



March 18, 2008

U.S. Nuclear Regulatory Commission
ATTN; Document Control Desk
Washington, DC 20555-0001

Zion Nuclear Power Station, Units 1 and 2
Facility Operating License Nos. DPR-39 and DPR-48
NRC Docket Nos. 50-295 and 50-304

Subject: Notification of "Amended Post-Shutdown Decommissioning Activities Report" (PSDAR) for Zion Nuclear Power Station, Units 1 and 2 in Accordance with 10 CFR 50.82(a)(7)

Reference: Commonwealth Edison Company letter and associated attachment, "Post-Shutdown Decommissioning Activities Report" for Zion Nuclear Power Station, Units 1 and 2 in Accordance with 10 CFR 50.82, "Termination of license," paragraph (a)(4)(i), dated February 14, 2000

Exelon Generation Company, LLC, and ZionSolutions, LLC, submitted an "Application for License Transfers and Conforming Administrative License Amendments" for Zion Nuclear Power Station (ZNPS), Units 1 and 2, to the NRC for review dated January 25, 2008. ZionSolutions is submitting the enclosed Amended PSDAR representing our plan of activities to become effective if the Application for License Transfers is approved.

In accordance with 10 CFR 50.82, "Termination of license," paragraph (a)(4)(i), Commonwealth Edison Company (now Exelon) submitted the reference document "Post-Shutdown Decommissioning Activities Report" (PSDAR) dated February 14, 2000, to the NRC. Permanent cessation of operations at the Zion Nuclear Power Station (ZNPS), Units 1 and 2, occurred on February 13, 1998.

This letter is provided to notify the NRC of a significant schedule change to the PSDAR in accordance with 10 CFR 50.82, "Termination of license," paragraph (a)(7), by which we intend to accelerate the decommissioning schedule if the application for license transfers is approved. The letter also provides significant decommissioning cost milestone changes due to the method of decommissioning (less decontaminating and more shipment to a burial ground). The Amended PSDAR is provided as an attachment to this letter. The attached Amended PSDAR demonstrates that our elected actions are consistent with NRC requirements for decommissioning activities.

Provisions to ensure the adequacy of the qualified and non-qualified decommissioning trust funds are detailed in the Application for License Transfers. The assurances and details for the funds and decommissioning project include documents addressing the representations and warranties of the seller and buyer, project budget and schedule for the length of the project, credit support agreement, irrevocable easement for radioactive waste disposal capacity at EnergySolutions disposal facility in Clive, Utah, a radioactive waste disposal services agreement, decommissioning trust provisions, and a performance guaranty.

A copy of this notification will be retained by us as a record until expiration of the reactor operating licenses for ZNPS, Units 1 and 2. In addition, we will notify the NRC, in accordance with 10 CFR 50.82(a)(7), of any significant changes in the attached Amended PSDAR.

If you have any questions about this letter, please contact me at 865-481-6912.

Respectfully,

A handwritten signature in black ink, appearing to read "Patrick Daly", with a long, sweeping horizontal line extending to the right.

Patrick Daly
Vice President , ZionSolutions

Attachment

cc: Regional Administrator - NRC Region III

Office of Nuclear Facility Safety - Illinois Department of Nuclear Safety

Zion Nuclear Power Station Units 1 and 2
Amended Post-Shutdown Decommissioning
Activities Report

March 17, 2008

TABLE OF CONTENTS

SECTION PAGE

I. INTRODUCTION	3
II. BACKGROUND	4
III. DESCRIPTION OF PLANNED DECOMMISSIONING ACTIVITIES	6
IV. SCHEDULE OF PLANNED DECOMMISSIONING ACTIVITIES	16
V. ESTIMATE OF EXPECTED DECOMMISSIONING COSTS	19
VI. ENVIRONMENTAL IMPACTS	26

I. INTRODUCTION

In accordance with the requirements of 10 CFR 50.82, "Termination of License," paragraph (a)(4)(i), Exelon Corporation, formerly Commonwealth Edison Company (ComEd), submitted a post-shutdown decommissioning activities report (PSDAR) for the Zion Nuclear Power Station, Units 1 and 2 (ZNPS) dated February 2000. By this revision, the PSDAR is updated to follow a request for transfer of the 10 CFR Part 50 ZNPS licenses (the Licenses) to *ZionSolutions, LLC* (Zion Solutions/ZS), a wholly-owned subsidiary of *EnergySolutions, LLC* (Energy Solutions/ES). The updated PSDAR also contains a revised cost estimate and a new decommissioning schedule.

This report is arranged into four sections that supply the information required in a PSDAR as described in 10 CFR 50.82. These sections include:

- A description of the planned decommissioning activities,
- A proposed schedule for their accomplishment,
- An estimate of expected costs, and
- A discussion that provides the reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by previously issued environmental impact statements.

Section II, "Background," provides a brief discussion of the design and history of ZNPS. The planned decommissioning activities and the general sequencing of their implementation are described in Section III, "Description of Planned Decommissioning Activities." The overall decommissioning schedule is found in Section IV, "Schedule of Planned Decommissioning Activities." A site-specific cost estimate is given in Section V, "Estimate of Expected Decommissioning Costs." Section VI, "Environmental Impacts," sets forth the reasons for concluding the ZNPS decommissioning related activities will be bounded by previously issued environmental impact statements.

II. BACKGROUND

The ZNPS is located in northeast Illinois on the west shore of Lake Michigan. The site is approximately 40 miles north of Chicago, Illinois, and 42 miles south of Milwaukee, Wisconsin.

ZNPS is comprised of two pressurized water reactors with supporting facilities (the Zion Units). The primary coolant system for each unit employed a four-loop pressurized water reactor nuclear steam supply system designed by Westinghouse Electric Corporation housed in a steel-lined, reinforced concrete containment structure. The units have undergone significant deactivation and draining of systems and are not capable of ever being restored to a power generating station.

A brief history of major plant operations and licensing-related actions for the Zion Units is as follows:

- Construction Permit issued, December 1968,
- Operating license issued April 6, 1973, for Unit 1 and November 14, 1973, for Unit 2,
- Commercial operations achieved, December 1973 for Unit 1 and September 1974 for Unit 2,
- Final reactor operation, February 21, 1997, for Unit 1 and September 19, 1996, for Unit 2, and
- All fuel removed from the reactor and placed in the spent fuel pool, April 27, 1997, for Unit 1 and February 25, 1998, for Unit 2.

On January 14, 1998, the Unicom Corporation and ComEd Boards of Directors authorized the permanent cessation of operations at ZNPS for economic reasons. The cost and time it would take to repair the steam generators combined with the cost of electricity in a deregulated environment in Illinois made continuing operation of ZNPS uneconomical.

In accordance with 10 CFR 50.82(a)(1)(i), ComEd certified in a letter¹ dated February 13, 1998, that as of February 13, 1998, operations ceased at ZNPS. In accordance with 10 CFR 50.82(a)(1)(ii), ComEd certified in a letter² dated March 9, 1998, that all fuel had been removed from the ZNPS reactor vessels and committed to maintain them permanently defueled. The NRC acknowledged the certification of permanent cessation of power operation and permanent removal of fuel from the reactor vessels in a letter³ dated May 4, 1998.

¹ ComEd letter, "Certification of Permanent Cessation of Operations," dated February 13, 1998

² ComEd letter, "Certification of Permanent Fuel Removal," dated March 9, 1998

³ NRC letter, "Certification of Permanent Cessation of Power Operation and Permanent Removal of Fuel from the Reactor for Zion nuclear station, Units 1 and 2," dated May 4, 1998

Pursuant to 10 CFR 50.82(a)(2), upon docketing of the certifications in the Reference 1 and 2 letters, the Licenses no longer authorize operation of the reactors or emplacement or retention of fuel in the reactor vessels. Also, pursuant to 10 CFR 50.51(b), "Continuation of license," the facility operating licenses scheduled to expire on April 6, 2013, for Unit 1, and November 14, 2013, for Unit 2, remain in effect until the NRC notifies the licensee that the Licenses have been terminated.

On January 25, 2008, Exelon Generation Company, LLC (Exelon) and Zion Solutions, LLC (ZS) submitted an *Application for License Transfers and Conforming Administrative License Amendments* to the NRC requesting that the NRC consent to the transfer of Exelon's Facility Operating License for ZNPS to ZS. The application has been accepted by the NRC and is currently being reviewed.

III. DESCRIPTION OF PLANNED DECOMMISSIONING ACTIVITIES

The primary goal is to decommission ZNPS in a safe and cost effective manner. EnergySolutions has entered into an agreement with Exelon under which ZS will assume ownership of the facility and undertake decommissioning activities, to be conducted by EnergySolutions and affiliated companies. The SAFSTOR decommissioning approach was chosen by ComEd originally to recognize constraints associated with storage of the spent fuel and decommissioning funding availability for ZNPS. In this Delayed-DECON approach, significant deactivation and draining of systems activities were to be interspersed with periods of time in which ZNPS was in a SAFSTOR condition.

Decommissioning field activities were scheduled to begin on the same schedule as if ZNPS operated to the end of its licensed lifetime (2013) to permit the decommissioning trusts to be fully funded prior to field activities. The revised plan described herein accelerates the decommissioning schedule and revises the cost estimate to reflect current knowledge and waste disposal options.

To accommodate the accelerated decommissioning schedule, the nuclear fuel stored in the Spent Fuel Nuclear Island (SFNI) will be placed in dry storage casks and stored in an Independent Spent Fuel Storage Installation (ISFSI), a secured storage pad on-site. Greater than Class C (GTCC) waste will also be stored at the ISFSI. The fuel and GTCC waste may eventually be transferred to another approved site or transferred to the Department of Energy (DOE) geologic repository when that facility commences operations. The site will be decommissioned and the Licenses will be amended to limit them to the portion of the site where the ISFSI containing the spent fuel and the GTCC waste will be located, with the remainder of the site being released for unrestricted use. When the fuel and the GTCC waste are removed from ZNPS site, the remainder of the site will be decommissioned and the license terminated. This approach significantly accelerates the decommissioning of the plant allowing the bulk of the land to be returned to alternate uses.

Based on the above overall plan, the decommissioning of ZNPS has been divided into the following periods.

- SAFSTOR Dormancy,
- Preparations for Decontamination and Dismantlement,
- Establishment of ISFSI and Transfer of the Spent Fuel and GTCC Waste,
- Decommissioning Operations,
- Restoration of the site except for the ISFSI.

- Removal of nuclear fuel and GTCC waste from the site, and
- Restoration of the remainder portion of the site.

The following provides a discussion of the revised decommissioning plan, the significant activities it comprises, and the general sequencing of activities in each of the above periods. (The planning required for each decommissioning activity, including the selection of the process to perform the work, will be completed prior to the start of work for that activity.) Finally, a discussion of other issues related to decommissioning is included.

Period 1: SAFSTOR Dormancy

A decommissioning organization was established for the SAFSTOR dormancy period. A SFNI was created out of the fuel handling building. A Defueled Safety Analysis Report (DSAR), Defueled Station Emergency Plan, Defueled Physical Security Plan, and Permanently Defueled Technical Specifications were developed for the SAFSTOR dormancy period.

Work activities to date during this period have included, but have not been limited to, the following:

- Developed a decommissioning organizational structure and selected staff.
- Reviewed and reclassified systems, structures, and components consistent with the defueled and permanently shutdown configuration.
- Reviewed and revised plant programs and procedures, as necessary, to be consistent with the defueled and permanently shutdown configuration.
- Designed and implemented spent fuel storage and fuel handling systems which are capable of functioning independently from other existing plant systems, structures, and components to support wet spent fuel storage in the fuel handling building (i.e., the SFNI).
- Drained/de-energized/secured/isolated systems not required to support decommissioning operations.
- Defueled the reactor vessels and reassembled them with internals in place.
- Performed radiation surveys of the plant and posted warning signs as appropriate.
- Erected physical barriers and/or secured all access to radioactive or contaminated areas, except as required for controlled access (i.e., inspection and maintenance).

During this period, spent fuel has been stored in the spent fuel pool inside of the SFNI. Sufficient personnel have been retained to maintain required systems and provide radiological surveillance to ensure that radioactivity is not spread from the plant to the site or the environment.

Equipment corrective and preventive maintenance, inspection activities, and routine operations have been performed. Systems/structures needed to support the SFNI, security, fire protection, and environmental and radiological monitoring have been maintained in safe condition and in accordance with Permanently Defueled Technical Specifications requirements. Abandoned systems have been monitored and maintained, as needed, to control radioactive material. Systems and equipment no longer needed have been removed from the site for asset recovery. In addition, the structural integrity of buildings has been monitored and maintained.

Areas that do not require routine access have been locked and secured. Areas containing radioactive materials or other contamination have been secured to prevent accidental intrusion and make deliberate intrusion very difficult. Shielding has been added, where necessary, to maintain radiation exposure to plant personnel as low as reasonably achievable (ALARA). Routine periodic radiological inspections of contaminated buildings have been conducted. Decontamination activities have been generally limited to those necessary to maintain exposures ALARA.

Radiological and environmental surveillance programs have been carried out during the SAFSTOR dormancy period to ensure that potential releases of radioactive material to the environment have been detected and controlled. The surveillance programs have been conducted in accordance with the Permanently Defueled Technical Specifications, facility operating licenses, DSAR, and Offsite Dose Calculation Manual.

Period 2: Preparations for Decommissioning

Buildings to be Decommissioned and Dismantled

Impacted Areas - These buildings are known to be impacted and contain virtually all the radioactive materials and radioactive contaminants for the facility. Detailed characterization will be required to determine the remediation (if any) necessary:

- Containment Building for Units 1 and 2 – Separate and independent containment for each reactor. The reactor containment buildings are described in Section 3.8.1 of the Defueled Safety Analysis Report (DSAR) dated August 1998.
- Fuel Handling Building, also termed the Spent Fuel Nuclear Island (SFNI) – Fuel handling and storage is in a common building for the two reactor units. Fuel storage and handling are described in Section 3.9 of the DSAR. The nuclear fuel stored in the SFNI will be placed in dry storage casks and stored in an ISFSI, a secured storage pad on-site.

- Radioactive Waste Building
- Auxiliary Building
- Interim Radwaste Storage Facility
- East DAW (dry active waste) Building

Known or Potentially Impacted Areas – Due to a series of primary system to secondary system leaks through the steam generators, the following buildings contain known or potentially impacted areas. Detailed characterization will be required to determine the remediation (if any) necessary. Roofs of all buildings within the protected area have potential accumulation of low level contaminants from airborne effluent releases:

- Turbine Building – A common building for the two reactor units
- Main Steam Valve Houses, Unit 1 and 2
- Waste Water Treatment Facility
- Warehouse/Mechanical Maintenance Training Area
- Station Construction Building
- IDNS Building
- Gate House
- North and South Warehouse

In addition, due to a series of operational events, several ground areas are considered known or potentially impacted. Detailed characterization will be conducted to determine the remediation (if any) necessary.

Preparations for Decontamination and Dismantlement

Preparations for decontamination and dismantlement occur during the time period when detailed preparations are undertaken to provide a smooth transition from SAFSTOR dormancy to dismantlement. The organization required will be comprised of ZS personnel, the present on-site organization at ZNPS, and support staff at Exelon or other outside sources, if required.

In preparation for actual decommissioning, the following activities will be performed:

- Prepare site support and storage facilities, as required.
- Conduct a characterization of the site so that radiological, regulated, and hazardous wastes will be identified, categorized, and quantified as decommissioning progresses.
- Conduct radiation surveys of work areas, major components, and sampling of internal piping contamination levels.

- Prepare work plans for decontamination and dismantling activities.
- Determine transportation and disposal container requirements for activated materials and/or hazardous materials, including shielding and stabilization.
- Develop activity specifications and task specific procedures for occupational exposure control, control and release of liquid and gaseous effluents, processing of radwaste generated in decommissioning, site security, and industrial safety.
- Develop specifications for the transfer of nuclear fuel from the SFNI to the ISFSI for the storage of the fuel in dry cask storage.
- Develop specification for the storage of GTCC waste on the ISFSI.

Period 3: Establishment of ISFSI and Transfer of the Spent Fuel and GTCC Waste

During the early phase of site decommissioning, the spent nuclear fuel will be removed from the spent fuel pool and stored in dry cask storage containers. During the same time periods, the segmentation, packaging, and storage of Greater than Class C radioactive (GTCC) materials from the reactor will be accomplished. Once the spent fuel and GTCC materials are packaged in the dry cask containers, they will be stored on-site on the independent spent fuel storage installation, commonly referred to as an ISFSI. A stable geological, on-site location will be selected for the construction of an ISFSI. The ISFSI will be a 3'- 4' thick reinforced concrete rectangular structure approximately 200' x 300' in size.

The scope of this work will include the following major activities:

- ISFSI site selection and geotechnical evaluation
- Design and construction of the ISFSI
- Procurement of the dry cask storage systems
- Inspection and evaluation of the spent nuclear fuel
- Spent fuel transfer activities preparations: procedure and train program development, demonstration and "dry run" activities
- Transfer of the spent fuel from the fuel pool to the ISFSI
- Transfer of the GTCC materials to the ISFSI
- ISFSI operations

Finally, when the high level repository in Yucca Mountain, Nevada becomes operational, these spent fuel and GTCC storage containers will be transported to the Yucca Mountain facility for their ultimate disposal.

Period 4: Decommissioning Operations

The actual decontamination and dismantlement of ZNPS will occur during the period of decommissioning operations. Decommissioning will commence when sufficient preparation and planning have been completed for the work to be performed even though the complete site planning may not be completed.

Activities to be performed during this period include, but are not limited to, the following.

- Conduct decontamination or removal of components and piping systems, as required, to minimize worker exposure. Remove, package, and dispose of all piping and components that are no longer needed to support decommissioning operations.
- Remove control rod drive housings and the head service structure from the reactor vessel head and package for controlled disposal.
- Segment reactor vessel closure head and vessel flange for shipment.
- Disassemble/segment remotely underwater the reactor internals and package in shielded casks.
- Segment/section the reactor vessel, placing segments into shielded containers. These operations will be performed remotely in air using a contamination control envelope.
- Remove the reactor coolant piping and pumps.
- Remove systems and associated components as they become nonessential to the vessel removal operations, related decommissioning activities, or worker health and safety (e.g., waste collection and processing systems, electrical and ventilation systems, etc.).
- Remove activated concrete biological shield and accessible contaminated concrete.
- Modify the containment structure to permit removal of large components.
- Remove the steam generators and pressurizer for shipment and controlled disposal.
- Remove steel liners from the refueling canal and containment.
- Remove contaminated equipment and material from the auxiliary building.
- Decommission and dismantle the Spent Fuel Pool for disposal.

- Decontaminate remaining site buildings and facilities with residual contaminants. Package and dispose of all remaining low-level radioactive waste along with any remaining hazardous materials.
- Remove remaining components, equipment, and plant services in support of the area release survey(s).

Prepare a license termination plan (LTP) in accordance with 10 CFR 50.82(a)(9). The LTP will define the details of the final radiological survey to be performed once all decontamination activities are completed. The LTP will conform to the format defined in Regulatory Guide 1.179⁴ and will address the limits of 10 CFR 20, Subpart E, "Radiological Criteria for License Termination," using the pathways analysis defined in NUREG-1575⁵. Following the guidance in these documents will ensure that the survey is conducted so that applicable regulatory criteria are satisfied. Once the NRC has approved the license termination plan, the final remediation of site facilities may commence.

Period 5: Site Restoration

Site restoration will be accomplished following the completion of decommissioning activities at each location of the site. Restored areas on the site will be back-filled, graded, and landscaped as needed. Some structures onsite may remain to be available for alternative use. The electrical switchyard will not be included in the site restoration activities because it will remain in active use after decommissioning in support of the existing offsite electrical transmission and distribution system.

After site remediation, the final survey will be performed to demonstrate that the remediated portion of the site (excluding the ISFSI containing the spent fuel and GTCC waste) can be released for unrestricted use and deleted from the Licenses. The entire site will be released for unrestricted use when the spent nuclear fuel and GTCC waste have been removed from the site and the ISFSI has been decommissioned and its location remediated.

Decommissioning Methods

The decontamination and/or dismantlement of contaminated systems, structures, and components may be accomplished by decontamination in place, decontamination and dismantlement, or dismantlement and disposal. A combination of these methods may be utilized to reduce contamination levels, worker radiation exposures, and project costs. These methods are the most practicable and widely used in the industry.

⁴ Regulatory Guide 1.179, "Standard Format and Content of License Termination Plans for Nuclear Power Reactors," dated January 1999

⁵ NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)," and Supplement.

General Description of Decommissioning Activities Relating to Removal of Radiological Components and Structures

Components will be safely and efficiently removed using the techniques and methods determined to be the most appropriate for the particular circumstances. Material removed in the decontamination and dismantling process will be routed to an onsite central processing area. Materials whose level of contamination is below the applicable radiological limits will be released for unrestricted disposition (e.g., scrap, recycle, or general disposal). Radioactively contaminated or activated materials will be removed from the site as necessary.

Low-level radioactive waste will be processed in accordance with plant procedures and existing commercial options. Contaminated material will be characterized and segregated for additional onsite decontamination or processing, offsite processing (e.g., disassembly, chemical cleaning, volume reduction, waste treatment, etc.), and/or packaged for controlled disposal at a low-level radioactive waste disposal facility.

Contaminated concrete and structural steel components will be decontaminated and/or removed as required to gain access to contaminated and uncontaminated systems and components. After the systems and components are removed and processed as described above, the remaining contaminated concrete and structural steel components will be decontaminated and/or removed. Contaminated concrete will be packaged and shipped to a low-level waste disposal facility. Contaminated structural steel components may be removed to a processing area for volume reduction and packaging for shipment to a processing facility or to a low-level radioactive waste disposal facility, as required.

Buried contaminated components (e.g., piping, drains, etc.) will be excavated. After excavation, the components will be examined to ensure that they are physically sound prior to cutting and removal. Appropriate contamination controls will be employed to minimize the spread of contamination and protect personnel.

Low-Level Radioactive Waste Burial Volume

The technical approach for Zion relies on the large volume removal of components and debris from the radiological controlled areas including, containments, auxiliary, and fuel buildings. The approach utilizes rail shipments for the majority of the interior components and structure of these buildings to our low-level waste disposal facility in Clive, Utah. The low-level waste disposal will also include the majority of the secondary steam and feed water systems given the fact that both units experienced steam generator tube leaks during plant operation. This approach is intended to minimize the end radiological dose condition of the site once decommissioning is completed, significantly reduce the possibility of inadvertent release of contaminated material to sanitary landfills, and to reduce schedule time and cost by reducing surface survey and decontamination activities. This approach results in an increase of material to be transported for low-level waste disposal, however, it reduces the material that would be transported for disposal in sanitary landfills. The total volume of low-level waste shipments is expected to be approximately 172,838 cubic meters (6 million cubic feet) and would represent approximately 40 to 50 unit train shipments, with each unit train expected to have 40 cars each.

Low-Level Radioactive Waste Disposal

The low-level radioactive waste generated in the decontamination and dismantling of ZNPS will be shipped to the EnergySolutions facility located in Clive, Utah.

After ZNPS shutdown, very low levels of radioactive contamination have been identified in secondary side systems. The secondary side of the steam generators, main steam system, condensate system, and feed water system, along with connecting systems and equipment, may contain some radioactive contamination. Material removed from the secondary side of the plant will be surveyed, decontaminated when appropriate, and buried as low-level radioactive waste.

Removal of Mixed Wastes

Hazardous radioactive (i.e., mixed) wastes are not expected to be generated during decommissioning. Existing mixed wastes, if any, will be managed according to all applicable Federal and State regulations.

Mixed wastes from ZNPS will be transported only by authorized and licensed transporters and shipped only to authorized and licensed facilities. If technology, resources, and approved processes are available, processes will be evaluated to render the mixed waste non-hazardous.

Storage of Spent Fuel and GTCC Waste

The Nuclear Waste Policy Act of 1982 assigned the responsibility for disposal of spent nuclear fuel and high-level radioactive waste created by the commercial nuclear generating plants to the DOE. This legislation also created a Nuclear Waste Fund to cover the cost of the program, which

has been funded, in part, by the sale of electricity from ZNPS, and an estimated equivalent for fuel assemblies irradiated prior to April, 1983.

After several delays, the date for operation of the DOE storage facility is uncertain. The nuclear fuel and GTCC waste will be stored in an on-site ISFSI. The fuel and GTCC waste may eventually be transferred to another approved site or transferred to the Department of Energy (DOE) geologic repository when that facility commences operations.

IV. SCHEDULE OF PLANNED DECOMMISSIONING ACTIVITIES

SAFSTOR has been utilized to date as the decommissioning approach since the permanent shutdown and defueling of Zion Units 1 and 2, with preparations for decontamination and dismantlement deferred until the license expiration date for Zion Unit 2, November 14, 2013. The new *EnergySolutions* plan is to shift to the DECON decommissioning method, accelerate the decommissioning schedule, and begin preparation for decommissioning at the time of the approval of the transfer of the Licenses to ZS, which is assumed to occur in late 2008. In addition to accelerating decommissioning, the revised schedule incorporates the movement of the spent fuel and GTCC waste to an ISFSI constructed at ZNPS where they will remain safely stored until they are shipped to an Exelon facility or transferred to the DOE for permanent disposal. Although the method of storing the spent fuel has changed from storage in the SFNI to storage on the ISFSI, the need for a second, final decontamination and dismantlement period has not changed. Under the new plan, however, it will be the decontamination and dismantlement of the ISFSI and associated systems that will occur once the spent fuel and GTCC waste are transferred offsite.

Major milestones established for decommissioning ZNPS are listed in the table below. The listed milestones assume approval of the transfer of the Licenses and closing of the contractual transactions between Exelon, *EnergySolutions* and ZS by the end of 2008.

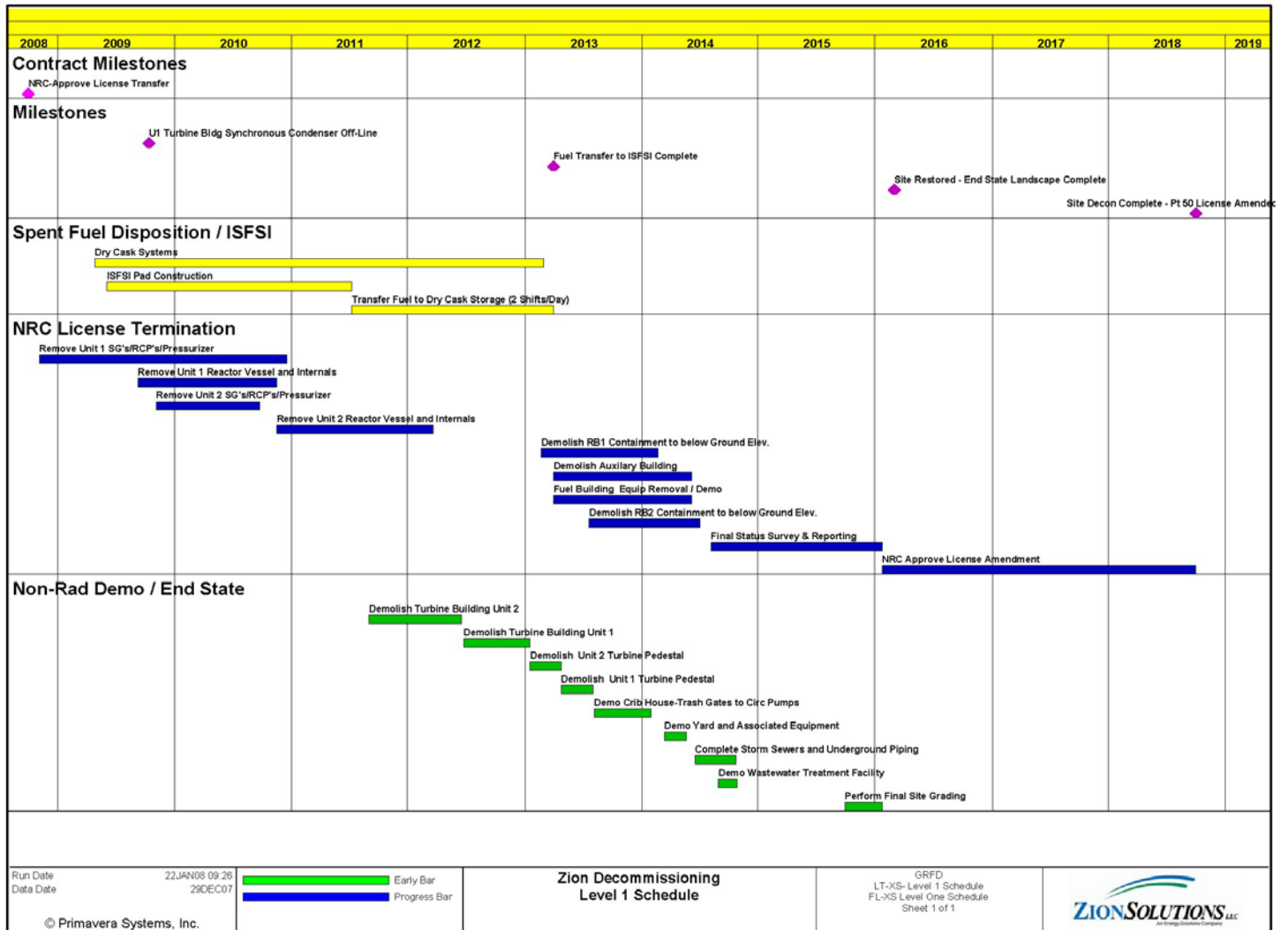
PERIOD DATES	
SAFSTOR Dormancy	
Unit 1	2000-2007
Unit 2	2000-2007
Preparations for Decontamination and Dismantlement	
Unit 1	2007-2008
Unit 2	2007-2008
Decommissioning Operations (except ISFSI)	
Unit 1	2007-2015
Unit 2	2007-2015
License Termination Plan Submitted	2012
Major Equipment Removal Completed	2012
ISFSI Established	2010
Fuel and GTCC waste Transferred to ISFSI	2013
Final Site Survey/(all but ISFSI)	2017
ZS applies to NRC for partial site release and transfer of ISFSI back to Exelon	2018
ISFSI Decommissioning by Exelon	~2025
(unless transferred earlier to an approved storage site)	
Full Site Restoration by Exelon	~2026-2028
(unless spent fuel and GTCC waste transferred earlier to an approved storage site)	

Figure IV-I, “ZNPS Decommissioning Schedule,” presents the schedule and milestones in a project timeline. The schedule begins with the date that the various contractual agreements are signed between EnergySolutions, ZS and Exelon and ends with receipt of a license amendment that releases all of the site except the ISFSI from radiological controls and NRC regulation.

The capability to suspend decontamination and dismantlement activities and maintain ZNPS in a safe storage condition with appropriate funding will be maintained even if an unexpected eventuality requires the temporary slowdown or suspension of decommissioning activities. Should the need arise to suspend operations or make other significant schedule changes from activities presented in Figure IV-1, ZS will notify the NRC in writing per 10 CFR 50.82(a)(7). In addition, ZS will identify the remaining dismantlement activities with the submittal of the license termination plan per 10 CFR 50.82(9)(ii)(B). Other minor schedule changes that occur during the life of the project will not necessitate that a revised schedule be submitted.

Figure IV-1

ZNPS Decommissioning Schedule



V. ESTIMATE OF EXPECTED DECOMMISSIONING COSTS

In February 1999, TLG Services, Inc. completed the first ZNPS site-specific decommissioning cost estimate which was submitted by a ComEd letter⁶ dated February 14, 2000. The estimate included consideration of regulatory requirements, contingency for unknown or uncertain conditions, and the availability of low and high-level radioactive waste disposal sites. The methodology utilized to develop the cost estimate followed the basic approach presented in "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates,"⁷ which involved a unit cost factor approach for estimating the decommissioning activity costs. It also included use of site specific information when available (e.g., hourly labor rates, and commodities) and the latest available industry experience (e.g., information from the Shippingport Station Decommissioning Project, and TLG Services experience in planning and engineering for the Shoreham Plant, Yankee Rowe Plant, Trojan Plant, Rancho Seco Plant, and other facilities). The estimate has been updated periodically by TLG to refine the costs as more detailed site-specific information is obtained and industry experience grows with the decommissioning of other nuclear plants. The most recent estimate was completed by TLG in December 2006.

The most recent TLG estimate has been utilized to obtain site-specific commodity quantities, and then applied its currently estimated unit cost factors, which take into consideration the methods and schedule discussed in the sections above, to arrive at an updated estimated cost to decommission the ZNPS. The total estimated cost to complete decommissioning of ZNPS is approximately \$978.0 million in 2007 dollars. This estimate includes provisions for storage of spent fuel and GTCC wastes on the ZNPS site until 2018, as well as site restoration costs for all areas except the ISFSI. Table V-I, "Summary of ZNPS Decommissioning Costs," provides EnergySolutions' cost estimate summary.

Funding for decommissioning ZNPS is provided by an external trust. Funds for the decommissioning of ZNPS were collected through 2006. The funding assurance mechanism used as the source of revenues for the external sinking funds was traditional "cost-of-service" ratemaking.

A decommissioning cost estimate is being submitted herein, as ZS intends to commence decontamination and dismantlement of the ZNPS and spend more than 23 percent of the decommissioning funds. This PSDAR will not be updated for minor changes in anticipated decommissioning costs. However, the status of the ZNPS decommissioning funding will continue to be reported to the NRC in accordance with 10 CFR 50.75(f)(1), "Reporting and recordkeeping for decommissioning planning." Additionally, ZS will inform the NRC in writing of any significant schedule and decommissioning cost changes per 10 CFR 50.82(a)(7), and

⁶ ComEd letter, "Submittal of the Zion nuclear station Site-Specific Decommissioning Cost Estimate," dated February 14, 2000

⁷ Atomic Industrial Forum, Inc.; National Environmental Studies Project-036, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," dated May 1986

provide an updated site-specific estimate of remaining decommissioning costs with the license termination plan per 10 CFR 50.82(a)(9)(ii)(F).

Table V-1

Decommissioning Cost Estimate

		(\$ Millions)
Exelon 2007 - 2008 Fuel Storage Costs		\$21.0
Exelon Fund Retainage		\$25.0
Exelon Tax Liability Retainage		\$11.0
Preliminary Planning		\$12.7
Dismantlement Activities		
Decontamination	\$4.5	
Removal	\$142.8	
Transportation & Disposal	\$171.4	
Project Staffing	\$206.4	
Materials and Equipment	\$30.9	
Insurance and Regulatory Fees	\$2.8	
Other Decommissioning Costs	\$85.4	
Total Dismantlement Costs		\$644.3
		<hr/>
		\$714.0
Spent Fuel Storage		\$210.9
Site Restoration		\$53.2
		<hr/>
Total Decommissioning Costs		\$978.0

Based on 2007 Dollars

Note: Dismantlement and Spent Fuel Storage Costs equal un-escalated raw cost plus contingency, corporate allocation and profit.

Comparison of Current Decommissioning Cost Estimate with Original PSDAR Estimate

The cost estimate included in the original PSDAR, dated February 14, 2000, projected a total cost of \$904 million in 1996 dollars as shown in Table V-2. For purposes of comparing the current cost estimate to the original PSDAR estimate, Table V-2 applies cost escalation factors to the original PSDAR cost estimate to adjust the estimate from 1996 dollars to current 2008 dollars based on historical inflation rates. Separate escalation factors were applied for low level waste burial and non-burial costs. Once escalation is applied to account for inflation, the original PSDAR cost estimate of \$904 million in 1996 dollars is equivalent to \$1.374 billion in current 2008 dollars.

Table V-3 is provided to compare the original PSDAR cost estimate after conversion to 2008 dollars with the current PSDAR cost estimate. As shown in the table, the current estimate of \$978 million is approximately 29% less than the original PSDAR estimate converted to 2008 dollars of \$1.374 billion.

Table V-4 is provided to show correlation of the amended PSDAR cost estimate line items with the decommissioning cost estimate line items provided in Table V-1. This correlation is necessary because the breakdown of cost categories in the original PSDAR cost estimate is different than the standard cost summary breakdowns contained in subsequent site-specific estimates and the current site-specific estimate. The format shown in Tables V-1 and V-4 are the same as the format of the decommissioning cost estimate summary provided in the License Transfer Application dated 1/25/08.

Comparison of Current Decommissioning Cost Estimate with Most Recent Site-Specific Cost Estimate

Table V-5 compares the most recent site-specific estimate prepared by TLG with the site-specific estimate prepared by EnergySolutions. TLG's most recent site-specific estimate of \$1.043 billion was issued in February 2007 and was estimated in 2006 dollars. Table V-5 escalates the 2006 costs to 2008 dollars to account for inflation, and results in a total estimate of \$1.091 billion in 2008 dollars. As shown, in the table, the current EnergySolutions estimate of \$978 million is approximately 10% less than the TLG 2007 estimate converted to 2008 dollars of \$1.091 billion.

TABLE V-2
ORIGINAL PSDAR COST ESTIMATE AND ESCALATION TO 2008 DOLLARS

PSDAR - Feb 2000	
Key Tasks / Milestone	
Unit 1	
1998/1999 Decommissioning Costs	54,326
Staffing	49,467
Low Level Waste Burial	64,918
Equipment Removal	58,406
Low-Level Waste Packaging and Shipping	9,121
Decontamination Activities	5,760
Other Costs	75,724
Subtotal	317,722
Unit 2 and Common	
1998/1999 Decommissioning Costs	54,327
Staffing	56,624
Low-Level Waste Burial	91,360
Equipment Removal	90,250
Low-Level Waste Packaging and Shipping	10,615
Decontamination Activities	9,185
Other Costs	93,681
Subtotal	406,042
Spent Fuel Management	180,499
Total	904,263

PSDAR - Feb 2000	
Key Tasks / Milestone	
Unit 1 + Unit 2 and Common	
1998/1999 Decommissioning Costs	108,653
Staffing	106,091
Low Level Waste Burial	156,278
Equipment Removal	148,656
Low-Level Waste Packaging and Shipping	19,736
Decontamination Activities	14,945
Other Costs	169,405
Subtotal	723,764
Spent Fuel Management	
	180,499
Total	904,263

PSDAR - Feb 2000 (escalated to 2008 dollars)	
Key Tasks / Milestone	
Unit 1 + Unit 2 and Common	
1998/1999 Decommissioning Costs	134,730
Staffing	140,040
Low Level Waste Burial	395,383
Equipment Removal	196,226
Low-Level Waste Packaging and Shipping	26,052
Decontamination Activities	19,727
Other Costs	223,615
Subtotal	1,135,773
Spent Fuel Management	
	238,259
Total	1,374,031

Dollars in thousands: Unadjusted 1996 dollars (except for 1998/1999 Decommissioning Costs which are in current 2000 dollars)

Escalation (Non-LLW Burial) is based on CPI-U historical data from BLS
 LLW Burial Escalation is based on NUREG 1307 Rev 10 Table 2.1

	CPI-U Dec-Dec	CPI-U Avg- Avg	LLW Burial
1997	1.70%	2.30%	8.80%
1998	1.60%	1.60%	8.80%
1999	2.70%	2.20%	8.80%
2000	3.40%	3.40%	8.80%
2001	1.60%	2.80%	8.80%
2002	2.40%	1.60%	8.80%
2003	1.90%	2.30%	8.80%
2004	3.30%	2.70%	8.80%
2005	3.40%	3.40%	8.80%
2006	2.50%	3.20%	8.80%
2007	4.10%	2.80%	8.80%

Escalation factor 1996 costs	1.33	1.32	1997-2007
Escalation factor 1998/1999 costs	1.25	1.24	2000-2007
Escalation factor 1996 LLW burial costs			2.53 1997-2007

TABLE V-3
COMPARISON OF ORIGINAL PSDAR COST ESTIMATE (ESCALATED TO 2008) TO AMENDED PSDAR COST ESTIMATE

PSDAR - Feb 2000 (escalated to 2008 dollars)	
Key Tasks / Milestone	
Unit 1 + Unit 2 and Common	
1998/1999 Decommissioning Costs	134,730
Staffing	140,040
Low-Level Waste Burial	395,383
Equipment Removal	196,226
Low-Level Waste Packaging and Shipping	26,052
Decontamination Activities	19,727
Other Costs	223,615
Subtotal - License Termination	1,135,773
 Spent Fuel Management	 238,259
Total	1,374,031

Dollars in thousands: Unadjusted current 2008 dollars

Site Restoration
 (Note 1)

Total	1,374,031
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Amended PSDAR - March 2008	
Key Tasks / Milestone	
Unit 1 + Unit 2 and Common	
2007/2008 Decommissioning Costs	33,700
Staffing	206,400
Low-Level Waste Burial	134,600
Equipment Removal	142,800
Low-Level Waste Packaging and Shipping	36,800
Decontamination Activities	4,500
Other Costs	155,100
Subtotal - License Termination	713,900
 Spent Fuel Management	 210,900
Total	924,800

Dollars in thousands: Unadjusted current 2008 dollars

Site Restoration
 (Note 1)

	53,200
Total	978,000

% Cost Change (from Feb 2000 PSDAR)	
Key Tasks / Milestone	
Unit 1 + Unit 2 and Common	
2007/2008 Decommissioning Costs	-75%
Staffing	47%
Low-Level Waste Burial	-66%
Equipment Removal	-27%
Low-Level Waste Packaging and Shipping	41%
Decontamination Activities	-77%
Other Costs	-31%
Subtotal - License Termination	-37%
 Spent Fuel Management	 -11%
Total	-33%

Site Restoration
 (Note 1)

Total	-29%
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Note 1: Assumes site restoration costs were addressed in the "Other Costs" category in the 2000 PSDAR for comparison of Total Project Costs between the 2000 and 2008 estimates.

TABLE V-4

CORRELATION OF AMENDED PSDAR COST ESTIMATE TO COST ESTIMATE IN TABLE V-1 and LICENSE TRANSFER APPLICATION

Amended PSDAR - Feb 2008	
Key Tasks / Milestone	
Unit 1 + Unit 2 and Common	
2007/2008 Decommissioning Costs	33,700
Staffing	206,400
Low-Level Waste Burial	134,600
Equipment Removal	142,800
Low-Level Waste Packaging and Shipping	36,800
Decontamination Activities	4,500
Other Costs	155,100
Subtotal - License Termination	713,900
Spent Fuel Management	210,900
Total	924,800
Site Restoration	53,200
Total	978,000

Dollars in thousands: Unadjusted current 2008 dollars

License Transfer Application - Jan 2008	
Exelon 2007-2008 Fuel Storage Costs	21,000
Preliminary Planning	12,700
Subtotal	33,700
Project Staffing	206,400
Transportation & Disposal	171,400
Removal	142,800
(Low-Level Waste Packaging and Shipping is included in Transportation & Disposal above)	
Decontamination	4,500
Materials and Equipment	30,900
Insurance and Regulatory Fees	2,800
Other Decommissioning Costs	85,400
Exelon Fund Retainage	25,000
Exelon Tax Liability Retainage	11,000
Subtotal	155,100
Subtotal - License Termination	713,900
Spent Fuel Management	210,900
Total	924,800
Site Restoration	53,200
Total	978,000

Dollars in thousands: Unadjusted current 2008 dollars

TABLE V-5

COMPARISON OF MOST RECENT SITE-SPECIFIC COST ESTIMATE (TLG 2007) WITH 2008 LICENSE TRANSFER APPLICATION AND AMENDED PSDAR COST ESTIMATE

Site-Specific Cost Estimate (TLG Feb 2007)		SSCE (TLG Feb 2007 Escalated to 2008 Dollars)		License Transfer Application - Jan 2008 and Amended PSDAR - March 2008 Cost Estimate		% Cost Change (from Escalated TLG 2007 Estimate)	
Decontamination	10,970	Decontamination	11,420	Decontamination	5,100	Decontamination	-55%
Removal	196,422	Removal	204,475	Removal	158,800	Removal	-22%
Packaging	17,746	Packaging	18,474	Packaging	1,100	Packaging	-94%
Transportation	14,031	Transportation	14,606	Transportation	36,800	Transportation	152%
Waste Disposal	128,445	Waste Disposal	139,748	Waste Disposal	134,600	Waste Disposal	-4%
Off-Site Waste Processing	36,145	Off-Site Waste Processing	37,627	Off-Site Waste Processing	-	Off-Site Waste Processing	-100%
Program Management	410,921	Program Management	427,769	Program Management	269,700	Program Management	-37%
Spent Fuel Management	36,234	Spent Fuel Management	37,720	Spent Fuel Management	-	Spent Fuel Management	-100%
Insurance and Regulatory Fees	15,475	Insurance and Regulatory Fees	16,109	Insurance and Regulatory Fees	3,200	Insurance and Regulatory Fees	-80%
Energy	15,018	Energy	15,634	Energy	6,500	Energy	-58%
Characterization and Licensing Surveys	23,741	Characterization and Licensing Surveys	24,714	Characterization and Licensing Survey	700	Characterization and Licensing Surveys	-97%
Property Taxes	20,562	Property Taxes	21,405	Property Taxes	11,300	Property Taxes	-47%
Miscellaneous Equipment	12,842	Miscellaneous Equipment	13,369	Miscellaneous Equipment	34,700	Miscellaneous Equipment	160%
Site O&M	5,374	Site O&M	5,594	Site O&M	19,400	Site O&M	247%
<u>Dormancy Costs</u>	<u>98,749</u>	<u>Dormancy Costs</u>	<u>102,798</u>	<u>Dormancy Costs</u>	<u>32,000</u>	<u>Dormancy Costs</u>	<u>-69%</u>
TOTAL	1,042,675	TOTAL	1,091,462	TOTAL	713,900	TOTAL	-35%
NRC License Termination	695,934	NRC License Termination	725,717	NRC License Termination	713,900	NRC License Termination	-2%
Spent Fuel Management	244,863	Spent Fuel Management	254,902	Spent Fuel Management	210,900	Spent Fuel Management	-17%
<u>Site Restoration</u>	<u>101,877</u>	<u>Site Restoration</u>	<u>110,842</u>	<u>Site Restoration</u>	<u>53,200</u>	<u>Site Restoration</u>	<u>-52%</u>
TOTAL	1,042,674	TOTAL	1,091,462	TOTAL	978,000	TOTAL	-10%

Dollars in thousands: 2006 dollars

Dollars in thousands: Escalated Dec 2006 to Dec 2007 dollars; Dollars in thousands: Unadjusted current 2008 dollars

Escalation factor 2006 non-burial cos: 1.041

Escalation factor 2006 LLW burial cos: 1.088

VI. ENVIRONMENTAL IMPACTS

10 CFR 50.82(a)(4)(i) requires that the PSDAR include “a discussion that provides the reasons for concluding that the environmental impacts associated with the site-specific decommissioning activities will be bounded by appropriate previously issued environmental impact statements.” The potential environmental impacts associated with the proposed decommissioning activities for ZNPS were compared with similar impacts given in the Final Environmental Statement (FES) for ZNPS⁸, and in the Generic Environmental Impact Statements (GEISs) on decommissioning^{9 10} and radiological criteria for license termination¹¹. The following discussion provides that comparison.

The decommissioning of ZNPS will have the following positive environmental effects:

- Radiological sources that create the potential for radiation exposure to site workers and the public will be reduced on an accelerated schedule.
- The site will be returned to a condition allowing unrestricted use in the 2017 time frame except for the ISFSI and 345 yard.
- Noise levels in the vicinity of ZNPS will be reduced.
- Hazardous materials and chemicals will be removed.
- Local traffic will be reduced (i.e., fewer employees, contractors, and materials shipments than are required to support an operating nuclear power plant).

The decommissioning of ZNPS will be accomplished with no significant adverse environmental impacts based on the following:

- No site-specific factors pertaining to ZNPS would alter the conclusions of the ZNPS FES or the GEISs.
- Radiation dose to the public will be minimal.
- Radiation dose to decommissioning workers will be maintained As Low As Reasonable Achievable (ALARA) according to 10 CFR Part 20.

⁸ Atomic Energy Commission, "Final Environmental Statement Related to Operation of Zion nuclear station Units 1 and 2," dated December 1972

⁹ NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," dated August 1988

¹⁰ NUREG-0586, "Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," Supplement 1, dated November 2002

¹¹ NUREG-1496, "Generic Environmental Impact Statement in Support of Rulemaking on Radiological Criteria for License Termination of NRC Licensed Nuclear Facilities," dated July 1997

- The low-level radioactive waste removed from ZNPS will occupy a small portion of the burial volume at approved waste disposal sites, and the disposal at local commercial landfills will be minimized in favor of LLW disposal to reduce the risk of inadvertent release of radiological material.
- The non-radiological environmental impacts are temporary and not significant.

The effects of decommissioning activities with respect to specific environmental issues are discussed below.

Radiation Dose to the Public

Radiation dose to the public will be maintained below levels comparable to when ZNPS was operating, through the continued application of radiation protection and contamination controls combined with the reduced source term available in the facility.

Occupational Radiation Exposure

An occupational dose estimate for the decommissioning of ZNPS will be performed prior to the start of decommissioning activities based on confirmed characterization results of area contamination and activity levels. This estimate will include the exposure from decontamination and dismantlement activities, the establishment of a storage pad for nuclear fuel dry storage casks and placement of the spent fuel and GTCC waste in dry storage containers and moved to on-site storage.

Occupational dose will be limited to 5 rem/year Total Effective Dose Equivalent (TEDE) as required by 10 CFR Part 20 and will further be administratively controlled to a limit of 2.0 rem/year TEDE. Administrative radiation dose control will continue throughout decommissioning, which will ensure that doses to personnel do not exceed regulatory limits. In addition, there will be equitable distribution of dose among available qualified workers to ensure collective dose to the work force is kept ALARA.

While Reference 10 GEIS, Appendix G, Table G-10, lists the average annual occupational dose (Person-rem/yr) for ZNPS Unit 1 and 2 as 645 person-rem/year during normal power operations, this reference does not provide enough information to adequately apply to decommissioning planning. It can be assumed that the average cumulative occupational dose provided by Table G-11 in this reference for decommissioning a PWR SAFSTOR, 792 person-rem, can be used as a guidance level until further information is available to perform detailed dose mapping and work planning.

Radiological and Non-Radiological Materials Transportation Impact

The NRC in NUREG-0586, "Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," Supplement 1, (GEIS) has taken the position that its regulations are adequate to protect the public against unreasonable risk from the transportation of radioactive materials

and that the effects of transportation of radioactive waste on public health and safety are considered to be neither detectable nor destabilizing.¹² The NRC analysis further determined that their consideration of the existing data for decommissioning methods and transportation modes should bound the transportation impacts for all decommissioning options for PWRs and BWRs.

The main transportation mode considered for the risks was by truck on public roads. The major transport mode for radiological shipments from Zion to the burial site at Clive, Utah, will be by rail rather than by truck for which the risk impacts were made. Waste transportation will utilize DOT approved gondola and other specialty rail cars to ship low level waste in bulk in the form of unit trains and individual cars. The NRC indicates in the GEIS that the shipment of spent fuel by rail reduces the radiological impacts significantly (more than a factor of 10 for shipments from the northeast to Nevada) and that similar reductions would be expected in the radiological impacts of the shipment of low level waste from decommissioning if shipments were made by rail rather than by truck. Thus the transportation mode to be used at Zion should result in a lower risk than considered in the GEIS.

The GEIS also states that it is not likely that the actual nonradiological impacts of transportation accidents would be as high as indicated or that they would be either detectable or destabilizing. The nonradiological debris from Zion will be transported by truck from the site to a nonradiological disposal site.

The transportation impacts of radiological and nonradiological wastes from Zion to the burial sites will thus be within the bounds of the analysis used in the GEIS and the effects on public health and safety are considered to be neither detectable nor destabilizing.

Non-Radiological Environmental Impacts

The non-radiological environmental impacts from decommissioning ZNPS are temporary and not significant. The largest occupational risk associated with the decommissioning is the risk of industrial accidents. This risk will be minimized by adherence to work controls during decommissioning similar to the procedures followed during power operations. Procedures controlling work related to asbestos, lead, and other non-radiological hazards will also remain in place during decommissioning. The primary environmental effects of decommissioning are temporary, and include small increases in noise levels and dust in the immediate vicinity of the site, and small increases in truck traffic to and from the site for hauling equipment and debris. These effects will be similar to those experienced during normal refueling outages and will certainly be less severe than those present during the original plant construction. No significant socioeconomic impacts other than those associated with the decommissioning project (e.g., loss of jobs), or impacts to local culture, archaeological, terrestrial, or aquatic resources have been identified.

^{12]} NUREG-0586, "Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," Supplement 1, Section 4.3.17.3, dated November 2002.

Additional Considerations

While not quantitative, the following considerations are also relevant to concluding that decommissioning activities will not result in significant environmental impacts not previously reviewed.

- The release of effluents will continue to be controlled by plant license requirements and plant operating procedures throughout decommissioning. With respect to radiological releases, ZNPS will continue to operate in accordance with the Offsite Dose Calculation Manual during decommissioning. Releases of non-radiological effluents will continue to be in accordance with the requirements of the National Pollutant Discharge Elimination System (NPDES) and State of Illinois permits.
- Radiation protection principles used during plant operations will remain in effect during decommissioning to ensure that protective techniques, clothing, and breathing apparatus are used as appropriate.
- Sufficient decontamination prior to dismantlement will be performed to ensure that occupational dose and public exposure will not exceed those estimated in the GEISs.
- Transport of radioactive waste will be in accordance with plant procedures, applicable Federal and State regulations, and the requirements of the receiving facility. The majority of the LLW will be transported via rail minimizing the number of shipments when compared to truck transport over public highways.
- Site access control during decommissioning will ensure that residual contamination is minimized as a radiation release pathway to the public.

Conclusion

Based on the above discussion, the potential environmental impacts associated with decommissioning ZNPS have already been postulated in and will be bounded by the previously issued environmental impact statements, specifically the Reference 8 plant-specific FES and the Reference 9, 10 and 11 GEISs. This is principally due to the following reasons.

- The postulated impacts associated with the decommissioning method chosen, DECON, have already been considered in the ZNPS FES and the GEISs.
- There are no unique aspects of ZNPS or of the decommissioning techniques to be utilized that would invalidate the conclusions reached in the ZNPS FES and the GEISs.

- The methods to be employed to dismantle and decontaminate ZNPS are standard construction-based techniques fully considered in the ZNPS FES and the GEISs.

Therefore, it can be concluded that the environmental impacts associated with the site-specific decommissioning activities for ZNPS will be bounded by appropriate previously issued environmental impact statements.