

### 3.5 INSTRUMENTATION SYSTEMS

#### 3.5.1 Operational Safety Instrumentation

##### Applicability

Applies to plant operational safety instrumentation systems.

##### Objective

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

##### Specification

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

### Radioactive Gaseous Effluent Instrumentation

The radioactive gaseous effluent monitoring instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in gaseous effluents during actual or potential releases of gaseous effluents. The alarm/trip setpoints for these instruments shall be calculated in accordance with the procedures in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. The operability and use of this instrumentation are consistent with the requirements of General Design Criteria 60, 63, and 64 of Appendix A to 10 CFR Part 50.

### References

- (1) FSAR Section 6.3.5
- (2) FSAR Section 15.6.5
- (3) FSAR Section 15.1.5
- (4) CP&L Letter to the Directorate of Licensing dated October 23, 1973.

TABLE 3.5-1 (Continued)

ENGINEERED SAFETY FEATURE SYSTEM INITIATION INSTRUMENT SETTING LIMITS

<u>NO.</u>	<u>FUNCTIONAL UNIT</u>	<u>CHANNEL ACTION</u>	<u>SETTING LIMIT</u>
6. (Cont'd)	b. 480V Emerg. Bus Undervoltage (Degraded Voltage) Time Delay	Trip Normal Supply Breaker	412 Volts $\pm$ 1 Volt 10.0 second delay $\pm$ 0.5 sec.
7.	Containment Radioactivity High	Ventilation Isolation	The alarm is set with a method described in the ODCM.

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

\*\* Initiates also containment isolation (Phase B).

\*\*\* Derived from equivalent  $\Delta P$  measurements.

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

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

Applicability

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

Objective

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

Specification

- 3.9.3.1      The dose rate due to radioactive materials in gaseous effluents released from the site boundary (see Figure 1.1-1) shall be limited to the following:
- a.    For radionoble gases: <500 mrem/yr to the total body, <3000 mrem/yr to the skin, and
  - b.    For I-131, I-133, and tritium, and for all radioactive materials in particulate form, inhalation pathway only, with half lives greater than 8 days: <1500 mrem/yr to any organ.
- 3.9.3.2      With the dose rate(s) exceeding the above limits, without delay decrease the release rate to within the above limits. In addition, a prompt notification must be made to the Commission in accordance with Specification 6.9.2(a)(10).
- 3.9.3.3      In the event that the immediate action required by 3.9.3.2 above cannot be satisfied, the facility shall be placed in hot shutdown

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

Applicability

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

Objective

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

Specification

3.9.5.1      The dose to a member of the public from I-131, I-133, tritium and radioactive materials in particulate form, with half-lives greater than 8 days in gaseous effluents released to unrestricted areas (See Figure 1.1-1), shall be limited, at all times, to the following:

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

3.9.5.2      With the calculated dose commitment from the release of I-131, I-133, tritium and radioactive materials in particulate form, with half lives greater than 8 days, in gaseous effluents exceeding any of the limits prescribed by Specification 3.9.5.1 above, prepare and submit a report to the Commission in accordance with Specification 6.9.3.2.

### Objective

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

### Specification

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

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

### Applicability

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

### Objective

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

### Specification

4.10.4.1 Cumulative dose contributions for the current calendar quarter and current calendar year for I-131, I-133, tritium, and radionuclides in particulate form with half lives greater than 8 days shall be determined in accordance with the methodology and parameters in the ODCM at least once per 31 days.

TABLE 4.10-2

RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS PROGRAM

Type of Release	Sampling Frequency	Minimum Analysis Frequency	Required Activity Analysis	Required LLD <sup>a</sup> μCi/ml
Waste Gas Decay Tanks	P	P	Principal Gamma Emitters <sup>c</sup>	1E-04
Containment Pressure Reliefs and Containment Purges	W <sup>e</sup> Grab Sample <sup>b</sup>	W <sup>e</sup> on Grab Sample	Principal Gamma Emitters <sup>c</sup>	1E-04
			Tritium	1E-06
<u>Continuous Releases</u>	M <sup>e,g,h</sup> Grab Sample for Radionoble Gases and Tritium	M <sup>e</sup> on Grab Sample	Principal Gamma Emitters <sup>c</sup>	1E-04
1. Plant Vent			Tritium	1E-06
2. Condenser Air Ejector Vent If S/G Activity is $>1 \times 10^{-4}$ μCi/cc condenser off-gas is routed to plant vent	Continuous <sup>d</sup> Radioiodine Sample	W <sup>f</sup>	I-131 I-133 on Sample	1E-12 1E-10
	Continuous <sup>d</sup> Particulate Sample	W <sup>f</sup> on Sample	Principal Gamma Emitters <sup>c</sup>	1E-11
	Continuous <sup>d</sup> Particulate Samples to be Composited	Q on Composite	Sr-89, Sr-90	1E-11
		M on Composite	Alpha	1E-11
	Continuous	Noble Gas Monitor	Noble Gases Gross Beta and Gamma	2E-5 μCi/cc