

**ENERGY
NORTHWEST**

P.O. Box 968 ■ Richland, Washington 99352-0968

December 20, 2001
GO2-01-168

Docket No. 50-397

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

Gentlemen:

Subject: **COLUMBIA GENERATING STATION, OPERATING LICENSE NPF-21
FEEDWATER NOZZLE INSPECTION REPORT
R-15 MAINTENANCE AND REFUELING OUTAGE**

Reference: Letter G02-95-268, dated December 8, 1995, JV Parrish (Energy Northwest) to
NRC, "WNP-2 Feedwater Nozzle Inspection Report"

The Columbia Generating Station Feedwater Nozzle Inspection Report for the R-15
Maintenance and Refueling Outage is attached. This report is submitted pursuant to section
4.4.3.1(2) of NUREG-0619, "BWR Feedwater Nozzle and Control Rod Drive Return Line
Nozzle Cracking."

Should you have any questions or desire additional information pertaining to this report, please
call RN Sherman at 509-377-8616.

Respectfully,



DW Coleman, Manager
Performance Assessment and Regulatory Programs
Mail Drop PE20

Attachment

cc: EW Merschoff - NRC - RIV
JS Cushing - NRC - NRR
JO Luce - EFSEC

NRC Sr. Resident Inspector - 988C
DL Williams - BPA/1399
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IB01

COLUMBIA GENERATING STATION FEEDWATER NOZZLE INSPECTION REPORT R-15 MAINTENANCE AND REFUELING OUTAGE

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I. Introduction

This report is submitted pursuant to the Energy Northwest response to NUREG-0619, in which Columbia Generating Station committed to perform ultrasonic examinations of at least one of the six feedwater nozzle inner radii, bore and safe-end regions from the reactor outside diameter during each refueling outage.

This report covers the period from October 24, 1999, to July 2, 2001, and includes reactor vessel feedwater nozzle inspections performed during the Columbia Generating Station R-15 Maintenance and Refueling Outage (R-15).

No unacceptable indications were found during this inspection period. The feedwater sparger flow hole cracking found during the R-13 Maintenance and Refueling Outage (R-13) was reexamined during R-15.

II. Report Content

The report content is herein presented in accordance with the reporting guidance of Section 4.4.3.1(2) of NUREG-0619.

- (a) Number of startup/shutdown cycles since the previous inspection and total number of cycles:

There were six startup/shutdown cycles from the date of the previous feedwater nozzle inner radius examination (September 1999) to when the plant was shutdown in May 2001 in preparation for R-15.

The total number of reactor feedwater thermal cycles, due to startups and shutdowns since initial startup and testing of the plant in April 1984, is 73.

- (b) Summary of methods used and results of previous inspections:

Energy Northwest has developed an angle beam shear wave technique for the Columbia Generating Station feedwater nozzle design. The technique was qualified on the Columbia Generating Station feedwater mock-up, which is a feedwater nozzle from the terminated Douglas Point Unit 1 reactor vessel. The inner radius (Zone 1) of the nozzle is scanned using a 70-degree angle transducer. The inner radius (Zone 2) and bore region (Zone 3) are scanned using a 25-degree angle transducer.

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The Ultrasonic Testing (UT) procedure used for the examinations is Energy Northwest NDE&I Instruction QCI 6-4 "Ultrasonic Examination of Feedwater Nozzle Inner Radii." A copy of QCI 6-4 was included in the R-10 feedwater nozzle inspection report (Reference). Changes to this procedure that affect UT scanning techniques are verified on the feedwater nozzle mock-up. No changes to this procedure have been made since the R-10 submittal.

Calibration data for reactor feedwater nozzle inner radius examinations have been predetermined using the Columbia Generating Station feedwater nozzle mock-up. This validates the use of the reactor vessel calibration block representing the shell course containing the feedwater nozzle for calibration.

Indications that exceed 25 percent full-screen-height are recorded. Indications that exceed 50 percent full-screen-height are evaluated. No indications meeting the threshold for recording or evaluation have been detected in previous examinations.

Previous examination during R-13 detected cracking around the feedwater sparger flow holes. This remote visual examination of the feedwater spargers was performed using a 0.001-inch wire for resolution.

- (c) Changes in feedwater system or operating procedures that affect feedwater flow or temperature and that should be considered in predicting future cracking tendencies based on past history:

There were no changes to the feedwater system or operating procedures since the R-14 Maintenance and Refueling Outage that could potentially increase the tendency for nozzle cracking.

- (d) Discussion of R-15 inspection results:

Feedwater Nozzle Inner Radius:

Ultrasonic examination of one reactor feedwater nozzle inner radius, bore and nozzle to safe-end weld at azimuth 90 from the vessel-outside diameter was performed during R-15.

Energy Northwest and General Electric examiners certified to either Level II or Level III UT performed the examinations.

No indications were detected that met the threshold for recording or evaluation.

Feedwater Sparger:

Cracks in the flow holes were recorded and mapped. Engineering evaluation concluded that operation for one fuel cycle is acceptable. The sparger will be reexamined and reevaluated during the R-16 Maintenance and Refueling Outage (R-16).

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(e) On-line leakage monitoring data:

The design of Columbia Generating Station does not incorporate on-line leakage monitoring for the reactor feedwater sparger.

(f) Information regarding UT crack-like indications and any subsequent liquid penetrant information:

No crack-like indications were observed.

III. Next Scheduled Examination.

The next examination is scheduled for R-16 (Spring 2003).