

10 CFR 50.59  
10 CFR 50.90

January 17, 2013

ZS-2013-0023

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:** Update to the Supplement for the Request for Amendment to Approve Methods of Analysis, use of the Upgraded Fuel Handling Building Crane System as a Single-Failure Proof Crane and Approval of a NUREG 0612 Compliant Heavy Loads Handling Program

**Reference: 1.** *ZionSolutions, LLC* Letter ZS-2012-0519, Daly to NRC, "Additional Information Supplementing the Request for Amendment to Approve Methods of Analysis, use of the Upgraded Fuel Handling Building Crane System as a Single-Failure Proof Crane and Approval of a NUREG 0612 Compliant Heavy Loads Handling Program," dated December 20, 2012.

**Reference: 2.** *ZionSolutions, LLC* Letter ZS -2012-0448, Daly to NRC, "Request for Amendment to Approve Methods of Analysis, use of the Upgraded Fuel Handling Building Crane System as a Single-Failure Proof Crane and Approval of a NUREG 0612 Compliant Heavy Loads Handling Program," dated October 25, 2012

*ZionSolutions, LLC (ZS)* submitted Reference 2 to request that the NRC amend the *ZionSolutions* licenses to incorporate an upgraded single-failure proof Fuel Handling Building crane meeting the applicable criteria of NUREG-0554 "Single Failure-Proof Cranes for Nuclear Power Plants" and to any applicable criteria as listed in NUREG-0612 "Control of Heavy Loads at Nuclear Power Plants: Resolution of Generic Technical Activity A-36" Appendix C."

Reference 1 provided design details and amendment updates associated with modifications to the crane runway rail clip design and for corrections to the Fuel Handling Building Crane main hoist reeving stress calculation. Reference 1 also included discussion of an error in the runway girder splice analysis and a commitment to update the progress on its correction. ZS further committed to update the NRC staff regarding an evaluation of the extent of condition for the calculation errors identified in References 1 and 2. This letter contains that update.

*FSME20*

### Girder Splice Repair Status

ZS review of a preliminary Architect Engineer (AE) design for modification of the girder splice is underway. The preliminary design involves joining the bridge runway girders on each span (total of two repair locations) with butt welds of the top and bottom flange. This modification would bring the runway into conformance with the as-modeled condition, i.e. acceptable stress interaction ratios for those conditions. Additionally, to possibly avoid the need for a complex weld repair, the AE is also performing a localized STAAD analysis to evaluate structural capability for the predicted load without the need for modification.

These two actions will proceed in parallel until a resolution method is selected by ZS. NRC will be informed of the method of resolution and either the design of the modification in support of the current analyses or the approach and results of the alternative analysis. A resolution will be provided or updated, as information becomes available, by March 8, 2013.

### Extent of Condition Status

ZS is in the process of performing a review of Condition Reports (CRs) involving the engineering and design process. The preliminary results of the CR review show that the issues fall into two general areas: 1) adequacy of ZS contractors' initial engineering analysis e.g., analysis of the girder splice, the runway clip, and the crane reeving; and, 2) the adequacy of ZS contractors' issued-for-construction design products such as conduit drawings and rebar placement drawings. The former engineering analysis issues primarily involve the FHB and crane. The latter design product issues primarily involve the ISFSI and haul path systems, structures, and components.

The evaluation is being performed in two steps:

#### **Step 1: Evaluation of Engineering Analysis Issues**

The evaluation of engineering adequacy (analysis products) will include an apparent cause analysis using procedure ZS-LS-107 "Apparent Cause Evaluation." In addition, the following steps will be performed and these findings will be used to inform the apparent cause analysis. Conclusions from these evaluations will be provided to the NRC when complete:

1. ZS will review its process for acceptance of vendor's products (governed by Procedure ZS-FT-303, "Fuel Transfer & Dry Fuels Storage Supplier Document Review") to determine both effectiveness of the implementation of the procedure and gauge the technical depth of review performed. This review will determine if additional reviews must be performed by ZS personnel on the remaining products to be received.

An initial review of the vendor product review program has been completed. The review was conducted by examining the completed review sheets and interviewing the assigned reviewers to judge the effectiveness of the reviews. The expectation for reviews, conducted in accordance with the controlling procedure (ZS-FT-303), is that appropriate and applicable design inputs and design information were utilized and the results were

reasonable. This review criteria was selected since proven firms with previous project-relevant experience were chosen as the AE and crane vendor. These vendor document reviews were conducted by several different ZS engineers over a period of many months. The reviewers expended approximately 1000 hours conducting the reviews associated with the Fuel Handling Building structural analyses and the Fuel Handling Building Crane analyses and drawings. These reviews were conducted as an iterative process that included written and verbal exchanges over many months and included random checking of calculations including methods and results, based on the comments. It should be noted that detailed reviews, conducted by ZS engineers for purposes other than the supplier acceptance reviews, identified the runway clip condition as well as the crane reeving issue.

ZS preliminary judgment, subject to completion of the apparent cause evaluation, is that the reviews conducted by ZS met or exceeded the procedural requirements.

2. The AE has evaluated the extent of condition regarding the FHB and crane analysis issues and has provided an evaluation of past performance and a plan of action for improvement. ZS is reviewing this evaluation and will inform NRC of the evaluation results and of actions taken.

As an initial, compensatory action, the AE's civil/structural supervisor (a registered professional engineer) will perform an additional, detailed design review of the civil/structural products yet to be completed. This review will be independent of and supplementary to those reviews already required by the AE's procedures.

3. For the Crane supplier, ZS performed an assessment on those calculations, focusing on assumptions and correct application of load cases, which were the areas of concern based on the previous calculation errors.

This assessment did not identify any further errors of that nature.

The results of the engineering evaluation will be provided to the NRC by February 15, 2013.

### **Step 2: Design Product Issue Evaluation**

Because of the number of issues involved, a common cause analysis of issued-for-construction design product adequacy will be performed in accordance with the procedure ZS-LS-109 "Common Cause Evaluation." None of these issues, to date, have resulted in an impact on the Heavy Loads Amendment Request of October 25, 2012. If an impact is identified, the NRC will be promptly notified.

The results of the Design Product Evaluation will be provided to NRC by February 28, 2013. In summary, the following regulatory commitments have been made in this letter and will be provided by ZS on the specified date:

- |   |                   |
|---|-------------------|
| 1. Final girder splice modification or alternative analysis.      | March 8, 2013     |
| 2. Results of "Step 1" Evaluation of Engineering Analysis Issues. | February 15, 2013 |
| 3. Results of "Step 2" Design Product Issues Evaluation           | February 28, 2013 |

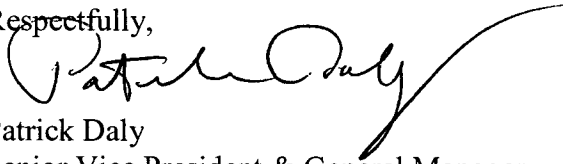
ZionSolutions, LLC

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If you have any questions, please call Mr. Jack Bailey (224) 789-4138.

Respectfully,

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

Patrick Daly

Senior Vice President & General Manager

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cc: John Hickman, U.S. NRC Senior Project Manager  
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