



Entergy Nuclear Operations, Inc.  
Palisades Nuclear Plant  
27780 Blue Star Memorial Highway  
Covert, MI 49043-9530  
Tel 269 764 2000

Jeffery A. Hardy  
Regulatory Assurance Manager

PNP 2015-059

July 31, 2015

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

SUBJECT: Response to Request for Supplemental Information for Relief Request  
Number RR 4-22 – Proposed Alternative, Use of Alternate ASME  
Code Case N-770-1 Baseline Examination (TAC No. MF6448)

Palisades Nuclear Plant  
Docket 50-255  
Renewed Facility Operating License No. DPR-20

- REFERENCES:
1. Entergy Nuclear Operations, Inc. letter, PNP 2015-043, *Relief Request Number RR 4-22 – Proposed Alternative, Use of Alternate ASME Code Case N-770-1 Baseline Examination*, dated July 7, 2015 (ADAMS Accession No. ML15190A262).
  2. Nuclear Regulatory Commission letter, *Palisades Nuclear Plant – Supplemental Information Needed for Acceptance of Relief Request Number RR 4-22 – Proposed Alternative, Use of Alternate ASME Code Case N-770-1 Baseline Examination (TAC No. MF6448)*, dated July 23, 2015 (ADAMS Accession No. ML15203A043).

Dear Sir or Madam:

In Reference 1, Entergy Nuclear Operations, Inc. (ENO) requested Nuclear Regulatory Commission (NRC) approval of a request for relief for a proposed alternative for the Palisades Nuclear Plant (PNP) pursuant to 10 CFR 50.55a(z)(2).

In Reference 2, the NRC requested supplemental information to facilitate its review of the proposed alternative.

**PROPRIETARY**

The enclosure contains confidential information submitted under 10 CFR 2.390. Withhold from public disclosure. When separated from the enclosure, the remainder of the submittal may be decontrolled.

A047  
NRR

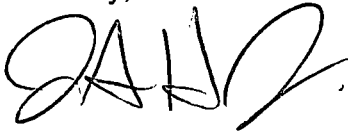
Attachment 1 contains the ENO response to the NRC request for supplemental information.

Attachment 2 provides a Structural Integrity Associates, Inc. (SI) proprietary authorization affidavit supporting the proprietary nature of the information contained on the portable drive in the enclosure. The affidavit sets forth the basis on which the information may be withheld from public disclosure by the NRC and addresses the specific considerations listed in paragraph (b) of 10 CFR 2.390, *Public inspections, exemptions, requests for withholding*. Accordingly, it is respectfully requested that the information which is proprietary to SI be withheld from public disclosure in accordance with 10 CFR 2.390.

The enclosure contains a one terabyte Seagate Backup Portable Drive (serial number NA7LMJGW) containing proprietary ANSYS computer code input, output, database, and results files for the SI flaw analysis calculations that supported the proposed alternative.

This letter contains no new commitments and no revised commitments.

Sincerely,

A handwritten signature in black ink, appearing to be 'JAH' followed by a stylized flourish.

JAH/jse

Attachment 1: Response to Request for Supplemental Information for Relief Request Number RR 4-22 Proposed Alternative

Attachment 2: Structural Integrity Associates, Inc. Affidavit Documentation

Enclosure: Portable Drive Containing Files for Structural Integrity Associates, Inc. Flaw Analysis Calculations (Proprietary)

cc: Administrator, Region III, USNRC (w/o enclosure)  
Project Manager, Palisades, USNRC (w/enclosure, portable drive serial number NA7LMJ67)  
Resident Inspector, Palisades, USNRC (w/o enclosure)

## ATTACHMENT 1

### Response to Request for Supplemental Information for Relief Request Number RR 4-22 Proposed Alternative

By letter dated July 7, 2015 (ADAMS Accession No. ML15190A262), Entergy Nuclear Operations, Inc. (ENO), proposed an alternative to 10 CFR 50.55a(g)(6)(ii)(F)(3) for the Palisades Nuclear Plant (PNP). This regulation defines the inspection requirement for branch connection butt welds at PNP in accordance with American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Case N-770-1, "Alternative Examination Requirements and Acceptance Standards for Class 1 PWR [Pressurized Water Reactor] Piping and Vessel Nozzle Butt Welds Fabricated With UNS N06082 or UNS W86182 Weld Filler Material With or Without Application of Listed Mitigation Activities," with NRC conditions.

In the proposed alternative, ENO requested an extension of the required inspection of the subject Alloy 82/182 branch connection welds in the primary coolant system for one cycle of operation as presented in Relief Request RR 4-22. The relief request was supported by a flaw analysis, which consisted of a report and calculations performed by Structural Integrity Associates, Inc. (SI). The calculations applied a finite element approach using ANSYS software to evaluate postulated flaws in the primary coolant system hot leg and cold leg branch connection welds.

By letter dated July 23, 2015 (ADAMS Accession No. ML15203A043), the Nuclear Regulatory Commission (NRC) requested supplemental information to enable the staff to make an independent assessment regarding the acceptability of the proposed alternative.

The ENO response to the request for supplemental information is provided below:

#### **NRC Request for Supplemental Information**

*NRC staff requests all input information available for the licensee's flaw evaluation model, which includes specific and detailed information on each interaction between the major steps of the analysis: (1) generation of finite element models, (2) weld residual stress simulation, and (3) fracture mechanics modeling to determine stress intensity factors. Examples of requested detailed information between each of these major steps are shown in the following:*

##### *(1) Generation of Hot leg and Cold Leg with Drain Nozzle Finite Element Models*

- 1. Geometric dimensions*
- 2. Modeling assumptions*
- 3. Material properties (elastic properties, elastic-plastic properties, creep properties)*
- 4. Mesh density, mesh density sensitivity*
- 5. Element types used*
- 6. Boundary conditions*

## ATTACHMENT 1

### Response to Request for Supplemental Information for Relief Request Number RR 4-22 Proposed Alternative

#### *(2) Weld Residual Stress Simulation*

- 1. The application of weld heat input and cooling affects*
- 2. Weld bead size*
- 3. Element types used*
- 4. Welding direction assumed*
- 5. The interactions between nodes to transmit stress effects*
- 6. The heat treatment application*
- 7. Post welding loading conditions that were applied*
- 8. Boundary conditions*
- 9. Solution process (such as element birth and death process in simulating the welding process)*

#### *(3) Fracture Mechanics Modeling to Determine Stress Intensity Factors*

- 1. Generation of crack into the finite element models of Step (1), which includes crack tip generation process, crack tip meshing, types of elements used for crack tip, crack tip nodal positions*
- 2. Process of mapping residual stresses from the weld residual stress analysis into the fracture mechanics models*
- 3. Post-processing extraction of stress intensity factors*
- 4. Stress intensity factors output*

### **ENO Response to Request for Supplemental Information**

The information provided in response to the NRC request for supplemental information is contained in the portable drive in the enclosure. This portable drive contains ANSYS computer code input, output, database, and results files for the SI flaw analysis calculations that support the Relief Request RR 4-22 submittal. These electronic files, together with the calculations that were previously submitted, contain specific and detailed information concerning the major steps of the calculations: (1) generation of finite element models, (2) weld residual stress simulation, and (3) fracture mechanics modeling to determine stress intensity factors.

## **ATTACHMENT 2**

### **Structural Integrity Associates, Inc. Affidavit Documentation**

Three Pages Follow

July 28, 2015

**AFFIDAVIT PURSUANT TO 10 CFR 2.390**

I, David W. Stager, state as follows:

- (1) I am the Chief Financial Officer of Structural Integrity Associates, Inc. (SI) and have been delegated the function of reviewing the proprietary information described in paragraph (2) which is sought to be withheld from public disclosure, and have been authorized to apply for its withholding.
- (2) The information sought to be withheld is contained in two (2) Seagate Backup Plus Portable Drives. Both portable drives are Model No. SRD00F1, and one is Serial Number NA7LMJGW and the other is Serial Number NA7LMJ67. These two (2) portable drives contain identical sets of SI electronic data files that are classified as "SI Proprietary Information" in accordance with the policies established by SI for the control and protection of proprietary and confidential information.
- (3) These (2) portable drives contain identical sets of electronic data files that are proprietary and confidential in nature and are of the type customarily held in confidence by SI and not made available to the public. Based on my experience, I am aware that other companies regard information of the kind contained in these two (2) portable drives as proprietary and confidential.
- (4) These two (2) portable drives have been made available to the U.S. Nuclear Regulatory Commission in confidence with the request that the information contained in these two (2) portable drives be received in confidence by the Commission and be withheld from public disclosure. The request for withholding of proprietary information is made in accordance with 10 CFR 2.390. The information for which withholding from disclosure is requested qualified under 10 CFR 2.390(a)(4), "Trade secrets and commercial or financial information obtained from a person and privileged or confidential."
- (5) The following criteria are customarily applied by SI to determine whether information should be classified as proprietary:

- (a) The information reveals details of SI's privately funded research and development plans and programs or their results.
- (b) Use of the information by a competitor would permit the competitor to significantly reduce its expenditures, in time or resources, to design, produce, or market a similar product or service.
- (c) The information includes test data or analytical techniques concerning a process, methodology, or component, the application of which results in a competitive advantage for SI.
- (d) The information reveals certain distinguishing aspects of a process, methodology, or component, the exclusive use of which provides a competitive advantage for SI in product optimization or marketability.
- (e) The information is vital to a competitive advantage held by SI, would be helpful to competitors to SI, and would likely cause substantial harm to the competitive position of SI.
- (f) The information requested to be withheld consists of patentable ideas.

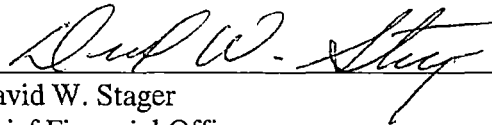
The information contained in these two (2) portable drives is considered proprietary for the reasons set forth in paragraphs (5)(a) through (5)(e) above.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of SI, because it would enhance the ability of competitors to provide similar analyses and engineering services without commensurate expenses.

In order for competitors of SI to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

I declare under penalty of perjury that the above information and request are true, correct, and complete to the best of my knowledge, information, and belief.

Executed at San Jose, California on this 28<sup>th</sup> day of July, 2015.



David W. Stager  
Chief Financial Officer  
Structural Integrity Associates, Inc.

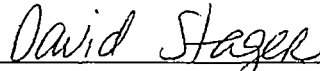
State of California

County of Santa Clara

Subscribed and sworn to (or affirmed) before me

on this 28<sup>th</sup> day of July, 2015,  
Date Month Year

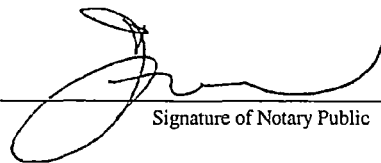
by



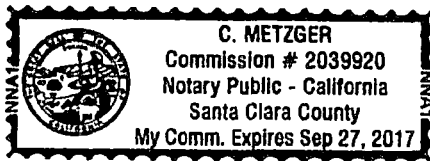
Name of Signer

proved to me on the basis of satisfactory evidence  
to be the person who appeared before me.

Signature



Signature of Notary Public



Place Notary Seal and/or Stamp Above



Structural Integrity Associates, Inc.®



**ENCLOSURE**

**Portable Drive Containing Files for  
Structural Integrity Associates, Inc. Flaw Analysis Calculations**

**PROPRIETARY**

**This enclosure contains confidential information submitted under 10 CFR 2.390. Withhold from public disclosure. When separated from this enclosure, the remainder of the submittal may be decontrolled.**

**One Portable Drive Enclosed**