



FPL Energy
Seabrook Station

FPL Energy Seabrook Station
P.O. Box 300
Seabrook, NH 03874
(603) 773-7000

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Docket No. 50-443
SBK-L-07001

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

Seabrook Station
NRC Order EA-03-009 Inspection Results

FPL Energy Seabrook, LLC (FPL Energy Seabrook) encloses the OR11 inspection results required by Section IV.E of NRC Order EA-03-009, Issuance of First Revised NRC Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors.

From the enclosed inspection results, FPL Energy Seabrook concludes that the Reactor Vessel Head Penetration nozzles are not degraded, and no wastage has occurred of the Reactor Pressure Vessel Head. Based on the degradation free inspection results, low head temperature, and operating schedule, FPL Energy Seabrook will follow the "Low PWSCC susceptibility category" for future inspections frequencies.

Should you have any questions regarding this information, please contact Mr. James M. Peschel, Regulatory Programs Manager, at (603) 773-7194.

Very truly yours,

FPL Energy Seabrook, LLC



Gene St. Pierre
Site Vice President

cc: S. J. Collins, NRC Region I Administrator
G. E. Miller, NRC Project Manager, Project Directorate I-2
G. T. Dentel, NRC Senior Resident Inspector

A101

ENCLOSURE TO SBK-L-07001

**FIRST REVISED NRC ORDER EA-03-009:
REACTOR PRESSURE VESSEL HEAD AND VESSEL HEAD
PENETRATION NOZZLE POST REFUELING OUTAGE INSPECTION RESULTS
FOR SEABROOK STATION – Fall 2006**

The First Revised NRC Order EA-03-009 ^[1] was issued on February 20, 2004, establishing interim inspection requirements for reactor pressure vessel heads of pressurized water reactors. In Section IV.E. of the NRC Order, the NRC required that the results of the inspection be provided within 60 days of the plant being returned to operation. FPL Energy Seabrook, LLC (FPL Energy Seabrook) hereby submits the inspection results for Seabrook Station for the fall 2006 refueling outage (OR11).

Seabrook Station Fall 2006 (OR-11) Post Outage Reactor Vessel Upper Head Inspection Results:

1. Plant Susceptibility Category:

The FPL Energy Seabrook reactor pressure vessel (RPV) closure head had approximately 2.53 effective degradation years (EDY) at the end of Cycle 11 based on a bounding head temperature of 559.6 degrees F. The inspection category identified in the Order is Low. The corresponding inspection method for the Low Category is specified in Section IV.C.(3) of the NRC Order.

2. Inspection Scope and Method:

2.a. RPV Bare Metal Head Surface Visual: A bare metal visual inspection (VT) of the RPV head top surface, including 360° around each RPV head penetration nozzle, was performed in accordance with section IV.C.(5)(a) of the NRC Order. The VT was performed under the insulation by delivering video cameras on a remote magnetic crawler under the insulation inside the shroud. Portions of the outer most penetrations adjacent to the shroud were inaccessible by the crawler mounted cameras. These locations were supplemented by a manually delivered camera probe to complete the 100% coverage requirement uphill of the outermost penetrations (inside the shroud). The reactor vessel head surface from under the shroud ring downslope to the outer edge of the horizontal flange surface was examined by direct visual examination. No limitations were noted.

2.b. RPV Head Penetration Non Visual Inspection: The ultrasonic (UT) examination technique option, identified in section IV.C.(5)(b)(i) of the First Revised NRC Order, was used on 78 of 79 reactor vessel head penetration (RVHP) nozzles excluding the vent. The examination area was planned to meet the NRC Order required area for all RVHP nozzles as modified by a relaxation request ^[2] for nozzles 74, 75, 76, 77, and 78. These five RVHP nozzles have external threaded ends with internal tapers, which limit the examination distance below the toe of the weld potentially to less than the distance required by the First Revised NRC Order. The relaxation request justified a reduced inspection distance for the 5 RVHP nozzles of 2 inches above the weld root to below the weld toe to the maximum extent practical but not less than 0.30 inches below the weld toe, the distance at which the hoop stresses drop below 20 ksi. The NRC approved the relaxation ³ allowing the alternate examination area.

As part of the UT examinations, the 78 RVHPs with interference fits were assessed to determine if leakage had occurred into the interference fit zone (annulus between the RPV head and the penetration above the pressure boundary weld). This "leak path" assessment was part of the evaluation procedure performed by the vendor (Westinghouse/Tecnomat).

The UT inspection procedure and essential variables used on the 78 RVHPs with interference fits has been demonstrated as part of the industry demonstration program conducted by the EPRI NDE Center.

The vent line, including the wetted surface of the J-groove weld and J-groove attachment weld were inspected using the eddy current examination (ECT) technique as identified in section IV.C.(5)(b)(ii) of the First Revised NRC Order. The examination area included the wetted surface of the vent line greater than 2 inches above the weld root to the bottom of the flush ground vent line and the wetted surface of the alloy 82/182 J-groove weld to the stainless steel clad interface. The Westinghouse ECT procedures for the vent line and J-groove weld have been qualified per their internal program.

3. Inspection Results Summary:

3.a. RPV Head Visual Results: The overall condition of the Seabrook Station RPV head surface was clean with no evidence of boric acid leakage occurring in the vicinity of the RV head at the interface of the 79 RVHPs. No wastage or boric acid leakage or buildup was observed on the reactor vessel head surface.

Thin white film/stains were observed on the vertical surfaces of some CRDM housings and on a spot above the insulation. The stains did not yield sufficient residue quantity to confirm if the chemical composition was from boric acid. The thin film stains did not result in accumulation of residue on the insulation and did not accumulate on or reach the reactor vessel head carbon steel surface. Isotopic analysis of the stain swipe residue indicated it was not from recent leakage. Review of video tapes from prior outages and the previous RV head bare metal visual, confirmed that the residue was unchanged. There was no degradation of the RPV head surface associated with the boric acid stains. These conditions were addressed as part of our boric acid corrosion control program and the corrective action program.

3.b. RPV Head Penetration Non Visual Inspection Results: There were no relevant indications identified by the ID UT in any of the 78 RVHPs (excluding the vent) in the Seabrook Station RPV head. The UT of 74 nozzles met or exceeded the Order required coverage area as identified in Section V.C.(5)(b)(i) of the First Revised NRC Order. The UT of the 4 other nozzles (74, 75, 76, & 78) met or exceeded the Order required coverage area as modified by the approved relaxation request ^[3] with coverage extending below the weld toe to greater than 0.30 inches on a horizontal plane. Note that the scan of penetration 77 exceeded the 1-inch distance below the weld, thus relaxation from the order was not required.

An assessment to determine if leakage has occurred into the interference fit zone was performed for the 78 interference fit RVHPs. There was no evidence of a "leak path" signature for any of the 78 interference fit RVHPs examined. The assessment results are also confirmed by the results of the bare metal visual examination.

The reporting criteria utilized for the ECT examination was to report all flaw like indications. The acceptance criteria utilized for this ECT examination was "no identified flaws or degradation."

There were no flaws or degradation detected by the ECT technique in the wetted surface of the head vent nozzle and associated J-groove weld.

4. Conclusion:

FPL Energy Seabrook has met the requirements of the First Revised NRC Order (EA-03-009) as modified by NRC approved relaxation requests ^[2&3] for the Seabrook Station Fall 2006 refueling outage by performing the required RPV head inspection.

From the results of the bare metal visual examinations, UT examinations, leak path assessments and ECT of the vent and J-groove attachment weld, FPL Energy Seabrook concludes that the RVHP nozzles are not degraded, and no wastage has occurred of the RPV head. Based on the degradation free inspection results, low head temperature, and operating schedule, FPL Energy Seabrook will follow the "Low PWSCC susceptibility category" for future inspection frequencies.

¹ US NRC Letter EA-03-009, "Issuance Of First Revised NRC Order (EA-03-009) Establishing Interim Inspection Requirements For Reactor Pressure Vessel Heads At Pressurized Water Reactors," from William Borchardt (NRC) to all Pressurized Water Reactor Licensees, Dated February 20, 2004.

² FPL Energy Seabrook Station Letter SBK-L-06119, "Relaxation Request from the First Revised NRC Order EA-03-009 Regarding Requirements for Nondestructive Examination of Nozzles Below the J-Groove, Seabrook Station, Docket No. 50-443," G. St. Pierre to NRC, May 30, 2006.

³ US NRC Letter (Adams Accession No. ML062620342), "Seabrook Station Unit No. 1 - Relaxation of the First Revised Order EA-03-009, (TAC No. MD2112) and Safety Evaluation for Alternate Examination Coverage," C. F. Holden (NRC) to G.F. St. Pierre, September 27, 2006.