

## 22. INSTRUMENTATION

- a. Instrument Calibration or Channel Calibration - An Instrument Calibration means the verification or 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. The acceptable range and accuracy of an instrument and its setpoint are given in the system design control document and its setpoint is used in the Technical Specifications. Instrument calibration may be performed by any series of sequential, overlapping, or total channel steps such that the entire instrument is calibrated. Instrument calibration includes the Instrument or Channel Functional Test, as appropriate.
- b. 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 logic.
- c. Instrument or Channel Functional Test - An Instrument or Channel Functional Test for
  - (1) Analog channels means the injection of a simulated signal into the channel as close to the sensor as practicable to verify the proper response, alarm, and/or initiating action.
  - (2) Bistable channels means the injection of a simulated signal into the sensor to verify the proper response, alarm and/or initiating action.
- d. Instrument or Channel Check - An instrument or channel check is a qualitative determination of acceptable operability by observation of instrument behavior during operation. This determination shall include, where possible, comparison of the instrument or channel with another independent instrument measuring the same variable.
- e. Logic System Functional Test - A logic system functional test means a test of all relays and contacts of a logic circuit to insure all components are operable per design intent. Where practicable, action will go to completion; i.e., pumps will be started and valves operated.
- f. 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.
- g. Protection Action - An action initiated by the protection system when a limit is reached. A protective action can be at a channel or system level.

## LIMITING CONDITION FOR OPERATION

## SURVEILLANCE REQUIREMENT

- (b) The RBM control rod block set-points are given in Table 3.2-C. The upscale High Power Trip Setpoint shall be applied when the core thermal power is greater than or equal to 85% of rated ( $P \geq 85\%$ ). The upscale Intermediate Power Trip Setpoint shall be applied when the core thermal power is greater than or equal to 65% of rated and less than 85% of rated ( $65\% < P < 85\%$ ). The upscale Low Power Trip Setpoint shall be applied when the core thermal power is greater than or equal to 30% of rated and less than 65% of rated ( $30\% < P < 65\%$ ). The RBM can be bypassed when core thermal power is less than 30% of rated. The RBM bypass time delay ( $t_{d2}$ ) shall be less than or equal to 2.0 seconds.

D. Radiation Monitoring Systems-  
Isolation & Initiation  
Functions

1. Steam Air Ejector Offgas  
System

- a) At least one post-treatment steam air ejector offgas system radiation monitor shall be operable during reactor power operation. The monitors shall be set to initiate immediate closure of the charcoal bed bypass valve and the air ejector offgas isolation valve at a setting equivalent to or below the dose rate limits in Specification 3.15.2.1.
- b) In the event no post-treatment monitor is operable, gases from the steam air ejector offgas system may be released to the environment for up to 72 hours provided (1) the charcoal bed of the offgas system is not bypassed, and (2) the offgas stack noble gas activity monitor is operable.

Otherwise, be in at least HOT STANDBY within the following 24 hours.

D. Radiation Monitoring Systems-  
Isolation & Initiation  
Functions

1. Steam Air Ejector Offgas  
System

Instrumentation shall be functionally tested, calibrated and checked as indicated in Table 4.2.D.

System logic shall be functionally tested as indicated in Table 4.2-D.

## LIMITING CONDITIONS FOR OPERATION

## SURVEILLANCE REQUIREMENT

- c) At least one pre-treatment steam air ejector offgas system radiation monitor shall be operable during reactor power operation. The monitors shall be set to initiate an alarm if the monitor exceeds a trip setting equivalent to 1.0 Ci/sec of noble gases after 30 minutes delay in the offgas holdup line.

In the event the noble gas flow in the air ejector offgas exceeds the equivalent of 1.0 Ci/sec after 30 minutes delay in the offgas holdup line, restore the rate to less than this limit within 72 hours or be in at least hot standby within the next 12 hours.

- d) In the event no pre-treatment monitor is operable, gases from the steam air ejector offgas system may be released for up to 30 days provided (1) the charcoal bed of the offgas system is not bypassed, (2) Grab samples are collected and analyzed weekly, and (3) the offgas stack noble gas activity monitor is operable, or at least 1 post-treatment monitor is operable.

Otherwise, be in at least HOT STANDBY within the following 24 hours.

2. Reactor Building Isolation and Standby Gas Treatment System

The limiting conditions for operation are given in Specification 3.7.B.

2. Reactor Building Isolation and Standby Gas Treatment System

Instrumentation shall be functionally tested, calibrated and checked as indicated in Table 4.2-D.

System logic shall be functionally tested as indicated in Table 4.2-D.

TABLE 4.2-D

## MINIMUM TEST AND CALIBRATION FREQUENCY FOR RADIATION MONITORING SYSTEMS

<u>Instrument Channels</u>	<u>Instrument Functional Test (9)</u>	<u>Calibration (9)</u>	<u>Source Check</u>	<u>Instrument Check</u>
1) Refuel Area Exhaust Monitors	Once/3 months	Once/Refueling	Once/month	Once/day
2) Reactor Building Area Exhaust Monitors	Once/3 months	Once/Refueling	Once/month	Once/day
3) Offgas Post-treatment Radiation Monitors	Once/3 months (10)	Once/Refueling	Once/month	Once/day
4) Offgas Pre-treatment Radiation Monitors	Once/3 months (10)	Once/Refueling	Once/month	Once/day
<u>Logic System Functional Test (4) (6)</u>	<u>Frequency (9)</u>			
1) Reactor Building Isolation	Once/Refueling			
2) Standby Gas Treatment System Actuation	Once/Refueling			
3) Steam Jet Air Ejector Offgas Line Isolation	Once/Refueling			
4) Steam Jet Air Ejector Charcoal Bed Bypass	Once/Refueling			

The refueling interlocks also operate one logic channel, and are required for safety only when the mode switch is in the refueling position.

For effective emergency core cooling for small pipe breaks, the HPCI system must function since reactor pressure does not decrease rapid enough to allow either core spray or LPCI to operate in time. The automatic pressure relief function is provided as a backup to the HPCI in the event the HPCI does not operate. The arrangement of the tripping contacts is such as to provide this function when necessary and minimize spurious operation. The trip settings given in the specification are adequate to assure the above criteria are met. The specification preserves the effectiveness of the system during periods of maintenance, testing, or calibration, and also minimizes the risk of inadvertent operation; i.e., only one instrument channel out of service.

Two air ejector offgas post-treatment monitors are provided. They are designed so that an instrument failure gives a downscale trip or an inoperative trip. When both instruments reach an upscale trip point, or when one reaches an upscale trip point and the other reaches a downscale trip point or an inoperative trip, a trip is actuated. The post-treatment monitors have three upscale trip setpoints, one (Hi) to initiate charcoal bed bypass valve

closure (valve CV-4134A open and CV-4134B closing to route offgas through the charcoal) and another (Hi Hi Hi) to initiate offgas system isolation valve (valve CV-4108) closure. The third trip point (Hi Hi) is for alarm initiation, and will initiate prior to the offgas isolation trip. Customarily, the trip setting for bypass valve closure is lower than the trip setting for offgas system isolation valve closure.

Two sets of two radiation monitors are provided which initiate the Reactor Building Isolation function and operation of the standby gas treatment system. Two instrument channels monitor the radiation from the refueling area ventilation exhaust ducts and two instrument channels monitor the building ventilation below the refueling floor.

Trip settings of  $< 9$  mr/hr for the monitors in the refueling area ventilation exhaust ducts are based upon initiating normal ventilation isolation and standby gas treatment system operation so that none of the activity released during the refueling accident leaves the Reactor Building via the normal ventilation path but rather all the activity is processed by the standby gas treatment system.

Flow integrators are used to record the integrated flow of liquid from the drywell sumps. The alarm unit in each

LIMITING CONDITIONS FOR OPERATION

## 3.14 RADIOACTIVE LIQUID EFFLUENT

3.14.1 The radioactive liquid effluent monitoring instrumentation channels shown in Table 3.14-1 shall be OPERABLE with their alarm and trip setpoints set to ensure that the limits of Specification 3.14.2 are not exceeded.

APPLICABILITY: As shown in Table 3.14-1.

ACTION:

- a. When a radioactive liquid effluent monitoring instrumentation channel alarm and trip setpoint is less conservative than a value which will ensure that the limits of 3.14.2 are met, adjust without delay to meet Specification 3.14.2, or suspend the release of radioactive liquid effluents monitored by the affected channel, or declare the channel inoperable.
- b. When less than the minimum required liquid effluent monitoring instrument channel is OPERABLE, take the ACTION stated in Table 3.14-1 and make every reasonable effort to restore the instrument to operable status. In the event the minimum required instrumentation is not returned to OPERABLE status within 30 days, explain in the next Semiannual Radioactive Material Release Report, in lieu of any other report, why the instrument was not made OPERABLE in a timely manner.

SURVEILLANCE REQUIREMENT

4.14.1.1 Each radioactive liquid effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION, and CHANNEL FUNCTIONAL TEST operations during the modes and at the frequencies shown in Table 4.14-1.

4.14.1.2 The setpoints shall be determined in accordance with the method described in the ODAM.

LIMITING CONDITIONS FOR OPERATION

3.14.2 The concentration of radioactive material in liquid effluent released from the site to the unrestricted area (see UFSAR Figure 1.2-1) shall not exceed the concentrations specified in 10CFR Part 20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall not exceed  $2 \times 10^{-4}$   $\mu\text{Ci/ml}$  total activity.

APPLICABILITY: At all times.

ACTION:

- a. With the concentration of radioactive material released from the site to unrestricted areas exceeding the limit, without delay restore the concentration within the limit.

SURVEILLANCE REQUIREMENT

4.14.2.1 Each radioactive liquid waste batch shall be sampled and analyzed in accordance with Table 4.14-2 before release.

Alternatively, pre-release analysis of batch(es) of radioactive liquid waste may be by gross  $\beta$  or  $\gamma$  counting provided the maximum permissible concentration,  $1 \times 10^{-7}$   $\mu\text{Ci/ml}$ , is applied at the unrestricted area boundary.

4.14.2.2 The results of pre-release analyses shall be used with the calculational methods in the ODA to establish trip setpoints for batch releases to assure that the concentration at the restricted area boundary does not exceed the limit in Specification 3.14.2.

4.14.2.3 In any week during which Service Water is released to the unrestricted area, a grab sample of water shall be collected from that Service Water System and analyzed as specified in Table 4.14-2, Item B.1 or B.2, and Item B.4.

In the event the radioactivity concentration in the service water exceeds the LLD stated in Table 4.14-2 for the analytical method used, the activity concentration shall be determined by sampling and post-release analyses specified in Table 4.14-2, Items B.2 through B.5.

LIMITING CONDITIONS FOR OPERATION

3.14.3 The dose or dose commitment to a member of the Public from radioactive materials in liquid effluents released to the unrestricted area (see UFSAR Figure 1.2-1) shall not exceed:

1.5 mrem to the total body during any calendar quarter,

5.0 mrem to any organ during any calendar quarter,

3.0 mrem to the total body during any calendar year, or

10.0 mrem to any organ during any calendar year.

APPLICABILITY: At all times.

ACTION:

- a. With the calculated dose from the release of radioactive materials in liquid effluents exceeding the above limit, prepare and submit to the Commission within 30 days from the end of the quarter during which the release occurred, pursuant to Specification 6.11.3, and in lieu of any other report, a Special Report which identifies the cause(s) for exceeding the limit and defines the corrective actions to be taken.

SURVEILLANCE REQUIREMENT

4.14.3 Dose Calculations. In any quarter in which radioactive liquid effluent is discharged, an assessment shall be performed in accordance with the ODAM at least once per 30 days in order to verify that the cumulative dose commitment does not exceed the limits in Specification 3.14.3.

TABLE 3.14-1

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABILITY#</u>	<u>ACTION</u>
1. Gross Radioactivity Monitors Providing Automatic Termination of Release			
a. Liquid Radwaste Effluent Line	(1)	During releases	18
2. Gross Radioactivity Monitors Not Providing Automatic Termination of Release			
a. RHR Service Water System Effluent Line	(1)	During releases	20
b. General Service Water System	(1)	During releases	20
c. RHR Rupture Disc Effluent Line	(1)	During releases	20
3. Flow Rate Measurement Devices			
a. Liquid Radwaste Effluent Line**	(1)	At all times	21
b. Liquid Radwaste Dilution Line	(1)	During releases	22

# Channel(s) shall be OPERABLE and in service except that channels out of service are permitted for preventive maintenance and required tests, checks, or calibrations.

\*\*Pump curves may be utilized to estimate flow in lieu of flow measurement devices.

TABLE 3.14-1  
(Continued)

TABLE NOTATION

- ACTION 18 With no channel OPERABLE, effluent may be released provided that prior to initiating a release:
1. At least two samples are analyzed in accordance with Specification 4.14.2.1, and;
  2. A technically qualified member of the Facility Staff verifies the release rate calculations and discharge valving determined by another technically qualified Facility Staff member.
- Otherwise, suspend release of radioactive effluents via this pathway.
- ACTION 20 With no channel OPERABLE, effluent releases via the affected pathway may continue provided the effluent is sampled and analyzed for gross radioactivity at least once per eight hours during actual release. The analysis shall be capable of detecting  $10^{-7}$   $\mu\text{Ci/ml}$ .
- ACTION 21 With no channel OPERABLE, effluent releases via this pathway may continue provided the flow rate is estimated with pump curves at least once per batch during actual releases.
- ACTION 22 With no channel OPERABLE, suspend release of radioactive effluents via this pathway.

TABLE 4.14-1

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>SOURCE CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>
1. Gross Beta or Gamma Radioactivity Monitors Providing Alarm and Automatic Isolation				
a. Liquid Radwaste Effluent Line	D*	D(6)	R(3)	Q(1)(2)
2. Gross Beta or Gamma Radioactivity Monitors Providing Alarm But Not Providing Automatic Isolation				
a. RHR Service Water System Effluent Line	D*	M	R(3)	Q(2)
b. General Service Water System Effluent Line	D*	M	R(3)	Q(2)
c. RHR Rupture Disc Effluent Line	D*	M	R(3)	Q(2)
3. Flow Rate Measurement Devices				
a. Liquid Radwaste Effluent Line	D(5)*	N.A.	R	Q
b. Liquid Radwaste Dilution Line	D(5)*	N.A.	R	Q

TABLE 4.14-1  
(Continued)

TABLE NOTATION

\*During releases via this pathway.

\*\*During liquid additions to the tank.

- (1) The CHANNEL FUNCTIONAL TEST shall also demonstrate that automatic isolation of this pathway if the following condition exists:
  1. Instrument indicates measured levels above the alarm/trip setpoint.
- (2) The CHANNEL FUNCTIONAL TEST shall also demonstrate that control room alarm annunciation occurs if any of the following conditions exist:
  1. Instrument indicates measured levels above the alarm/trip setpoint.
  2. Circuit failure.
  3. Instrument indicates a downscale failure.
  4. Instrument controls not set in operate mode.
- (3) The CHANNEL CALIBRATION shall include the use of a known radioactive source (traceable to the National Bureau of Standards radiation measurement system or acceptable non-NBS standards) positioned in a reproducible geometry with respect to the sensor and emitting beta or gamma radiation in the range measured by the channel. CHANNEL CALIBRATION may normally be done during refueling outages.
- (4) Not used
- (5) CHANNEL CHECK shall consist of verifying indication of flow during periods of release. CHANNEL CHECK shall be made at least once daily on any day on which continuous, periodic, or batch releases are made.
- (6) On any day on which a release is made, a SOURCE CHECK shall be made at least once, prior to the first release.

TABLE 4.14-2  
RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

Liquid Release Type	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection (LLD) <sup>a</sup> ( $\mu\text{Ci/ml}$ )
A. Batch Waste Release Tanks <sup>c</sup>	P Each Batch	P Each Batch	Principal Gamma Emitters <sup>e</sup>	$5 \times 10^{-7}$
			I-131 <sup>e</sup>	$1 \times 10^{-6}$
	P One Batch/M	M <sup>f</sup>	Dissolved and Entrained Gases	$1 \times 10^{-5}$
	P Each Batch	M <sup>f</sup> Composite <sup>b</sup>	H-3	$1 \times 10^{-5}$
			Gross alpha	$1 \times 10^{-7}$
	P Each Batch	Q <sup>f</sup> Composite <sup>b</sup>	Sr-89, Sr-90	$5 \times 10^{-8}$
B. Continuous Service Water Release <sup>d</sup>  Sample Points: <ul style="list-style-type: none"> <li>• General Service Water</li> <li>• RHR Service Water System A</li> <li>• RHR Service Water System B</li> </ul>	1. W Grab Sample	W <sup>f</sup>	Gross beta/gamma	$1 \times 10^{-7}$
	2. W Grab Sample	W <sup>f</sup>	Principal Gamma Emitters	$5 \times 10^{-7}$
			I-131	$1 \times 10^{-6}$
	3. M Grab Sample	M <sup>f</sup>	Dissolved and Entrained Gases	$1 \times 10^{-5}$
	4. W Grab Sample	M <sup>f</sup> Composite	H-3	$1 \times 10^{-5}$
			Gross alpha	$1 \times 10^{-7}$
	5. W Grab Sample	Q <sup>f</sup> Composite	Sr-89, Sr-90	$5 \times 10^{-8}$
			Fe-55	$1 \times 10^{-6}$

## 3.14.1 and 4.14.1 BASES

## 1. Radioactive Liquid Effluent Instrumentation

The radioactive liquid effluent instrumentation is provided to monitor and control, as applicable, the release of radioactive material in liquid effluents. The OPERABILITY and use of these instruments implements the requirements of 10CFR Part 50, Appendix A, General Design Criteria 60, 63, and 64. The alarm and/or trip setpoints for these instruments are calculated in the manner described in the ODAM to assure that the alarm and/or trip will occur before the limit specified in 10CFR Part 20.106 is exceeded.

Instrumentation is expected to be OPERABLE and in service when required by Specification. An instrument may be removed from service voluntarily for the purpose of tests, checks, calibration, or preventative maintenance without declaring the channel inoperable.

## 3.14.2 and 4.14.2 BASES

## 1. Liquid Effluent Concentration

Specification 3/4.14.2 is provided to satisfy the regulation governing the maximum concentration of radioactive material in liquid effluent that may be released to an unrestricted area as stated in 10CFR Part 20.106 and the regulation requiring surveys needed to determine compliance stated in Part 20.201.

Conformance to Specification 3.14.2, when applied to the activity concentration in the river at the site boundary due to liquid effluent, would assure that the average activity concentration in liquid effluent released to the unrestricted area is a small fraction of the limit specified in Part 20.106.

The sample points noted in Table 4.14-2 are adequate to ensure sampling of potential liquid radioactive effluents from the service water systems. The sample points include the General Service Water System and the RHR Service Water Systems A and B. The sample point for the RHR Service Water Systems is at a location downstream of the point where Emergency Service Water discharge joins with the RHR Service Water System, and upstream of the point where the RHR Rupture Disc Line branches off of the RHR Service Water System. This sample point will therefore provide for sampling effluents from the RHR Service Water System, Emergency Service Water System and/or RHR Rupture Disc line.

## 3.14.3 and 4.14.3 BASES

## 1. Dose Due to Radioactive Effluents

Specifications 3.14.3, 3.15.3, and 3.15.4 implement the requirements of 10CFR Part 50.36a and of 10 CFR Part 50, Appendix I, Section IV. These specifications state Limiting Conditions of Operation (LCO) to keep levels of radioactive materials in LWR effluents as low as is reasonably achievable. Compliance with these specifications will also keep average releases of radioactive material in effluents at small percentages of the limits specified in 10CFR Part 20.106. Surveillance requirements provide for the measurement of releases and calculation of doses to verify compliance with the Specifications. Action statements in these Specifications implement the requirements of 10CFR Part 50.36(c)(2) and 10CFR Part 50, Appendix I, Section IV.A in the event a LCO is not met.

LIMITING CONDITIONS FOR OPERATION

3.15.1 The radioactive gaseous effluent monitoring instrumentation channels shown in Table 3.15-1 shall be OPERABLE. Their radioactive noble gas monitor alarm setpoint shall be set to cause automatic alarm when the limits of Specification 3.15.2.1 are exceeded.

APPLICABILITY: As shown in Table 3.15-1.

ACTION:

- a. With radioactive gaseous effluent monitoring instrumentation channel alarm setpoint less conservative than a value which will ensure that the limits of 3.15.2 are met, adjust without delay to meet Specification 3.15.1, declare the channel inoperable, or immediately suspend any release via the instrumented pathway.
- b. When less than the minimum required gaseous effluent monitoring instrument channels OPERABLE, take the action stated in Table 3.15-1 and make every reasonable effort to restore the instrument to operable status. In the event the minimum required instrumentation is not returned to OPERABLE status within 30 days, explain in the next Semiannual Radioactive Material Release Report, in lieu of any other report, why the instrument was not made OPERABLE in a timely manner.

SURVEILLANCE REQUIREMENT

4.15.1.1 Each radioactive gaseous effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION, AND CHANNEL FUNCTIONAL TEST operations during the MODES and at the frequencies shown in Table 4.15-1.

4.15.1.2 The setpoints shall be determined according to the method described in the ODAM.

LIMITING CONDITIONS FOR OPERATIONSURVEILLANCE REQUIREMENT

3.15.2.1 The dose rate in the unrestricted area (see UFSAR Figure 1.2-1) due to radioactive noble gas released in effluents shall not exceed 500 mrem/year to the total body or 3000 mrem/year to skin.

3.15.2.2 The dose rate in the unrestricted area due to I-131, I-133, H-3, and to radioactive particulates having half-lives of 8 days or more that are released in effluents shall not exceed 1500 mrem/year to any organ.

APPLICABILITY: Whenever monitoring or sampling is required.

ACTION: When the dose rate exceeds a limit in 3.15.2, decrease the release rate without delay to comply with the limit.

4.15.2 Compliance with 3.15.2 shall be assessed on the basis of results of measurements specified in Table 4.15-2 and according to methodology stated in the ODAM.

LIMITING CONDITIONS FOR OPERATION

3.15.4 The dose to a member of the public from iodine-131, I-133, H-3, and from radionuclides in particulate form having half-lives greater than eight days in gaseous effluents released from the site to the unrestricted area (see UFSAR Figure 1.2-1) shall not exceed:

7.5 mrem to any organ during any calendar quarter, or,

15.0 mrem to any organ during any calendar year.

APPLICABILITY: At all times when monitors are required.

ACTION:

- a. With the calculated dose from the release of I-131, I-133, H-3, and radionuclides in particulate form having half-lives greater than eight days in gaseous effluents exceeding the above limit, prepare and submit a Special Report to the Commission within 30 days following the end of the calendar quarter during which the release occurred. The Special Report shall be made pursuant to Specification 6.11.3, shall be in lieu of any other report, and shall identify the cause(s) for exceeding the limit and define the corrective actions taken.

SURVEILLANCE REQUIREMENT

4.15.4.1 Dose Assessment An assessment shall be performed in accordance with the ODAM at least once every 31 days to verify that the cumulative dose commitment due to I-131, I-133, H-3, and radioactive particulates having half-lives greater than eight days in gaseous effluents does not exceed the limits in Specification 3.15.4.

LIMITING CONDITIONS FOR OPERATION

3.15.5 Every reasonable effort shall be made to maintain at least one train of the Offgas System OPERABLE.

Within four hours after commencing operation of the main condenser air ejector, at least one train of charcoal beds in the Offgas System shall be placed in operation to treat radioactive gases from the main condenser air ejector. During continuing reactor operation, at least one train of charcoal beds in the Offgas System shall be used to treat the gases before discharge.

APPLICABILITY: When the main condenser air ejector is operating.

ACTION:

- a. If gaseous wastes are discharged for more than 7 days without treatment, prepare and submit a Special Report to the Commission within 30 days pursuant to Specification 6.11.3, in lieu of any other report, including the following information:
  1. Identification of the inoperable equipment or subsystem and reason for inoperability.
  2. Action(s) taken to restore the inoperable equipment to OPERABLE status.
  3. Summary description of action(s) taken to prevent a recurrence.

SURVEILLANCE REQUIREMENT

4.15.5 The gaseous effluent monitoring systems of Specification 3.2.D shall be used to verify the operation of the offgas system.

TABLE 3.15-1

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

Instrument@	Minimum Channels Operable	Applicability#	Function	Action
1. Deleted				
2. Offgas Hydrogen Monitor (R2)	2	**	Monitor hydrogen concentration	29
3. Offgas Stack Monitoring System (R3)				
a. Noble Gas Activity Monitor	1	*	Monitor activity concentration, alarm	27
b. Iodine Sampler Cartridge	1	*	Collect iodine sample	31
c. Particulate Sampler Filter	1	*	Collect particulate sample	31
d. Effluent Flow Measuring Device	1	*	Measure air flow	26
e. Sample Flow Measuring Device	1	*	Measure air flow	26
4. Reactor Building Exhaust Vent Monitoring System (R4)				
a. Noble Gas Activity Monitor	1	*	Monitor activity concentration, alarm	27
b. Iodine Sampler Cartridge	1	*	Collect iodine sample	31
c. Particulate Sampler Filter	1	*	Collect particulate sample	31
d. Effluent Flow Measuring Device	1	*	Measure air flow	26
e. Sample Flow Measuring Device	1	*	Measure air flow	26
5. Turbine Building Exhaust Vent Monitoring System (R5)				
a. Noble Gas Activity Monitor	1	*	Monitor radioactivity concentration, alarm	27
b. Iodine Sampler Cartridge	1	*	Collect iodine sample	32
c. Particulate Sampler Filter	1	*	Collect particulate sample	32
d. Effluent Flow Measuring Device	1	*	Measure air flow	26
e. Sample Flow Measuring Device	1	*	Measure air flow	26

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TABLE 3.15-1  
(Continued)

TABLE NOTATION

@ Refer to O DAM Figure 3-1 for location of effluent monitoring points R1 thru R6.

# Channels shall be OPERABLE and in service except that channels out of service are permitted for the purpose of required tests, checks, calibration, and preventative maintenance without declaring the channel to be inoperable.

\* During releases via this pathway.

\*\* During offgas system operation.

ACTION 25 Deleted

ACTION 26 With no channel OPERABLE, effluent releases via this pathway may continue provided the flow rate is estimated whenever operation of a main exhaust fan combination is changed in the system.

ACTION 27 With no channel OPERABLE, effluent releases via this pathway may continue if grab samples are taken at least once per eight hours and these samples are analyzed for radioactivity within 24 hours or if an alternate monitoring system is utilized. Drywell purge is permitted whenever the offgas stack monitor or its alternate monitor is operating.

ACTION 28 Deleted

ACTION 29 With one channel OPERABLE, operation of the offgas system may continue provided the recombiner temperature sensor is operable. When only one of the preceding methods is operable, the offgas system may be operated provided gas samples are collected at least once per day and analyzed for hydrogen within the ensuing four hours.

ACTION 31 With no channel OPERABLE, effluent releases via this pathway may continue, provided samples required in Table 4.15-2 are continuously collected with auxiliary sampling equipment.

ACTION 32 With no channel OPERABLE, effluent releases via this pathway may continue if grab samples are taken at least once per eight hours and these samples are analyzed for radioactivity within 24 hours or if an alternate monitoring system is utilized.

TABLE 4.15-1  
(Continued)

TABLE NOTATION

# Instrumentation shall be OPERABLE and in service except that channels out of service are permitted for the purpose of required tests, checks, calibrations, and preventative maintenance without declaring the channel to be inoperable.

\* During releases via this pathway.

| \*\* During offgas system operation.

\*\*\*During operation of the steam jet air ejector.

(1) Not used.

(2) The CHANNEL FUNCTIONAL TEST shall also demonstrate that control room alarm annunciation occurs if any of the following conditions exist:

1. Instrument indicates measured levels above the alarm setpoint.
2. Circuit failure.
3. Instrument indicates a downscale failure.
- | 4. Deleted

(3) The CHANNEL CALIBRATION shall include the use of a known radioactive source (traceable to the National Bureau of Standards radiation measurement system or other acceptable non-NBS standards) positioned in a reproducible geometry with respect to the sensor and emitting beta and/or gamma radiation in the range measured by the channel in accord with established station calibration procedures. Alternately, after the initial calibration, noble gas activity monitors may be calibrated by laboratory analyzed gas samples collected and analyzed per Table 4.15-2, item A.

(4) The CHANNEL CALIBRATION shall include the use of at least two standard gas samples, each containing a known volume percent hydrogen in the range of the instrument, balance nitrogen.

## 3.15.1 and 4.15.1 BASES

## 1. Radioactive Gaseous Effluent Instrumentation

The radioactive gaseous effluent instrumentation is provided to monitor the release of radioactive materials in gaseous effluents and, as appropriate, to control potential releases. Instrumentation for monitoring the concentration of potentially explosive gas mixtures in the main condenser offgas treatment system is also provided. The presence of instruments for monitoring both radioactive and explosive gaseous effluents is depicted in ODAM Figure 3-1. The OPERABILITY and use of these instruments implements the requirements of 10CFR Part 50, Appendix A, General Design Criteria 60, 63, and 64.

Reactor building exhaust ventilation shaft radiation monitors initiate isolation of the reactor building normal ventilation and start standby gas treatment when a high trip point is reached.

DAEC is equipped with a radioactive gaseous effluent monitoring system which includes detectors at the offgas stack (R3), the reactor building vent (R4), and the turbine building vent (R5). A remote indication and control unit located near each detector displays the detector reading and, whenever the setpoint is exceeded, an indicator light. The data are also routed to a control computer and a control room display but do not cause a trip to isolate the ventilated area. In the event the control computer and/or control room display fail to function or are voluntarily taken out of service, each remote indication and control unit is designed to acquire data for up to 30 hours. It is intended that each affected remote indication and control unit display be observed at least once per 24 hours (in which case the affected channel remains OPERABLE).

If an alarm trip setpoint is exceeded at the same time the control computer and/or control room display are neither functioning nor in service, alarm annunciation will still occur in the control room. In the event the detector reading and the indication of exceeding the monitor setpoint are not provided at either the control room or the remote indication and control unit, then the affected channel is not OPERABLE and DAEC will either perform the appropriate ACTION or will provide an alternate monitoring system. This permits DAEC to retain the GE gaseous monitoring system as an alternate system for normal effluent monitoring when the Kaman system is temporarily inoperable. When used as an alternate monitoring system, the GE system is subject to the requirements stated in Specifications 3.15.1 and 4.15.1 and to LLD requirements stated in Table 4.15-2, Item C.

2. Not used
3. Gaseous Effluents

Assessments of dose required by Specifications 4.15.3 and 4.15.4 to verify compliance with Appendix I, Section IV are based on measured radioactivity in gaseous effluent and on calculational methods stated in the ODAM. Pathways of exposure and location of individuals are selected such that the dose to a nearby resident is unlikely to be underestimated. Dose assessment methodology described in the ODAM for gaseous effluent will be consistent with the methodology in Regulatory Guides 1.109 and 1.111. Cumulative and projected assessments of dose made during a quarter are based on historical average meteorological conditions measured at DAEC. Assessment made for the annual radiological environmental report will be based on annual averages of atmospheric conditions during the period of release.

### 3.15.2 and 4.15.2 BASES

#### Gaseous Effluent Concentration

This specification is intended to ensure that the concentration of radioactive material in the unrestricted area beyond the site boundary due to gaseous effluents from DAEC will maintain doses within the annual dose limits to unrestricted area provided in 10 CFR Part 20. Compliance with these limits also reasonably assures that radioactive material in gaseous effluents will not result in exposure of a member of the public in an unrestricted area to annual averaged concentrations exceeding the limit in 10 CFR Part 20.106. The occupancy time of members of the public who may occasionally be on the site is expected to be low enough to compensate for any less atmospheric dispersion on site than to the environs offsite.

Assessment of compliance is based upon an effluents measurement program defined in Table 4.15-2 and methodology stated in the ODAM. The resolving time of the measurements, i.e., the sample integration time, bounds the minimum averaging time of the effluent measurements. waste streams. The Standby Gas Treatment System is considered an Engineered Safety Feature and not an exhaust ventilation treatment system. Thus the exhaust ventilation system discharges via the reactor building vent.

### 3.15.3 and 4.15.3 BASES

#### Doses due to Noble Gases

These specifications implement the requirements of 10 CFR Part 50, Appendix I.

LIMITING CONDITIONS FOR OPERATION

3.16.2 A radiological environmental monitoring program shall be conducted as specified in Table 3.16-1.

APPLICABILITY: At all times.

ACTION:

- a. In the event the radiological environmental monitoring program is not conducted as specified in the Table 3.16-1, prepare and submit to the Commission in the Annual Radiological Environmental Report the reasons for not conducting the program in accord with the Table 3.16-1 and the plans for preventing a recurrence.
- b. In the event radioactivity in a sampled environmental medium, averaged over a calendar quarter, is attributable to DAEC and exceeds an appropriate value listed in Table 3.16-3 or, if not listed, causes a potential annual dose exceeding two times the quarterly dose limit in Specification 3.14.3 or 3.15.4, prepare and submit to the Commission within 30 days after discovery a Special Report which includes an evaluation of any release conditions, environmental factors or other conditions which caused the value(s) of Table 3.16-3 or two times the quarterly dose limit to be exceeded and which defines the corrective actions to be taken. If the radioactivity in environmental sample(s) is not attributable to releases from the Station, the Special Report is not

SURVEILLANCE REQUIREMENT

4.16.2.1 Sampling and analyses required in Table 3.16-1 shall be performed such that the detection capabilities specified in Table 3.16-2 are achieved under routine conditions. If a sample analysis does not meet the LLD specified, report the reason attributed in the next Annual Radiological Environmental Report.

4.16.2.2 Land Use Census DAEC shall conduct annually a land use census within three miles of the Station to identify radiologically important changes in land use.

LIMITING CONDITIONS FOR OPERATION

3.16.4 Appropriate equipment shall be operated in accordance with a Process Control Program to process wet radioactive waste solids destined for disposal to a form that meets appropriate requirements of 10 CFR Part 61.56 before the waste is shipped from the DAEC site.

APPLICABILITY: During Processing of radioactive waste solids for disposal.

ACTION:

1. Suspend delivery to a transport carrier of any container of radioactive waste not complying with 10 CFR Part 61.56.

SURVEILLANCE REQUIREMENT

4.16.4.1 The Process Control Program shall state the essential operating parameters of the process(es), the essential characteristics of the waste form to be shipped, and the essential product verification requirements.

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.

#### 3.16.4 and 4.16.4 BASES

##### 1. Radioactive Waste Solids

This specification implements the requirements of 10 CFR Part 50.36a(a), the General Design Criterion 60 of 10 CFR Part 50 Appendix A, and of 10 CFR Part 61.56 on characteristics of low-level radioactive wastes destined for disposal by burial. Applicable requirements on packaging and delivery of packages of radioactive material to a carrier for transport stated in 10 CFR Part 71 and on transportation of hazardous materials in 49 CFR 171-179 are not restated in the technical specifications.

Processing waste to meet characteristics permitted under 10 CFR Part 61.56 may include solidification, preparation for deposit in a high integrity container, or any form acceptable under Part 61 for shipment to and receipt by a licensed disposal facility or licensed radioactive waste processor.

It is intended that a Contractor may perform the waste processing provided he operates according to a Process Control Program approved in accordance with Technical Specification 6.15.

### 6.11.3 UNIQUE REPORTING REQUIREMENTS

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

- a. Reactor vessel base, weld and heat affected zone metal test specimens (Specification 4.6.A.2).
- b. I-131 dose equivalent exceeding 50% of equilibrium value (Specification 4.6.B.1.h).
- c. Inservice inspection (Specification 4.6.G).
- d. Reactor Containment Integrated Leakage Rate Test (Specification 4.7.A.2.f).
- e. deleted
- f. Fire Protection Systems (Specifications 3.13.A.3, 3.13.B.2, 3.13.B.3, 3.13.C.3, and 3.13.D.3).
- g. deleted

- h. Radioactive Liquid or Gaseous Effluent - calculated dose exceeding specified limit (Specifications 3.14.3, 3.15.3 and 3.15.4).  
(effective date 1/1/86)
- i. Off-Gas System inoperable (Specification 3.15.5).  
(effective date 1/1/86)
- j. Measured levels of radioactivity in an environmental sampling medium determined to exceed the reporting level values of Table 3.16-3 when averaged over any calendar quarter sampling period, (specification 3.16.2.b). (effective date 1/1/86)
- k. Annual dose to a member of the public determined to exceed 40 CFR Part 190 dose limit, (specification 3.16.1.b).  
(effective date 1/1/86)
- l. Radioactive liquid waste released without treatment when activity concentration exceeds 0.01 Ci/ml, (specification 3.14.4.a).  
(effective date 1/1/86)