Entergy

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Palisades Nuclear Plant
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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

Response to Request for Additional Information Regarding Relief Request from ASME Section XI Code requirements for Repair of Pressurizer Nozzle Penetrations

Dear Sir or Madam:

By letter dated September 15, 2006, Nuclear Management Company, LLC, former licensee for the Palisades Nuclear Plant (PNP), requested the Nuclear Regulatory Commission (NRC) review and approval of a relief request for an alternative repair technique for a pressurizer heater sleeve penetration repair at PNP. The alternate repair plan is to implement a Welding Services Incorporated/Structural Integrity Associates outer diameter pad plug design if a repair is necessary for the PNP pressurizer.

By electronic mail dated June 15, 2007, the NRC requested additional information on the proposed relief request. On July 17, 2007, a teleconference was held with the NRC to discuss the request for additional information. Enclosure 1 provides the Entergy Nuclear Operations response for the requested information.

Summary of Commitments

This letter contains no new commitments and no revision to existing commitments.

Christopher J. Schwarz
Site Vice President
Palisades Nuclear Plant

Enclosure (1)

CC Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC

ENCLOSURE 1
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION ON RELIEF REQUEST FOR REPAIR OF PRESSURIZER NOZZLE PENETRATIONS

By letter dated September 15, 2006, Nuclear Management Company, LLC, former licensee for the Palisades Nuclear Plant (PNP), requested the Nuclear Regulatory Commission (NRC) review and approval of a relief request for an alternative repair technique for a pressurizer heater sleeve penetration repair at PNP. The alternate repair plan is to implement a Welding Services Incorporated (WSI)/Structural Integrity Associates outer diameter pad plug design if a repair is necessary for the PNP.

By electronic mail dated June 15, 2007, the NRC requested additional information on the proposed relief request. On July 17, 2007, a teleconference was held with the NRC to discuss the request for additional information. Following are the Entergy Nuclear Operations, Inc. (ENO) responses to the requested information.

NRC RAI item 1

Step 1 of Attachment 1 on page 2 of 3 states that "cutting and removing a length of the heater sleeve does not cause cracking in the nozzle or in the J-groove weld." Briefly discuss the basis for this statement in terms of the cutting and removing method(s) to be utilized and their impact/effect as they relate to the nozzle and J-groove weld.

ENO Response

The contractor, WSI, has severed and removed approximately 195 heater sleeves successfully since 2003 without causing cracking or otherwise affecting the existing J-groove welds of the pressurizer sleeves.

WSI uses two different methods to perform the severing. The first method incorporates a twenty-pound tool that is suspended from an adjacent heater sleeve. This takes the entire load of the tool off of the sleeve being severed. This tool uses a .035" thick X 0.75" diameter abrasive wafer disk attached to a shaft that spins on an air fed turbine motor. The wafer disk severs the sleeve internal diameter (ID) at a single contact point and rotates 360 degrees inside of the sleeve. The radial severing feed rate and rotation speed are synchronized by computer with digital functions that are remotely controlled. The specific cut location is measured from the vessel surface and a fail safe stop indicator is attached to the tool to assure the proper location inside the sleeve is cut. The operator monitors the severing process. Once the sleeve is severed, the sleeve becomes loose and is easily removed from the penetration.

Using this severing method, no substantial loads are transferred to the J-prep groove welds because the weight of this severing tool is less than the weight of the heaters. Therefore, cutting and removing the heater sleeve will have no detrimental effect on the nozzle or J-groove weld.

The second method uses a tool that is much smaller and lighter than used in the first method. It also uses air to power a radial severing tool bit. This tool clamps directly onto the sleeve being severed. The tool bit rotates inside the sleeve to sever the sleeve

wall material using a cold machining process. This tool is manually operated and has not been designed for remote use.

Due to the small weight of this tool no substantial loads are transferred to the J-groove welds. Therefore, cutting and removing the heater sleeve will have no detrimental effect on the nozzle or J-groove weld.

Earlier designs of these tools left some scoring in the sleeve bore mock–ups that had to be removed by flapping. The tools today, however, have fail safes installed on them that eliminate "over cutting" or scoring the bores. Today there are no detrimental effects of the pressurizer bores resulting from use of either tool. After the severing is done and the pressurizer bore is flapped and a nondestructive examination (NDE) dye penetrant test (PT) performed. A visual inspection is then performed in the bore, to ensure cleanliness before a custom fit plug is installed.

NRC RAI item 2
Step 1 of Attachment 1 on page 2 of 3 states that "the heater sleeve has a tight fit with the sleeve penetration hole" and "removal of the severed sleeve is expected without applying force." Briefly discuss any contingent removal method(s) should the repair facility experience difficulty in removing a wedged nozzle. Include in your discussion any detrimental impact removal method(s) may have on the surrounding base metal including the nozzle opening as well as any Nondestructive evaluation (NDE) and repair method(s), as applicable.

ENO Response
WSI encountered some cases where leaks in the J-weld caused boron crystals to form in the annulus between the sleeve and wall, and the severed sleeves have been difficult to remove. WSI uses an expanding mandrel to grip the sleeve from the ID and tap it out using the slide hammer. WSI has only had one case in about 195 where the sleeve was so tight that the ID of the sleeve had to be machine bored to relieve the sleeve wall thickness so that it could be tapped out with the slide hammer.

Once the sleeves are removed, the bores are flapped to remove the oxides and NDE-PT is performed. WSI has not had any detrimental effects of the pressurizer bores due to extraction of the severed sleeves. Any marking of the bores would be removed by using a flapping wheel in preparation for the PT. Thereafter, bore dimensions are taken to machine a custom fit plug.

NRC RAI item 3
Step 2 of Attachment 1 on page 2 of 3 states the surface examination and ultrasonic (UT) examination of base material would be evaluated in accordance with the 2001/2003 Edition of ASME [American Society of Mechanical Engineers] *Section III,*

NB-5350 and NB-2532.1(b)(1), respectively. Please discuss your repair strategy if the base material inspection results identify indications exceeding the acceptance criteria.

ENO Response
If indications are identified during examination of the base metal they would be evaluated and/or repaired in accordance with ASME Section XI, 2001 edition, through the 2003 addenda requirements.

NRC RAI item 4
Briefly discuss method(s) to be used when verifying/measuring preheat and interpass temperatures in accordance with Code Case N-638-1, Section(s) 1.0(d) and 3.0(d), respectively. Please include within your discussion the surface examination method to be used should your method utilize weld-attached thermocouples per Code Case N-638-1 Section 4.0(c).

ENO Response
For preheat and interpass verification of the weld pads the contractor, WSI, would use contact pyrometers to measure the temperatures in accordance with Code Case N-638-1, Sections 1.0(d) and 3.0(d). The interpass temperature will be measured every three to five passes on the first three layers and every six to ten passes on subsequent layers. There are no plans to use weld-attached thermocouples.

NRC RAI item 5
Step 3 of Attachment 1 on page 2 of 3 indicates field machining may be necessary to shape the plug outside surface to the contour of the Pressurizer.

(a) Please discuss this process in terms of any lubricants that may be used and your actions to ensure cleanliness as well as complying with Section 3.0(e) of Code Case N-638-1.

(b) Include the methods to be used to ensure overall cleanliness of the penetration opening, plug material and weld pad surface as well as the interface or crevice area between the plug and Pressurizer penetration as it relates to a prospective point of contamination or flaw introduction during welding of the weld pad.

ENO Response
Shaping of the plug is typically performed prior to installing it or tack welding it into place in the pressurizer sleeve bore. The contractor, WSI, gathers a series of bore dimensions with a set of ID micrometers in the X and Y directions.

The dimensions are then used to custom machine an inconel 690 plug, on a shop lathe, that will tightly fit the sleeve bore. This on-site conducted machining is the referenced

field machining. The machine shaping operations do not affect the vessel cleanliness. The plug is machined on a shop lathe without any chemical lubricants.

Base material cleanliness is ensured by removing the mill scale in and within several inches around the sleeve penetrations. NDE-Magnetic Particle Testing (MT) is performed followed by NDE PT on the pressurizer surface and inside of the sleeve bore. All surfaces are cleaned with an acceptable residue-free solvent to remove all surface grit and contaminants.

Qualified NDE and welding personnel would clean, inspect and monitor to ensure that the annulus and weld region over and around the plug are free from potential sources of hydrogen or contaminants before and during the welding process.

NRC RAI item 6
Please provide material specification for shell base metal.

ENO Response
The Pressurizer base material is A-533 Grade B, Class 1, alloy steel.

NRC RAI item 7
Step 5 of Attachment 1 on page 3 of 3 discusses NDE of the welded pad.

(a) Please discuss your intentions concerning the condition on use of Code Case N-638-1 as shown in Regulatory Guide 1.147, Rev. 14 ["Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1"].

(b) Include your repair strategy if the welded pad pre-service inspection results identify indications that exceed the acceptance criteria.

ENO Response
The code reference for the acceptance criteria for the ultrasonic examination should be NB-5330 in accordance with Regulatory Guide 1.147, Rev. 14, for Code Case N-638-1, as specified in the conditional acceptance of the code case and not NB-5244 as is listed on page 3 of 3 of attachment 1.

Should pre-service inspection identify indications that exceed the acceptance criteria ENO would remove the rejectable indications by grinding and the welded pad would be repaired using qualified weld procedures in accordance with Code Case N-638-1, Section 2.0. The repairs would be subject to the same inspection requirements as the original weld.

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NRC RAI item 8

Step 3 of Attachment 1 on page 2 of 3 states that "The acceptance of the plug material is to be demonstrated in an ASME Section III compliance analysis." Please provide results of the compliance analysis.

ENO Response

If repairs are required, an ASME Section III analysis would be conducted. As a part of that analysis, the plug design would be in compliance with the Code requirements.