TENNESSEE VALLEY AUTHORITY

CHATTANOOGA. TENNESSEE 37401 500C Chestnut Street Tower II

MAR 12 1979

Director of Nuclear Reactor Regulation Attention: Mr. S. A. Varga, Chief Light Water Reactors Branch No. 4 Division of Project Management U.S. Nuclear Regulatory Commission Washington, DC 20555

Dear Mr. Varga:

In the Matter of the Application of) Docket Nos. 50-327 Tennessee Valley Authority) 50-328

As requested by D. B. Vassallo's letter of November 16, 1978, enclosed is a copy of the draft radiological effluent technical specifications for the Sequoyah Nuclear Plant. These specifications have been modified to reflect the Sequoyah design.

The enclosed submittal does not address waste solidification. TVA has deleted this specification for three basic reasons. First, requirements for the shipment of radioactive wastes in 10 CFR 71 do not require solidification when a qualified shipping container is used for transportation. In addition, the Department of Transportation and the burial sites themselves do not require that wastes be solidified. Second, TVA does not agree with the NRC staff's definition of solidification, particularly the requirement for homogeneity. And third, compared to the benefits achieved, the projected dose levels associated with the proposed solid waste surveillance requirements are inconsistent with the ALARA program.

The Offsite Dose Calculation Manual (ODCM) has not been completed; consequently, it is not included with this submittal. It is anticipated that the ODCM will be in draft form and available for submittal to the NRC staff by March 20, 1979.

We would like to meet with the staff in the near future to discuss our radiological effluent technical specification submittal.

Very truly yours,

· VE Gille lare J. E. Gilleland Assistant Manager of Power

Enclosure

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1.0 DEFINITIONS

CHANNEL CALIBRATION

1.9 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 performed by any series of sequential, overlapping or total channel steps such that the entire channel is calibrated.

CHANNEL CHECK

1.10 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 instrumentation channels measuring the same parameter.

CHANNEL FUNCTIONAL TEST

- 1.11 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.
 - b. Bistable channels the injection of a simulated signal into the sensor to verify OPERABILITY including alarm and/or trip functions.

SOURCE CHECK

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

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.0 DEFINITIONS (Continued)

It shall also contain the radiological environmental monitoring program.

OFFSITE DOSE CALCULATION MANUAL (ODCM)

1.29 An OFFSITE DOSE CALCULATION MANUAL (ODCM) shall be a manual containing the methodology and parameters to be used in the calculation of offsite doses due to radioactive gaseous and liquid effluents and in the calculation of gaseous and liquid effluent monitoring instrumentation alarm/trip setpoints.

1.30 A GASEOUS RADWASTE TREATMENT SYSTEM is any system designed and installed to reduce radioactive gaseous effluents by collecting primary coolant system offgases from the primary system and providing for delay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.

VENTILATION EXHAUST TREATMENT SYSTEM

1.31 A VENTILATION EXHAUST TREATMENT SYSTEM is any system designed and installed to reduce gaseous radioiodine or radioactive material in particulate form in effluents by passing ventilation or vent exhaust gases through charcoal adsorbers and/or HEPA filters for the purpose of removing iodines or particulates from the gaseous exhaust stream prior to the release to the environment. Engineering Safety Features (ESF) atmospheric cleanup systems are not considered to be VENTILATION EXHAUST TREATMENT SYSTEM components,

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FREQUENCY NOTATION

| NOTATION | FRE IENCY |
|----------|----------------------------------|
| S | At least once per 12 hours. |
| D | At least once per 24 hours. |
| W | At least once per 7 days. |
| м | At least once per 31 days. |
| Q | At least once per 92 days. |
| SA | At least once per 184 days. |
| R | At least once per 18 months. |
| S/U | Prior to each reactor startup. |
| Р | Completed Prior to each release. |
| N.A. | Not applicable. |

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INSTRUMENTATION

RADIOACTIVE LIQUID EFFLUENT INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.9 The radioactive liquid effluent monitoring instrumentation channels shown in Table 3.3-12 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Specification 3.11.1.1 are not exceeded.

APPLICABILITY: As shown in Table 3.3-12.

ACTION:

- a. With a radioactive liquid effluent monitoring instrumentation channel alarm/trip setpoint less conservative than a value which will ensure that the limits of 3.11.1.1 are met, immediately suspend the release of radioactive liquid effluents monitored by the affected channel or declare the channel inoperable.
- b. With less than the minimum number of radioactive liquid effluent monitoring instrumentation channels OPERABLE, TAke the ACTION shown in Table 3.3-12.
- c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.9.1 The setpoints shall be determined in accordance with procedures as described in the ODCM and shall be recorded.

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4.3.3.9.2 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 4.3-11.

4.3.3.9.3 Records - Auditable records shall be maintained, with procedures in the ODEM, of all radioactive liquid effluent monitoring instrumentation alarm/trip setpoints. Setpoints and setpoint calculations shall be available for review to ensure that the limits of Specification 3.11.1.1 are met.

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*Includes rinse, flush, and slurry waste from secondary system condensate deep bed demineralizer or filterdemineralizers.

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Pump curves may be utilized to estimate flow; in such cases, action statement 21 is not required. * When connected to the secondary system of the affected unit

TABLE 3.3-11 (Continued)

TABLE NOTATION

- ACTION 18 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases may be resumed for up to 14 days, provided that prior to initiating a release:
 - At least two independent samples are analyzed in accordance with Specification 4.11.1.1.3, and;
 - At least two technically qualified members of the Facility Staff independently verify the release rate calculations and discharge valving;

Otherwise, suspend release of radioactive effluents via this pathway.

- ACTION 19 With the number of channels OPERABLE less than required by The Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 14 days provided grab samples are analyzed for gross radioactivity (beta or gamma) at a limit of detection of at least 10⁻⁷ uCi/gram or an isotopic evaluation is performed;
 - At least once per 8 hours when the specific activity of the secondary coolant is > 0.01 uCi/gram DOSE EQUIVALENT I-131.
 - At least once per 24 hours when the specific activity of the secondary coolant is < 0.01 uCi/gram DOSE EQUIVALENT I-131.

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- ACTION 20 With the numbers of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 14 days provided that at least once per 8 hours grab samples are collected and analyzed for gross radioactivity (beta or gamma) at a lower limit of detection of at least 10⁻⁷ uCi/ml or an isotopic evaluation is performed.
- ACTION 21 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 14 days provided the flow rate is estimated at least once per 4 hours during actual releases.
- ACTION 22 With the numbers of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, liquid additions to this tank may continue for up to 28 days provided the tank liquid level is estimated during all liquid additions to the tank.
- ACTION 23 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via the affected pathway may continue for up to 14 days provided the gross radioactivity level is recorded at least once per 4 hours during actual release.

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TABLE 4.3-11

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

| INS | TRUMENT | CHANNEL | SOURCE CHECK | CHANNEL CALIBRATION | FUNCTIONAL TEST |
|-----|---|------------|-----------------|------------------------|--------------------|
| 1. | Gross Radioactivity Monitors Providing Alarm and Automatic Isolation | | | | |
| | a. Liquid Radwaste Effluents Line | D* | Р | R(3) . | Q(1) |
| | b. Steam Generator Blowdown Effluent Line | D* | м | R(3) | Q(1) |
| | c. Condensate Demineralizer Effluent Line | D* | Ρ | R(3) | Q(1) |
| 2. | Gross Radioactivity Monitors Providing Alarm but Not Providing Automatic Isolation. | | | | |
| | a. Essential Raw Cooling Water Effluent Line | D* | М | .R(3) | Q(2) |
| 3. | Activity Recorders (6) | | | | |
| | a. Liquid Radwaste Effluent Line | D * | N.A. | R | Q |
| | b. Steam Generator Blowdown Effluent Line | 0* | N.A. | R | Q |
| | c. Condensate Demineralizer Effluent Line | D * | N.A. | R | Q |
| | | | | | |

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| <u>T</u> | TABLE 4.3-11 (Continued) | | | | |
|--|--------------------------|-----------------|------------------------|-------------------------------|--|
| RADIOACTIVE LIQUID EFFLUENT M | ION I TOR ING | INSTRUMENT | ATION SURVEILLA | NCE REQUIREMENTS | |
| INSTRUMENT | CHANNEL CHECK | SOURCE CHECK | CHANNEL CALIBRATION | CHANNEL FUNCTIONAL TEST | |
| Tank Level Monitors (for tanks outside the building) (7) | | | | | |
| 9 . Condensate Storage Tank | D** | N.A. | R | Q | |
| b. Steam Generator Layup Tank | D* * | N.A. | R | Q | |
| 5. Flow Rate Monitors | | | | | |
| a. Liquid Radwaste Effluent Line | D ⁽⁴⁾ | N.A. | R | Q | |
| b. Steam Generator Blowdown Effluent Line | D ⁽⁴⁾ | N.A. • | R | Q | |
| c. Condensate Demineralizer Effluent Line | D(4) | N.A. | R | Q | |
| d. Cooling Tower Blacchain | D(4) | N.A. | R | Q | |

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TABLE 4.3-11 (Continued)

TABLE NOTATION

*During radioactive releases via this pathway

- **During primary to secondary leakage when connected to the secondary
 system of the affected unit.
- The CHANNEL FUNCTIONAL TEST shall also demonstrate that automatic isolation of this pathway and control room alarm annunciation occurs if any of the following conditions exist:
 - Instrument indicates measured levels above the alarm/trip setpoint.
 - 2. Circuit failure.
 - 3. Instrument controls not set in operate mode
- (2) The CHANNEL FUNCTIONAL TEST shall also demonstrate that control room alarm annunciation occurs if any of the following conditions exist:
 - Instrument indicates measured levels above the alarm/trip setpoint.
 - 2. Circuit failure.
 - 3. Instrument controls not set in operate mode

- (3) The vendor channel calibration for radioactivity measurement instrumentation shall be accepted for initial calibration. Subsequent calibrations are to be performed at intervals of at least once per 18 months using grab samples analyzed by laboratory instrumentation. The laboratory instrumentation used in the calibration program shall have been calibrated using standards that have been obtained from suppliers that participate in measurement assurance activities with the National Bureau of Standards.
- (4) 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 continuos, periodic, or batch releases are made.

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INSTRUMENTATION

RADIOACTIVE GASEOUS PROCESS AND EFFLUENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.10 The radioactive gaseous process and effluent monitoring instrumentation channels shown in Table 3.3-13 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Specification 3.11.2.1 are not exceeded.

APPLICABILITY: As shown in Table 3.3-13.

ACTION:

- a. With a radioactive gaseous process or effluent monitoring intrumentation channel alarm/trip setpoint less conservative than a value which will ensure that the limits of 3.11.2.1 are met, declare the channel inoperable.
- b. With less than the minimum number of radioactive gaseous process or effluent monitoring instrumentation channels OPERABLE, take the ACTION shown in Table 3.3-13.
- c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.10.1 The setpoints shall be determined in accordance with procedures as described in the ODCM and shall be recorded

4.3.3.10.2Each radioactive gaseous process or 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 4.3-12.

4.3.3.10.3 Auditable records shall be maintained of the calculations made in accordance with procedures in the ..., of all radioactive process and effluent monitoring instrumentation alarm/trip setpoints. Setpoints and setpoint calculations shall be available for review to ensure that the limits of Specification 3.11.2.1 are met.

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| | RADIOACTIVE | TABLE 3.3- | -13 ENT MONITORING IN | CTOUNCNEATION | |
|-----------------|--|---------------------------------|--------------------------|---------------------------------|-------|
| <u>In</u> 1. | STRUMENT Waste Gas Holdup System | MINIMUM CHANNELS OPERABLE | APPLICABILITY | FUNCTION | ACTIC |
| 2. | a. Effluent System Flow Rate Measuring Device Waste Gas Holdup System Explosive Gas Monitoring System | . 1 | • | System Flow Rate Measuremp.c | 25 |
| 1 | a. Hydrogen Monitor b. Oxygen Monitor | 1 | ** | % Hydrogen % Oxygen | 27 |

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RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

| INSTRUMENT Continuous Release Points 3. (see list below) | MINIMUM CHAMNELS OPERABLE | APPLICABILITY | FUNCTION_ | <u>ACTION</u> |
|--|---------------------------------|---------------|--------------------------------|---------------|
| a. Noble Gas Activity Monitor | 1 | * | Radioactivity Rate Measurement | 35 |
| b. Iodine Sampler Cartrid | ge 1 | * | Sample Indines | 28 |
| c. Particulate Sampler Filter | 1 | * | Sample particulates | 28 |
| d. Effluent System Flow Rate Measuring Device | 1 | * | System Flow Rate Measurement | 25 |
| e. Noble Gas Sampler Flo Rate Measuring Device | 1 | * . | Sampler Flow Rate Measurement | 25 |

(a) Condenser Vacuum Exhaust System

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(b) Shield Building Exhaust System 🛪

(c) Auxiliary Building Ventilation System

(d) Service Building Ventilation System

* will be continues release when in use

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TABLE NOTATION

*During radicactive rele ses via this pathway

**During the filling of the waste gas decay tanks

- ACTION 25 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 28 days provided the flow rate is estimated at least once per 4 hours.
- ACTION 26 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 28 days provided grab samples are taken at least once per 8 hours and these samples are analyzed for gross activity within 24 hours.
- ACTION 27 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, operation of the waste gas holdur system may continue provided grab samples are collected at least once per 4 hours and analyzed within ensuing 4 hours.
- ACTION 28 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 28 days, provided samples are continuously collected with auxiliary semiling equipment for periods on the order of seven (7) days.

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| TABLE | 4.3-12 | |
|-------|--------|--|
| | | |

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

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| INS | TRUMENT . | CHANNEL CHECK | SOURCE CHECK | CHANNEL CAL IBRATION | CHANNEL FUNCTIONAL TEST |
|-----|--|------------------|-----------------|-------------------------|-------------------------------|
| 1. | Waste Gas Decay Tanks | | | | |
| | a. System Effluent Flow Rate Measuring Device | P∗ | N/A | R | Q |
| 2. | Waste Gas Holdup System Explosive Gas Monitoring System | e | | | |
| | a. Hydrogen Monitor | D** | N/A | Q(4) | М |
| | b. Oxygen Monitor | D** | N/A | Q(5) | м |
| | | | | | |

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TABLE 4.3.12(Continued)

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| | | RADIOACTIVE GASEOUS EFFLUENT | MONITORING | INSTRUMEN | TATION SURVEILL | ANCE REQUIREMENTS |
|-------|--|---|------------------|-----------------|------------------------|----------------------------|
| INSTR | RUMENT | | CHANNEL CHECK | SOURCE CHECK | CHANNEL CALIBRATION | CHANNEL FUNCTIONAL TEST |
| 3. | Contin (se | nuaus Release founts ee list below) | | | | |
| | а. | Noble Gas Activity Monitor | D * | 8 | R(3) | Q(2) |
| | b. | Iodine Sampler | D * | N.A. | N.A. | N.A. |
| | с. | Particulate Sampler | D * | N.A. | N.A. | N.A. |
| | d. System Effluent Flow Rate Measurement Device | | D.* | N.A. | R | Q |
| | e. | Noble Gas Sampler Flow Rate Measurement Device | D.* | N.A. | R | Q |
| - | | (a) Condenser Va | cuum Exhaus | t System | • | |
| | | (b) Shield Build | ling Exhaust | System 🛠 | | |
| | | (c) Auxiliary Bu | ilding Vent | ilation Sy | ystem | |
| | | (d) Service Bu | Iding Vent | ilation 5 | ystein | |

* will be continuous release when in use

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TABLE 4.3-12 (Continued)

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TABLE NOTATION

*During radioactive releases via this pathway **During the filling of the waste gas decay tanks

(1) The CHANNEL FUNCTIONAL TEST shall also demonstrate that automatic isolation of this pathway and control room alarm annunciation occurs if any of the following conditions exist:

- Instrument indicates measured levels above the alarm/trip 1.
- Circuit failure. 2.

Instrument indicates a downscale failure. 3.

4. Instrument controls not set in operate mode.

- (2) The CHANNEL FUNCTIONAL TEST shall also demonstrate that control room alarm annunciation occurs if any of the following conditions exist:
 - Instrument indicates measured levels above the alarm/trip
 - Circuit failure. 2.

Instrument indicates a downscale failure. 3.

4. Instrument controls not set in operate mode.

(3) The vendor channel calibration for radioactivity measurement instrumentation shall be accepted for initial calibration. Subsequent calibrations are to be performed at intervals of at least once per 18 months using grab samples analyzed by laboratory instrumentation. The laboratory instrumentation used in the calibration program shall have been calibrated using standards that have been obtained from suppliers that participate in measurement assurance activities with the National Bureau of Standards.

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TABLE 4.3-12 (Continued)

- (4) The CHANNEL CALIBRATION shall include the use of standard gas samples containing a nominal:
 - 1. One volume percent hydrogen, balance nitrogen; and
 - 2. Four volume percent hydrogen, balance nitrogen.
- (5) The CHANNEL CALIBRATION shall include the use of standard gas samples containing a nominal:
 - 1. One volume percent oxygen, balance nitrogen; and
 - 2. Four volume percent oxygen, balance nitrogen.

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3/4.11 RADIOACTIVE EFFLUENTS

3/4.11.1 LIQUID EFFLUENTS

CONCENTRATION

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LIMITING CONDITION FOR OPERATION

3.11.1.1 The concentration of radioactive material released at anytime from the site to unrestricted areas (see Figure 3.11-1) shall be limited to the concentrations specified in 10 CFR 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 be limited to 2 x 10⁻⁴ uCi/ml total activity.

APPLICABILITY: At all times.

ACTION:

With the concentration of radioactive material released from the site to unrestricted areas exceeding the above limits, immediately restore concentration within the above limits and provide prompt notification to the Commission pursuant to Specification 6.9.1.12.

SURVEILLANCE REQUIREMENTS

4.11.1.1.1 The concentration of radioactive material at any time in liquid effluents released from the site shall be monitored in accordance with Table 3.3-12.

4.11.1.1.2 The liquid effluent monitors having provisions for automatic termination of liquid releases, as listed in Table 3.3-12, shall be used to limit the concentration of radioactive material released at any time from the site to unrestricted areas to the values given in Specification 3.11.1.1.

4.11.1.1.3 The radioactivity content of each batch of radioactive liquid waste to be discharged shall be determined prior to release by sampling and analysis in accordance with Table 4.11-1. The results of pre-release analyses shall be used with the methods in the ODCM to assure that the concentration at the point of release is limited to the values in Specification 3.11.1.1.

4.11.1.1.4 Post-release evaluation of composite samples shall be performed in accordance with Table 4.11-1. The results of the postrelease analyses shall be used with the methods in the ODCM to assure that the concentrations at the point of release are limited to the values in Specification 3.11.1.1.

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SURVEILLANCE REQUIREMENTS (Continued)

4.11.1.1.5 The radioactivity concentration of liquids discharged from continuous release points shall be determined by collection and analysis of samples in accordance with Table 4.11-1. The results of the analyses shall be used with the methods in the ODCM to assure that the concentrations at the point of release are limited to the values in Specification 3.11.1.1.

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4.11.1.1.6 Reports. The semiannual Radioactive Effluent Release Report shall include the information specified in Specification 6.9.1.9.

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TABLE 4.11-1

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Lower Limit Sampling Minimum Type of Activity of Detection Liquid Release Type Frequency Analysis Analysis (LLD) (uCi/ml)a Frequency P P 5 x 10-7 b A. Batch Waste Re-Each Batch Each Batch Principal_Gamma lease Tanks^e Emitters 9: 1. Waste Condensate ~~~~ Tanks (3) 1 x 10-6 I-131 2. Cask Decon Tank (1) 3. Laundry Tanks (2) P 4. Chemical Drain 1 × 10-5 One Batch/M M Dissolved and Tank (1) Entrained Gases 5. Monitor Tank (1) 6. Non-reclaimable 1 x 10⁻⁵ P H-3 Waste Tank (1) Each Batch M 7. High Crud Composite 1 x 10-7 Tanks (2) Gross a 8. Distillate Tanks 1 x 10-6 P-32 (2) P 5 x 10⁻⁸ Sr-89, Sr-90 Each Batch .0 CompositeC B. Plant Continuous once per dayd Principal Gamma W 5 x 10-7^b Releases f Composited Emitters9 (Steam generator grab sample blowdown performed 1 x 10-6 I-131 when primary to secondary leakage M occurs and Grab Sample M Dissolved and discharging to 1 x 10⁻⁵ Entrained Gases the environment). H-3 1 x 10-5 weekly d M Composited 1 x 10-7 Gross a 1 x 10-6 P-32 5 x 10-8 monthly d Sr-89, Sr-90 Q Composited

RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

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TABLE 4.11-1 (Continued)

TABLE NOTATION

- a. The lower limit of detection (LLD) is defined in Table Notation a. of Table 4.12-1 of Specification 4.12.1.1.
- b. For certain radionuclides with low gamma yield or low energies, or for certain radionuclide mixtures, it may not be possible to measure radionuclides in concentrations near the LLD. Under these circumstances, the LLD may be increased inversely proportionally to the magnitude of the gamma yield (i.e., 5 x 10⁻⁷/I, where I is the photon abundance expressed as a decimal fraction).
- c. A composite sample is one in which the quantity of liquid sampled is proportional to the quantity of liquid waste discharged and in which the method of sampling employed results in a specimen which is representative of the liquids released.
- d. Samples shall be collected in proportion to the rate of flow of the effluent stream. Prior to analyses, all samples taken for the composite shall be thoroughly mixed in order for the composite sample to be representative of the effluent release.
- A batch release is the discharge of liquid wastes of a discrete volume.
- f. A continuous release is the discharge of liquid wastes of a nondiscrete volume; e.g., from a volume of system that has an input flow during the continuous release.
- g. The principal gamma emitters for which the LLD specification will apply are exclusively the following radionuclides: Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144. This list does not mean that only these nuclides are to be detected and reported. Other peaks which are measurable and identifiable, together with the above nuclides, shall also be identified and reported. Nuclides which are below the LLD for the analyses should not be reported as being present at the LLD level. When unusual circumstances result in LLD's higher than required, the reasons shall be documented in the semiannual Radioactive Effluent Release Report.

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This figure shall consist of a map of the site area showing the unre-stricted area boundary for liquid effluents as defined in 10 CFR Part 20.3(a)(17).

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Figure 3.11-1

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LIMITING CONDITION FOR OPERATION

3.11.1.2 The dose or dose commitment to an individual from radioactive materials in liquid effluents released to unrestricted areas (see Figure 3.11-1) shall be limited:

- a. During any calendar quarter to < 1.5 mrem to the total body and to < 5 mrem to any organ, and *
- b. During any calendar year to < 3 mrem to the total body and to < 10 mrem to any organ."

APPLICABILITY: At all times.

ACTION:

- The lieu of any other report required by Specification the release of mark 6.9.1 a. 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, pursuant to Specification 6.9.2, a Special Report/which identifies the cause(s) for exceeding the limit(s) and defines the corrective actions to be taken to reduce the releases of radioactive materials in liquid effluents during the remainder of the current calendar quarter and during the subsequent three calendar quarters so that the average dose or dose commitment to an individual from such releases during these four calendar quarters is within 3 mrem to the total body and 10 mrem to any organ. This Special Report shall also include (1) the results of radiological analyses of the drinking water source, and (2) the radiological impact on finished drinking water supplies with regard to the requirements of 40 CFR 141, Safe Drinking Water Act. (Applicable only if drinking water supply is taken from the receiving water body.)
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.1.2.1 Dose Calculations. Cumulative dose contributions from liquid effluents shall be determined in accordance with the Offsite Dose Calculation Manual (ODCM) at least once per 31 days.

4.11.1.2.2 Reports. The semiannual Radioactive Effluent Release Report shall include the information specified in Specification 6.9.1.9.

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* These doses are per reactor 3/4 11-6

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LIQUID WASTE TREATMENT

LIMITING CONDITION FOR OPERATION

appropriate subsystem of the

3.11.1.3 The Aliquid radwaste treatment system shall be OPERABLE. The system shall be used to reduce the radioactive materials in liquid wastes prior to their discharge when the projected dose due to liquid effluent releases to unrestricted areas (see Figure 3.11-1) when averaged over = 31 days would exceed 0.06 mrem to the total body or 0.2 mrem to any organ.

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APPLICABILITY: During liquid effluent releases

ACTION:

- a. With radioactive liquid waste being discharged without treatment and in excess of the above limits, prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2, a Special Report which includes the following information: In her of any other report regulated by Specification 6.4.1,
 - Identification of equipment or subsystems not OPERABLE and the reason for inoperability.
 - Action(s) taken to restore the inoperable equipment to OPERABLE status.
 - 3. Summary description of a vion(s) taken to prevent a recurrence.
- b. The provisions of Specification 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.1.3.1 Doses due to liquid releases to unrestricted areas shall be projected at least once per 🛫 days.

Station Proversition and the state of the st

4.11.1.3.2 The liquid radwaste system shall be demonstrated OPERABLE at least once per 92 days unless the liquid radwaste system has been utilized to process radioactive liquid effluents during the previous 92 days.

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LIQUID HOLDUP TANKS

LIMITING CONDITION FOR OPERATION

3.11.1.4 The quantity of radioactive material contained in each of the following tanks shall be limited the second second for the dissolved or entrained noble gases.

Condensate Storage Tank
 Steam Generator Layup Tank

APPLICABILITY: At all times.

ACTION:

by the following expression $\sum \frac{Ci}{mpc_i} \leq 13,000$

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- 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 hrs either reduce the tank contents to within the limit or provide prompt notification to the Commission pursuant to Specification 6.9.1.12. The written followup report shall include a schedule and description of activities planned and/or taken to reduce the tank contents to within the above limit.
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not appilcable.

SURVEILLANCE REQUIREMENTS

4.11.1.4 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.

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3/4.11.2 GASEOUS EFFLUENTS

DOSE RATE

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LIMITING CONDITION FOR OPERATION

3.11.2.1 The dose rate, at any time, in the unrestricted areas (see Figure 5.1-1) due to radioactive materials released in gaseous effluents from the site shall be limited to the following values:

- a. The dose rate limit for noble gases shall be < 500 mrem/yr to the total body and < 3000 mrem/yr to the skin, and</p>
- b. The dose rate limit for all radioiodines and for all radioactive materials in particulate form and radionuclides other than noble gases with half lives greater than 8 days shall be < 1500 mrem/yr to any organ.

APPLICABILITY: At all times.

ACTION:

With the dose rate(s) exceeding the above limits, immediately decrease the release rate to comply with the limit(s) give in Specification 3.11.2.1 and provide prompt notification to the Commission pursuant to Specification 6.9.1.12.

SURVEILLANCE REQUIREMENTS

4.11.2.1.1 The release rate, at any time, of noble gases in gaseous effluents shall be controlled by the offsite dose rate as established above in Specification 3.11.2.1.

4.11.2.1.2 The noble gas effluent continuous monitors having provisions for the automatic termination of gaseous releases, as listed in Table 3.3-13, shall be used to limit offsite doses within the values established in Specification 3.11.2.1 when monitor setpoint values are exceeded.

4.11.2.1.3 The release rate of radioactive materials, other than noble gases, in gaseous effluents shall be determined by obtaining representative samples and performing analyses in accordance with the sampling and analysis program, specified in Table 4.11-2.

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SURVEILLANCE REQUIREMENTS

4.11.2.1.4 The dose rate in unrestricted areas, due to radioactive materials other than noble gases released in gaseous effluents, shall be determined to be within the required limits by using the results of the sampling and analysis program, specified in Table 4.11-2, with the methods in the ODCM.

4.11.2.1.5 <u>Reports</u> The semiannual Radioactive Effluent Release Report shall include the information specified in Specification 6.9.1.9.

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TABLE 4.11-2

RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS PROGRAM

| Gaseous Release Type | Sampling Frequency | Minimum Analysis Frequency | Type of Activity Analysis | Lower Limit of Detection (LLD) |
|---|-------------------------|---|--|-----------------------------------|
| A. Noble Gases ; Tritium #1. Condenser Vacuum | M | м | Principal Gamma Emitters ^f | 1 x 10 ^{-4b} |
| 2. Auxiliary Bidg. Exhaust C | Sample · | | H-3 | 1 x 10 ⁻⁶ |
| Service Bldg. Exhaust Shield Bldg. Exhaust h,c | | | | |
| B. Jodine and Particulars B. All Release Types | Continuous ^e | Wd | I-131 | 1 × 10 ⁻¹² |
| as insted in A. | | Sample | I-133 | 1×10^{-10} . |
| | Continuous ^e | W ^d Particulate Sampl <u>e</u> | Principal Gamma Emitters ^f (I-131, Others) | 1 × 10 ⁻¹¹ |
| | Continuous e | M Composite Particulate Sample | Gross alpha | 1 × 10 ⁻¹¹ |
| | Continuous e | Q Composite Particulate Sample | Sr-89, Sr-90 | 1 x 10 ⁻¹¹ |

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TABLE NOTATION

- a. The lower limit of detection (LLD) is defined in Table Notation a. of Table 4.12-1 of Specification 4.12.1.1.
- b. For certain radionuclides with low gamma yield or low energies, or for certain radionuclide mixtures, it may not be possible to measure radionuclides in concentrations near the LLD. Under these circumstances, the LLD may be increased inversely proportionally to the magnitude of the gamma yield (i.e., $1 \times 10^{-4}/I$, where I is the photon abundance expressed as a decimal fraction).
- c. Analyses shall also be performed following shutdown, startup, or similar operational occurrence which could alter the mixture of radionuclides.
- d. Analyses shall also be performed at least once per 24 hours for 7 days following each shutdown, startup or similar operational occurrence which uld lead to significant increases or decreases in radioiodine releases. Samplers shall also be changed and analyzed at the intervals in Specifications 3.11.2.1 and 3.11.2.3. When samples collected for 24 hours are analyzed, the corresponding LLD's may be increased by a factor of 10.
- e. The ratio of the sample flow rate to the sampled stream flow rate shall be known for the time period covered by each dose or dose rate calculation made in accordance with Specifications 3.11.2.1, . 3.11.2.2 and 3.11.2.3.
- f. The principal gamma emitters for which the LLD specification will apply are exclusively 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-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141 and Ce-144 for particulate emissions. This list does not mean that only these nuclides are to be detected and reported. Other peaks which are measurable and identifiable, together with the above nuclides, shall also be identified and reported. Nuclides which are below the LLD for the analyses should not be reported as being present at the LLD level for that nuclide. When unusual circumstances result in LLD's higher than required, the reasons shall be documented in the semiannual effluent report.
- g. Sampled during primary to secondary leakage
- h. Sampled only when in service

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DOSE, NOBLE GASES

LIMITING CONDITION FOR OPERATION

3.11.2.2 The air dose in unrestricted areas (see Figure 5.1-1) due to noble gases released in gaseous effluents shall be limited to the following:

During any calendar guarter, to < 5 mrad for gamma radiation a. and < 10 mrad for beta radiation;

During any calendar year, to < 10 mrad for gamma radiation and < 20 mrad for beta radiation; b.

APPLICABILITY: At all times.

ACTION:

ted air dose of specification 6:1.1 a. 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, pursuant to Specification 6.9.2, a Special Report Which identifies the cause(s) for exceeding the limit(s) and defines the corrective actions to be taken to reduce the releases of radioactive noble gases in gaseous effluents during the remainder of the current calendar quarter and during the subsequent three calendar quarters so that the average dose during these four calendar quarters is within (10) mrad for gamma radiation and (20) mrad for beta radiation.

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.2.2.1 Dose Calculations Cumulative dose contributions for the total time period shall be determined in accordance with the Offsite Dose Calculation Manual (CDCM) at least once every 31 days.

4.11.2.2.2 Reports The semiannual Radioactive Effluent Release Reprot shall include the information specified in Specification 6.9.1.9.

* These doses are per reactor

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DOSE, RADIOIODINES, RADIOACTIVE MATERIAL IN PARTICULATE FORM, AND RADIONUCLIDES OTHER THAN NOBLE GASES

LIMITING CONDITION FOR OPERATION

3.11.2.3 The dose to an individual from radioiodines, radioactive materials in particulate form, and radionuclides (other than noble gases); with half-lives greater than 8 days in gaseous effluents released to unrestricted areas (see Figure 5.1-1) shall be limited to the following:

During any calendar quarter to < 7.5 mrem to any organ; * a.

b. During any calendar year to < 15 mrem to any organ; and *

APPLICABILITY: At all times.

ACTION:

- In lieu of any other report dose from by specification 6.9.1 With the calculated dose from the release of radioiodines, a. radioactive materials in particulate form, or radionuclides other than noble gases in gaseous effluents exceeding any of the above limits, prepare and submit to the commission within 30 days, pursuant to Specification 6.9.2, a Special Report which identifies the cause(s) for exceeding the limit and defines the corrective actions to be taken to reduce the releases of radioiodines, radioactive materials in particulate form, and radionuclides other than noble gases with halflives greater than 8 days in gaseous effluents during the remainder of the current calendar quarter and during the subsequent three calendar quarters so that the average dose or dose commitment to an individual from such releases during these four calendar quarters is within (15) mrem to any organ.
- The provisions of Specifications 3.0.3 and 3.0.4 are not b. applicable.

SURVEILLANCE REQUIREMENTS

4.11.2.3.1 Dose Calculations Cumulative dose contributions for the tota' time period shall be determined in accordance with the ODCM at least once every 31 days.

4.11.2.3.2 Reports The semiannual Radioactive Effluent Release Report shall include the information specified in Specification 6.9.1.9.

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* These doses are per reactor

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GASEOUS RADWASTE TREATMENT

LIMITING CONDITION FOR OPERATION

appropriate subsystems of the

3.11.2.4 The gaseous radwaste treatment system and the ventilation exhaust treatment system shall be OPERABLE. The gaseous radwaste treatment system shall be used to reduce radioactive materials in gaseous waste prior to their discharge when the projected gaseous effluent air doses due to gaseous effluent releases to unrestricted areas (see Figure 5.1-1) when averaged over 31 days would exceed 0.2 mrad for gamma radiation and 0.4 mrad for beta radiation and ventilation exhaust treatment system shall be used to reduce radioactive materials in gaseous waste prior to their discharge when the projected doses due to gaseous effluent releases to unrestricted areas (see Figure 5.1-1) when averaged over 31 days would exceed 0.3 mrem to any organ. *

required pation subsystems of

APPLICABILITY: At all times.

ACTION:

- in lev of any other report With gaseous waste being discharged for more than 31 days without a. treatment and in excess of the above limits, prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2, a Special report which includes the following information:
 - Identification of equipment of subsystems not OPERABLE and 1. the reason for inoperability.
 - Action(s) taken to restore the inoperable equipment to 2. OPERABLE STATUS.
 - Summary description of action(s) taken to prevent a re-3. currence.
- The provisions of Specification 3.0.3 and 3.0.4 are not b. applicable.

SURVEILLANCE REQUIREMENTS

4.11.2.4.1 Doses due to gaseous releases to unrestricted areas shall be projected at least once per 31 days. alternation occurcilance

4.11.2.4.2 The appropriate systems shall be demonstrated OPERABLE at least once per 92 days unless the appropriate system has been utilized to process radioactive gaseous effluents during the previous 92 days.

* These dives ine per reactor

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SEQUOYAH UNIT 7

DOSE

LIMITING CONDITION FOR OPERATION

3.11.2.5 The dose or dose commitment to a real individual from all uranium fuel cycle sources is limited to < 25 mrem to the total body or any organ (except the thyroid, which is limited to < 75 mrem) over a in lieu of any other report required by Specification 6:1.1 period of 12 consecutive months.

APPLICABILITY: At all times.

ACTION:

- With the calculated dose from the release of radioactive a. materials in liquid or gaseous effluents exceeding twice the limits of Specifications 3.11.1.2.a, 3.11.1.2.b, 3.11.2.2.a 3.11.2.2.b, 3.11.2.3.a, or 3.11.2.3.b, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 and limit the subsequent releases such that the dose or dose commitment to a real individual from all uranium fuel cycle sources is limited to < 25 mrem to the total body or any organ (except thyroid, which is limited 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 efficient pathways and direct radiation) are less than the 40 CFR Part 190 Standard. Otherwise, obtain a variance from the Commission to permit releases which exceeds the 40 CFR Part 190 Standard.
- The provisions of Specification 3.0.3 and 3.0.4 are not b. applicable

SURVEILLANCE REQUIREMENTS

4.11.2.5.1 Dose Calculations Cumulative dose contributions from liquid and gaseous effluents shall be determined in accordance with Specifications 3.11.1.2.a, 3.11.1.2.b, 3.11.2.2.a, 3.11.2.2.b, 3.11.2.3.a, and 3.11.2.3.b. and in accordance with the Offsite Dose Calculation Hanual (-ADCH)-

4.11.2.5.2 Reports Special Reports shall be submitted as required under Specification 3.11.2.5.a.

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EXPLOSIVE GAS MIXTURE

LIMITING CONDITION FOR OPERATION

3.11.2.6 The concentration of hydrogen and/or oxygen in the waste gas holdup system shall be limited to $\leq 2\%$ by volume.

APPLICABILITY: At all times.

ACTION:

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- a. With the concentration of hydrogen and/or oxygen in the waste gas holdup system > 2% by volume but < 4% by volume, restore the concentration of hydrogen and/or oxygen to within the limit within 48 hours.
- b. With the concentration of hydrogen and/or oxygen in the waste gas holdup system > 4% by volume, immediately suspend all additions of waste gases to the system and reduce the concentration of hydrogen and/or oxygen to < 2% within 48 hours.</p>
- c. The provisions of Specification 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.2.6 The concentrations of hydrogen and/or oxygen in the waste gas holdup system shall be determined to be within the above limits by monitoring the addition of waste gases to the Waste Gas Decay Tank with the hydrogen and/or oxygen monitor required OPERABLE by Table 3.3-13 of Specification 3.3.3.10.

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| AS STORAGE TANKS | | |
|---|------|----|
| IMITING CONDITION FOR OPERATION | | - |
| .11.2.7 The quantity of radioactivity contained in each gas storage hall be limited to < curies noble gases (considered as Xe-133). | tank | 10 |
| PPLICABILITY: At all times 50,000 | | |
| CTION: | | 1 |
| a. With the quantity of radioactive material in any gas decay tank exceeding the above limit, immediately suspend all additions of radioactive material to the tank and within 48 hours either reduce the tank contents to within the limit or provide prompt notification to the Commission pursuant to Specification 6.9.1.12. The written followup report shall include a description of activities planned and/or taken to reduce the tank contents to within the above limit. | 1 | |
| b. The provisions of Specifications 3.0.3 and 3.0.4 are not | | 12 |
| applicable. | | |
| applicable. | | |
| applicable. DRVEILLANCE REQUIREMENTS .11.2.7 The quantity of radioactive material contained in each gas decay tank shall be determined to be within the above limit at least once per 24 hours when radioactive materials are being added to the tank. | 1 | R |
| applicable. WRVEILLANCE REQUIREMENTS .11.2.7 The quantity of radioactive material contained in each gas decay tank shall be determined to be within the above limit at least once per 24 hours when radioactive materials are being added to the tank. | 1 | |
| applicable. CORVEILLANCE REQUIREMENTS .11.2.7 The quantity of radioactive material contained in each gas decay tank shall be determined to be within the above limit at least once per 24 hours when radioactive materials are being added to the tank. | 1 | |
| applicable. URVEILLANCE REQUIREMENTS 1.11.2.7 The quantity of radioactive material contained in each gas decay tank shall be determined to be within the above limit at least once per 24 hours when radioactive materials are being added to the tank. | 1 | |
| applicable. DURVEILLANCE REQUIREMENTS .11.2.7 The quantity of radioactive material contained in each gas decay tank shall be determined to be within the above limit at least once per 24 hours when radioactive materials are being added to the tank. | 1 | |
| applicable. MERVEILLANCE REQUIREMENTS .11.2.7 The quantity of radioactive material contained in each gas decay tank shall be determined to be within the above limit at least once per 24 hours when radioactive materials are being added to the tank. | 1 | |
| applicable. MERVEILLANCE REQUIREMENTS 1.11.2.7 The quantity of radioactive material contained in each gas decay tank shall be determined to be within the above limit at least once per 24 hours when radioactive materials are being added to the tank. | 1 | |
| applicable. URVEILLANCE REQUIREMENTS .11.2.7 The quantity of radioactive material contained in each gas decay tank shall be determined to be within the above limit at least once per 24 hours when radioactive materials are being added to the tank. | 1 | |
| applicable. DURVEILLANCE REQUIREMENTS .11.2.7 The quantity of radioactive material contained in each gas decay tank shall be determined to be within the above limit at least once per 24 hours when radioactive materials are being added to the tank. | 1 | |
| applicable. <u>URVEILLANCE REQUIREMENTS</u> .11.2.7 The quantity of radioactive material contained in each gas decay tank shall be determined to be within the above limit at least once per 24 hours when radioactive materials are being added to the tank. | 1 | |
| applicable. <u>DRVEILLANCE REQUIREMENTS</u> .11.2.7 The quantity of radioactive material contained in each gas decay tank shall be determined to be within the above limit at least ince per 24 hours when radioactive materials are being added to the tank. | | |

| A. With the radiological environmental monitoring program not being conducted as specified in Table 3.12-1, 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, sample unavailability, or to malfunction of sampling equipment. If the latter, every effort shall be made to complete corrective action prior to the end of the next sampling period.) b. With the level of radioactivity in an environmental sampling medium at one or more of the locations specified in Table 3.12 (Content) and the inits of Table 6.9-2 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 6.9-2 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. c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable. | 110N: a. With the radiological environmental monitoring program not being conducted as specified in Table 3-12-1, 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, sample unavailability, or to malfunction of sampling equipment. If the latter, every effort shall be made to complete corrective action prior to the end of the next sampling period.) b. With the level of radioactivity in an environmental sampling medium at one or more of the locations specified in Table 2000 (1990) (1 | PLICAB | ILITY: At all times. |
|--|--|---|--|
| a. With the radiological environmental monitoring program not being conducted as specified in Table 3.12-1, 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, sample unavailability, or to malfunction of sampling equipment. If the latter, every effort shall be made to complete corrective action prior to the end of the next sampling period.) b. With the level of radioactivity in an environmental sampling medium at one or more of the locations specified in Table 2.104 (2010) (2 | 4. With the radiological environmental monitoring program not being conducted as specified in Table 3-12-1, 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, sample unavailability, or to malfunction of sampling equipment. If the latter, every effort shall be made to complete corrective action prior to the end of the next sampling period.) b. With the level of radioactivity in an environmental sampling medium at one or more of the locations specified in Table 2112 (1997) 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 6.9-2 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. c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable. | TION: | |
| b. With the level of radioactivity in an environmental sampling medium at one or more of the locations specified in Table 2012 (a) exceeding the limits of Table 6.9-2 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 6.9-2 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. c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable. | b. With the level of radioactivity in an environmental sampling medium at one or more of the locations specified in Table 2.12 (a) exceeding the limits of Table 6.9-2 when avera, ed 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 6.9-2 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. c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable. | đ. | With the radiological environmental monitoring program not being conducted as specified in Table 3.12-1, 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, sample unavail- ability, or to malfunction of sampling equipment. If the latter, every effort shall be made to complete corrective action prior to the end of the next sampling period.) |
| c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable. | C. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable. URVEILLANCE REQUIREMENTS 12.1.1 The radiological environmental monitoring samples shall be offered pursuant to Table 3.12-1 from the locations shown on igure 3.12-1, 3.12-2, and 3.12-3 and shall be analyzed pursuant. 12.1 Reports - The results of analyses performed on the radio- | b. | With the level of radioactivity in an environmental sampling medium at one or more of the locations specified in Table 1996 (1996) exceeding the limits of Table 6.9-2 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 6.9-2 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. |
| | URVEILLANCE REQUIREMENTS 12.1.1 The radiological environmental monitoring samples shall be allected pursuant to Table 3.12-1 from the locations shown on igure 3.12-1, 3.12-2, and 3.12-3 and shall be analyzed pursuant b the requirements of Tables 3.12-1 and 4.12-1. .12.1 Reports - The results of analyses performed on the radio- | с. | The provisions of Specifications 3.0.3 and 3.0.4 are not applicable. |
| URVEILLANCE REQUIREMENTS | 12.1.1 The radiological environmental monitoring samples shall be offected pursuant to Table 3.12-1 from the locations shown on igure 3.12-1, 3.12-2, and 3.12-3 and shall be analyzed pursuant. The requirements of Tables 3.12-1 and 4.12-1. .12.1 Reports - The results of analyses performed on the radio- | URVEILL | ANCE REQUIREMENTS |
| the second of th | .12.1 <u>Reports</u> - The results of analyses performed on the radio- | ollecte igure 3 | d-pursuant-to-Table 3.12-1 from the locations shown on .12-1, 3.12-2, and 3.12-3 and shall be analyzed pursuant |
| ollected pursuant to Table 3.12-1 from the locations shown on igure 3.12-1, 3.12-2, and 3.12-3 and shall be analyzed pursuant | .12.1 Reports - The results of analyses performed on the radio- | o the r | equirements of Tables 3.12-1 and 4.12-1- |
| ollected pursuant to Table 3.12-1 from the locations shown on | nnual Radiological Environmental Operating Report, pursuant to pecification 6.9.1.6. | o the rolling of the | equirements of Tables 3.12-1 and 4.12-1 <u>Reports</u> - The results of analyses performed on the radio- environmental monitoring samples shall be summarized in the adiological Environmental Operating Report, pursuant to ation 6.9.1.6. |

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RADIOLOGICAL ENVIRONMENTAL MONITORING

3/4.12.2 LAND USE CENSUS

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LIMITING CONDITION FOR OPERATION

3.12.2 A land use census shall be conducted and shall identify the location of the nearest milk animal, the nearest residence and the nearest garden* of greater than 500 square feet producing fresh leafy vegetables in each of the 16 meteorological sectors within a distance of five miles. ** (For elevated releases as defined in Regulatory Guide 1.111, March 1976, the land use census shall also identify the locations of all milk animals and all gardens of greater than 500 square feet producing fresh leafy vegetables in each of the 16 meteorological sectors within a distance of three miles.)**

APPLICABILITY: At all times.

ACTION:

- add this location to those listed in the ODCM.
- a. With a land use census identifying a location(s) which yields a calculated dose or dose commitment greater than the values currently being calculated in Specification 4.11.2.3.1, prepare and submit to the Commission within 30 days, pursuant to Specification 5.9.2, a Special Report which identifies the new location(s): add this location to those in the open
- b. With a land use census identifying a location(s) which yields a calculated dose or dose commitment (via the same exposure pathway) greater than at a location from which samples are currently being obtained in accordance with Specification 3.12.1, prepare and submit to the Commission within 30 days, pursuant to Specification 6.5.2, a Special Report which identifies the new location. The new location 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.
- c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.12.2.1 The land use census shall be conducted at least once per 12 months between the dates of April 1 and October 1, by door-to-door survey, aerial survey, or by consulting local agriculture authorities.

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

** A conservatively calculated 15 mrem/yr isodose line will be constructed around the plant and the milk-cow census limited to this area. *Broad leaf vegetation sampling may be performed at the site boundary in the direction sector with the highest D/Q in lieu of the garden census.

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RADIOLOGICAL ENVIRONMENTAL MONITORING

3/4.12.3 INTERLABORATORY COMPARISON PROGRAM

LIMITING CONDITION FOR OPERATION

3.12.3 Analyses shall be performed on radioactive materials supplied as part of an ______ Comparison Program which has been approved by NRC.

APPLICABILITY: At all times.

ACTION:

- a. With analyses not being performed as required above, report the corrective actions taken to prevent a recurrence to the Commission in the Annual Radiological Environmental Operating Report.
- b. The provisions of Specification 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.12.3 The results of analyses performed as part of the above required Interlaboratory Comparison Program shall be included in the Annual Radiological Environmental Operating Report pursuant to Specification 6.9.1.6.

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INSTRUMENTATION

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3/4.3.3.9 RADIOACTIVE LIQUID EFFLUENT INSTRUMENTATION

The rad pactive liquid effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in liquid effluents during actual or potential releases. The alarm/trip procedures outlined in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. The OPERABILITY of General Design Criteria 60, 63 and 64 of Appendix A to 10 CFR Part 50.

3/4.3.3.10 RADIOACTIVE GASEOUS EFFLUENT INSTRUMENTATION

The radioactive gaseous effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in gaseous effluents during actual or potential releases. The alarm/trip setpoints for these instruments shall be calculated in accordance with 'procedures outlined' in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. This instrumenconcentrations of potentially explosive gas mixtures in the waste gas holdup system. The OPERABILITY and use of this instrumentation is consistent with the requirements of General Design Criteria 60, 63 and 64

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3/4.11 RADIOACTIVE EFFLUENTS

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3/4.11.1 LIQUID EFFLUENTS

3/4.11.1.1 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. This limitation provides additional assurance that the levels of radioactive materials in bodies of water outside the site will not result in exposures within (1) the Section II.A design objectives of Appendix I, 10 CFR Part 50, to an individual and (2) the limits of 16 CFR Part 20.106(e) to the population. The concentration limit for noble gases is based upon the assumption that Xe-135 is the controlling radioisotope and its MPC in air (submersion) was converted to an equivalent concentration in water using the methods described in International Commission on Radiological Protection (ICRP) Publication 2.

3/4.11.1.2 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 ACTION 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". Also, for fresh water sites with drinking water supplies which can be potentially affected by plant operations, there is reasonable assurance that the operation of the facility will not result in radionuclide concentrations in the finished drinking water that are in excess of the requirements of 40 CFR 141. The dose calculations in the ODCM 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 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 19/7. NUREG-0133 provides methods for dose calculations consistent with Regulatory Guides 1.109 and 1.113.

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This specification applies to the release of liquid effluents from each reactor at the site. For units with shared radwaste treatment systems, the liquid effluents from the shared system are proportioned among the units sharing that system.

3/4.11.1.3 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 requirements 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 A to 10 CFR Part 50. The specified limits governing the use of appropriate portions of the liquid radwaste treatment system were specified as a suitable fraction of the guide set forth in Section II.A of Appendix I, 10 CFR Part 50, for liquid effluents.

3/4.11.1.4 LIQUID HOLDUP TANKS

Restricting the quantity of radioactive material contained in the specified tanks provides assurance that the event of an uncontrolled release of the tanks' contents, the resulting concentrations would be less than the limits of 10 CFR Part 20, Appendix A Table 11, Column 2, at the nearest potable water supply and the nearest surface water supply in an unrestricted area.

3/4.11.2 GASEOUS EFFLUENTS

3/4.11.2.1 DOSE RATE

This specification is provided to ensure that the dose rate at anytime at the exclusion area boundary from gaseous affluents from all 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, either within or outside the exclusion area boundary, to annual average concentrations exceeding the limits specified in Appendix B, Table II of 10 CFR Part 20 (10 CFR Part 20.106(b)). For individuals who may at times be within the exclusion area boundary, the occupancy of the individual will be sufficiently low to compensate for

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any increase in the atmospheric diffusion factor above that for the exclusion area boundary. 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 exclusion area boundary to \leq (500) mrem/year to the total body or to \leq (3000) mrem/year to the skin. These release rate limits also restrict, at all times, the corresponding thyroid dose rate above background to an infant via the cow-milk-infant pathway to \leq 1500 mrem/year for the nearest cow to the plant.

This specification applies to the release of gaseous effluents from all reactors at the site. For units with shared radwaste treatment systems, the gaseous effluents from the shared system are proportioned among the units sharing that system.

3/4.11.2.2 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 ACTION statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I 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 conform with the guides of Appendix I 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 provided for determining the air doses at the exclusion area boundary will be based upon the historical average atmospheric conditions. NUREG-0133 provides methods for dose calculations consistent with Regulatory Guides 1.109 and 1.111.

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3/4.11.2.3 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

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Conditions for Operation are the guides set forth in Section II.C of Appendix I. The ACTION 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 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 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, "Calculating 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 I, 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 are examined in the development of these calculations are: 1) individual inhalation of airborne radionuclides, 2) deposition of radionuclides onto green leafy vegetation with subsequent consumption by man, 3) deposition onto grassy areas where milk animals and meat producing animals graze with consumption of the milk and meat by man, and 4) deposition on the ground with subsequent exposure of man.

3/4.11.2.4 GASEOUS WASTE TREATMENT

The OPERABILITY of the gaseous radwaste treatment system and the ventilation exhaust treatment systems ensures that the systems will be available for use whenever gaseous effluents require treatment prior to release to the environment. The requirement that the appropriate portions of these systems be used 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 IID of Appendix I to 10 CFR Part 50. The specified limits governing the use of appropriate portions of the systems were specified as a suitable fraction of the guide set forth in Sections II.B and II.C of Appendix I, 10 CFR Part 50, for gaseous effluents.

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3/4.11.2.5 DOSE

This specification is provided to meet the reporting requirements of 40 CFR 190.

3/4.11.2.6 EXPLOSIVE GAS MIXTURE

This specification is provided to ensure that the concentration of potentially explosive gas mixtures contained in the waste gas treatment system is maintained below the flammability limits of hydrogen and oxygen.

Maintaining the concentration of hydrogen and oxygen below their flammability limits provides assurance that the releases of radioactive materials will be controlled in conformance with the requirements of General Design Criterion 60 of Appendix A to 10 CFR Part 50.

OECAY 3/.4.11.2.7 GAS TANKS

Restricting the quantity of radioactivity contained in each gas tank provides assurance that in the event of an uncontrolled release of the tanks contents, the resulting total body exposure to an individual at the nearest exclusion area boundary will not exceed 0.5 rem. This is consistent with Standard Review Plan 15.7.1, "Waste Gas System Failure."

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3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING

BASES

3/4 12.1 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 expsures 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. The initially specified monitoring program will be effective for at least the first three years of commercial operation. Following this period, program changes may be initiated based on operational experience.

3/4.12.2 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. Restricting the census to gardens of greater than 500 square feet provides assurance that significant exposure pathways via leafy vegetables will be identified and monitored since a garden of this size is the minimum required to produce the quantity (26 kg/year) of leafy vegetables assumed in Regulatory Guide 1.109 for consumption by a child. To determine this minimum garden size, the following assumptions were used, 1) that 20% of the garden was used for growing broad leaf vegetation (i.e., similar to lettuce and cabbage), and 2) a vegetation yield of 2 kg/square meter.

3/4.12.3 INTERLABORATORY COMPARISON PROGRAM

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

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6.0 ADMINISTRATIVE CONTROLS

6.1 RESPONSIBILITY

6.1.1 The Plant Superintendent shall be responsible for overall unit operation and shall delegate in writing the succession to this responsibility during his absence.

6.2 ORGANIZATION

OFFSITE

6.2.1 The offsite organization for unit management and technical support shall be as shown on Figure 6.2-1.

UNIT STAFF

6.2.2 The Unit organization shall be as shown on Figure 6.2-2 and:

- a. Each on duty shift shall be composed of at least the minimum shift crew composition shown in Table 6.2-1.
- b. At least one licensed Operator shall be in the control room when fuel is in the reactor.
- c. At least two licensed Operators shall be present in the control room during reactor start-up, scheduled reactor shutdown and during recovery from reactor trips.
- d. An individual qualified in radiation protection procedures shall be on site when fuel is in the reactor.
- e. All CORE ALTERATIONS shall be directly supervised by either a licensed Senior Reactor Operator or Senior Reactor Operator Limited to Fuel Handling who has no other concurrent responsibilities during this operation.
- f. A Fire Brigade of at least 5 members shall be maintained onsite at all times". The Fire Brigade shall not include 3 members of the minimum shift crew necessary for safe shutdown of the unit or any personnel required for other essential functions during a fire emergency.

Fire Brigade composition may be less than the minimum requirements for a period of time not to exceed 2 hours in order to accommodate unexpected absence of Fire Brigade members provided immediate action is taken to restore the Fire Brigade to within the minimum requirements.

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TABLE 6.2-1

MINIMUM SHIFT CREW COMPOSITION#

| LICENSE | APPLIÇA | APPLICABLE MODES | | |
|--------------|-------------|------------------|--|--|
| CATEGORY | 1, 2, 3 8 4 | 586 | | |
| SOL | 1 | 1* | | |
| OL | 2 | 1 | | |
| Non-Licensed | 2. | 1 | | |

*Does not include the licensed Senior Reactor Operator or Senior Reactor Operator Limited to Fuel Handling, supervising CORE ALTERATIONS.

#Shift crew composition may be less than the minimum requirements for a period of time not to exceed 2 hours in order to accommodate unexpected absence of on duty shift crew members provided immediate action is taken to restore the shift crew composition to within the minimum requirements of Table 6.2-1.

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6.3 UNIT STAFF QUALIFICATIONS

6.3.1 Each member of the unit staff shall meet or exceed the minimum qualifications of ANSI N18.1-1971 for comparable positions, except for the Health Physicist who shall meet or exceed the qualifications of Regulatory Guide 1.8, September 1975.

6.4 TRAINING

6.4.1 A retraining and replacement training program for the unit staff shall be maintained under the direction of the Assistant Plant Superintendent and shall meet or exceed the requirements and recommendations of Section 5.5 of ANSI N18..-1971 and Appendix "A" of 10 CFR Part 55.

6.4.2 A training program for the Fire Bridgade shall be maintained under the direction of the Assistant Plant Superintendent and shall meet or exceed the requirements of Section 27 of the NFPA Code-1975, except for Fire Bridage training sessions which shall be held at least once per 92 days.

6.5 REVIEW AND AUDIT

6.5.0 The Manager of Power is responsible for the safe operation of all TVA power plants. The functional organization for Review and Audit is shown on Figure 6.2-1.

6.5.1 PLANT OPERATIONS REVIEW COMMITTEE (PORC)

FUNCTION

6.5.1.1 The PORC shall function to advise the Plant Superintendent on all matters related to nuclear safety.

COMPOSITION

6.5.1.2 The PORC shall be composed of the:

| lairman: lember: lember: lember: lember: lember: | Plant Superintendent Operations Supervisor Results Supervisor Maintenance Supervisor Assistant Plant Superintendent Quality Assurance Staff Supervisor Health Physicist |
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ALTERNATES

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6.5.1.3 All alternate members shall be appointed in writing by the PORC Chairman to serve on a temporary basis; however, no more than two alternates shall participate as voting members in PORC activities at any one time.

MEETING FREQUENCY

6.5.1.4 The PORC shall meet at least once per calendar month and as convened by the PORC Chairman or his designated alternate.

QUORUM

6.5.1.5 The minimum quorum of the PORC necessary for the performance of the PORC responsibility and authority provisions of these technical specifications shall consist of the Chairman or his designated alternate and four members including alternates.

RESPONSIBILITIES

6.5.1.6 The PORC shall be responsible for:

- a. Review of 1) all procedures required by Specification 6.8 and changes thereto, 2) any other proposed procedures or changes thereto as determined by the Plant Superintendent to affect nuclear safety.
- Review of all proposed tests and experiments that affect nuclear safety.

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ADMINISTRATIVE CONTROLS

- c. Review of all proposed changes to Appendix "A" Technical Specifications.
- Review of all proposed changes or modifications to unit systems or equipment that affect nuclear safety.
- e. Investigation of all violations of the Technical Specifications including the preparation and forwarding of reports covering evaluation and recommendations to prevent recurrence to the Chief, Nuclear Generation Branch and to the Chairman of the Nuclear Safety Review Board.
- Review all written reports requiring 24 hour notification to the Commission.
- g. Review of unit operations to detect potential nuclear safety hazards.
- h. Performance of special reviews, investigations or analyses and reports thereon as requested by the Plant Superintendent or the Nuclear Safety Review Board.
- Review of the Plant Physical Security Plan and implementing procedures and shall submit recommended changes to the Nuclear Safety Review Board.
- j. Review of the Site Radiological Emergency Plan and implementing procedures and shall submit recommended changes to the Nuclear Safety Review Board.
- k. Review of every unplanned release of radioactive material to the environs; evaluate the event; specify remedial action to prevent recurrence; and document the event description, evaluation, and corrective action and the disposition of the corrective action in the plant records.

AUTHORITY

6.5.1.7 The PORC shall:

- Recommend in writing to the Plant Superintendent approval or disapproval of items considered under 6.5.1.6(a) through (d) above.
- b. Render determinations in writing with regard to whether or not each item considered under 6.5.1.6(a) through (e) above constitutes an unreviewed safety question.

c. Provide written notification within 24 hours to the Chief, Nuclear Generation Branch and the Nuclear Safety Review Board of disagreement between the PORC and the Plant Superintendent; however, the Plant Superintendent shall have responsibility for resolution of such disagreements pursuant to 6.1.1 above.

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6.5.1.8 The PORC shall maintain written minutes of each PORC meeting that, at a minimum, document the results of all PORC activities performed under the responsibility and authority provisions of these technical specifications. Copies shall be provided to the Chief, Nuclear Generation. Branch and the Nuclear Safety Review Board.

6.5.2 NUCLEAR SAFETY REVIEW BOARD (NSRB)

FUNCTION

6.2.2.1 The NSRB shall function to provide independent review and audit of designated activities in the areas of:

- a. nuclear power plant operations
- b. nuclear engineering
- c. chemistry and radiochemistry
- d. metallurgy

e. instrumentation and control

f. radiological safety

g. mechanical and electrical engineering

h. quality assurance practices

COMPOSITION

6.5.2.2 The chairman, members and alternate members of the NSRB shall be appointed in triting by the Manager of Power and shall have an academic degree in an engineering or physical science field, or the equivalent; and in addition, shall have a minimum of five years technical experience, of which a minimum of three years shall be in one or more areas given in 6.5.2.1.

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6.5.2.3 The NSRB shall be composed of at least five members, including the Chairman. Members of the NSRB may be from the Office of Power, from other offices or divisions within TVA, or from external to the TVA.

CONSULTANTS

6.5.2.4 Consultants shall be utilized as determined by the NSRB Chairman to provide expert advice to the NSRB.

MEETING FRECUENCY

6.5.2.5 The NSRB shall meet at least once per calendar quarter during the initial year of unit operation following fuel loading and at least once per six months thereafter.

OUORUM

6.5.2.6 The minimum quorum of the NSRB necessary for the performance of the NSRB review and audit functions of these technical specifications shall consist of members, or alternates, and the Chairman, or his designated alternate in total number to be at least **Provide 14**. **No more than two alternates shall participate as voting** members in NSRB activities at any one time. No more than a minority of the quorum shall have line resposibility for operation of the Sequoyah Nuclear Plant.

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REVIEW

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6.5.2.7 The NSRB shall review:

- a. The safety evaluations for 1) changes to procedures, equipment or systems and 2) tests or experiments completed under the provision of Section 50.59, 10 CFR, to verify that such actions did not constitute an unreviewed safety question.
- b. Proposed changes to procedures, equipment or systems which involve an unreviewed safety question as defined in Section 50.59, 10 CFR.
- c. Proposed tests or experiments which involve an unreviewed safety question as defined in Section 50.59, 10 CFR.
- d. Proposed changes to Technical Specifications or this Operating License.
- e. Violations of codes, regulations, orders, Technical Specifications, license requirements, or of internal procedures or instructions having nuclear safety significance.
- f. Significant operating abnormalities or deviations from normal and expected performance of unit equipment that affect nuclear safety.
- g. All written reports requiring 24 hour notification to the Commission.
- h. All recognized indications of an unanticipated deficiency in some aspect of design or operation of structures, systems, or components that could affect nuclear safety.

i. Reports and meetings minutes of the PORC.

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| AUDITS | |
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| 6.5.2. of the | 8 Audits of unit activities shall be performed under the cognizanc NSRB. These audits shall encompass: |
| a | The conformance of unit operation to provisions contained within the Technical Specifications and applicable license conditions at least once per 12 months. |
| b. | The performance, training and qualifications of the entire unit staff at least once per 12 months. |
| с. | The results of actions taken to correct deficiencies occurring in unit equipment, structures, systems or method of operation that affect nuclear safety at least once per 6 months. |
| d. | The performance of activities required by the Operational Quality Assurance Program to meet the criteria of Appendix "B", 10 CFR 50, at least once per 24 months. |
| e. | The Site Radiological Emergency Plan and implementing procedures at least once per 24 months. |
| f. | The Plant Physical Security Plan and implementing procedures at least once per 24 months. |
| g. | Any other area of unit operation considered appropriate by the NSRB or the Manager of Power. |
| h. | The Facility Fire Protection Program and implementing proce- dures at least once per 24 months. |
| i. | An independent fire protection and loss prevention program inspection and audit shall be performed annually utilizing either qualified offsite licensee personnel or an outside fire protection firm. |
| j. | An inspection and audit of the fire protection and loss preven- tion program shall be performed by an outside qualified fire |
| k. 1 r | he radiological environmental monitoring program and the esults thereof at least once per 12 months. |
| 1. T a | t least once per 24 months. |
| | |
| HORITY | |
| .2.9 1 se area | The NSRB shall report to and advise the Manager of Power on as of responsibility specified in Sections 6.5.2.7 and 6.5.2.8. |
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RECORDS

6.5.2.10 Records of NSR3 activities shall be prepared, approved and distributed as indicated below:

- a. Minutes of each NSRB meeting shall be prepared, approved and forwarded to the Manager of Power within 14 days following each meeting.
- b. Reports of reviews encompassed by Section 6.5.2.7 above, shall be prepared, approved and forwarded to the Manager of Power within 14 days following completion of the review.
- c. Audit reports encompassed by Section 6.5.2.8 above, shall be forwarded to the Manager of Power and to the management positions responsible for the areas audited within 30 days after completion of the audit.

6.6 REPORTABLE OCCURRENCE ACTION

6.6.1 The following actions shall be taken for REPORTABLE OCCURRENCES:

- a. The commission shall be notified and/or a report submitted pursuant to the requirements of Specification 6.9.
- b. Each REPORTABLE DCCURRENCE requiring 24 hour notification to the Commission shall be reviewed by the PORC and submitted to the NSRB and the Chief, Nuclear Generation Branch.

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6.7 SAFETY LIMIT VIOLATION

6.7.1 The following actions shall be taken in the event a Safety Limit is violated:

- a. The unit shall be placed in at least HOT STANDBY within one hour.
- b. The Safety Limit violation shall be reported to the Commission, the Chief, Nuclear Generation Branch and to the NSRB within 24 hours.
- c. A Safety Limit Violation Report shall be prepared. The report shall be reviewed by the PORC. This report shall describe (1) applicable circumstances preceding the violation, (2) effects of the violation upon facility components, systems or structures, and (3) corrective action taken to prevent recurrence.
- d. The Safety Limit Violation Report shall be submitted to the Commission, the NSRB and the Chief, Nuclear Generation Branch within 14 days of the violation.

6.8 PROCEDURES

6.8.1 Written procedures shall be established, implemented and maintained covering the activities referenced below:

- a. The applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, Revision 2, February 1978.
- b. Refueling operations.
- c. Surveillance and test activities of safety related equipment.
- d. Plart Physical Security Plan implementation.
- e. Site Radiological Emergency Plan implementation.
- f. Fire Protection Program implementation.
- 3. The radiological environmental monitoring program.
- h. OFFSITE DOSE CALCULATION MANUAL implementation.

6.8.2 Each procedure of 6.8.1 above, and changes thereto, shall be reviewed by the PORC and approved by the Plant Superintendent prior to implementation and reviewed periodically as set forth in administrative procedures.

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ADMINISTRATIVE CONTROLS

6.8.3 Temporary changes to procedures of 6.8.1 above may be made provided:

- a. The intent of the original procedure is not altered.
- b. The change is approved by two members of the plant management staff, at least one of whom holds a Senior Reactor Operator's License on the unit affected.
- c. The change is documented, reviewed by the PORC and approved by the Plant Superintendent within 14 days of implementation.

6.9 REPORTING REQUIREMENTS

ROUTINE REPORTS AND REPORTABLE OCCURRENCES

6.9.1 In addition to the applicable reporting requirements of Title 10, Code of Federal Regulations, the following reports shall be submitted to the Director of the Regional Office of Inspection and Enforcement unless otherwise noted.

STARTUP REPORT

6.9.1.1 A summary report of plant startup and power escalation testing shall be submitted following (1) receipt of an operating license, (2) amendment to the license involving a planned increase in power level, (3) installation of fuel that has a different design or has been manufactured by a different fuel supplier, and (4) modifications that may have significantly altered the nuclear, thermal, or hydraulic performance of the plant.

6.9.1.2 The startup report shall address each of the tests identified in the FSAR and shall include a description of the measured values of the operating conditions or characteristics obtained during the test program and a comparison of these values with design predictions and specifications. Any corrective actions that were required to obtain satisfactory operation shall also be described. Any additional specific details required in license conditions based on other commitments shall be included in this report.

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ADMINISTRATIVE CENTROLS

6.9.1.3 Startup reports shall be submitted within (1) 90 days following completion of the startup test program, (2) 90 days following resumption or commencement of commercial power operation, or (3) 9 months following initial criticality, whichever is earliest. If the Startup Report does not cover all three events (i.e., initial criticality, completion of startup test program, and resumption or commencement of commercial power operation), supplementary reports shall be submitted at least every three months until all three events have been completed.

ANNUAL REPORTS

6.9.1.4 Annual reports covering the activities of the unit as described below for the previous calendar year shall be submitted prior to March 1 of each year. The initial report shall be submitted prior to March 1 of the year following initial criticality.

6.9.1.5 Reports required on an annual basis shall include a tabulation on an annual basis for the number of station, utility and other personnel (including contractors) receiving exposures greater than 100 mrem/yr and their associated man rem exposure according to work and job functions, e.g., reactor operations and surveillance, inservice inspection, routine maintenance, special maintenance (describe maintenance), waste processing, and refueling. The dose assignment to various duty functions may be estimates based on pocket dosimeter, TLD, or film badge measurements. Small exposures totalling less than 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total whole body dose received from external sources shall be assigned to specific major work functions.

- 1/ A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station.
- 2/ This tabulation supplements the requirements of \$20.407 of 10 CFR Part 20.

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6.9.1.6 On an annual basis, a report shall be submitted which will include an assessment of offsite radiation doses from the radioactive liquid and gaseous effluents released from the unit during the previous year. Doses to be evaluated shall include, for effluents to the atmosphere: Noble gases- gamma air, beta air, total body, and skin; Iodines and Particulates- maximum organ. Population doses (total body and thyroid) within 80 km (50 miles) shall also be calculated. Meteorological conditions for the period shall be used for determining the doses due to gaseous effluents and a summary of the meteorology shall be included. Reported doses due to liquid effluents shall include total body, skin, and maximum organ. Population doses (total body, skin, and maximum organ) from the plant to the mouth of the Tennessee River shall also be calculated. River flow conditions for the same period shall be used in determining individual and population doses. An assessment of onsite radiation doses from direct radiation and gaseous effluents shall also be included in this report. This report shall be transmitted with the Semiannual Radioactive Effluent Release Report for the second half of the year.

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT 3/

6.9.1.7 Routine radiological environmental operating reports covering the operation of the unit during the previous calendar year shall be submitted prior to May 1 of each year. The initial report shall be submitted prior to May 1 of the year following initial criticality.

6.9.1.8 The annual radiological environmental operating report shall include summaries, interpretations, and evaluation of the results of the radiological environmental surveillance activities for the report period, including a comparison with preoperational studies, operational controls (as appropriate), and/or previous environmental surveillance reports and an assessment of the observed impacts of the plant operation on the environment. The reports shall also include the results of the land use censuses required by Specification 3.12.2. If harmful effects or evidence of irreversible damage are detected by the monitoring, the report shall provide an analysis of the problem and a planned course of action to alleviate the problem.

The annual radiological environmental operating reports shall include summarized and tabulated results in the format of Table 6.9-1 of all radiological environmental samples taken during the report period. In the event that some results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as possible in a supplementary report.

The report shall also include the following: a summary description of the radiological environmental monitoring program including sampling methods for each sample type, size and physical characteristics of each sample type, sample preparation methods, analytical methods, and measuring equipment used, and maps and tables of appropriate sampling stations giving their location relative to the site; the results of land use censuses required by Specification 3.12.2;

REPORTABLE OCCURRENCES Univer of ۰, A. A. H. 10 Control Lucyilo b fiern and range based upon detectable measurements only. Fraction of detectable measurements at syscified locations is indicated in perantheses. (1) Rauge B ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY Location with Hughess Annual Man Reporting Period Distance and Duraction Muminel Lower Linuit of Detection [LLD] as defined in table notation a. of Table 4.12.1 of Specification 4, 12.1.1. Docket No. Nerra All Indicator Lucations Mean (1) Range . LE 6.9-1 (County, Stele) . drate. The example date are provided for illustrative purposes only. of Derection* Lower Limit Name of Facility Location of Facility Type or L Tote Number of Anayton Performed [Unit of Measurerrent] Medium or Pathwey 101 Langmuz p.1. Proiscinsters Presentationd SEQUOYAH UNIT 1

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and the results of licensee participation in Quality Assurance Program required by Specification 3.12.3.

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT 3/

6.9.1.9 Routine radioactive effluent release reports covering the operating of the unit during the previous 6 months of operation shall be submitted within 60 days after January 1 and July 1 of each year. The period of the first report shall begin with the date of initial criticality.

6.9.1.10 The radioactive effluent release reports shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit as outlined in Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid And Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants," with data summarized on a quarterly basis following the format of Appendix B thereof.

The radioactive effluent release reports shall include the following information for all unplanned releases to unrestricted areas of radioactive materials in gaseous and liquid effluents:

- a. A description of the event and equipment involved.
- b. Cause(s) for the unplanned release.
- c. Actions taken to prevent recurrence.
- d. Consequences of the unplanned release.
- ^{3/}A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station; however, for units with separate radwaste systems, the submittal shall specify releases of radioactive material from each unit.

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MONTHLY REACTOR OPERATING REPORT

6.9.1. Routine reports of operating statistics and shutdown experience shall be submitted on a monthly basis to the Director, Office of Management and Program Analysis, U.S. Nuclear Requiatory Commission, Washington, D.C. 20555, with a copy to the Regional Office of Inspection and Enforcement, no later than the 15th of each month following the calendar month covered by the report. In addition, any changes to the Offsite Dose Calculational Manual of Specification 6.13 shall be submitted with the Monthly Operating Report within 90 days from which the change (s) was made.

REPORTABLE OCCURRENCES

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12 14 6.9.1.27 The REPORTABLE OCCURRENCES of Specification 6.9.1.22 and 6.9.1.26 below, including corrective actions and measures to prevent recurrence, shall be reported to the NRC. Supplemental reports may be required to fully describe final resolution of occurrence. In case of corrected or supplemental reports, a licensee event report shall be completed and reference shall be made to the original report date.

PROMPT NOTIFICATION WITH WRITTEN FOLLOWUP

6.9.1. The types of events listed below shall be reported within 24 hours by telephone and confirmed by telegraph, mailgram, or facsimile transmission to the Director of the Regional Office, or his designate no later than the first working day following the event, with a written followup report within 14 days. The written followup report shall include, as a minimum a completed copy of a license event report form. Information provided on the licensee event report form shall be supplemented, as needed, by additional narrative material to provide complete explanation of the circumstances surrounding the event.

- a. Failure of the reactor protection system or other systems, subject to limiting safety system settings to initiate the required protective function by the time a monitored parameter reaches the setpoint specified as the limiting safety system setting in the technical specifications or failure to complete the required protective function.
- b. Operation of the unit or affected systems when any parameter or operation subject to a limiting condition for operation is less conservative than the least conservative aspect of the limiting condition for operation established in the technical specifications.
- c. Abnormal degradation discovered in fuel cladding, reactor coolant pressure boundary, or primary containment.

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- d. Reactivity anomalies involving disagreement with the predicted value of reactivity balance under steady state conditions during power operation greater than or equal to 1% ak/k: a calculated reactivity balance indicating a SHUTCOWN MARGIN less conservative than specified in the technical secifications; short-term reactivity increases that correspond to a reactor period of less than 5 seconds or. If subcritical, an unplanned reactivity insertion of more than 0.5% Ak/k; or occurrence of any unplanned criticality.
- e. Failure or malfunction of one or more components which prevents or could prevent, by itself, the fulfillment of the functional requirements of system(s) used to cope with accidents analyzed in the SAR.
- f. Personnel error or procedural inadequacy which prevents or could prevent, by itself, the fulfillment of the functional requirements of systems required to cope-with accidents analyzed in the SAR.
- 9. Conditions arising from natural or man-made events that, as a direct result of the event require unit shutdown, operation of safety systems, or other protective measures required by technical specifications.
- h. Errors discovered in the transient or accident analyses or in the methods used for such analyses as described in the safety analysis report or in the bases for the technical specifications that have or could have permitted reactor operation in a manner less conservative than assumed in the analyses.
- i. Performance of structures, systems, or components that requires remedial action or corrective measures to prevent operation in a manner less conservative than assumed in the accident analyses in the safety analysis report or technical specifications bases; or discovery during unit life of conditions not specifically considered in the safety analysis report or technical specifications that require remedial action or corrective measures to prevent the existence or development of an unsafe condition.
- j. Occurrence of an unusual or important event that causes a significant environmental impact, that affects potential environmental impact from unit operation. or that has high public or potential public interest concerning environmental impact from unit operation.
- k. Occurrence of radioactive material contained in liquid or gaseous holdup tanks in excess of that permitted by the limiting condition for operation established in the technical specifications.

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THIRTY DAY WRITTEN REPORTS

6.9.1. The types of events listed below shall be the subject of written reports to the Director of the Regional Office within thirty days of occurrence of the event. The written report shall include, as a minimum, a completed copy of a licensee event report form. Information provised on the licensee event report form shall be supplemented, as a difference, by additional narrative material to provice complete explanation of the circumstances surrounding the event.

- a. Reactor protection system or engineered safety feature instrument settings which are found to be less conservative than those established by the technical specifications but which do not prevent the fulfillment of the functional requirements of affected systems.
- b. Conditions leading to operation in a degraded mode permitted by a limiting condition for operation or plant shutdown required by a limiting condition for operation.
- c. Observed inadequacies in the implementation of administrative or procedural controls which threaten to cause reduction of degree of redundancy provided in reactor protection systems or engineered safety feature systems.
- d. Abnormal degradation of systems other than those specified in 6.9.1. 2.c above designed to contain radioactive material resulting from the fission process.
- e. An unplanned offsite release of 1) more than 1 curie of radioactive material in liquid effluents, 2) more than 150 curies of noble gas in gaseous effluents, or 3) more than 0.05 curies or radioiodine in gaseous effluents. The report of an unplannic offsite release of radioactive material shill include the following information:
 - 1. A description of the event and equipment involved.
 - 2. Cause(s) for the unplanned release.
 - 3.. Actions taken to prevent recurrence.
 - Consequences of the unclanned release.

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f. Measured levels of radioactivity in an environmental sampling medium determined to exceed the reporting level values of Table 6.9-2 when averaged over any calendar quarter sampling period. When more than one of the radionuclides in Table 6.9-2 are detected in the sampling medium, this report shall be submitted if:

 $\frac{\text{concentration (1)}}{\text{limit level (1)}} + \frac{\text{concentration (2)}}{\text{limit level (2)}} + \dots \ge 1.0$

When radionuclides other than those in Table 6.9-2 are detected and are the result of plant effluents, this report shall be submitted if the potential annual dose to an individual is equal to or greater than the calendar year limits of Specifications 3.11.1.2, 3.11.2.2 and 3.11.2.3. 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.

SPECIAL REPORTS

6.9.2 Special reports shall be submitted to the Director of the Office of Inspection and Enforcement Regional Office within the time period -specified for each report.

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TABLE 6.9-2

REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

| | REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES Reporting Levels | | | | |
|-----------|--|--|-----------------------|---------------------|-----------------------------|
| Analysis | Water (pCi/l) | Airborne Particulate or Gases (pCi/m ³) | Fish (pCi/Kg, wet) | Milk (pC1/1) | Vegetables (pCi/Kg, wet) |
| H-3 | 3 x 10 ⁴ | | | | |
| Mn-54 | 1×10^{3} | | 3 × 10 ⁴ | | |
| Fe-59 | 4×10^{2} | | 1 × 10 ⁴ | | |
| Co-58 | 1×10^{3} | | 3 x 10 ⁴ | | |
| Co-60 | 3×10^2 | · · | 1×10^4 | | |
| Zn-65 | 3×10^2 | | 2 x 10 ⁴ | | |
| Zr-166-95 | 4×10^{2} | | | | |
| I-131 | 15 | 0.9 . | | 3 | 1 × 10 ² |
| Cs-134 | 30 | 10 | 1×10^{3} | 60 | 1 × 10 ³ |
| Cs-137 | 50 | 20 | 2×10^{3} | 70 | 2 × 10 ³ |
| Ra-La-140 | 2×10^{2} | | | 3 x 10 ² | 2 × 10 |

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6.10 RECORD RETENTION

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In addition to the applicable record retention requirements of Title 10, Code of Federal Regulations, the following records shall be retained for at least the minimum period indication.

6.10.1 The following records shall be retained for at least five years:

- Records and logs of unit operation covering time interval at each power level.
- Records and logs of principal maintenance activities, inspections, repair and replacement or principal items of equipment related to nuclear safety.
- c. ALL REPORTABLE OCCURRENCES submitted to the Commission.
- Records of surveillance activities, inspections and calibrations required by these Technical Specifications.
- e. Records of changes made to the procedures required by Specification 6.8.1.
- f. Records of radioactive shipments.
- g. Records of licensable sealed source and fission detector leak tests and results.
- Records of annual physical inventory of all licensable sealed source material of record.

6.10.2. The following records shall be retained for the duration of the Unit Operating License:

- a. Records and drawing changes reflecting unit design modifications made to systems and equipment described in the Final Safety Analysis Report.
- Records of new and irradiated fuel inventory, fuel transfers and assembly burnup histories.
- Records of radiation exposure for all individuals entering radiation control areas.
- d. Records of gaseous and liquid radioactive material released to the environs.

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- Records of radiation exposure for all individuals entering radiation control areas.
- d. Records of gaseous and liquid radioactive material released to the environs.
- e. Records of transient or operational cycles for those unit components identified in Tat 5.7-1.
- f. Records of reactor tests and experiments.
- Records of training and qualification for current members of the unit staff.
- Records of in-service inspections performed pursuant to these Technical Specifications.
- r. Records of Quality Assurance activities required by the Operational Quality Assurance Manual.
- j. Records of reviews performed for changes made to procedures or equipment or reviews of tests and experiments pursuant to 10 CFR 50.59.
- k. Records of meetings of the PORC and the NSRB.

6.11 RADIATION PROTECTION PROGRAM

Procedures for personnel radiation protection shall be prepared consistent with the requirements of 10 CFR Part 20 and shall be approved, maintained and adhered to for all operations involving personnel radiation exposure.

6.12 HIGH RADIATION AREA

6.12.1 In lieu of the "control device" or "alarm signal" required by paragraph 20.203(c) (2) of 10 CFR 20, each high radiation area in which the intensity of radiation is greater than 100 mrem/hr but less than 1000 mrem/hr shall be barricaded and conspicuously posted as a high radiation area and entrance thereto shall be controlled by requiring issuance of a Special Work Permit*. Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

*Health Physics personnel or personnel escorted by Health Physics personnel in accordance with approved emergency procedures, shall be exempt from the SWP issuance requirement during the performance of their assigned radiation protection duties, provided they comply with approved radiation protection procedures for entry into high radiation areas.

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a. A radiation monitoring device which continuously indicates the radiation dose rate in the area.

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- b. A radiation monitoring device with continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate level in the area has been established and personnel have been made knowledgeable of them.
- c. An individual qualified in radiation protection procedures who is equipped with a radiation dose rate monitoring device. This individual shall be responsible for providing positive control over the activities within the area and shall perform control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified by the facility Health Physicist in the Special Work Permit.

6.12.2 The requirements of 6.12.1, above, shall also apply to each high radiation area in which the intensity of radiation is greater than 1000 mrem/hr. In addition, locked doors shall be provided to prevent unauthorized entry into such areas and the keys shall be maintained under the administrative control of the Shift Engineer on duty and/or the Health Physicist.

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6.13 OFFSITE DOSE CALCULATION MANUAL (ODCM)

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FUNCTION

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6.13.1 The ODCM shall describe the methodology and parameters to be used in the calculation of offsite doses due to radioactive gaseous and liquid effluents and in the calculation of gaseous and liquid effluent monitoring instrumentation alarm/trip setpoints consistent with the applicable LCO's contained in these Technical Specifications. Methodologies and calculational procedures acceptable to the Commission are contained in NUREG-0133. It shall also contain a flow diagram of the liquid and gaseous radwaste treatment systems and a description of the radiological environmental monitoring program.

The ODCM shall be submitted to the Commission at the time of proposed Padiological Effluent Technical Specifications and shall be subject to review and approval by the Commission prior to implementation.

6.13.2 Any changes to the ODCM shall be made by either of the following methods:

- A. Licensee initiated changes:
 - Shall be submitted to the Commission by inclusion in the Monthly Operating Report pursuant to Specification 6.9.1.10 within 90 days of the date the change(s) was made effective and shall contain:
 - a. sufficiently detailed information to totally support the rationale for the change without benefit of additional or supplemental information. Information submitted should consist of a package of those pages of the ODCM to be changed with each page numbered and provided with an approval and date box, together with appropriate analyses or evaluations justifying the change(s):
 - a determination that the change will not reduce the accuracy or reliability of dose calculations or setpoint determinations; and
 - c. documentation of the fact that the change has been reviewed and found acceptable by both the PORC and NSRB.
 - Shall become effective upon a date specified and agreed to by both the PORC and the NSRB following their review and acceptance of the change(s).

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B. Commission initiated changes:

- Shall be determined by the PORC to be applicable to the facility after consideration of facility design.
- The licensee shall provide the Commission with written notification of their determination of applicability including any necessary revisions to reflect facility design.
- Shall be reviewed by the NSRB at its next regularly scheduled meeting.

6.14 MAJOR CHANGES TO RADIOACTIVE WASTE TREATMENT SYSTEMS (Liquid and Gaseous)

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6.14.1 The radioactive waste treatment systems (liquid and gaseous) are those systems described in the facility Final Safety Analysis Report or Hazards Summary Report, and amendments thereto, which are used to maintain that control over radioactive materials in gaseous and liquid effluents required to meet the LCO's set forth in Specifications 3.11.1.1, 3.11.1.2, 3.11.1.3, 3.11.1.4, 3.11.2.1, 3.11.2.2, 3.11.2.3, 3.11.2.4, 3.11.2.5, and 3.11.2.7.

6.14.2 Major changes to the radioactive waste systems (liquid and gaseous) shall be made by either of the following methods. For the purpose of this specification 'major changes' is defined in Specification for 6.14.3 below.

A. Licensee initiated changes:

- The Commission shall be informed of all changes by the inclusion of a suitable discussion of each change in the Semiannual Radioactive Effluent Release Report for the period in which the changes were made. The discussion of each change shall contain:
 - 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 totally support the reason for the change without benefit of additional or supplemental information;
 - a detailed description of the equipment, components and processes involved and the interfaces with other plant systems;

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- an evaluation of the change which shows the predicted releases of radioactive materials in liquid and gaseous effluents from those previously predicted in the license application and amendments thereto;
- e) an evaluation of the change which shows the expected maximum exposures to individual in the unrestricted area and to the general population from those previously estimated in the license application and amendments thereto;
- f) 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;
- g) an estimate of the exposure to plant operating personnel as a result of the change; and
- h) documentation of the fact that the change was reviewed and found acceptable by both the PORC and the NSRB.
- The change shall become effective upon review and acceptance by both the PORC and NSRB.
- B. Commission initiated changes:
 - The applicability of the change to the facility shall be determined by the PORC after consideration of the facility design.
 - The licensee shall provide the Commission with written notification of its determination of applicability including any necessary revisions to reflect facility design.
 - The change shall be reviewed by the NSRB, at its next regulariy scheduled meeting.
 - The change shall become effective on a date specified by the Commission.

6.16.3 Background and definition of what constitutes 'major changes' to radioactive waste systems (liquid and gaseous).

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A. Background

- 10 CFR Part 50, Section 50.34a(a) requires that each application to construct a nuclear power reactor provide a description of the equipment installed to maintain control over radioactive material in gaseous and liquid effluents produced during normal reactor operations including operational occurrences.
- 2) 10 CFR Part 50, Section 50.34a (b)(2) requires that each application to construct a nuclear power reactor provide an estimate of the quantity of radionuclides expected to be released annually to unrestricted areas in liquid and gaseous effluents produced during normal reactor operation.
- 3) 10 CFR Part 50, Section 50.34a(3) requires that each application to construct a nuclear power reactor provide a description of the provisions for packaging, storage and shipment offsite of solid waste containing radioactive materials resulting from treatment of gaseous and liquid effluents and from other sources.
- 4) 10 CFR Part 50, Section 50.34a(3)(c) requires that each application to operate a nuclear power reactor shall include (1) a description of the equipment and procedures for the control of gaseous and liquid effluents and for the maintenance and use of equipment installed in radioactive waste systems and (2) a revised estimate of the infrimation required in (b)(2) if the expected releases ind exposures differ significantly from the estimate submitted in the application for a construction permit.
- 5) The Regulatory staff's Safety Evaluation Report and amendments thereto issued prior to the issuance of an operating license contains a description of the radioactive waste systems installed in the nuclear power reactor and a detailed evaluation (including estimated releases of radioactive materials in liquid and gaseous waste from normal operation, estimated annual maximum exposures to an individual in the unrestricted area and estimated exposures to the general poulation) which shows the capability of these systems to meet the appropriate regulations.

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6) The Regulatory Staff's Final Environmental Statement issued prior to the issuance of an operating license contains a detailed evaluation as to the expected environmental impact from the estimated releases of radioactive material in liquid and gaseous effluents.

B. Definition

"Major Changes" to radioactive waste systems (liquid and gaseous) shall include the following:

- Major changes in process equipment, components, structures and effluent monitoring instrumentation from those described in the Final Safety Analysis Report (FSAR) or the Hazards Summary Report and evaluated in the staff's Safety Evaluation Report (SER) (e.g., deletion of evaporators and installation of demineralizers);
- Major changes in the design of radwaste treatment systems (liquid and gaseous) that could significantly alter the characteristics and/or quantities of effluents released from those previously considered in the FSAR and SER;
- 3) Changes in system design which may invalidate the accident analysis as described in the SER (e.g., changes in tank capacity that would alter the curies released); and
- 4) Changes in system design that could potentially result in a significant increase in occupational exposure of operating personnel (e.g., use of skid mounted equipment, use of mobile processing equipment).