluents Limits and Reporting Operability (Cont'd)

f. Action(s) taken to prevent a recurrence of equipment failures.

This is in lieu of a Licensee Event Report.

5. Main Condenser Air Ejector

The release rate of the sum of the activities from the noble gases measured at the main condenser air ejector shall be limited to 100 microcuries/sec per MWt (after 30 minutes decay) at all times. With the release rate of the sum of the activities from noble gases at the main condenser air ejector exceeding 100 microcuries/sec per MWt (after 30 minutes decay), restore the release rate to within its limits within 72 hours, or be in at least HOT STANDBY within the next 12 hours.

6. System Operability and Plant Operations

In the event a limit and/or associated action requirements identified in Sections 12.4.A and 12.4.B cannot be satisfied because of circumstances in excess of those addressed in this Section, no changes are required in the operational condition of the plant, and this does not prevent the plant from entry into any operational mode.

FOR INFORMATION ONLY

12.4.B Gaseous Effluents Surveillance

1. Dose Rate

The dose rates due to radioactive materials released in gaseous effluents from the site shall be determined to be within the prescribed limits by obtaining representative samples in accordance with the sampling and analysis program specified in Table 12.4-1. The dose rates are calculated using methods prescribed in the ODCM.

2. Noble Gas Dose

The air dose due to releases of radioactive noble gases in gaseous effluents shall be determined to be within the prescribed limits by obtaining representative samples in accordance with the sampling and analysis program specified in Sections A and B of Table 12.4-1. The allocation of effluents between units having shared effluent control system and the air doses are determined using methods prescribed in the ODCM at least once ever 31 days.

3. Iodine-131, Iodine-133, Tritium and Particulate Dose

The dose to a member of the public due to releases of iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days shall be determined to be within the prescribed limits by obtaining representative samples in accordance with the sampling and analysis program specified in Table 12.4-1.

For radionuclides not determined in each batch or weekly composite, the dose contribution to the current calendar quarter cumulative summation may be estimated by assuming an average monthly concentration based on the previous monthly or quarterly composite analyses. However, for reporting purposes, the calculated dose contributions shall be based on the actual composite analyses when possible.

The allocation of effluents between units having shared effluent control systems and the doses are determined using the methods prescribed in the ODCM at least once every 31 days.

4. Off-Gas Treatment

Doses due to treated gases released to unrestricted areas at or beyond the site boundary shall be projected at least once per 31 days in accordance with the ODCM.

FOR INFORMATION ONLY

12.4.B Gaseous Effluents Surveillance - Continued

5. Noble Gases at the Main Condenser Air Ejector

The radioactivity release rate of noble gases at (near) the outlet of the main condenser air ejector shall be continuously monitored. The release rate of the sum of the activities from noble gases from the main condenser air ejector shall be determined to be within the limits of 12.4.A at the following frequencies by performing an isotopic analysis of a representative sample of gases taken at the recombiner outlet, or at the air ejector outlet if the recombiner is by-passed.

1. At least once per 31 days.

2. Within 4 hours following an increase, as indicated by the main condenser air ejector noble gas activity monitor, or greater than 50%, after factoring out increases due to changes in thermal power level and off-gas flow, in the nominal steady -state fission gas release from the primary coolant.

FOR INFORMATION ONLY

Table 12.4-1

RADIOACTIVE GASEOUS WASTE SAMPLING
AND ANALYSIS PROGRAM
UNIT 1

GASEOUS RELEASE TYPE	SAMPLING FREQUENCY	MINIMUM ANALYSIS FREQUENCY	TYPE OF ACTIVITY ANALYSIS	LOWER LIMIT OF DETECTION (LLD)[1] (µCi/ml)
A. Main Chimney	M (Grab Sample)	M	Principal Gamma Emitters [5] Tritium Noble Gases [7]	$1x10^{-4}$ $1x10^{-6}$ $1x10^{-6}$
	M[4,6] (Continuous)	M [3,7] Iodine Sample	I-131 I-133	$1x10^{-12}$ $1x10^{-10}$
	M[6] (Continuous)	M [3] Particulate Sample[7]	Principal Gamma Emitters [5]	$1x10^{-11}$
	Q (Continuous)	Q Composite Particulate Sample	Sr-89, Sr-90 Gross Alpha	$1x10^{-11}$

Table 12.4-1

RADIOACTIVE GASEOUS WASTE SAMPLING
AND ANALYSIS PROGRAM
UNITS 2 & 3

GASEOUS RELEASE TYPE	SAMPLING FREQUENCY	MINIMUM ANALYSIS FREQUENCY	TYPE OF ACTIVITY ANALYSIS	LOWER LIMIT OF DETECTION (LLD)[1] (μCi/ml)
A. Main Chimney Reactor Bldg. Vent Stack	M (Grab Sample)	M[2] M	Principal Gamma Emitters[5] Tritium	$1x10^{-4}$ $1x10^{-6}$
B. All Release Types as Listed in A above	Continuous[4]	W[3] Iodine Sample	I-131 I-133	$1x10^{-12}$ $1x10^{-10}$
	Continuous[4]	W[3] Particulate Sample	Principal Gamma Emitters [5] (I-131, others)	$1x10^{-11}$
	Continuous[4]	Q Composite Particulate Sample	Sr-89 Sr-90	$1x10^{-11}$ $1x10^{-11}$
	Continuous[4]	Q Composite Particulate Sample	Gross Alpha	$1x10^{-11}$
C. Main Chimney	Continuous[4]	Noble Gas Monitor	Noble Gases	$1x10^{-6}$
D. Reactor Bldg. Vent Stack	Continuous[4]	Noble Gas Monitor	Noble Gases	$1x10^{-4}$
E. MVRS Process Exhaust Sampler	Continuous[4]	W[6] Iodine Sample	I-131 I-133	$1x10^{-12}$ $1x10^{-10}$
	Continuous[4]	W[6] Particulate Sample	Principal Gamma Emitters [5] (I-131, others)	$1x10^{-11}$
F. MVRS HVAC Exhaust Sampler	Continuous[4]	W[6] Iodine Sample	I-131 I-133	$1x10^{-12}$ $1x10^{-10}$
	Continuous[4]	W[6] Particulate Sample	Principal Gamma Emitters [5] (I-131, others)	$1x10^{-11}$

FOR INFORMATION ONLY

TABLE 12.4-1 (Cont'd)

RADIOACTIVE GASEOUS WASTE SAMPLING
AND ANALYSIS PROGRAM

TABLE NOTATION

1. The lower limit of detection (LLD) is defined in the ODCM.

2. Sampling and analyses shall also be performed following shutdown, startup, or a thermal power change exceeding 20 percent of rated thermal power in 1 hour unless (1) analysis shows that the dose equivalent I-131 concentration in the primary coolant has not increased more than a factor of 5, and (2) the noble gas activity monitor shows that effluent activity has not increased by more than a factor of 3.

3. Samples shall be changed at least once per 7 days and the analyses completed within 48 hours after removal from the sampler. Sampling shall also be performed within 24 hours following each shutdown, startup, or thermal power level change exceeding 20% of rated thermal power in one hour. This requirement does not apply if 1) analysis shows that the dose equivalent I-131 concentration in the primary coolant has not increased more than a factor of 5, and 2) the noble gas activity monitor shows that effluent activity has not increased by more than a factor of 3. When samples collected for 24 hours are analyzed, the corresponding LLD's may be increased by a factor of 10.

4. The ratio of sample flow rate to the sampled stream flow rate shall be known.

5. 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, and Mn-54, Fe-59, Co-60, Zn-65, Co-58, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144 for particulate emissions. Other peaks which are measurable and identifiable by gamma ray spectrometry, together with the above nuclides, shall be also identified and reported when an actual analysis is performed on a sample. Nuclides which are below the LLD for the analyses shall not be reported as being present at the LLD level for the nuclide.

6. Analysis frequency shall be increased to 1/week if release rates exceed 1% of any applicable limit referenced in the ODCM, when added to Units 2 and 3 airborne effluents.

12.4.C Gaseous Effluents Bases

1. Gaseous Effluents - Dose

This Section is provided to ensure that the dose at the unrestricted area boundary from gaseous effluents from the units on site will be within the annual dose limits of 10CFR20 for unrestricted areas. These limits provide reasonable assurance that radioactive material discharged in gaseous effluents will not result in the exposure of an individual in an unrestricted area to annual average concentrations exceeding the limits specified in Appendix B, Table 2 of 10CFR20.1001-2402. The release rate limits restrict, at all times, the corresponding gamma and beta dose rates above background to an individual at or beyond the unrestricted area boundary to less than or equal to 500 mrem/year to the total body or to less than or equal to 3000 mrem/year to the skin. These release rate limits also restrict, at all times, the corresponding thyroid dose rate above background via the inhalation pathway to less than or equal to 1500 mrem/year. For purposes of calculation doses resulting from airborne releases, the main chimney is considered to be an elevated release point and the reactor building vent stack is considered to be a mixed mode release point.

2. Dose, Noble Gases

This Section is provided to implement the requirements of Sections II.B, III.A and IV.A of Appendix I, 10 CFR Part 50. The Operability Requirements implement the guides set forth in Section II.3 of Appendix I. The statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive material in gaseous effluents will be kept "as low as is reasonably achievable." The surveillance requirements implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I is to be shown by calculational procedures based on models and data such that the actual exposure of an individual through the appropriate pathways is unlikely to be substantially underestimated. The dose calculations established in the ODCM for calculating the doses due to the actual release rates of radioactive noble gases in gaseous effluents will be 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. NUREG-0133 provides methods for dose calculations consistent with Regulatory Guides 1.109 and 1.111.

FOR INFORMATION ONLY

12.4.C Gaseous Effluents Bases (Cont'd)

3. Dose, Radioiodines, Radioactive Material in Particulate Form and Radionuclides Other than Noble Gases

This Section is provided to implement the requirements of Sections II.C, III.A and IV.A of Appendix I, 10 CFR Part 50. The Operability Requirements are the guides set forth in Section II.C of Appendix I. The statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive materials in gaseous effluents will be kept "as low as reasonably achievable." The ODCM calculational methods specified in the surveillance requirements implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I be shown by calculational procedures based on models and data such that the actual exposure of an individual through appropriate pathways is unlikely to be substantially underestimated. The ODCM calculational methods approved by NRC for calculating the doses due to the actual release rates of the subject materials are required to be consistent with the methodology provided in Regulatory Guide 1.109. "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I", Revision 1, October 1977 and Regulatory Guide 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors," Revision 1, July 1977. These equations also provide for determining the actual doses based upon the historical average atmospheric conditions. The release rate limits for radioiodines, radioactive material in particulate form and radionuclides other than noble gases are dependent on the existing radionuclide pathways to man, in the unrestricted area. The pathways which were examined in the development of these limits were: 1) individual inhalation of airborne radionuclides, 2) deposition of radionuclides onto green leafy vegetation with subsequent consumption by man and 3) deposition onto grassy areas where milk animals graze with consumption of the milk by man.

4. Gaseous Waste Treatment

The operability of the gaseous waste treatment which reduces amounts or concentrations of radioactive materials ensures that the system will be available for use whenever gaseous effluents require treatment prior to release to the environment. The requirement that the appropriate portions of this system be operable 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 design objective Section II.D of Appendix I to 10 CFR Part 50.

12.5 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

A. Radiological Environmental Monitoring Program

1. The Radiological Environmental Monitoring Program given in Table 12.5-1 shall be conducted except as specified below.

2. With the Radiological Environmental Monitoring Program not being conducted as specified in Table 12.5-1, prepare and submit to the Commission, in the Annual Radiological Environmental 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, contractor omission which is corrected as soon as discovered, malfunction of sampling equipment, or if a person who participates in the program goes out of business. If the equipment malfunctions, corrective actions shall be completed as soon as practical. If a person supplying samples goes out of business, a replacement supplier will be found as soon as possible. All deviations from the sampling schedule shall be describe in the Annual Report.

3. When the level of radioactivity in an environmental sampling medium at one or more of the locations specified in the Table 12.5-1 exceeds the limits of the Table 12.5-2 when averaged over any calendar quarter, prepare and submit to the Commission within 30 days from the end of the affected calendar quarter, a Special Report which includes an evaluation of any release conditions, environmental factors or other aspects which caused the limits of the Table 12.5-2 to be exceeded. This report is not required if the measured level of radioactivity was not the result of plant effluents; however in such an event the condition shall be reported and described in the Annual Radiological Environmental Operating Report.

4. With milk samples unavailable from one or more of the sample locations required by Table 12.5-1, identify locations for obtaining replacement samples and add them to the Radiological Environmental Monitoring Program within 30 days. The locations from which samples were unavailable may then be deleted from the monitoring program. In lieu of Licensee Event Report, identify the cause of the unavailability of samples and identify the new location(s) for obtaining replacement samples in the Annual Radiological Environmental Operating Report and also include in the report a revised figure(s) and table reflecting the new location(s).

FOR INFORMATION ONLY

12.5.A Radiological Environmental Monitoring Program (Cont'd)

5. A census of nearest residences and of animals producing milk for human consumption shall be conducted annually (during the grazing season for animals) to determine their location and number with respect to the site. The nearest residence in each of the 16 meteorological sectors shall also be determined within a distance of five miles. The census shall be conducted under the following conditions:

   1. Within a 2-mile radius from the plant site, enumeration of animals and nearest residences by a door-to-door or equivalent counting technique.

   2. Within a 5-mile radius, enumeration of animals by using referenced information from country agricultural agents or other reliable sources.

6. With a land use census identifying location(s) of animals which yield(s) calculated dose or dose commitment greater than the values currently being calculated in Section 12.4.A.3, the new location(s) shall be added to the Radiological Environmental Monitoring Program within 30 days, if possible.

   The sampling location, having the lowest calculated dose or dose commitment (via the same exposure pathway) may be deleted from this monitoring program after October 31 of the year in which this land use census was conducted.

7. Radiological analyses shall be performed on samples representative of those in Table 12.5-1, supplied as a part of the Interlaboratory Comparison Program which has been approved by the NRC.

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

9. System Operability and Plant Operations

   In the event a limit and/or associated action requirements identified in Sections 12.5.A and 12.5.B cannot be satisfied because of circumstances in excess of those addressed in these Sections, no changes are required in the operational condition of the plant, and this does not prevent the plant from entry into any operational mode.

B. Radiological Environmental Monitoring Surveillance

1. The radiological environmental monitoring samples shall be collected pursuant to Table 12.5-1 from the locations specified in the ODCM and shall be analyzed pursuant to the requirements of Table 12.5-3.

12.5.B Radiological Environmental Monitoring Surveillance (Cont'd)

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

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

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

5. The results of the analyses performed as part of the required Interlaboratory Comparison Program shall be included in the Annual Radiological Environmental Operating Report. The analyses shall be done in accordance with ODCM Table 11-1.

TABLE 12.5-1
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	MINIMUM NUMBER OF SAMPLES AND SAMPLE LOCATIONS*	SAMPLING AND COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
1. AIRBORNE A. Particulates	17 locations	Continuous operation of sampler for a week	Gross beta and gamma isotopic as specified in ODCM Table 11-1.
B. Radioiodine	17 locations	Continuous operation of sampler for two weeks	I-131 as specified in ODCM Table 11-1.
2. DIRECT RADIATION	42 locations (Minimum of two TLDs per packet)	Quarterly	
3. WATERBORNE A. Surface Water	2 locations	Monthly composite of weekly collected samples	Gamma Isotopic analysis of each composite sample
B. Sediment	1 downstream location in receiving body of water	Annually	Gamma Isotopic analysis of each sample
C. Plant Cooling Water	Intake, Discharge	Weekly Composite	Gross Beta analysis of each sample
4. INGESTION A. Milk	2 locations	At least once weekly when animals are on pasture; at least once per month at other times	I-131 analysis of each sample
B. Fish	1 location in receiving body of water	Semiannually	Gamma Isotopic analysis on edible portions

*Sample locations are described in ODCM Chapter 11.

FOR INFORMATION ONLY

Table 12.5-2

REPORTING LEVELS FOR RADIOACTIVITY
CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

ANALYSIS	WATER (pCi/l)	AIRBORNE PARTICULATE OR GASES (pCi/m^3)	FISH (pCi/Kg, wet)	MILK (pCi/1)	FOOD PRODUCTS (pCi/Kg, wet)
H-3	2×10^4 (see Note 1)				
Mn-54	1×10^3		3×10^4		
Fe-59	4×10^2		1×10^4		
Co-58	1×10^3		3×10^4		
Co-60	3×10^3		2×10^4		
Zn-65	3×10^2		2×10^4		
Zr-Nb-95	4×10^2				
I-131	2	0.9		3	1×10^2
Cs-134	30	10	1×10^3	60	2×10^3
Cs-137	50	20	1×10^3	70	2×10^3
Ba-La-140	2×10^2			3×10^2	

Note: 1) For drinking water samples. This is 40 CFR Part 141 value.

Table 12.5-3
PRACTICAL LOWER LIMITS OF DETECTION (LLD) FOR STANDARD
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SAMPLE MEDIA	ANALYSIS	(LLD)[D,E] (4.66σ)	UNITS
Airborne "Particulate"	Gross Beta[B]	0.01	pCi/m^3(C)
	Gamma Isotopic	0.01	pCi/m^3(C)
Airborne I-131	Iodine-131	0.10	pCi/m^3(C)
Milk/Public Water	I-131	5[A]	pCi/1
	Cs-134	10	pCi/1
	Cs-137	10(C)	pCi/l
	Tritium	200	pCi/1
	Gross Beta[B]	5	pCi/1
	Gamma Isotopic	20	pCi/1/nuclide
Sediment	Gross Beta[B]	2	pCi/g dry
	Gamma Isotopic	0.2	pCi/g dry
Fish Tissue	I-133-Thyroid	0.1	pCi/g wet
	Cs-134, 137	0.1	pCi/g wet
	Gross Beta[B]	1.0	pCi/g wet
	Gamma Isotopic	0.2	pCi/g wet

Note:
A. 0.5 pCi/l on milk samples collected during the pasture season.
B. Reference to Cs-137
C. 5.0 pCi/1 on milk samples

(Notes continued next two pages)

ARCHIVE DOCUMENT COPY

FOR INFORMATION ONLY

Table 12.5-3 (Cont'd)

PRACTICAL LOWER LIMITS OF DETECTION (LLD) FOR STANDARD
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

TABLE NOTATION

D. The LLD is the smallest concentration of radioactive material in a sample that will be detected with 95 percent 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)

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

Where:

LLD is the "A priori" lower limit of detection for a blank sample or background analysis as defined above (as pCi per unit mass or volume).

S_b is the square root of the background count or of a blank sample count; is the estimated standard error of a background count or a blank sample count as appropriate (in units of counts).

E is the counting efficiency (as counts per disintegration).

A is the number of gamma rays omitted per disintegration for gamma ray radionuclide analysis (A = 1.0 for gross alpha and tritium measurements).

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

2.22 is the number of disintegrations per minute per picocurie.

Y is the fractional radiochemical yield when applicable (otherwise Y=1.0).

λ is the radioactive decay constant for the particular radionuclide (in units of reciprocal minutes).

Δt is the elapsed time between the midpoint of sample collection and the start time of counting. (t = 0.0 for environmental samples and for gross alpha measurements).

t is the duration of the count (in units of minutes).

The value of "S_b" used in the calculation of the LLD for a detection system shall be based on an actual observed background count or a blank sample count (as appropriate) rather than on an unverified theoretically predicted value. Typical values of "E", "V", "Y", "t" and "Δt" shall be used in the calculation.

FOR INFORMATION ONLY

Table 12.5-3 (Cont'd)

PRACTICAL LOWER LIMITS OF DETECTION (LLD) FOR STANDARD
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

TABLE NOTATIONS

For gamma ray radionuclide analyses the background counts are determined from the total counts in the channels which are within plus or minus one FWHM (Full Width at Half Maximum) of the gamma ray photopeak energy normally used for the quantitative analysis for that radionuclide. Typical values of the FWHM shall be used in the calculation.

The LLD for all measurements 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 sample measurement.

E. Other radionuclides which are measurable and identifiable by gamma ray spectrometry, together with the nuclides indicated in Table 12.5-3, shall also be identified and reported when an actual analysis is performed on a sample. Nuclides which are below the LLD for the analyses shall not be reported as being present at the LLD level for that nuclide.

12.5.C Radiological Environmental Monitoring Program Bases

1. Monitoring Program

The radiological environmental monitoring program required by this Section provides measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides, which lead to the highest potential radiation exposures of individuals resulting from the station operation. This monitoring program thereby supplements the radiological effluent monitoring program by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and modeling of the environmental exposure pathways. Program changes may be initiated based on operational experience.

The detection capabilities required by Table 12.5-3 are state-of-the-art for routine environmental measurements in industrial laboratories. The specified lower limits of detection for I-131 in water, milk and other food products correspond to approximately one-quarter of the Appendix I to 10 CFR Part 50 design objective dose-equivalent of 15 mrem/year for atmospheric releases and 10 mrem/year for liquid releases to the most sensitive organ and individual. They are based on the assumptions given 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", October 1977, except the change for an infant consuming 330 liter/year of drinking water instead of 510 liters/year.

2. Land Use Census

This Section is provided to ensure that changes in the use of unrestricted areas are identified and that modifications to the monitoring program are made if required by the results of this census. This census satisfies the requirements of Section IV.B.3 of Appendix I to 10 CFR Part 50.

3. Interlaboratory Comparison Program

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

FOR INFORMATION ONLY

12.6 RECORDKEEPING AND REPORTING

1. Station Operating Records

    1. Records and/or logs relative to the following items shall be kept in a manner convenient for review and shall be retained for at least five years.

        1. Records and periodic checks, inspection and/or calibrations performed to verify the surveillance requirements (See the applicable surveillance in the Instrumentation, Liquid Effluents, Gaseous Effluents, and Radiological Environmental Monitoring Sections) are being met. All equipment failing to meet surveillance requirements and the corrective action taken shall be recorded.

        2. Records of radioactive shipments.

    2. Records and/or logs relative to the following items shall be recorded in a manner convenient for review and shall be retained for the life of the plant.

        1. Records of off-site environmental monitoring surveys.

        2. Records of radioactivity in liquid and gaseous wastes released to the environment.

        3. Records of reviews performed for changes made to the ODCM.

2. Reports

    1. Radioactive Effluent Release Report

    The Radioactive Effluent Release Report covering the operation of the unit during the previous 12 months of operation shall be submitted to the Commission according to the Technical Specifications. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be (1) consistent with the objectives outlined in the ODCM and PCP and (2) in conformance with 10 CFR Part 50.36a and Section IV.B.1 of Appendix I to 10 CFR Part 50.

    2. Annual Radiological Environmental Operating Report

    The Annual Radiological Environmental Operating Report covering the operation of the unit during the previous calendar year shall be submitted according to Technical Specifications. The report shall include summaries, interpretations, and analysis of trends of the results of the Radiological Environmental Monitoring Program for the reporting period. The material provided shall be consistent with the objectives in (1) the ODCM and (2) Sections IV.B.2., IV.B.3, and IV.C of Appendix I to 10 CFR Part 50. A detailed listing of the requirement of the report is given below:

12.6.2 Reports - Continued

(a) Results of environmental sampling summarized on a quarterly basis following the format of Regulatory Guide 4.8 Table 1 (December 1975); (individual sample results will be retained at the station);

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. Summaries, interpretations, and analysis of trends of the results are to be provided.

(b) An assessment of the monitoring results and radiation dose via the principal pathways of exposure resulting from plant emissions of radioactivity including the maximum noble gas gamma and beta air doses in the unrestricted area. The assessment of radiation doses shall be performed in accordance with the ODCM.

(c) Results of the census to determine the locations of animals producing milk for human consumption, and the pasture season feeding practices at dairies in the monitoring program.

(d) The reason for the omission if the nearest dairy to the station is not in the monitoring program.

(e) An annual summary of meteorological conditions concurrent with the releases of gaseous effluents in the form of joint frequency distributions of wind speed, wind direction, and atmospheric stability.

(f) The results of the interlaboratory comparison program described in Section 12.5.A.7.

(g) The results of the 40 CFR Part 190 uranium fuel cycle dose analysis for each calendar year.

(h) A summary of the monitoring program, including maps showing sampling locations and tables giving distance and direction of sampling locations from the station.

3. Non-Routine Environmental Report

(a) If a confirmed measured radionuclide concentration in an environmental sampling medium averaged over any calendar quarter sampling period exceeds the reporting level given in Table 12.5-2 and if the radioactivity is attributable to plant operation, a written report shall be submitted to the Regional Administrator of NRC Regional Office, with a copy of the Director, Office of Nuclear Reactor Regulation, within 30 days from the end of the quarter. When more than one of the radionuclides in Table 12.5-2 are detected in the medium, the reporting level shall have been exceeded if $SC_i/(RL)_i$ is equal to or greater than 1 where C is the concentration of the i^{th} radionuclide in the medium and RL is the reporting level of radionuclide i.

12.6.2 Reports - Continued

(b) If radionuclides other than those in Table 12.5-2 are detected and are due to plant effluents, a reporting level is exceeded if the potential annual dose to an individual is equal to or greater than the design objective doses of 10 CFR Part 50, Appendix I.

(c) This report shall include an evaluation of any release conditions, environmental factors, or other aspects necessary to explain the anomalous affect.

12.6.3. Offsite Dose Calculation Manual (ODCM)

1. The ODCM shall contain the methodology and parameters used in the calculation of offsite doses due to radioactive gaseous and liquid effluents and in the calculation of gaseous and liquid effluent monitoring Alarm/Trip setpoints and in the conduct of the Radiological Environmental Monitoring Program. The ODCM shall also contain (1) the Radioactive Effluent Controls and Radiological Environmental Monitoring Programs required by Technical Specification Sections 3.2.F, 3.2.G, 3.8.A, 3.8.B and 3.8.E and (2) descriptions of the information that should be included in the Annual Radiological Environmental Operating and Radioactive Effluent Release Reports required by Technical Specifications Sections 6.6.C.1 and 6.6.C.2 (Upgraded Technical Specifications 6.9.A.3 and 6.9.A.4). Methodologies and calculational procedures acceptable to the Commission are contained in NUREG-0133.

   The ODCM shall be subject to review and approval by the Commission prior to initial implementation.

2. Changes to the ODCM:

   (1) Shall be documented and records of reviews performed shall be retained as required by Specification 6.5.B (Upgraded Technical Specification 6.10.B). This documentation shall contain:

      (a) Sufficient information to support the change together with appropriate analyses or evaluations justifying the change(s); and

      (b) A determination that the change will maintain the level of radioactive effluent control required by 10 CFR Part 20.1302, 40 CFR Part 190, 10 CFR Part 50.36a, and Appendix I to 10 CFR Part 50 and not adversely impact the accuracy or reliability of effluent, dose or set point calculations.

   (2) Shall be effective after review and acceptance by the Onsite Review & Investigative Function and the approval of the Station Manager, on the date specified by the Onsite Review and Investigative Function.

12.6.3 Offsite Dose Calculation Manual (ODCM)-(Cont'd)

(3) Shall be submitted to the Commission in the form of a complete, legible copy of the entire ODCM as a part of or concurrent with the Semiannual Radioactive Effluent Release Report for the period of the report in which any change to the ODCM was made effective. Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed, and shall indicate the date (e.g., month/year) the change was implemented.

12.6.4. Major Changes to Radioactive Waste Treatment Systems (Liquid and Gaseous)

NOTE: This information may be submitted as part of the annual FSAR update.

1. Licensee initiated major changes to the radioactive waste systems may be made provided:

   The change is reported in the Monthly Operating Report for the period in which the evaluation was reviewed by the On-Site Review and Investigative Function. The discussion of each change shall contain:

   (1) A summary of the evaluation that led to the determination that the change could be made in accordance with 10 CFR Part 50.59;

   (2) Sufficient detailed information to support the reason for the change;

   (3) A detailed description of the equipment, components, and process involved and the interfaces with other plant systems;

   (4) An evaluation of the change which shows the predicted releases of radioactive materials in liquid and gaseous effluents that differ from those previously predicted in the license application and amendments;

   (5) A comparison of the predicted releases of radioactive materials in liquid and gaseous effluents to the actual releases for the period in which the changes were made;

   (6) An estimate of the exposure to plant operating personnel as a result of the change; and

   (7) Documentation of the fact that the change was reviewed and found acceptable by the On-Site Review and Investigative Function.

2. The change shall become effective upon review and acceptance by the On-Site Review and Investigative Function.

DRESDEN NUCLEAR POWER STATION PROCESS CONTROL PROGRAM

Requirements:

Technical Specifications, Section 6.9, Process Control Program
•TECH SPECS 6.13, Process Control Program•

FOR INFORMATION ONLY

Special Controls/Reviews:

1. Revisions to this procedure must be Onsite reviewed.

2. Revisions to this procedure must be reviewed by the Radwaste Coordinator.

L. Ferrell
Originator

J. Shelian
Department Procedure Writer

M. Mikota/R. Papach
Technical Reviewer/Verifier

T. Nauman
Authorization

Effective Date

DRESDEN NUCLEAR POWER STATION PROCESS CONTROL PROGRAM

A. SCOPE: FOR INFORMATION ONLY

The purpose of the Dresden Nuclear Power Station (DNPS) Process Control Program (PCP) is to establish the process parameters which will provide a reasonable assurance that all Low-Level Radioactive Waste (LLRW) processed at Dresden Station will meet or exceed any and all acceptance criteria for processing, packaging, onsite storage, and shipment of LLRW to Licensed Burial Facilities.

These criteria include all Department of Transportation (DOT), Nuclear Regulatory Commission (NRC), State, and Licensed Burial Facilities' rules and regulations for the processing, packaging, on-site storage, and shipping of LLRW.

Although a Stock Equipment Company Cement Solidification System was installed during 1979, DNPS currently uses Commercial, Vendor - Supplied Processing Systems for the processing of the primary liquid LLRW streams generated by the Station.

Commonwealth Edison requires that all Vendors used to process liquid LLRW at DNPS must meet all applicable Commonwealth Edison Co. quality standards and shall have submitted a Process System Topical Report to the NRC. Furthermore, the vendor solidification/stabilization media must be approved by the Licensed Burial Sites.

B. USER REFERENCES:

1. Technical Specifications, Units 1, 2, & 3.

   a. Section 1.0 Definition of Process Control/Program. •TECH SPECS 1.0, Definition of Process Control Program•

   b. Section 6.9, Process Control Program. •TECH SPECS 6.13, Process Control Program•

2. Procedures.

   a. DAP 02-27, Integrated Reporting Process IRP.

   b. DAP 10-01, Onsite Review and Investigative Function/Plant Operations Review Committee (PORC).

   c. DAP 10-02, 10CFR50.59 Review Screenings and Safety Evaluations.

   d. DOP 2000 Series, Radwaste Operating Procedures.

   e. Vendor Procedures.

B. 3. Commonwealth Edison Program for Implementation of 10 CFR Part 61 and 10 CFR Part 20.311 Dated December 22, 1983.

4. Commonwealth Edison Quality Assurance Manual.

5. 10 CFR Part 20.311, Transfer for Disposal and Manifests.

6. 10 CFR Part 61, Licensing Requirements for the Land Disposal of Radioactive Waste.

7. 10 CFR Part 71, Packaging and Transportation of Radioactive Material.

8. 49 CFR Part 173, General Requirements for Shipments and Packaging.

C. KEY DEFINITIONS:

NOTE

The following definition of the PCP is from Tech Specs 1.0 Definition of Process Control/Program. •TECH SPECS 1.0, Definition of Process Control Program•

1. PROCESS CONTROL PROGRAM (PCP) - shall contain the current formulas, sampling, analysis, test and determination to be made to ensure that processing and packaging of actual or simulated wet solid wastes will be accomplished in such a way to assure compliance with 10 CFR Parts 20, 61, and 71, State Regulations, burial ground requirements, and other requirements governing the disposal of solid radioactive waste.

2. SOLIDIFICATION - Liquid Waste processed to either a stable or unstable free standing monolith.

D. SUPPLEMENTS:

NONE.

E. POLICY:

1. Records of license reviews performed for changes made to the PCP program shall be maintained for the life of the plant.

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

3. All waste streams shall be classified per 10 CFR 61.55 and meet the waste characteristics per 10 CFR part 61.56.

4. Station and Vendor Procedures shall be followed to comply with this PCP.

NOTE

Steps E.5 and E.6 are required by Tech Specs 6.9, Process Control Program. *TECH SPECS 6.13, Process Control Program*

E. 5. Changes to the PCP shall be documented. This documentation shall contain:

a. Sufficient information to support the change together with the appropriate analyses of evaluations justifying the change(s), and

b. A determination that the change will maintain the overall conformance of the solidified waste product to existing requirements of Federal, State, or other applicable regulations.

6. Changes shall become effective after review and acceptance by the On-site Review Function, and the approval of the Station Manager per DAP 10-01, Onsite Review and Investigative Function/Plant Operations Review Committee (PORC).

7. Because all solidification is performed by Vendors, the Vendor Process Control Procedures contain the formulas, sampling, analysis, test and determination required to be made to ensure that processing and packaging of waste is accomplished to assure compliance with the required regulations.

8. If any of the PCP criteria are not satisfied, resulting in a defective product, then the shipment of the defective product shall be suspended until a root cause determination has been identified per DAP 02-27, Integrated Reporting Process IRP.

9. Major Changes to Radioactive Waste Treatment Systems may be made provided that the change is reported in the Monthly Operating Report for the period in which the evaluation was reviewed by the On-site Review Function.

a. The discussion of each change shall contain:

(1) A summary of the evaluation that led to the determination that the change could be made in accordance with 10 CFR 50.59, per DAP 10-02, 10CFR50.59 Review Screenings and Safety Evaluations;

(2) Sufficient detailed information to support the reason for the change;

E. 9. a. (3) A detailed description of the equipment, components, and process involved and the interfaces with other plant systems;

(4) An evaluation of the change which shows the predicted quantity of solid waste that differ from those previously predicted in the license application and amendments;

(5) A comparison of the predicted quantity of radioactive materials in solid waste to the actual quantity for the period in which the changes were made;

(6) An estimate of the exposure to plant operating personnel as a result of the change; and

(7) Documentation of the fact that the change was reviewed and found acceptable by the On-Site Review Function.

b. The change shall become effective upon review and acceptance by the On-Site Review Function.

c. The changes may be made by submitting this information as part of the annual RUFSAR update.

d. All references to the Stock Solidification System have been deleted from the PCP, as Dresden presently uses a Vendor Solidification Process only. The Stock Solidification System never functioned as intended and because of changing regulations on the solidification PCP, the use of Contract Vendor Services proved to be more cost effective over using the Stock System.

F. PROCEDURE:

1. VENDOR PROCESS SYSTEM(S):

a. DNPS currently uses Commercial, Vendor supplied, processing systems for the processing of the primary liquid LLRW streams generated by the Station.

b. Commonwealth Edison requires that all Vendors used to process liquid LLRW at DNPS must meet all applicable Commonwealth Edison Co. quality standards and shall have submitted a Process System Topical Report to the NRC. Furthermore, the vendor solidification/stabilization media must be approved by the Licensed Burial Sites.

F. 2. LIQUID WASTE PROCESSING SYSTEM:

a. Liquid radwaste processing consists of dewatering, solidification, Vendor supplied filter/process system, or an evaporative process to treat the following waste streams: spent resin, concentrated liquids, sludges, filter media, filter cartridges and oil.

b. Spent ion-exchange resin is collected in the Spent Resin Tank prior to processing for disposal.

(1) Spent resin may originate from any one of the following systems:

- Condensate.
- Fuel Pool.
- Reactor Water Clean Up.
- Floor Drain Processing System.
- Radwaste Equipment Drain Processing Systems.

(2) Resins are allowed to settle in the Spent Resin Tank and then are discharged to the Vendor Processing System via a resin water slurry.

(3) Vendor resin beds are also used for decontamination of plant systems such as the Spent Fuel Pool, RWCU, and SDC. These resins are then handled by the Vendor Processing System.

c. CONCENTRATED WASTES: In general, various drains and sump discharges are collected in Floor Drain Collector Tank and/or Waste Collector Tank for waste treatment.

(1) Water from these tanks can be sent through a filter or demineralizer prior to being sent to the Max Recycle System where it is concentrated utilizing the Max Recycle Concentrator or Vendor supplied processing systems.

(2) The Max Recycle Concentrator boils off the water into a distillate and a concentrate. The distillate is sent to waste Systems for filtration, demineralization and plant re-use OR discharged to the river. The concentrates are periodically discharged to the vendor processing system for waste treatment.

F. 2. d. **FILTER SLUDGES:** Filtering devices using precoat media are used at DNPS in a variety of process streams.

(1) These devices are used primarily for the removal of suspended solids from the liquid waste streams.

(2) The precoat material from these devices are routinely removed from the filter vessel and discharged to a Filter Sludge Tank.

(3) Periodically, the filter sludge is discharged to the Vendor Processing System for waste treatment.

e. **LUBRICANTS AND/OR OILS:** Various lubricants and oils become contaminated as a consequence of normal operating and maintenance activities. These contaminated lubricants/oils are processed for treatment on an as needed basis using a Vendor.

f. **FILTER CARTRIDGES:** Various filter cartridges are dried and placed into a High Integrity Container(s) (HIC) for disposal or are encapsulated in an In-Situ Liner for waste processing.

g. **ACTIVATED HARDWARE:** Activated Hardware is stored in the Spent Fuel Pools.

(1) The waste includes items such as: Control Rods, Fuel Channels, and Nuclear Instrumentation.

(2) These items are processed periodically using remote underwater handling equipment provided by a Vendor.

(3) The waste is then put into a liner for shipment and/or storage.

3. <u>DRY ACTIVE WASTE (DAW):</u>

Dry Active Waste such as paper, wood, plastic, cardboard, hoses, cloth and metals, etc. become contaminated as a consequence of normal operating and maintenance activities.

a. DAW is collected, surveyed and sorted for compatible and non-compatible wastes.

b. Contaminated compatible waste is packaged in containers to facilitate on-site pre-compaction and/or off-site super-compaction or incineration.

c. Contaminated Non-compatible DAW is sorted to provide an efficient handling method for waste treatment.

F. 3. d. In addition, DAW items are surveyed for release when applicable.

4. SECONDARY WASTE STREAMS: Periodically, wastes are generated from such sources as decontaminations, tank cleanings, sump cleanings, dried Sewage Treatment Plant Waste, waste oil and other waste from cleanup of inadvertent contaminations.

a. Wastes generated in this manner are sampled on a batch basis.

b. Appropriate formulas for rationing solidification agent to waste are developed on small bench samples, or if the consistency of the waste is known, from established formulas.

c. Secondary waste streams such as DAW (Dry Active Waste) and activated hardware are packaged and handled as a case by case bases. Samples of the above waste streams are obtained and analyzed by DNPS personnel per approved procedures.

5. INSPECTION: All shipping containers are inspected for compliance with DOT, Station, On-site Storage, and/or burial site requirements prior to use.

a. When applicable, containers of Concentrated Waste, Spent Resin and Sludges, are inspected for quality of solidification and/or dewatering requirements.

b. Dewatering requirements for the Station/Burial Site is <1% free standing water.

(1) If free standing water or poor solidification is observed, then samples of the particular series of batches is taken for root cause determination.

(2) Additional samples may be taken, as warranted, to ensure free standing water and solidification requirements are maintained.

c. Process parameters in use during the production of these containers will be investigated and corrective actions taken as warranted.

6. SHIPMENT: All wastes shipped off site are packaged in DOT approved shipping containers.

a. All transport vehicles must meet the appropriate DOT and NRC requirements prior to loading.

b. Packages are inspected and shipments (vehicles) are inspected for compliance with DOT, NRC and Burial Site criterion prior to leaving the site.

FOR INFORMATION ONLY

G. DISCUSSION:

NONE.

W. WRITER'S REFERENCES:

1. NRC Branch Technical Position on Waste Form.

2. NUREG 0133, Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants - October 1978.

3. Dresden Final Safety Analysis Report, 11.4, Solid Waste Management System.

FOR INFORMATION ONLY

6.9 PROCESS CONTROL PROGRAM (PCP)

A. The PCP shall contain the sampling, analysis, and formulation determination by which solidification of radioactive wastes from liquid systems is assured.

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

C. Licensee initiated changes may be made to the PCP provided the change:

1. Shall be submitted to the Commission in the Semi-Annual Radioactive Effluent Release Report for the period in which the change was made and shall contain:

   a. Sufficiently detailed information to support the change;

   b. A determination that the change did not reduce the overall conformance of the solidified waste product to existing criteria for solid wastes; and

   c. Documentation that the change has been reviewed and found acceptable by the onsite review function.

2. Shall become effective upon review and acceptance by the onsite review function.

FOR INFORMATION ONLY

This page reserved for GENERIC QUAD CITIES ANNEX INDEX

CHAPTER 12.0

All pages in Chapter 12.0 are designated REVISION 1.0

SPECIAL NOTE

Until removal of the Radiological Effluent Technical Specifications has been approved by the Nuclear Regulatory Commission, the requirements of the Technical Specifications shall take precedence over this chapter, should any differences occur.

9402150243 55pp

FOR INFORMATION ONLY

PAGE	REVISION
12 - i	1.0
12 - ii	1.0
12 - iii	1.0
12 - iv	1.0
12 - 1	1.0
12 - 2	1.0
12 - 3	1.0
12 - 4	1.0
12 - 5	1.0
12 - 6	1.0
12 - 7	1.0
12 - 8	1.0
12 - 9	1.0
12 - 10	1.0
12 - 11	1.0
12 - 12	1.0
12 - 13	1.0
12 - 14	1.0
12 - 15	1.0
12 - 16	1.0
12 - 17	1.0
12 - 18	1.0
12 - 19	1.0
12 - 20	1.0
12 - 21	1.0
12 - 22	1.0
12 - 23	1.0
12 - 24	1.0
12 - 25	1.0
12 - 26	1.0
12 - 27	1.0
12 - 28	1.0
12 - 29	1.0
12 - 30	1.0
12 - 31	1.0
12 - 32	1.0
12 - 33	1.0
12 - 34	1.0
12 - 35	1.0
12 - 36	1.0
12 - 37	1.0
12 - 38	1.0
12 - 39	1.0
12 - 40	1.0
12 - 41	1.0
12 - 42	1.0
12 - 43	1.0
12 - 44	1.0
12 - 45	1.0
12 - 46	1.0
12 - 47	1.0
12 - 47	1.0
12 - 49	1.0
12 - 50	1.0
12 - 51	1.0
12 - 52	1.0

FOR INFORMATION ONLY

CHAPTER 12

RADIOACTIVE EFFLUENT TECHNICAL STANDARDS
(RETS)
TABLE OF CONTENTS

FOR INFORMATION ONLY

CHAPTER 12

RADIOACTIVE EFFLUENT TECHNICAL STANDARDS (RETS) LIST OF TABLES

* At present, there is no Table 12.3-2 in this chapter.

FOR INFORMATION ONLY

12.1 Definitions

12.1.1 Channel Calibration - A Channel Calibration shall be the adjustment, as necessary, of the Channel output such that it responds with the necessary range and accuracy to known values of the parameter which the Channel monitors. The Channel Calibration shall encompass the entire Channel including the sensor and alarm and/or trip functions, and shall include the Channel Functional Test. The Channel Calibration may be perfomed by any series of sequential, overlapping or total Channel steps such that the entire Channel is calibrated.

12.1.2 Channel Check - A Channel Check shall be the qualitative assessment of Channel behavior during operation by observation. This determination shall include, where possible, comparison of the Channel indication and/or status with other indications and/or status derived from independent instrument Channels measuring the same parameter.

12.1.3 Channel Function Test - A Channel Functional Test shall be:

a. Analog Channels - the injection of a simulated signal into the Channel as close to the sensor as practicable to verify Operability including alarm and/or trip functions and Channel failure trips.

b. Bistable Channels - the injection of a simulated signal into the sensor to verify Operability including alarm and/or trip functions.

The Channel Functional Test may be performed by any series of sequential, overlapping or total Channel steps such that the entire Channel is tested.

12.1.4 Dose Equivalent I-131 - Dose Equivalent I-131 is 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 Table III of TID-14844, "Calculation of Distance Factors For Power and Test Reactor Sites."

12.1.5 Hot Standby - Hot standby means operation with the reactor critical, system pressure less than 1060 psig, the main steam isolation valves closed, and thermal power not exceeding 15%.

12.1.6 Immediate - Immediate means that the required action will be initiated as soon as practicable considering the safe operation of the unit and the importance of the required action.

12.1.7 Member(s) of the Public - Members of the Public means an individual in a controlled or unrestricted area. However, an individual is not a member of the public during any period in which the individual receives an occupational dose.

12.1.8 Modes Switch Interlock - A reactor mode switch selects the proper interlocking for the operating or shutdown condition of the plant. Following are the reactor mode switch positions and interlocks provided:

1. Shutdown - In this position, a reactor scram is initiated, power to the control rod drives is removed, and the reactor protection trip systems have been deenergized for 10 seconds prior to permissive for manual reset.

2. Refuel - In this position, interlocks are established so that one control rod only may be withdrawn when flux amplifiers are set at the proper sensitivity level and the refueling crane is not over the reactor. Also the trips from the turbine control valves, turbine stop valves, main steam isolation valves, and condenser vacuum are bypassed. If the refueling crane is over the reactor, all rods must be fully inserted and none can be withdrawn.

3. Startup/Hot Standby - In this position, the reactor protection scram trips, initiated by condenser low vacuum and main steamline isolation valve closure, are bypassed, the low pressure main steamline isolation valve closure trip is bypassed, and the reactor protection system is energized, with IRM and APRM neutron monitoring system trips and control rod withdrawal interlocks in service.

4. Run - In this position, the reactor system pressure is at or above 825 psig and the reactor protection system is energized with the APRM protection and RBM interlocks in service (excluding the 15% high flux scram).

12.1.9 Offsite Dose Calculation Manual (ODCM) - The Offsite Dose Calculation Manual shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring Alarm/Trip Setpoints, and in the conduct of the Radiological Environmental Monitoring Program. The ODCM shall also contain (1) the Radioactive Effluent Controls and Radiological Environmental Monitoring Programs required by Sections 12-5 and (2) descriptions of the information that should be included in the Radioactive Effluent Release Reports and in the Annual Radiological Environmental Operating Reports required by Sections 12.6.2.1 and 12.6.2.2.

FOR INFORMATION ONLY

12.1.10 Operable - Operability - A system, subsystem, train, component, or device shall be Operable or have Operability when it is capable of performing its specified function(s). Implicit in this definition shall be the assumption that is necessary attendant instrumentation, controls, normal and energency electrical power sources, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component or device to perform its function(s) are also capable of performing their related support function(s).

12.1.11 Operating - Operating means that a system, subsystem, train, component or device is performing its intended functions in its required manner.

12.1.12 Operating Cycle - Operating Cycle is the interval between the end of one Refueling Outage for a particular unit and the end of the next subsequent Refueling Outage for the same unit.

12.1.13 Process Control Program (PCP) - The Process Control Program shall contain the current formulas, sampling, analyses, test, and determinations to be made to ensure that 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 10CFR Parts 20, 61, and 71, State regulations, burial ground requirements, and other requirements governing the disposal of solid radioactive waste.

12.1.14 Protective Instrumentation Definitions - Protective instrumentation definitions are as follows:

a. Channel - A Channel is an arrangement of a sensor and associated components used to evaluate plant variables and produce discrete outputs used in logic. A Channel terminates and loses its identity where individual Channel outputs are combined in a logic.

b. Trip System - A Trip System means an arrangement of instrument Channel trip signals and auxiliary equipment required to initiate action to accomplish a protective trip function. A Trip System may require one or more instrument Channel trip signals related to one or more plant parameters in order to initiate Trip System action. Initiation of Protective Action may require the tripping of a single Trip System or the coincident tripping of two Trip Systems.

c. Protective Action - An action initiated by the protection system when a limit is reached. A Protective Action can be at the Channel or system level.

FOR INFORMATION ONLY

d. Protective Function - A system protective action which results form the Protective Action of the Channels monitoring a particular plant condition.

12.1.15 Rated Thermal Power - Rated Thermal Power means a steady- state power level of 2511 thermal megawatts.

12.1.16 Reactor Power Operation - Reactor Power Operation is any operation with the mode switch in the Startup/Hot Standby or Run position with the reactor critical and above 1% Rated Thermal Power.

12.1.17 Reactor Vessel Pressure - Reactor Vessel Pressures listed in the Technical Specifications, unless otherwise indicated, are those measured by the reactor vessel steam space detector.

12.1.18 Refueling Outage - Refueling Outage is the period of time between the shutdown of the unit prior to a refueling and startup of the plant subsequent to that refueling. For the purpose of designating frequency of testing and surveillance, a Refueling Outage shall mean a regularly scheduled Refueling Outage; however, where such outages occur within 8 months of the completion of the previous Refueling Outage, the required surveillance testing need not be performed until the next regularly scheduled outage.

12.1.19 Source Check - Source Check is the qualitative assessment of instrument response when the sensor is exposed to a radioactive source.

12.1.20 Definitions Related to Estimating Dose to the Public Using the Appendix I Computer Program:

a. Actual - Refers to using known release data to project the dose to the public for the previous month. This data is stored in the database and used to demonstrate compliance with the reporting requirements of Chapter 12.

b. Projected - Refers to using known release data from the previous month or estimated release data to forecast a future dose to the public. This data is NOT incorporated into the database.

FOR INFORMATION ONLY

This page is intentionally left blank.

FOR INFORMATION ONLY

12.2 INSTRUMENTATION

12.2.1.A Radioactive Liquid Effluent Instrumentation Operability

Applicability: Applies to radioactive effluents from the plant.

The effluent monitoring instrumentation shown in Table 12.2.1 shall be operable with alarm setpoints set to ensure that the limits of Section 12.3 are not exceeded. The alarm setpoints shall be determined in accordance with Section 10.2.

1. With a radioactive liquid effluent monitoring instrument alarm/trip setpoint less conservative than required, without delay suspend the release of radioactive liquid effluents monitored by the affected instrument, or declare the instrument inoperable, or change the setpoint so it is acceptably conservative.

2. With one or more radioactive liquid effluent monitoring instruments inoperable, take the action shown in Table 12.2-1. Exert best efforts to return the instrument 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.

12.2.1.B Radioactive Liquid Effluent Instrumentation Surveillance

Applicability: Applies to the periodic measurements of radioactive effluents.

Each radioactive liquid effluent monitoring instrument shown in Table 12.2-2 shall be demonstrated operable by performance of the given source check, instrument check, calibration, and functional test operations at the frequencies shown in Table 12.2-2.

FOR INFORMATION ONLY

12.2.1.A Radioactive Liquid Effluent Instrumentation Operability	12.2.1.B Radioactive Liquid Effluent Instrumentation Surveillance
3. In the event a limiting condition for operation and associated action requirements cannot be satisfied because of circumstances in excess of those addressed in the specifications, provide a 30-day written report to the NRC and no changes are required in the operational condition of the plant, and this does not prevent the plant from entry into an operational mode.	

FOR INFORMATION ONLY

12.2.2.A Radioactive Gaseous Effluent Instrumentation Operability

The effluent monitoring instrumentation shown in Table 12.2-3 shall be operable with alarm/trip setpoints set to ensure that the limits of Section 12.4 are not exceeded. The alarm/trip setpoints shall be determined in accordance with the Section 10.1.

1. With a radioactive gaseous effluent monitoring instrument alarm/trip set point less conservative than required, without delay suspend the release of radioactive gaseous effluents monitored by the affected instrument, or declare the instrument inoperable, or change the setpoint so it is acceptably conservative.

2. With one or more radioactive gaseous effluent monitoring instruments inoperable, take the action shown in Table 12.2-3. Exert best efforts to return the instrument 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. This is in lieu of an LER.

3. In the event a limiting condition for operation and associated action requirements cannot be satisfied because of circumstances in excess of those addressed in the specifications, provide a 30-day written report to the NRC and no changes are required in the operational condition of the plant, and this does not prevent the plant from entry into an operational mode.

12.2.2.B Radioactive Gaseous Effluent Instrumentation Surveillance

Each radioactive gaseous radiation monitoring instrument in Table 12.2-4 shall be demonstrated operable by performance of the given source check, instrument check, calibration, and functional test operations at the frequency shown in Table 12.2-4.

FOR INFORMATION ONLY

TABLE 12.2-1

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

Minimum No. of Operable Channels	Total No. of Channels	Parameter	Action[1]
1	1	Service Water Effluent Gross Activity Monitor	A
1	1	Liquid Radwaste Effluent Flow Rate Monitor	C
1	1	Liquid Radwaste Effluent Gross Activity Monitor	B

Notes

Action A: With less than the minimum number of operable channels, releases via this pathway may continue, provided that at least once per 12 hours grab samples are collected and analyzed for beta or gamma activity at an LLD of less than or equal to 10^{-7} uCi/ml.

Action B: With less than the minimum number of operable channels, effluent releases via this pathway may continue, provided that prior to initiating a release, at least 2 independent samples are analyzed in accordance with Section 12.3.A.1, and at least 2 members of the facility staff independently verify the release calculation and discharge valving. Otherwise, suspend release of radioactive effluents via this pathway.

Action C: With less than the minimum number of operable channels, releases via this pathway may continue, provided the flow rate is estimated at least once per 4 hours during actual releases. Pump curves may be utilized to estimate flow.

FOR INFORMATION ONLY

TABLE 12.2-2

RADIOACTIVE LIQUID EFFLUENT MONITORING
INSTRUMENTATION SURVEILLANCE REQUIREMENTS

Instrument	Instrument Check(1)	Calibration(1)(3)	Functional Test(1)(2)	Source Check(1)
Liquid Radwaste Effluent Gross Activity Monitor	D	R	Q (7)	(6)
Service Water Effluent Gross Activity Monitor	D	R	Q (7)	R
Liquid Radwaste Effluent Flow Rate Monitor	(4)	R	NA	NA

Notes

(1) D = once per 24 hours
M = once per 31 days
Q = once per 92 days
R = once per 18 months
S = once per 6 months

(2) The Instrument Functional Test shall also demonstrate that control room alarm annunciation occurs, if any of the following conditions exist, where applicable.

a. Instrument indicates levels above the alarm setpoints.
b. Circuit failure.
c. Instrument indicates a downscale failure.
d. Instrument controls not set in OPERATE mode.

(3) Calibration shall include performance of a functional test.

(4) Instrument Check to verify flow during periods of release.

(5) Calibration shall include performance of a source check.

(6) Source check shall consist of observing instrument response during a discharge.

(7) Functional test may be performed by using trip check and test circuitry associated with the monitor chassis.

FOR INFORMATION ONLY

TABLE 12.2-3

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

Minimum No. of Operable Channels[1]	Total No. of Channels	Parameter	Action [2]
1	2	SJAE Radiation Monitors	D
1	2	Main Chimney Noble Gas Activity Monitor	A
1	1	Main Chimney Iodine Sampler	C
1	1	Main Chimney Particulate Sampler	C
1	1	Reactor Bldg. Vent Sampler Flow Rate Monitor	B
1	1	Reactor Bldg. Vent Iodine Sampler	C
1	1	Reactor Bldg. Vent Particulate Sampler	C
1	1	Main Chimney Sampler Flow Rate Monitor	B
1	1	Main Chimney Flow Rate Monitor	B
1	2	Reactor Bldg. Vent Noble Gas Monitor	E
1	1	Main Chimney High Range Noble Gas Monitor	F

Notes

(1) For SJAE monitors, applicable during SJAE operation. For other instrumentation, applicable at all times.

(2) Action A: With the number of operable channels less than the minimum requirement, effluent releases via this pathway may continue, provided grab samples are taken at least once per 8 hour shift and these samples are analyzed within 24 hours.

FOR INFORMATION ONLY

TABLE 12.2-3 (Con't)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

Action B: With the number of operable channels less than the minimum required, effluent releases via this pathway may continue provided that the flow rate is estimated at least once per 4 hours.

Action C: With less than the minimum channels operable, effluent releases via this pathway may continue provided samples are continuously collected with auxiliary sampling equipment, as required in Table 12.4-1.

Action D: With less than the minimum channels operable, gases from the main condenser off gas system may be released to the environment for up to 72 hours provided at least one chimney monitor is operable; otherwise, be in hot stand-by in 12 hours.

Action E: With less than the minimum channels operable, immediately suspend release of radioactive effluents via this pathway.

Action F: With less than the minimum channels operable, initiate the preplanned alternate method of monitoring the appropriate parameter(s) within 72 hours, and:

(1) either restore the inoperable channel(s) to operable status within 7 days of the event, or

(2) prepare and submit a Special Report to the Commission within 30 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to operable status.

FOR INFORMATION ONLY

TABLE 12.2-4

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

Instrument	Mode(2)	Instrument Check(1)	Calibration(1)(4)	Functional Test(1)(3)	Source Check(1)
Main Chimney Noble Gas Activity Monitor	B	D	R	Q	M
Main Chimney Sampler Flow Rate Monitor	B	D	R	Q[6]	NA
Reactor Bldg. Vent Sampler Flow Rate Monitor	B	D	R	Q[6]	NA
Main Chimney Flow Rate Monitor	B	D	R	Q	NA
Reactor Bldg Vent Activity Monitor	B	D	R	Q	Q
SJAE	A	D	R	Q	R
Main Chimney Iodine and Particulate Sampler	B	D[5]	NA	NA	NA
Reactor Bldg. Vent Iodine and Particulate Sampler	B	D[5]	NA	NA	NA
Main Chimney High Range Noble Gas Monitor	B	D[5]	R	Q	M

Notes

(1) D = once per 24 hours
M = once per 31 days
Q = once per 92 days
R = once per 18 months

(2) A = during SJAE operation
B = at all times

(3) The Instrument Functional Test shall also demonstrate that control room alarm annunciation occurs, if any of the following conditions exist, where applicable:

a. Instrument indicates levels above the alarm setpoint
b. Circuit failure
c. Instrument indicates a downscale failure
d. Instrument controls not set in OPERATE mode

FOR INFORMATION ONLY

TABLE 12.2-4 (cont'd)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

(4) Calibration shall include performance of a functional test.

(5) Instrument check to verify operability of the instrument; that the instrument is in place and functioning properly.

(6) Functional test shall be performed on local switches providing low flow alarm.

FOR INFORMATION ONLY

12.2.C LIQUID AND GASEOUS EFFLUENTS INSTRUMENTATION BASES

1. The radioactive liquid and gaseous effluent instrumentation is provided to monitor the release of radioactive materials in liquid and gaseous effluents during releases. The alarm setpoints for the instruments are provided to ensure that the alarms will occur prior to exceeding the limits of RETS and 10 CFR 20.

FOR INFORMATION ONLY

12.3.A Liquid Effluents Limits and Reporting

1. The concentration of radioactive material released form the site to unrestricted areas (at or beyond the site boundary, see Quad Cities Station ODCM Annex, Appendix F, Figure F-1) shall be limited to the concentrations specified in 10 CFR Part 20, Appendix B, Table 11, Column 2 with the Table 12.3-1 values representing the MPC's for noble gases.

   With the concentration of radioactive material released from the site to unrestricted areas exceeding the above limits, without delay decrease the release rate of radioactive materials and/or increase the dilution flow rate to restore the concentration to within the above limits.

2. The dose or dose commitment above background to a member of the public from radioactive materials in liquid effluents released to unrestricted areas (at or beyond the site boundary) from the site shall be limited to the following:

   a. During any calendar quarter:

      (1) Less than or equal to 3 mrem to the whole body.

      (2) Less than or equal to 10 mrem to any organ.

12.3.B Liquid Effluents Surveillance

1. The concentration of radioactive material in unrestricted areas shall be determined to be within the prescribed limits by obtaining the representative samples in accordance with the sampling and analysis program specified in Table 12.3-3. The sample analysis results will be used with the calculational methods in the ODCM to determine that the concentrations are within the limits of Specification 12.3.A.1.

2. a. The dose contributions from measured quantities of radioactive material shall be determined by calculation at least once per 31 days and a cumulative summation of these total body and organ doses shall be maintained for each calendar quarter.

12.3.A Liquid Effluents Limits and Reporting

3 b. During any calendar year:

(1) Less than or equal to 6 mrem to the whole body.

(2) Less than or equal to 20 mrem to any organ.

c. With the calculated dose from the release of radioactive materials in liquid effluents exceeding any of the above limits, prepare and submit to the Commission within 30 days a Special Report which identifies the cause(s) for exceeding the limit(s) and defines the corrective actions taken and the proposed actions to be taken to ensure that future releases are in compliance with 12.3.A.2.a & b. This is in lieu of a Licensee Event Report.

d. With the calculated dose from the release of radioactive materials in liquid effluents exceeding the limits of Specification 12.3.A.2.a. or 12.3.A.2.b., prepare and submit a Special Report to the Commission within 30 days and limit the subsequent releases such that the dose or dose commitment to a member of the public from

12.3.B Liquid Effluents Surveillance

b. Doses computed at the nearest community water system will consider only the drinking water pathway and shall be projected using the methods prescribed in the ODCM at least once per 92 days.

12.3.A Liquid Effluents Limits and Reporting	12.3.B Liquid Effluents Surveillance
all uranium fuel cycle sources is limited to less than or equal to 25 mrem to the total body or any organ (except thyroid, which is limited to less than or equal to 75 mrem) over 12 consecutive months. This Special Report shall include an analysis which demonstrates that radiation exposures to all members of the public from all uranium fuel cycle sources (including all effluent pathways and direct radiation) are less than the 40 CFR Part 190 Standard. Otherwise obtain a variance from the Commission to permit releases which exceed the 40 CFR Part 190 Standard. The radiation exposure analysis contained in the Special Report shall use methods prescribed in the ODCM. This report is in lieu of a Licensee Event Report.	
3 e. With the projected annual whole body or any internal organ dose computed at the nearest downstream community water system is equal to or exceeds 2 mrem from all radioactive materials released in liquid effluents from the Station, prepare and submit a Special Report within 30 days to the operator of the community water system.	

12.3.A Liquid Effluents Limits and Reporting	12.3.B Liquid Effluents Surveillance
The report is prepared to assist the operator in meeting the requirements of 40 CFR 141: EPA Primary Drinking Water Standards. A copy of this report will be sent to the NRC. This is in lieu of a Licensee Event Report.	
3. At all times during processing prior to discharge to the environs, process and control equipment provided to reduce the amount or concentration of radioactive materials shall be operated when the projected dose due to liquid effluent releases to unrestricted areas (see Figure 12.5-1), when averaged over 31 days, exceeds 0.13 mrem to the total body or 0.42 mrem to any organ.	3. Liquid Waste Treatment a. Doses due to liquid releases to unrestricted areas (at or beyond the site boundary) shall be projected at least once per 31 days in accordance with ODCM.
4. If liquid waste has to be or is being discharged without treatment as required above, prepare and submit to the Commission within 30 days, a report which includes the following information: a. Identification of the defective equipment. b. Cause of the defective equipment. c. Action(s) taken to restore the equipment to an operating status. d. Length of time the above requirements were not satisfied.	

FOR INFORMATION ONLY

12.3.A Liquid Effluents Limits and Reporting

5. In the event a limited and/or associated action requirements identified in Sections 12.3.A and 12.3.B cannot be satisfied because of circumstances in excess of those addressed in this Section, no changes are required in the operational condition of the plant, and this does not prevent the plant from entry into an operational mode.

FOR INFORMATION ONLY

TABLE 12.3-1

ALLOWABLE CONCENTRATION OF DISSOLVED OR ENTRAINED NOBLE GASES RELEASED FROM THE SITE TO UNRESTRICTED AREAS IN LIQUID WASTE

NUCLIDE	AC(uCi/ml)*
Kr-85m	2×10^{-4}
Kr-85	5×10^{-4}
Kr-87	4×10^{-5}
Kr-88	9×10^{-5}
Ar-41	7×10^{-5}
Xe-131m	7×10^{-4}
Xe-133m	5×10^{-4}
Xe-133	6×10^{-4}
Xe-135m	2×10^{-4}
Xe-135	2×10^{-4}

* Computed from Equation 20 of ICRP Publication 2 (1959), adjusted for infinite cloud submersion in water, and R = 0.01 rem/week, density = 1.0 g/cc abd Pw/Pt = 1.0.

FOR INFORMATION ONLY

TABLE 12.3-3
RADIOACTIVE LIQUID WASTE SAMPLING
AND ANALYSIS PROGRAM

LIQUID RELEASE TYPE	SAMPLING FREQUENCY	MINIMUM ANALYSIS FREQUENCY	TYPE OF ACTIVITY ANALYSIS	LOWER LIMIT OF DETECTION (LLD) (uci/ml)
A. Batch Waster Release Tanks	Prior to Each Batch	Prior to Each Batch	Principal Gamma Emitters[e]	$5x10^{-7}$
			I-131	$1x10^{-6}$
	Prior to Each Batch	M Composite[b]	Gross Alpha	$1x10^{-7}$
			H-3	$1x10^{-5}$
	Prior to Each Batch	Q Composite[b]	Fe-55	$1x10^{-6}$
			Sr-89, Sr-90	$5x10^{-8}$
	Prior to One Batch/M	M	Dissolved & Entrained Gases[f] (Gamma Emitters)	$1x10^{-5}$
B. Plant Continuous Releases	M[c] (Grab Sample)	M[c]	I-131	$1x10^{-6}$
			Principle Gamma Emitters[e]	$5x10^{-7}$
			Dissolved and Entrained Gases[f] (Gamma Emitters)	$1x10^{-5}$
			H-3	$1x10^{-5}$
			Gross Alpha	$1x10^{-7}$
	Q[c] (Grab Sample)	Q[c]	Sr-89, Sr-90	$5x10^{-8}$
			Fe-55	$1x10^{-6}$

FOR INFORMATION ONLY

TABLE 12-3-3 (Continued)

RADIOACTIVE LIQUID WASTE SAMPLING
AND ANALYSIS PROGRAM

TABLE NOTATION

a. The LLD is defined in Notation A of Table 11-3.

b. A composite sample is one in which the quantity of liquid samples is proportional to the quantity of liquid waste discharged and in which the method of sampling employed results in a specimen which is representative of the liquids released.

c. If the alarm setpoint of the service water effluent monitor as determined in the ODCM is exceeded, the frequency of analysis shall be increased to daily until the condition no longer exists.

d. A batch release is the discharge of liquid wastes of a discrete volume. Prior to sampling for analyses, each batch shall be isolated then thoroughly mixed to assure representative sampling. A continuous release is the discharge of liquid wastes of a nondiscrete volume; e.g., from a volume or system that has an input flow during the release.

e. The principal gamma emitters for which the LLD specification applies exclusively are the following radionuclides: Mn-54, Fe-59, Co-60, Zn-65, Co-58, Mo-99, Cs-134, Cs137, Ce-141, and Ce-144. Other peaks which are measurable and identifiable by gamma ray spectrometry together with the above nuclides, shall be also identified and reported when the actual analysis is performed on a sample. Nuclides which are below the LLD for the analyses shall not be reported as being present at the LLD level for that nuclide.

f. The dissolved and entrained gases (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. Other dissolved and entrained gases (gamma emitters) which are measurable and identifiable by gamma-ray spectrometry, together with the above nuclides, shall also be identified and reported when an actual analysis is performed on a sample. Nuclides which are below the LLD for the analyses shall not be reported as being present at the LLD level for that nuclide.

FOR INFORMATION ONLY

12.3.C LIQUID EFFLUENTS BASES

1. Concentration

This specification is provided to ensure that the concentration of radioactive materials released in liquid waste effluents from the site to unrestricted areas will be less than the concentration levels specified in Appendix B, Table 2, Column 2 to 10CFR20.1001 - 20.2402. The concentration limit for noble gases was converted to an equivalent concentration in water using the International Commission on Radiological Protection (ICRP) Publication 2.

2. Dose

This specification is provided to implement the requirements of Sections II.A, III.A and IV.A of Appendix I, 10 CFR Part 50. The Limiting Condition for Operation implements the guides set forth in Section II.A of Appendix I. The statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive material in 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 calculational procedures based on models and data such that the actual exposure of an individual through appropriate pathways is unlikely to be substantially underestimated. The equations specified in the ODCM for calculating the doses due to the actual release rates of radioactive materials in liquid effluents will be consistent with the methodology provided in Regulatory Guide 1.109, "Calculation of Annual doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I", Revision 1, October 1977 and Regulatory Guide 1.113, "Estimating Aquatic Dispersion of Effluents from Accidental and Routine Reactor Releases for the Purpose of Implementing Appendix I", April 1977. NUREG-0113 provides methods for dose calculations consistent with Reg Guide 1.109 and 1.113.

FOR INFORMATION ONLY

12.3.C LIQUID EFFLUENTS BASES (CONT.)

3. Liquid Waste Treatment

The operability of the liquid radwaste treatment system ensures that this system will be available for use whenever liquid effluents require treatment prior to release to the environment. The requirement that the appropriate portions of this system be used when specified provides assurance that the releases of radioactive materials in liquid effluents will be kept "as low as is reasonably achievable". This specification implements the requirements of 10 CFR Part 50.36a, General Design Criterion 60 of Appendix A to 10 CFR Part 50 and design objective Section 11.D of Appendix I to 10 CFR Part 50.

FOR INFORMATION ONLY

12.4 Gaseous Effluents

12.4.A. Gaseous Effluents Limits and Reporting

1. The dose rate in unrestricted areas (at or beyond the site boundary, see Quad Cities Station ODCM Annex, Appendix F, Figure F-1) due to radioactive materials released in gaseous effluents from the site shall be limited to the following:

   a. For Noble Gases:

      (1) Less than 500 mrem/ year to the whole body.

      (2) Less than 3000 mrem/ year to the skin.

   b. For iodine-131, for iodine 133, and for all radionuclides in particulate form with half-lives greater than 8 days less than 1500 mrem/year.

12.4.B Gaseous Effluents Surveillance

1. The dose rates due to radioactive materials released in gaseous effluents from the site shall be determined to be within the prescribed limits by obtaining representative samples in accordance with the sampling and analysis program specified in Table 12.4-1. The dose rates are calculated using methods prescribed in the Off-Site Dose Calculation Manual (ODCM).

FOR INFORMATION ONLY

12.4.A. Gaseous Effluents Limits and Reporting	12.4.B Gaseous Effluents Surveillance
c. If the dose rates exceed the above limits, without delay decrease the release rates to bring the dose rates within the limits, and to provide prompt notification to the Commission (12.6.2.1)	
2. The air dose in unrestricted areas (at or beyond the site boundary) due to Noble Gases released in gaseous effluents from the unit shall be limited to the following:	2. The air dose due to releases of radioactive noble gases in gaseous effluents shall be determined to be within the prescribed limits by obtaining representative samples in accordance with the sampling and analysis program specified in sections A and B of Table 12.4-1. The allocation of effluents between units having shared effluent control systems and the air doses are determined using methods prescribed in the ODCM at least once every 31 days.
a. For gamma radiation:	
(1) Less than or equal to 5 mrad during any calendar quarter.	
(2) Less than or equal to 10 mrad during any calendar year.	
b. For Beta radiation:	
(1) Less than or equal to 10 mrad during any calendar quarter.	
(2) Less than or equal to 20 mrad during any calendar year.	

FOR INFORMATION ONLY

12.4.A. Gaseous Effluents Limits and Reporting	12.4.B Gaseous Effluents Surveillance
2 c. With the calculated air dose from radioactive noble gases in gaseous effluents exceeding any of the above limits, prepare and submit to the Commission within 30 days, a Special Report which identifies the cause(s) for exceeding the limit(s) and defines the corrective actions to be taken to ensure that future releases are in compliance with 12.4.A.2.a & b. This is in lieu of a Licensee Event Report.	
d. With the calculated air dose from radioactive noble gases in gaseous effluents exceeding the limits of Specification 12.4.A.2.a. or 12.4.A.2.b., prepare and submit a Special Report to the Commission within 30 days and limit the subsequent releases such that the doses or dose committment to a member of the public from all uranium fuel cycle sources is limited to less than or equal to 25 mrem to the total body or any organ (except thyroid, which is limited to less than or equal to 75 mrem) over 12 consecutive months. This Special Report shall include an analysis which demonstrates that radiation exposure to all members of the public from all uranium fuel cycle sources (including all effluent pathways and direct	

12.4.A. Gaseous Effluents Limits and Reporting	12.4.B Gaseous Effluents Surveillance
radiation) are less than the 40 CFR Part 90 Standard. Otherwise, obtain a variance from the Commission to permit releases which exceed the 40 CFR Part 190 Standard. The radiation exposure analysis contained in the Special Report shall use the methods prescribed in the ODCM. This report is in lieu of a Licensee Event Report.	
3. The dose to a member of the public in unrestricted areas (at or beyond the site boundary) from iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released from the unit shall be limited to the following:	3. The dose to a member of the public due to releases of iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days shall be determined to be within the prescribed limits by obtaining representative samples in accordance with the sampling and analysis program specified in Table 12.4-1. For radionuclides not determined in each batch or weekly composite, the dose contribution to the current calendar quarter cumulative summation may be estimated by assuming an average monthly concentration based on the previous monthly or quarterly composite analyses. However, for reporting purposes, the calculated dose contributions shall be based on the actual composite analyses when possible. The allocation of effluents between units having shared effluent control systems and the doses are determined using the methods prescribed in the ODCM at least once every 31 days.

FOR INFORMATION ONLY

12.4.A. Gaseous Effluents Limits and Reporting	12.4.B Gaseous Effluents Surveillance
3 a. Less than or equal to 7.5 mrem to any organ during any calendar quarter.	
b. Less than or equal to 15 mrem to any organ during any calendar year.	
c. With the calculated dose from the release of iodine131, iodine-133, tritium, and all radionuclides in particulate form with halflives greater than 8 days in gaseous effluents exceeding any of the above limits, prepare and submit to the Commission within 30 days, a Special Report which identifies the cause(s) for exceeding the limit and defines the corrective actions taken and the proposed actions to be taken to ensure that future releases are in compliance with 12.4.A.3.a & 12.4.A.3.b. This is in lieu of a Licensee Event Report.	
d. With the calculated dose from the release of iodine131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents exceeding the limits of Section 12.4.A.3a. or 12.4.A.3b., prepare and submit a Special Report to the Commission within 30 days and limit subsequent releases such that the dose or dose commitment to a member of the public from	

FOR INFORMATION ONLY

12.4 A. Gaseous Effluents Limits and Reporting	12.4.B Gaseous Effluents Surveillance
all uranium fuel cycle sources is limited to less than or equal to 25 mrem to the total body or organ (except the thyroid, which is limited to less than or equal to 75 mrem) over 12 consecutive months. This Special Report shall include an analysis which demonstrates that radiation exposures to all members of the public from all uranium fuel cycle sources (including all effluent pathways and direct radiation) are less than the 40 CFR Part 190 Standard. Otherwise, obtain a variance from the Commission to permit releases which exceed the 40 CFR Part 190 Standard. The radiation exposure analysis contained in the Special Report shall use the methods prescribed in the ODCM. This report is in lieu of a Licensee Event Report.	
4. Off-gas System	4. Off-gas System
a. At all times during processing for discharge to the environs, process and control equipment provided to reduce the amount or concentration of radioative materials shall be operated.	Doses due to treated gases released to unrestricted areas at or beyond the site boundary shall be projected at least once per 31 days in accordance with the ODCM.
b. The above specification shall not apply for the Off-Gas Charcoal Adsorber Beds below 30 percent of rated thermal power.	

FOR INFORMATION ONLY

12.4.A. Gaseous Effluents Limits and Reporting

5.	The release rate of the sum of the activities from the noble gases measured at the main condenser air ejector shall be limited to less than or equal to 100 microcuries/sec per MWt (after 30 minutes decay) at all times. With the release rate of the sum of the activities from noble gases at the main condenser air ejector exceeding 100 microcuries/sec per MWt (after 30 minutes decay), restore, the release rate to within its limits within 72 hours, or be in at least HOT STANDBY within the next 12 hours.	5.	The radioactivity rate of noble gases at (near) the outlet of the main condenser air ejector shall be continuously monitored in accordance with Specification 12.2.2.A. The release rate of the sum of the activities from nolble gases from the main condenser air ejector shall be determined to be within the limits of Specification 12.4.A.5 at the following frequencies by performing an isotope analysis of a representative sample of gases taken at the recombiner outlet, or at the air ejector outlet if the recombiner is bypassed.
		a.	At least once per 31 days.
		b.	Within 4 hours following an increase, as indicated by the main condenser air ejector noble gas activity monitor, of greater than 50%, after factoring out increases due to changes in thermal power level and off-gas flow, in the nominal steady-state fission gas release from the primary coolant.
6.	In the event a limit and/or associated action requirement identified in Sections 12.4.A and 12.4.B cannot be satisfied because of circumstances in excess of those addressed in this Section, no changes are required in the operational condition of the plant, and this does not prevent the plant from entry into an operational mode.		

FOR INFORMATION ONLY

TABLE 12.4-1

RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS PROGRAM

GASEOUS RELEASE TYPE	SAMPLING FREQUENCY	MINIMUM ANALYSIS FREQUENCY	TYPE OF ACTIVITY ANALYSIS	LOWER LIMIT OF DETECTION (LLD) (uCi/ml)
A. Main Chimney Reactor Bldg. Vent Stack	M Grab Sample	M[b]	Principal Gamma Emitters[e]	$1x10^{-4}$
		M	Tritium	$1x10^{-6}$
B. All Release Types as Listed in A Above	Continuous (d)	W[c] Charcoal Sample	I-131	$1x10^{-12}$
			I-133	$1x10^{-10}$
	Continuous (d)	W[c] Particulate Sample	Principal Gamma Emitters[e] (I-131, others)	$1x10^{-11}$
	Continuous (d)	Q Composite Particulate Sample	SR-89	$1x10^{-11}$
			SR-90	$1x10^{-11}$
	Continuous (d)	M Composite Particulate Sample	Gross Alpha	$1x10^{-11}$
C. Main Chimney	Continuous (d)	Noble Gas Monitor	Noble Gases	$1x10^{-6}$
D. Reactor Bldg. Vent Stack	Continuous (d)	Noble Gas Monitor	Noble Gases	$1x10^{-4}$

FOR INFORMATION ONLY

TABLE 12.4-1 (Continued)
TABLE NOTATION

a. The lower limit of detection (LLD) is defined in table notation A. of Table 12.5-3.

b. Sampling and analyses shall also be performed following shutdown, startup, or a thermal power change exceeding 20 percent of rated thermal power in 1 hour unless (1) analysis shows that the DOSE EQUIVALENT I-131 concentration in the primary coolant has not increased more than a factor of 5, and (2) the noble gas activity monitor shows that effluent activity has not increased by more than a factor of 3.

c. Samples shall be changed at least once per 7 days and the analyses completed within 48 hours after removal from the sampler. Sampling shall also be performed within 24 hours following each shutdown, startup, or thermal power level change exceeding 20% of rated thermal power in one hour. This requirement does not apply if (1) analysis shows that the DOSE EQUIVALENT I-131 concentration in the primary coolant has not increased more than a factor of 5, and (2) the noble gas activity monitor shows that effluent activity has not increased by more than a factor of 3. When samples collected for 24 hours are analyzed, the corresponding LLD's may be increased by a factor of 10.

d. The ratio of sample flow rate to the sampled stream flow rate shall be known.

e. 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, and Mn-54, Fe-59, Co-60, Zn-65, Co-58, Mo-99, Cs-134, Cs-137, Ce141, and Ce-144 for particulate emissions. Other peaks which are measurable and identifiable by gamma ray spectrometry, together with the above nuclides, shall be also identified and reported when an actual analysis is performed on a sample. Nuclides which are below the LLD for the analyses shall not be reported as being present at the LLD level for that nuclide.

FOR INFORMATION ONLY

12.4.C. GASEOUS EFFLUENTS BASES

1. Gaseous Effluents Dose

This specification is provided to ensure that the dose at the unrestricted area boundary from gaseous effluents from the units on the site will be within the annual dose limits of 10CFR20. These limits provide reasonable assurance that radioactive material discharged in gaseous effluents will not result in the exposure of an individual in an unrestricted area to annual average concentrations exceeding the limits specified in Appendix B, Table 2 of 10CFR20. The specified release rate limits restrict, at all times, the corresponding gamma and beta dose rates above background to an individual at or beyond the unrestricted area boundary to less than or equal to 500 mrem/year to the total body or to not less than or equal to 3000 mrem/year to the skin. These release rate limits also restrict, at all times, the corresponding thyroid dose rate above background via the inhalation pathway to not less than or equal to 1500 mrem/year. For purposes of calculating doses resulting from airborne releases the main chimney is considered to be an elevated release point, and the reactor vent stack is considered to be a mixed mode release point.

2. Dose, Noble Gases

This specification is provided to implement the requirements of Sections II.B, III.A and IV.A of Appendix I, 10 CFR Part 50. The Limiting Condition for Operation implements the guides set forth in Section II.B of Appendix I. The statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive material in gaseous effluents will be kept "as low as is reasonably achievable." The Surveillance Requirements implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I is to be shown by calculational procedures based on models and data such that the actual exposure of an individual through the appropriate pathways is unlikely to be substantially underestimated. The dose calculations established in the ODCM for calculating the doses due to the actual release rates of radioactive noble gases in gaseous effluents will be 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 provide for determining the air doses at the unrestricted boundary based upon the historical average atmospheric conditions. NUREG-0133 provides methods for dose calculations consistent with Regulatory Guides 1.109 and 1.111.

12.4.C GASEOUS EFFLUENTS BASES (CONT.)

3. Dose, Radioiodines, Radioactive Material in Particulate Form and Radionuclides other than Noble Gases

This specification is provided to implement the requirements of Sections II.C, III.A and IV.A of Appendix I, 10 CFR Part 50. The Limiting Conditions for Operation are the guides set forth in Section II.C of Appendix I. The statements provide the required operating flexibility and at the same time implement the guides set forth in Section Iv.A of Appendix I to assure that the releases of radioactive materials in gaseous effluents will be kept "as low as is reasonable achievable." The ODCM calculational methods specified in the surveillance requirements implements the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I be shown by calculational procedures based on models and data such that the actual exposure of an individual through appropriate pathways is unlikely to be substantially underestimated. The ODCM calculational methods approved by NRC for calculating the doses due to the actual release rates of the subject materials are required to be consistent with the methodology provided in Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I", Revision 1, October 1977 and Regulatory Guide 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors," Revision 1, July 1977. These equations also provide for determining the actual doses based upon the historical average atmospheric conditions. The release rate specifications for radioiodines, radioactive material in particulate form and radionuclides other than noble gases are dependent on the existing radionuclide pathways to man, in the unrestricted area. The pathways which were examined in the development of these specifications were: 1) individual inhalation of airborne radionuclides, 2) deposition of radionuclides onto green leafy vegetation with subsequent consumption by man and 3) deposition onto grassy areas where milk animals graze with consumption of the milk by man.

FOR INFORMATION ONLY

12.5 ENVIRONMENTAL MONITORING

12.5.A Environmental Monitoring Program

1. The environmental monitoring program given in Table 12.5-1 shall be conducted except as specified below.

2. With the radiological environmental monitoring program not being conducted as specified in Table 12.5-1, 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, contractor omission which is corrected as soon as discovered, malfunction of sampling equipment, or if a person who participates in the program goes out of business. If the equipment malfunctions, corrective actions shall be completed as soon as practical. If a person supplying samples goes out of business, a replacement will be found as soon as possible. All deviations from the sampling schedule shall be described in the annual report.

12.5.B. Environmental Monitoring Surveillance

1. The radiological environmental monitoring samples shall be collected pursuant to Table 12.5-1 from the locations specified in the ODCM, and shall be analyzed pursuant to the requirements of Table 12.5-3.

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

12.5.A Environmental Monitoring Program

3. With the level of radioactivity in an environmental sampling medium at one or more of the

FOR INFORMATION ONLY

locations specified in the ODCM exceeding the limits of Table 12.5-2 when averaged over any calendar quarter, prepare and submit to the Commission within 30 days from the end of the affected calendar quarter, a Special Report which includes an evaluation of any release conditions, environmental factors or other aspects which caused the limits of Table 12.5-2 to be exceeded. This report is not required if the measured level of radioactivity was not the result of plant effluents; however, in such an event the condition shall be reported and described in the Annual Radiological Environmental Operating Report.

12.5 B. Environmental Monitoring Surveillance

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

FOR INFORMATION ONLY

12.5.A Environmental Monitoring Program	12.5.B. Environmental Monitoring Surveillance
4. With milk samples unavailable from one or more of the sample locations required by Table 12.5-1, identify locations for obtaining replacement samples and add them to the radiological environmental monitoring program within 30 days. The locations from which samples were unavailable may then be deleted from the monitoring program. In lieu of a Licensee Event Report, identify the cause of the inavailability of samples and identify the new location(s) for obtaining replacement samples in the Annual Radiological Environmental Operating report and also include in the report a revised figure(s) and table for the ODCM reflecting the new location(s).	4. The results of the land use census shall be included in the Annual Radiological Environmental Operating Report.
5. A census of nearest residences of animals producing milk for human consumption shall be conducted annually (during the grazing season for animals) to determine their location and number with respect to the site. The nearest residence in each of the 16 meteorological sectors shall also be determined within a distance of five miles. The census shall be conducted under the following conditions: a. Within a 2-mile radius from the plant site, enumeration of animals and nearest residences by a door-to-door or equivalent counting technique.	5. The results of the analyses performed as part of the required crosscheck program shall be included in the Annual Radiological Environmental Operating Report. The analyses shall be done in accordance with Section 5.3.1 and Chapter 11.

12.5.A Environmental Monitoring Program	12.5.B. Environmental Monitoring Surveillance
b Within a 5-mile radius, enumeration of animals by using referenced information from county agricultural agents or other reliable sources. With a land use census identifying location(s) of animals which	

yield(s)an ODCM calculated dose or dose commitment greater than the values currently being calculated in Specification 12.4.A.3, the new location(s) shall be added to the radiological environmental monitoring program with 30 days, if possible.

The sampling location, having the lowest calculated dose or dose commitment (via the same exposure pathway) may be deleted from this monitoring program after October 31 of the year in which this land use census was conducted.

7. Radiological analyses shall be performed on samples representative of those in Table 12.5-1, supplied as a part of the Interlaboratory Comparison Program which has been approved by the NRC.

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

9. In the event a limit and/or associated actions requirements identified in Sections 12.5.A and 12.5.B cannot be satisified because of circumstances in exess of those addressed in these Sections, no changes are required in the operational condition of the plant, and

this does not prevent the plant from entry into an operational mode.

FOR INFORMATION ONLY

TABLE 12.5-1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Minimum Number of Samples and Sample Locations*	Sampling and Collection Frequency	Type and Frequency of Analysis
1. AIRBORNE			
a. Particulates	16 locations	Continuous operation of sampler for a week	Gross beta and gamma Isotopic as specified in ODCM.
b. Radioiodine	16 locations	Continuous operation of sampler for two weeks	I-131 as specified in ODCM.
2. DIRECT RADIATION	Forty Locations (Minimum of two TLDs per packet)	Quarterly	
3. WATERBORNE			
a. Public Water	2 Locations	Monthly composite of weekly collected samples	Gamma Isotopic analysis of each composite sample
b. Sediment	1 downstream location in receiving body of water	Annually	Gamma Isotopic analysis of each sample
c. Plant Cooling Water	Intake, Discharge	Weekly composite	Gross Beta analysis of each sample
4. INGESTION			
a. Milk	2 Locations	At least once weekly when animals are on pasture; at least once per month at other times.	I-131 analysis of each sample
b. Fish	1 location in receiving body of water	Semi-annually	Gamma Isotopic analysis on edible portions

*Sample locations are described in the ODCM

FOR INFORMATION ONLY

TABLE 12.5-2

REPORTING LEVELS FOR RADIOACTIVITY
CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

Reporting Levels

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

a) for drinking water samples. This is 40 CFR Part 141 value.

FOR INFORMATION ONLY

TABLE 12.5-3

PRACTICAL LOWER LIMITS OF DETECTION (LLD)
FOR STANDARD ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM

Sample Media	Analysis	LLD[A,B] (4.66 σ)	Units
Airborne "Particulate"	Gross Beta +	0.01	pCi/m^3
	Gamma Isotopic	0.01	pCi/m^3
Airborne I-131	Iodine 131	0.10	pCi/m^3
Milk/Public Water	I-131	5°	pCi/l
	Cs-134	10	pCi/l
	Cs-137	10 ▲	pCi/l
	Tritium	200	pCi/l
	Gross Beta +	5	pCi/l
	Gamma Isotopic	20	pCi/l/nuclide
Sediment	Gross Beta +	2	pCi/g dry
	Gamma Isotopic	0.2	pCi/g dry
Fish Tissue	I-131 Thyroid	0.1	pCi/g wet
	Cs-134, 137	0.1	pCi/g wet
	Gross Beta +	1.0	pCi/g wet
	Gamma Isotopic	0.2	pCi/g wet

° 0.5 pCi/l on milk samples collected during the pasture season.

\+ Referenced to Cs-137

▲ 5.0 pCi/l on milk samples

FOR INFORMATION ONLY

TABLE 12.5-3 (Continued)

PRACTICAL LOWER LIMITS OF DETECTION (LLD)
FOR STANDARD ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM

TABLE NOTATION

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

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

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

Where:

LLD is the "a priori" lower limit of detection for a blank sample or background analysis as defined above (as pCi per unit mass or volume).

s_b is the square root of the background count or of a blank sample count; is the estimated standard error of a background count or a blank sample count as appropriate (in units of counts).

E is the counting efficiency (as counts per disintegration).

A is the number of gamma rays emitted per disintegration for gamma ray radionuclide analysis (A=1.0 for gross alpha and tritium measurements).

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

2.22 is the number of disintegrations per minute per picocurie.

Y is the fractional radio-chemical yield when applicable (otherwise Y = 1.0).

λ is the radioactive decay constant for the particular radionuclide (in units of reciprocal minutes).

Δt is the elapsed time between the midpoint of sample collection and the start time of counting. (Δt = 0.0 for environmental samples and for gross alpha measurements).

t is the duration of the count (in units of minutes).

FOR INFORMATION ONLY

TABLE 12.5-3 (Continued)

PRACTICAL LOWER LIMITS OF DETECTION (LLD)
FOR STANDARD ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM

TABLE NOTATION

The value of "s_b" used in the calculation of the LLD for a detection system shall be based on an actual observed background count or a blank sample count (as appropriate) rather than on an unverified theoretically predicted value. Typical values of "E", "V", "Y", "t", and "Δt" shall be used in the calculation.

For gamma ray radionuclide analyses the background counts are determined from the total counts in the channels which are within plus or minus one FWHM (Full Width at Half Maximum) of the gamma ray photopeak energy normally used for the quantitative analysis for that radionuclide. Typical values of the FWHM shall be used in the calculation.

The LLD for all measurements 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 sample measurement.

B. Other radionuclides which are measureable and identifiable by gamma-ray spectrometry, together with the nuclides indicated in Table 12.5-2, shall also be identified and reported when an actual analysis is performed on a sample. Nuclides which are below the LLD for the analyses shall not be reported as being present at the LLD level for that nuclide.

FOR INFORMATION ONLY

12.5.C RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

1. Monitoring Program

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

The detection capabilities required by Table 12.5-3 are state-of-the-art for routine environmental measurements in industrial laboratories. The specified lower limits of detection for I-131 in water, milk and other food products correspond to approximately one-quarter of the Appendix I to 10 CFR Part 50 design objective dose-equivalent of 15 mrem/year for atmospheric releases and 10 mrem/year for liquid releases to the most sensitive organ and individual. They are based on the assumptions given 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", October 1977, except the change for an infant consuming 330 liter/year of drinking water instead of 510 liters/year.

2. Land Use Census

This specification is provided to ensure that changes in the use of unrestricted areas are identified and that modifications to the monitoring program are made if required by the results of this census. This census satisfies the requirements of Section IV.B.3 of Appendix I to 10 CFR Part 50.

3. Interlaboratory Comparison Program

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

FOR INFORMATION ONLY

12.6 RECORD KEEPING AND REPORTING

12.6.1 Plant Operating Records

A. Records and/or logs relative to the following items shall be kept in a manner convenient for review and shall be retained for at least 5 years:

1. Records and periodic checks, inspection and/or calibrations performed to verify that the surveillance requirements (see Section 6.4 of the Technical Specifications) are being met (all equipment failing to meet surveillance requirements and the corrective action taken shall be recorded);

2. Records of radioactive shipments;

B. Records and/or logs relative to the following items shall be recorded in a manner convenient for review and shall be retained for the life of the plant:

1. Records of offsite environmental monitoring surveys;

2. Records of radioactivity in liquid and gaseous wastes released to the environment;

4. Records of reviews performed for changes made to the Offsite Dose Calculation Manual.

12.6.2 Reports

1. Radioactive Effluent Release Report

The Radioactive Effluent Release Report covering the operation of the unit during the previous 12 months of operation shall be submitted prior to April 1 of each year. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be (1) consistent with the objectives outlined in the ODCM and PCP and (2) in conformance with 10 CFR 50.36a and Section IV.B.1 of Appendix I to 10 CFR Part 50.

2. Annual Radiological Environmental Operating Report

An annual report containing the data taken in the standard radiological monitoring program (Table 12.5-1) shall be submitted prior to May 1 of each year. The content of the report shall include:

a. Results of all environmental measurements summarized in the format of the Regulatory Guide 4.8 Table 1 (December 1975). (Individual sample results will be retained at the Station). 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 missing results. Summaries, interpretations, and analysis of trends of the results are to be provided.

b. An assessment of the monitoring results and radiation dose via the principal pathways of exposure resulting from plant emissions of radioactivity including the maximum noble gas gamma and beta air doses in the unrestricted area. The assessment of radiation doses shall be performed in accordance with the Offsite Dose Calculation Manual (ODCM).

c. Results of the census to determine the locations of nearest residences and of nearby animals producing milk for human consumption (Table 12.5-1).

d. The reason for the emission if the nearest dairy to the station is not in the monitoring program (Table 12.5-1).

e. An annual summary of meteorological conditions concurrent with the releases of gaseous effluents in the form of joint frequency distributions of wind speed, wind direction, and atmospheric stability.

f. The results of the Interlaboratory Comparison Program described in Section 12.5.C.3.

g. The results of the 40 CFR 190 uranium fuel cycle dose analysis for each calendar year.

h. A summary of the monitoring program, including maps showing sampling locations and tables giving distance and direction of sampling locations from the Station.

3. If a confirmed measured radionuclide concentration in an environmental sampling medium averaged over any calendar quarter sampling period exceeds the reporting level given in Table 12.5-2 and if the radioactivity is attributable to plant operation, a written report shall be submitted to the Administrator of the NRC Regional Office, with a copy to the Director, Office of Nuclear Reactor Regulation, within 30 days from the end of the quarter.

FOR INFORMATION ONLY

a. When more than one of the radionuclides in Table 12.5-2 are detected in the medium, the reporting level shall have been exceeded if

$$\frac{C_i}{R.L._i} \geq 1$$

where C_i is the average quarterly concentration of the i^{th} radionuclide in the medium and RL is the reporting level of radionuclide i.

b. If radionuclides other than those in Table 12.5-2 are detected and are due to plant effluents, a reporting level is exceeded if the potential annual dose to an individual is equal to or greater than the design objective doses of 10 CFR 50, Appendix 1.

c. This report shall include an evaluation of any release conditions, environmental factors, or other aspects necessary to explain the anomalous effect.

12.6.2.3 OFFSITE DOSE CALCULATION MANUAL (ODCM)

12.6.2.3.A. The OFFSITE DOSE CALCULATION MANUAL (ODCM) shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring Alarm/Trip Setpoints, and in the conduct of the Radiological Environmental Monitoring Program. The ODCM shall also contain (1) the Radioactive Effluent Controls and Radiological Environmental Monitoring Programs described in section 12.5 and (2) descriptions of the information that should be included in the Semi-annual Radioactive Effluent Release Reports and in the Annual Radiological Environmental Operating Reports required by sections 12.6.2.1 and 12.6.2.2.

The ODCM shall be subject to review and approval by the Commission prior to implementation.

12.6.2.3.B. Changes to the ODCM

1. Shall be documented and records of reviews performed shall be retained as required by Specification 6.5.B.14. This documentation shall contain:

   a. Sufficient information to support the change together with the appropriate analyses or evaluations justifying the change(s) and

FOR INFORMATION ONLY

b. A determination that the change will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR Part 50 and not adversely impact the accuracy or reliability of effluent, dose, or setpoint calculations.

2. Shall become effective after review and acceptance by the Onsite Review and Investigative Function and the approval of the Plant Manager on the date specified by the Onsite Review and Investigative Function.

3. Shall be submitted to the Commission in the form of a complete, legible copy of the entire ODCM as a part of or concurrent with the Radioactive Effluent Release Report for the period of the report in which any change to the ODCM was made effective. Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed, and shall indicate the date (e.g., month/year) the change was implemented.

12.6.2.4 MAJOR CHANGES TO RADIOACTIVE WASTE TREATMENT SYSTEMS (LIQUID AND GASEOUS)

A. Licensee initiated major changes to the radioactive waste systems may be made provided:

1. The change is reported in the Monthly Operating Report for the period in which the evaluation was reviewed by the onsite review function. The discussion of each change shall contain:

a. A summary of the evaluation that led to the determination that the change could be made in accordance with 10 CFR 50.59;

b. Sufficient detailed information to support the reason for the change;

c. A detailed description of the equipment, components, and process involved and the interfaces with other plant systems;

d. An evaluation of the change which shows the predicted releases of radioactive materials in liquid and gaseous effluents and (or quantity of solid waste that differ from those previously predicted in the license application and amendments);

FOR INFORMATION ONLY

e. A comparison of the predicted releases of radioactive materials in liquid and gaseous effluents and in solid waste to the actual releases for the period in which the changes were made;

f. An estimate of the exposure to plant operating personnel as a result of the change; and

g. Documentation of the fact that the change was reviewed and found acceptable by the onsite review function.

2. The change shall become effective upon review and acceptance by onsite review function.