DRS D-13

XX, 2004

MEMORANDUM TO: Patrick Louden, Chief
Branch 7
Division of Reactor Projects

FROM: David Hills, Chief

Mechanical Engineering Branch
Division of Reactor Safety

SUBJECT: POINT BEACH NUCLEAR PLANT, UNIT 1,
DRS INPUT TO INTEGRATED REPORT 50-266/04-03;
50-301/04-03

Attached is the report input for the Point Beach Nuclear Plant, Unit 1, Inspection Report 50-266/04-03; 50-301/04-03. This report input documents completion of TI 2515/150 Reactor Pressure Vessel Head and Vessel Head Penetration Nozzles, TI 2515/152 Reactor Pressure Vessel Lower Head Penetration Nozzles, and IP 71111.08 Inservice Inspection Activities for Unit 1. I have reviewed this input and have determined it is ready for distribution to the licensee and dissemination to the public. Additionally, please place W. Koo and T. Sullivan of NRR on distribution for this report as required by TI 2515/150 and TI 2515/152.

POST INSPECTION DATA INPUT TO INSPECTION REPORT 50-266/04-03; 50-301/04-03:

Procedure Status & Sample Size:

TI-152 - Status - Completed for Unit 1 only.
TI-150 - Status - Completed for Unit 1 only.

IP 71111.08 (September 9, 2003 version)
Status - Completed (for Unit 1 only) full sample not available.
Sample size = 5.
Please add the following statement in RPS for why the full sample was not available for review: "Activities not available for review are identified and explained in Section 1R08.a of IR 50-266/04-03."

0-7

NCV to enter into RPS:

Please enter the following finding into RPS.

05000266/2004003-01	NCV	Substitution of Weld Surface Examinations for Volumetric Examinations

- Green. The inspectors identified a Non-Cited Violation of 10 CFR 50.55a(a)3i for the licensee's substitution of weld surface examinations into the risk based portion of the Inservice Inspection Program, which required volumetric weld examinations.

  This finding was greater than minor because it affected the Mitigating Systems Cornerstone objective of equipment reliability and if left uncorrected, could allow unacceptable piping system weld flaws to remain in-service and render safety related systems inoperable. The finding is of very low safety significance by management review, because the licensee had sufficient time left in the Code interval to perform the required number of volumetric examinations of piping welds in the affected risk based category during future Unit 1 outages (Section 1R08).

Attachment: Input to Inspection Report 50-266/04-03; 50-301/04-03

CONTACT: M. Holmberg, DRS
(630) 829-9748

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To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	RIII		RIII	N				
NAME	MHolmberg:		DHills					
DATE	/04		/04					

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Cover Letter

__ No input, no significant findings.
_X_ Input below, no color or Green findings were identified.

The report documents an NRC-identified finding of very low safety significance (Green). This finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because this finding was entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section VI.A of the NRC Enforcement Policy. If you contest the Non-Cited Violation, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement, U. S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Point Beach facility.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Title Page

Inspectors: M. Holmberg, Reactor Inspector
T. Bilik, Reactor Inspector
C. Roque-Cruz, Reactor Engineer

SUMMARY OF FINDINGS

ADAMS boilerplate - Inspectable area: Inservice Inspection Activities.

Modify second paragraph as follows:

The inspections were conducted by resident and inspectors based in the NRC Region III office. One Green finding associated with a Non-Cited Violation (NCVs) was identified.

A. Inspector-Identified Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Non-Cited Violation of 10 CFR 50.55a(a)3i for the licensee's substitution of weld surface examinations into the risk based portion of the Inservice Inspection Program, which required volumetric weld examinations.

  This finding was greater than minor because it affected the Mitigating Systems Cornerstone objective of equipment reliability and if left uncorrected, could allow unacceptable piping system weld flaws to remain in-service and render safety related

systems inoperable. The finding is of very low safety significance by management review, because the licensee had sufficient time left in the Code interval to perform the required number of volumetric examinations of piping welds in the affected risk based category during future Unit 1 outages (Section 1R08).

REPORT DETAILS

1. REACTOR SAFETY

1R08 Inservice Inspection Activities (IP 71111.08)

a. Inspection Scope

For Unit 1, the inspectors evaluated the implementation of the licensee's Inservice Inspection (ISI) Program for monitoring degradation of the reactor coolant system boundary and risk significant piping system boundaries, based on review of records of nondestructive examinations.

From April 05, 2004, through April 28, 2004, inside the Unit 1 containment building the inspectors observed ultrasonic (UT) examinations which constituted one type (volumetric) of nondestructive examination activity. Specifically, the inspectors observed UT examination of two pressurizer spray line welds (RC-03-PS-1001-14 and 15), two auxiliary feedwater system welds (AF-03-1002-76 and 77), and one feedwater system weld (FW-16-FW-1002-15). Additionally, the inspectors observed a second and third type of nondestructive examination activities related to the under head vent line dye penetrant (PT) examination of reactor vessel nozzle No. 26 J-groove weld and a visual VT-3 examination of a feedwater system hanger (EB-9-FW-1111). The inspectors selected these components in order of risk priority as identified in Section 71111.08-03 of inspection procedure 71111.08. The inspectors evaluated these examinations for compliance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI and plant Technical Specifications (TS) requirements and to verify that indications and defects (if present) were dispositioned in accordance with the ASME Code. The inspectors concluded that this review counted as two inspection samples as described in Section 71111.08-5 of inspection procedure 71111.08 "Inservice Inspection Activities."

From April 05, 2004, through April 28, 2004, in an office on the 8 foot level of the Technical Support Building (TSB), the inspectors reviewed the licensee's records related to three examinations (summary report 004500 for control rod drive housings No. 1, reactor pressure vessel head flange report 99U1-350P004, and reactor pressure vessel Stud No. 44 report 99U-350P021) with recordable indication accepted for continued service. The inspectors evaluated these examinations for compliance with the ASME Code Section XI. The inspectors concluded that this review counted as one inspection sample as described in Section 71111.08-5 of inspection procedure 71111.08 "Inservice Inspection Activities."

From April 5, 2004, through April 28, 2004, in an office on the 8 foot level of the TSB, the inspectors reviewed the licensee's records related to pressure boundary welding to

replace pipe and elbows on 2 inch lines to the T-34B safety injection system accumulator (Class 2 component). Specifically, the inspectors reviewed records for welds FW-1 and FW-2, to verify that the welding acceptance and preservice examinations (e.g. pressure testing, visual, dye penetrant, and weld procedure qualification tensile tests and bend tests) were performed in accordance with ASME Code, Section III, Section V, Section IX, and Section XI. The inspectors concluded that this review counted as 1 inspection sample as described in Section 71111.08-5 of inspection procedure 71111.08 "Inservice Inspection Activities."

From April 5, 2004, through April 28, 2004, in an office on the 8 foot level of the TSB, the inspectors reviewed the licensee's records associated with two ASME Section XI Code replacement activities (replace pipe and elbows on 2 inch lines to the T-34B safety injection system accumulator) for Code Class 2, to verify that the ASME Code Section III, Section V, and Section XI requirements were met. The inspectors concluded that this review counted as 1 inspection sample as described in Section 71111.08-5 of inspection procedure 71111.08 "Inservice Inspection Activities."

From April 5, 2004, through May 14, 2004, in room 138 of the on-site training building, the inspectors observed acquisition of steam generator (SG) tube eddy current (ET) data for the Unit 1 SGs. The inspectors also reviewed the SG ET examination scope, expansion criteria, analysis procedures, and examination reports for the Unit 1 SG A and B to confirm that:

- TS requirements were met;
- the inspection was consistent with the Electric Power Research Institute (EPRI) Guidelines;
- areas of potential degradation were inspected;
- eddy current probes and equipment were qualified in accordance with the EPRI Guidelines for the expected types of tube degradation.

The inspectors concluded that the review discussed above did not count as a completed inspection sample as described in Section 71111.08-5 of inspection procedure 71111.08 "Inservice Inspection Activities." The specific activities that were not available for review to complete this inspection sample are identified in the table below.

Inspection Procedure 7111108 Section Number	Reason Activity was Unavailable For Inspection	Reduction in Inspection Procedure Samples
Section 02.02.a 1 thru 4: associated with review of licensee in-situ pressure testing of steam generator tubes.	The licensee did not identify any tubes that required pressure testing.	The inspectors concluded that these unavailable activities constituted a reduction by one from the total number of procedure samples required by Section 71111.08-5 of inspection procedure 71111.08.
Section 02.02.f and g: Confirm that all repair processes used were approved in the technical specifications for use at the site; reviewed tube repair criteria;	The licensee did not identify any tubes that required repair.	
Section 02.02.h: associated with steam generator tube leakage greater than 3 gallons per day.	The licensee reported that no steam generator tube leakage had been observed.	
Section 02.02.k associated with review of one to five samples of eddy current data.	The inspectors did not identify any "serious questions" regarding the eddy current data.	

The specific list of documents reviewed by the inspectors in conducting this inspection are listed in the attachment to this report.

b. Findings

b.1 Substitution of Weld Surface Examinations for Volumetric Examinations

Introduction The inspectors identified a Green NCV of 10 CFR 50.55a(a)3i for the licensee's substitution of weld surface examinations into the risk based portion of the ISI Program, which required volumetric weld examinations.

Description On April 9, 2004, while performing the baseline ISI procedure (IP 7111108), the inspectors identified that the licensee had inappropriately credited surface examination of welds in the risk based ISI program.

By letter dated July 3, 2002, the licensee requested approval to use a risk informed ISI program in accordance with EPRI TR-112657 as an alternative to the weld inspection program required by the ASME Code for Class 1 and 2 piping welds. The NRC approved this request under provisions allowed in CFR 50.55a(3)i as an acceptable alternative program which would provide for a comparable level of safety. Table 4-1 of EPRI TR-112657 requires volumetric examination of welds subject to for all degradation mechanisms except for microbiologically induced corrosion (MIC) and outside diameter stress corrosion cracking (ODSCC). On January 17, 2003, the licensee submitted the Owners Inservice Inspection Summary Report for Unit 1 to the NRC. In this report, the

licensee credited two Unit 1 safety injection (SI) system weld PT examinations, completed in September 2002, as risk based weld examinations (SIS-04-SI-1005-25 and SIS-04-SI-1005-25B). The licensee had not identified these welds as susceptible to MIC or ODSCC or any other degradation mechanism (e.g. weld category R1.20 from Code Case N-578-1). Therefore, by taking credit for these surface PT examinations, the licensee reduced the number of volumetric examinations for this category of welds in the risk based ISI Program. The inspectors concluded that the licensee's use of surface examinations changed the basis for the approved risk based ISI Program (EPRI TR-11267), which required volumetric examinations to detect degradation that typically originates from the inside surface of piping systems. The inspectors were concerned that substitution of surface examinations for volumetric examinations, could allow unacceptable piping system weld flaws to remain in-service and render safety related systems inoperable.

Analysis The licensee's performance deficiency associated with this finding, is the failure to perform the required volumetric weld examinations by substitution of weld surface examinations. The inspectors concluded that the finding was greater than minor in accordance with Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspections Reports," Appendix B, "Issue Disposition Screening" because, if left uncorrected, the substitution of surface examinations in place of volumetric examinations could allow unacceptable piping system weld flaws to remain in-service. The finding was assigned to the Mitigating System Cornerstone because the affected weld examinations identified were associated with the SI system (mitigating system) and the finding affected the Mitigating System Cornerstone objective of equipment reliability. The inspectors determined that the finding could not be evaluated using the Significance Determination Process (SDP) in accordance with NRC Inspection Manual Chapter 0609, "Significance Determination Process," because the SDP for the Mitigating Systems Cornerstone only applied to degraded systems/components, not to the program/process failures that could result in failure to detect degraded systems/components. Therefore, this finding was reviewed by the Regional Branch Chief in accordance with IMC 0612, Section 05.04c, who agreed with the inspectors, that this finding was of very low safety significance (Green). The inspectors determination of very low risk was based on the fact that, the licensee had sufficient time left in the Code interval to perform the required number of volumetric examinations of piping welds in the affected risk based category during future Unit 1 outages.

Enforcement On April 9, 2004, while performing the baseline ISI, the inspectors identified a NCV of 10 CFR 50.55a(a)(3)(i).

10 CFR 50.55a(a)(3)(i) states in part that alternatives to requirements of paragraph 10 CFR 50.55a(g) [ASME Section XI Code] may be used, when authorized by the NRC. By letter dated July 2, 2003, in accordance with 10 CFR 50.55a(a)(3)(i), the NRC approved the licensee's use of a risk based ISI program in accordance with EPRI TR-112657 "Revised Risk-Informed Inservice Inspection Evaluation Procedure," Revision B-A. In EPRI TR-112657, Table 4-1, volumetric examinations of welds were identified as the approved weld examination technique for all degradation mechanisms except MIC and ODSCC.

Contrary to these requirements, on January 17, 2003, the licensee took credit for surface examinations of welds SIS-04-SI-1005-25 and SIS-04-SI-1005-25B, completed in September of 2002 in their risk based ISI program. These welds were not subject to MIC or ODSCC and therefore, the licensee's use of weld surface examinations was contrary to requirements of EPRI TR-112657 Table 4-1. However, because of the very low safety significance of this finding and because the issue was entered into the licensee's corrective action program (CAP 055529), it is being treated as a NCV, consistent with Section VI.A.1 of the Enforcement Policy (NCV 05000266/2004003-01).

4OA2 Identification and Resolution of Problems

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

From April 5, 2004, through April 28, 2004, in an office on the 8 foot level of the TSB, the inspectors performed a review of a sample of ISI related problems that were identified by the licensee and entered into the corrective action program. The inspectors reviewed these corrective action program documents to confirm that the licensee had appropriately described the scope of the problems. Additionally, the inspectors' review included confirmation that the licensee had an appropriate threshold for identifying issues and had implemented effective corrective actions. The inspectors evaluated the threshold for identifying issues through interviews with licensee staff actions to incorporate lessons learned from industry issues related to the ISI Program and reviews of corrective actions for degraded or non-conforming components identified in the last Unit 1 outage ISI Summary Report. The inspectors performed these reviews to ensure compliance with 10 CFR Part 50 Appendix B, Criterion XVI, "Corrective Action" requirements. The specific corrective action documents that were reviewed by the inspectors are listed in the attachment to this report.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA5 Other Activities

.1 Reactor Pressure Vessel Head and Vessel Head Penetration Nozzles (TI 2515/150)

a. Inspection Scope

On February 11, 2003, the NRC issued Order EA-03-009 (NRC Accession Number ML030410402). This order required examination of the reactor pressure vessel (RPV) head and associated vessel head penetration (VHP) nozzles to detect primary water stress corrosion cracking (PWSCC) of VHP nozzles and corrosion of the RPV head. The purpose of TI 2515/150 "Reactor Pressure Vessel Head and Vessel Head Penetration Nozzles," Revision 2 was to implement an NRC review of the licensees'

head and VHP nozzle inspection activities required by NRC Order EA-03-009. The inspectors performed a review in accordance with TI 2515/150 of the licensee's procedures, equipment, and personnel used for examinations of the Unit 1 RPV and VHP to confirm that the licensee met requirements of NRC Order EA-03-009 (as revised by NRC letter dated February 20, 2004). The results of the inspectors' review included documentation of observations and conclusions in response to the questions identified in TI 2515/150.

From April 5, 2004 through May 26, 2004, in an office on the 8 foot level of the TSB building, (unless otherwise stated), the inspectors performed a review of the licensee's Unit 1 head inspection related activities in response to NRC Order EA-03-009. To evaluate the licensee's efforts in conducting examination, the inspectors:

- performed direct visual examination of the head-to-nozzle interface for portions of 30 VHP nozzles inside the Unit 1 containment from access doors in the service structure surrounding the head;
- observed the licensee personnel conducting a remote visual examination of the RPV head for portions of 12 VHP nozzles inside the Unit 1 containment building;
- conducted interviews with the licensee's nondestructive examination personnel performing non-destructive examinations of the vessel head in the head inspection trailer within the site protected area;
- reviewed the head inspection procedures;
- reviewed the certification records for the nondestructive examination personnel performing examinations of the vessel head;
- reviewed the procedures used for identification and resolution of boric acid leakage from systems and components above the vessel head;
- reviewed, the licensee's procedures and corrective actions implemented for boric acid leakage;
- reviewed the videotaped PT examinations conducted on the VHP nozzle No. 26 J-weld in an on-site trailer;
- reviewed the videotaped cleaning and visual examination of portions of 6 head-to-nozzle interface areas in an on-site trailer;
- reviewed automated UT data for rotating and blade probes collected during the Unit 1 vessel head at 20 VHP nozzle locations in an on-site trailer;
- reviewed automated UT data collected for VHP nozzles No. 32 and No. 33 during the previous Unit 1 outage in an on-site trailer; and
- observed manual ultrasonic examination of the lower portions of VHP nozzles No. 32 and No. 33 from a remote camera monitor in an on-site trailer.

The inspectors conducted these reviews to confirm that the licensee performed the vessel head examinations in accordance with requirements of NRC Order EA-03-009 (or Order relaxation requests), using procedures, equipment, and personnel qualified for the detection of PWSCC in vessel VHP nozzles and detection of vessel head wastage.

From May 11, 2004, through May 26, 2004, in an office on the 8 foot level of the TSB building, (unless otherwise stated), the inspectors performed a review of the licensee's repair activities for VHP nozzle No. 26. The inspectors reviewed the licensee's weld procedures, certified mill test reports for the weld materials used, process traveler steps,

weld control records and observed portions of the repair welding in the Unit 1 containment to confirm ASME Code Section III and Section IX requirements were met (as amended by a licensee Code relief request).

From April 5, 2004, through April 28, 2004, in an office on the 8 foot level of the TSB, the inspectors reviewed the licensee's vessel head VHP nozzle susceptibility ranking calculation C11470 "Reactor Vessel Head Effective Degradation Year (EDY)" to:

- verify that appropriate plant-specific information was used as input;
- confirm the basis for the head temperature used by licensee; and
- determine if previous VHP cracks had been identified, and if so, documented in the susceptibility ranking calculation.

a. Observations

Summary

The licensee performed a remote visual examination of the top surface of the Unit 1 vessel head using a robotic crawler with a high-resolution camera supplemented with direct visual examinations to complete inspection of the 49 Unit 1 VHP nozzles and the head vent line penetration. Based upon this inspection, the licensee did not identified any leaking VHP nozzles or evidence of RPV head wastage. The licensee also conducted UT examinations for each of the 49 VHP nozzles and head vent line penetration nozzle. Due to limitations in UT examination coverage at the bottom end of 17 VHP nozzle locations, the licensee requested relaxation from Order EA-03-009 requirements. The licensee also performed PT examinations of the head vent line and VHP nozzle No. 26 J-groove weld locations. During the PT examination of the VHP nozzle No. 26 J-groove weld, the licensee identified linear indications (cracks) which required repair. The licensee subsequently removed the cracked nozzle No. 26 J-groove weld and completed a temper bead weld repair.

Evaluation of Inspection Requirements

In accordance with requirements of TI-150, the inspectors evaluated and answered the following questions:

1. *For each of the examination methods used during the outage, was the examination performed by qualified and knowledgeable personnel? (Briefly describe the personnel training/qualification process used by the licensee for this activity.)*

   Above Head Visual Examinations

   Yes. The licensee conducted a remote and direct visual examination of the top surface of the vessel head with knowledgeable staff members certified to Level II or Level III as VT-2 examiners in accordance with procedure NDE-3 "Written

Practice For Qualification And Certification For NDE Personnel" This qualification and certification procedure met the industry standard ANSI/ANST CP-189 "Standard for Qualification and Certification of Nondestructive Testing Personnel." Additionally, the licensee's VT-2 personnel had access to photographs of each penetration location taken during the last Unit 1 visual head inspection completed in 2002.

Under Head Automated UT Examinations

Yes. The licensee's vendor personnel that performed the automated UT were certified to level II or III in UT examination in accordance with vendor (Framatome) procedure 54-ISI-30-01 "Written Practice for the Qualification and Certification of NDE personnel." This procedure met the industry standard ANSI/ANST CP-189 "Standard for Qualification and Certification of Nondestructive Testing Personnel." Additionally, the licensee's vendor UT acquisition and analysis personnel had a minimum of 16 hours training on the automated UT examination techniques used.

Under Head Manual Ultrasonic Examinations

Yes. The licensee conducted a manual UT examination of the lower portions of VHP nozzles No. 32 and No. 33 below the J-groove weld with a knowledgeable staff member certified to Level III as for UT examination in accordance with procedure NDE-3 "Written Practice For Qualification And Certification For NDE Personnel." This procedure met the industry standard ANSI/ANST CP-189 "Standard for Qualification and Certification of Nondestructive Testing Personnel."

Under Head PT Examinations

Yes. The licensee conducted a solvent removable PT examination of the head vent and penetration VHP nozzle No. 26 J-groove weld locations with a knowledgeable staff member certified to Level III in PT examination in accordance with procedure NDE-3 "Written Practice For Qualification And Certification For NDE Personnel." This procedure met the industry standard ANSI/ANST CP-189 "Standard for Qualification and Certification of Nondestructive Testing Personnel."

2. *For each of the examination methods used during the outage, was the examination performed in accordance with demonstrated procedures?*

Above Head Visual Examinations

Yes. The licensee performed a bare metal inspection of the vessel head in accordance with procedure NDE-757 "Visual Examination For Leakage of Reactor Pressure Vessel Penetrations." The licensee considered this procedure to be demonstrated because examination personnel could resolve lower case

alpha numeric characters 0.158 inches in height at a maximum of 6 feet under existing lighting, which met Code visual VT-2 examination criterion.

However, the inspectors identified parameters that could impact the quality/effectiveness of the inspection which were not controlled by the procedure. Specifically, the procedure did not provide:

- guidance for when and how to collect samples of deposits if any had been identified near the interface of lower head penetrations. Further, no guidance existed to identify what analysis would be performed to determine the source of deposits identified. Instead, the licensee staff stated that they would follow a Bottom Mounted Instrument Inspection Decision Tree Diagram to make decisions on sampling of deposits on the upper head.

- guidance or threshold for identification and documentation of corrosion or wastage (e.g. 1 percent or 10 percent wastage etc.). Note that the licensee and NRC inspectors did not identify any significant corrosion or wastage in the visual examinations of the RPV head.

- demonstration of the near distance resolution capability for the remote camera system.

- demonstration of color resolution capability for the remote camera system.

For the items discussed above, the licensee provided verbal direction or controlled the parameters, such that the inspectors did not consider the quality of the visual examination to be compromised.

The inspectors observed the licensee personnel performing the remote visual examination of the upper surface of the reactor head under the insulation using a camera mounted to a robotic crawler in accordance with procedure NDE-757 for portions of 12 vessel head VHP nozzle locations. The licensee was able to position the inspection camera within a few inches of the vessel head penetration VHP nozzle interface with sufficient lighting such that a sharp/clear visual image was obtained. The inspectors judged the resolution capability of the remote visual camera system to be very good, based upon the ability to resolve very small debris particles at the penetration nozzle-to-head interfaces.

The inspectors reviewed the licensee's demonstration of visual resolution and noted that it was consistent with the procedure requirements. The inspectors also performed a direct visual inspection for portions of 30 VHP nozzles viewable at 5 of the 6 inspection ports in the service structure. Based on this examination, the inspectors noted that the remote picture quality appeared to provide for a superior inspection to that achievable by a direct visual examination from the service structure access doors.

Under Head UT and PT Examinations

Yes. The licensee's vendor performed automated UT examinations in accordance with Framatome ANP Nondestructive Examination Procedure 54-ISI-100-11, "Remote Ultrasonic Examination of Reactor Head Penetrations." The licensee's vendor demonstrated an earlier version of this procedure on mockup VHP nozzles which contained cracks or simulated cracks as documented in EPRI MRP-89 "Materials Reliability Program Demonstrations of Vendor Equipment and Procedures for the Inspection of Control Rod Drive Mechanism Head Penetrations." The inspectors reviewed the revisions to procedure 54-ISI-100-11 implemented since the licensee's vendor had demonstrated this procedure in EPRI MRP-89, to ensure that any equipment configuration changes did not affect flaw detection capability. Additionally, the licensee's vendor had demonstrated the capability to detect a leakage path in the interference zone using this procedure on a mockup with a simulated leak path and at other nuclear power plants with observed leakage paths such as the Oconee Units. However, the inspectors noted that this UT procedure/method was not designed to detect PWSCC contained entirely within the J-groove welds of VHP nozzles.

The inspectors identified a potential weakness in the licensee's implementation of procedure 54-ISI-100-11, "Remote Ultrasonic Examination of Reactor Head Penetrations." The inspectors noted that the licensee's vendor typically ran the blade UT probe to failure which precluded a final calibration check of the failed UT probe. If the vendor had elected to incorporate ASME Code Section XI rules into this procedure, the examination data would have been considered invalid back to last known UT equipment calibration check. The licensee's vendor UT analyst typically accepted the UT data up to point of probe failure. This practice was allowed by the licensee's procedure however, the inspectors concluded that it placed greater reliance on the licensee's vendor UT data analyst which could increase the probability of missing cracks due to human errors.

Unknown. The licensee conducted under head automated UT examinations of the vessel head vent line nozzle penetration in accordance with procedure 54-ISI-137-03 "Remote Ultrasonic Examination of Reactor Vessel Head Vent Line Penetrations." The licensee's vendor considered this procedure demonstrated based upon the ability to see electric discharge machined (EDM) notches in the UT calibration standard (reference 54-PQ-137-01 "Remote Ultrasonic Examination of Reactor Vessel Head Vent Line Penetrations"). The inspectors noted that this type of demonstration would not assure the capability of this equipment to detect PWSCC. Therefore, the inspectors could not independently confirm the ability of this equipment to detect PWSCC in the head vent line nozzle base material.

Yes. The licensee conducted manual UT examinations of the lower portions of VHP nozzles No. 32 and No. 33 below the J-groove weld in accordance with procedure NDE-141 "Manual Ultrasonic Examination of Reactor Head Penetrations." The licensee demonstrated this procedure in a blind test on a control rod drive penetration tube mockup with EPRI. EPRI considered this

procedure qualified for detection only and not for sizing of flaws. This manual UT examination did not include the J-groove weld region of VHP nozzles No. 32 and No. 33.

Yes. To detect PWSCC in the J-groove weld area of the head vent line and VHP nozzle No. 26, the licensee performed a PT examination in accordance with procedure NDE-451 "Visible Dye Penetrant Examination Temperature Applications 45°F to 125°F." The licensee considered the use of an ASME Code qualified solvent removable visible PT procedure to detect surface breaking PWSCC flaws in the J-groove welds as demonstrated. This procedure allowed the licensee to use a greater temperature range over the standard band specified in Article 6, of Section V of the ASME Code. The ASME Code allows expanded temperature ranges if the procedure is demonstrated at the limits of the expanded temperature band. The inspectors confirmed that the licensee had appropriately demonstrated the procedure on a quench cracked aluminum comparator block in accordance with the ASME Code Section V, Article 6 requirements.

3. *For each of the examination methods used during the outage, was the examination able to identify, disposition, and resolve deficiencies and capable of identifying the PWSCC and/or head corrosion phenomena described in Order EA-03-009?*

Above Head Visual Examinations

Yes. The inspectors determined through direct observation of the bare metal head, interviews with inspection personnel, reviews of procedures and inspection reports, and reviews of video tape documentation that the licensee was capable of detecting and characterizing leakage from cracking in penetration VHP nozzles.

The upper head had been cleaned during the previous outage and was relatively free of debris or deposits which would mask evidence of leakage. The inspectors performed a direct visual examination through five of six viewing ports in the service structure and observed the licensee performing the remote video inspection of the bare metal head conducted under the insulation with a camera mounted to a magnetic crawler. The licensee also supplemented the remote visual with direct visual examinations and performed frequent checks of the VT-2 visual examination quality indicator card during these examinations. Overall, the inspectors concluded that the remote visual examination resolution and picture quality equal or superior to a direct visual examination. The licensee was able to obtain a visual examination at each of the 49 VHP nozzles and the head vent line nozzle penetration, with no obstructions or interferences. Therefore, the inspectors concluded that the inspection performed was capable of detecting evidence of leakage at the VHP nozzle penetrations cause by PWSCC or corrosion of the vessel head caused by boric acid.

Under Head VHP Automated UT Examinations

Yes. For the VHP nozzle base metal material the UT equipment, techniques and procedures had been demonstrated as effective in detection of PWSCC. The licensee used automated UT equipment with two different configurations. A blade type UT probe was used to acquire data for sleeved VHP nozzles and relied on a single transducer pair optimized for detection of circumferentially oriented flaws using a time of flight diffraction (TOFD) UT technique. A rotating head type UT probe was used to acquire data from VHP nozzles without thermal sleeves. The rotating probe contained multiple TOFD transducer configurations and shear wave transducers which were designed to optimize detection of both circumferential and axial oriented flaws. Both the blade and rotating head UT probes were configured to detect evidence of leakage/corrosion in the interference zone behind the VHP nozzle based on the pattern in the UT backwall response. During the Unit 1 VHP examinations, the licensee's vendor identified that a rotating probe shear wave transducer failed to detect the reflectors in the calibration block during the post examination calibration check because it was "to noisy." The licensee determined that loss of data from this one transducer had no affect on the rotation probes ability to detect PWSCC due to the multiple transducers on the rotating probe which were still functioned properly. The inspectors agreed with the licensee's evaluation that failure of this UT transducer would not affect the ability of the rotating probe to detect PWSCC.

No. The licensee's UT examination methods implemented on the VHP nozzles were not designed to detect J-groove weld cracking and therefore, had not been demonstrated for detection of PWSCC or other flaws contained entirely within the J-groove welds. Therefore, for PWSCC contained entirely within the J-groove weld, the inspectors concluded that the licensee's UT examination method would not be effective for detection of PWSCC.

Under Head Vent Line Penetration Automated UT Examinations

Unknown. A rotating probe with pulse-echo type shear and longitudinal wave transducers was used to acquire data from the head vent line penetration. The licensee's vendor considered the UT method used on the head vent nozzle as demonstrated based upon the ability to see simulated cracks (EDM notches) in the UT calibration standard (reference 54-PQ-137-01 "Remote Ultrasonic Examination of Reactor Vessel Head Vent Line Penetrations"). The EDM process results in a uniform notch with a relatively wide air filled gap perpendicular to one surface that is readily detected by UT examination. In contrast, PWSCC gaps are very small (e.g. tight), are not uniform in nature and may not be perpendicular to the surface, which represents a more significant challenge for detection by UT examination. Therefore, the inspectors concluded that demonstration of this UT technique on EDM notches in the calibration standard was not sufficient to confirm the ability of this UT probe to detect PWSCC.

Under Head Manual UT Examinations Of VHP Nozzle No. 32 And No. 33

Yes. The licensee performed manual UT examinations of the lower portions of VHP nozzles No. 32 and No. 33 below the J-groove weld in accordance with procedure NDE-141 "Manual Ultrasonic Examination of Reactor Head Penetrations." The licensee demonstrated this procedure during a blind test on a VHP nozzle mockup containing EDM notches at an EPRI facility. The licensee's inspector also examined samples of VHP nozzles with PWSCC removed from the Oconee plant. The EPRI staff confirmed that the licensee's inspector was able to detect the PWSCC flaws in the Oconee samples. Therefore, the inspector concluded that the licensee procedure was qualified for detection of PWSCC flaws in the VHP nozzle base material.

Under Head Vent Line Penetration PT Examinations

Yes. The licensee conducted a PT examination of the head vent line and VHP nozzle No. 26 J-weld in accordance with procedure NDE-451 and which was effective at detection of PWSCC. The inspectors observed the videotaped PT examination conducted on the head vent line penetration J-groove weld and confirmed that the licensee met Code penetrant dwell time and developer times and observed that no recordable indications were identified. For the VHP nozzle No. 26 J- groove weld, the licensee performed a series of PT examinations (with intermediate buffing/grinding steps) and confirmed two patches of multiple linear indications in the J-groove weld. The inspectors observed the videotaped PT examinations conducted on the VHP nozzle 26 J-groove weld that identified the two areas of small linear indications. Therefore, the inspectors concluded that the Code qualified PT examination of these J-groove welds was capable of detecting PWSCC based on identification of flaw like indications in VHP nozzle No. 26 and based upon a review of vendor data that clearly showed the ability of Code PT examinations to detect PWSCC at other reactor sites.

4. *What was the physical condition of the reactor head (debris, insulation,* dirt, *boron from other sources, physical layout, viewing obstructions)?*

Above Head Visual Examinations

The Unit 1 vessel head insulation consisted of reflective metal insulation panels installed on a support structure over the top of the reactor head with access for visual examinations through six viewing ports in the metal service structure surrounding the top of the head. The inspectors viewed the bare metal head condition through five of these six viewing ports and considered the head condition relatively clean. However, the outer surface of the penetration tubes above the head generally contained a sprayed on white mastic coating which had been applied as a sealer in the original head insulation design. The bare metal head was covered with a light gray colored coating applied by the head fabricator, which provided an adequate surface for visual resolution of boric acid deposits. The inspectors also observed portions of the licensee's visual examination and videotaped portions completed on other shifts. The remote camera visual inspection was conducted under the insulation support structure and the as-found head condition was generally clean (free of debris, insulation,

dirt). For some penetration locations, the annulus gap contained loose debris (presumed to be mastic which was scraped off the upper penetration tube housings during installation of new insulation during the last outage), which did not hinder the licensee's evaluation of the penetrations, because the licensee vacuumed, blew air or used a soft brush to remove this loose debris. The licensee supplemented the remote camera inspection with direct visual examinations at some VHP nozzles. The licensee did not identify any obstructions which limited their visual inspection and licensee inspection personnel were able to fully examined the 49 VHP nozzles, and the head vent line penetration.

The inspectors identified that the licensee had not determined if the visual examination scope would meet NRC Order EA 03-009 requirements. NRC order EA-03-009 dated February 20, 2004, required the licensee to complete a 95 percent surface area examination of the upper head including areas upslope and downslope of the service structure. The service structure and vertical insulation panels represented areas where the vessel head surface was not examined. The inspectors' questions as to the adequacy of the visual examination coverage, prompted the licensee to document in CAP 056522, the need to develop a calculation to estimate the area of visual examination coverage in a formal calculation. The licensee subsequently decided to document coverage in an internal memorandum dated May 17, 2004. In this memorandum, the licensee determined through review of drawings related to the head, head service structure and insulation package, that the total head area not available for visual examination was 1.5 percent. The inspectors' questions as to how this number was calculated, prompted the licensee to issue a new memorandum dated May 24, 2004, which documented the square inches of surface areas obstructed. In this memorandum, the licensee changed the total obstructed area to 5 percent and concluded that the visual examination scope would be able to achieve the 95 percent coverage required by the Order.

5. *Could small boron deposits, as described in Bulletin 2001-01, be identified and characterized?*

Above Head Visual Examinations

Yes. Based upon the quality and scope of the licensee's visual examination, and independent direct observations, the inspectors concluded that any boron deposits characteristic of coolant leakage would have been identified (if any had been present). The inspectors noted that no boric acid deposits were found on the 49 VHP nozzles and head vent line penetration nozzle. The inspectors independently observed the remote visual examination for portions of 12 VHP nozzles and direct examinations of portions of 30 VHP nozzles and did not observe white deposits (boric acid) with characteristics (adherent popcorn like) indicative of reactor coolant system leakage. The licensee performed a systematic inspection and documented the visual examination results for every nozzle-to-vessel interface location. No indications of head leakage were recorded.

6. *What material deficiencies (i.e., cracks, corrosion, etc) were identified that require repair?*

At penetration VHP nozzle No. 26, the licensee's UT examination identified a circumferentially oriented indication (60-70 degree extent) located in the J-groove weld and which extended for 20 to 25 percent through-wall into the penetration tube. The licensee determined that this indication was likely due to original construction J-groove weld repair activities and was not considered a flaw. To confirm this conclusion, the licensee performed four PT examinations of the VHP nozzle No. 26 J-weld with intermediate buffing/grinding steps to attempt to remove axial indications. In the final PT examination the licensee identified two patches of flaw-like axial indications at the surface of the J-groove weld. One area of linear indications measured approximately 1.5 inch by 0.6 inch and the other area measured 2.5 inch by 0.6 inch. The licensee did not record the actual size, number or spacing of these indications. The licensee documented their basis for not to performing additional PT examinations of other J-groove welds in an internal memorandum dated May 13, 2004 and letter to the NRC dated May 23, 2004.

The licensee decided to repair VHP nozzle No. 26, based upon the PT examination results which identified linear indications in the J-groove weld. The licensee's repair technique involved removal of the lower portion of the VHP nozzle up through the existing J-groove weld and installation of a new temperbead weld that overlapped a portion of the existing J-groove weld. The licensee performed this new temper bead weld repair in accordance with vendor travel "Ambient ID Temper Bead Repair for CRDM Nozzles" and the welding occurred in accordance with weld procedure specification (WPS) 5S-WP3/43/ F43TBSCA301. The inspectors reviewed the certified mill test reports for the weld filler materials, process traveler steps, weld control records and observed portions of the machine operator repair welding to confirm ASME Code Section III and Section IX requirements (as amended by the licensee's Code relief request) were met. Additionally, the inspectors performed independent calculations of weld heat input for weld passes No. 1 through No. 3, to confirm that weld heat input remained within 10 percent of that qualified in accordance with Code Case N-638 requirements. The inspectors also reviewed final weld UT examination records to confirm that no flaws were identified in the VHP nozzle No. 26 repair weld.

The licensee's vendor used non-structural attachment (tack) welds on the existing J-groove weld at VHP nozzle No. 26 to mount tooling used in machining and welding. The inspectors identified that the repair process traveler steps did not include a PT examination following removal of this tack weld as required by the ASME Code Section III, paragraph NB-4435. Initially, the licensee staff considered that the existing J-groove weld was no longer part of the pressure boundary and therefore, did not consider the ASME Code Section III requirements to apply. However, based upon followup discussions with the inspectors and NRR staff, the licensee staff submitted a supplement to the relief requests for VHP nozzle No. 26 (MR 02-018-1 and MR 02-018-2) on May 21,

2004, to request relief and to justify this deviation from Code requirements. By phone conference held on May 26, 2004, NRR staff granted the licensee verbal approval to use this relief request. The inspectors considered this violation of the ASME Code to be of minor significance, because it involved regulatory compliance, and did not have any potential safety significance.

7. *What, if any, impediments to effective examinations, for each of the applied methods, were identified (e.g., centering rings, insulation, thermal sleeves, instrumentation, nozzle distortion)?*

Above Head Visual Examinations

None.

Under Head PT Examination of Head Vent Line and VHP nozzle No. 26

None.

Under Head Ultrasonic Examinations

NRC Order EA-03-009 dated February 20, 2004, required licensee's to scan to at least 1 inch below the lowest point at the toe of the J-groove weld for each penetration and all areas with greater than 20 ksi (1000 pounds per square inch) tension residual and normal operating stress. For 17 VHP nozzle locations, the licensee was not able to obtain at least a full 1 inch below the J-groove weld. For these nozzles the maximum extent volumetrically scanned at the tube outside diameter below the downhill side of the weld was less than the 1 inch due to the short length of nozzle existing below the J-groove weld and the UT transducer configuration. Specifically, the axially aligned transducer pair used on the blade probe resulted in a small volume of uninspected tube material at the inside corner of these sleeved VHP nozzle locations. On conference calls with NRR and Region based staff held on May 6, 2004, and May 11, 2004, the licensee discussed their intent to justify this limitation in a relaxation request to the NRC Order EA-03-009 using a deterministic fracture mechanics approach which assumed the uninspected area contained flaws. On May 14, 2004, the licensee issued a letter requesting relaxation to Order EA-03-009, which identified the 17 VHP nozzles to which this condition applied.

For VHP nozzles No. 32 and No. 33, the licensee was not able to get full 360 degree UT examination coverage with the blade UT probe due to nozzle distortion which created an insufficient clearance gap between the thermal sleeves and VHP nozzles. The licensee had similar inspection problems with these locations during the last Unit 1 outage and had to replace these thermal sleeves to allow access during the previous outage. The licensee determined that this previous replacement work would complicate another thermal sleeve removal and reinstallation activity which would be necessary to support additional UT examination coverage. The extent of uninspected area below the J-groove welds for VHP nozzles No. 32 and No. 33 was 42 degrees and 306 degrees

respectively. The licensee also identified an additional 60 degrees of uninspected area in and above the J-groove weld for VHP nozzle No. 33. On conference calls with NRR and Region based staff held on May 6, 2004, and May 11, 2004, the licensee discussed their intent to further justify this limitation in a supplemental relaxation request to the NRC Order EA-03-009. On May 14, 2004, the licensee completed additional manual UT examinations on the lower end of VHP nozzles No. 32 and No. 33 such that the examination coverage required by the Order was met for VHP nozzle No. 32. On May 14, 2004, the licensee issued a letter requesting relaxation to Order EA-03-009, for the limited UT coverage on VHP nozzle No. 33 which included the a deterministic fracture mechanics analysis approach to support continued operation. On May 19, 2004, the licensee elected to remove the thermal sleeve from VHP nozzle No. 33 to permit access for the rotating UT probe to complete the examination coverage for VHP nozzle No. 33 rather than pursue the request for Order relaxation. On May 20, 2004, the licensee completed the rotating UT probe examination for VHP nozzle No. 33, such that this VHP nozzle no longer required relaxation from Order EA-03-009 requirements.

8. *What was the basis for the temperatures used in the susceptibility ranking calculation, were they plant-specific measurements, generic calculations, (e.g., thermal hydraulic modeling, instrument uncertainties), etc.?*

NRC Order EA-03-009 required licensee's to calculate the susceptibility category of each reactor head to PWSCC-related degradation. The susceptibility category in EDY establishes the basis for the licensee to perform appropriate head inspections during each refueling outage. The licensee documented the Unit 1 RPV head EDY in calculation C11470 "Reactor Vessel Head Effective Degradation Year (EDY)." In this calculation, the licensee used the formula required by NRC Order EA-03-009 and determined the EDY for each operating Unit. As of April 1, 2004, Unit 1 was at 15.5 EDY which placed this Unit in the high susceptibility category. The inspectors also reviewed the examination records from the previous Unit 1 head examinations and confirmed that no PWSCC of VHPs had been previously identified.

NRC Order EA-03-009 also required the licensee to have used best estimate values in determining the susceptibility category for the vessel head. The inspectors reviewed Table 2-1 of EPRI MRP-48 "PWR Materials Reliability Program Response to NRC Bulletin 2001-01," which documented an operating head temperatures of 559 through 592 degrees Fahrenheit over the operating life of Unit 1. The current operating head temperature was identified as 592 degrees Fahrenheit in MRP-48 and this value had been used in the licensee's susceptibility ranking calculation. The inspectors questioned the licensee staff as to the source of the head temperature used in MRP-48, which prompted the licensee to document additional information obtained from their vendor. In a memorandum to file dated April 22, 2004, the licensee documented that an upper head bulk mean fluid temperature of 591.6 degrees Fahrenheit had been calculated by the licensee's vendor using a proprietary THRIVE computer model. This model was used to produce a range of head temperatures based on vessel core inlet operating temperatures. The temperature for the Point Beach Unit 1 head was determined by graphical interpolation from the THRIVE computer runs. Therefore, the inspectors concluded that the licensee had used a combination of

plant specific information and a generic analytical model to determine operating head temperatures for Point Beach Unit 1.

9. *During non-visual examinations, was the disposition of indications consistent with the guidance provided in Appendix D of this TI? If not, was a more restrictive flaw evaluation guidance used?.*

   The inspectors determined that this question was not applicable, because the licensee did not identify any flaws that required evaluation and return to service.

10. *Did procedures exist to identify potential boric acid leaks from pressure-retaining components above the vessel head?*

    Yes. The licensee performed inspections of components within containment to identify leakage which included the area above the vessel head. This inspection was conducted by Operations and Maintenance Department personnel during the conduct of the reactor coolant system leakage test in accordance with procedure 1-PT-RCS-1 "Reactor Coolant System (RCS) Pressure Test- Inside/Outside Containment Unit 1." The licensee stated that this procedure was implemented four to five weeks prior to the outage with the plant at power to complete an "as-found" leakage inspection, but the scope at this point did not include areas above the reactor head. The licensee implemented this procedure a second time just after plant shutdown and once again just prior to plant startup from the refueling outage. During the two inspections with the plant shutdown, the licensee's inspection scope included areas above the reactor head. The licensee staff were required to document indications of boric acid or active leakage (none were identified) on evaluation sheets of Appendix C of the Boric Acid Leakage and Corrosion Monitoring Program. The overall division of responsibilities and integrated actions to address boric acid leakage was identified in NP 7.4.14 "Boric Acid Leakage and Corrosion Monitoring" and the Boric Acid Leakage and Corrosion Monitoring Program.

11. *Did the licensee perform appropriate follow-on examinations for boric acid leaks from pressure retaining components above the vessel head?*

    Not applicable. The licensee did not identify any instances of active boric acid leakage from components above the Unit 1head. The inspectors independently reviewed data records of leakage identified during the last Unit 1 RCS leakage tests to confirmed that no indications of boric acid leakage were recorded for areas near the reactor vessel head. Additionally, the NRC had confirmed that no evidence of boric acid leakage had contacted the Unit 1 head during the prior outage bare metal head examination (reference NRC inspection report 2002-013).

c. <u>Findings</u>

No findings of significance were identified.

.2 Reactor Pressure Vessel Lower Head Penetration Nozzles (TI-2515/152)

a. Inspection Scope

On August 21, 2003, the NRC issued Bulletin 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity." The purpose of this Bulletin was to: (1) Advise pressurized water reactor (PWR) licensees that current methods of inspecting the vessel lower heads may need to be supplemented with additional measures (e.g., bare-metal visual inspections) to detect reactor coolant pressure boundary leakage; (2) request PWR addressees to provide the NRC with information related to inspections that have been or will be performed to verify the integrity of the reactor vessel lower head penetrations, and; (3) require PWR addresses to provide a written response to the NRC in accordance with the provisions of Title 10 of the Code of Federal Regulations (10 CFR 50.54(f)).

The objective of TI 2515/152, "Reactor Pressure Vessel Lower Head Penetration Nozzles," was to support the NRC review of licensees' vessel lower head penetration inspection activities that were implemented in response to Bulletin 2003-02. The licensee had committed to perform a bare metal inspection of the lower vessel head for Unit 1 in response to the NRC Bulletin 2003-02. The inspectors performed a review in accordance with TI 2515/152 Revision 0, of the licensee's procedures, equipment, and personnel used for reactor vessel lower head penetration examinations to confirm that the licensee met commitments associated with Bulletin 2003-02. The results of the inspectors' review included documenting observations and conclusions in response to the questions identified in TI 2515/152.

From April 5, 2004, through April 23, 2004, in an office on the 8 foot level of the TSB (unless otherwise stated), the inspectors reviewed activities associated with licensee inspect of the Unit 1 lower vessel head. Specifically, the inspectors:

- performed a direct visual examination of the nozzle-to-head interface for portions of each of the 36 bottom head penetrations inside the Unit 1 containment from a staging platform under the reactor vessel ;
- interviewed nondestructive examination personnel in the head inspection trailer within the site protected area;
- reviewed the lower head visual inspection procedure NDE-757 "Visual Examination For Leakage of Reactor Pressure Vessel Penetrations;"
- reviewed the certification records for the nondestructive examination personnel;
- reviewed the licensee's procedure for certification of visual examination personnel; and
- reviewed visual examination and evaluation of indication records.

b. Observations

Summary

Based upon a bare metal direct visual examination of the lower head, the licensee did not identify evidence of reactor coolant system leakage near the instrument nozzle penetrations. One quadrant of the vessel at the 270 to 360 degrees azimuth had evidence of corrosion stains that were caused by rundown from liquid sources above the bottom of the vessel. The licensee believed that these stains were caused by condensed moisture corrosion of the vessel support steel. A few penetrations in this quadrant were contacted by this rust stain, but did not result in debris/deposits in the nozzle-to-head interface.

Evaluation of Inspection Requirements

In accordance with requirements of TI 2515/152, the inspectors evaluated and answered the following questions:

a. *For each of the examinations methods used during the outage, was the examination:*

1. *Performed by qualified and knowledgeable personnel? (Briefly describe the personnel training/qualification process used by the licensee for this activity.)*

   Yes. The licensee conducted a direct visual examination of the Unit 1 lower vessel head penetration interface and lower vessel head surface for leakage or boric acid deposits with knowledgeable staff members certified to Level III as VT-2 examiners. One examiner was a licensee staff member certified to licensee procedure NDE-3 "Written Practice For Qualification And Certification For NDE Personnel" and the other was a licensee contractor certified to the contractors procedure 2-NDES-001 "Nondestructive Examination Personnel Qualification and Certification." These qualification and certification procedures met the industry standard ANSI/ANST CP-189 "Standard for Qualification and Certification of Nondestructive Testing Personnel." Additionally, the VT-2 examination personnel had reviewed photographs of the boric acid deposits indicative of penetration leakage found at the South Texas Nuclear Power Plant.

2. *Performed in accordance with demonstrated procedures?*

   Yes. The licensee performed a bare metal inspection of the lower head in accordance with procedure NDE-757 "Visual Examination For Leakage of Reactor Pressure Vessel Penetrations." The licensee considered this procedure to be demonstrated because there examination personnel could resolve the lower case alpha numeric characters 0.158 inches in height at a maximum of 6 feet under existing lighting to meet Code VT-2 inspection criterion.

The inspectors identified lack of procedure guidance which could potentially impact the quality/effectiveness of the inspection. Specifically, the procedure did not provide:

- guidance for when and how to collect samples of deposits if any had been identified near the interface of lower head penetrations. Further, no procedure guidance existed to identify what analysis would be performed to determine the source of deposits identified. Instead, the licensee staff stated that they would follow a Bottom Mounted Instrument Inspection Decision Tree Diagram to make decisions on sampling of deposits on the lower head.

- guidance or threshold for identification and documentation of corrosion or wastage (e.g. 1 percent or 10 percent wastage etc.). Note that the licensee and NRC inspectors did not identify any significant corrosion or wastage in the visual examinations of the vessel head.

- useful orientation and penetration numbering figure/schematic for the bottom mounted instrument (BMI) penetrations. Specifically, the procedure used a top down schematic vice a bottom up picture (actual view that the licensee's visual examiners were presented with) and the BMI numbers marked by examination personnel did not match the designated numbers on vendor drawings. The licensee had physically marked each penetration with numbers (1 through 36) to assist in the lower head examination.

The inspectors performed an independent direct bare metal visual examinations for most of the 36 lower head penetration nozzles from the platform under the vessel head used by licensee visual inspectors. The inspectors determined that each penetration was readily accessible such that the licensee inspectors were able to conduct the visual examination from within a few inches of each penetration location. Additionally, the inspectors reviewed a sample of licensee photographs taken at each penetration nozzle. Based upon this inspection and interviews with inspection staff, the inspectors did not identify any concerns associated with implementation of the visual inspection procedure for the lower head.

3. Able to identify, disposition, and resolve deficiencies?

Yes. The lower vessel head at the 270 to 360 degree (south) quadrant contained corrosion stains in a pattern that suggested a flow of liquid had run down from a source above. This flow pattern impacted several lower head penetrations. In most cases this flow pattern did not reach the BMI head-to-nozzle interface because of a raised metal pad that extended for several inches around the surface of the lower vessel head at each penetration. Based upon the visual examination, the licensee did not

identify any penetration nozzles with deposits at the nozzle-to-head interface, indicative of boric acid leakage.

4. Capable of identifying pressure boundary leakage as described in the bulletin and/or vessel lower head corrosion?

Yes. The inspectors performed a direct visual inspection of portions of the 36 lower BMI penetration nozzles. Based on this examination, and interviews with licensee examiners, the inspectors concluded that the visual examination was capable of detecting deposits indicative of pressure boundary leakage and head corrosion as described in the bulletin.

b. *Could small boric acid deposits representing reactor coolant system leakage as described in the Bulletin 2003-02, be identified and characterized, if present by the visual examination method used?*

Yes. If small boric acid deposits characteristic/indicative of leakage had existed, the inspectors concluded that the licensee's examination would have identified these. However, the licensee did not identify any boric acid deposits indicative of leakage.

c. *How was the visual inspection conducted (e.g., with video camera or direct visual by examination personnel).*

Licensee examination personnel conducted a direct visual examination of each of the lower head penetration nozzles. This examination included a bare metal visual examination of the lower head up to the transition to the vertical vessel shell wall. The licensee examiner reported that he was looking for evidence of boric acid deposits or corrosion for this inspection. However, as discussed above there was no specific direction in the procedure for when lower head corrosion/wastage would be recorded.

d. *How complete was the coverage (e.g., 360 degrees around the circumference of all the nozzles)?*

The licensee's visual examination coverage included a 360 degree unobstructed view of each of the 36 lower head penetration nozzles at the interface of the vessel head. Because the lower insulation was removed, the entire lower head was accessible to the licensee staff for the visual examination.

e. *What was the physical condition of the vessel lower head (e.g., debris, insulation, dirt, deposits from any source, physical layout, viewing obstructions)? Did it appear that there are any boric acid deposits at the interface between the vessel and the penetrations?*

The Point Beach Unit 1 lower head was surrounded by mirror-type insulation. The original insulation configuration conformed with the contour of the lower vessel dome with a 3 inch gap between the vessel and insulation. Each BMI penetration had a slight gap that varied in size and is normally covered by metal flashing. For the Unit 1 visual examination, this insulation had been removed to provide unobstructed access to the BMI penetrations. The licensee intended to install a revised lower head insulation structure with a tub type configuration (e.g. horizontal insulation floor with vertical walls). This revised insulation design provided for access doors in the vertical and horizontal walls to allow access for future bare metal head inspections.

On the lower head, the inspectors observed scattered patches of what the licensee staff believed was an corrosion resistant coating applied to the vessel head by the original fabrication vendor prior to installation. The remnants of this coating did not interfere with the inspection. The lower vessel at the 270 to 360 degree quadrant contained corrosion and stains in a pattern that suggested a flow of liquid had run down from a source above the lower head.

f. *What material deficiencies (i.e., crack, corrosion, etc.) were identified that required repair?*

None. The licensee did not identify any boric acid deposits indicative of leakage and therefore, no repairs were required.

g. *What, if any, impediments to effective examinations, for each of the applied nondestructive examination method, were identified (e.g., insulation, instrumentation, nozzle distortion)?*

None. The direct visual examination required access to the vessel lower head and BMI nozzle penetrations by climbing down a ladder, into the keyway (a sump area under the vessel). This area was a confined space, a high radiation area, and was congested by the instrument tubes and their supports. Scaffold had been installed to support removal of the lower insulation and to allow access for direct inspection of the BMI penetrations. With the insulation removed, each penetration was accessible from this platform for direct visual inspection.

h. *Did the licensee perform appropriate follow-on examinations for indications of boric acid leaks from pressure-retaining components above the vessel lower head?*

The licensee did not identify indications of boric acid leakage from pressure-retaining components above the lower head.

i. *Did the licensee take any chemical samples of the deposits? What type of chemical analysis was performed (e.g. Fourier Transform Infrared), what*

constituents were looked for(e.g., boron, lithium, specific isotopes), and what were the licensee's criteria for determining any boric acid deposits were not from RCS leakage (e.g., Li-7, ratio of specific isotopes, etc.)?

Not applicable. The licensee did not identify any boric acid deposits on the lower head and therefore, did not perform any chemical samples.

j. *Is the licensee planning to do any cleaning of the head?*

Yes. The licensee staff stated that the lower head would be cleaned with deionized water, rags and scotch-bright pads prior to reinstalling the lower head insulation.

k. *What are the licensee's conclusions regarding the origin of any deposits present and what is the licensee's rationale for the conclusions?*

The licensee did not identify any deposits on the Unit 1 lower head. The inspectors questioned the licensee staff as to the source of the corrosion stains at the 270 to 360 degree quadrant on the head in a pattern that suggested a flow of liquid had run down from a source above the lower head. The licensee staff stated they believed that this flow pattern was the result of condensed moisture which had run down the side of the vessel from corrosion occurring on the vessel support steel. The licensee had not been able to visually confirm the source of these rust contrails due to the narrow gap between the vessel wall and mirror insulation.

In July of 2003, the licensee identified of boric acid deposits at the lower head insulation seams and where the BMI tubes penetrated the insulation (reference CAP 034123). The licensee concluded that the leak source for these deposits was the sand box covers or top hat covers in the refueling cavity (e.g. refueling water seal leakage) and that this leakage would not likely contact the vessel. The licensee had chemically tested the boric acid found on the lower head insulation seams and based on the absence of lithium confirmed that source of boric acid deposits was not reactor coolant leakage.

.3 (Closed) URI 50-266/03-09-01: On September 16, 2003, the licensee's vendor identified that during the Unit 1 vessel head UT inspection completed in September of 2002, that the rotating UT probe head stalled due to coupling slippage which resulted in partial data acquisition in 10 of the 19 VHP nozzles (reference Framatome NCR 6028873- Lack of UT Coverage During U1 Refueling Outage No.27 Head Inspection). The licensee documented this issue in the corrective action system as CA053202 and CE012362. The licensee's vendor implemented corrective actions which included a redesigned coupling on the rotating UT probe and use of a backup analysts to prevent recurrence prior to using this tool during the Unit 2 VHP examinations. Additionally, the licensee performed an analysis of the coverage limitations and determined that there was sufficient Unit 1 data for the examination results to remain valid. The licensee

subsequently performed UT of the affected VHP nozzles during the Unit 1 refueling outage No. 28 and no flaws were identified. The inspectors did not identify any violations of NRC requirements for this issue and this URI is considered closed.

c. Findings

No findings of significance were identified.

4OA6 Meetings

.1 Interim Exit Meetings

Interim exit was conducted for:

- Temporary Instruction 2515/150, Temporary Instruction 2515/152 and the ISI procedure (IP 7111108) with Mr. J. Shaw and other members of your staff on April 23, 2004, April 28, 2004, and May 26, 2004. The licensee confirmed that none of the potential report input discussed was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

J. McCarthy, Director of Site Operations
J. Shaw, Plant Manager
J. Schweitzer, Director of Engineering
B. Kemp, Reactor Vessel Head Engineer
B. Jensen, Level III
C. Krause, Senior Regulatory Compliance Engineer
J. Connolly, Regulatory Affairs Manager (Acting)
R. Turner, Inservice Inspection Coordinator

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

Opened

05000266/2004003-01	NCV	Substitution of Weld Surface Examinations for Volumetric Examinations

Closed

05000266/2003009-01	URI	Partial Data Acquisition Due To Coupling Slippage

05000266/2004003-01	NCV	Substitution of Weld Surface Examinations for Volumetric Examinations

Discussed

None.

LIST OF DOCUMENTS REVIEWED

1R08 Inservice Inspection Activities

Documents Associated with Two Types of Nondestructive Testing

RC-03-PS-1001-14; Primary ISI Isometric PBNP Unit 1 Pressurizer Spray From Loop A; Revision 2.
Point Beach Nuclear Plant Ultrasonic Calibration Record; RC-03-PS-1001-14; April 6, 2004.
Point Beach Nuclear Plant Ultrasonic Piping Examination Record; RC-03-PS-1001-14; dated April 6, 2004.
Point Beach Nuclear Plant Ultrasonic Calibration Record; RC-03-PS-1001-15; dated April 7, 2004.
Point Beach Nuclear Plant Ultrasonic Piping Examination Record; RC-03-PS-1001-15; dated April 7, 2004.
AF-03-AFW-1002; ISI Isometric Auxiliary Feedwater to Steam Generator B; Revision 1.
Point Beach Nuclear Plant Ultrasonic Calibration Record; AF-03-AFW-1002-76; dated April 27, 2004.
Point Beach Nuclear Plant Ultrasonic Piping Examination Record; AF-03-AFW-1002-76; dated April 27, 2004.
Point Beach Nuclear Plant Ultrasonic Calibration Record; AF-03-AFW-1002-77; dated April 27, 2004.
Point Beach Nuclear Plant Ultrasonic Piping Examination Record; AF-03-AFW-1002-77; dated April 27, 2004.
FW-16-FW-1002; Primary ISI Isometric PBNP Unit 1 Loop B Feedwater Inside Containment; Revision 4.
Point Beach Nuclear Plant Ultrasonic Calibration Record; FW-16-FW-1002-15; dated April 27, 2004.
Point Beach Nuclear Plant Ultrasonic Piping Examination Record; FW-16-FW-1002-15; dated April 27, 2004.
EB-9-FW-H10; Pipe Hanger Support Detail; Revision 0.
Point Beach Nuclear Plant Visual Examination Record; EB-9-FW-H10; dated April 23, 2004.
NDE 109; Manual Ultrasonic Examination Using Longitudinal Wave Straight Beam Techniques; Revision 6.
NDE 163; Manual Ultrasonic Examination of Ferritic Pressure Vessel Welds Greater Than 2 Inches In Thickness; Revision 10.
NDE-172; PDI Generic Procedure For The Ultrasonic Examination Of Ferritic Piping Welds; Revision 7.

NDE-173; PDI Generic Procedure For The Ultrasonic Examination Of Austenitic Piping Welds; Revision 6.
NDE-350; Magnetic Particle Examination Alternating Current AC Yoke; Revision 24.
NDE-451; Visible Dye Penetrant Examination Temperature Applications 45°F to 125°F; Revision 21.
NDE-753; Visual Examination (VT-2) Leakage Detection of Nuclear Power Plant Components; Revision 10.
Memorandum to G. Sherwood, DE Oakley, R. Turner from W.A. Jenson; ASME Section XI IWA-2240 Demonstration of the Performance Demonstration Initiative Generic Procedure As a Replacement for NDE-163 and NDE-170; March 19, 2003.
NDE Procedure Qualification NDE-451; Visible Dye Penetrant Examination Temperature Applications 45°F to 125°F; March 12, 2002.

Documents Associated With Relevant Indications

Indication disposition report; Magnetic Particle Examination and Technique Record; Component ID: RPV-HFLANGE-C; Component description: head to flange (AZ 240-360); dated February 15, 2000.
Indication disposition report; Liquid Penetrant Examination Record; Component ID: RPV; Component description: CRDM Nozzle #1; dated October 01, 2002.
Indication disposition report; Magnetic Particle Examination and Technique Record; Component ID: RPV-STUD-44; Component description: Closure stud; dated February 15, 2000.

Documents Related to Code Pressure Boundary Welding

WO 0212615; Cut weld and remove pipe from SI accumulator nozzle at 1SI-833C for PT exam of nozzle inner diameter; October 28, 2002.
WO 0212682; Cut weld and remove pipe from B SI accumulator nozzle at 1SI-833B for PT exam of nozzle inner diameter; January 14, 2003.
2.P8-GT-SM; Welding procedure for austenitic stainless steels ASME group P-8 GTAW-SMAW Revision 0.
Fillet to Socket Weld Data Sheet; Component: FW-1 and FW-2 T-034B Nozzle; dated October 03, 2002.

Documents Related to Code Repairs or Replacements

WO 0212615; Cut weld and remove pipe from SI accumulator nozzle at 1SI-833C for PT exam of nozzle inner diameter; dated October 28, 2002.
WO 0212682; Cut weld and remove pipe from B SI accumulator nozzle at 1SI-833B for PT exam of nozzle inner diameter; dated January 14, 2003.
Repair Replacement Form 2002-0095; T-34B; dated September 30, 2002.
ASME Section XI Code Reconciliation Checklist; SI System Weld Filler Material; dated September 30, 2002.
Visual Weld Examination Record; FW-2; dated October 1, 2002.
Visual Weld Examination Record; FW-1; dated October 2, 2002.
Liquid Penetrant Examination Record; FW-2; dated October 1, 2002.
Liquid Penetrant Examination Record; FW-1; dated October 2, 2002.

ASME Section XI R/R/M Pressure Test Data Sheet; FW-1, FW-2; dated October 13, 2002.
WPS 2.P8-GT-SM; Welding Procedure For Austenitic Stainless Steels ASME Group P-8 GTAW-SMAW; Revision 0.
PQR WP-2; Revision 4.

Other Documents

PBNP Indication Disposition Report; IDR No. 02U1-E008; Component No. 1CH-10; Component Description: Core drilled hole; dated April 28, 2001.
PBNP Indication Disposition Report; IDR No. 01U1-L004; Component No. U1C; Component Description: Unit 1 Containment; dated October 2, 2002.
PBNP Fillet/Socket Weld Data Sheet; Equipment No. ISI 00853D; WO No. 0212465; dated October 04, 2002.
Drawing No. PBC-309; ISI Classification Drawing: Keyway sump "A" / Tunnel; Date: 08/13/1998.
Drawing No. PBC-312; ISI Classification Drawing: Electrical penetrations; Date: 09/01/1998.
SEM 7.11.2; ISI Data Sheet Review and Indication Evaluation Guideline; March 19, 2004.

Documents Related to Steam Generator Tube Inspection Activities

NMC-400-002; Multifrequency Eddy Current Testing of Non-Ferromagnetic Steam Generator Tubing; Revision 2.
NMC-400-004; Analysis of Rotating Eddy Current Data; Revision 3.
NMC-400-003; Analysis of Bobbin Coil Eddy Current Data; Revision 3.
NMC-400-007; Eddy Current Site Specific Performance Demonstration; Revision 0.
Point Beach Unit 1 Steam Generator Eddy Current Examination Report; dated May 4, 2004.
Memorandum from G. Sherwood (NMC) from P. Nelson (WE); dated April 30, 2004.
CAP056028; Possible Loose Parts in SG; dated April 24, 2004.
Steam Generator Degradation Assessment for Point Beach Unit 1 U1R28; dated April 2004.
MRS-TRC-1468; Us of Appendix H Qualified Techniques at Point Beach Unit 1 For the Spring 2004 Steam Generator Inspection; April 13, 2004.
Westinghouse Electric P-BOB-001; Steam Generator Eddy Current Inspection Examination Technique Specification Sheets; April 9, 2004.
NP 7.7.17; Requirements for Steam Generator Primary Side Activities; Revision 2.

4OA2 Identification and Resolution of Problems - Inservice Inspection

Corrective Action Documents

CAP 047990; OE 14934 Problems with ultrasonic testing caused unnecessary pipe replacement; dated August 21, 2003.
CAP 054136; Unit 2 S/G tube leakage exceeded 5 gpd; dated February 23, 2004.
CAP 053177; Increased fluoride contamination in the Unit 1 S/Gs; dated January 25, 2004.

CAP 033575; OE 16308 Incorrect diameter probe used during Eddy Current Inspection; dated June 16, 2003.
CAP 029936; Service water intrusion into "A" and "B" S/Gs for unit Unit 1; dated October 26, 2002.
CAP 003372; NSAL-02-13 Fatigue Life of CE steam generator primary manway studs; dated August 20, 2003.
CAP 032045; New AFW restricting orifices may not meet Section XI R/R requirements; dated April 6, 2003.
CAP 051046; SW pipe wall thinning noted during execution of U2226 WO 9905610; dated October 14, 2003.
CAP 032290; Inservice Inspection limited examinations; dated April 17, 2003.
CAP 051206; Small wires found in the secondary side on the "A" steam generator; dated October 18, 2003.
CAP 051407; Small wires found in the secondary side on the "B" steam generator; dated October 24, 2003.
CAP 029413; Accumulator nozzle have unidentified indications on the inside surface; dated September 19, 2002.
CAP 010698; Accumulator nozzles have unidentified indications on the inside surface; dated September 21, 2002.
OTH 026613; Accumulator nozzles have unidentified indications on the inside surface; dated October 07, 2002.
OTH 026615; Accumulator nozzles have unidentified indications on the inside surface; dated October 07, 2002.
OTH 026616; Accumulator nozzles have unidentified indications on the inside surface; dated October 07, 2002.
CE 012362; Framatome NRC 6028873 - Lack of UT coverage during U1R27 RPV inspection; dated September 18, 2003.
CA 053202; Framatome NRC 6028873 - Lack of UT coverage during U1R27 RPV inspection; dated October 15, 2003.
CAP 022754; Liner Plate Degradation; dated April 25, 2002.
CAP 012575; Liner Plate Degradation-U1R26 Restart issue; dated April 13, 2001.
CAP 012576; Liner Plate Degradation; dated April 13, 2001.

Corrective Action Reports Initiated as a Result of NRC Inspection
CAP 055529; NIS-1 report contains information that could be misunderstood; dated April 09, 2004.
CAP 055517; Repair/Replacement documentation may have incomplete information; dated April 09, 2004.
CAP 055652; Wrong size of weld filler metal used; dated April 13/2004.
CAP 055664; Procedure NDE-750 does not require recording boric acid on stainless steel bolts; dated April 13, 2004.
CAP 055678; Feedback Regarding NDE From NRC Exit On 4/09/04; dated April 14, 2004.
CAP 056011; Tracking Mechanism for ISI Relief Requests not Clear; dated April 23, 2004.
OTH012761; Calculate New RPV Head Temperatures - Post RPV Head Replacement; dated April 26, 2004.

4OA5.1 Reactor Pressure Vessel Head and Vessel Head Penetration Nozzles (TI 2515/150)

Nondestructive Examination Reports

Point Beach Unit 1 (U1R28) - Extent of UT Coverage in RVHP Nozzle Material; dated May 6, 2004.
Point Beach Nuclear Power Plant Liquid Penetrant Examination Record; Nozzle 26, dated April 29, 2004.
Point Beach Nuclear Power Plant Liquid Penetrant Examination Record; Nozzle 26, dated May 2, 2004.
Point Beach Nuclear Power Plant Liquid Penetrant Examination Record; Nozzle 26, dated May 5, 2004.
Videotaped of dye penetrant examinations of nozzle 26; performed April 29, 2004, April 30, 2004, May 2, 2004 and May 5, 2004.
Point Beach Nuclear Power Plant Visual Examination Record; RPV closure head; dated April 26, 2004.
Point Beach Nuclear Power Plant Visual Examination Record; RPV closure head; dated April 27, 2004.
Point Beach Nuclear Power Plant Visual Examination Record; RPV closure head; dated May 1, 2004.
Point Beach Nuclear Power Plant Remote Visual Examination Record; RPV closure head; dated May 23, 2004.
Point Beach Nuclear Power Plant Visual Examination Record; RPV closure head; dated May 6, 2004.
Point Beach Nuclear Power Plant Ultrasonic Calibration Record; Penetrations 32 and 33; dated May 14, 2004.
Videotaped upper head examination and cleaning from April 26, 2004 through May 6, 2004.
Ultrasonic Calibration Data Sheets; Penetration No. 26 J-Groove Weld After Machining 0, 45 Degree, and OD Creeping wave Scans; dated May 12, 2004.
51-5045099-00; Point Beach Unit 1 (U1R28) RVH Nozzle UT Inspection Final Report; draft dated May 26, 2004.

Other Documents

Westinghouse letter report LTR-RCDA-0377, Revision 2
C11470; Reactor Vessel Head Effective Degradation Year (EDY); May 29, 2003.
EPRI MRP-89; Materials Reliability Program Demonstrations of Vendor Equipment and Procedures for the Inspection of Control Rod Drive Mechanism Head Penetrations; September 2003.
WCAP-15950; Structural Integrity Evaluation of Reactor Vessel Upper Head Penetration to Support Continued Operation of Point Beach Units 1 & 2, dated September 2002.
PWR Materials Reliability Program Response to NRC Bulletin 2001-01 (MPR-48); EPRI 1006284; dated August 2001.
Calculation Cover Sheet and Review Report; Reactor vessel head effective degradation; Calc # C11470; dated May 29, 2003.
Letter from B. Rassler (EPRI) to B. Jenson (Nuclear Management Company); Blind demonstration testing of UT procedure, dated May 3, 2004.

54-ISI-30-01; Written Practice for the Qualification and Certification of NDE Personnel; dated August 18, 2004.
Framatome ANP Certificate of Personnel Qualification for:

- Jonathan D. Buttram, UT Level III; dated February 5, 2004.
- Jason D. Breza, UT Level II; dated January 29, 2004.
- Michael W. Key, UT Level III; dated January 29, 2004.
- Kent Gebetsberger, UT; dated September 14, 2002.
- Chuck Martin, UT Level II; dated September 14, 2002.
- John Touhalisky, UT Level II; dated September 14, 2002.
- Robert Kellerhall, UT Level II; September 14, 2002.

NMC Record of Certificate of NDE Personnel as UT Level III for William Jensen, dated August 19, 2003.
1-PT-RCS-1; Reactor Coolant System Pressure Test - Inside/ Outside Containment Unit 1; dated October 15, 2002.
1-PT-RCS-1; Reactor Coolant System Pressure Test - Inside/ Outside Containment Unit 1 Appendix B; dated October 13, 2002.
SEM 7.11.5; RCS Leak Test for Unit 1; dated April 13, 2001.
WO No. 9923859; Visual Examination Leak Test Record Data Sheets (13 pages); dated May 09, 2001.
Boric Acid Walkdown Data Sheets Refueling Outage: U1R27; dated September 15, 2002.
Organizational Assessment Audit Plan and Checklist: First Quarter 2001 Engineering Audit; Scope: Repair and Replacement Modification Activities Relating to ASME Section XI, Inservice Testing per ASME Section XI; Document #: A-P-01-03; dated January 15, 2001.
Record of Certification of NDE Personnel; William Jenson; Visual Level III; August 13, 2003.
Record of Certification of NDE Personnel; Patric Turner; Visual Level II; August 12, 2003.
Weld Control Records; Layers 1 through 14; dated May 12 & 13, 2004.
Drawing 5019702; Point Beach Unit 1 CRDM Nozzle ID Temper Bead Weld Repair; Revision 3.
Quality Assurance Data Package No. 23-5044625-00; Welding Filler Material For NMC, Point Beach Unit 1 Reactor Vessel Head Repair; dated May 7, 2004.
Process Traveler; Ambient ID Temper Bead Repair For CRDM Nozzles; dated May 7, 2004.
Repair/Replacement Form No. 2004-03; Repair Nozzle 26; dated May 11, 2004.
Weld Procedure Specification 55-WP3/43/F43TBSCA301; Revision 1.
Procedure Qualification Record 55- PQ7164-03; dated May 23, 2003.
Procedure Qualification Record 55- PQ7183-03; dated May 8, 2004.
WCAP 14929; Probabilistic Evaluation of Reactor Vessel Closure Head Penetration Integrity for Point Beach Units 1 and 2; Revision 0.
Point Beach U1R27 Reactor Vessel Head CRDM Nozzle Ultrasonic Examination Report; dated October 5, 2002.
Memorandum to file; Point Beach Nuclear Plant Vessel Closure Head Temperature; dated April 22, 2004.
MRP-89; Materials Reliability Program Demonstrations of Vendor Equipment and Procedures for the Inspection of Control Rod Drive Mechanism Head Penetrations; September 2003.

54-5016639-00; Framatome ANP Reactor Vessel Head Penetration Leak Path Qualification Report; dated February 6, 2002.
54-5040736-00; Framatome ANP Demonstration of CRDM Leak Path Detection Technique; dated February 26, 2004.
Letter from A. Johnson (WE) to USNRC; GL 97-01 120 Day Response Point Beach Nuclear Plant, Units 1 and 2; dated July 30, 1997.
Letter from A. J Cayia (WE) to USNRC; Supplemental Response to NRC Bulletins 2001-01, 2002-01, and 2002-02 for Reactor Vessel Head and Head Penetration Nozzle - Inspection Findings; dated November 24, 2003.
CA053202; Framatome NCR 6028873-Lack of UT Coverage During U1R27 RPV Inspection; dated October 15, 2003.
CE012362; Framatome NCR 6028873-Lack of UT Coverage During U1R27 RPV Inspection; dated September 18, 2003.
Memorandum; Obstructed Area of Unit 1 Reactor Vessel Dome; dated May 24, 2004.

Procedures

NDE-757;Visual Examination For Leakage of Reactor Pressure Vessel Penetrations; Revision 3.
NDE-451; Visible Dye Penetrant Examination Temperature Applications 45°F to 125°F.; Revision 21.
54-ISI-100-11; Remote Ultrasonic Examination of Reactor Head Penetrations; Revisions 9 through 11.
54-ISI-137-03; Remote Ultrasonic Examination of Reactor Vessel Head Vent Line Penetrations; Revision 3.
54-PQ-137-01; Remote Ultrasonic Examination of Reactor Vessel Head Vent Line Penetrations; Dated February 22, 2002.
54-PQ-137-01; Remote Ultrasonic Examination of Reactor Vessel Head Vent Line Penetrations; Dated September 20, 2002.
54-PQ-137-01; Remote Ultrasonic Examination of Reactor Vessel Head Vent Line Penetrations; Dated November 21, 2002.
1-PT-RCS-1; Reactor Coolant System (RCS) Pressure Test- Inside/Outside Containment Unit 1; Revision 1.
NP 7.4.14; Boric Acid Leakage and Corrosion Monitoring; Revision 0.
Boric Acid Leakage and Corrosion Monitoring Program; Revision 0.
NDE-141; Manual Ultrasonic Examination of Reactor Head Penetrations; Revision 0.

4OA5.2 Reactor Pressure Vessel Lower Head Penetration Nozzles (TI 2515/152)

Drawings

TP-3609-4 "Section Thru Bottom of Reactor Vessel" Revision 0.
RT-49006-RI "RVCH Insulation System General Arrangement Drawing," Revision 0.
West 685J441, sht A, B, C, D, "NIS Bottom Mounted Instrumentation Point Beach NP," Revision 9.

Nondestructive Examination Reports

Point Beach Visual Examination Record; Reactor Pressure Vessel BMI Tubes; April 6, 2004.

Procedures

NDE-757 ;Visual Examination For Leakage of Reactor Pressure Vessel Penetrations; Revision 3.
NDE-3; Written Practice For Qualification And Certification For NDE Personnel; Revision 28.
2-NDES-001; Nondestructive Examination Personnel Qualification and Certification; Revision 2.

Other Documents

Point Beach Nuclear Plant Visual Examination Record; Reactor Pressure Vessel BMI tubes; April 6, 2004.
Record of Certification NDE Personnel; William Jensen; August 19, 1983.
IHI Southwest Technologies, INC. Statement of NDE Certification; Victor Morton; January 5, 2004.

LIST OF ACRONYMS USED

ASME	American Society of Mechanical Engineers
BMI	Bottom Mounted Instrument
CFR	Code of Federal Regulations
EDY	Effective Degradation Years
IMC	Inspection Manual Chapter
ISI	Inservice Inspection
EPRI	Electric Power Research Institute
MIC	Microbiologically Induced Corrosion
NCV	Non-Cited Violation
No.	Number
ODSCC	Outside Diameter Stress Corrosion Cracking
PT	Dye Penetrant
PWR	Pressurized Water Reactor
PWSCC	Primary Water Stress Corrosion Cracking
RCS	Reactor Coolant System
SG	Steam Generator
TI	Temporary Instruction
TOFD	Time Of Flight Diffraction
TS	Technical Specification
TSB	Technical Support Building
UT	Ultrasonic
VHP	Vessel Head Penetration
WPS	Weld Procedure Specification