

REACTIVITY CONTROL SYSTEMS

BASES

3/4.1.2 BORATION SYSTEMS (Continued)

stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity change in the event the single injection system becomes inoperable.

The boron capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of 1% $\Delta k/k$ after xenon decay and cooldown from 200°F to 70°F. This condition requires either 600 gallons of 7875 ppm borated water from the boric acid storage system or 3,000 gallons of 1800 ppm borated water from the borated water storage tank.

The bottom 4 inches of the borated water storage tank are not available, and the instrumentation is calibrated to reflect the available volume. All boric acid tank volume is available. The limits on water volume, and boron concentration ensure a pH value of between 7.0 and 11.0 of the solution recirculated within containment after a design basis accident. The pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion cracking on mechanical systems and components.

The OPERABILITY of one boron injection system during REFUELING ensures that this system is available for reactivity control while in MODE 6.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section (1) ensure that acceptable power distribution limits are maintained, (2) ensure that the minimum SHUTDOWN MARGIN is maintained, and (3) limit the potential effects of a rod ejection accident. OPERABILITY of the control rod position indicators is required to determine control rod positions and thereby ensure compliance with the control rod alignment and insertion limits.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original criteria are met. For example, misalignment of a safety or regulating rod requires a restriction in THERMAL POWER. The reactivity worth of a misaligned rod is limited for the remainder of the fuel cycle to prevent exceeding the assumptions used in the safety analysis.

The position of a rod declared inoperable due to misalignment should not be included in computing the average group position for determining the OPERABILITY of rods with lesser misalignments.

REACTIVITY CONTROL SYSTEMS

BASES

3/4.1.3. MOVABLE CONTROL ASSEMBLIES (Continued)

The maximum rod drop time permitted is consistent with the assumed rod drop time used in the safety analyses. Measurement with $T_{avg} \geq 525^{\circ}\text{F}$ and with reactor coolant pumps operating ensures that the measured drop times will be representative of insertion times experienced during a reactor trip at operating conditions.

Control rod positions and OPERABILITY of the rod position indicators are required to be verified on a nominal basis of once per 12 hours with frequent verifications required if an automatic monitoring channel is inoperable. These verification frequencies are adequate for assuring that the applicable LCO's are satisfied. A 1.5% group average position uncertainty is applied to the rod index curves. Therefore, the position indicators must be capable of supporting this accuracy. The Surveillance Requirement ensures this accuracy by keeping the RPI calibrated to a "known" position as indicated by the API. Using the API as a "known" position is valid provided two consecutive reed switches are not inoperable. Having one entire string (i.e., every other reed switch) inoperable is acceptable.

A specific surveillance of the reed switches is not required because:

- 1) When one or more reed switch fails closed, a large API indication of asymmetry occurs.
- 2) Two failed open reed switches in series result in a large indication of asymmetry.
- 3) Failed open reed switches not in series (up to every other switch) are bounded by the analysis.

Therefore, a reed switch condition not bounded by the analysis will be indicated by API system asymmetry indications.

Technical Specification 3.1.3.8 provides the ability to prevent excessive power peaking by transient xenon at RATED THERMAL POWER. Operating restrictions resulting from transient xenon power peaking, including xenon-free startup, are inherently included in the limits of Sections 3.1.3.6 (Regulating Rod Insertion Limits), 3.1.3.9 (Axial Power Shaping Rod Insertion Limits), and 3.2.1 (Axial Power Imbalance) for transient peaking behavior bounded by the following factors. For the period of cycle operation where regulating rod groups 6 and 7 are allowed to be inserted at RATED THERMAL POWER, an 8% peaking increase is applied at or above 92% FP. An 18% increase is applied below 92% FP. For operation where only regulating rod group 7 is allowed to be inserted at RATED THERMAL POWER, a 5% peaking increase is applied at or above 92% FP and a 13% increase is applied below 92% FP.

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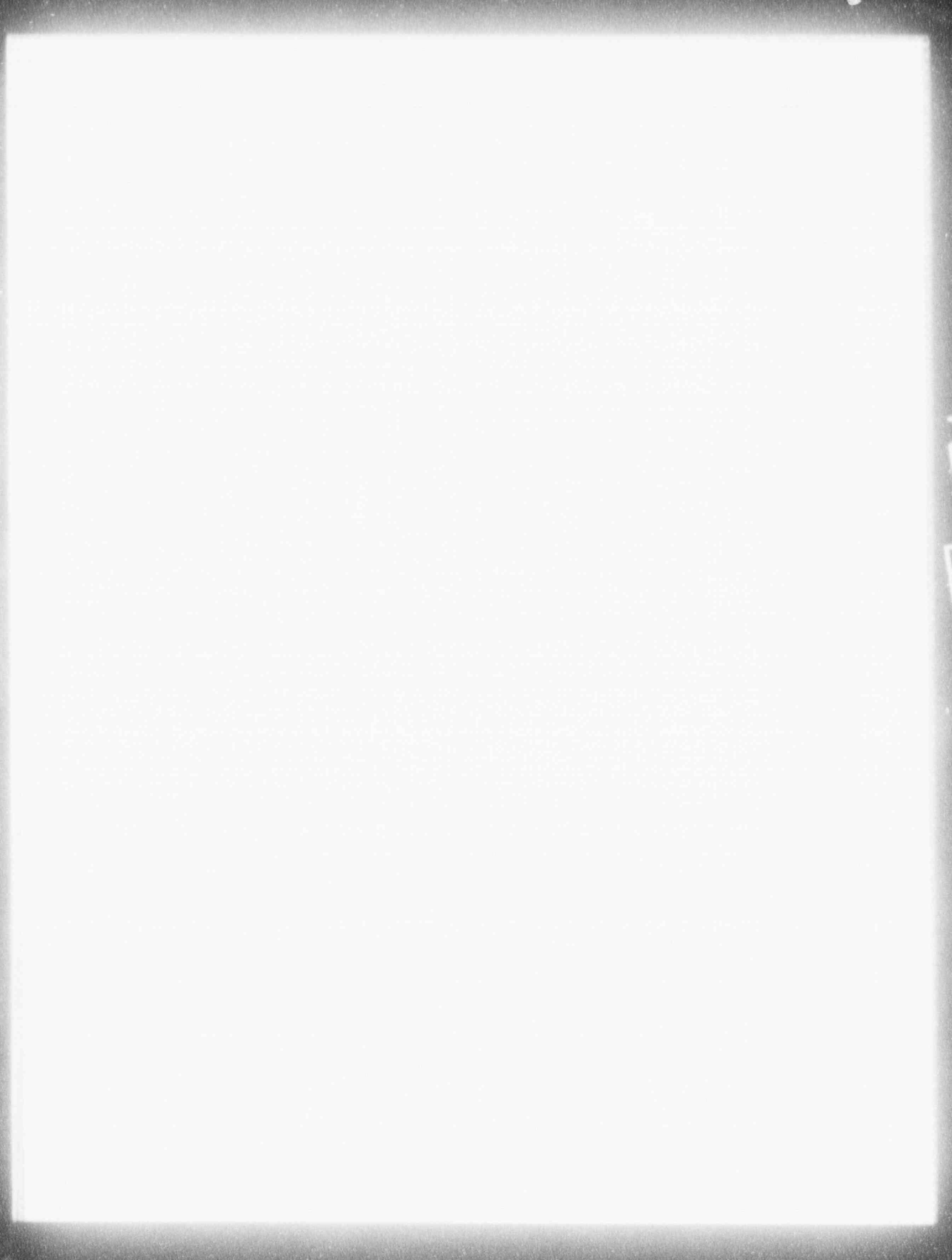
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INSTRUMENTATION

WASTE GAS SYSTEM OXYGEN MONITOR

LIMITING CONDITION FOR OPERATION

3.3.3.9 The Waste Gas System Oxygen monitor shall be OPERABLE with its alarm setpoints set to ensure that the limits of Specification 3.11.2 are not exceeded.

APPLICABILITY: During additions to the waste gas surge tank.

ACTION:

- a. With the waste gas system oxygen monitor alarm setpoint less conservative than required by the above Specifications, declare the channel inoperable and comply with ACTION b.
- b. With the waste gas system oxygen monitor inoperable, additions to the waste gas surge tank may continue provided another method for ascertaining oxygen concentrations, such as grab sample analysis, is implemented to provide measurements at least once per four (4) hours during degassing and daily during other operations. Exert best efforts to return the waste gas system oxygen monitor to OPERABLE status within 30 days and, if unsuccessful, explain in the next Semiannual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner.
- c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.9 The waste gas system oxygen monitor shall be demonstrated OPERABLE by:

- a. Performance of a CHANNEL CHECK at least once per 24 hours during additions to the waste gas surge tank.
- b. At least once per 92 days by performance of a CHANNEL CALIBRATION. 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.

RADIOACTIVE EFFLUENTS

LIQUID HOLDUP TANKS*

LIMITING CONDITION FOR OPERATION

3.11.1 The quantity of radioactive material contained in each of the following unprotected outdoor tanks shall be limited to less than or equal to 10 curies, excluding tritium and dissolved or entrained noble gases.

- a. Outside temporary tank.

APPLICABIL . . . At all times.

ACTION:

- a. With the quantity of radioactive material in any of the above listed tanks exceeding the above limit, immediately suspend all additions of radioactive material to the tank and within 48 hours reduce the tank contents to within the limit, and describe the event leading to this condition in the next Semiannual Radioactive Effluent Release Report.
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

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

*Tanks included in this specification are those outdoor tanks that are not surrounded by liners, dikes, or walls capable of holding the tank contents or that do not have tank overflows and surrounding area drains connected to the liquid radwaste treatment system.

RADIOACTIVE EFFLUENTS

EXPLOSIVE GAS MIXTURE (Hydrogen rich systems not designed to withstand a hydrogen explosion)

LIMITING CONDITION FOR OPERATION

3.11.2 The concentration of oxygen in the waste gas system shall be limited to less than or equal to 2% by volume whenever the hydrogen concentration exceeds 4% by volume.

APPLICABILITY: At all times.

ACTION:

- a. With the concentration of oxygen in the waste gas system greater than 2% by volume but less than or equal to 4% by volume, reduce the oxygen concentration to the above limits, within 48 hours.
- b. With the concentration of oxygen in the waste gas system greater than 4% by volume and the hydrogen concentration greater than 4% by volume, immediately suspend all additions of waste gases to the system and reduce the concentration of oxygen to less than or equal to 2% by volume without delay.
- c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.2 The concentrations of oxygen in the waste gas system shall be determined to be within the above limits by monitoring the waste gases in the waste gas system as required by Specification 3.3.3.9.

5.0 DESIGN FEATURES

5.1 SITE

EXCLUSION AREA

5.1.1 The exclusion area is shown on Figure 5.1-1.

LOW POPULATION ZONE

5.1.2 The low population zone is shown on Figure 5.1-2.

SITE BOUNDARY

5.1.3 The UNRESTRICTED AREA and SITE BOUNDARY for radioactive liquid effluents is shown on Figure 5.1-3. The UNRESTRICTED AREA and SITE BOUNDARY for radioactive gaseous effluents is shown on Figure 5.1-4.

5.2 CONTAINMENT

CONFIGURATION

5.2.1 The containment structure is comprised of a steel containment vessel, having the shape of a right circular cylinder with a hemispherical dome and ellipsoidal bottom, surrounded by a reinforced concrete shield building.

5.2.1.1 CONTAINMENT VESSEL

- a. Nominal inside diameter = 130 feet.
- b. Nominal inside height = 285.5 feet.
- c. Net free volume = 2.834×10^6 cubic feet.
- d. Nominal thickness of vessel walls - 1 1/2 inches.
- e. Nominal thickness of vessel dome - 13/16 inches.
- f. Nominal thickness of vessel bottom - 1 1/2 inches.

5.2.1.2 SHIELD BUILDING

- a. Minimum annular space = 4.5 feet.
- b. Annulus nominal volume = 678,700 cubic feet.
- c. Nominal outside height (measured from top of foundation base to the top of the dome) = 279.5 feet.
- d. Nominal inside diameter = 139.25 feet.
- e. Cylinder wall minimum thickness = 2.5 feet.
- f. Dome minimum thickness = 2.0 feet.
- g. Dome inside radius = 125.29 feet.

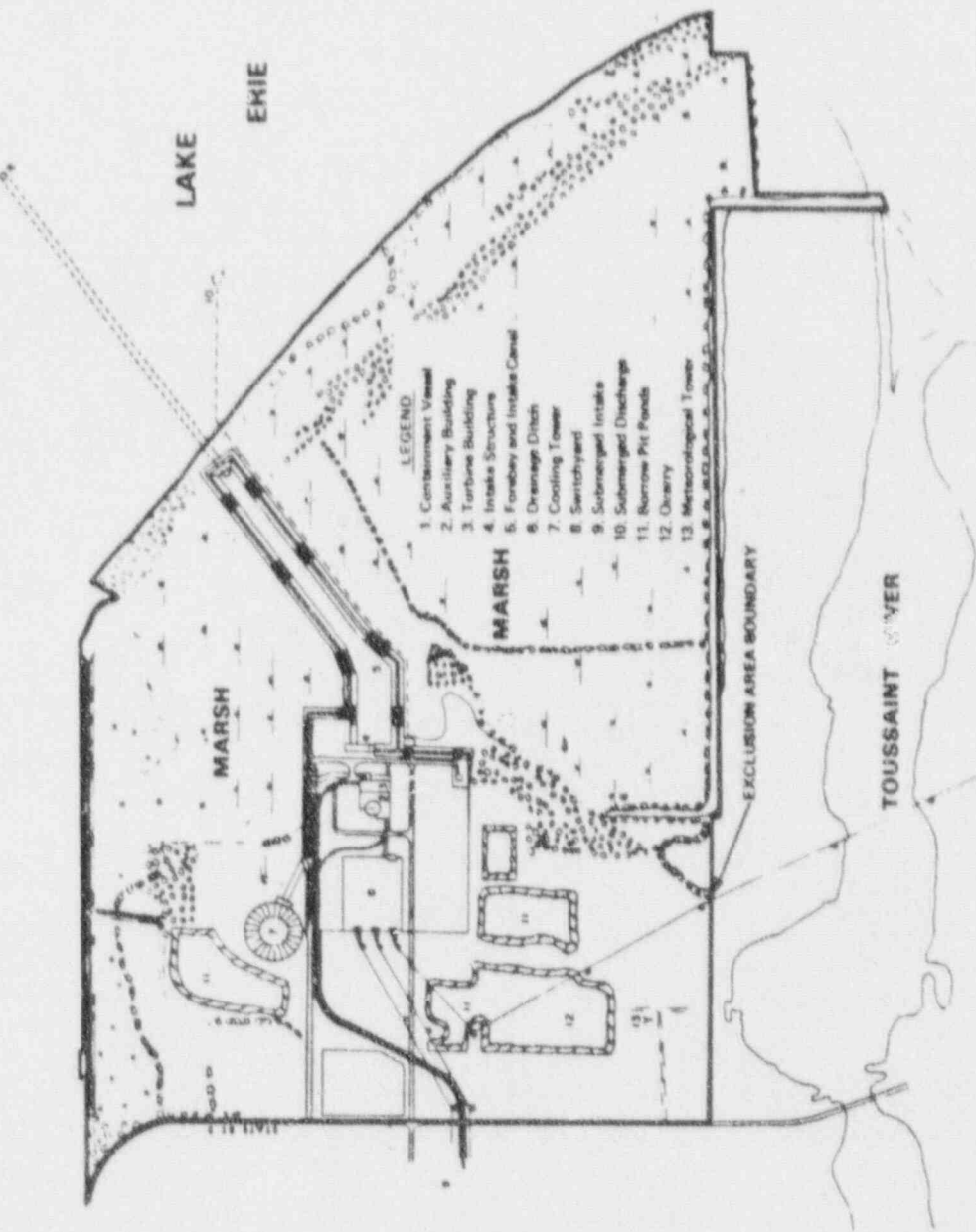


FIGURE 5.1.1
 DAVIS-BESSE NUCLEAR POWER STATION
 EXCLUSION AREA

ADMINISTRATIVE CONTROLS

6.8.4 (Continued)

c. Post-Accident Sampling

A program which will ensure the capability to obtain and analyse reactor coolant, radioactive iodines and particulates in plant gaseous effluents, and containment atmosphere samples under accident conditions. The program shall include the following:

- (i) Training of personnel,
- (ii) Procedures for sampling and analysis,
- (iii) Provisions for maintenance of sampling and analysis equipment.

d. Radioactive Effluent Controls Program

A program shall be provided conforming with 10 CFR 50.36a for the control of radioactive effluents and for maintaining the doses to MEMBERS OF THE PUBLIC from radioactive effluents as low as reasonably achievable. The program (1) shall be contained in the ODCM, (2) shall be implemented by operating procedures, and (3) shall include remedial actions to be taken whenever the program limits are exceeded. The program shall include the following elements:

- 1) Limitations on the operability of radioactive liquid and gaseous monitoring instrumentation including surveillance tests and setpoint determination in accordance with the methodology in the ODCM.
- 2) Limitations on the concentrations of radioactive material released in liquid effluents to UNRESTRICTED AREAS conforming to 10 CFR Part 20, Appendix B, Table II, Column 2,
- 3) Monitoring, sampling, and analysis of radioactive liquid and gaseous effluents in accordance with 10 CFR 20.106 and with the methodology and parameters in the ODCM.
- 4) Limitations on the annual and quarterly doses or dose commitment to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released from each unit to UNRESTRICTED AREAS conforming to Appendix I to 10 CFR Part 50,
- 5) Determination of cumulative and projected dose contributions from radioactive effluents for the current calendar quarter and current calendar year in accordance with the methodology and parameters in the ODCM at least every 31 days,

ADMINISTRATIVE CONTROLS

6.8.4 (Continued)

d. Radioactive Effluent Controls Program (Continued)

- 6) Limitations on the operability and use of the liquid and gaseous effluent treatment systems to ensure that the appropriate portions of these systems are used to reduce releases of radioactivity when the projected doses in a 31-day period would exceed 2 percent of the guidelines for the annual dose or dose commitment conforming to Appendix I to 10 CFR Part 50,
- 7) Limitations on the dose rate resulting from radioactive material released in gaseous effluents to areas beyond the SITE BOUNDARY conforming to the doses associated with 10 CFR Part 20, Appendix B, Table II, Column 1,
- 8) Limitations on the annual and quarterly air doses resulting from noble gases released in gaseous effluents from each unit to areas beyond the SITE BOUNDARY conforming to Appendix I to 10 CFR Part 50,
- 9) Limitations on the annual and quarterly doses to a MEMBER OF THE PUBLIC from Iodine-131, Iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released from each unit to areas beyond the SITE BOUNDARY conforming to Appendix I to 10 CFR Part 50,
- 10) Limitations on the annual dose or dose commitment to any MEMBER OF THE PUBLIC due to releases of radioactivity and to radiation from uranium fuel cycle sources conforming to 40 CFR Part 190.

e. Radiological Environmental Monitoring Program

A program shall be provided to monitor the radiation and radionuclides in the environs of the plant. The program shall provide (1) representative measurements of radioactivity in the highest potential exposure pathways, and (2) verification of the accuracy of the effluent monitoring program and modeling of environmental exposure pathways. The program shall (1) be contained in the ODCM, (2) conform to the guidance of Appendix I to 10 CFR Part 50, and (3) include the following:

- 1) Monitoring, sampling, analysis, and reporting of radiation and radionuclides in the environment in accordance with the methodology and parameters in the ODCM,
- 2) A Land Use Census to ensure that changes in the use of areas at and beyond the SITE BOUNDARY are identified and that modifications to the monitoring program are made if required by the results of this census, and

ADMINISTRATIVE CONTROLS

6.8.4 (Continued)

e. Radiological Environmental Monitoring Program (Continued)

- 3) Participation in an Interlaboratory Comparison Program to ensure that independent checks on the precision and accuracy of the measurements of radioactive materials in environmental sample matrices are performed as part of the quality assurance program for environmental monitoring.

6.9 REPORTING REQUIREMENTS

ROUTINE REPORTS

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 appropriate Regional Office 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 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.

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

ADMINISTRATIVE CONTROLS

SPECIAL REPORTS

6.9.2 Special reports shall be submitted to the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 50.4 within the time period specified for each report. These reports shall be submitted covering the activities identified below pursuant to the requirements of the applicable reference specifications:

- a. ECCS Actuation, Specifications 3.5.2 and 3.5.3.
- b. Inoperable Seismic Monitoring Instrumentation, Specification 3.3.3.3.
- c. Inoperable Meteorological Monitoring Instrumentation, Specification 2.3.3.4.
- d. Seismic event analysis, Specification 4.3.3.3.2.
- e. Fire Detection Instrumentation, Specification 3.3.3.8
- f. Fire Suppression Systems, Specifications 3.7.9.1 and 3.7.9.2.

6.10 RECORD RETENTION

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

- a. Records and logs of facility operation covering time interval at each power level.
- b. Records and logs of principal maintenance activities, inspections, repair and replacement of principal items of equipment related to nuclear safety.
- c. All REPORTABLE EVENTS.
- d. Records of surveillance activities, inspections and calibrations required by these Technical Specifications.
- e. Records of changes made to Operating Procedures.
- f. Records of radioactive shipments.
- g. Records of sealed source and fission detector leak tests and results.
- h. Records of annual physical inventory of all sealed source material of record.

ADMINISTRATIVE CONTROLS

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

- a. Records and drawing changes reflecting facility design modifications made to systems and equipment described in the Final Safety Analysis Report.
- b. Records of new and irradiated fuel inventory, fuel transfers and assembly burnup histories.
- c. 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 of operational cycles for those facility components identified in Table 5.7-1.
- f. Records of reactor tests and experiments.
- g. Records of training and qualification for current members of the plant staff.
- h. Records of in-service inspections performed pursuant to these Technical Specifications.
- i. Records of Quality Assurance activities required by the QA 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 SRB and the CNRB.
- l. Records for Environmental Qualification which are covered under the provisions of paragraph 6.13.
- m. Records of analyses required by the radiological environmental monitoring program that would permit evaluation of the accuracy of the analyses at a later date. This should include procedures effective at specified times and QA records showing that these procedures were followed.
- n. Records of the service lives of all safety related hydraulic and mechanical snubbers including the date at which the service life commences and associated installation and maintenance records.
- p. Records of reviews performed for changes made to the OFFSITE DOSE CALCULATION MANUAL and the PROCESS CONTROL PROGRAM.