



GPU Nuclear Corporation

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U. S. Nuclear Regulatory Commission
Att: Document Control Desk
Washington, DC 20555

Dear Sir:

Subject: Oyster Creek Nuclear Generating Station (OCNGS)
Docket No. 50-219
Revision to NUREG-0619 Routine Inspection
Criteria for Feedwater and Control Rod Drive Return
Line Nozzles

By letter dated July 8, 1992, the staff requested that GPU Nuclear review and address the issues identified in their safety evaluation and provide a schedule indicating when the capability to detect thermal fatigue cracks with the phased-array UT technique would be available. In response to these requests, a meeting was held with the staff on July 23, 1992. A meeting summary and a request for the following additional information was issued by the staff on July 30, 1992:

1. The inspections GPUN has performed on the feedwater nozzles and control rod return line nozzle including safe ends and to what extent they were inspected. The inspections performed should be compared to NUREG-0619. In addition, the number of startup and shutdown cycles Oyster Creek has experienced during its operation since Cycle 7 should also be included.
2. Provide the results of the phased-array UT performed on the Oyster Creek mock-up including thermal fatigue cracks.

In response to request number 1, Enclosure 1 identifies the inspections performed during past refueling outages (7R through 13R). Enclosures 2 and 3 summarize the GPU Nuclear correspondence regarding the schedules for liquid penetrant and ultrasonic testing, respectively.

The number of start-up/shut-down cycles between 7R outage and the present is 94.

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With respect to request number 2, the demonstration of the phased-array UT technique to detect thermal fatigue cracks has been scheduled and the staff has been invited to observe the demonstration process. The results and acceptability of the phased-array UT technique to detect and characterize thermal fatigue cracks should be apparent at that time.

As identified in the July 30, 1992 meeting summary, GPU has proposed the following:

1. Utilize the phased-array ultrasonic test (UT) technique as a primary method to detect, characterize and monitor flaws in the feedwater and control rod drive return line nozzles.
2. Eliminate routine liquid penetrant (PT) examinations of feedwater and control rod drive return line nozzles.
3. Defer feedwater nozzle UT from 14R (November 1992) to 15R (October 1994) so feedwater and control rod drive return line nozzles are inspected in the same outage with a fully Appendix VIII, Section XI, ASME qualified procedure.
4. Following successful Appendix VIII UT qualification, demonstration of adequate sensitivity for Oyster Creek specific assumed flaw sizes and successful 15R examination with no cracks, perform UT inspections once each Inservice Inspection (ISI) interval (every 10 years) in accordance with the ASME Code.

During the July 23, 1992 meeting with the staff, GPU Nuclear was informed that a decision on the above proposals could not be made at that time because of the generic implications and impact on the inspection methods and frequency established by NUREG-0619, "BWR Feedwater (FW) Nozzle and Control Rod Drive Return Line (CRDRL) Nozzle Cracking".

The 14R outage is currently scheduled to start on November 28, 1992. In order to support this schedule, we request a timely response to items 1, 2 and 3. A response to item number 4 is not necessary at this time to support the upcoming outage.

If there are any questions please contact Mr. Michael Laggart at (201) 316-7968.



J. C. DeVine
Vice President and Director
Technical Functions

JCDV/EJP:lga
Attachments

cc: Administrator, Region I
Senior Resident Inspector
Oyster Creek NRC Project Manager

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REFUELING OUTAGE EXAMINATIONS

REFUELING OUTAGE	NUREG-D619 WORK COMPLETED
7R 04/23/77-08/04/77	PT - FW Nozzles (See Note 1.) PT - CRDRL Nozzle - No indications FW Nozzle Repairs Installed improved FW sparger and thermal sleeve Assembly having a single piston ring seal and flow baffles for FW nozzles. Installed new thermal sleeve and baffle design for the CRDRL nozzle.
8R 09/16/78-12/08/78	Visual - FW Sparger
9R 01/05/80-07/16/80	Visual - FW Sparger
10R 02/12/83-11/03/84	Visual - FW Sparger Visual - CRDRL Nozzle
11R 04/11/86-12/21/86	Visual - FW Sparger
12R 09/30/88-05/11/89	UT - Feedwater Nozzles (See Note 2.) Visual - FW Sparger Visual - CRDRL Nozzle
13R 02/16/91-06/28/91	JT - Control Rod Drive Return Line Nozzle Visual - FW Sparger Visual - CRDRL Nozzle

REFUELING OUTAGE EXAMINATIONS

NOTE 1: During the 7R refueling outage, the extent of the liquid penetrant examination coverage was the cladded surface. This area extended into the nozzle approximately 8 inches, measured from the vessel's ID wall. During the actual examinations, liquid penetrant interpretations were made in the adjacent uncladded bore region, where the extent of coverage was limited to approximately 3-4 inches.

NOTE 2: NUPEG 0619, section 4.3.2.3 (UT Inspection and Subsequent PT of Recordable Indications) requires an external UT examination of all feedwater nozzle safe ends, bores and inside blend radii. During the 12R refueling outage, an external ultrasonic examination was performed for detecting both axial and circumferential flaws in the four feedwater nozzles. The extent of coverage was the nozzle safe end to nozzle weld on the entire surface from the nozzle boss transition to the safe-end transition, the inside blend radii, the nozzle bore region and the vessel shell to nozzle weld. A small segment of the safe end, approximately 3 inches of the outboard side, was not examined during the 12R inspection. No reportable indications were detected.

ROUTINE PT INSPECTIONS OF FW/CRDRL NOZZLES

CHRONOLOGY OF CORRESPONDENCE

LETTER REFERENCE	SUMMARY	COMMENT
04/09/81	GPUN commits to perform routine PT during Cycle 13 refueling outage.	Original commitment to NUREG-0619
08/25/81	GPUN confirms commitment to inspect CRDRL nozzle at frequency and by method in NUREG-0619, Paragraph 8.2(5)	As a result of NRC 7/20/81 request
11/29/82	PT moved up from Cycle 13 to Cycle 11 refueling outage.	More efficient use of personnel for both economic and ALARA considerations
07/26/8	NRC informed that GPUN would not plan on proceeding with internal PT inspections.	GPUN believes UT inspection will substantiate lack of significant nozzle cracking.
11/20/85	GPUN states that PT examinations will only be performed during Cycle 12 refueling outage should flaws be detected by UT examination which would compromise nozzle integrity	UT inspection should be able to detect flaws which would compromise nozzle integrity. An evaluation of findings would determine if PT is necessary for further investigation.
	GPUN also informed NRC that, based upon the sensitivity of the UT technique during 12R, it will be determined as to whether a PT exam is required during 13R.	Based on successful application of the Phased-Array UT techniques.
01/18/90	GPUN informs NRC that UT is a suitable alternative to PT exams and that it would provide the basis for eliminating the 13R PT exam for FW/CRDRL nozzles in a separate submittal.	Based on successful application of UT on FW nozzles during 12R and FW mock-up testing.
	GPUN also informed NRC that no PT examinations of the internal diameters of the nozzles were performed.	Based on finding no reportable indications during the 12R UT inspection.

ENCLOSURE 2 (CONT'D)

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ROUTINE PT INSPECTIONS OF FW/CRDRL NOZZLES

CHRONOLOGY OF CORRESPONDENCE

LETTER REFERENCE	SUMMARY	COMMENT
07/12/90	<p>GPUN informs NRC of proposal to defer the 13R PT exam for FW Nozzles, future PT exam of CRDRL Nozzles, replace routine PT exams of FW nozzles with UT exams.</p> <p>GPUN states that PT examinations will only be performed should flaws be detected by UT examination which would compromise nozzle integrity.</p>	<p>Based on successful application of UT on FW nozzles during 12R, FW mock-up testing, CRDRL mock-up testing.</p> <p>Based on sensitivity and successful application of Phased-Array technique during upcoming 13R.</p>
04/18/91	GPUN informs NRC that there is a technical basis to revise the NUREG-0619 inspection intervals for nozzles.	Based on successful application of UT on FW & CRDRL Nozzles in service and with FW & CRDRL mock-up tests.
04/08/92	GPUN proposes changes to NUREG-0619 inspection intervals. Specifically, to delete routine PT, unless flaws which would compromise nozzle integrity are detected.	Based on successful application of UT technique, use of fracture mechanics and commitment to demonstrate UT can detect thermal fatigue cracks.

ENCLOSURE 3

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UT EXAMINATION OF FW/CRDRL NOZZLES

CHRONOLOGY OF CORRESPONDENCE

LETTER REFERENCE	SUMMARY	JUSTIFICATION
04/09/81	UT inspection to begin during Cycle 10 refueling outage.	Original commitment
11/29/82	GPUN revises UT of FW nozzles from Cycle 10 to Cycle 11 reload outage.	Due to analysis showing tendency toward further cracking would be eliminated per design changes, visual inspection results of spargers during Cycles 8 & 9 reload outages, expected crack growth limitations.
07/26/85 11/20/85	GPUN revises UT inspection of FW nozzles from Cycle 11 to Cycle 12 refueling outage.	To reduce Cycle 11 refueling outage scope and because the results of tests and analyses which demonstrate that any previously undetected flaws in the FW nozzles will not grow to an unacceptable size.
01/18/90	GPUN reports that during 12R it completed a UT examination of weld, inner radii and inner bore of FW nozzle.	Reported FW UT inspection results.
07/12/90	GPUN proposes to replace PT of CRDRL nozzle with UT during 13R, defer the 13R PT exam for FW nozzles, replace future PT exams of FW/CRDRL nozzles with UT exams.	This is based on the successful demonstration of the UT technique on FW and CRDRL mock-ups and inservice FW UT inspection.
04/18/91	GPUN informs the NRC that there is a technical basis to revise the NUREG-0619 inspection intervals for nozzles.	Based on successful application of UT on FW & CRDRL nozzles in service and with FW & CRDRL mock-up tests.

ENCLOSURE 3 (CONT'D)

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UT EXAMINATION OF FW/CRDRL NOZZLES

CHRONOLOGY OF CORRESPONDENCE

LETTER REFERENCE	SUMMARY	JUSTIFICATION
04/08/92	<p>GPUN proposes to eliminate future routine PT inspections and perform UT inspections of FW and CRDRL nozzles once each ISI period.</p> <p>GPUN proposes to defer the FW UT inspection from 14R to 15R.</p>	<p>This is based on the successful demonstration of the UT technique on FW & CRDRL nozzles and mock-ups, the upcoming demonstration of UT to detect thermal fatigue cracks and Fracture Mechanics analysis.</p> <p>This is based on Fracture Mechanics analysis which shows that a small flaw will not grow significantly by 15R.</p>