

January 31, 2003

Mr. John L. Skolds, President
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: ZION NUCLEAR POWER STATION, UNITS 1 AND 2 - ISSUANCE OF
AMENDMENTS RE: ELIMINATE REQUIREMENT FOR CONTINUOUS
CONTROL ROOM WATCH WHEN NUCLEAR FUEL IS STORED IN THE
SPENT FUEL POOL (TAC NOS. MB1363 AND MB1364)

Dear Mr. Skolds:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 183 to Facility Operating License No. DPR-39 and Amendment No. 170 to Facility Operating License No. DPR-48 for the Zion Nuclear Power Station, Units 1 and 2, respectively. The amendments are in response to your application dated February 28, 2001, as supplemented by letter dated June 13, 2002.

The amendments revise the Technical Specifications to eliminate the requirement for at least one person qualified to stand watch to be present in the control room when nuclear fuel is stored in the spent fuel pool.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA/

Michael K. Webb, Project Manager, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-295 and 50-304

Enclosures: 1. Amendment No. 183 to DPR-39
2. Amendment No. 170 to DPR-48
3. Safety Evaluation

cc w/encls: See next page

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DATE	8/14/2002	8/13/2002	8/19/02	8/23/02

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EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-295

ZION NUCLEAR POWER STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 183
License No. DPR-39

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Exelon Generation Company, LLC (the licensee) dated February 28, 2001, as supplemented by letter dated June 13, 2002, 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 Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-39 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B as revised through Amendment No. 183, 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 and shall be implemented within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Robert A. Gramm, Chief, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: January 31, 2003

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-304

ZION NUCLEAR POWER STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 170
License No. DPR-48

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Exelon Generation Company, LLC (the licensee) dated February 28, 2001, as supplemented by letter dated June 13, 2002, 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 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 Appendices A and B as revised through Amendment No. 170, 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 and shall be implemented within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Robert A. Gramm, Chief, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: January 31, 2003

ATTACHMENT TO LICENSE AMENDMENT NOS. 183 AND 170

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

DOCKET NOS. 50-295 AND 50-304

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the attached pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change.

Remove Page

5-3

Insert Page

5-3

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 183 TO FACILITY OPERATING LICENSE NO. DPR-39
AND AMENDMENT NO. 170 TO FACILITY OPERATING LICENSE NO. DPR-48
EXELON GENERATION COMPANY, LLC
ZION NUCLEAR POWER STATION, UNITS 1 AND 2
DOCKET NOS. 50-295 AND 50-304

1.0 INTRODUCTION

By application dated February 28, 2001, as supplemented by letter dated June 13, 2002, Exelon Generation Company, LLC (the licensee) requested changes to the Technical Specifications (TSs) (Appendix A to Facility Operating License Nos. DPR-39 and DPR-48) for the Zion Nuclear Power Station (ZNPS), Units 1 and 2 (Zion 1 and 2). The changes would eliminate from the Zion 1 and 2 TS Section 5.2.2, "Facility Staff," the requirement for at least one person qualified to stand watch to be present in the control room when nuclear fuel is stored in the spent fuel pool (SFP).

The June 13, 2002, supplemental letter provided clarifying information that did not change the scope of the original *Federal Register* notice (66 FR 34283, published June 27, 2001) or the original no significant hazards consideration determination.

2.0 BACKGROUND

In February 1998, the licensee's predecessor, Commonwealth Edison Company (ComEd), certified to the U.S. Nuclear Regulatory Commission (NRC or the Commission) the permanent cessation of operations of Zion 1 and 2. In March 1998, ComEd certified to the NRC that all fuel assemblies had been permanently removed from both Zion 1 and 2 reactor vessels and placed in the common ZNPS SFP. Exelon plans to maintain ZNPS in the SAFSTOR condition (a period of safe storage of the defueled facility) until final decommissioning and dismantlement.

A spent fuel nuclear island (SFNI) has been implemented to simplify the infrastructure for safe, long-term spent fuel storage. The spent fuel cooling and support systems were isolated from other plant systems. Spent fuel support equipment was consolidated in or near the fuel building. The principal components of the SFNI cooling system include two evaporative cooling towers, two cooling tower pumps, two SFP pumps, and two SFP heat exchangers. Local controls in the fuel building are provided for the SFP pumps, cooling tower pumps, cooling towers, and the fuel building ventilation system. The equipment cannot be operated from the control room. Operating personnel monitor the SFP water level and temperature, SFP pump suction and discharge pressure, cooling tower pump suction and discharge pressure, fuel building supply and exhaust fans operating status, and fuel building temperature and pressure

using local indication once per shift in accordance with Zion 1 and 2 operating surveillances. The ZNPS Defueled Safety Analysis Report (DSAR), Section 3.9.2.1.5, requires that the SFP level be checked once per day by operations personnel. Local indication and annunciation of fuel building radiation level is also provided.

In the control room, there are no remote controls that affect safe storage of the spent fuel. Personnel in the control room have monitoring capability for the SFP high and low water level, SFP water high temperature, and fuel building high radiation conditions.

TS Section 5.2.2 addresses facility staff organization requirements. The minimum shift crew composition consists of one shift supervisor and one non-certified operator. Subsection 5.2.2.b states, "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." The continuous manning requirement of the control room is based on the original plant configuration in which the control room was the main control point for operating and monitoring the Zion 1 and 2 reactors, associated support systems, and steam turbine/generator systems. Continuous monitoring of reactor operation and immediate response to changing plant conditions was essential while ZNPS was operating. The licensee basis for its request to eliminate the requirement for at least one person to be present the control room is that continuous presence in the control room is no longer required to effectively monitor the storage of used fuel in the SFP. The licensee stated that the proposed change would optimize the efficiency of the shift crew for routine operations and enhance shift crew response to off normal conditions.

3.0 EVALUATION

In NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," the NRC staff published the results of its evaluation of the potential accident risk in a SFP at decommissioning plants in the United States. The results of the study indicate that the risks at SFPs are low and well within the Commission's Safety Goals. The staff's conclusions apply to decommissioning facilities with SFPs that meet the design and operational characteristics assumed in the risk analysis. These characteristics are identified in the study as Industry Decommissioning Commitments (IDCs) and Staff Decommissioning Assumptions (SDAs). The staff used the IDCs and SDAs in NUREG-1738, along with engineering judgment, to conduct this review.

Zion 1 and 2 have each been shut down and defueled for more than five years (since February 1997 and September 1996, respectively). All used fuel from operation of ZNPS is stored in the shared SFP. Local controls for SFP pumps, cooling tower pumps, cooling towers, and the fuel building ventilation system are located in the fuel building. These systems cannot be operated from the main control room. There are no remote controls in the main control room that affect safe storage of the spent fuel. Therefore, the staff is satisfied that the operators can take no control actions related to the SFP from the main control room.

The licensee has stated that the most limiting event associated with the SFP is a loss of SFP inventory. It further states that the analysis of this event conservatively results in 83 hours that are available to take compensatory actions for restoring SFP water level and cooling without significant radiological consequences for plant workers. In accordance with the requirements of ZNPS operating surveillances, operating personnel monitor SFP water level and temperature,

SFP pump suction and discharge pressure, cooling tower pump suction and discharge pressure, fuel building supply and exhaust fans operating status, and fuel building temperature and pressure using local indications once per shift (twice a day). Critical parameters such as pool level and temperature are recorded during these surveillances.

The staff is therefore satisfied that SFP parameters are being monitored directly and at a sufficient frequency.

In addition to the above surveillances, the licensee has stated that the plant pager system is being modified to alert operating personnel when abnormal SFP conditions are present. Specifically, a designated pager, worn by the operating personnel, will alarm for SFP high and low water level, SFP high water temperature, fuel building high radiation, cooling tower pump trips, and abnormal fuel building ventilation system operation. The operators can then go either to the main control room or the fuel building to determine the specifics from the SFP Data Acquisition System. Based on the licensee's use of a reliable pager system, the staff is satisfied that abnormal conditions will be made known to the operators in a timely fashion.

In a letter dated June 13, 2002, ZNPS provided responses to the following IDCs and SDAs from NUREG-1738 involving or affecting operator performance related to the SFP. In addition, the letter provided information regarding the reliability of the pager system.

IDC No. 2: Procedures and training of personnel will be in place to ensure that onsite and offsite resources can be brought to bear during an event.

The ZNPS De-fueled Station Emergency Plan (DSEP) requires that the site maintain an augmented De-fueled Emergency Response Organization that consists of an emergency director, radiation protection director, technical director, and communicator. All members receive initial training and annual requalification training per plan requirements. The DSEP includes training requirements for onsite and offsite support personnel and discusses arrangements in place with local government agencies, including police, fire, and hospital. The staff is satisfied that ZNPS has procedures and training in place to ensure that onsite and offsite resources can be brought to bear during an event.

IDC No. 3: Procedures will be in place to establish communication between onsite and offsite organizations during severe weather and seismic events.

The ZNPS DSEP has an Emergency Action Level, HA3, Natural or Destructive Phenomena affecting SFP that addresses severe weather and seismic conditions. Emergency Plan Implementing Procedures provide proceduralized guidance for establishing communication with both onsite and offsite organizations. In addition, each member of the shift crew carries a site pager that will allow offsite personnel to contact a shift member 24 hours a day. The staff is satisfied that communication procedures are in place.

IDC No. 5: Spent fuel pool instrumentation will include readouts and alarms in the control room (or where personnel are stationed) for SFP temperature, water level, and area radiation levels.

The ZNPS main control room has high and low level alarms, a high temperature alarm, and area high radiation alarms, but has never had readouts of these parameters. These readouts

are located locally in the fuel building along with SFP pump suction and discharge pressure, cooling tower pump suction and discharge pressure, fuel building supply and exhaust fans operating status, and fuel building temperature and pressure, and are monitored once per shift. In addition, as described above, operating personnel will carry pagers to alert them that an alarm has initiated. In its letter of June 13, 2002, the licensee stated that the pager system has been in use since January 1998 with no failures. The automatic dialing interface that initiates a page when an alarm is received has been in operation for approximately 16 months, also with no failures. The licensee further stated that operations personnel were surveyed regarding knowledge of plant areas where the pagers would not function. The survey indicated that the pagers have proven to be reliable in all areas routinely traveled by operations personnel. In a phone call conducted on September 4, 2002, the licensee stated that Zion Administrative Procedure 310-01, Revision 20, "Shift Relief and Turnover," includes a checklist that requires the oncoming Shift Supervisor to be wearing the pager prior to assuming the watch. In addition, the licensee stated that the procedure requires the Shift Supervisor to conduct a functional test of the pager during the watch. The staff is satisfied that sufficient SFP information on temperature, water level, and area radiation levels is available where personnel are stationed.

IDC No. 7: Procedures or administrative controls to reduce the likelihood of rapid drain down events will include (1) prohibitions on the use of pumps that lack adequate siphon protection or (2) controls for pump suction and discharge points. The functionality of anti-siphon devices will be periodically verified.

The licensee responds that permanently installed piping prevents draining the pool via siphoning below eight feet above the top of the stored fuel. In addition, there is an anti-siphon hole in the SFP pump return piping that is verified free of obstruction by periodic surveillance. Proceduralized pool evolutions involving the use of portable pumps and hoses are administratively controlled and are subject to anti-siphon review. The staff is satisfied that sufficient procedures and administrative controls to reduce the likelihood of rapid drain down events are in place.

IDC No. 9: Procedures will be in place to control SFP operations that have the potential to rapidly decrease SFP inventory. These administrative controls may require additional operations and management review, management physical presence for designated operations or administrative limitations such as restrictions on heavy load movements.

In its response, the licensee has stated that procedures are in place to control SFP operations that have a potential to rapidly decrease SFP inventory. The licensee stated that these administrative controls require operations or management review, management physical presence for designated operations and administrative limitations on heavy load limits. For example, the licensee states that the Fuel Building Overhead Crane Procedure/Checklist contains a prerequisite for a supervisor to be present when carrying loads over the SFP. The staff is satisfied that procedures, administrative controls, and management oversight are in place to minimize the potential to rapidly decrease SFP inventory.

SDA No. 2: Walk-downs of SFP systems will be performed at least once per shift by the operators. Procedures will be developed for and employed by the operators to provide guidance on the capability and availability of onsite and offsite inventory makeup

sources and time available to initiate these sources for various loss of cooling or inventory events.

The licensee has stated that walk-downs of the SFP building and recording of critical parameters such as pool level and temperature are performed every shift in accordance with operating procedures. Abnormal operating procedure, Uncontrolled Loss of Level, contains provisions for pool makeup using both onsite and offsite sources. The DSAR discusses limiting loss of inventory events and the time available for inventory makeup. Time to boil estimates are periodically updated and are provided to operating personnel in a maintained SFP status document. The staff is satisfied that once per shift walk-downs, along with alarm pagers, are sufficient to monitor the critical SFP parameters, that procedures are in place for timely pool makeup, and that timing information is available for operator use.

SDA No. 3: Control room instrumentation that monitors SFP temperature and water level will directly measure the parameters involved. Level instrumentation will provide alarms at levels associated with calling in offsite resources and with declaring a general emergency.

ZNPS SFP level and temperature indications have never been located in the main control room. Direct measurement is done locally in the fuel building. The licensee response states that the control room low level alarm is initiated from an in-pool displacement type level transmitter. The alarm annunciates at two inches below the low end of the normal pool level range, which is approximately 24 feet above the top of the fuel assemblies or about 20 feet above pool access radiological restrictions. Thus, low level annunciation is received days before any required SFP level restoration actions are required. The temperature alarm signal is received from an in-pool temperature probe. Both alarms are included in the alarm pagers described above.

The highest level of emergency classification for the SFP level or temperature event is an Unusual Event. This emergency action level is entered if the pool temperature exceeds 150 °F or the level drops below the 613-foot elevation (approximately one foot below the normal range low). The staff is satisfied that SDA No. 3 is met.

Evaluation Summary

The staff concludes that the proposed revision to Zion 1 and 2 TS Section 5.2.2, "Facility Staff," to eliminate the requirement for at least one person qualified to stand watch to be present in the control room when nuclear fuel is stored in the SFP is consistent with the commitments and assumptions of NUREG-1738 and, with good engineering judgment, will not pose an increased risk to the public. The proposed revision is, therefore, acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Illinois State official was notified of the proposed issuance of the amendments. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has

determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (66 FR 34283). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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Date: January 31, 2003

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