

June 9, 2016

Mr. Raúl Marcos, Quality & Environment Manager
Equipos Nucleares, S.A (ENSA)
Avda. Juan Carlos I, 8
39600 Maliaño, Cantabria (Spain)

SUBJECT: ENSA'S NUCLEAR REGULATORY COMMISSION INSPECTION REPORT
NO. 99901379/2016-201 AND NOTICE OF NONCONFORMANCE

Dear Mr. Marcos:

On April 25-29, 2016, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Equipos Nucleares, S.A. (hereafter referred to as ENSA) facility in Santander, Spain. The purpose of this limited-scope routine inspection was to assess ENSA's compliance with provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21, "Reporting of Defects and Noncompliance," and selected portions of Appendix B, "Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities."

This inspection specifically evaluated ENSA's implementation of quality activities associated with the design and fabrication of the replacement steam generators for Beaver Valley Power Station, Unit 2 in accordance with the applicable requirements of Appendix B to 10 CFR Part 50, and Section III, "Rules for Construction of Nuclear Facility Components," of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code. The enclosed report presents the results of the inspection. This NRC inspection report does not constitute NRC endorsement of ENSA's overall quality assurance (QA) program.

During this inspection, the NRC inspection team found that the implementation of your QA program did not meet certain regulatory requirements imposed on you by your customers or NRC licensees. Specifically, the NRC inspection team determined that ENSA was not fully implementing its QA program in the areas of design control, control of purchased material, equipment, and services, and control of special processes. The specific findings and references to the pertinent requirements are identified in the enclosures to this letter. In response to the enclosed notice of nonconformance (NON), ENSA should document the results of the extent of condition review for these findings and determine if there are any effects on other safety-related components.

Please provide a written statement or explanation within 30 days of this letter in accordance with the instructions specified in the enclosed NON. We will consider extending the response time if you show good cause for us to do so.

In accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," the NRC will make available electronically for public inspection a copy of this letter, its enclosure, and your response through the NRC Public Document Room

or from the NRC's Agencywide Documents Access and Management System, which is accessible at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response (and if applicable), should not include any personal privacy, proprietary, or Safeguards Information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material be withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information would create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

Sincerely,

/RA/

Richard P. McIntyre, Acting Chief
Quality Assurance Vendor Inspection Branch-2
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket No.: 99901379

Enclosures:

1. Notice of Nonconformance
2. Inspection Report No. 99901379/2016-201
and Attachment

or from the NRC's Agencywide Documents Access and Management System, which is accessible at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response (and if applicable), should not include any personal privacy, proprietary, or Safeguards Information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material be withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information would create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

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NRO-002

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NOTICE OF NONCONFORMANCE

Equipos Nucleares, S.A.
Avda. Juan Carlos I, 8
39600 Maliaño, Cantabria (Spain)

Docket No. 99901379
Report No. 2016-201

Based on the results of a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the Equipos Nucleares, S.A. (hereafter referred to as ENSA) facility in Santander, Spain, from April 25, 2016, through April 29, 2016, it appears that ENSA did not conduct certain activities in accordance with NRC requirements that were contractually imposed upon ENSA by its customers or NRC licensees:

- A. Criterion III, "Design Control," of Appendix B, "Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," states, in part, that "Measures shall also be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems, and components."

Section 4.2, "Use of Unqualified Source Material," of ENSA's General Procedures (GP) Manual GP.08.20, "Commercial Grade Dedication Program," Revision 2, dated February 23, 2015, states, in part, that "Use of Unqualified Source Material as defined in ASME Section III is not considered Commercial Grade Dedication if applied within ASME III boundaries and follows requirements sets forth in NCA 3855.5. The process to provide compliance with this section is documented through a MIP. In the event that the metallic raw material is to be used in other safety related applications outside the ASME III scope, the dedication process is performed following Section 8 of Quality Assurance Manual for Unqualified Source Material."

Contrary to the above, as of April 29, 2016, ENSA failed to ensure the selection and review for suitability of application of materials that are essential to the safety-related functions of structures, systems, and components. Specifically, ENSA's Material Inspection Plan (MIP) 0BV2MIP001, "Certification Compliance with 10 CFR 50 Appendix B, 10 CFR 21, and Westinghouse Specification A105C01-GEN Revision B, of Carbon Steel forged Flanges SA-105," did not establish and document the sample testing population for the acceptance of material critical characteristics used for the commercial-grade dedication of the feed water ring (FWR) assembly inspection port slip-on and blind flange SA-105 carbon steel material. In addition, ENSA did not verify that the supplier had quality controls in place to ensure heat traceability of the material. ENSA performed material testing verification on a limited sample of the 25 pieces received from multiple heats of material. Furthermore, ENSA's certified material test reports incorrectly stated that all the test results were in compliance with the requirements of Appendix B to 10 CFR Part 50 and 10 CFR Part 21, "Reporting of Defects and Noncompliance." During the inspection, the NRC inspection team determined that the safety-related supplier of the flange material was removed from ENSA's Qualified Vendors List and thus required the flange material to be accepted under ENSA's commercial-grade dedication program or the process for utilization of unqualified source material process of Section III, "Rules for Construction of Nuclear Facility Components," of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code. Industry operating experience has shown that leaking FWR

inspection port covers have led to water hammer events that distorted the supports of the FWR.

This issue has been identified as Nonconformance 99901379/2016-201-01.

- B. Criterion IX, "Control of Special Processes," of Appendix B to 10 CFR Part 50, states that "Measures shall be established to assure that special processes, including welding, heat treating, and nondestructive testing, are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements."

Section 5.10, "Draining and Drying," of ENSA's Specification No. 0BV2CS601, "Hydrostatic Pressure Test," Revision 1, dated November 25, 2015, states that "Draining and drying of the secondary chamber of the Steam Generator shall be as described in the specification No. 0BV2FS503." Specification No. 0BV2CS601 also provides quantitative values such as pressure and temperature of hydrostatic test and water chemistry criteria before and after the hydrostatic test.

Contrary to the above, as of April 29, 2016, ENSA failed to assure that special processes were controlled and accomplished using qualified procedures in accordance with specifications and acceptance criteria. Specifically, ENSA used several open flame gas burners that were installed underneath the secondary side of the steam generators to facilitate final drying and vacuuming after the secondary side hydrostatic pressure test, without a qualified procedure for this activity. ENSA Specifications Nos. 0BV2CS601 and 0BV2FS503, "Draining and Drying of the Secondary Side," Revision 1, dated September 30, 2015, did not provide instructions, specifications, controls and/or acceptance criteria for the heating process. By not having a qualified procedure, ENSA could not determine the maximum temperature the steam generators experienced during the heating process which could last up to a week. Excessive heating of the steam generators could create warping and affect the materials and dimensional tolerances (e.g. distortion) of the steam generator components.

This issue has been identified as Nonconformance 99901379/2016-201-02.

- C. Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50, states, in part, that "Measures shall be established assure that purchased material, equipment, and services, whether purchased directly or through contractors and subcontractors, conform to the procurement documents. These measures shall include provisions, as appropriate, for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor, inspection at the contractor or subcontractor source, and examination of products upon delivery."

Contrary to the above, as of April 29, 2016, ENSA failed to establish adequate measures to obtain objective evidence of quality furnished by the contractor or subcontractor. Specifically, ENSA did not provide adequate documented objective evidence in their external audit reports of material and service suppliers to provide reasonable assurance that the suppliers had implemented an Appendix B to 10 CFR Part 50 and 10 CFR Part 21, "Reporting of Defects and Noncompliance," programs for the supply of safety-related basic components. For a sample of 11 audits reviewed by the NRC

inspection team, the evaluation of the suppliers' 10 CFR Part 21 programs and associated implementing procedures did not demonstrate adequate compliance with the requirements of 10 CFR Part 21.

This issue has been identified as Nonconformance 99901379/2016-201-03.

Please provide a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Chief, Quality Assurance Vendor Inspection Branch-2, Division of Construction Inspection and Operational Programs, Office of New Reactors, within 30 days of the date of the letter transmitting this Notice of Nonconformance. This reply should be clearly marked as a "Reply to a Notice of Nonconformance" and should include for each noncompliance: (1) the reason for the noncompliance or, if contested, the basis for disputing the noncompliance; (2) the corrective steps that have been and the results achieved; (3) the corrective steps that will be to avoid further noncompliance; and (4) the date when the corrective action will be completed. Where good cause is shown, the NRC will consider extending the response time.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System, which is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible, it should not include any personal privacy, proprietary, or Safeguards Information (SGI) so that the NRC can make it available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material be withheld, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information would create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

Dated this the 9th day of June 2016.

**U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NEW REACTORS
DIVISION OF CONSTRUCTION INSPECTION AND OPERATIONAL PROGRAMS
VENDOR INSPECTION REPORT**

Docket No.: 99901379

Report No.: 99901379/2016-201

Vendor: Equipos Nucleares, S.A.
Avda. Juan Carlos I, 8
39600 Maliaño, Cantabria (Spain)

Vendor Contact: Mr. Raúl Marcos
Quality and Environment Manager
E-mail: marcos.raul@ensa.es
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Nuclear Industry Activity: Equipos Nucleares, S.A.'s scope of supply includes the fabrication of steam generators, reactor pressure vessels, reactor vessels cover heads, reactor vessel internals, reactor vessel supports, and other nuclear components such as fuel storage racks, casks, and transportation containers.

Inspection Dates: April 25-29, 2016

Inspectors: Yamir Diaz-Castillo NRO/DCIP/QVIB-2
Richard P. McIntyre NRO/DCIP/QVIB-2
John Honcharik NRO/DEIA/MCB
Paul A. Klein NRR/DE/ESGB

Approved by: Richard P. McIntyre, Acting Chief
Quality Assurance Vendor Inspection Branch-2
Division of Construction Inspection
and Operational Programs
Office of New Reactors

EXECUTIVE SUMMARY

Equipos Nucleares, S.A.
99901379/2016-201

The U.S. Nuclear Regulatory Commission (NRC) staff conducted a vendor inspection at the Equipos Nucleares, S.A. (hereafter referred to as ENSA) facility in Santander, Spain to verify that it had implemented an adequate quality assurance (QA) program that complies with the requirements of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities." In addition, the NRC inspection team also verified that ENSA implemented a program under 10 CFR Part 21, "Reporting of Defects and Noncompliance," and the applicable sections of Section III, "Rules for Construction of Nuclear Facility Components," Section V, "Nondestructive Examination," and Section IX, "Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators," of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code. The NRC inspection team conducted the inspection from April 25-29, 2016. This was the first NRC inspection at the ENSA facility.

This technically-focused inspection specifically evaluated ENSA's implementation of quality activities associated with the design and fabrication of the replacement steam generators for Beaver Valley Power Station Unit 2.

These regulations served as the bases for the NRC inspection:

- Appendix B to 10 CFR Part 50
- 10 CFR Part 21

During the course of this inspection, the NRC inspection team implemented Inspection Procedure (IP) 43002, "Routine Inspections of Nuclear Vendors," July 15, 2015, IP 43004, "Inspection of Commercial-Grade Dedication Programs," dated November 29, 2013, and IP 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance," dated February 13, 2012.

Some of the specific activities observed by the NRC inspection team included:

- Ultrasonic testing (UT) inspections including calibration of UT equipment to verify bonding of the weld clad on the channel head in the divider plate region of the replacement steam generator No. 3

In addition to observing these activities, the NRC inspection team verified that measuring and test equipment (M&TE) was properly identified, marked, calibrated, and used within its calibrated range. The NRC inspection team also performed a walk down of ENSA's assembly floor areas and verified that nonconforming components were properly identified, marked, and segregated when practical, to ensure that they were not reintroduced into the manufacturing processes.

With the exception of the notice of nonconformances described below, the NRC inspection team determined that, in general, the design and fabrication activities in support of the replacement steam generators for Beaver Valley Power Station, Unit 2 were performed in accordance with the applicable requirements of Appendix B to 10 CFR Part 50, 10 CFR Part 21, and Section III of the ASME B&PV Code and that ENSA's personnel are implementing these policies and procedures effectively. The results of this inspection are summarized below.

Design Control

The NRC inspection team issued Nonconformance 99901379/2016-201-01 in association with ENSA's failure to implement the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. Nonconformance 99901379/2016-201-01 cites ENSA for failing to ensure the selection and review for suitability of application materials that are essential to the safety-related functions of structures, systems, and components. Specifically, ENSA's Material Inspection Plan (MIP) 0BV2MIP001, "Certification Compliance with 10CFR50 Appendix B, 10CFR21, and Westinghouse Specification A105C01-GEN Rev B, of Carbon Steel forged Flanges SA-105," did not establish and document the sample testing population for the acceptance of material critical characteristics used for the commercial-grade dedication of the feed water ring (FWR) assembly inspection port slip-on and blind flange SA-105 carbon steel material. In addition, ENSA did not verify that the supplier had quality controls in place to ensure heat traceability of the material. ENSA performed material testing verification on a limited sample of the 25 pieces received from multiple heats of material. Furthermore, ENSA's certified material test reports incorrectly stated that all the test results were in compliance with the requirements of Appendix B to 10 CFR Part 50 and 10 CFR Part 21. During the inspection, the NRC inspection team determined that the safety-related supplier of the flange material was removed from ENSA's Qualified Vendors List and thus required the flange material to be accepted under ENSA's commercial-grade dedication program or the utilization of unqualified source material process of Section III of the ASME B&PV Code. Industry operating experience has shown that leaking FWR inspection port covers have led to water hammer events that distorted the supports of the FWR.

Manufacturing Control

The NRC inspection team issued Nonconformance 99901379/2016-201-02 in association with ENSA's failure to implement the regulatory requirements of Criterion IX, "Control of Special Processes," of Appendix B to 10 CFR Part 50. Nonconformance 99901379/2016-201-02 cites ENSA for failing to assure that special processes were controlled and accomplished using qualified procedures in accordance with specifications and acceptance criteria. Specifically, after completion of the secondary side hydrostatic pressure test, ENSA used several open flame gas burners that were installed underneath the secondary side of the steam generators to facilitate final drying and vacuuming without a qualified procedure for this activity. ENSA Specifications Nos. 0BV2CS601 and 0BV2FS503, "Draining and Drying of the Secondary Side," Revision 1, dated September 30, 2015, did not provide instructions, specifications, controls and/or acceptance criteria for the heating process. By not having a qualified procedure, ENSA could not determine the maximum temperature the steam generators experienced during the heating process in one localized area, or the length of the heating process, which could last up to a week. Excessive heating of the steam generators could create warping and affect the materials and dimensional tolerances (e.g. distortion) of the steam generator components.

Supplier Oversight

The NRC inspection team issued Nonconformance 99901379/2016-201-03 in association with ENSA's failure to implement the regulatory requirements of Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50.

Nonconformance 99901379/2016-201-03 cites ENSA for failing to establish adequate measures to obtain objective evidence of quality furnished by the contractor or subcontractor. Specifically, ENSA did not provide adequate documented objective evidence in their external audit reports of material and service suppliers to provide reasonable assurance that the suppliers had implemented an Appendix B to 10 CFR Part 50 and 10 CFR Part 21 programs. For a sample of 11 audits reviewed by the NRC inspection team, the evaluation of the suppliers' 10 CFR Part 21 programs and associated implementing procedures did not demonstrate adequate compliance with the requirements of 10 CFR Part 21 for the supply of Appendix B safety-related basic components and services.

Other Inspection Areas

The NRC inspection team determined that ENSA is implementing its control of M&TE, nonconforming material, parts, or components, and corrective action programs in accordance with the applicable regulatory requirements of Appendix B to 10 CFR Part 50. In addition, the NRC inspection team determined that ENSA is implementing its 10 CFR Part 21 program for evaluating deviations and reporting defects that could create a substantial safety hazard in accordance with regulatory requirements. No findings of significance were identified.

REPORT DETAILS

1. Design Control and Commercial-Grade Dedication

a. Inspection Scope

The NRC inspection team reviewed Equipos Nucleares S.A.'s (hereafter referred to as ENSA) policies and implementing procedures that govern the design-control and commercial-grade dedication programs to verify their compliance with the regulatory requirements of Criterion III, "Design Control," of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," and the requirements of Section NCA-3855.5, "Utilization of Unqualified Source Material," of Section III, "Rules for Construction of Nuclear Facility Components," of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code.

During pre-inspection discussions with ENSA and Westinghouse Electric Company (WEC) personnel concerning the replacement steam generators for Beaver Valley Power Station Unit 2 (hereafter referred to as BV2 RSGs), the NRC inspection team was informed that WEC maintains the design responsibility for the BV2 RSGs. Therefore, the NRC evaluation of design control was divided into two major activities: (1) a pre-inspection activity reviewing design information at the WEC's office in Rockville, MD, and (2) discussions with ENSA personnel and review of related documentation during the on-site inspection at ENSA's facilities in Santander, Spain.

Prior to the on-site inspection, the NRC inspection team requested specific design information about the BV2 RSGs from WEC. This information was mostly either related to recent steam generator operating experience or was the topic of recent NRC interactions with the U.S. nuclear industry. In particular, the NRC inspection team requested design information related to the fluid elastic instability (FEI) analysis to follow-up on lessons learned from the San Onofre Nuclear Generating Station (SONGS) steam generator tube degradation event (see Agencywide Documents Access and Management System (ADAMS) Accession No. ML15062A125). The NRC inspection team's review of design information also considered the changes incorporated into Draft Revision 4 (March 2016) Section 5.4.2.1, "Steam Generator Materials and Design," of Standard Review Plan (SRP) NUREG-0800. In addition, the NRC inspection team also requested design information related to design of the tube-to-tubesheet welds, the subject of a recently issued NRC Regulatory Issue Summary, RIS 2016-02, "Design Basis Issues Related to Tube-to-Tubesheet Joints in Pressurized-Water Reactor Steam Generators," Revision 0, dated March 23, 2016 (see ADAMS Accession No. ML15169A543). The NRC inspection team also requested information related to design changes for the BV2 RSGs relative to the Beaver Valley Unit 1 replacement steam generators (hereafter referred to as BV1 RSGs) that have successfully operated (i.e., no loss of tube integrity) since they were installed in the plant during the 2006 refueling outage.

After reviewing the information provided by WEC, the NRC inspection team requested clarification on a few items in the design information related to FEI analysis (e.g., fluid elastic stability acceptance criterion), tube to anti-vibration bar spacing, and the tube-to-tubesheet weld design compliance with Subsection NB-4350, "Special Qualification Requirements for Tube-To-Tubesheet Welds," of Section III of the

ASME B&PV Code. WEC personnel provided clarification of these items during a phone call with the NRC inspection team on April 8, 2016. Based on the information provided by WEC, the NRC inspection team was able to determine that with respect to key parameters that affect FEI, the BV2 RSGs design is similar to BV1 RSGs, within the parameters of other in-service WEC Model 54 steam generators, and well removed from the values for the SONGS replacement steam generators.

The NRC inspection team also discussed the design control, commercial-grade dedication and utilization of unqualified source material programs with ENSA's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

b.1 Design Control

The NRC inspection team's on-site inspection activities at ENSA emphasized evaluating how the design specifications were met, how design changes were controlled and approved, and the interactions between ENSA and the designer (WEC) to resolve non-conformances. The NRC inspection team's primary focus was related to items including design areas that could affect FEI in the upper tube bundle (e.g., the anti-vibration bar (AVB) tube support system), and other key design and fabrication specifications in areas such as tubesheet drilling, the tube-to-tubesheet weld, and hydraulic expansion of the tubes within the tubesheet. The NRC inspection team verified how the design specifications for the following were met: results from hydraulic tube expansion measurements in the tubesheet; tube-to-antivibration bar gap measurements; the weld procedure qualification record (PQR) for the tube-to-tubesheet welds showing minimum weld throat measurements; helium leak test results for the tube-to-tubesheet weld, and tubesheet drilling run-out measurements. The NRC inspection team also assessed the handling of non-conformances and the handling of design changes to evaluate the interactions between ENSA and the WEC.

No findings of significance were identified.

b.2 Commercial-Grade Dedication

During the inspection, the NRC inspection team was notified by ENSA that they do not routinely perform commercial-grade dedication or activities associated with the utilization of unqualified source material in accordance Subsection NCA-3855.5, "Utilization of Unqualified Source Material," of the Section III of the ASME B&PV Code. The goal of ENSA is to procure safety-related components and services from suppliers with a Quality Assurance program that meets the requirements of Appendix B to 10 CFR Part 50 as well as program that meets the requirements of 10 CFR Part 21, "Reporting of Defects and Noncompliance."

ENSA identified that they had performed an acceptance activity for the processing of the feed water ring (FWR) assembly inspection port slip-on and blind flange SA-105 carbon steel material. During the review of the Material Inspection Plan (MIP) No. 0BV2MIP001 "Certification Compliance with 10CFR50 Appendix B, 10CFR21, and Westinghouse Specification A105C01-GEN Rev. B, of Carbon Steel forged

Flanges SA-105,” Revision 1, associated with the slip-on and blind flanges, the NRC inspection team noted that ENSA had only tested a limited sample of the 25 pieces received from multiple heats of material. The NRC inspection team determined that ENSA had not documented a basis that on how they developed the sample population for MIP inspection and testing.

Upon further review, the NRC inspection team learned that ENSA had intended to purchase the slip-on and blind flanges as safety-related from Tubos Reunidos. However, after an audit performed in September 2013, ENSA placed a restriction on Tubos Reunidos that no purchase orders (POs) should be sent to this supplier. ENSA eventually removed Tubos Reunidos from their Qualified Vendor’s List (QVL) but not before buying the slip-on and blind flanges. When ENSA became aware that the slip-on and blind flanges were procured from Tubos Reunidos, ENSA proceeded to develop MIP No. 0BV2MIP001 and sent it to WEC for approval. In a letter dated January 15, 2014, WEC approved MIP No. 0BV2MIP001 and ENSA proceeded to use the slip-on and blind flanges material for the FWR assembly.

The NRC inspection team determined that ENSA did not establish and document the sample testing population for the acceptance of material critical characteristics used for the commercial-grade dedication of the FWR assembly inspection port slip-on and blind flange SA-105 carbon steel material. In addition, ENSA did not verify that the supplier had quality controls in place to ensure heat traceability of the material. ENSA performed material testing verification on a limited sample of the 25 pieces received from multiple heats of material. Furthermore, ENSA’s certified material test reports (CMTRs) incorrectly stated that all the test results were in compliance with the requirements of Appendix B to 10 CFR Part 50 and 10 CFR Part 21. As described above, the NRC inspection team determined that the safety-related supplier of the flange material was removed from ENSA’s QVL and thus required the flange material to be accepted under ENSA’s commercial-grade dedication program or the utilization of unqualified source material process of Section III of the ASME B&PV Code. Industry operating experience has shown that leaking FWR inspection port covers have led to water hammer events that distorted the supports of the FWR. The NRC inspection team identified this issue as Nonconformance 99901379/2016-201-01 for ENSA’s failure to ensure the selection and review for suitability of application materials that are essential to the safety-related functions of structures, systems, and components. ENSA initiated C/PAR No. 0086/16 to address this issue.

c. Conclusion

The NRC inspection team issued Nonconformance 99901379/2016-201-01 in association with ENSA’s failure to implement the regulatory requirements of Criterion III of Appendix B to 10 CFR Part 50. Nonconformance 99901379/2016-201-01 cites ENSA for failing to ensure the selection and review for suitability of application materials that are essential to the safety-related functions of structures, systems, and components. Specifically, ENSA’s MIP No. 0BV2MIP001 did not establish and document the sample testing population for the acceptance of material critical characteristics used for the commercial-grade dedication of the FWR assembly inspection port slip-on and blind flange SA-105 carbon steel material.

2. Manufacturing Control

a. Inspection Scope

The NRC inspection team reviewed ENSA's policies and implementing procedures that govern manufacturing controls to verify compliance with the regulatory requirements of Criterion IX, "Control of Special Processes," of Appendix B to 10 CFR Part 50 as well as with the applicable requirements of Section III, Section V, "Nondestructive Examination," and Section IX, "Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators," of the ASME B&PV Code and the American Society for Nondestructive Testing (ASNT) SNT-TC-1A, "Personnel Qualification and Certification in Nondestructive Testing."

For welding activities, the NRC inspection team reviewed shop travelers, weld procedure specifications (WPS), supporting PQRs, welder qualifications, ASME B&PV Code data reports, and the calibration certificates of the welding equipment. For non-destructive examination (NDE) activities, the NRC inspection team reviewed procedures for magnetic particle testing (MT), liquid penetrant testing (PT), radiographic testing (RT), and Ultrasonic Testing (UT) as well as PT reports, PT examiner qualifications, and UT Level III inspector qualifications, and the calibration certificates of the measuring equipment.

The NRC inspection team also discussed the manufacturing control program with ENSA's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

b.1 Welding Process

The NRC inspection team verified that the WPSs were qualified in accordance with the applicable requirements of Section III and Section XI of the ASME B&PV Code using the supporting PQRs and the applicable ENSA procedures and instructions.

The NRC inspection team also verified that the applicable welding data; such as weld material and heat/lot number, WPS, inspection procedures used, and final inspection results were recorded in accordance with the applicable ENSA procedures and instructions. The welding data was recorded on the associated weld record for each weld joint along with the applicable NDE results. It should be noted that in-process inspections are documented in the electronic version of the traveler. All applicable information, including drawings, procedures, instructions and NDE test results are included in the electronic version of the traveler.

b.2 Control of Weld Material

The NRC inspection team observed the weld material storage and issue station and verified that weld material was adequately controlled, including that flux covered weld electrodes were either in hermetically sealed containers, or were kept in baking or portable ovens to control the moisture content within the requirements of the applicable filler metal specification and Section III of the ASME B&PV Code. The NRC inspection team also verified that calibrated thermocouples were used and had

valid calibration documentation in accordance with applicable ENSA procedures. In addition, the NRC inspection team verified that weld material was controlled at all times until its consumption.

b.3 Nondestructive Examination

The NRC inspection team witnessed UT inspections including calibration of UT equipment to verify bonding of the cladding on the channel head to divider plate on the No. 3 BV2 RSG in accordance with 0BV2CS202, "UT Inspection of Cladding on Channel head to Partition," Revision 6, dated October 30, 2015. The NRC inspection team also observed that appropriate cleaning was performed in accordance with applicable ENSA procedures.

The NRC inspection verified that the examinations were performed by qualified personnel and qualified procedures in accordance with the applicable requirements of Section III and Section V of the ASME B&PV Code and ASNT SNT-TC-1A.

b.4 Heat Treatment

During a walk down of ENSA's fabrication facilities, the NRC inspection team noted that the No. 3 BV2 RSG was laying horizontally and a localized section of the secondary side was being heated up with several open flame burners. The open flame burners were located down the length of the steam generator shell, but were not evenly distributed around the circumference of the steam generator shell. The NRC inspection team did not observe any routine rotation of the steam generator, or temperature monitoring during the heating process. The steam generator was completely assembled, including the primary side tubing, and supports (i.e., anti-vibration bars).

Section 5.10, "Draining and Drying," of ENSA's Specification No. 0BV2CS601, "Hydrostatic Pressure Test," Revision 1, dated November 25, 2015, states that "Draining and drying of the secondary chamber of the Steam Generator shall be as described in the specification No. 0BV2FS503." Specification No. 0BV2CS601 also provides quantitative values such as pressure and temperature of hydrostatic pressure test and water chemistry criteria before and after the hydrostatic pressure test. However, there were no instructions on the maximum temperature, method of heating, duration and location of applying heat to the steam generator to facilitate drying without affecting material and dimensional tolerances.

Since there were no procedures or written instructions for controlling the heating, ENSA failed to assure that special processes were controlled and accomplished using qualified procedures in accordance with specifications and acceptance criteria. By not having a qualified procedure, ENSA could not determine the maximum temperature the steam generators experienced during the heating process in one localized area, or the length of the heating process, which could last up to a week. Excessive heating of the steam generators could create warping and affect the materials and dimensional tolerances (e.g. distortion) of the steam generator components. Therefore, there is no objective evidence that the heating was controlled, including maximum temperature, location of heating and duration that could affect the materials and dimensional tolerances (e.g. distortion) of the steam generator components. The NRC inspection team identified this issue as

Nonconformance 99901379/2016-201-02 for ENSA's failure to assure that special processes were controlled and accomplished using qualified procedures in accordance with specifications and acceptance criteria. ENSA initiated C/PAR No. 0087/16 to address this issue.

b.5 Qualification and Training of Welding and Nondestructive Examination Personnel

The NRC inspection team reviewed the associated welder qualification records and confirmed that the welders had completed the required training and had maintained their qualifications in accordance with ENSA procedures. The NRC inspection team also verified that the applicable procedure for welder qualification meets the requirements of Sections III and IX of the ASME B&PV Code.

The NRC inspection team also reviewed the ENSA procedures for MT, PT, RT, and UT inspections, and verified that they were consistent with the applicable ASME B&PV Code requirements. In addition, the NRC inspection team reviewed the Level III non-destructive examiner and Level II non-destructive inspector qualification records and confirmed they were qualified in accordance with the requirements in ASNT SNT-TC-1A.

c. Conclusion

The NRC inspection team issued Nonconformance 99901379/2016-201-02 in association with ENSA's failure to implement the regulatory requirements of Criterion IX, of Appendix B to 10 CFR Part 50. Nonconformance 99901379/2016-201-02 cites ENSA for failing to assure that special processes were controlled and accomplished using qualified procedures in accordance with specifications and acceptance criteria. Specifically, after completion of the secondary side hydrostatic pressure test, ENSA used several open flame gas burners that were installed underneath the secondary side of the steam generators to facilitate final drying and vacuuming without a qualified procedure for this activity. ENSA Specifications Nos. 0BV2CS601 and 0BV2FS503 did not provide instructions, specifications, controls and/or acceptance criteria for the heating process. By not having a qualified procedure, ENSA could not determine the maximum temperature the steam generators experienced during the heating process in one localized area, or the length of the heating process, which could last up to a week. Excessive heating of the steam generators could create warping and affect the materials and dimensional tolerances (e.g. distortion) of the steam generator components.

3. Supplier Oversight

a. Inspection Scope

The NRC inspection team reviewed ENSA's policies and implementing procedures that govern the oversight of contracted activities and external audits program to verify compliance with the requirements of Criterion IV, "Procurement Document Control," and Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50.

The NRC inspection team verified that the POs included, as appropriate: the scope of work, right of access to facilities, and extension of contractual requirements to subcontractors. In addition, the NRC inspection team confirmed that all of the safety-related POs reviewed included clauses invoking the provisions of 10 CFR Part 21.

The NRC inspection team reviewed a sample of external audits to evaluate compliance with ENSA's program and technical requirements. The NRC inspection team confirmed that the audit reports contained objective evidence of the review of the relevant quality assurance (QA) criteria of Appendix B to 10 CFR Part 50. The NRC inspection team also reviewed a sample of training and qualification records of ENSA's lead auditors and auditors and confirmed that auditing personnel had completed all the required training and had maintained qualification and certification in accordance with ENSA's policies and procedures. In addition, the NRC inspection team verified that external audits were performed by qualified lead auditors and auditors.

The NRC inspection team also discussed the supplier oversight program with ENSA's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

As an ASME B&PV Code N-Type Certificate Holder, ENSA can qualify suppliers of materials and services in accordance with Subsection NCA-3842.2, "Evaluation of the Qualified Material Organization's Program by Certified Material Organizations of Certificate Holders," of Section III of the ASME B&PV Code. These suppliers' quality system program must meet the requirements of NCA-3800, "Metallic Organization's Quality System Program." In Information Notice No. 86-21, "Recognition of American Society of Mechanical Engineers Accreditation Program for N Stamp Holders," the NRC stated that having a QA program based on NCA-3800 is evidence that the supplier has a documented QA program that meets the requirements of Appendix B to 10 CFR Part 50. However, since the NRC's recognition only applied to the programmatic aspects of the ASME accreditation program, users are still responsible for ensuring that the supplier is effectively implementing the approved QA program. For the procurement of safety-related components, these suppliers must also have a program that meets the requirements of 10 CFR Part 21.

During the review of a sample of external audits, the NRC inspection team noted that for a sample of 11 suppliers, the external audits did not contain adequate documented objective evidence to provide reasonable assurance that the suppliers had implemented an adequate 10 CFR Part 21 program. Specifically, the evaluation and documentation of these suppliers' 10 CFR Part 21 programs and implementing procedures did not demonstrate adequate compliance with the requirements of 10 CFR Part 21. For example, the external audits did not contain sufficient information to determine if the supplier had an adequate procedure for the identification and evaluation of deviations and whether this procedure contained the appropriate timeliness and notification requirements.

These included supply of materials and services such as nickel alloy forged flow limiting insert, stainless steel forged nozzle end, seamless alloy steel piping, manufacturing of the spray nozzle assembly, nickel alloy forged primary nozzle closure ring, alloy 690 plates, ferritic steel bolting material, low alloy steel filler weld wire, and hot bending of

seamless alloy steel pipes. The NRC inspection team identified this issue as an example of Nonconformance 99901379/2016-201-03 for ENSA's failure to provide documented objective evidence necessary to confirm the conclusions associated with the supplier's 10 CFR Part 21 programs documented in the external audits. ENSA initiated C/PAR No. 0088/16 to address this issue.

c. Conclusion

The NRC inspection team issued Nonconformance 99901379/2016-201-03 in association with ENSA's failure to implement the regulatory requirements of Criterion VII, of Appendix B to 10 CFR Part 50. Nonconformance 99901379/2016-201-03 cites ENSA for failing to establish adequate measures to obtain objective evidence of quality furnished by the contractor or subcontractor. Specifically, ENSA did not provide adequate documented objective evidence in their external audit reports of material and service suppliers to provide reasonable assurance that the suppliers had implemented an Appendix B to 10 CFR Part 50 and 10 CFR Part 21 programs. For a sample of 11 audits reviewed by the NRC inspection team, the evaluation of the suppliers' 10 CFR Part 21 programs and associated implementing procedures did not demonstrate adequate compliance with the requirements of 10 CFR Part 21 for the supply of Appendix B safety-related basic components and services.

4. 10 CFR Part 21 Program

a. Inspection Scope

The NRC inspection team reviewed ENSA's policies and implementing procedures that govern ENSA's 10 CFR Part 21 program to verify compliance with the regulatory requirements. In addition, the NRC inspection team evaluated the 10 CFR Part 21 postings and a sample of ENSA's POs for compliance with the requirements of 10 CFR 21.21, "Notification of Failure to Comply or Existence of a Defect and its Evaluation," and 10 CFR 21.31, "Procurement Documents." The NRC inspection team also verified that ENSA's nonconformance and corrective action procedures provide a link to the 10 CFR Part 21 program.

For the only 10 CFR Part 21 evaluation performed by ENSA, the NRC inspection team verified that ENSA had effectively implemented the requirements for evaluating deviations and failures to comply. The NRC inspection team verified that the notifications were performed in accordance with the requirements of 10 CFR 21.21.

The NRC inspection team also discussed the 10 CFR Part 21 program with ENSA's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The NRC inspection team concluded that ENSA is implementing its 10 CFR Part 21 program in accordance with the regulatory requirements of 10 CFR Part 21. Based on the limited sample of documents reviewed, the NRC inspection team also determined that ENSA is implementing its policies and procedures associated with the 10 CFR Part 21 program. No findings of significance were identified.

5. Control of Measuring and Test Equipment

a. Inspection Scope

The NRC inspection team reviewed ENSA's policies and implementing procedures that govern the M&TE program to verify compliance with the requirements of Criterion XII, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50.

The NRC inspection team determined that the M&TE had the appropriate calibration stickers and current calibration dates, including the calibration due date. The NRC inspection team also verified that the M&TE had been calibrated, adjusted, and maintained at prescribed intervals prior to use. In addition, the calibration records reviewed by the NRC inspection team indicated the as-found or as-left conditions, accuracy required, calibration results, calibration dates, and the due date for recalibration. The NRC inspection team also verified that the selected M&TE was calibrated using procedures traceable to known industry standards.

The NRC inspection team also verified that when M&TE equipment is received from the calibration service supplier and the calibration certificate states that it was found to be out of calibration, ENSA generates a nonconformance report (NCR) to identify items that have been accepted using this equipment since the last valid calibration date and to perform an extent of condition review.

The NRC inspection team also discussed the control of M&TE program with ENSA's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The NRC inspection team concluded that ENSA is implementing its M&TE program in accordance with the regulatory requirements of Criterion XII of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that ENSA is implementing its policies and procedures associated with the M&TE program. No findings of significance were identified.

6. Nonconforming Materials, Parts, or Components and Corrective Action

a. Inspection Scope

The NRC inspection team reviewed ENSA's policies and implementing procedures that govern the control of nonconformances to verify compliance with the requirements of Criterion XV, "Nonconforming Materials, Parts, or Components," and Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50.

The NRC inspection team reviewed ENSA's Corrective/Preventive Actions (CPAs) and NCR control logs and selected a sample of NCRs and CPAs to verify that ENSA had implemented an adequate program to ensure that nonconforming items and conditions adverse to quality were promptly identified and corrected. The NRC inspection team verified that nonconforming components were properly identified, marked, and segregated when practical, to ensure they were not reintroduced into the manufacturing process. In addition, the NRC inspection team verified that the CPAs provide: (1) adequate documentation and description of conditions adverse to quality; (2) an appropriate analysis of the cause of these conditions and the corrective actions taken to prevent recurrence; (3) direction for review and approval by the responsible authority; (4) a description of the current status of the corrective actions; and (5) the follow-up actions taken to verify timely and effective implementation of the corrective actions.

The NRC inspection team also discussed the nonconformance and corrective action programs with ENSA's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The NRC inspection team concluded that ENSA is implementing its nonconforming materials, parts, or components and corrective action programs in accordance with the regulatory requirements of Criterion XV and Criterion XVI of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that ENSA is implementing its policies and procedures associated with the control of nonconforming materials, parts, or components and corrective actions. No findings of significance were identified.

7. Entrance and Exit Meetings

On Monday, April 25, 2016, the NRC inspection team discussed the scope of the inspection with Rafael Triviño, ENSA's Senior Vice-President Managing Director and other members of ENSA's management and technical staff. On Friday, April 29, 2016, the NRC inspection team presented the inspection results and observations during an exit meeting with Mr. Triviño and other members of ENSA's management and technical staff. The attachment to this report lists the attendees of the entrance and exit meetings, as well as those individuals whom the NRC inspection team interviewed.

ATTACHMENT

1. ENTRANCE/EXIT MEETING ATTENDEES

Name	Title	Affiliation	Entrance	Exit	Interviewed
Rafael Triviño	Senior Vice-President Managing Director	Equipos Nucleares, S.A. (ENSA)	X	X	
Alfonso Alvarez Miranda	Vice-President Operations	ENSA	X	X	
Miguel Angel Andérez	Vice-President Projects	ENSA	X	X	
Angel Cosío Gandarillas	Vice-President Human Resources	ENSA	X	X	
Enrique Casado	Quality Assurance (QA) Manager	ENSA	X	X	X
Raúl Marcos	Quality & Environment Manager	ENSA	X	X	X
Javier Sánchez Pereda	Product Quality Manager	ENSA	X	X	
Francisco Javier Maldonado	Engineering Manager	ENSA	X	X	
Mario Mesones Torre	Production Manager	ENSA	X	X	
Domingo Lima Almeida	Advanced Technology Center Manager	ENSA		X	
Antonio Fidel Igareda Santamaría	Project Manager	ENSA	X		
Rubén Bravo	Project Manager	ENSA	X	X	
Antonio Igareas	Project Manager	ENSA		X	
Emilio Esteban Lázaro	IT Manager	ENSA	X	X	
Guillermo García Lopez	Quality Engineer	ENSA	X	X	X
Immaculada Fernández	Quality Engineer	ENSA	X	X	X
Iván González de Riancho	Project Engineer	ENSA	X	X	X

Name	Title	Affiliation	Entrance	Exit	Interviewed
Joaquín Ruiz de Villa	Project Engineer	ENSA	X	X	
Juan Francisco Lorenzo	Supplies Control	ENSA	X	X	
Pablo Alvarez Oliveri	Procurement Department	ENSA	X	X	
José M. Zavala	Procurement	ENSA		X	
Laura Rioyo Rumayor	Labor Relations	ENSA	X	X	
Greg Kammerdeiner	Senior Consulting Engineer	First Energy Nuclear Operating Company	X	X	X
Ryan R. Lowes	Principal Engineer	Westinghouse Electric Company (WEC)	X	X	X
John W. Bowyer	Resident Manager	WEC			X
Christopher Bostock	Mechanical Engineer	Demark, Inc.			X
Yamir Diaz-Castillo	Inspection Team Leader	Nuclear Regulatory Commission (NRC)	X	X	
Richard P. McIntyre	Acting Branch Chief/Inspector	NRC	X	X	
John Honcharik	Inspector	NRC	X	X	
Paul A. Klein	Inspector	NRC	X	X	

2. INSPECTION PROCEDURES USED

- Inspection Procedure (IP) 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance," dated February 13, 2012
- IP 43002, "Routine Inspections of Nuclear Vendors," July 15, 2015
- IP 43004, "Inspection of Commercial-Grade Dedication Programs," November 29, 2013

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Status	Type	Description
99901379/2016-201-01	Opened	NON	Criterion III
99901379/2016-201-02	Opened	NON	Criterion IX
99901379/2016-201-03	Opened	NON	Criterion VII

4. DOCUMENTS REVIEWED

Policies and Procedures

- Equipos Nucleares, S.A. (ENSA) Quality Assurance Manual, Revision 43, dated January 14, 2013
- General Procedure (GP) 02.01, "Indoctrination, Training, Qualification, and Certification of Personnel on Activities in the Quality Area," Revision 20, dated December 14, 2015
- GP.02.09, "Training, Qualification, and Certification of Personnel," Revision 25, dated February 5, 2016
- GP.03.02.03, "Engineering Functions and Responsibilities," Revision 4, dated March 21, 2106
- GP.05.01, "Design and Analysis Reports," Revision 29, dated March 1, 2016
- GP.05.02.01, "Preparation, Review and Approval of Drawings," Revision 9, dated April 3, 2016
- GP.05.03, "Preparation, Review, and Approval of Specifications," Revision 20, dated March 8, 2016
- GP.05.09, "Validation and Verification of the Design and Analysis Computer Programs," Revision 11, dated March 1, 2013
- GP.05.17, "Issue of Welding Procedure Qualifications and Welding Procedure Specifications," Revision 16, dated January 10, 2014

- GP.05.32, "Safety Culture," Revision 2, dated February 27, 2014
- GP.06.01, "Preparation and Control of Laboratory Procedure," Revision 17, dated November 4, 2013
- GP.08.01, "Purchasing of Materials or Parts and Subcontracting," Revision 33, dated March 23, 2016
- GP.08.02, "Reception and Storage of Materials and/or Services," Revision 23, dated April 20, 2015
- GP.08.03, "Suppliers Audits," Revision 21, dated March 23, 2016
- GP.08.06, "Basis for the Qualification of Suppliers," Revision 19, dated November 17, 2015
- GP.08.07, "Suppliers Assessment," Revision 14, dated April 4, 2014
- GP.08.08, "Classification of Materials and Subcontracting," Revision 12, dated January 23, 2014
- GP.08.20, "Commercial Grade Dedication Program," Revision 2, dated February 23, 2015
- GP.10.08, "Storage, Handling, and Delivery of Welding Material," Revision 25, dated August 8, 2014
- GP.12.01, "Training and Qualification and Certification of NDE Personnel," Revision 44, dated January 29, 2016
- GP.14.01, "Periodical Calibration of Measuring and Testing Instruments," Revision 57, dated March 8, 2016
- GP.15.01, "Handling of Non-Conforming Conditions," Revision 40, dated February 21, 2013
- GP.15.03, "Handling of Stop Work Orders," Revision 3, dated November 10, 2014
- GP.15.05, "Reporting of Defects and Noncompliances under 10 CFR 21," Revision 7, dated March 6, 2013
- GP16.01, "Corrective/Preventive Actions," Revision 24, dated March 15, 2016
- Supplier Quality Assurance Requirements (SQAR)-06, "General Q.A. Requirements for the Purchase of Welding Material," Revision 1, dated March 3, 2009
- SQAR-10, "Supplier Quality Assurance Requirements for Materials and Services," Revisions 10, 11, and 12, dated March 30, 2011, January 31, 2013, and September 17, 2015, respectively

- SQAR-14, "Q.A. Requirements for Services under ISO-EN 17025 and/or ISO 17020," Revision 4, dated February 25, 2015
- ENSA's Specification No. 0BV2FS010, "Antivibration Bars Assembly and Inspection," Revision 4, dated January 28, 2015
- ENSA Specification No. 0BV2CS506, "Deep Drilling of the Tubesheet," Revision 6, dated May 23, 2014
- ENSA Specification No. 0BV2CS601, "Hydrostatic Pressure Test," Revision 1, dated November 25, 2015
- ENSA Specification No. 0BV2FS503, "Draining and Drying of the Secondary Side," Revision 1, dated September 30, 2015
- ENSA's Specification No. 0BV2FS019, "Mechanical Polishing (Pre-Electro polishing) of the Channel Head and Tubesheet," Revision 1, dated March 13, 2015
- ENSA's Specification No. 0BV2FS501, "Cleaning," Revision 1, dated February 3, 2015
- ENSA's Specification No. 0BV2CS301, "Radiographic Examination," Revision 12, dated December 18, 2015
- Letter from Laura S. Walker, Westinghouse Electric Company (WEC), to Mr. Rubén Bravo, ENSA, "ENSA Material Inspection Plan - Certification Compliance with 10CFR50 Appendix B, 10CFR21 and Westinghouse Specification A105C01-GEN Rev. B, of Carbon Steel Forged Flanges SA-105 - 0BV2MIP001, Rev. 01; ENSA Inspection Point Program (IPP) - P-2555-PP1, Rev. 3; ENSA Drawings - Gusset - 0BV2.3402, Rev. 00; Plugs - 0BV2.4003, Rev. 00 - Approval," dated January 15, 2014

Part 21 Documents

- EVAL-2011-01, "Evaluation of defects and non-compliance under 10 CFR 21," Revision 1, dated March 23, 2011
- NDC-2011-01, "Notification of defects and non-compliance under 10 CFR 21," Revision 1, dated March 23, 2011

Design Documents

- "Beaver Valley Unit 2 Model 54F Replacement Steam Generator Radar Charts of Parameters Related to Tube Bundle Fluid Elastic Instability," Revision 0, dated December 17, 2014
- FENOC/Westinghouse Executive Steering Committee Presentation dated February 2, 2015, "Beaver Valley Unit 2 Replacement Steam Generator and Replacement Reactor Vessel Closure Head Status Update," Laura Walker, Westinghouse Program Manager.

- “Tube-to-Tubesheet Weld Analysis - Reconciliation for the Beaver Valley 2 Model 54F Replacement Steam Generators,” Revision 0, dated August 25, 2015
- WEC Design Specification No. 425A49, “54F Replacement Steam Generator Design,” Revision 4, dated April 22, 2015
- Inspection Point Plan (IPP) 1BV2-32A04, “Hydraulic Expansion & AVBS Weld,” dated March 30, 2015
- IPP 1BV2-32A04, Operation 2400, “Measurement of the Hydraulically Expanded Zone of the Tubes by AES,” dated June 4, 2015
- Drawing No. OBV2.3203, “AVB’s, Retaining Rings and Bars Assembly,” Revision 1
- Drawing No. OBV2.3202, “Tube Set Insertion and Weld Assembly,” Revision 0
- Drawing No. 0BV2.40M0, “As-Built Dimensions - Master,” Revision 0, dated November 11, 2014
- Drawing No. 0BV2.1000, “Final Channel head and Weld and Final Machining,” Revision 1
- Drawing No. 0BV23300, “Final Lower Assembly,” Revision 0
- Drawing No. 0BV2.2600, “Feedwater Ring Assembly,” Revision 1
- Drawing No. 0BV2.2602, “Feedwater Ring Miscellaneous Details,” Revision 1
- Engineering Change Notice No. ECN-MCRE-BV2-14-17, Drawing No. BV2RSG-D270/Rev. 1, “BV2RSG Tube Support and Flow Baffle Plates Installation,” Revision 0
- ENSA Technical Report ITI-OBV2-002-2014, “Tube to Tubesheet Qualification Report,” Revision 1, dated December 17, 2014

Calibration, Inspection and Test Reports

- For the following measuring and testing equipment, the NRC inspection team verified that the calibration was current and reviewed the associated Certificates of Calibration:
 - Flex meter, No. 0620-6380
 - Calibration block No. NL-449
 - Digital watch, No. 0740-4350
 - Micrometer, No. 0700-0483-0609
 - Digital thermometer, No. 0740-4832
 - Ultrasound machine, No. 0620-5794
 - Magnetic flow meter, No. 0620-5378
 - Ultrasound calibration block, No. 0620-7386
 - Metal inner gas welding machine, No. 0740-4333
 - Oven thermometer, Nos. 0740-4576 and 0740-4675-2212

- Instruction No. 0BV2CS202, "UT Inspection of Cladding on Channel Head to Partition," Revision 6, dated October 30, 2015
- Ultrasonic Testing Certificate (Inspection Report) 3BV2UT056, "UT to Verify Bond in the Channel Head Cladding," Revision 0, dated April 27, 2016
- Weld Procedure Specification (WPS) No. 0BV2WT234, "Austenitic Cladding/Buttering SMAW/GTAW," dated January 16, 2014
 - Procedure Qualification Record (PQR)-866, "SMAW Corrosion Resistant Weld Metal Overlay," dated January 7, 1997
 - PQR-1268, "Shield Metal Arc Welding, Gas Tungsten Arc Welding," dated December 10, 2009
- WPS No. 0BV2WT210, "Circumferential welds between P3 Gr3 materials (SMAW/SAW/GTAW)," Revision 4, dated December 30, 2015
 - PQR-963 Manual SMAW, dated April 16, 1999
 - PQR-964 Machine GTAW, dated December 2, 1999
 - PQR-1296 Machine SAW, dated May 12, 2011
- WPS No. 0BVWT216, "Buttering of Channel Head Nozzle for Safe-End," Revision 0, dated February 19, 2006, "Inconel Buttering on P3 Materials (GTAW Hot Wire)"
 - PQR-1166, dated June 19, 2006
- WPS No. 0BV2WT244, "Safe-End (GTAW Manual, GTAW Machined and SMAW Processes," dated March 19, 2014
 - PQR-907, dated December 23, 2000
 - PQR-859, dated February 14, 2008
 - PQR-864, dated January 17, 2008
- ENSA GTAW Procedure Qualification Record PQR-1115, Tube to Tubesheet Welding Procedure Qualification (Inconel 690 Tubes to Inconel 690 Clad), dated June 16, 2004
- Radiographic Testing (RT) Report No. 1BV2TR024, "Channel Head to Barrel Weld - SG-1," Revision 4, dated August 31, 2015
- RT Report No. 2BV2RT010, "Safe-end Weld on SG-2," Revision 01, dated May 20, 2015
- Magnetic Particle Testing (MT) Report No. 1BV2MT036, "Channel Head to Barrel Weld - SG-1," Revision 0, dated September 5, 2015
- Ultrasonic Testing (UT) Report No. 3BV2UT056, "UT Verify Bond in the Channel Head Cladding," Revision 0, dated April 27, 2016
- Visual Testing (VT) Report 2BV2CV10, "Safe-end Weld on SG-2," Revision 0, dated May 13, 2015

- Liquid Penetrant Testing (PT) Report No. 2BV2CV116, "Safe-end Weld on SG-2," Revision 0, dated May 15, 2015
- American Society of Mechanical Engineers (ASME) Boiler & Pressure Vessel (B&PV) Code Data Report for Channel Head to Shell Weld - SG-1, including Welding Record (WR) No. 1BV2/154, "Channel Head to Shell Weld - SG-1"
- ASME Code Data Report for Channel Head to Barrel Weld - SG-1," including WR No. 1BV2/153, "Channel Head to Barrel Weld"
- ASME Code Data Report for Safe-End to Nozzle Weld - SG2," including WR No. 2BV2/064, "Safe-End to Nozzle Weld"
- Certified Material Test Report (CMTR) for Weld Electrode No. E9018m sfa5.5, Heat No. 026125184
- CMTR for Weld Electrode No. E9018m sfa5.5, Heat No. 026125188
- CMTR for Weld Wire Class sfa5.23 and flux Lincoln MIL800-H-class F9P4, Heat No. 1054x and Heat No. 1054Y (for flux)
- ENSA Dimensional Certificate 2BV2DC056 RSG For Beaver Valley Unit 2, IPP 30A02, "Dimensional Control of Drilling Tubesheet, " Revision 0, dated August 12, 2014
- Base Material Receiving Inspection Report (IR) No. 0BV2/033 for a forged shell cut out in SA-508 Gr. 3 Cl.2, Heat No. 05D138-1-1, Revision 3, dated February 22, 2013
- Base Material Receiving IR No. 0BV2/153 for carbon steel SA-105 slip-on flanges, Heat No. 87T1 and 1521T1, Revision 0, dated May 13, 2014
- Base Material Receiving IR No. 0BV2/173 for carbon steel SA-105 blind flanges, Heat No. 5153, Revision 0, dated July 23, 2014
- Base Material Receiving IR No. 0BV2/184 for carbon steel SA-105 slip-on flanges, Heat Nos. 1521T1 and 87T1, Revision 0, dated August 29, 2014
- Base Material Receiving IR No. 0BV2/215 for carbon steel SA-105 blind flanges, Heat No. 5153, Revision 0, dated December 23, 2014

Purchase Orders

- Procurement Request No. 0BV2B040 for carbon steel SA-105 slip-on and blind flanges, Revision 2, dated June 17, 2013
- Purchase Order (PO) No. 141039 to the European Commission (IRMM) for calibration services of charpy specimens, Revision 0, dated May 27, 2014
- PO No. 150007 to the Fundacion General UPM Publicaciones for calibration services of a magnetic field strength meter, Revision 0, dated January 13, 2015

- PO No. 150071 to Metrologia Sariki, S.A. for calibration services, Revision 1, dated January 28, 2015
- PO No. 150815 to Instituto Nacional de Tecnología Aeroespacial E. Terr for calibration services of resistance temperature detectors, Revision 0, dated April 7, 2015
- PO No. 150834 to Metal-Test, S.L. for calibration services of a laser, Revision 0, dated March 9, 2015
- PO No. 151017 to Trescal España de Metrologia, SLU for calibration services of an oscilloscope, Revision 0. Dated May 12, 2015
- PO No. 151141 to National Institute of Standard and Technologies, for calibration services of low and high energy charpy V-notch, Revision 0, dated May 20, 2015
- PO No. 151674 to Trescal Iberica de Calibración, S.L. for calibration services of a flow meter, Revision 1, dated September 10, 2015
- PO No. 151732 to HBM Ibérica S.L. for calibration services of a transducer, Revision 0, dated September 11, 2015
- PO No. 153056 to Fundación Fomento Innovación Industrial for calibration services of a voltage meter and a multimeter, Revision 0, dated December 2, 2015
- PO No. 160253 to Trescal España de Metrologia, SLU for calibration services of dew point meter, Revision 0, dated January 19, 2016
- PO No. 160838 to Faro Europe GMBH & Co. KG for calibration services of a laser, Revision 0, dated March 22, 2016
- PO No. 0BV2/906 to Special Metals Company for weld wire, Revision 1, dated September 27, 2013
- PO No. 0BV2/023 to Apex Nuclear Equipment for anti-vibration bars, retaining rings, and retainer bars Revision 1, dated June 27, 2013
- PO No. 0BV2/121 to OME for socket head cap screw and copper flat washers, Revision 1, dated March 1, 2016
- PO No. 0BV2/043 to Technetics for a metal ring, Revision 0, dated November 21, 2013
- PO No. 0BV2/527 to Talleres Arriaj, S.L. for manufacturing, inspection, and preparation for transport of flange pin, Revision 0, dated April 23, 2014
- PO No. 0BV2/011 to Industeel Groupe Arcelor for tube support plates and flow distribution baffle plates, Revision 1, dated May 8, 2012
- PO No. 0BV2/030 to Dubose National Energy Services for carbon steel bars, dated November 11, 2013

- PO No. 0BV2/028 to Valinox Nucleaire for pipe material, Revision 0 dated May 7, 2013
- PO No. 0BV2/001 to Japan Steel Works for forged tube sheet, Revision 2, dated February 29, 2012
- PO No. 0BV2/009 to Sandvik Steel for seamless tubing and spare tubes, Revision 4, dated April 14, 2014
- PO No. 0BV2/025 to Aubert & Duval for nickel alloy forged flow limiting insert, Revision 0, dated March 6, 2013
- PO No. 0BV2/032 to Forge Monchieri S.p.A. for stainless steel forged nozzle safe end, Revision 1, dated October 4, 2013
- PO No. 0BV2/037 to Petrol Raccord, S.p.A for seamless alloy steel pipe, Revision 0, dated October 2, 2013
- PO No. 0BV2/519 to Atecsol Soldaduras, S.L, for manufacturing of the spray nozzle assembly, Revision 0, dated January 20, 2014
- Po No. 0BV2/024 to Forgital Dembiermont for nickel alloy forged primary nozzle closure ring, Revision 1, dated March 18, 2013
- PO No. 0BV2/016 to Thyssennkrupp VDM for alloy 690 plates, Revision 0, dated November 30, 2012
- PO No. 0BV2/041 to Vicente Berrizbetia for ferritic steel bolting material, Revision 0, dated September 9, 2013
- PO No. 0BV2/526 to Newtesol for complete manufacturing of piping, Revision 1, dated May 12, 2014
- PO No. 0BV2/901 to Air Liquide Welding for low alloy steel filler wire, Revision 0, dated November 14, 2011
- PO No. 0BV2/516 to Tuberias y Soldaduras Especiales for hot bending of seamless alloy steel pipes, Revision 0, dated November 6, 2013
- PO No. 0BV2/515 to Mindasa for machining of the primary nozzle closure ring, Revision 1, dated September 10, 2014
- PO No. 0BV2/521 to Cortalia Tecnicas Metalurgicas for complete manufacturing and inspection of support pad, support arm, and support shim, Revision 0, dated January 16, 2014
- PO No. 0BV2/31 to Tubos Reunidos for seamless carbon steel pipe, Revision 0, dated June 17, 2013
- PO No. 0BV2.040 to Tubos Reunidos S.A. for carbon steel SA-105 4 NPS Class slip-on and blind flanges, Revision 0, dated December 19, 2013

- PO No. 0BV2.040 to Tubos Reunidos S.A. for carbon steel SA-105 4 NPS Class slip-on and blind flanges, Revision 1, dated August 18, 2014

Audit Reports

- Audit Report (AR) No. 39/14 of Special Metals Welding Products Company, Revision 0, dated December 21, 2014
- AR No. 21/11 of Apex Nuclear Equipment, Revision 0, dated June 13, 2011
- AR No. 19/15 of OME, Revision 0, dated May 28, 2015
- AR No. 04/15 of Technetics, Revision 0, dated May 3, 2015
- AR No. 08/13 of Talleres Arriaj, Revision 0, dated May 19, 2013
- AR No. 01/16 of Industeel Groupe Arcelor, Revision 0, dated February 12, 2016
- AR No. 15/11 of Dubose National Energy Services, Revision 0, dated May 2, 2011
- AR No. 09/14 of Valinox Nucleaire, Revision 0, dated April 16, 2014
- AR No. 30/10 of Japan Steel Works, Revision 0, dated April 6, 2011
- AR No. 07/14 of Sandvik Steel, Revision 0, dated March 26, 2014
- AR No. 21/15 of Cortalia Tecnicas Metalurgicas, S.L., Revision 0, dated July 1, 2015
- AR No. 14/13 of Tubos Reunidos Industrial S.L.U., Revision 0, dated November 17, 2013
- AR No. 19/11 of Aubert & Duval, Revision 0, dated June 8, 2011
- AR No. 26/12 of Forge Monchieri, S.p.A., Revision 0, dated November 20, 2012
- AR No. 18/13 of Petrol Raccord S.p.A., Revision 0, dated December 19, 2013
- AR No. 25/13 of Atecsol Soldaduras, S.L., Revision 0, dated January 28, 2014
- AR No. 11/11 of Forgital Dembiermont, Revision 0, dated October 23, 2011
- AR No. 22/11 of Thyssenkrupp VDM, Revision 0, dated October 10, 2011
- AR No. 10/12 of Vicente Berrizbeitia, Revision 0, dated June 6, 2012
- AR No. 02/02 of Vicente Berrizbeitia, Revision 0, dated March 7, 2007
- AR No. 11/08 of Vicente Berrizbeitia, Revision 0, dated May 28, 2008

- AR No. 41/14 of Vicente Berrizbeitia, Revision 0, dated June February 2, 2015
- AR No. 03/12 of Newtesol, Revision 0, dated February 14, 2012
- AR No. 09/10 of Air Liquide Welding, Revision 0, dated March 17, 2010
- AR No. 08/12 of Air Liquide Welding, Revision 0, dated March 13, 2012
- AR No. 28/15 of Air Liquide Welding, Revision 0, dated October 11, 2015
- AR No. 09/12 of Tuberias y Soldaduras, Revision 0, dated April 11, 2012
- AR No. 23/15 of Mindasa, Revision 0, May 11, 2015

Personnel Training and Qualification Records

- Lead Auditor Qualifications for Adrián Oti, Sara Cobo, Sergio Seoanne, José Manuel Martínez, José Manuel Escobedo, and Juan Francisco Lorenzo López
- List of Qualified Welders from March 16, 2016 through April 15, 2016
- NDE Qualification Records for the following personnel:
 - Adolfo Diez Gutierrez - VT Level II
 - Adolfo Martínez Sarraga - PT Level II, VT Level II
 - Pablo Incera Pérez - MT Level III, PT Level III, RT Level III, VT Level III
 - Carlos Fernández Salegui - MT Level II, PT Level II, RT Level II, VT Level II
 - Arturo Villalobos Pereda - MT Level II, PT Level II-L, UT Level II, VT Level II
 - Jonas Martín San Miguel Vado - MT Level II, PT Level II, UT Level II, VT Level II
 - Antonio Cabeza Fernández - MT Level III, PT Level III, UT Level III, VT Level III

Nonconformance Reports

0BV2/048, 0BV2/054, 0BV2/055, 1BV2/019, 1BV2/036, and 2BV2/040

Corrective and Preventive Action Requests

365/10, 84/12, 38/14, 69/14, 175/13, 79/15, 85/15, 103/15, 240/15, 37/16, and 73/16

Opened during the inspection: 86/16, 87/16, and 88/16