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10 CFR 50.4(b)(6)
10 CFR 50.71(e)
10 CFR 50.59(d)(2)

RS-08-121

October 2, 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: Submittal of Defueled Safety Analysis Report Update, Revision 5
Report of Changes, Tests and Experiments

References: (1) Exelon Generation Company, LLC (EGC) letter, "Submittal of Defueled Safety Analysis Report Update," dated October 2, 2006

(2) Exelon Generation Company, LLC (EGC) letter, "Report of Changes, Tests and Experiments," dated December 11, 2002

In accordance with the requirements of 10 CFR 50.71, "Maintenance of records, making of reports," paragraph (e), Exelon Generation Company, LLC (EGC) is submitting Revision 5 of the Defueled Safety Analysis Report (DSAR) for the Zion Nuclear Power Station (ZNPS). In accordance with 10 CFR 50.71(e)(4), the DSAR update is being submitted within 24 months of the previous ZNPS DSAR revision which was submitted in Reference (1).

The changes to the DSAR reflect administrative changes (i.e., editorial and DSAR text changes) and plant design changes. Revision 5 includes changes made from October 2006 through August 2008. We have evaluated the DSAR changes and determined the changes screened out as not requiring an evaluation under 10 CFR 50.59.

Attachment 1 contains a summary of the DSAR changes. Attachment 2 contains page change instructions. Attachment 3 contains the update to the ZNPS DSAR. As required by 10 CFR 50.71(e), this attachment consists of replacement pages to be inserted into the DSAR. Changes to the DSAR are indicated by revision bars.

NMSS01
FSME

In accordance with 10 CFR 50.59, "Changes, tests, and experiments," paragraph (d)(2), a report of changes, tests, and experiments, including a summary of the 10 CFR 50.59 evaluation of each change is required to be submitted on a biennial basis. In Reference (2), the previous ZNPS 10 CFR 50.59 report was submitted. There were no 10 CFR 50.59 evaluations performed for ZNPS in the reporting period from December 11, 2002 to August 31, 2006 and therefore, a summary of evaluations was not submitted for those reporting periods. Attachment 4 contains a summary of 10 CFR 50.59 evaluations performed during the time period from September 2006 through August 2008.

As Manager – Licensing, I certify that the information in this submittal accurately presents changes made since the previous submittals necessary to reflect information and analyses submitted to the NRC or prepared in accordance with NRC requirements.

Should you have any questions concerning this letter, please contact Ms. Amy Hambly at (630) 657-2808.

Respectfully,

Patrick R. Simpson
Manager – Licensing

Attachment 1: Summary of Changes
Attachment 2: Page Change Instructions
Attachment 3: ZNPS DSAR Revision 5
Attachment 4: 10 CFR 50.59 Summary Report

ATTACHMENT 1

SUMMARY OF DSAR CHANGES

Pages	Description of Change
Figure 3-42	Delete one Auxiliary Building exhaust fan. The fan has been permanently removed from the plant.
Pages 4-11, 4-13, 4-14, 4-16	Eliminate references to the Radiation Monitor Display System (RMDS). The RMDS system is no longer in use.
Page 6-5	Delete obsolete references associated with the Quality Assurance Topical Report.

ATTACHMENT 2

PAGE CHANGE INSTRUCTIONS

To perform the October 2008 Zion Defueled Safety Analysis Report (DSAR) update, please remove the existing pages and insert pages dated October 2008 as follows:

SECTION	REMOVE	INSERT
List of Effective Pages	LOEP-2	LOEP-2
List of Effective Pages	LOEP-6	LOEP-6
List of Effective Pages	LOEP-7	LOEP-7
Chapter 3	Figure 3-42	Figure 3-42
Chapter 4	page 4-11	page 4-11
Chapter 4	page 4-13	page 4-13
Chapter 4	page 4-14	page 4-14
Chapter 4	page 4-16	page 4-16
Chapter 6	page 6-5	page 6-5

LIST OF EFFECTIVE PAGES

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Controlled Copy Cover Sheet	OCTOBER 2002
List of Effective Pages Tab	
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LOEP-3	OCTOBER 2000
LOEP-4	OCTOBER 2004
LOEP-5	OCTOBER 2004
LOEP-6	OCTOBER 2008
LOEP-7	OCTOBER 2008
Master Table of Contents Tab	
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2-i	AUGUST 1998
2-ii	AUGUST 1998
3-i	AUGUST 1998
3-ii	OCTOBER 2002
3-iii	AUGUST 1998
3-iv	OCTOBER 2000
3-v	OCTOBER 2004
4-i	AUGUST 1998
4-ii	OCTOBER 2004
5-i	AUGUST 1998
6-i	OCTOBER 2006
7-i	OCTOBER 2000
Chapter 1 Tab	
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1-ii	AUGUST 1998
1-iii	AUGUST 1998
1-1	OCTOBER 2002
1-2	AUGUST 1998
1-3	OCTOBER 2002
1-4	OCTOBER 2002
1-5	OCTOBER 2002
1-6	OCTOBER 2002
1-7	OCTOBER 2000
1-8	AUGUST 1998
1-9	OCTOBER 2002
Table 1-1(1)	AUGUST 1998
Figure 1-1	AUGUST 1998
Figure 1-2	AUGUST 1998
Figure 1-3	AUGUST 1998
Figure 1-4	AUGUST 1998
Figure 1-5	AUGUST 1998
Figure 1-6	AUGUST 1998
Figure 1-7	OCTOBER 2000
Figure 1-8	AUGUST 1998
Figure 1-9	AUGUST 1998
Figure 1-10	AUGUST 1998
Figure 1-11	AUGUST 1998
Figure 1-12	OCTOBER 2000
Figure 1-13	AUGUST 1998
Figure 1-14	OCTOBER 2000
Figure 1-15	AUGUST 1998
Figure 1-16	AUGUST 1998
Figure 1-17	AUGUST 1998
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2-iv	AUGUST 1998
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2-5	AUGUST 1998
2-6	AUGUST 1998
2-7	AUGUST 1998
2-8	OCTOBER 2000
2-9	OCTOBER 2000
2-10	AUGUST 1998
2-11	AUGUST 1998
2-12	AUGUST 1998
2-13	AUGUST 1998
2-14	AUGUST 1998
2-15	AUGUST 1998
2-16	AUGUST 1998
2-17	AUGUST 1998
2-18	AUGUST 1998
2-19	AUGUST 1998
2-20	AUGUST 1998
2-21	AUGUST 1998
2-22	AUGUST 1998
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2-27	AUGUST 1998
Table 2-1(1)	AUGUST 1998

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Figure 3-13	AUGUST 1998	4-1	OCTOBER 2002
Figure 3-14	AUGUST 1998	4-2	OCTOBER 2000
Figure 3-15	AUGUST 1998	4-3	OCTOBER 2002
Figure 3-16	AUGUST 1998	4-4	AUGUST 1998
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Figure 3-18	AUGUST 1998	4-6	OCTOBER 2004
Figure 3-19	AUGUST 1998	4-7	OCTOBER 2004
Figure 3-20	AUGUST 1998	4-8	AUGUST 1998
Figure 3-21	AUGUST 1998	4-9	AUGUST 1998
Figure 3-22	AUGUST 1998	4-10	OCTOBER 2000
Figure 3-23	AUGUST 1998	4-11	OCTOBER 2008
Figure 3-24	AUGUST 1998	4-12	OCTOBER 2000
Figure 3-25	AUGUST 1998	4-13	OCTOBER 2008
Figure 3-26	AUGUST 1998	4-14	OCTOBER 2008
Figure 3-27	AUGUST 1998	4-15	OCTOBER 2000
Figure 3-28	AUGUST 1998	4-16	OCTOBER 2008
Figure 3-29	AUGUST 1998	4-17	OCTOBER 2000
Figure 3-30	AUGUST 1998	Table 4-1(1)	OCTOBER 2004
Figure 3-31	AUGUST 1998	Table 4-2(1)	OCTOBER 2004
Figure 3-32	OCTOBER 2000	Table 4-3(1)	OCTOBER 2004
Figure 3-33	AUGUST 1998	Figure 4-1	OCTOBER 2004
Figure 3-34	AUGUST 1998	Chapter 5 Tab	
Figure 3-35	AUGUST 1998	5-i	AUGUST 1998
Figure 3-36	AUGUST 1998	5-ii	AUGUST 1998
Figure 3-37	AUGUST 1998	5-iii	AUGUST 1998
Figure 3-38	AUGUST 1998	5-1	AUGUST 1998
Figure 3-39	OCTOBER 2000	5-2	OCTOBER 2000
Figure 3-39A	OCTOBER 2000	5-3	OCTOBER 2000
Figure 3-40	OCTOBER 2002	5-4	OCTOBER 2000
Figure 3-41	OCTOBER 2000	5-5	OCTOBER 2000
Figure 3-42	OCTOBER 2008	5-6	AUGUST 1998
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Figure 3-43	AUGUST 1998	5-8	OCTOBER 2000
Figure 3-44	AUGUST 1998	Table 5-1(1)	AUGUST 1998
Figure 3-45	AUGUST 1998	Table 5-2(1)	AUGUST 1998
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Figure 3-46	OCTOBER 2000	Table 5-4(1)	OCTOBER 2000
Figure 3-47	OCTOBER 2000	Table 5-5(1)	OCTOBER 2000
Figure 3-48	AUGUST 1998	Table 5-6(1)	AUGUST 1998
Chapter 4 Tab		Table 5-7(1)	OCTOBER 2000
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PAGE	DATE	PAGE	DATE
Figure 5-4	AUGUST 1998		
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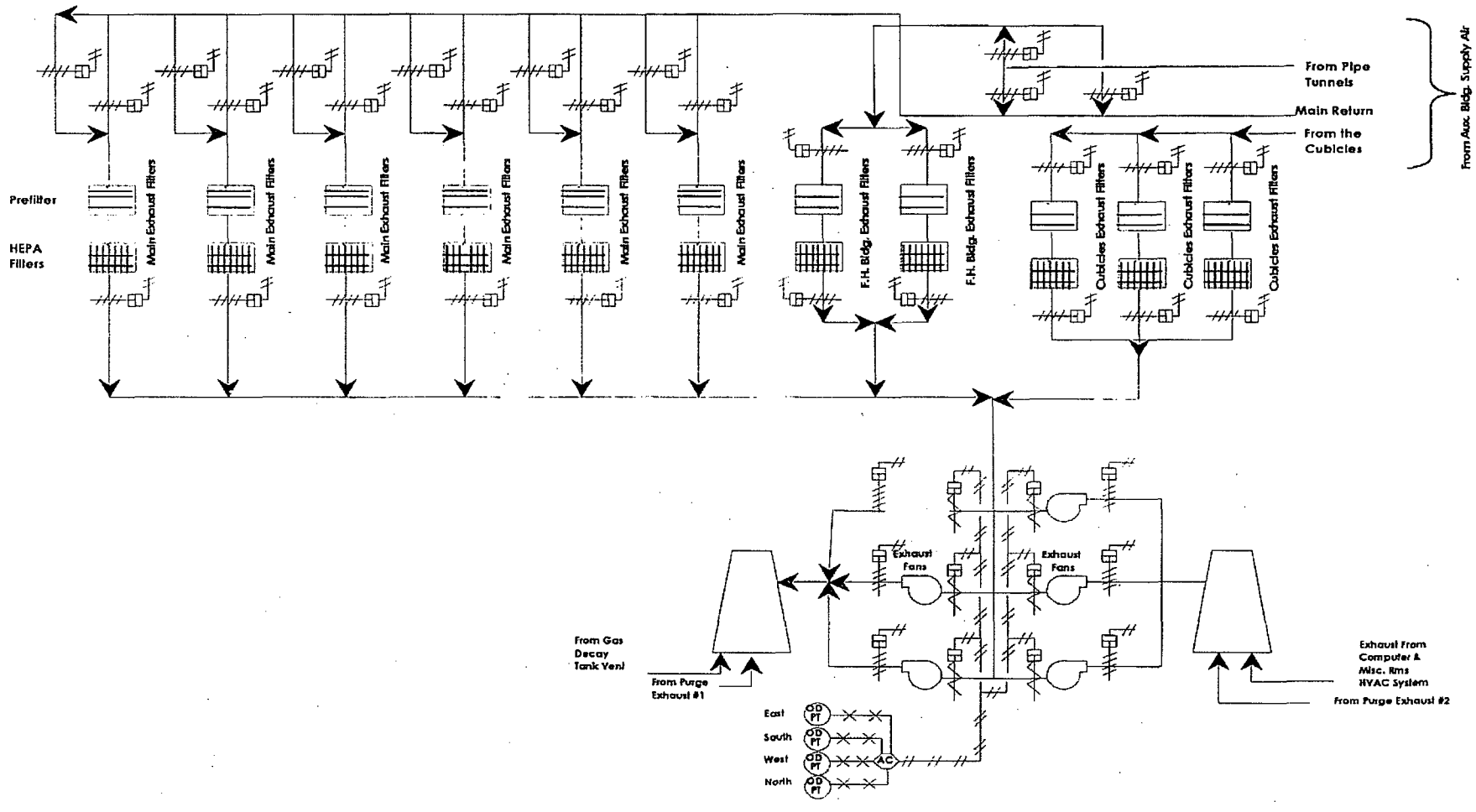
6-3	OCTOBER 2000		
6-4	OCTOBER 2002		
6-5	OCTOBER 2008		
Chapter 7 Tab			
7-i	OCTOBER 2000		
7-1	OCTOBER 2000		
7-2	OCTOBER 2000		

ATTACHMENT 3

ZION NUCLEAR POWER STATION
DEFUELED SAFETY ANALYSIS REPORT REVISION 5



ZION STATION DSAR

Figure 3-42

AUXILIARY BUILDING VENTILATION EXHAUST SYSTEM (SIMPLIFIED)

OCTOBER 2008

In the defueled condition, radioactive material exists in the form of particulates and noble gases. Radioactive isotopes of iodine present during normal plant operations are no longer present. As such, the instrument channels in the radiation monitoring system monitor either particulates or gases.

None of the radiation monitors are relied upon to initiate an accident mitigation function for the events described in Chapter 5.0. In the defueled configuration, potential radiological events of concern focus on fuel building activities (i.e., spent fuel) and liquid releases to the lake. The process radiation monitoring system and the area radiation monitoring system provides general radiological monitoring as well as specific information on the dispersion and concentration of radioactivity in the event of a radiological event in the fuel building or an abnormal liquid release to the lake. This enables personnel to evaluate and respond to an event accordingly.

4.6.2 Process and Effluent Radiological Monitoring and Sampling Systems

4.6.2.1 System Description

The Process Radiation Monitoring System consists of channels which primarily give early warning of an equipment or system malfunction and also warn personnel of increasing radiation which might result in a radiation health hazard.

All radiation monitoring channels employ instrument failure alarms at the radiation monitoring cabinets and at local indicators (where provided). Instrument failure alarms are initiated upon failure of the radiation monitor, loss of detector signal, loss of power, or, for offline detectors, loss of sample flow. Control interlocks fail in the high radiation position upon instrument failure and must be manually reset.

Radiation monitor trip points are established in accordance with the Offsite Dose Calculation Manual (ODCM) to ensure "an as low as practicable" site boundary dose is obtained which is consistent with the design characteristics of the monitoring equipment, and acceptable operating considerations.

The process Radiation Monitoring System provides radiological monitoring of key areas and activities at the station. The primary areas of focus for the current radiation monitoring system are the fuel building and liquid effluent pathways. In general, the monitors provide both local and remote indication.

The detector output is transmitted to the SPING system control terminal console in the Control Room. The radioactivity level is output on the console at the request of the operator. High radioactivity indications are displayed by an alarm and automatic data output at the control console. The system can detect, quantify, and identify alpha and beta particulate. The monitors are located in the Fuel Building and alarm locally.

Isolation valves are installed on the inlet and discharge sample lines to the monitors to allow for maintenance and calibration.

4.6.2.1.1.2 Auxiliary Building Vent Stack SPING Air Monitor

This vent stack SPING continuously monitors the vent stack effluent for beta and alpha particulate and noble gas. The monitor outputs data and alarms to the SPING central control console.

This monitor outputs low flow and flow irregularity alarms to the control console.

This SPING monitor has no self-contained pump to induce a sample flow through the SPING. The sample is fed to the SPING by the Isokinetic Sampling System at a flow rate of up to approximately 2 cfm. The purpose of this system is to regulate the sample flow to accurately duplicate stack gas velocity and pressure to the vent stack SPING monitor. This allows a valid indication of the particulate content of the vent stack effluent.

4.6.2.1.1.3 Fuel Building Exhaust Air Monitor

The Fuel Building exhaust air monitor continuously monitors Fuel Building ventilation exhaust air for radioactive particulate and noble gas. Local and remote annunciation is provided.

This monitor has been installed as part of the Spent Fuel Nuclear Island (SFNI) design. It is not part of the existing process radiation monitoring system discussed in section 4.6.2.1.

4.6.2.1.2 Liquid Radiation Monitors

The liquid radiation monitors are a set of self-contained monitors used to measure radioactivity levels in liquid process and effluent streams. Table 4-3 provides a list of these monitors and identifies their tag numbers and sensitivities.

Detector outputs are transmitted to the Radiation Monitoring System cabinets in the Control Room. The radioactivity levels are indicated by the module meters and recorded on paper. High radioactivity-alarm indications are displayed on the Radiation Monitoring System cabinets.

4.6.2.1.2.1 Waste Disposal System Liquid Effluent Monitor

This channel continuously monitors all Liquid Waste System releases from the Boric Acid Monitor Tanks. A scintillation detector in a shielded assembly monitors all effluent discharges. Automatic valve closure action is initiated by the waste disposal system liquid effluent monitor to prevent further release after a high radioactivity condition is indicated or alarmed. The valve is located over 250 feet downstream of the monitor to allow closure prior to any radioactive release to the lake.

The accuracy of these monitors will be maintained to provide a highly reliable backup to the multiple sample analyses prior to discharge. A single monitor is provided on each discharge line and is considered adequate since the tank sample analyses are the primary method for determination of allowable discharge volume and flow. The release of liquid waste is performed under administrative control and these channels provide continuous monitoring during the release.

4.6.2.1.2.2 Fire Sump Discharge Liquid Monitor

The fire sump discharge liquid monitor is installed on the discharge of the fire sump pumps. A liquid proportional composite sampler is also installed on this discharge line. Upon actuation of the high radiation alarm from the fire sump discharge liquid monitor, the permanently installed fire sump pumps are automatically tripped to terminate release of radioactivity to the lake.

4.6.2.2 Calibration and Testing

Each channel employs an isotopic check source for channel testing. For many of these channels, the check source test is initiated at the Radiation Monitoring System cabinets. Check source testing of selected monitors requires local operation. Westinghouse supplied monitors can be tested online, without actuating interlocks, by increasing the interlock setpoint above the check source activity level.

All radiation monitors are calibrated by exposing the detectors to an isotope(s) of known activity. By changing the distance or placing filters between detector and the standard isotope, the field intensity is varied thereby allowing for a multi-point calibration. Channels employing count rate meters may be electronically calibrated via a pulse generator input.

The waste disposal system liquid effluent monitors are calibrated by the use of two (2) isotopic standards of different intermediate activity levels. The standards are monitored during calibration in a configuration similar to that of the monitored sample during normal operation. This method allows for an accurate isotopic calibration without contamination of the system.

The method of calibration of laboratory radiation counting instrumentation is in accordance with the vendor's manual. Complete documentation of calibration checks is maintained.

4.6.3 Area Radiation Monitoring Instrumentation

4.6.3.1 System Description

The Area Radiation Monitoring System consists of channels which indicate radiation levels in the fuel building.

Table 4-2 identifies the radiation monitors that are important to the defueled condition, including their location and a summary of the important features of each monitor. The detector output is amplified and the log count-rate is determined by the integral amplifier at the detector. The radiation level is typically shown at the detector and is transmitted to the radiation monitoring system cabinets in the Fuel Building and Control Room where it is indicated on a meter or Data Acquisition System (DAS) computer system and recorded. Most area radiation alarms are displayed locally and on DAS in the Control Room.

The Fuel Building overhead crane radiation monitor utilizes a gamma scintillation type detector with an integral amplifier at the detector. Since this type unit is a current integrating device rather than a pulse system, it is not affected by stray electro-static or electro-magnetic fields. In addition, this detector will not saturate in high radiation fields. When the level exceeds the range of the instrument, it merely reads full scale until such time as the level recedes to a point within the instrument's range. This radiation monitor, which is mounted in the cab of the crane, is interlocked with the crane hoists such that a high radiation level will stop upward motion of the main and auxiliary hoists.

4.6.3.2 Design Features Important to the Defueled Condition

The Area Radiation Monitoring System Components, as described above, are considered Important to the Defueled Condition.

4.7 Sealed Sources

Departmental procedures detail methods of leak testing sealed sources and receipt, handling and storage of radioactive sources. Approved calibration procedures outline specific techniques for the safe handling of calibration sources.

Accountability of sources is maintained in inventory records that are routinely updated. Source accessibility control is achieved through storage areas that are maintained locked to unauthorized personnel. While in use, sources are kept under the control of an authorized individual.

Radioactive sealed sources shall be leak tested for contamination. Any licensed sealed source is exempt from such leak tests if the source contains 100 microcuries or less of beta and/or gamma emitting material or 5 microcuries or less alpha emitting material.

6.5.6 Process Control Program

The Process Control Program (PCP) contains the current formulas, sampling analyses, tests, and determinations to be made to ensure that processing and packaging of solid radioactive wastes based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to assure compliance with 10CFRParts 20, 61, and 71; state regulations; burial ground requirements; and other requirements governing the disposal of solid radioactive waste. Dry active waste (DAW) such as compacted trash and contaminated components are not included in the scope of the PCP. Written procedures are established, implemented, and maintained covering the key activities of the Process Control Program.

Changes to the PCP shall be documented and records of reviews performed shall be retained as required by Technical Specifications.

6.5.7 Maintenance Rule Program

A Maintenance Rule Program has been established, in accordance with 10CFR50.65, for monitoring the performance of structures, systems, and components associated with the storage, control, and maintenance of spent fuel in a safe condition. The Maintenance Rule Program has established performance criteria for these SSCs such that attainment of the criteria provides reasonable assurance that the SSCs are capable of fulfilling their intended functions.

6.5.8 Quality Assurance Program

The Quality Assurance Program is implemented in accordance with the Quality Assurance Topical Report.

6.6 REVIEW AND INVESTIGATIVE FUNCTION

The review and investigative functions are conducted in accordance with the plant Technical Specifications.

ATTACHMENT 4

ZION NUCLEAR POWER STATION
10 CFR 50.59 SUMMARY REPORT

Change Number and Title: 2006-37; Install Design Change 363342, Manual Control for Auxiliary Building Exhaust Stack Flow Panel 2LP084

Description: Modify Auxiliary Building Exhaust Stack Flow Panel 2LP084 to provide manual control of the sample flow motor operated control valves.

Summary: This modification allows the operator to manually adjust the stack sample flow rates based on the overall stack exhaust flow. This ensures the sample flow is representative of the gaseous effluent through the Auxiliary Building exhaust stack and therefore provides accurate radiation monitoring capability. The design function of the 2LP084 flow panel and associated radiation monitors is to provide indication of increasing activity and to monitor radioactive discharges to the environment to ensure concentrations do not exceed specified limits. The evaluation concluded that the design change could be installed without obtaining a license amendment.