

BWR FEEDWATER NOZZLE  
INSERVICE INSPECTION SUMMARY REPORT  
FOR  
GRAND GULF NUCLEAR STATION  
COMMERCIAL OPERATING DATE: JULY 1, 1985

REPORT NUMBER: NUREG-0619-00006  
REFERENCE: NUREG-0619

OWNER/OPERATOR  
ENTERGY OPERATIONS, INC.  
ECHELON ONE  
P. O. BOX 31995  
JACKSON, MS. 39286-1995

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11/5/98

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According to NUREG-0619, a detailed report must be submitted to the Nuclear Regulatory Commission discussing the inspections performed on the Feedwater Nozzle Blend Radii and Bore Regions (Inner Radius) and Nozzle-to-Safe-End Welds. Program Plan M-489.1, Inservice Inspection Program, is in compliance with the requirements of Table 2 of NUREG-0619, which require augmented volumetric examinations of these areas. This report summarizes the inspections performed since the previous report through RFO9.

The volumetric exams were performed by Franatome Technologies under contract to Entergy Operations, Inc. The data reports for all examinations are available for review upon request.

To provide the Nuclear Regulatory Commission with the requested information, this report is being presented in the following format. Each item listed in Paragraph 4.4.3.1(2) of NUREG-0619 is addressed separately.

### a. Startup/Shutdown Cycles

1. Total number of cycles at Grand Gulf: 111; total includes 46 scrams, 65 heatups and their respective cooldowns.
2. Total number of cycles since the previous volumetric examinations on the blend radii: 8; total includes 5 scrams, 3 heatups and their respective cooldowns.
3. Total number of cycles since the previous surface examinations on the blend radii: 111; total includes 46 scrams, 65 heatups and their respective cooldowns.
4. Total number of cycles since the previous volumetric examinations on the nozzle-to-safe-end welds: 8; total includes 5 scrams, 3 heatups and their respective cooldowns.
5. Total number of cycles since the previous surface examinations on the nozzle-to-safe-end welds:

N4A and N4B: 55; total includes 25 scrams, 30 heatups and their respective cooldowns.

N4C and N4D: 47; total includes 20 scrams, 27 heatups and their respective cooldowns.

N4E and N4F: 24; total includes 10 scrams, 14 heatups and their respective cooldowns.

### b. Summary of Methods Used and Results of Previous Inspections

The volumetric exams performed during RFO9 were the sixth examinations performed in accordance with NUREG-0619 since the preservice examinations. During RFO9, volumetric exams were performed on all six (6) of the nozzle blend radii and bore regions (inner radius) and two of the six nozzle-to-safe end welds, N4A and N4B.

Refer to Tables 1 and 2 (attached) for examination method, results, and date examinations were performed.

**c. System Changes and Changes in Operating Procedures**

There have not been any system changes or changes to operating procedures that would affect system temperature or flow during this period.

**d. Inspection Results**

During RFO9 volumetric exams were performed on all six feedwater nozzle blend radii, bore regions (inner radii) as well as on two nozzle-to-safe end welds, N4A and N4B.

No indications were recorded on the blend radii, bore region, or nozzle-to-safe end welds which required evaluation in accordance with ASME Section XI.

Final analysis of the ultrasonic examination data was performed and found to be acceptable in accordance with GGNIS-M-489.2, Program Plan For The Performance of ASME Section XI Examinations.

**e. Leakage Monitoring**

Grand Gulf has not installed any type of on-line leakage monitoring system capable of detecting leakage through degraded seals on the feedwater spargers.

**f. Information Regarding UT Crack-like Indications and Any Subsequent PT indications**

No UT crack-like indications were detected, therefore no penetrant testing was required.

**TABLE 1**  
 Inner Radius  
 Page 1 of 3

ID/ AZIMUTH	EXAM TYPE	PROCEDURE	RESULTS	DATE
N4A @ 30°	UT	GG21A3802AB	No Recordable Indications	09/19/78
	PT	GG21A3809AA (RADIUS & BORE)	2 Areas Of Recordable Indications	04/07/80
	UT	UT-23-380 ATT. "A" ZONE 1	No Recordable Indications	12/19/80
	UT	UT-23-380 ATT. "B" ZONE 2	No Recordable Indications	12/19/80
	UT	UT-23-380 ATT. "C" ZONE 3	No Recordable Indications	12/19/80
	UT	UT-28	No Recordable Indications	10/20/86
	UT	UT-23	No Recordable Indications	04/14/89
	UT	UT-23	No Recordable Indications	05/22/92
	UT	83A6042	1 Area Of Recordable Indication	05/06/95
	UT	QAI 9.60	No Recordable Indications <sup>1</sup>	05/05/98
N4B @ 90°	UT	GG21A3802AB	No Recordable Indications	09/19/78
	PT	GG21A3809AA (RADIUS & BORE)	No Recordable Indications	04/07/80
	UT	UT-23-380 ATT. "A" ZONE 1	No Recordable Indications	12/19/80
	UT	UT-23-380 ATT. "B" ZONE 2	No Recordable Indications	12/19/80
	UT	UT-23-380 ATT. "C" ZONE 3	No Recordable Indications	12/19/80
	UT	UT-28	No Recordable Indications	10/20/86
	UT	UT-23	No Recordable Indications	04/14/89
	UT	UT-23	No Recordable Indications	05/22/92
	UT	83A604	2 Areas Of Recordable Indications	05/06/95
	UT	QAI 9.60	No Recordable Indications <sup>1</sup>	05/06/98

<sup>1</sup> The previous exams exhibited non-relevant reflectors generated from geometry and mode conversion (GIN 95/01768). Current techniques (QAI 9 60) uses computer optimized beam paths that produce no reflectors in the absence of flaws.

**TABLE 1**  
 Inner Radius  
 Page 2 of 3

ID/ AZIMUTH	EXAM TYPE	PROCEDURE	RESULTS	DATE
N4C @ 150°	UT	GG21A3802AB	No Recordable Indications	09/19/78
	PT	GG21A3809AA (RADIUS & BORE)	No Recordable Indications	04/07/80
	UT	UT-23-380 ATT. "A" ZONE 1	No Recordable Indications	12/19/80
	UT	UT-23-380 ATT. "B" ZONE 2	No Recordable Indications	12/19/80
	UT	UT-23-380 ATT. "C" ZONE 3	No Recordable Indications	12/19/80
	UT	UT-28	No Recordable Indications	10/20/86
	UT	UT-23	No Recordable Indications	04/14/89
	UT	UT-23	No Recordable Indications	05/22/92
	UT	83A6042	4 Areas Of Recordable Indications	05/06/95
	UT	QAI 9.60	No Recordable Indications <sup>1</sup>	05/06/98
N4D @ 210°	UT	GG21A3802AB	No Recordable Indications	09/19/78
	PT	GG21A3809AA (RADIUS & BORE)	No Recordable Indications	04/07/80
	UT	UT-23-380 ATT. "A" ZONE 1	No Recordable Indications	12/19/80
	UT	UT-23-380 ATT. "B" ZONE 2	No Recordable Indications	12/19/80
	UT	UT-23-380 ATT. "C" ZONE 3	No Recordable Indications	12/19/80
	UT	UT-28	No Recordable Indications	10/20/86
	UT	UT-23	No Recordable Indications	04/14/89
	UT	UT-23	No Recordable Indications	05/22/92
	UT	83A6042	2 Areas Of Recordable Indications	05/06/95
	UT	QAI 9.60	No Recordable Indications <sup>1</sup>	05-06-98

<sup>1</sup> The previous exams exhibited non-relevant reflectors generated from geometry and mode conversion (GIN 95/01768). Current techniques (QAI 9.60) uses computer optimized beam paths that produce no reflectors in the absence of flaws.

TABLE 1  
 Inner Radius  
 Page 3 of 3

ID/ AZIMUTH	EXAM TYPE	PROCEDURE	RESULTS	DATE
N4E @ 270°	UT	GG21A3802AB	No Recordable Indications	09/19/78
	PT	GG21A3809AA (RADIUS & BORE)	No Recordable Indications	04/07/80
	UT	UT-23-380 ATT. "A" ZONE 1	No Recordable Indications	12/19/80
	UT	UT-23-380 ATT. "B" ZONE 2	No Recordable Indications	12/19/80
	UT	UT-23-380 ATT. "C" ZONE 3	No Recordable Indications	12/19/80
	UT	UT-28	No Recordable Indications	10/20/86
	UT	UT-23	No Recordable Indications	04/14/89
	UT	UT-23	No Recordable Indications	05/20/92
	UT	83A6042	No Recordable Indications	05/06/95
	UT	QAI 9.60	No Recordable Indications	05-06-98
	N4F @ 330°	UT	GG21A3802AB	No Recordable Indications
PT		GG21A3809AA (RADIUS & BORE)	No Recordable Indications	04/07/80
UT		UT-23-380 ATT. "A" ZONE 1	No Recordable Indications	12/19/80
UT		UT-23-380 ATT. "B" ZONE 2	No Recordable Indications	12/19/80
UT		UT-23-380 ATT. "C" ZONE 3	No Recordable Indications	12/19/80
UT		UT-28	No Recordable Indications	10/20/86
UT		UT-23	No Recordable Indications	04/14/89
UT		UT-23	No Recordable Indications	05/20/92
UT		83A6042	No Recordable Indications	05/06/95
UT		QAI 9.60	No Recordable Indications	05-05-98

**TABLE 2**

Nozzle-To-Safe End

Page 1 of 3

ID/ AZIMUTH	EXAM TYPE	PROCEDURE	RESULTS	DATE
N4A @ 30°	PT	PT-01-390	No Recordable Indications	01/09/81
	PT	PT-04-390	No Recordable Indications	04/12/83
	PT	QAP 9.50	No Recordable Indications	09/21/86
	UT	UT-22-380	No Recordable Indications	02/19&25/81
	UT	UT-22-380	1 Recordable Indication	04/12/83
	UT	UT-51	Non-Relevant/Inside Surface Geometry	10/06/86
	UT	UT-51	Non-Relevant/Inside Surface Geometry	04/12/89
	UT	GE-UT-209	Non-Relevant/Inside Surface Geometry	05/21/92
	UT	QAI 9.22/4	No Recordable Indications	05/08/95
	UT	54-151-131-00	No Recordable Indications	05/05/98
	PT	QAI 9.30	No Recordable Indications	05/05/98
N4B @ 90°	PT	PT-01-390	No Recordable Indications	01/09/81
	PT	PT-04-390	No Recordable Indications	04/12/83
	PT	QAP 9.50	No Recordable Indications	09/21/86
	UT	UT-22-380	No Recordable Indications	02/19&25/81
	UT	UT-22-380	3 Recordable Indications	04/12/83
	UT	UT-51	Non-Relevant/Inside Surface Geometry	10/06/86
	UT	UT-51	Non-Relevant/Inside Surface Geometry	04/10/89
	UT	GE-UT-209	Inside Surface Geometry	05/21/92
	UT	QAI 9.22/4	No Recordable Indications	05/06/95
	UT	54-151-131-00	No Recordable Indications	05/05/98
	PT	QAI 9.30	No Recordable Indications	05/06/98



**TABLE 2**

Nozzle-To-Safe End

Page 2 of 3

ID/ AZIMUTH	EXAM TYPE	PROCEDURE	RESULTS	DATE
N4C @ 150°	PT	PT-01-390	No Recordable Indications	01/09/81
	PT	PT-04-390	No Recordable Indications	04/12/83
	UT	UT-22-380	3 Recordable Indications	02/19&25/81
	UT	UT-22-380	12 Recordable Indications	04/12/83
	UT	UT-51	Non-Relevant/Inside Surface Geometry	10/06/86
	PT	PT-SR	No Recordable Indications	03/21/89
	UT	UT-51	Non-Relevant/Inside Surface Geometry	04/12/89
	UT	GE-UT-209	Inside Surface Geometry	05/22/92
	UT	QAI 9.22/4	2 Recordable Indications	05/06/95
N4D @ 210°	PT	PT-01-390	No Recordable Indications	01/09/81
	PT	PT-04-390	No Recordable Indications	04/12/83
	UT	UT-22-380	No Recordable Indications	2/19&25/81
	UT	UT-22-380	3 Recordable Indications	04/12/83
	UT	UT-51	Non-Relevant/Inside Surface Geometry	10/09/86
	PT	PT-SR	No Recordable Indications	03/21/89
	UT	UT-51	Non-Relevant/Inside Surface Geometry	04/07/89
	UT	GE-UT-290	Non-Relevant/Inside Surface Geometry	05/22/92
	UT	QAI 9.22/4	No Recordable Indications	05/08/95

**TABLE 2**

Nozzle-To-Safe End

Page 3 of 3

ID/ AZIMUTH	EXAM TYPE	PROCEDURE	RESULTS	DATE
N4E @ 270°	PT	PT-01-390	1 Recordable Indications	01/09/81
	PT	PT-04-390	No Recordable Indications	04/12/83
	UT	UT-22-380	No Recordable Indications	02/19&25/81
	UT	UT-22-380	6 Recordable Indications	04/12/83
	UT	UT-51	Non-Relevant/Inside Surface Geometry	10/07/86
	UT	UT-51	Non-Relevant/Inside Surface Geometry	04/11/89
	PT	QAI 9.13	No Recordable Indications	05/09/92
	UT	GE-UT-209	Non-Relevant/Inside Surface Geometry	05/21/92
	UT	QAI 9.22/4	4 Recordable Indications	05/06/95
N4F @ 330°	PT	PT-01-390	No Recordable Indications	01/09/81
	PT	PT-04-390	No Recordable Indications	04/12/83
	UT	UT-22-380	No Recordable Indications	2/19&25/81
	UT	UT-22-380	3 Recordable Indications	04/12/83
	UT	UT-51	Non-Relevant/Inside Surface Geometry	10/07/86
	UT	UT-51	Non-Relevant/Inside Surface Geometry	04/11/89
	PT	QAI 9.13	No Recordable Indications	05/09/92
	UT	GE-UT-209	Non-Relevant/I.D. Surface & Root Geometry	05/22/92
	UT	QAI 9.22/4	3 Recordable Indications	05/06/95