UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

COMMONWEALTH EDISON COMPANY

DOCKET NO. 50-304

ZION NUCLEAR POWER STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 167
License No. DPR-48

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Commonwealth Edison Company (the licensee) dated October 2, 1998, as supplemented by information in letters dated April 13, 1999, July 8, 1999, August 30, 1999, and September 15, 1999, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Operating License and the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-48 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 167, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Masnik, Chief
Decommissioning Section
Project Directorate IV and Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Operating License
and Technical Specifications

Date of Issuance: December 30, 1999

ATTACHMENT TO LICENSE AMENDMENT NOS. 180 AND 167

FACILITY OPERATING LICENSE NOS. DPR-39 AND DPR-48

DOCKET NOS. 50-295 AND 50-304

Replace the entirety of the Appendix A "Technical Specifications," and the Bases to the Technical Specifications with the attached pages. The new pages are identified by Amendment Nos. 180 and 167 for Units 1 and 2, respectively. Also replace the following pages of Facility Operating License No. DPR-39 and Facility Operating License No. DPR-48 with the attached pages. The revised pages are identified by Amendment number and contain marginal lines indicating the areas of change.

REMOVE	INSERT
Technical Specifications	
All	All
Facility Operating License No. DPR-39	
4	4
5	5
6	---
6a	---
7	---
Facility Operating License No. DPR-48	
4	4
5	5
6	---
7	---

ZION NUCLEAR POWER STATION

PERMANENTLY DEFUELED

TECHNICAL SPECIFICATIONS

TABLE OF CONTENTS

1.0 USE AND APPLICATION

1.1 Definitions

----------NOTE----------
The defined terms of this section appear in capitalized type and are applicable throughout these Technical Specifications and Bases.

Term	Definition
ACTIONS	ACTIONS shall be that part of a Specification that prescribes Required Actions to be taken under designated Conditions within specified Completion Times.

1.0 USE AND APPLICATION

1.2 Logical Connectors

PURPOSE

The purpose of this section is to explain the meaning of logical connectors.

Logical connectors are used in Technical Specifications (TS) to discriminate between, and yet connect, discrete Conditions, Required Actions, Completion Times, Surveillances, and Frequencies. The only logical connectors that appear in TS are AND and OR. The physical arrangement of these connectors constitutes logical conventions with specific meanings.

BACKGROUND

Several levels of logic may be used to state Required Actions. These levels are identified by the placement (or nesting) of the logical connectors and by the number assigned to each Required Action. The first level of logic is identified by the first digit of the number assigned to a Required Action and the placement of the logical connector in the first level of nesting (i.e., left justified with the number of the Required Action). The successive levels of logic are identified by additional digits of the Required Action number and by successive indentions of the logical connectors.

If logical connectors are used to state a Condition, Completion Time, Surveillance, or Frequency, only the first level of logic is used, and the logical connector is left justified with the statement of the Condition, Completion Time, Surveillance, or Frequency.

(continued)

1.2 Logical Connectors

EXAMPLES (continued)

The following examples illustrate the use of logical connectors.

EXAMPLE 1.2-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Verify . . . AND A.2 Restore . . .	

In this example, the logical connector AND is used to indicate that when in Condition A, both Required Actions A.1 and A.2 must be completed.

EXAMPLE 1.2-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Trip . . . OR A.2.1 Verify . . . AND A.2.2. Reduce . . .	

This example represents a more complicated use of logical connectors. Required Actions A.1 and A.2 are alternative choices, only one of which must be performed as indicated by the use of the logical connector OR and the left justified placement. Either of the Actions may be chosen. If A.2 is chosen, then both A.2.1 and A.2.2 must be performed as indicated by the logical connector AND.

1.0 USE AND APPLICATION

1.3 Completion Times

PURPOSE	The purpose of this section is to establish the Completion Time convention and to provide guidance for its use.
BACKGROUND	Limiting Conditions for Operation (LCOs) specify minimum requirements for ensuring safe storage of irradiated fuel. The ACTIONS associated with an LCO state Conditions that typically describe the ways in which the requirements of the LCO can fail to be met. Specified with each stated Condition are Required Action(s) and Completion Time(s).
DESCRIPTION	The Completion Time is the amount of time allowed for completing a Required Action. It is referenced to the time of discovery of a situation (e.g., variable not within limits) that requires entering an ACTIONS Condition unless otherwise specified. Required Actions must be completed prior to the expiration of the specified Completion Time. An ACTIONS Condition remains in effect and the Required Actions apply until the Condition no longer exists or the unit is not within the LCO Applicability.
IMMEDIATE COMPLETION TIME	When "Immediately" is used as a Completion Time, the Required Action should be pursued without delay and in a controlled manner.

1.0 USE AND APPLICATION

1.4 Frequency

PURPOSE

The purpose of this section is to discuss the proper use and application of Frequency requirements.

DESCRIPTION

Each Surveillance Requirement (SR) has a specified Frequency in which the Surveillance must be met in order to meet the associated LCO. An understanding of the correct application of the specified Frequency is necessary for compliance with the SR.

The "specified Frequency" is referred to throughout this section and each of the Specifications of Section 3.0, Surveillance Requirement (SR) Applicability. The "specified Frequency" consists of the requirements of the Frequency column of each SR as well as certain Notes in the Surveillance column that modify performance requirements.

EXAMPLES

The following examples illustrate the various ways that Frequencies are specified. In these examples, the Applicability of the LCO (LCO not shown) is when irradiated fuel is stored in the spent fuel pool.

(continued)

1.4 Frequency

EXAMPLES (continued)

EXAMPLE 1.4-1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Verify parameter is within limits.	12 hours

Example 1.4-1 contains the type of SR most often encountered in the Technical Specifications (TS). The Frequency specifies an interval (12 hours) during which the associated Surveillance must be performed at least one time. Performance of the Surveillance initiates the subsequent interval. Although the Frequency is stated as 12 hours, an extension of the time interval to 1.25 times the stated Frequency is allowed by SR 3.0.2 for operational flexibility. The measurement of this interval continues at all times, even when the SR is not required to be met per SR 3.0.1 (such as when a variable is outside specified limits, or the facility is outside the Applicability of the LCO). If the interval specified by SR 3.0.2 is exceeded while the facility is the specified condition in the Applicability of the LCO, and the performance of the Surveillance is not otherwise modified, then SR 3.0.3 becomes applicable.

(continued)

1.4 Frequency

EXAMPLES (continued)

EXAMPLE 1.4-2

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Verify parameter is within limits.	Within 24 hours prior to moving irradiated fuel AND 24 hours thereafter

Example 1.4-2 has two Frequencies. The first is a one-time performance Frequency, and the second is of the type shown in Example 1.4-1. The logical connector "AND" indicates that both Frequency requirements must be met. The use of "prior to" indicates that the surveillance must be performed once before the initiation of fuel handling activities. This type of Frequency does not qualify for 25% extension allowed by SR 3.0.2. "Thereafter" indicates future performances must be established per SR 3.0.2, but only after a specified condition is first met (i.e., the "once" performance in this example).

2.0 SAFETY LIMITS

This section is not applicable to defueled facilities.

3.0 LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY

LCO 3.0.1	LCOs shall be met during the specified conditions in the Applicability, except as provided in LCO 3.0.2.
LCO 3.0.2	Upon discovery of a failure to meet an LCO, the Required Actions of the associated Conditions shall be met. If the LCO is met or no longer applicable prior to expiration of the specified Completion Time(s), completion of the Required Action(s) is not required, unless otherwise stated.

3.0 SURVEILLANCE REQUIREMENT (SR) APPLICABILITY

SR 3.0.1 SRs shall be met during specified conditions in the Applicability for the individual LCOs, unless otherwise stated in the SR. Failure to meet a Surveillance whether such failure is experienced during performance of the Surveillance or between performances of the Surveillance, shall be failure to meet the LCO. Failure to perform a Surveillance within the specified Frequency shall be failure to meet the LCO, except as provided in SR 3.0.3. Surveillances do not have to be performed on variables outside specified limits.

SR 3.0.2 The specified Frequency for each SR is met if the Surveillance is performed within 1.25 times the interval specified in the Frequency, as measured from the previous performance or as measured from the time a specified condition of the Frequency is met.

SR 3.0.3 If it is discovered that a Surveillance was not performed within its specified Frequency, then compliance with the requirement to declare the LCO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified Frequency, whichever is less. This delay period is permitted to allow performance of the Surveillance.

If the Surveillance is not performed within the delay period, the LCO must be immediately declared not met and the applicable Condition(s) must be entered. The completion times of the Required Actions begin immediately upon expiration of the delay period.

When the Surveillance is performed within the delay period and the Surveillance is not met, the LCO must immediately be declared not met, and the applicable Condition(s) must be entered. The completion times of the Required Actions begin immediately upon failure to meet the Surveillance.

3.1 DEFUELED PLANT SYSTEMS

3.1.1 Spent Fuel Pool Water Level

LCO 3.1.1 The spent fuel pool water level shall be $\geq$ 23 ft over the top of irradiated fuel assemblies seated in the storage racks.

APPLICABILITY: During movement of irradiated fuel assemblies in the spent fuel pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Spent fuel pool water level not within limit.	A.1 Suspend movement of irradiated fuel assemblies in the spent fuel pool.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.1.1	Verify the spent fuel pool water level is $\geq$ 23 ft above the top of the irradiated fuel assemblies seated in the storage racks.	Within 24 hours prior to movement of irradiated fuel assemblies AND and 24 hours thereafter

3.1 DEFUELED PLANT SYSTEMS

3.1.2 Spent Fuel Pool Boron Concentration

LCO 3.1.2 The spent fuel pool boron concentration shall be $\geq$ 500 ppm.

APPLICABILITY: During movement of fuel assemblies in the spent fuel pool, or

When fuel assemblies are stored in Region 2 of the spent fuel pool and a spent fuel pool verification has not been performed since the last movement of fuel assemblies in the spent fuel pool.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Spent fuel pool boron concentration not within limit.	A.1	Suspend movement of fuel assemblies in the spent fuel pool.	Immediately
	AND		
	A.2.1	Initiate action to restore spent fuel pool boron concentration to within limit.	Immediately
	OR		
	A.2.2	Verify by administrative means Region 2 spent fuel pool verification has been performed since the last movement of fuel assemblies in the spent fuel pool.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	Verify the spent fuel pool boron concentration is within limit.	Within 31 days prior to movement of irradiated fuel assemblies AND 31 days thereafter

3.1 DEFUELED PLANT SYSTEMS

3.1.3 Spent Fuel Assembly Storage

LCO 3.1.3 The combination of initial enrichment and discharge fuel burnup of each spent fuel assembly stored in Region 2 shall be within the Acceptable Burnup Domain of Figure 3.1.3-1.

APPLICABILITY: Whenever any fuel assembly is stored in Region 2 of the spent fuel pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of the LCO not met.	A.1 Initiate action to move the noncomplying fuel assembly from Region 2.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.3.1	Verify by administrative means the initial enrichment and discharge fuel burnup of the fuel assembly is in accordance with Figure 3.1.3-1.	Prior to storing the fuel assembly in Region 2

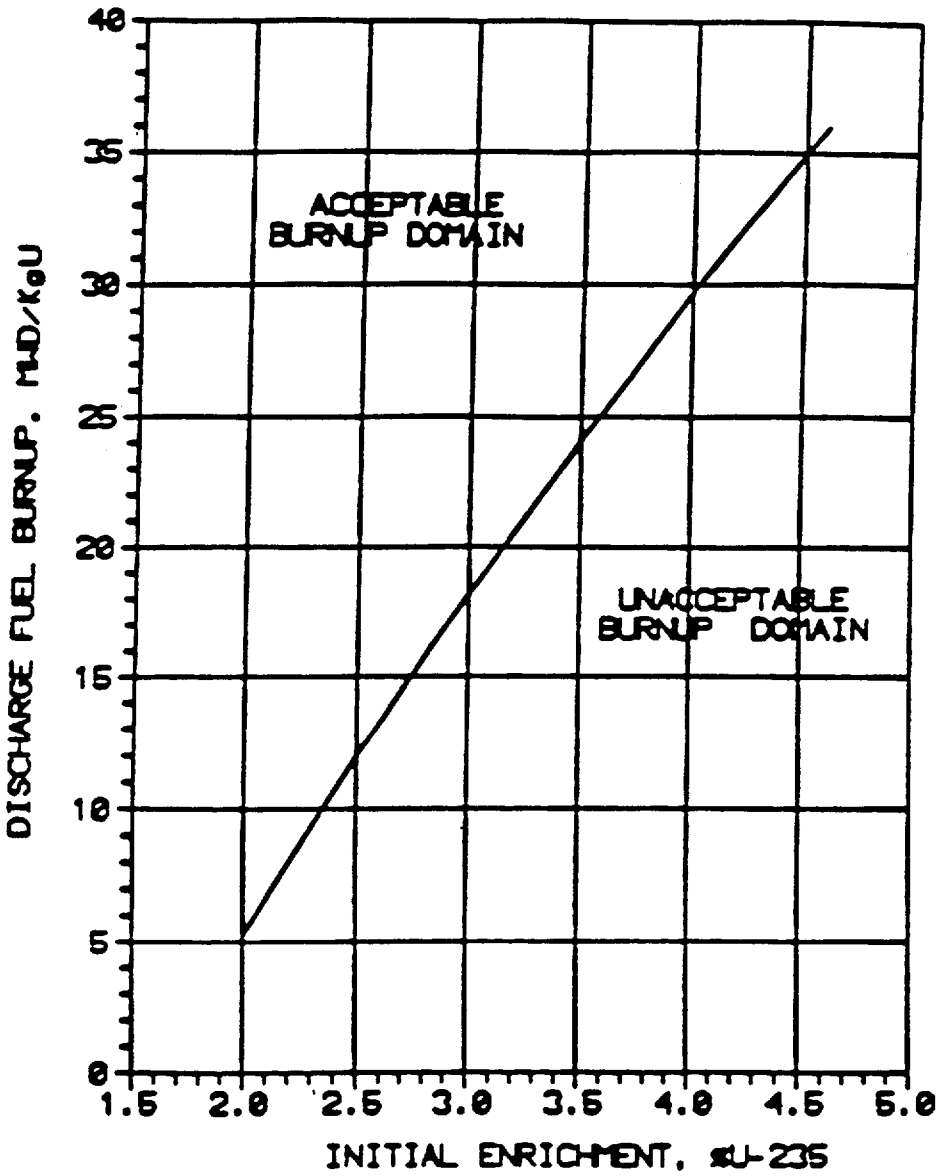

Figure 3.1.3-1
Fuel Assembly Burnup Limits in Region 2

4.0 DESIGN FEATURES

4.1 Site

4.1.1 Site Location

Zion Units 1 and 2 are located at the Zion Station which consists of a tract of land of approximately 250 acres located in the extreme eastern portion of the city of Zion, Lake County, Illinois, on the west shore of Lake Michigan approximately 6 miles NNE of the center of the city of Waukegan, Illinois, and 8 miles south of the center of the city of Kenosha, Wisconsin. It is located at longitude 87° 48.1' W and latitude 42° 26.8' N.

4.0 DESIGN FEATURES

4.1 Fuel Storage

4.2.1 Criticality

4.2.1.1 The spent fuel storage racks are designed and shall be maintained with:

a. Fuel assemblies having a maximum U-235 enrichment of 4.65 weight percent;

b. $k_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties;

c. A nominal 9.14 inch center to center distance between fuel assemblies placed in Region 2 of the spent fuel storage racks;

d. A nominal 10.54 inch north-south and 10.78 east-west center to center distance between fuel assemblies placed in Region 1 of the spent fuel storage racks;

e. One row of six storage cells with a nominal 18.75 inch center to center distance between cells for storing failed fuel canisters in Region 1 of the spent fuel storage racks;

f. Irradiated fuel assemblies with a discharge burnup in the "acceptable burnup domain" of Figure 3.1.3-1 allowed unrestricted storage in either Region 1 or Region 2 of the spent fuel storage rack(s); and

g. New or irradiated fuel assemblies with a discharge burnup in the "unacceptable burnup domain" of Figure 3.1.3-1 stored in Region 1 of the spent fuel storage racks.

(continued)

4.2 Fuel Storage

4.2.1 Criticality (continued)

4.2.1.2 The new fuel storage racks are designed and shall be maintained with:

a. Fuel assemblies having a maximum U-235 enrichment of 4.65 weight percent;

b. $k_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties; and

c. A nominal 21 inches center to center distance between fuel assemblies placed in the storage racks.

4.2.2 Drainage

The spent fuel pool is designed and shall be maintained to prevent draining of the pool below elevation 598 ft.

4.2.3 Capacity

The spent fuel pool is designed and shall be maintained with a storage capacity limited to no more than 3012 fuel assemblies.

5.0 ADMINISTRATIVE CONTROLS

5.1 Responsibility

5.1.1 The Decommissioning Plant Manager shall be responsible for overall plant operations and shall delegate in writing the succession to this responsibility during his absence.

The Decommissioning Plant Manager or his designee shall approve, prior to implementation, each proposed test, experiment, or modification to systems or equipment that affect the safe storage of nuclear fuel.

5.1.2 The Shift Supervisor shall be responsible for the shift command function.

5.0 ADMINISTRATIVE CONTROLS

5.2 Organization

5.2.1 General Organizational Requirements

Onsite and offsite organizations shall be established for station and corporate management, respectively. The onsite and offsite organizations shall include the positions for activities affecting the safe storage and handling of nuclear fuel.

a. Lines of authority, responsibility, and communication shall be established and defined for the highest management levels through intermediate levels to and including all operating organization positions. These relationships shall be documented and updated, as appropriate, in the form of organization charts, functional descriptions of departmental responsibilities and relationships, and job descriptions for key personnel positions, or in equivalent forms of documentation. These requirements shall be documented in the Quality Assurance Manual or a site specific quality assurance program description incorporated directly or by reference in the DSAR.

b. The Decommissioning Plant Manager shall be responsible for overall plant safety and shall have control over those onsite activities necessary for safe storage and handling of nuclear fuel.

c. A Corporate Vice-President shall have corporate responsibility for the safe handling and storage of nuclear fuel and shall take any measures needed to ensure acceptable performance of the staff in operating, maintaining, and providing technical support to the plant to ensure the safe handling and storage of nuclear fuel.

d. The individuals who train the Certified Fuel Handlers, and those who carry out health physics and quality assurance functions may report to an appropriate onsite manager; however, they shall have sufficient organizational freedom to ensure their ability to perform their assigned functions.

(continued)

5.2 Organization

5.2.2 Facility Staff

The facility staff organization shall include the following:

a. Each on duty shift shall be composed of at least the minimum shift crew composition shown in Figure 5.2.2-1.

b. At least one person qualified to stand watch in the control room (non-certified operator or Certified Fuel Handler) shall be present in the control room when nuclear fuel is stored in the spent fuel pool.

c. All fuel handling operations shall be directly supervised by a Certified Fuel Handler.

d. Administrative procedures shall be developed and implemented to limit the working hours of personnel who perform functions important to the safe storage and handling of nuclear fuel assemblies (e.g., Certified Fuel Handlers, non-certified operators, radiation protection personnel, and key maintenance personnel) such that the heavy use of overtime is not routinely required.

e. The Shift Supervisor shall be a Certified Fuel Handler.

Table 5.2.2-1
Minimum Shift Crew Composition[a]

Position	Minimum Crew Number
Shift Supervisor	1
Non-certified operator	1
Total	2

(a) The shift crew composition may be one less than the minimum requirements of Table 5.2.2-1 for not more than two hours to accommodate unexpected absences of on-duty shift crew members provided immediate action is taken to restore the shift crew composition to within minimum requirements of Table 5.2.2-1. This provision does not permit any shift crew position to be unmanned upon shift change due to an oncoming shift crew member being late or absent.

5.0 ADMINISTRATIVE CONTROLS

5.3 Facility Staff Qualifications

5.3.1 Staff Qualifications

Each member of the facility staff shall meet or exceed the minimum qualifications of ANSI N18.1, "Selection and Training of Nuclear Power Plant Personnel," dated March 8, 1971, with the following exceptions:

Either the Manager of the Health Physics Department or the Lead Health Physicist shall meet or exceed the qualifications of "Radiation Protection Manager" of Regulatory Guide 1.8, September 1975.

The Decommissioning Operations Manager shall meet the requirement of Operations Manager in ANSI N18.1, "Selection and Training of Nuclear Power Plant Personnel," dated March 8, 1971, with the exception that this individual may be qualified as a Certified Fuel Handler at time of appointment in lieu of holding a Senior Reactor Operator license.

5.0 ADMINISTRATIVE CONTROLS

5.4 Training

5.4.1 Training

A training and retraining program for the Certified Fuel Handlers shall be maintained under the direction of the Decommissioning Plant Manager or designee.

5.0 ADMINISTRATIVE CONTROLS

5.5 Procedures

5.5.1 Procedures

Written procedures shall be established, implemented, and maintained covering the following activities:

a. The procedures applicable to the safe storage of nuclear fuel recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February, 1978;

b. Fire Protection Program implementation; and

c. All programs specified in Specification 5.6.

5.0 ADMINISTRATIVE CONTROLS

5.6 Programs and Manuals

The following programs shall be established, implemented and maintained.

5.6.1 Offsite Dose Calculation Manual (ODCM)

a. The ODCM shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring alarm and trip setpoints, and in the conduct of the radiological environmental monitoring program;

b. The ODCM shall also contain the radioactive effluent controls and radiological environmental monitoring activities, and descriptions of the information that should be included in the Annual Radiological Environmental Operating and Radioactive Effluent Release Reports required by Specification 5.7.2 and Specification 5.7.3;

c. Licensee initiated changes to the ODCM:

1. Shall be documented and records of reviews performed shall be retained. This documentation shall contain:

i. Sufficient information to support the change(s) together with the appropriate analyses or evaluations justifying the change(s), and

ii. A determination that the change(s) will maintain the levels of radioactive effluent control required by 10 CFR 20.1302, 40 CFR 190, 10 CFR 50.36a, and 10 CFR 50, Appendix I, and do not adversely impact the accuracy or reliability of effluent, dose, or setpoint calculations;

2. Shall become effective after the approval of the Decommissioning Plant Manager or designee; and

(continued)

5.6 Programs and Manuals

5.6.1 Offsite Dose Calculation Manual (ODCM) (continued)

3. Shall be submitted to the NRC in the form of a complete, legible copy of the entire ODCM as a part of or concurrent with the Radioactive Effluent Release Report for the period of the report in which any change in the ODCM was made effective. Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed, and shall indicate the date (i.e., month and year) the change was implemented.

5.6.2 Radioactive Effluent Controls Program

This program conforms to 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 shall be contained in the ODCM, shall be implemented by procedures, and shall include remedial actions to be taken whenever the program limits are exceeded. The program shall include the following elements:

a. Limitations on the functional capability of radioactive liquid and gaseous monitoring instrumentation including surveillance tests and setpoint determination in accordance with the methodology in the ODCM;

(continued)

5.6 Programs and Manuals

5.6.2 Radioactive Effluent Controls Program (continued)

b. Limitations on the concentrations of radioactive material released in liquid effluents to unrestricted areas, conforming to ten times the concentration values in 10 CFR 20, Appendix B, Table 2, Column 2;

c. Monitoring, sampling, and analysis of radioactive liquid and gaseous effluents in accordance with 10 CFR 20.1302 and with the methodology and parameters in the ODCM;

d. Limitations on the annual and quarterly doses or dose commitment to a member of the public from radioactive materials in liquid effluents released for each unit to unrestricted areas, conforming to 10 CFR 50, Appendix I;

e. 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;

f. Limitations on the functional capability and use of the liquid and gaseous effluent treatment systems to ensure that 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 50;

(continued)

5.6 Programs and Manuals

5.6.2 Radioactive Effluent Controls Program (continued)

g. Limitations on the dose rate resulting from radioactive material released in gaseous effluents to areas beyond the site boundary conforming to the following:

1. For noble gases: less than or equal to a dose rate of 500 mrem/yr to the whole body and less than or equal to a dose rate of 3000 mrem/yr to the skin; and

2. For tritium and for all radionuclides in particulate form with half-lives greater than 8 days: less than or equal to a dose rate of 1500 mrem/yr to any organ;

h. 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 50;

i. Limitations on the annual and quarterly doses to a member of the public from 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 50; and

j. 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 190.

The provisions of SR 3.0.2 are applicable to Radioactive Effluent Controls Program surveillance frequencies.

(continued)

5.6 Programs and Manuals

5.6.3 Outdoor Storage Tank Radioactivity Monitoring Program

This program provides controls for the quantity of radioactivity contained in unprotected outdoor liquid storage tanks. This program is required if radioactive liquid is contained in unprotected (as defined below) outdoor storage tanks. The liquid radwaste quantities shall be determined in accordance with the ODCM

The program shall include a surveillance program to ensure that the quantity of radioactivity contained in all outdoor liquid radwaste tanks that are not surrounded by liners, dikes, or walls, capable of holding the tanks' contents and that do not have tank overflows and surrounding area drains connected to the liquid radwaste treatment system is less than the amount that would result in concentrations less than the limits of 10 CFR 20, Appendix B, Table 2, Column 2, at the nearest potable water supply and the nearest surface water supply in an unrestricted area, in the event of an uncontrolled release of the tanks' contents.

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Outdoor Storage Tank Radioactivity Monitoring Program surveillance frequencies.

(continued)

5.6 Programs and Manuals

5.6.4 Technical Specification (TS) Bases Control Program

This program provides a means for processing changes to the Bases of these Technical Specifications.

a. Changes to the Bases of the TS shall be made under appropriate administrative controls and reviews.

b. Licensees may make changes to Bases without prior NRC approval provided the changes do not involve either of the following:

1. A change in the TS incorporated in the license; or

2. A change to the DSAR or Bases that involves an unreviewed safety question as defined in 10 CFR 50.59.

c. The Bases Control Program shall contain provisions to ensure that the Bases are maintained consistent with the DSAR.

d. Proposed changes that meet the criteria of b(1) or b(2) above shall be reviewed and approved by the NRC prior to implementation. Changes to the Bases implemented without prior NRC approval shall be provided to the NRC on a frequency consistent with 10 CFR 50.71(e) as modified by approved exemptions.

5.0 ADMINISTRATIVE CONTROLS

5.7 Reporting Requirements

The following reports shall be submitted in accordance with 10 CFR 50.4.

5.7.1 Occupational Radiation Exposure Report

----------NOTE----------
A single submittal may be made for a multiple unit station. The submittal should combine sections common to all units at the station.

A tabulation covering the previous calendar year shall be submitted prior to April 30 of each year on the number of station, utility and other personnel (including contractors) receiving exposures greater than 100 mrem/year and their associated man rem exposure according to work and job functions (e.g., fuel handling, surveillance, routine maintenance, special maintenance (describe maintenance), and waste processing). This tabulation supplements the requirements of 10 CFR 20.2206. The dose assignments to various duty functions may be estimates based on pocket dosimeter, TLD, or film badge measurements. Small exposures totaling 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.

5.7.2 Annual Radiological Environmental Operating Report

----------NOTE----------
A single submittal may be made for a multiple unit station.

The Annual Radiological Environmental Operating Report covering unit activities during the previous calendar year shall be submitted before May 15 of each year. The report shall include summaries, interpretations, and analysis of trends of the results of the Radiological Environmental Monitoring Program for the reporting period. The material provided shall be consistent with the objectives outlined in (1) the ODCM and (2) Sections IV.B.2, IV.B.3, and IV.C of Appendix I of 10 CFR Part 50.

(continued)

5.7 Reporting Requirements

5.7.2 Annual Radiological Environmental Operating Report (continued)

In the event that some individual 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 in a supplementary report as soon as possible.

5.7.3 Radioactive Effluent Release Report

----------NOTE----------
A single submittal may be made for a multiple unit station. The submittal should combine sections common to all units at the station.

The Radioactive Effluent Release Report covering unit activities shall be submitted prior to May 1 of each year in accordance with 10 CFR 50.36a. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be (1) consistent with the objectives outlined in the ODCM and Process Control Program and (2) in conformance with 10 CFR 50.36a and Section IV.B.1 of Appendix I to10 CFR Part 50.

5.0 ADMINISTRATIVE CONTROLS

5.8 High Radiation Area

5.8.1 Pursuant to 10 CFR 20, paragraph 20.1601(c), in lieu of the "control device" or "alarm signal" required by 10 CFR 20.1601, each high radiation area, as defined in 10 CFR 20, in which the intensity of radiation is equal to or less than 1000 mrem/hr at 30 cm (12 in) from the radiation source or from any surface which the radiation penetrates, shall be barricaded and conspicuously posted as a high radiation area and entrance thereto shall be controlled by requiring issuance of a Radiation Work Permit (RWP). Individuals qualified in radiation protection procedures or personnel continuously escorted by such individuals may be exempt from the RWP issuance requirement during the performance of their assigned duties in high radiation areas with exposure rates equal to or less than 1000 mrem/hr, provided they are otherwise following plant radiation protection procedures for entry into such high radiation areas.

Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

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

b. A radiation monitoring device which 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 levels in the area have been established and personnel have been made knowledgeable of them; or

c. An individual qualified in radiation protection procedures with a radiation dose rate monitoring device, who is responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified in the Radiation Work Permit.

(continued)

5.8 High Radiation Area

5.8.2 In addition to the requirements of Specification 5.8.1, areas accessible to personnel with radiation levels greater than 1000 mrem/hr at 30 cm (12 in) from the radiation source or from any surface which the radiation penetrates shall require the following:

a. Locked doors to prevent unauthorized entry. The keys shall be maintained under the administrative control of the operating shift supervision on duty and/or health physics supervision.

b. Personnel access and exposure control over activities being performed within these areas shall be specified by an approved RWP. During emergency situations which involve personnel injury or actions taken to prevent major equipment damage, continuous surveillance and radiation monitoring of the work area by an individual qualified in radiation protection procedures may be substituted for the routine RWP procedure.

c. Each person entering the area shall be provided with an alarming radiation monitoring device which continuously integrates the radiation dose rate (such as an electronic dosimeter). Continuous coverage by a radiation technician may be substituted for alarming dosimetry.

5.8.3 For individual high radiation areas accessible to personnel with radiation levels of greater than 1000 mrem/hr at 30cm (12 in.), that are located within large areas (with the exception of 5.8.4), including the containment outside the missile barrier, where no enclosure exists for purposes of locking, and where no enclosure can be reasonably constructed around the individual area, that individual area shall be barricaded (by a more substantial obstacle than a rope), conspicuously posted, and a flashing light shall be activated as a warning device.

(continued)

5.8 High Radiation Area

5.8.4 For individual high radiation areas accessible to personnel with radiation levels of greater than 1000 mrem/hr at 30 cm (12 in.), that are located within the containment inside the missile barrier, where no enclosure exists for purposes of locking the individual area, the access control shall be per the following:

a. The missile barrier ingress/egress points shall be barricaded, locked and conspicuously posted to prevent access; or

b. 1. The missile barrier ingress/egress points shall be conspicuously posted and have direct or electronic surveillance that is capable of preventing unauthorized entry; and

2. Additional localized postings shall be provided in areas with normal personnel access inside the missile barrier to inform personnel of dose rates greater than 1000 mrem/hr at 30 cm (12 in.).

5.0 ADMINISTRATIVE CONTROLS

5.9 Reviews

5.9.1 Qualified Technical Review

Thorough reviews of the documents specified below shall be conducted by a Qualified Technical Reviewer. Persons performing these reviews shall be knowledgeable in the subject area being reviewed. Qualified Technical Reviews must be completed prior to implementation of proposed activities.

a. Qualified Technical Reviewers shall be individuals without direct responsibility for the document under review; these reviewers may be from the same functionally cognizant organization as the individual or group performing the original work.

b. Qualified Technical Reviewers shall have at least 5 years of professional experience and either a Bachelor's degree in Engineering or the Physical Sciences or shall have equivalent qualifications evaluated on a case by case basis and approved by the Decommissioning Plant Manager. The Decommissioning Plant Manager shall document the appointment of Qualified Technical Reviewers.

c. The following subjects shall be independently reviewed by a Qualified Technical Reviewer:

1. Safety evaluations for changes in the facility as described in the DSAR, changes in procedures as described in the DSAR, and tests or experiments not described in the DSAR to verify that such actions do not involve a change to the Technical Specifications or will not involve an unreviewed safety question as defined in 10 CFR 50.59;

2. Proposed changes to the programs required by Specification 5.6, to verify that such changes do not involve a change to the Technical Specifications and will not involve an unreviewed safety question as defined in 10 CFR 50.59; and

3. Proposed changes to the license, Technical Specifications, or Bases.

(continued)

5.9 Reviews

5.9.2 Station Review Committee (SRC)

The SRC is responsible for reviewing and advising the Decommissioning Plant Manager on matters related to the safe storage of nuclear fuel. This review function is independent of line organization responsibilities.

a. The SRC shall include a minimum of five members. Alternates may be substituted for regular members. The licensee shall designate in writing the chairman, the members, and alternates for the SRC.

b. The SRC shall collectively have experience and knowledge in the following functional areas:

1. Fuel handling and storage (including the potential for criticality),
2. Chemistry and radiochemistry,
3. Engineering,
4. Radiation protection, and
5. Regulatory assurance.

c. The SRC shall hold at least one meeting per quarter.

d. A quorum shall consist of three regular members or their duly appointed alternates. Those members representing the line organizations responsible for the operation and maintenance of the facility shall not constitute a majority of the quorum. At least one member of the quorum shall be the chairman or the chairman's designated alternate.

e. As a minimum, the SRC shall perform the following functions:

1. Advise the Decommissioning Plant Manager on all matters related to safe storage of nuclear fuel; and

2. Notify the responsible Corporate Vice-President of any safety significant disagreement between the SRC and the Decommissioning Plant Manager within 24 hours.

(continued)

5.9 Reviews

5.9.2 Station Review Committee (SRC) (continued)

f. The SRC shall be responsible for reviewing:

1. The safety evaluations for new documents or changes to documents completed under the provisions of 10 CFR 50.59 to verify that such actions do not involve an unreviewed safety question as defined in 10 CFR 50.59. This review may be completed after implementation of the affected procedure;

2. Changes to structures, systems, or components important to the safe storage of nuclear fuel to verify that such changes do not involve an unreviewed safety question as defined in 10 CFR 50.59. This review may be completed after implementation of the change;

3. Tests or experiments involving the safe storage of nuclear fuel to verify that such tests or experiments do not involve an unreviewed safety question as defined in 10 CFR 50.59. This review may be completed after performance of the test or experiment;

4. Proposed changes to the license, Technical Specifications, or Bases;

5. Violations of codes, regulations, orders, license requirements, or internal procedures/instructions having nuclear safety significance;

6. Indications of unanticipated deficiencies in any aspect of design or operation of structures, systems, or components that could affect safe storage of nuclear fuel;

7. Significant accidental, unplanned, or uncontrolled radioactive releases, including corrective action(s) to prevent recurrence;

(continued)

5.9 Reviews

5.9.2 Station Review Committee (SRC) (continued)

8. Significant operating abnormalities or deviations from normal and expected performance of equipment that affect safe storage of nuclear fuel;

9. Internal and external experience information related to the safe storage of nuclear fuel that may indicate areas for improving facility safety; and

10. Reportable Events.

Reports or records of these reviews shall be forwarded to the Decommissioning Plant Manager within 30 days after completion of the review.

5.9.3 Records

Written records of reviews shall be maintained. As a minimum, these records shall include:

a. Results of the activities conducted under the provisions of Specifications 5.9.1 and 5.9.2; and

b. Determination of whether each item considered under Specifications 5.9.2.f.1 through 5.9.2.f.3 involves an unreviewed safety question as defined in 10 CFR 50.59.

ZION NUCLEAR POWER STATION

PERMANENTLY DEFUELED

TECHNICAL SPECIFICATIONS

BASES

TABLE OF CONTENTS

B 3.0 LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY

BASES

LCOs

LCO 3.0.1 and LCO 3.0.2 establish the general requirements applicable to all Specifications and apply at all times, unless otherwise stated.

LCO 3.0.1

LCO 3.0.1 establishes the Applicability statement within each individual Specification as the requirement for when the LCO is required to be met (i.e., when the facility is in the specified conditions of the Applicability statement of each Specification.)

LCO 3.0.2

LCO 3.0.2 establishes that upon discovery of a failure to meet an LCO, the associated ACTIONS shall be met. The Completion Time of each Required Action for an ACTIONS Condition is applicable from the point in time that an ACTIONS Condition is entered. The Required Actions establish those remedial measures that must be taken within specified Completion Times when the requirements of an LCO are not met. This Specification establishes that:

a. Completion of the Required Actions within the specified Completion Times constitutes compliance with a Specification; and

b. Completion of the Required Actions is not required when an LCO is met within the specified Completion Time, unless otherwise specified.

(continued)

BASES

LCO 3.0.2 (continued)

The Completion Times of the Required Actions are also applicable when a specified condition in the Applicability is entered intentionally. The reasons for intentionally relying on the ACTIONS include, but are not limited to, performance of Surveillances, preventive maintenance, corrective maintenance, or investigation of problems. Entering ACTIONS for these reasons must be done in such a manner that does not compromise the safe storage of irradiated fuel. Intentional entry into ACTIONS should not be made for convenience.

B 3.0 SURVEILLANCE REQUIREMENT (SR) APPLICABILITY

BASES

SRs

SRs 3.0.1 through 3.0.3 establish the general requirements applicable to all Specifications and apply at all times, unless otherwise stated.

SR 3.0.1

SR 3.0.1 establishes the requirement that SRs must be met during the specified conditions in the Applicability for which the requirements of the LCO apply, unless otherwise specified in the individual SRs. This Specification is to ensure that Surveillances are performed to verify that variables are within specified limits. Failure to meet a Surveillance within the specified Frequency, in accordance with SR 3.0.2, constitutes a failure to meet an LCO.

Surveillances do not have to be performed when the facility is in a condition for which the requirements of the associated LCO are not applicable, unless otherwise specified.

SR 3.0.2

SR 3.0.2 permits a 25% extension of the interval specified in the Frequency. This extension facilitates Surveillance scheduling and considers facility conditions that may not be suitable for conducting the Surveillance (e.g., other ongoing Surveillance or maintenance activities).

The 25% extension does not significantly degrade the reliability that results from performing the Surveillance at its specified Frequency. This is based on the recognition that the most probable result of any particular Surveillance being performed is the verification of conformance with the SRs. Any exceptions to SR 3.0.2 are stated in the individual Specifications.

The provisions of SR 3.0.2 are not intended to be used repeatedly merely as a convenience to extend Surveillance intervals or periodic Completion Time intervals beyond those specified.

(continued)

BASES

SR 3.0.3

SR 3.0.3 establishes the flexibility to defer declaring an affected variable outside the specified limits when a Surveillance has not been completed within the specified Frequency. A delay period of up to 24 hours applies from the point in time that it is discovered that the Surveillance has not been performed in accordance with SR 3.0.2, and not at the time that the specified Frequency was not met.

This delay period provides adequate time to complete Surveillances that have been missed. This delay period permits the completion of a Surveillance before complying with Required Actions or other remedial measures that might preclude completion of the Surveillance.

The basis for this delay period includes consideration of facility conditions, adequate planning, availability of personnel, the time required to perform the Surveillance, the safety significance of the delay in completing the required Surveillance, and the recognition that the most probable result of any particular Surveillance being performed is the verification of conformance with the requirements. When a Surveillance with a Frequency based not on time intervals, but upon specified facility conditions or operational situations, is discovered not to have been performed when specified, SR 3.0.3 allows the full delay period of 24 hours to perform the Surveillance.

Failure to comply with specified Frequencies for SRs is expected to be an infrequent occurrence. Use of the delay period established by SR 3.0.3 is a flexibility which is not intended to be used as an operational convenience to extend Surveillance intervals.

(continued)

BASES

SR 3.0.3 (continued)

If a Surveillance is not completed within the allowed delay period, then the variable is considered outside the specified limits, and the Completion Times of the Required Actions for the applicable LCO Conditions begin immediately upon expiration of the delay period. If a Surveillance is failed within the delay period, then the variable is outside the specified limits and the Completion Times of the Required Actions for the applicable LCO Conditions begin immediately upon the failure of the Surveillance.

Completion of the Surveillance within the delay period allowed by this Specification, or within the Completion Time of the ACTIONS, restores compliance with SR 3.0.1.

B 3.1 DEFUELED PLANT SYSTEMS

B 3.1.1 Spent Fuel Pool Water Level

BASES

BACKGROUND

When the plant was operational, this specification provided assurance that the assumptions regarding the iodine decontamination factor would be met following a fuel handling accident. Following the permanent defueling of the reactors, the fuel handling accident was re-analyzed based on the extended time since shutdown and corresponding reductions in iodine activity that are consistent with the plant's permanently defueled condition. As described in Ref. 1 and 2, these new analyses determined that 10 CFR 100 and 10 CFR 50 App. A, Criterion 19 limits would still be met even with no decontamination by the spent fuel pool water.

Although the specification for spent fuel pool water level during fuel handling operations is no longer needed to ensure an adequate iodine decontamination factor, the specification continues to provide assurance of adequate cooling for the irradiated fuel being handled by ensuring that it remains covered by water. Therefore the specification was retained essentially unchanged from the operational Technical Specifications.

The assumptions in the fuel handling accident analyses are given in Ref. 1 and 2.

APPLICABLE SAFETY ANALYSES

In the operational Technical Specifications, the specification for minimum water level in the spent fuel pool during fuel handling activities provided assurance of substantial iodine removal if a fuel handling accident were to occur. However, as indicated in Ref. 1 and 2, the limits of 10 CFR 100 and 10 CFR 50 App. A, Criterion 19 would not be exceeded if a

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

fuel handling accident occurred even with no removal of iodine activity by spent fuel pool water. This is the result of the decay of radioactive iodine during the lengthy period since the last reactor operation at the station.

However the specification for water level in the in the SFP also ensures that irradiated fuel which is not the storage racks will be adequately cooled by ensuring that it remains covered with water during normal fuel handling operations, and provides significant shielding for personnel safety.

LCO

The spent fuel pool water level is required to be 23 ft over the top of irradiated fuel assemblies seated in the storage racks. The 23 ft level was formerly based on preserving the assumptions of the previous fuel handling accident analysis. Although this level is no longer needed for iodine decontamination following a fuel handling accident, past practice indicates that this level provides assurance that the irradiated fuel being handled will be covered by water and consequently will be adequately cooled and provides significant shielding for personnel safety. The 23 ft level has therefore been retained as the minimum required for movement of irradiated fuel assemblies within the spent fuel pool.

APPLICABILITY

This LCO applies during movement of irradiated fuel assemblies in the spent fuel pool since it is during such activities that irradiated fuel may be higher than the top of the fuel in the storage racks. An irradiated fuel assembly that is higher than that stored in the racks may not be protected against uncovery by design features which ensure that fuel in the racks remains covered with water. This design features consists of the lowest pipe opening in the spent fuel pool being at approximately 598 ft which is above the top of the fuel stored in the racks (approximately 590 ft).

(continued)

BASES

ACTIONS

A.1

When the initial conditions for an accident cannot be met, steps should be taken to preclude the accident from occurring. When the spent fuel pool water level is lower than the required level, the movement of irradiated fuel assemblies in the spent fuel pool is immediately suspended. This action effectively precludes the possibility of withdrawing an irradiated fuel assembly above the water level which would result in a loss of cooling and shielding. This does not preclude movement of a fuel assembly to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.1.1.1

This SR verifies that the spent fuel pool water level is sufficiently high to ensure adequate cooling and shielding for the fuel being handled. The water level in the spent fuel pool must be checked periodically. The 24 hour Frequency is appropriate because the volume in the pool is normally stable and is acceptable based on operating experience. In addition, water level changes are controlled by plant procedures.

REFERENCES

1. Zion Station Calculation 22S-0-110X-0057, Fuel Handling Accident Offsite Dose Calculation with Extended Radioactive Decay and no AB Filtration

2. Zion Station Calculation 22S-0-110X-0059, Fuel Handling Accident Control Room Dose Calculation with Extended Radioactive Decay

B 3.1 DEFUELED PLANT SYSTEMS

B 3.1.2 Spent Fuel Pool Boron Concentration

BASES

BACKGROUND

The spent fuel pool is divided into two separate and distinct regions which, for the purpose of criticality considerations, are considered as separate areas. Region 1, with 336 storage positions, is designed to accommodate fuel with a maximum initial enrichment of 4.65 wt% U-235, regardless of burnup. Region 2, with 2670 storage positions, is designed to accommodate fuel with various initial enrichments which have accumulated minimum burnups within the acceptable domain according to Figure 3.1.3-1. Region 1 also contains six (6) defective fuel assembly storage containers.

The water in the spent fuel pool normally contains dissolved boron, which results in large subcriticality margins. However, the NRC guidelines specify that the limiting k_{eff} of 0.95 be evaluated in the absence of soluble boron. Hence, the design of both regions is based on the use of unborated water. The design maintains each region in a subcritical condition with the regions fully loaded.

The double contingency principle discussed in ANSI N16.1-1975 and an NRC letter dated April 14, 1978 (Ref. 1) allows credit for soluble boron under other abnormal or accident conditions, since only a single accident or event need be considered at one time. For example, the most severe scenario is associated with the movement of fuel from Region 1 to Region 2 and accidental misloading of a fuel assembly in Region 2. This could potentially increase the reactivity of Region 2. To prevent criticality if an accidental misloading event, were to occur, boron is dissolved in the spent fuel pool water.

(continued)

BASES

BACKGROUND (continued)

Safe storage in the high density storage racks with no movement of assemblies may therefore be achieved by controlling the location of each assembly in accordance with LCO 3.1.3, "Spent Fuel Assembly Storage." Prior to movement of an assembly to Region 2, it is necessary to perform SR 3.1.3.1.

APPLICABLE SAFETY ANALYSES

Events can be postulated that could increase the k_{eff} of the spent fuel pool. However, the presence of dissolved boron in the spent fuel pool water prevents criticality in both regions of the pool.

These postulated events are of two types. A fuel assembly could be inadvertently misloaded in Region 2 (e.g., an unirradiated fuel assembly or an insufficiently depleted fuel assembly). The second type of postulated event is associated with a fuel assembly which is dropped adjacent to a fully loaded Region 2 storage rack. This could have a small positive reactivity effect on Region 2. However, the negative reactivity effect of the soluble boron compensates for the increased reactivity caused by either one of the two postulated event scenarios. Analyses of these two types of events are described in Ref. 2.

LCO

The specified minimum spent fuel pool boron concentration is 500 ppm. The specified concentration of dissolved boron in the spent fuel pool preserves the assumptions used in the analyses of the postulated event scenarios as described in Ref. 2.

APPLICABILITY

This LCO applies during movement of fuel assemblies in the spent fuel pool or whenever fuel assemblies are stored in Region 2 of the spent fuel pool, until a spent fuel pool verification has been performed following the last movement of fuel assemblies in the spent fuel pool.

(continued)

BASES

APPLICABILITY (continued)

The LCO applies during movement of fuel assemblies in the pool because the potential for a dropped fuel assembly exists during such movements. The LCO also applies when fuel assemblies are stored in Region 2 of the spent fuel pool, until a verification has been performed following the last movement because during movement there is the potential for an inadvertent misloading of an assembly that should be in Region 1 into Region 2. However the independent verification provides adequate assurance that no misloading has occurred in Region 2. There is no restriction regarding storage of fuel assemblies in Region 1 since any fuel assembly meeting the limitations described under Design Features may be stored in Region 1.

ACTIONS

A.1, A.2.1, and A.2.2

When the concentration of boron in the spent fuel pool is less than required, immediate action must be taken to preclude the occurrence of a reactivity event or to mitigate the consequences of a reactivity event in progress. This is most efficiently achieved by immediately suspending the movement of fuel assemblies in the spent fuel pool. This does not preclude movement of a fuel assembly to a safe position.

Action must also be immediately initiated to restore the boron concentration simultaneously with suspending movement of fuel assemblies.

An acceptable alternative to restoring the boron concentration is to verify by administrative means that the spent fuel pool verification has been performed since the last movement of fuel assemblies in the spent fuel pool. However, prior to resuming movement of fuel assemblies, the concentration of boron must be restored.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.2.1

This SR verifies that the concentration of boron in the spent fuel pool is within the required limit. As long as this SR is met, the analyzed events are fully addressed. The 31 day Frequency is appropriate considering the volume of the spent fuel pool, the normally maintained boron concentration, and because no major dilution of pool water is expected to take place over this period of time.

REFERENCES

1. Double contingency principle of ANSI N16.1-1975, as specified in the April 14, 1978 NRC letter (Section 1.2) and implied in the proposed revision to Regulatory Guide 1.13 (Section 1.4, Appendix A).

2. Letter from C. Y. Shiraki, NRC to T. J. Kovach, ComEd, dated February 23, 1993, Issuance of License Amendment 142/131, allowing increase of the Spent Fuel Pool storage Capacity to 3012 assemblies

B 3.1 DEFUELED PLANT SYSTEMS

B 3.1.3 Spent Fuel Assembly Storage

BASES

BACKGROUND

The spent fuel pool is divided into two separate and distinct regions which, for the purpose of criticality considerations, are considered as separate areas. Region 1, with 336 storage positions, is designed to accommodate fuel with a maximum initial enrichment of 4.65 wt% U-235, regardless of burnup. Region 2, with 2670 storage positions, is designed to accommodate fuel with various initial enrichments which have accumulated minimum burnups within the acceptable domain according to Figure 3.1.3-1. Region 1 also contains six (6) defective fuel assembly storage containers.

The water in the spent fuel pool normally contains dissolved boron which results in large subcriticality margins. However, the NRC guidelines specify that the limiting k_{eff} of 0.95 be evaluated in the absence of soluble boron. Hence, the design of both regions is based on the use of unborated water. The design maintains each region in a subcritical condition with the regions fully loaded.

The double contingency principle discussed in ANSI N16.1-1975 and an NRC letter dated April 14, 1978 (Ref. 1) allows credit for soluble boron under other abnormal or accident conditions, since only a single accident or event need be considered at one time. For example, the most severe scenario is associated with the movement of fuel from Region 1 to Region 2 and accidental misloading of a fuel assembly in Region 2. This could potentially increase the reactivity of Region 2. To prevent criticality if an accidental misloading event, were to occur, boron is dissolved in the spent fuel pool water.

(continued)

BASES

BACKGROUND (continued)

Safe storage in the high density storage racks with no movement of assemblies may therefore be achieved by controlling the location of each assembly in accordance with LCO 3.1.3, "Spent Fuel Assembly Storage." Prior to movement of an assembly to Region 2, it is necessary to perform SR 3.1.3.1.

APPLICABLE SAFETY ANALYSES

The hypothetical accidents can only take place during or as a result of the movement of an assembly. For these accident occurrences, the presence of soluble boron in the spent fuel pool (controlled by LCO 3.1.2, "Spent Fuel Pool Boron Concentration") prevents criticality in both regions. By closely controlling the movement of each assembly and by checking the location of each assembly after movement, the time period for potential accidents may be limited to a small fraction of the total operating time. During the remaining time period with no potential for accidents, the operation may be under the auspices of LCO 3.1.3.

LCO

The restrictions on the placement of fuel assemblies within the spent fuel pool, in accordance with Figure 3.1.3.-1, ensures that the k_{eff} of the spent fuel pool will always remain < 0.95, assuming the pool to be flooded with unborated water. This is supported by the analyses describes in Ref. 2.

APPLICABILITY

This LCO applies whenever any fuel assembly is stored in Region 2 of the spent fuel pool. The provisions of Design Feature 4.2.1 provide protection against criticality for fuel stored in Region 1 of the spent fuel pool.

(continued)

BASES

ACTIONS

A.1

When the configuration of fuel assemblies stored in Region 2 the spent fuel pool is not in accordance with Figure 3.1.3-1, the immediate action is to initiate action to make the necessary fuel assembly movement(s) to bring the configuration into compliance with Figure 3.1.3-1.

SURVEILLANCE REQUIREMENTS

SR 3.1.3.1

This SR verifies by administrative means that the initial enrichment and burnup of the fuel assembly is in accordance with Figure 3.1.3-1. For fuel assemblies in the unacceptable range of Figure 3.1.3-1, storage is only allowed in Region 1.

REFERENCES

1. Double contingency principle of ANSI N16.1-1975, as specified in the April 14, 1978 NRC letter (Section 1.2) and implied in the proposed revision to Regulatory Guide 1.13 (Section 1.4, Appendix A).

2. Letter from C. Y. Shiraki, NRC to T. J. Kovach, ComEd, dated February 23, 1993, Issuance of License Amendment 142/131, allowing increase of the Spent Fuel Pool storage Capacity to 3012 assemblies

C. This amended license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations: 10 CFR Part 20, Section 30.34 of 10 CFR Part 30, Section 40.41 of 10 CFR Part 40, Sections 50.54 and 50.59 of 10 CFR Part 50 and Section 70.32 of 10 CFR Part 70; and is subject to all applicable provisions of the Act and to the rules, regulations and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified below.

(1) Deleted.

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

(3) Deleted.

(4) Deleted.

(5) Deleted.

(6) The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, guard training and qualification, and safeguards contingency plans including amendments made pursuant to provision of the Miscellaneou Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The plans, which contain Safeguards Information protected under 10 CFR 73.21, are entitled: "Zion Nuclear Power Station Security Plan," with revisions submitted through September 22, 1993; "Zion Power Station Training and Qualification Plan," with revision submitted through March 2, 1993; and "Zion Nuclear Power Station Safeguards Contingency Plan," with revisions submitted through December 4, 1992. Changes made in accordance with 10 CFR 73.55 shall be implemented in accordance with the schedule set forth therein. (revised 1-15-81; Am. 61; revised 10-11-88; Am. 113)

(7) Spent Fuel Pool Modification

The licensee is authorized to modify the spent fuel pool as described in the application dated January 15, 1992, as supplemented October 2 and 16, 1992.

(a) Deleted.
(b) Deleted.
(c) (deleted 1-15-81; Am. 61)
(d) (deleted 1-15-81; Am. 61)
(e) Deleted.

(8) Deleted.

(9) Deleted.

(10) Deleted.

(11) Deleted.

3. This amended license is issued without prejudice to subsequent licensing action which may be taken by the Commission.

4. This license is effective as of the date of issuance and shall expire at midnight on April 6, 2013.

FOR THE ATOMIC ENERGY COMMISSION

Original Signed by Roger S. Boyd

A. Giambusso, Deputy Director
for Reactor Projects
Directorate of Licensing

Date of Issuance: October 19, 1973

C. This license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations: 10 CFR Part 20, Section 30.34 of 10 CFR Part 30, Sections 50.54 and 50.59 of 10 CFR Part 50, and Section 70.32 of 10 CFR Part 70; and is subject to all applicable provisions of the Act and to the rules, regulations and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified below:

(1) Deleted.

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

(3) Deleted 3-11-83; Am. 72.

(4) Deleted.

(5) Deleted.

(6) The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, guard training and qualification, and safeguards contingency plans including amendments made pursuant to provision of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The plans, which contain Safeguards Information protected under 10 CFR 73.21, are entitled: "Zion Nuclear Power Station Security Plan," with revisions submitted through September 22, 1993; "Zion Power Station Training and Qualification Plan," with revision submitted through March 2, 1993; and "Zion Nuclear Power Station Safeguards Contingency Plan," with revisions submitted through December 4, 1992. Changes made in accordance with 10 CFR 73.55 shall be implemented in accordance with the scedule set forth therein. (revised 10-11-88; Am. 102)

(7) Spent Fuel Pool Modification

The licensee is authorized to modify the spent fuel pool as described in the application dated January 15, 1992, as supplemented October 2 and 16, 1992.

(a) Deleted.

(b) Deleted.

(c) Deleted 1-15-81; Am. 58.

(d) Deleted 1-15-81; Am. 58.

(e) Deleted 1-15-81; Am. 58

(8) Deleted.

(9) Deleted.

(10) Deleted.

(11) Deleted.

3. This license is issued without prejudice to subsequent licensing action which may be taken by the Commission.

4. This license is effective as of the date of issuance and shall expire at midnight on November 14, 2013.

FOR THE NUCLEAR REGULATORY COMMISSION

Original Signed by Roger S. Boyd

A. Giambusso, Deputy Director
for Reactor Projects
Directorate of Licensing

Date of Issuance: Nov. 14, 1973