WASHINGTON PUBLIC POWER SUPPLY SYSTEM

NUCLEAR POWER PLANT NO. 2

FEEDWATER NOZZLE INSPECTION REPORT

SPRING, 1990

Prepared by:	O. Jones TFHoyer 1/16/91 O. Jones ISI Engineer	1-15-91 Date
Reviewed by:	CR Noyes CR Noyes Manager, Engineering Systems Support	1/15/91 Date
	RL Koenigs RL Koenigs Manager, Generation Engineering	1/18/91 Date
	RL Webring RL Webring Manager, Plant Technical	1/18/91 Date
Approved by:	JW Baker JW Baker Plant Manager	1/23/91 Date

SUMMARY

This report addresses reactor vessel feedwater nozzle inspections for WNP-2 performed during the fifth refueling outage (RF90A, April 1990). This report is required by NUREG-0619, Section 4.4.3.

In response to NUREG-0619, the Supply System WNP-2 Inservice Inspection Program Plan committed to ultrasonically examining at least one feedwater nozzle bore, inner diameter radius and safe-end from the reactor outside diameter (OD) for six successive refueling outages. If no indications resulting from service-induced outages are found during this time period, subsequent inservice examinations of feedwater nozzles are to be performed in accordance with normal ASME Section XI requirements.

The plant experienced eight (8) startup/shutdown cycles from startup after the RF89A outage in June 1989 to shutdown in April 1990 for the RF90A outage, including shutdown for R5.

The low-flow control valves RFW-FCV-10A and RFW-FCV-10B, installed during RF87A (Spring 1987), continued to perform well. These valves replaced the RFW-FCV-10 valve to minimize thermal cycling of the RFW nozzles caused by the on/off mode in which the RFW-FCV-10 valve controlled RFW level during low-flow/startup conditions.

No recordable indications were found in the ultrasonic examinations of one reactor feedwater nozzle (FW-N4-IR @ 270 and FW-N4-BORE @ 270) and safe-end region (SE to N4) at the RF90A refueling outage .

NDE EXAMINATION

During WNP-2 refueling outage RF90A, the Supply System performed ultrasonic examination of one reactor feedwater nozzle safe-end, bore and inner radius from the vessel OD.

The Supply System has developed an angle beam shear wave technique that is unique to the WNP-2 feedwater nozzle design. The procedure was qualified on the WNP-2 feedwater mock-up, which is a feedwater nozzle from the scrapped Douglas Point Unit 1 reactor vessel. The inner radius, Zone 1, of the nozzle is scanned using a 72 degree angle transducer. The inner radius, Zone 2, and bore region, Zone 3, are scanned using a 25 degree angle transducer. The UT procedures used for examination, QCI 6-4 and QCI 6-13, are contained in Appendix I. Any changes to procedures that affect UT scanning techniques are verified on the feedwater nozzle mock-up.

Calibration data for reactor feedwater nozzle inner radius examinations have been predetermined using the WNP-2 feedwater nozzle mock-up. This allows the examiner to use the reactor vessel calibration block representing the shell course containing the feedwater nozzle for calibration. The transfer data is contained in Table I of procedure QCI 6-4. Indications that exceed 25% full screen height (FSH) are recorded and indications that exceed 50% FSH are evaluated.

The examinations were performed by Supply System and General Electric examiners certified to either Level II or Level III UT.

No recordable indications were found. The Supply System has examined four other RFW nozzles during previous refueling outages, using the same UT technique. No recordable indications were found in this nozzle or the previous four nozzles examined.

The three examiners performing the UT examinations on the nozzle and safe-end extension received a total radiation dosage of 0.610 Man Rem.

LEAKAGE MONITORING

WNP-2 does not have on-line leakage monitoring for the RFW sparger. Reference FSAR Section 5.2.4.10.

STARTUP/SHUTDOWN CYCLES

WNP-2 experienced eight (8) startup/shutdown cycles since the last feedwater nozzle inspection report was issued for RF89A. There were seven (7) startup/shutdowns from June 25, 1989 to September 21, 1989, but no others until the manual shutdown on April 21, 1990 for the RF90A outage.

This brings the total cycles since initial heat up in April 1984 to 88. The data covering RF89A-RF90A was compiled from the Monthly Core Energy Output worksheets.

EXAMINATION OF RFW NOZZLES AFTER COASTDOWN

Whenever feedwater temperature reduction is used to extend the fuel cycle, the Supply System has committed to performing a volumetric examination on one feedwater nozzle during the subsequent outage. Reference letter from G.Sorensen (WPPSS) to NRC, dated February 14, 1990 (G02-90-024), in support of issuance of Amendment No. 77 (Facility Operating License No. NPF-21) for adding Section 3/4.1.6, "Reactivity Control Systems, Feedwater Temperature".

No recordable indications were found in the ultrasonic examinations of the reactor feedwater nozzle (FW-N4-IR @ 270 and FW-N4-BORE @ 270) and safe-end region (SE to N4) at the RF90A refueling outage, as noted in the SUMMARY..

NEXT SCHEDULED EXAMINATION

The Supply System will perform an ultrasonic examination from the outside diameter (OD) of the reactor vessel on the remaining reactor feedwater nozzle inner radius, bore and safe-end (6th of 6 nozzles) per the commitment in FSAR Section 5.2.4.10 and the Inservice Inspection Program Plan Section 5.3.2 during the refueling outage scheduled for Spring 1991 (RF91A).

REFERENCES

1. Feedwater Nozzle Inspection Report for Refueling Outage R86A, November 25, 1986.
2. Feedwater Nozzle Inspection Report for Refueling Outage RF87A December 7, 1987.
3. Feedwater Nozzle Inspection Report for Refueling Outage RF88A December 14, 1988.
4. Feedwater Nozzle Inspection Report for Refueling Outage RF89A December 27, 1989.