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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Oyster Creek Nuclear Generating Station
Renewed Facility Operating License No. DPR-16
NRC Docket No. 50-219

Subject: Response to Request for Additional Information - End of Interval Relief Requests Associated with the Fourth 10-Year Inservice Inspection (ISI) Interval

References:
1) Letter from J. Barstow (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "End of Interval Relief Requests Associated with the Fourth 10-Year Inservice Inspection (ISI) Interval," dated January 7, 2014

2) Letter from J. G. Lamb (U.S. Nuclear Regulatory Commission) to M. J. Pacilio (Exelon Generation Company, LLC), "Oyster Creek Nuclear Generating Station – Request for Additional Information Regarding the Fourth 10-Year Interval Inservice Inspection Program Plan Requests for Relief (TAC Nos. MF3406 and MF3407)," dated September 17, 2014

In the Reference 1 letter, Exelon Generation Company, LLC (Exelon) requested relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." These reliefs apply to the fourth 10-year Inservice Inspection (ISI) interval, which concluded on January 14, 2013, for the Oyster Creek Nuclear Generating Station. The fourth 10-year ISI interval utilized the ASME Boiler and Pressure Vessel Code, Section XI, 1995 Edition with 1996 Addenda.

In the Reference 2 letter, the U.S. Nuclear Regulatory Commission requested additional information. Attached is our response.

There are no regulatory commitments in this letter.

If you have any questions concerning this letter, please contact Tom Loomis at (610) 765-5510.

Respectfully,

James Barstow
Director - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Attachment: Response to Request for Additional Information

cc: Regional Administrator, Region I, USNRC
USNRC Senior Resident Inspector, OCNGS
Project Manager [OCNGS] USNRC

ATTACHMENT

Response to Request for Additional Information

By letter dated January 7, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14028A579), Exelon Generation Company, LLC (Exelon or the licensee) submitted Requests for Relief R-44 and R-45 from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI for Oyster Creek Nuclear Generating Station (Oyster Creek). The requests for relief apply to the fourth 10-year inservice inspection (ISI) interval, in which the licensee adopted the 1995 Edition through the 1996 Addenda of ASME Code Section XI as the code of record.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the Relief Requests R-44 and R-45, and has determined that a request for additional information (RAI) is needed to complete its technical review. The NRC staff's RAIs are listed below.

Question:

2.1 Request for Relief R-44, Part A, Examination Category B-A, Items B1.12, B1.21, B1.22, and B1.40, Pressure Retaining Welds in Reactor Vessels

2.1.1 The ASME Code states that essentially 100% of the "accessible length" of the subject welds must be examined. Please state the accessible length of each of the reactor pressure vessel circumferential and meridional head welds, and clarify whether the volumetric coverage percentages obtained are applicable to the accessible length, as opposed to the entire length of the weld.

Response:

The volumetric coverage percentages obtained are applicable to the entire weld length. Essentially 100% of the accessible length was examined for all welds listed in Table 1. Relief for the Examination Category B-A, Items B1.21 and B1.22 is withdrawn. Relief still applies to Items B1.12 and B1.40 because the "accessible length" requirement does not apply to these Items. See Table 1 below for the welds that remain applicable to this relief request.

Question:

2.1.2 Fully clarify the wave modality and insonification angles used for all ultrasonic examinations, if not already provided.

Response:

See Table 1 below.

Table 1

S= Shear mode, L = Longitudinal mode

Weld	Description	Coverage	Item	Angle Mode
NR02 1-574	Reactor Head to Flange	58%	B1.40	45S, 60L
NR02 2-563D	Upper Intermediate Shell Course	64.3%	B1.12	45S, 70L
NR02 2-563E	Upper Intermediate Shell Course	67.6%	B1.12	45S, 70L
NR02 2-563F	Upper Intermediate Shell Course	53%	B1.12	45S, 70L
NR02 2-564A	Lower Intermediate Shell Course	50.7%	B1.12	45S, 70L
NR02 2-564C	Lower Intermediate Shell Course	49.4%	B1.12	45S, 70L
NR02 2-564D	Lower Shell Course Assembly	55.2%	B1.12	45S, 70L
NR02 2-564E	Lower Shell Course Assembly	48.3%	B1.12	45S, 70L
NR02 2-564F	Lower Shell Course Assembly	67.9%	B1.12	45S, 70L

Question:

2.2 Request for Relief R-44, Part B, Examination Category B-D, Items B3.90 and B3.100, Full Penetration Welded Nozzles in Vessels

2.2.1 Fully clarify the wave modality and insonification angles used for all ultrasonic examinations, if not already provided.

Response:

See Table 2 below.

Table 2

S= Shear mode, L = Longitudinal mode

Weld	Description	Coverage	Item	Angle Mode
NR02 3-565A	N1A Recirc Outlet Nozzle	45.2%	B3.90	45S, 60L
NR02 3-565B	N1B Recirc Outlet Nozzle	45.2%	B3.90	45S, 60L
NR02 3-565C	N1C Recirc Outlet Nozzle	22%	B3.90	45S, 60L, 70L, 60S
NR02 3-565D	N1D Recirc Outlet Nozzle	22%	B3.90	45S, 60L, 70L, 60S
NR02 3-565E	N1E Recirc Outlet Nozzle	47.9%	B3.90	45S, 60L
NR02 6-566A	N3A Main Steam Nozzle	52.9%	B3.90	45S, 60L
NR02 6-566B	N3B Main Steam Nozzle	52.9%	B3.90	45S, 60L
NR02 4-566A	N4A Feedwater Nozzle	51.8%	B3.90	60L
NR02 4-566B	N4B Feedwater Nozzle	52.5%	B3.90	60L
NR02 4-566C	N4C Feedwater Nozzle	49.5%	B3.90	60L
NR02 4-566D	N4D Feedwater Nozzle	52.5%	B3.90	60L
NR02 2-566A	N5A Isolation Condenser Nozzle	29%	B3.90	45S, 60L, 70L, 60S
NR02 2-566A	N5A Isolation Condenser Nozzle Inner Radius	78.9%	B3.100	60S, 65S, 70S
NR02 2-566B	N5B Isolation Condenser Nozzle	22%	B3.90	45S, 60L, 70L, 60S
NR02 2-566B	N5B Isolation Condenser Nozzle Inner Radius	68.8%	B3.100	60S, 65S, 70S
NR02 2-567A	N6A Core Spray Nozzle	28.1%	B3.90	45S, 60L
NR02 2-567A	N6A Core Spray Nozzle Inner Radius	44%	B3.100	45S, 60L
NR02 2-567B	N6B Core Spray Nozzle	61.7%	B3.90	45S, 60L
NR02 2-567B	N6B Core Spray Nozzle Inner Radius	60.9%	B3.100	60S, 66S, 70S
NR02 1-576	N7A Closure Head Nozzle	76%	B3.90	45S, 60S, 60L
NR02 1-576	N7A Closure Head Nozzle Inner Radius	74%	B3.100	60S, 70S, 80S
NR02 3-576	N7B Closure Head Nozzle	78%	B3.90	45S, 60S, 60L
NR02 3-576	N7B Closure Head Nozzle Inner Radius	88%	B3.100	60S, 70S, 80S
NR02 5-576	N8 Closure Head Nozzle	89%	B3.90	60L
NR02 6-567	N9 CRD Return Nozzle	69%	B3.90	55S, 60L

Question:

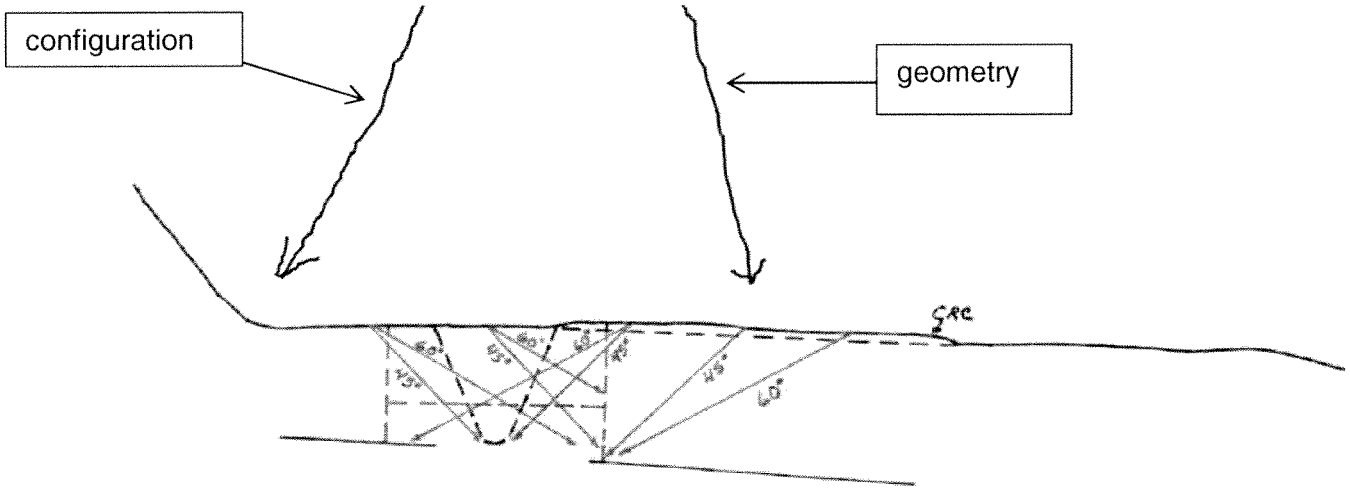
2.3 Request for Relief R-44, Part C, Examination Category B-F, Item B5.10, Pressure Retaining Dissimilar Metal Welds in Vessel Nozzles

2.3.1 The licensee has provided only general information regarding the impracticality of obtaining ASME Code-required volumetric examinations for Category B-F, Item B5.10 welds. The statements "OD [outside diameter] safe end configuration," and "Nozzle OD configuration," are inadequate to explain the bases for not obtaining the ASME Code required examination volumes. Please submit detailed and specific information to support the bases for limited examination coverage for each weld in ASME Code, Category B-F, and therefore, demonstrate impracticality. Include detailed descriptions (written and/or sketches, as necessary) of the interferences to applied nondestructive examination techniques, if not already provided.

Response:

Weld NR02 4-565D: Downstream examinations were limited due to the nozzle to safe-end configuration. All scans were limited due to incomplete machining of the corrosion resistant cladding (CRC) on the OD surface. Machining of the OD surface CRC stopped near the weld centerline, and left a step approximately 0.020" to 0.040" in height, 360 degrees. Reference photo page A40 from the January 7, 2014 submittal. During the recent 2014 outage, the step was eliminated and the required examination volume was examined with 100% coverage.

Weld NR02 5-567: Nozzle configuration and CRC geometry limited the scanning. Surface preparation of this weld was limited due to its location close to the bioshield and the adjacent main steam line. See the sketch below for the nozzle configuration and CRC geometry.



Question:

2.3.2 Please confirm that the required surface examinations were performed for the Category B-F, Item B5.10 welds, whether these surface examinations were full ASME Code examinations (>90% coverage per Code Case N-460), and describe any indications that were detected.

Response:

A surface examination (liquid penetrant) was performed on 100% of weld NR02 4-565D during 1R20 (2004). No indications were recorded during examination.

A surface examination (liquid penetrant) was performed on 100% of weld NR02 5-567 during 1R24 (2012). No indications were recorded during examination.

Question:

2.4 Request for Relief R-45, Part D, Examination Category B-J, Item B9.11, Pressure Retaining Welds in Piping

2.4.1 State the materials of construction and the wall thicknesses for all Category B-J welds and base materials.

Response:

The materials of construction, pipe size, and schedule are shown on Table 3 below along with the wave modality and insonification angles.

Table 3

S= Shear mode, L = Longitudinal mode, SS = Stainless Steel, CS = Carbon Steel.

Weld	Description	Coverage	Item	Material	Size / Sched.	Angle Mode
NE-5-0002	Safe End to Elbow	50%	B9.11	SS	10" / 80	45S, 60L
NE-5-0022A	Safe End to Elbow	50%	B9.11	SS	10" / 80	45S, 60L
NG-D-0002	Elbow to Pipe	50%	B9.11	SS	26" / 80	45S, 60L
NE-2-0061	Pipe to Valve V-14-0167	50%	B9.11	SS	10" / 80	45S, 60L
NE-2-0256	Pipe to Valve V-14-0037	50%	B9.11	SS	10" / 80	45S, 60L
NE-2-0255	V-14-0036 to Pipe	50%	B9.11	SS	10" / 80	45S, 60L
NE-2-0257	V-14-0037 to Pipe	50%	B9.11	SS	10" / 80	45S, 60L
NE-2-220	Valve to Pipe	50%	B9.11	SS	10" / 80	45S, 60L
NE-2-240	Valve to Pipe	50%	B9.11	SS	10" / 80	45S, 60L
NE-5-206	Valve to Pipe	50%	B9.11	SS	10" / 80	45S, 60L
NE-5-214	Valve to Pipe	50%	B9.11	SS	10" / 80	45S, 60L
NU-1-0001	Valve to Pipe	50%	B9.11	SS	14" / 80	45S, 60L
ND-10-0005	Pipe to Valve V-16-0063	50%	B9.11	SS	6" / 80	45S, 70S
ND-10-0009	Pipe to Valve	50%	B9.11	SS	6" / 80	45S, 70S
NG-A-0007	Valve to Elbow	50%	B9.11	SS	26" / 80	45S, 60L
NG-A-0006	Elbow to Valve	50%	B9.11	SS	26" / 80	45S, 60L
NG-A-0014	Elbow to Pump	50%	B9.11	SS	26" / 80	45S, 60L
NG-A-0018	Elbow to Valve	50%	B9.11	SS	26" / 80	45S, 60L
NG-B-0006	Valve to Elbow	50%	B9.11	SS	26" / 80	45S, 60L
NG-B-0012	Pump to Elbow	50%	B9.11	SS	26" / 80	45S, 60L
NG-B-0005	Pipe to Valve V-37-20	50%	B9.11	SS	26" / 80	45S, 60L
NG-B-0016	Elbow to Valve	50%	B9.11	SS	26" / 80	45S, 60L
NG-C-0005	Valve to Elbow	50%	B9.11	SS	26" / 80	45S, 60L
NG-C-0012	Pump to Elbow	50%	B9.11	SS	26" / 80	45S, 60L
NG-C-0016	Elbow to Valve	50%	B9.11	SS	26" / 80	45S, 60L
NG-C-0004	Pipe to Valve	50%	B9.11	SS	26" / 80	45S, 60L
ND-10-0020	Valve V-16-0061 to Pipe	50%	B9.11	SS	6" / 80	45S, 70S
ND-1-0029	Elbow to Valve	50%	B9.11	SS	6" / 80	45S, 70S
NE-2-0124	Pipe to Valve V-14-0170	50%	B9.11	SS	10' / 80	45S, 60L
NE-2-0254	Pipe to Valve V-14-36	50%	B9.11	SS	10' / 80	45S, 60L
NU-4-0002	Tee to Valve	50%	B9.11	SS	10" / 80	45S, 60L
NG-B-0017	Valve to Pipe	50%	B9.11	SS	26" / 80	45S, 60L
NG-A-0019	Valve to Pipe	50%	B9.11	SS	26" / 80	45S, 60L
ND-1-0209	Valve V-16-0001 to Pipe	50%	B9.11	SS	6" / 80	45S, 70S
ND-1-0208	Elbow to Valve	50%	B9.11	SS	6" / 80	45S, 70S
MV-5-001	Flange to Tee	50%	B9.11	SS	4"	45S, 70S
ND-10-0008	Valve to Elbow	50%	B9.11	SS	6" / 80	45S, 60L, 70S
NG-D-0004	Pipe to Valve	50%	B9.11	SS	26" / 80	45S, 60L

Weld	Description	Coverage	Item	Material	Size / Sched.	Angle Mode
NG-D-0005	Valve to Pipe	50%	B9.11	SS	26" / 80	45S, 60L
NG-D-0011R1	Pump to Elbow WOL (Weld Overlay)	52%	B9.11	SS	26" / 80	45L, 60L, 25L, 70L, 0L
NG-D-0015	Elbow to Valve	75%	B9.11	SS	26" / 80	45S, 60L
NG-D-0016	Valve to Pipe	75%	B9.11	SS	26" / 80	45S, 60L
NG-D-0022A	Pipe to Safe End	75%	B9.11	SS	26" / 80	45S, 60L
NG-E-0006	Pipe to Valve	75%	B9.11	SS	26" / 80	45S, 60L
NG-E-0007	Valve to Elbow	50%	B9.11	SS	26" / 80	45S, 60L, 45L, 60S
NG-E-0016A	Elbow to Valve	50%	B9.11	SS	26" / 80	45S, 60L
NG-E-0017	Valve to Pipe	50%	B9.11	SS	26" / 80	45S, 60L
NU-2-0001	Pipe to Valve	50%	B9.11	SS	14" / 80	45S, 60L
NZ-3-0082	Valve to Elbow	75%	B9.11	SS	8" / 80	45S, 70S
ND-10-0021	Pipe to V-16-61	50%	B9.11	SS	6" / 80	45S, 60S, 70S
NU-3-0006	Valve V-17-54 to Pipe	50%	B9.11	SS	14" / 80	45S, 60L
NU-4-0003	Tee to Valve	50%	B9.11	SS	14" / 80	45S, 60L
NZ-3-0005	Valve to Tee	39%	B9.11	SS	8" / 80	45S, 70L
NZ-3-0023	Pipe to V-20-0150	50%	B9.11	SS	8" / 80	45S, 70L
NZ-3-0024	Valve to Tee	48%	B9.11	SS	8" / 80	45S, 70L
NZ-3-0028	Elbow to Valve	50%	B9.11	SS	8" / 80	45S, 70L
NZ-3-0029	Valve to Elbow	50%	B9.11	SS	8" / 80	45S, 70L
NZ-3-0032	Tee to Valve	44%	B9.11	SS	8" / 80	45S, 70L
NZ-3-0033	Valve to Elbow	50%	B9.11	SS	8" / 80	45S, 70L
NZ-3-0052	Valve to Tee	43%	B9.11	SS	8" / 80	45S, 70L
NZ-3-0056	Valve to Elbow	50%	B9.11	SS	8" / 80	45S, 70L
NZ-3-0070	Valve to Tee	44%	B9.11	SS	8" / 80	45S, 70L
NZ-3-0076	Pipe to Valve	50%	B9.11	SS	8" / 80	45S, 70L
NZ-3-0077	Valve to Elbow	45%	B9.11	SS	8" / 80	45S, 70L
NZ-3-0081	Pipe to V-20-0023	50%	B9.11	SS	8" / 80	45S, 70L
RF-2-0115	Valve to Pipe	87%	B9.11	CS	18" / 80	45S
NZ-3-0004	Pipe to Valve V-20-0015	50%	C5.11	SS	8" / 80	45S, 60S, 70S
V-1-173 Valve Body	EMRV Valve Body Weld	82%	B12.40	CS	6" Inlet	45S
CD-14-001B/ 211-C-6	Hemi Head to Nozzle Weld	50%	C2.21	SS	8" / NA	45S, 60L
CD-14-001B/ 211-S-6	Hemi Head to Nozzle Weld	50%	C2.21	SS	12" / NA	45S, 60L

Question:

2.4.2 Please confirm that the required surface examinations were performed for the Category B-J, Item B9.11 welds, whether these surface examinations were full ASME Code examinations (>90% coverage per Code Case N-460), and describe any indications that were detected.

Response:

Oyster Creek Nuclear Generating Station implemented Code Case N-663 during the fourth interval. Therefore, surface examinations were not required on these welds.

Question:

2.4.3 Fully clarify the wave modality and insonification angles used for all ultrasonic examinations, if not already provided. If applicable, state whether shear wave only techniques were used to examine any austenitic weld. The longitudinal wave method has been shown capable of detecting planar inside diameter (ID) surface-breaking flaws on the far-side of austenitic welds. If longitudinal examination methods were not employed, please justify why these techniques were not used as part of a best effort examination to maximize coverage.

Response:

See Table 3 above.

Welds ND-10-0005, ND-10-0009, ND-1-0209, ND-1-0208, MV-5-001, ND-10-0020, ND-10-0021, ND-1-0029 and NZ-3-0004 were examined with only shear wave examination techniques due to the thickness being ≤0.500". PDI procedure demonstration has shown that the 70 degree shear wave technique is appropriate for opposite side flaw detection for thicknesses ≤0.500" when examination scanning is limited to one side of the weld.

Weld RF-2-0115 was examined with only shear waves due to the material being carbon steel. Note that weld NQ-2-0215 has been withdrawn from this relief as discussed below.

Question:

2.5 Request for Relief R-45, Part E, Examination Category B-M-1, Item B12.40, Pressure Retaining Welds in Valve Bodies

2.5.1 Please state the materials of construction for all valve body welds in Category B-M-1.

Response:

The material of construction for all valve body welds in Category B-M-1 is forged carbon steel.

Question:

2.5.2 Fully clarify the wave modality and insonification angles used for all ultrasonic examinations, if not already provided.

Response:

The wave modality and insonification angle used for ultrasonic examinations was 45 shear for V-1-173 valve body weld.

Question:

2.6 Request for Relief R-45, Part F, Examination Category C-B, Item C2.21, Pressure

Retaining Nozzle Welds in Class 2 Vessels

2.6.1 The description associated with Category C-B component, Item C2.21, lists the ASME examination type (nozzle to head weld); however, it is not clear to what actual component the nozzle is welded to, or what system is involved. For request for relief Category C-B, Item C2.21 (nozzle-to-head welds), please state the actual component and to what system this weld is associated.

Response:

The component is the Isolation Condenser which is part of the Emergency Condenser System.

Question:

2.6.2 Please state the materials of construction and the wall thicknesses for all welds in Examination Category C-B.

Response:

The material of construction is stainless steel. Refer to Pages 74 and 75 of Relief Request R-45 for measured thickness.

Question:

2.6.3 Please confirm that the required surface examinations (liquid penetrant or magnetic particle) were performed for the subject welds, whether these surface examinations were full ASME Code examinations (>90% coverage per Code Case N-460), and describe any indications that were detected.

Response:

Surface examintations (liquid penetrant) were performed on these Isolation Condenser welds. No recordable indications were identified.

Question:

2.7 Request for Relief R-45, Part G, Examination Category C-F-1, Item C5.11, Pressure Retaining Welds in Austenitic Stainless Steel or High Alloy Piping

2.7.1 Fully clarify the wave modality and insonification angles used for all ultrasonic examinations. State whether shear wave only techniques were used to examine any austenitic weld. The longitudinal wave method has been shown capable of detecting planar ID surface-breaking flaws on the far-side of austenitic welds. If longitudinal examination methods were not employed please justify why these techniques were not used as part of a best effort examination to maximize coverage.

Response:

Refer to Table 3 above. PDI procedure demonstration has shown that the 70 degree shear wave technique is appropriate for opposite side flaw detection for thicknesses ≤0.500" when examination scanning is limited to one side of the wall.

Question:

2.7.2 Please confirm that the required surface examinations (liquid penetrant or magnetic particle) were performed for the subject welds, whether these surface examinations were full ASME Code examinations (>90% coverage per Code Case N-460), and describe any indications that were detected.

Response:

Oyster Creek Nuclear Generating Station implemented Code Case N-663 during the fourth interval. Therefore, surface examinations were not required.

Question:

2.8 Request for Relief R-45, Part H, Examination Category C-F-2, Item C5.81, Pressure Retaining Welds in Carbon or Low Alloy Steel Piping

For ASME Code Category C-F-2, Item C5.81, Weld NQ-2-0215, only a surface examination is required per IWC-2500. From the drawing and description provided by the licensee, it is unclear why a full surface examination could not be completed on this weld as there are no obstructions or access restrictions listed or shown that would prevent full access to the surface of the weld. The licensee's drawing appears to indicate that an ultrasonic testing examination, not a surface examination, was performed.

Response:

In addition to a surface exam, weld NQ-2-0215 was inadvertently examined with ultrasonic testing during the fourth interval. Accordingly, relief is no longer requested for this weld.

Question:

2.8.1 Please confirm that the required surface examination (liquid penetrant or magnetic particle) was performed for the subject weld, whether these surface examinations were full ASME Code examinations (>90% coverage per Code Case N-460), and describe any indications that were detected.

Response:

A surface examination (magnetic particle) was performed on 100% of the required area of weld NQ-2-0215 during 1R20 (2004). No indications were recorded during examination.