UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 22, 2018

Mr. John A. Kerr, Nuclear Quality Leader
Dresser, LLC
12790 Normandy Blvd.
Jacksonville, FL 32221

SUBJECT: DRESSER, LLC'S NUCLEAR REGULATORY COMMISSION INSPECTION REPORT NO. 99902058/2017-201

Dear Mr. Kerr:

On January 22-26, 2018, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Dresser, LLC's facility (hereafter referred to as Dresser) in Jacksonville, FL. The purpose of this limited scope inspection was to assess Dresser's compliance with the 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 technically-focused inspection specifically evaluated Dresser's implementation of the quality activities associated with the design, fabrication, and testing of the main steam safety valves for the Westinghouse Electric Company AP1000 reactor design and for the domestic operating reactors. The enclosed report presents the results of this inspection. This NRC inspection report does not constitute NRC endorsement of your overall quality assurance (QA) or 10 CFR Part 21 programs.

During this inspection, the NRC staff inspected records associated with inspections, tests, analyses, and acceptance criteria (ITAAC) from Revision 19 to the certified AP1000 Design Control Document. Specifically, these activities were associated with ITAACs 2.2.04.02.a, 2.2.04.03.a, 2.2.04.04.a, 2.2.04.05.a.ii, 2.2.04.08.ii, and 2.2.04.08a.ii for the Vogtle Electric Generating Plant Units 3 and 4. The NRC inspection team did not identify any findings associated with the ITAAC contained in Section 4 of the attachment to this report.

Based on the results of this inspection, the NRC inspection team found the implementation of your QA program met the requirements imposed on you by your customers or NRC licensees. No findings of significance were identified.

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.

Sincerely,

/RA/

Terry W. Jackson, Chief
Quality Assurance Vendor Inspection Branch-1
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket No.: 99902058

EPID No.: I-2017-201-0064

Enclosure:
Inspection Report No. 999002058/2017-201
and Attachment

SUBJECT: DRESSER, LLC'S NUCLEAR REGULATORY COMMISSION INSPECTION REPORT NO. 99902058/2017-201

Dated: February 22, 2018

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

Docket No.:	99902058
Report No.:	99902058/2017-201
Vendor:	Dresser, LLC. 12790 Normandy Blvd. Jacksonville, FL 32221
Vendor Contact:	Mr. John A. Kerr Nuclear Quality Leader Email: john.a.kerr@bhge.com Phone: 1-904-570-3209
Nuclear Industry Activity:	Dresser, LLC (hereafter referred to as Dresser) is an American Society of Mechanical Engineers (ASME) Boiler & Pressure Vessel (B&PV) Code Certificate Holder holding an N, NV, and NPT stamp. Dresser's scope of supply includes the design, fabrication, and testing of ASME B&PV Code Section III, Class 1, 2, and 3 valves, parts, and appurtenances.
Inspection Dates:	January 22-26, 2018

Inspectors:		
Yamir Diaz-Castillo	NRO/DCIP/QVIB-1	Team Leader
Nicholas Savwoir	NRO/DCIP/QVIB-1	
Raju Patel	NRO/DCIP/QVIB-2	
Thomas Scarbrough	NRO/DEI/MEB	

Approved by: Terry W. Jackson, Chief
Quality Assurance Vendor Inspection Branch-1
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Enclosure

EXECUTIVE SUMMARY

Dresser, LLC
99902058/2017-201

The U.S. Nuclear Regulatory Commission (NRC) staff conducted a vendor inspection at the Dresser, LLC's (hereafter referred to as Dresser) facility in Jacksonville, FL, 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 also verified that Dresser implemented a program under 10 CFR Part 21, "Reporting of Defects and Noncompliance." Furthermore, the NRC inspection verified that Dresser had implemented a program in accordance with the applicable requirements 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 and ASME QME-1-2007, "Qualification of Active Mechanical Equipment used in Nuclear Power Plants."

Dresser is a subsidiary of Baker Hughes, a General Electric Company. Dresser's Jacksonville facility took responsibility for all the design and intellectual property that was transferred from the Dresser facilities located in Avon, MA (Masoneilan control valves), and in Pineville, LA (Consolidated safety valves). The NRC performed an inspection of Dresser's Pineville facility in May 2016, however, this was the first NRC inspection of Dresser at the Jacksonville facility.

This technically-focused inspection specifically evaluated Dresser's implementation of quality activities associated with the design, fabrication, and testing of the main steam safety valves for the Westinghouse Electric Company AP1000 reactor design being provided to the Vogtle Electric Generating Plant Units 3 and 4. Specific activities observed by the NRC inspection team included:

- Dimensional inspection, hardness testing, and positive material identification of a valve body for Byron Station as part of commercial-grade dedication (CGD)

- Dimensional inspection and wall thickness testing of a valve diaphragm for Watts Bar Nuclear Plant as part of CGD

- Liquid penetrant inspection of a valve body for Duke Energy

- Daily verification of a hardness tester and daily calibration of the Positive Material Identification X-Ray gun

- Receipt inspection of a round bar

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.

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) 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," dated January 27, 2017, and IP 43004, "Inspection of Commercial-Grade Dedication Programs," dated January 27, 2017.

Corrective Action

The NRC inspection team reviewed the corrective actions that Dresser took to address Nonconformance No. 99901468/2016-201-01, documented in inspection report No. 99901468/2016-201, dated June 15, 2016. The NRC inspection team reviewed the documentation that provided the objective evidence that all of the corrective actions were completed and adequately implemented. Based on this review, the NRC inspection team closed Nonconformance No. 99901468/2016-201-01.

Other Inspection Areas

The NRC inspection team determined that Dresser is implementing its programs for training and qualification; 10 CFR Part 21; design control; commercial-grade dedication; procurement document control; control of equipment, materials, and services; identification and control of materials, parts, and components; control of special processes; test control; control of M&TE; nonconforming material, parts, or components; corrective action; and internal audits in accordance with the applicable regulatory requirements of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed and activities observed, the NRC inspection team also determined that Dresser is implementing its policies and procedures associated with these programs. No findings of significance were identified.

REPORT DETAILS

1. 10 CFR Part 21 Program

   a. Inspection Scope

   The NRC inspection team reviewed Dresser, LLC's (hereafter referred to as Dresser) policies and implementing procedures that govern the implementation of Dresser's 10 CFR Part 21, "Reporting of Defects and Noncompliance," 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 Dresser's purchase orders (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 Dresser's nonconformance and corrective action procedures provide a link to the 10 CFR Part 21 program.

   Furthermore, for a sample of 10 CFR Part 21 evaluations performed by Dresser, the NRC inspection team verified that Dresser 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, as applicable.

   The NRC inspection team also discussed the 10 CFR Part 21 program with Dresser'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 Dresser established 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 Dresser is implementing its policies and procedures associated with the 10 CFR Part 21 program. No findings of significance were identified.

2. Design Control

   a. Inspection Scope

   The NRC inspection team reviewed Dresser's policies and implementing procedures that govern the implementation of the design-control program 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 applicable requirements of Subsection NCA, "General Requirements for Division 1 and Division 2," Subsection NC, "Class 2 Components," 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.

The NRC inspection team focused on the design control activities for the main steam safety valves (MSSVs) being designed, fabricated, and qualified for the Vogtle Electric Generating Plant (VEGP) Units 3 and 4 AP1000 nuclear power plants. The NRC inspection team verified the design and qualification requirements for the AP1000 MSSVs in the Dresser documentation were consistent with the provisions in the AP1000 Design Control Document, Tier 2, Section 10.3.2.2.2, "Main Steam Safety Valves," Revision 19, and the Westinghouse Electric Company (WEC) Design Specification No. APP-PV65-Z0-001, "Main Steam Safety Valve, ASME B&PV Code, Section III, Class 2," Revision 8, dated January 31, 2013, and the WEC Valve Data Sheet Report No. APP-PV65-Z0R-001, "Main Steam Safety Valves (MSSV), ASME Section III, Class 2 Valve Data Sheet Report," Revision 5, dated March 7, 2012.

The NRC inspection team conducted a visual examination of the safety valve assembly manufactured by Dresser that underwent testing to qualify the AP1000 MSSV design. The NRC inspection team verified that the valve assembly was tested for qualification of the design in accordance with the requirements of ASME Standard QME-1-2007, "Qualification of Active Mechanical Equipment used in Nuclear Power Plants." The NRC inspection team also observed expected wear from the extensive flow testing performed on the valve assembly without any significant performance concerns.

As part of the evaluation of the ASME design for the AP1000 MSSVs, the NRC inspection team reviewed WEC's Quality Release & Certificate of Conformance PO No. 4500724257, "Quality Release & Certificate of Conformance for PV65-MSSV's," dated December 20, 2017. This package included the ASME B&PV Code Data NV Report, Certified Material Test Report (CMTR), Heat Treatment Records, Hydrostatic Test Reports, Final Nondestructive Examination (NDE), Certificate of Conformance (CoC), and data plate images for the applicable MSSV. The NRC inspection team verified that Dresser maintained a record of the current qualifications for its Registered Professional Engineer who certified the AP1000 MSSV design report. The NRC inspection team did not identify any issues with the AP1000 MSSV design report.

To address a gap identified in the QME-1 qualification reports regarding the application of the static load to the least rigid axis of the valve assembly consistent with WEC Design Specification No. APP-PV65-Z0-001 for the AP1000 MSSVs, Dresser provided design descriptions and photographs of the QME-1 test set-up at the valve test facility to demonstrate that the static load was applied to the least rigid axis of the valve assembly. The NRC inspection team evaluated the information provided by Dresser, including Dresser's Test Procedure No. NUP 0268, "Static Seismic Side Load Test Procedure for Nuclear Control Valves," Revision 3, dated January 17, 2003, which showed that the static side load is required to be applied to the least rigid axis of the valve assemblies for seismic qualification.

The NRC inspection team identified several computer software tools that are used for calculations as part of Dresser's Design Report No. DR11-003, "Main Steam Safety Valve for Westinghouse Electric Company LLC, V.C. Summer, Vogtle," Revision 3, dated September 14, 2017, for the AP1000 MSSVs. The NRC inspection team reviewed Dresser's Controlled Administrative Procedure CAP-010, "Masoneilan Software Quality Assurance," July 2, 1999, for the verification of computer software tools. In response to the NRC inspection team's questions, Dresser provided information demonstrating the applicable verification of the computer software tools used for calculations in Design Report DR11-003 for the AP1000 MSSVs. For example, the NRC inspection team

reviewed Dresser's PO No. 1010131769, "ANSYS Technical Services," GE Hitachi Nuclear Energy, Revision 2, dated April 29, 2016, to confirm the application of quality requirements for the verification of this computer software tool.

The NRC inspection team also reviewed design changes during and following QME-1 testing for the AP1000 MSSVs. During QME-1 testing, small dimensional adjustments were implemented for the valve internals to improve the valve performance. For example, the NRC inspection team reviewed Dresser's Design Change Documentation No. 147541291, "Spindle 3707SA-RT Design Change Request," dated March 4, 2016, providing justification for changes to specific dimensions of the spindle during QME-1 testing. Regarding design changes after QME-1 testing, the NRC inspection team reviewed Dresser's Design Change Documentation No. 50000244236, "Dresser Nuclear Product Design Revision (QAF-3-5-0 Revision A)," dated February 20, 2017, as a sample of the revision of spindle dimensions that were verified by engineering justification for the drawing changes.

With respect to the design control activities evaluated during this inspection for the AP1000 MSSVs, the NRC inspection team verified that (1) Dresser's design control process adequately translated technical and quality requirements into procedures and instructions, (2) applied materials conformed to the material specifications, (3) design activities were effectively controlled by documented instructions and procedures, and (4) design changes were accomplished in accordance with the approved procedures.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

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

3. Commercial-Grade Dedication

a. Inspection Scope

The NRC inspection team reviewed Dresser's policies and implementing procedures that govern the implementation of the commercial-grade dedication (CGD) program to verify their compliance with the regulatory requirements of Criterion III and Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50.

This assessment included a review of the policies and procedures governing the implementation of CGD activities, interviews with Dresser's personnel, observation of dedication activities, and review of related documentation. Specifically, the NRC inspection team reviewed dedication packages for the AP1000 MSSVs to assess the different elements of the CGD program, including the technical evaluation process,

design drawings, work package instructions, and inspection reports. The NRC inspection team evaluated the criteria for the identification of item functions, credible failure mechanisms/modes, selection of critical characteristics and acceptance criteria, and the identification of verification methods to verify the effective implementation of Dresser's dedication process. In addition, the NRC inspection team reviewed and evaluated a sample of commercial-grade surveys of commercial suppliers to ensure that Dresser effectively verified the supplier had adequately controlled the critical characteristics during the fabrication process or service activities. In addition, the NRC inspection team witnessed the CGD of five nuclear valve bodies for Exelon's Bryon Station, and one yoke diaphragm casting for Tennessee Valley Authority's Watts Bar Nuclear Plant by the quality control (QC) inspector in accordance with the applicable Dresser procedure.

The NRC inspection team discussed the CGD program with Dresser'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 Dresser established its CGD program in accordance with the regulatory requirements of Criterion III and criterion VII of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that Dresser is implementing its policies and procedures associated with the CGD program. No findings of significance were identified.

4. Supplier Oversight and Internal Audits

a. Inspection Scope

The NRC inspection team reviewed Dresser's policies and implementing procedures that govern the implementation of the supplier oversight and internal audits programs to verify compliance with the requirements of Criterion IV, "Procurement Document Control," Criterion VII, and Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed Dresser's Approved Suppliers List (ASL), a sample of POs, external and internal audits, and receipt inspection records to verify compliance with the applicable regulatory and technical requirements.

For the sample of POs reviewed, the NRC inspection team verified that the POs included, as appropriate, the applicable technical and quality requirements. In addition, the NRC inspection team verified that for the sample of receipt inspection records reviewed (e.g., receipt inspection reports, Certificates of Conformance, Certificate of Calibration, and CMTRs), these records were (1) reviewed by Dresser for compliance with the requirements of the POs, and (2) the records contained the applicable technical and regulatory information.

Dresser is a member of the Nuclear Industry Assessment Committee (NIAC), which consists of companies who supply goods and services to the nuclear industry based on a quality program that meets the requirements of Appendix B to 10 CFR Part 50 or ASME NQA-1, "Quality Assurance Requirements for Nuclear Facility Applications," and accept 10 CFR Part 21. NIAC develops and maintains procedures and processes necessary to plan, guide, and share supplier evaluations (audits) with its members. Dresser uses NIAC audits to support the qualification and maintenance of suppliers. Once a NIAC audit is received, Dresser's Nuclear Quality Leader reviews the audit for completeness and adequacy, evaluates the audit report in accordance with Dresser's QA program and the appropriateness of the scope, and approves the audit report as the basis for including the vendor on the ASL.

For the sample of external and internal audits reviewed, the NRC inspection team verified the audit reports included an audit plan, any findings identified, adequate documented objective evidence of compliance with the applicable requirements, and a review by Dresser's responsible management. In addition, the NRC inspection team also verified that the external and internal audits were performed by qualified auditors and, in the case of the internal audits, that these audits were performed by personnel not having direct responsibilities in the areas being audited. Furthermore, the NRC inspection team reviewed a sample of training and qualification records of Dresser's auditors and confirmed that auditing personnel had completed all the required training and had maintained the applicable qualification and certification in accordance with Dresser's policies and procedures.

The NRC inspection team also witnessed the receipt inspection of a round bar received from a supplier on Dresser's ASL. The NRC inspection team noted that the QC inspector used the receipt inspection procedure, and performed the inspection by verifying the material traceability on the bar with the supplier's CMTR and Dresser's PO to confirm the material received met the PO requirements. In addition, the QC inspector performed a visual inspection for any damage, seams, laps or surface defects; and then verified the dimensions and documented his results in a dimensional inspection report with his acceptance stamp and date of inspection.

The NRC inspection team also discussed the supplier oversight and internal audits programs with Dresser'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 Dresser established its supplier oversight and internal audits programs in accordance with the regulatory requirements of Criterion IV, Criterion VII, and Criterion XVIII of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that Dresser is implementing its policies and procedures associated with the supplier oversight and internal audits programs. No findings of significance were identified.

5. Material Traceability

a. Inspection Scope

The NRC inspection team reviewed Dresser's policies and implementing procedures that govern the material traceability program to verify compliance with the regulatory requirements of Criterion VIII, "Identification and Control of Material, Parts, and Components," of Appendix B to 10 CFR Part 50.

The NRC inspection team performed a walk-down of Dresser's fabrication areas verified raw materials, parts, and instruments used for nuclear work were either marked with a part number, or a Dresser unique serial number, and with a production order number that identified the status of the fabrication process. The NRC inspection team verified that the material was traceable to a Dresser PO and/or a vendor CMTR.

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

b. Observation and Findings

No findings of significance were identified.

c. Conclusion

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

6. Manufacturing Control

a. Inspection Scope

The NRC inspection team reviewed Dresser's policies and implementing procedures that govern the implementation of the control of special processes to verify compliance with the regulatory requirements of Criterion IX, "Control of Special Processes," of Appendix B to 10 CFR Part 50 and with the requirements of Subsection NCA, and Subsection NC, of Section III, Section V, "Nondestructive Examination," and Section IX, "Welding and Brazing Qualification," of the ASME B&PV Code, 1998 Edition, 2000 Addenda, and American Society for Nondestructive Testing (ASNT) SNT-TC-1A, "Personnel Qualification and Certification in Nondestructive Testing."

Although there were no welding activities during the week of the inspection, the NRC inspection team reviewed a sample of welding and nondestructive examination (NDE) records associated with the fabrication and inspection of the AP1000 MSSVs. The NRC inspection team verified that the welding procedure specifications (WPS) and associated procedure qualification records (PQR) were adequately qualified in accordance with the requirements of Section IX of the ASME B&PV Code. In addition, the NRC inspection

team verified that the applicable welding data; such as weld material identification number, WPS, supporting PQRs, inspection procedures, and the final inspection results were recorded on the weld travelers.

The NRC inspection team performed a walk-down of the weld storage area to verify that weld filler metal were being adequately controlled to prevent degradation, inadvertent use, or loss of traceability in accordance with the applicable Dresser procedures. The NRC inspection team reviewed a sample of weld issuance tickets and confirmed that the tickets adequately link the weld filler metal to applicable traveler and the welder. The NRC inspection team verified whether weld filler metal was kept in containers (and the environmental condition of the storage facility was controlled). In addition, the NRC inspection team confirmed that the weld machines were calibrated within the range of use, using known traceable standards, and their calibration frequency maintained.

The NRC inspection team witnessed a liquid penetrant (LP) examination of a valve body for Duke Energy. The NRC inspection team verified that the LP procedure used by Dresser met the applicable requirements of Section V of the ASME B&PV Code. No relevant indications were identified by the Level II NDE inspector. The NRC inspection team verified that the Level II NDE inspector performed the examination in accordance with Dresser's procedures and the appropriate acceptance criteria using calibrated instruments. In addition, the NRC inspection team reviewed a sample of LP and Magnetic Particle examination reports for several components used in the fabrication of the AP1000 MSSVs and confirmed that all examinations were (1) performed in accordance with Dresser's qualified procedures, and (2) performed by qualified personnel in accordance with the requirements of Sections III and V of ASME B&PV Code, and ASNT SNT-TC-1A.

The NRC inspection team also reviewed a sample of welder training and qualification records to confirm that welders had completed the required training and had maintained their qualifications in accordance with the applicable Dresser procedures. In addition, the NRC inspection team also verified that the Dresser procedure for welder qualification meets the applicable requirements of Sections III and IX of the ASME B&PV Code. Furthermore, for a sample of training and qualification records for NDE personnel, the NRC inspection team confirmed that they were qualified in accordance with the requirements of ASNT SNT-TC-1A.

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

b. Observation and Findings

No findings of significance were identified.

c. Conclusion

The NRC inspection team concluded that Dresser established its manufacturing control program in accordance with the regulatory requirements of Criterion IX of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that Dresser is implementing its policies and

procedures associated with the manufacturing program. No findings of significance were identified.

7. Test Control

a. Inspection Scope

The NRC inspection team reviewed Dresser's policies and implementing procedures that govern the implementation of the test control program to verify compliance with the requirements of Criterion XI, "Test Control," of Appendix B to 10 CFR Part 50, and with the requirements of ASME QME-1-2007.

The NRC inspection team focused on the test control process for the AP1000 MSSVs being designed, fabricated, and qualified by Dresser. The NRC inspection team verified that Dresser's testing instructions and procedures for the AP1000 MSSVs were consistent with the provisions in WEC Design Specification No. APP-PV65-Z0-001, WEC Valve Data Sheet Report No. APP-PV65-Z0R-001, and ASME QME-1-2007. No testing activities for the AP1000 MSSVs were underway at Dresser during this inspection. The NRC inspection team also reviewed a video of the QME-1 qualification flow testing for the AP1000 MSSVs conducted at the valve test facility.

The NRC inspection team reviewed Dresser QME-1 Qualification Report No. QR16-01 and Application Report No. QR16-02, "AP1000 PV65 3707S Main Steam Safety Valve for Westinghouse Electric Company, LLC, V.C. Summer & Vogtle," Revision 2, dated September 14, 2017, as part of its evaluation of test control activities for the AP1000 MSSVs. Dresser's QME-1 qualification report demonstrated the functional qualification of the AP1000 MSSV in accordance with the ASME QME-1-2007 provisions specified in the WEC Design Specification. In the QME-1 Application Report, Dresser described the acceptance of the production valves based on a one-for-one comparison of the tested QME-1 qualified valve assembly. The QME-1 Application Report specifies the functional requirements for the AP1000 MSSVs including set pressure, tolerance, blowdown, accumulation, and seat leakage.

The NRC inspection team reviewed Test Report No. TR-SV7-GL2010S, "Safety-Related Class Outside Containment High Energy Line Break (HELB) Qualification Report for model SV7," Revision 4, dated February 16, 2016, for the seismic and environmental qualification of the AP1000 MSSV position indication switch. The NRC inspection team verified this report adequately qualified the AP1000 position indication switch consistent with the specified Institute of Electrical and Electronics Engineer standards.

The NRC inspection team also reviewed Dresser's Cleaning Instruction No. CL012-OS712, "Nuclear Cleaning Procedure for AP1000 MSSV PV65," Revision A, dated July 19, 2016; Dresser's Consolidated Lubricating Instruction No. LU004_OS712, "Standard Lubricant for Westinghouse AP1000 Project," Revision 1, dated October 31, 2011; and Dresser's Protective Coating Instruction No. PC092_OS712, "Protective Coatings for AP1000 MSSV PV65," dated September 21, 2016, to evaluate the adequacy of Dresser's instructions for cleaning, lubrication, and protective coating for AP1000 MSSVs. The NRC inspection team also reviewed Dresser's Engineering Guidelines No. 490_OS712, "Final Inspection of Nuclear Products for WEC AP1000 Project," Revision 3, dated January 21, 2014, to evaluate the Dresser's process for final inspection of the AP1000 MSSVs.

The NRC inspection team reviewed the Dresser's Hydrostatic Testing Instruction No. 017_OS712, "Hydrostatic Shell Testing of Nuclear Pressure Relied Valve Parts for WEC AP1000 Project," Revision 4, dated January 21, 2014, to evaluate the hydrostatic testing for the AP1000 MSSVs. At the valve testing station, Dresser's test personnel described the hydrostatic testing conducted on the AP1000 MSSVs. During this evaluation, the NRC inspection team verified the current calibration of a selected digital pressure gage used for hydrostatic testing of the Dresser valves. In addition, the NRC inspection team reviewed the hydrostatic test records prepared by Dresser for the AP1000 MSSVs. The hydrostatic test records for the AP1000 MSSVs included valve identification, test media, pressure range, calibrated pressure gage information, acceptance criteria, and signatures of tester and authorized nuclear inspector. The NRC inspection team also verified the training and qualification records for a selected Dresser hydrostatic tester.

The NRC inspection team reviewed Dresser's Nuclear Order Control Instruction No. OS712, Revision C, dated June 28, 2016, for implementing the quality plans for procurement and manufacture of nuclear valves at Dresser. The NRC inspection team reviewed Dresser's Production Order Operation List, Production Order No. 20877005, Part No. 90030803, and "Production Valve JX-16-CN0025," dated May 22, 2017, to verify Dresser's process for tracking test control activities. In addition, the NRC inspection team reviewed Dresser's Production Order Package No. 20975134, "Rework on 3707AS-RT25-AP-XTF1-NC2051 P/N 90030803," dated August 11, 2017, for rework of a specific MSSV following failure of functional testing at a valve test facility. Dresser performed the rework and returned the valve to the test facility for retesting. The NRC inspection team reviewed Dresser's Inspection Plan No. 3707S, "Inspection Plan NR-3707A for 3700 Series Safety Valves," dated August 10, 2017, for instructions for responding to failed functional testing. The NRC inspection team discussed the evaluation and resolution of the failure of proper lift for this valve with Dresser personnel. Dresser provided information demonstrating that this valve successfully completed follow-up testing, including lift, at the valve test facility.

With respect to the test control activities evaluated during this inspection for the AP1000 MSSVs, the NRC inspection team verified that (1) testing was performed in accordance with the applicable QME-1 provisions; (2) test procedures provided adequate descriptions of the pre-testing, testing, and post-testing activities; (3) test procedures included test objectives, test requirements, applicable prerequisites, and acceptance criteria; (4) instrumentation and components were correctly identified in drawings and test procedures; and (5) controls for data collection and documenting the accuracy of test instruments.

The NRC inspection team discussed the test control program with Dresser'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 Dresser established its test control program in accordance with the regulatory requirements of Criterion XI of Appendix B to

10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that Dresser is implementing its policies and procedures associated with the test control program. No findings of significance were identified.

8. Control of Measuring and Test Equipment

a. Inspection Scope

The NRC inspection team reviewed Dresser's policies and implementing procedures that govern the implementation of the Measuring and Test Equipment (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.

For a sample of M&TE used in some of the activities observed, 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, the M&TE is removed from use and segregated to prevent further usage until the out of tolerance condition is reviewed and dispositioned. Dresser initiates a nonconformance report to perform an evaluation to identify which items 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 observed the calibration of the Positive Material Identification X-Ray gun used to determine the chemical composition of a metal or alloy. The NRC inspection team verified that the calibration technician was performing the calibration in accordance with the applicable procedures.

The NRC inspection team also discussed the M&TE program with Dresser'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 Dresser established 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 Dresser is implementing its policies and

procedures associated with the M&TE program. No findings of significance were identified.

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

a. Inspection Scope

The NRC inspection team reviewed Dresser's policies and implementing procedures that govern the implementation of the control of nonconformances and corrective actions 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 a sample of nonconformance reports (NCRs) to verify that Dresser: (1) dispositioned the NCRs in accordance with the applicable procedures, (2) documented an appropriate technical justification for various dispositions, and (3) took adequate corrective action with regard to the nonconforming items. For NCRs that were dispositioned as use as-is, the NRC inspection team confirmed that the technical justifications were documented to verify the acceptability of the nonconforming item. The NRC inspection team also verified that Dresser's NCR process provides a link to the 10 CFR Part 21 program.

The NRC inspection team attended a material review board (MRB) meeting. The MRB consisted of a nuclear engineer, nuclear schedulers for the Consolidated and Masoneilan valve product lines, and a manufacturing engineer. Dresser places production orders in orange folders to designate nuclear work along with providing a preliminary NCR print out to physically travel with the nonconforming material. Dresser primarily uses the enterprise application software SAP to route, track and control its nonconforming material.

The NRC inspection team also reviewed a sample of corrective action reports (CARs) to ensure that conditions adverse to quality were promptly identified and corrected. Dresser primarily uses an Action Tracking System to route, track and control its CARs. The NRC inspection team verified that the CARs provided: (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. In addition, the NRC inspection team verified that Dresser's corrective action process provides a link to the 10 CFR Part 21 program. The NRC inspection team also reviewed how Dresser handles customer issues and concerns, which are tracked using a field issues reporting tool (FIRT). The FIRT is a source of input for the corrective action program.

The NRC inspection team also discussed the nonconforming materials, parts, or components and corrective action programs with Dresser'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 Corrective Action Associated with Nonconformance No. 99901468/2016-201-01

Following the June 2016 inspection of Dresser, the NRC issued Nonconformance 99901468/2016-201-01 for Dresser's failure to adequately review parts essential to the safety-related functions of components for suitability of application. Specifically, Dresser failed to adequately verify the material property critical characteristic of tensile strength during the commercial-grade dedication of valve spindles. In addition, Dresser failed to provide a technical evaluation to justify the hardness margin tolerance, used to accept a hardness value, which is a critical characteristic used during commercial-grade dedication for a valve spindle.

In a follow-up response dated August 15, 2016, Dresser stated the cause of the nonconformance was that Procedure No. EG-504, "Hardness Calculation for Safety Related Materials," Revision 4, dated June 30, 2014, described the method for calculating acceptable hardness values using a correlated formula for steel, but did not account for the method or source of acceptance for non-steel material valves in the procedure. Dresser identified that prior procedure revisions only included steel materials. The addition of four non-steel materials values to the procedure were not obtained by the method for calculating acceptable hardness values using the correlated formula for steel. The four non-steel materials tensile and hardness limits were obtained from the American Society of Testing and Materials (ASTM) Code Reference 8.2, ASTM Code Reference 8.3 and Reference 8.1 of Part D of Section II of the ASME B&PV Code. Dresser's corrective actions included performing a 10 CFR Part 21 Evaluation (No. 16-01) which determined no safety concern existed for any of the components impacted. Dresser took corrective actions to reanalyze all items commercially dedicated per Procedure No. EG504 and revised the EG504 procedure to describe the method and source used for obtaining acceptable tensile strength and hardness values for dedication of various materials including stainless steel, and non-steels.

In a follow-up response dated November 3, 2016, Dresser clarified the conversion formula to correlate hardness and tensile strength used in Procedure No. EG-504 to convert published tensile strength to an equivalent hardness. Dresser stated the formula is not used to convert the measured hardness to tensile strength and shall not be used to convert tensile strength to hardness for non-steel materials. Dresser revised Procedure No. EG504 to restrict the use of the conversion formula to steel materials only. Dresser stated the mechanical properties, chemical composition, and dimensional characteristics of the valve/valve parts are purchased and processed through the ASME audited commercial supplier quality assurance program, PMI Testing, and Dresser Quality Assurance program. In its response, Dresser referenced publications to demonstrate empirical correlation formulas that convert hardness value to tensile strength, and vice versa, are available only for steels and cast irons. In Section 2 of the response, Dresser stated that it had validated the material properties met the ASTM/ASME material specifications and no safety issues were identified during the failure modes and effects analysis performed.

In a follow-up response dated March 24, 2017, Dresser stated the corrective actions had been taken to revise Procedure No. EG504. In addition, Dresser provided the application, safety function, failure modes, critical characteristics and references of the

spindle. Dresser also provided technical justification to support the measurements of hardness provides assurance of the performance of the spindle.

The NRC inspection team reviewed the documentation that provided objective evidence for the completion of the corrective actions and reviewed the 10 CFR Part 21 Evaluation No. 16-01. The NRC inspection team also confirmed that Procedure No. EG 504 was updated to Revision 5. The verification of material property as a critical characteristics was revised to designate Method 1 for steel and Method 2 for non-steel. Based on this review, the NRC inspection team closed Nonconformance 99901468/2016-201-01.

c. Conclusion

The NRC inspection team concluded that Dresser established 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 Dresser is implementing its policies and procedures associated with the control of nonconforming materials, parts, or components and corrective action. No findings of significance were identified.

10. Entrance and Exit Meetings

On January 22, 2018, the NRC inspection team discussed the scope of the inspection with Mr. James Flemming, North American Supply Chain Leader, and other members of Dresser's management and technical staff. On January 26, 2018, the NRC inspection team presented the inspection results and observations during an exit meeting with Mr. Steven Effa, Shop Operations Manager, and other members of Dresser'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
James Flemming	North America Supply Chain Leader	Dresser	X		
John Kerr	Nuclear Quality Leader	Dresser	X	X	X
Sean Curran	Nuclear Program Manager	Dresser	X	X	
David Smith	Manufacturing Engineering Manager	Dresser	X	X	
Nayem Jahinger	Nuclear Engineering Manager	Dresser	X	X	X
Sean Donahue	Materials Manager	Dresser	X		
Steve Farmer	Engineering Leader	Dresser	X		
Brad Sloan	Plant Manager	Dresser	X		
Shannon Olson	Operations Manager	Dresser	X	X	
Matt Hurlbert	Calibration Program Manager	Dresser		X	X
Pat Baranack	Operations Manager	Dresser	X	X	
Rod Rumer	Operations Manager	Dresser	X		
James Meeker	Regional Sales Manager	Dresser		X	
Steven Effa	Shop Operations Manager	Dresser		X	
Christopher Valdivia	Site Training Leader	Dresser	X	X	
Michael McConnell	Master Scheduling Leader	Dresser	X		
Trevor Ilse	Sourcing Leader	Dresser		X	

Name	Title	Affiliation	Entrance	Exit	Interviewed
Brian Neely	Quality Control Leader	Dresser	X		
Brian Chishcko	Quality Management System Leader	Dresser			X
Rhonda Neely	Quality Management Specialist	Dresser	X	X	
Rajesh Krithivasan	Senior Nuclear Design Engineer	Dresser	X	X	X
Richard Klimas	Senior Nuclear Design Engineer	Dresser			X
Matt Cepkauskas	Nuclear Design Engineer	Dresser	X		
David Harvey	Nuclear Design Engineer	Dresser	X	X	X
Justin Bates	Nuclear Engineer	Dresser		X	
Tuan Doan	Nuclear Engineer	Dresser	X	X	
Ju Young Kim	Nuclear Engineer	Dresser	X		
George Walker	Quality Engineer	Dresser			X
Jonah Parson	Quality Technician	Dresser			X
James Atkenson	Quality Technician	Dresser			X
Kyle Holbart	Sr. Welding Engineer	Dresser			X
Carl Anderson	Welding Process Engineer	Dresser			X
Peter Furman	Welding Engineer	Dresser	X	X	
Michael Califona	Welder	Dresser			X
Juanita Lee	Welder	Dresser			X
Whitney Ukpai	Manufacturing Engineer	Dresser		X	
John Rogers	Manufacturing Leader	Dresser			X

Name	Title	Affiliation	Entrance	Exit	Interviewed
Bradley Parke	Application Engineer	Dresser		X	
Chad York	Nuclear Hydrostatic Tester	Dresser			X
Michael Barrie	Non-destructive Examination Technician	Dresser			X
Kailey Euceda	Project Manager	Dresser			X
Janet Kerr	Nuclear Scheduler	Dresser			X
Donald Farley	Nuclear Scheduler	Dresser			X
Alberta Bordeaux	Nuclear Scheduler	Dresser			X
Annelliese Ayala	Nuclear Intern	Dresser			X
Iris Reyes	Claims/Warranty	Dresser			X
Jennett Saucetto	Claims/Warranty	Dresser			X
Tiffany Patrick	Human Resources	Dresser		X	
Yamir Diaz-Castillo	Inspection Team Leader	NRC	X	X	
Nicholas Savwoir	Inspector	NRC	X	X	
Raju Patel	Inspector	NRC	X	X	
Thomas Scarbrough	Inspector	NRC	X	X	
Terry Jackson	Branch Chief	NRC		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,” dated January 27, 2017

IP 43004, “Inspection of Commercial-Grade Dedication Programs,” dated January 27, 2017

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Status	Type	Description
99901468/2016-201-01	CLOSED	NON	Criterion III

4. INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA (ITAAC)

The NRC inspection team identified the following inspections, tests, analyses, and acceptance criteria (ITAAC) related to components being fabricated and tested by Dresser, LLC (hereafter referred to as Dresser). At the time of the inspection, Dresser had already shipped all 24 main steam safety valves (MSSVs) for Vogtle Electric Generating Plant Units 3 and 4. The MSSVs are used to prevent the steam pressure from exceeding 110 percent of the main steam system design pressure during specific plant transients. For the ITAAC listed below, the NRC inspection team reviewed Dresser's quality assurance controls in the areas of Criterion III, "Design Control," Criterion VII, "Controlled of Purchased Material, Equipment, and Services," and Criterion XI, "Test Control" of Appendix B to 10 CFR Part 50. The ITAAC's design commitment referenced below are for future use by the NRC staff during the ITAAC closure process; the listing of these ITAAC design commitments does not constitute that they have been met and/or closed.

The NRC inspection team reviewed Dresser's activities to determine whether information will be available to support close out of the applicable ITAAC for the AP1000 MSSVs. The NRC inspection team found that the completed design and qualification of the MSSVs will provide information that will help support close out of ITAAC 2.2.04.02.a (as-built American Society of Mechanical Engineers (ASME) Boiler and Pressure (B&PV) Code design reports), ITAAC 2.2.04.04.a (ASME B&PV Code pressure boundary report), ITAAC 2.2.04.05.a.ii (Seismic Category I report), ITAAC 2.2.04.08.ii (total MSSV capacity per steam generator), and ITAAC 2.2.04.08a.ii (set pressure less than 1305 psig). Information that could be applied to help close out ITAAC 2.2.04.03.a (pressure boundary welds) was not available for review.

The NRC inspection team did not identify any findings associated with the ITAAC identified below.

No.	ITAAC No.	Design Commitment	Acceptance Criteria
220	2.2.04.02.a	2.a) The components identified in Table 2.2.4-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.	The ASME Code Section III design reports exist for the as-built components identified in Table 2.2.4-1 as ASME Code Section III.

No.	ITAAC No.	Design Commitment	Acceptance Criteria
222	2.2.04.03.a	3.a) Pressure boundary welds in components identified and constructed in accordance with ASME Code Section III requirements.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.
224	2.2.04.04.a	4.a) The components identified in Table 2.2.4-1 as ASME Code Section III retains their pressure boundary integrity at their design pressure.	A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function.
227	2.2.04.05.a.ii	5.a) The seismic Category I equipment identified in Table 2.2.4-1 can withstand seismic design basis loads without loss of safety function.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function.
235	2.2.04.08.ii	8.a) The SGS provides a heat sink for the RCS and provides overpressure protection in accordance with Section III of the ASME Boiler and Pressure.	i) The sum of the rated capacities recorded on the valve vendor code plates of the steam generator safety valves exceeds 8,240,000 lb/hr per steam generator.
236	2.2.04.08a.ii	8.a) The SGS provides a heat sink for the RCS and provides overpressure protection in accordance with Section III of the ASME Boiler and Pressure Vessel Code.	ii) A report exists to indicate the set pressure of the valves is less than 1305 psig.

5. DOCUMENTS REVIEWED

Policies and Procedures

- Quality Assurance Manual for Nuclear Valves, Valve Parts, and Instrument, Revision 1, dated August 11, 2017
- Nuclear Quality System Procedure (NQSP) No. 1.2, “Reporting Requirements Concerning Defects and Noncompliance 10 CFR Part 21,” Revision 1, dated March 23, 2017

- NQSP No. 4.0, “Control of Purchased Items and Services,” Revision 1, dated March 27, 2017
- NQSP 5.0, “Nuclear Work Order Documentation,” Revision 1, dated March 28, 2017
- NQSP No. 7.2, “Processing of Unqualified Source Material,” Revision 1, dated March 28, 2017
- NQSP 8.0, “Material Identification Procedure – Traceable Material,” Revision 1, dated March 28, 2017
- NQSP 8.2, “Shelf Life Control,” Revision 1.0, dated March 28, 2017
- NQSP 9.0, “Weld Material Storage Procedure,” Revision 1, dated March 28, 2017
- NQSP 9.1, “Weld Material Distribution Procedure,” Revision 1.0, dated March 28, 2017
- NQSP 9.2, “Welding Identification and Stamp Control,” Revision 9.2, dated March 28, 2017
- NQSP 9.3, “Welding Procedure and Procedure Qualifications,” Revision 1, dated March 28, 2017
- NQSP 12.0, “Procurement Controls of Commercial Grade Calibration Services,” Revision B, dated August 8, 2016
- NQSP 14.0, “Certified Material Test Report and Material Reconciliation,” Revision 1, dated March 29, 2017
- NQSP 15.0, “Nonconformance Identification and Disposition Procedure,” Revision 1, dated March 13, 2017
- NQSP No. 18, “Training, Examination, and Certification of Auditors,” Revision 1, dated March 30, 2017
- NQSP No. 18.1, “Qualification and Certification of Inspection Personnel,” Revision 1.1, dated July 17, 2017
- NQSP 20.0, “Sampling Inspection Procedure,” Revision 1.1, dated September 19, 2017
- NQSP No. 22, “Commercial Grade Dedication,” Revision 1, dated March 30, 2017
- NQSP 22.2, “Procurement Controls of Commercial Grade Calibration Services, Revision 1.1, dated September 20, 2017
- EG504, “Hardness Calculation for Safety Related Materials”, Revision A, dated August 24, 2016
- GEFPT-QWI8.5-001, “F&PT Nonconforming Screening Matrix,” Revision 2, dated May 1, 2017

- GEJAX-TP-HT001, “Flow and Process Technologies Post Weld Heat Treatment,” Revision 3, dated October 6, 2017

- GE Oil & Gas Measurement & Control (GEMC) - FPT-JAX-SWI-7.4-001-EN, “Receiving Inspection,” Revision 3, dated May 24, 2017

- GEMC-QWI 8.2-001, “Zero Acceptance Sampling,” Revision 1.2, dated August 28, 2017

- QCP001, “Written Practice for Personnel Qualification and Certification in Nondestructive Examination Processes,” Revision B, dated March 17, 2016

- QCMT 003, “Magnetic Particle Examination,” Revision A, dated May 19, 2016

- QCPT 003, “Liquid Penetrant Examination,” Revision F, dated July 12, 2017

- QCPT001_OS573, “Liquid Penetrant Examination for Grand Gulf,” Revision A, dated January 22, 2018

- Technical Report No. TR-0643, "Technical Evaluation of Pressure Relief Valves and Parts for Commercial Grade Dedication Applications, "Revision A, dated February 27, 2017

Design and Commercial-Grade Dedication Records

- AP1000 Design Control Document, Tier 2, Section 10.3.2.2.2, “Main Steam Safety Valves,” Revision 19

- Design Report DR11-003, “Main Steam Safety Valve for Westinghouse Electric Company LLC, V.C. Summer, Vogtle,” Revision 3, dated September 14, 2017

- Design Change Documentation No. 147541291, “Spindle 3707SA-RT Design Change Request,” dated March 4, 2016

- Design Change Documentation No. 50000244236, “Dresser Nuclear Product Design Revision (QAF-3-5-0 Revision A),” dated February 20, 2017

- Drawing No. 4NC2051, “Valve Type: 3700 Series, Valve Code: 8” 3707SA-RT25-AP-XTF1-NC2051,” Revision F, dated April 12, 2016

- Production Order Operation List, Production Order 20877005, Part No. 90030803, “Production Valve JX-16-CN0025,” dated May 22, 2017

- Production Order Package No. 20975134, “Rework on 3707AS-RT25-AP-XTF1-NC2051 P/N 90030803,” dated August 11, 2017

- Qualification Plan QP15-01, “AP1000, PV65 3707S Main Steam Safety Valve for Westinghouse Electric Company, LLC, V.C Summer, Vogtle,” Revision 2, dated March 3, 2016

- Valve Application Report VA-292, “Capacity Calculations for 3707S-RT Main Steam Safety Valve,” Revision 3, dated January 23, 2018

- Westinghouse Electric Company (WEC) Design Specification No. APP-GW-VP-010, “Equipment Qualification Methodology and Documentation Requirements for AP1000 Safety-Related Valves and Valve Appurtenances,” Revision 2, dated April 2010

- WEC Design Specification No. APP-PV65-Z0-001, “Main Steam Safety Valve, ASME B&PV Code, Section III, Class 2,” Revision 8, dated January 31, 2013

- WEC Data Sheet No. APP-PV65-Z0R-001, “Main Steam Safety Valves (MSSV), ASME Section III, Class 2 Valve Data Sheet Report,” Revision 5, dated March 7, 2012

- Document Control Number TR-0643, “Technical Evaluation For Pressure Relief Valves and Parts for Commercial Grade Dedication,” Revision 0, dated February 27, 2017

- Quality Assurance Form (QAF) 22.1, “Commercial-Grade Dedication Plan, for Bracket Mounting Assembly, dated November 4, 2016

- Commercial-grade dedication packages for the dedication of valve bodies, yoke diaphragms, O-rings, disc collar, disc holders, lower adjusting rings, upper adjusting rings, bottom spring washers, bolted caps, and bracket kits

<u>American Society of Mechanical Engineers (ASME) and Welding Records</u>

- National Board Certification Publication NB18, Certification No. 18414, “Safety Valve Dresser Jacksonville 8 NPS Inlet 10 Dual NPS Outlet,” dated October 13, 1967

- Welding Procedure Specification, (WPS) ES-173, “Gas Tungsten Arc Welding P-8 Stainless Steel,” Revision R, dated October 25, 2007

- Procedure Qualification Record (PQR)-2A, “Gas Tungsten Arc Welding Manual,” Revision A, dated June 24, 1996

- WPS ES-267, “Stellite Overlay on P8 and P43 materials using GTAW with no Post Weld Heat Treat (PWHT),” Revision AC, dated May 1, 2017

- PQR-55A, “Hardfacing Overlay without PWHT of P8,” for WPS E-267 to ASME Section IX, Revision A, dated May 1, 2017

- PQR 55B, “Hardfacing Overlay without PWHT of P8 with hardness,” for WPS ES-267 to ASME Section IX, Revision A, dated May 1, 2017

- PQR 69A, “Hardfacing Overlay without PWHT of P43 with hardness,” for WPS ES-267 to ASME Section IX, Revision A, dated May 1, 2017

- PQR 69B, “Hardfacing Overlay without PWHT of P43 with hardness,” for WPS ES-267 to ASME Section IX, Revision A, dated May 1, 2017

Calibration, Heat Treatment, Non-Destructive Examination (NDE), Inspection and Test Records

- Test Procedure No. PTCTC-G/2015/en/0082, “Test Procedure for the Qualification Test According to ASME QME-1-2007 for a 8” Class 1500 Spring Loaded Safety Valve,” Revision A, dated October 8, 2015

- Test Report No. PTCTC-G/2015/en/0111, “Test Report on the Qualification Tests for a GE Oil & Gas Main Steam Safety Valve Performed at the Large Valve Test Facility GAP,” Revision A, dated March 4, 2016

- Assembly Instruction No. AS025_OS712, “Assembly of 3707S Series Safety Valves,” Revision A, March 1, 2017.

- Cleaning Instruction No. CL012-OS712, “Nuclear Cleaning Procedure for AP1000 MSSV PV65,” Revision A, dated July 19, 2016

- Consolidated Lubricating Instruction No. LU004_OS712, “Standard Lubricant for Westinghouse AP1000 Project,” Revision 1, dated October 31, 2011

- Controlled Administrative Procedure No. CAP-010, “Masoneilan Software Quality Assurance,” dated July 2, 1999

- Engineering Guidelines No. 490_OS712, “Final Inspection of Nuclear Products for WEC AP1000 Project,” Revision 3, dated January 21, 2014

- Hydrostatic Testing Instruction No. 017_OS712, “Hydrostatic Shell Testing of Nuclear Pressure Relied Valve Parts for WEC AP1000 Project,” Revision 4, dated January 21, 2014

- Inspection Plan No.3707S, “Inspection Plan NR-3707A for 3700 Series Safety Valves,” dated August 10, 2017

- Nuclear Order Control Instruction No. OS712, Revision C, dated June 28, 2016

- Performance Testing Instruction No. PT018_OS712, “Functional Testing of PV65 MSSV’s for AP1000,” dated Revision C, November 30, 2016

- Performance Testing Instruction No. PT149, “SRV/SV Static Seismic Test Procedure,” Revision 2, dated March 17, 2010

- Protective Coating Instruction No. PC092 OS712, “Protective Coatings for AP1000 MSSV PV65,” dated September 21, 2016

- Test Procedure No. NUP.0268, “Static Seismic Side Load Test Procedure for Nuclear Control Valves,” Revision 3, dated January 17, 2003

- Functional Qualification Report QR16-01, “QME-1 Testing Functional Qualification Report QR16-01 AP1000 PV65 3707S Main Steam Safety Valve for Westinghouse

Electric Company, LLC, V.C. Summer, Vogtle," Revision 2, dated September 13, 2017, and Revision 3, dated January 25, 2018

- QME-1 Application Report QR16-02, "AP1000 PV65 3707S Main Steam Safety Valve for Westinghouse Electric Company, LLC, V.C. Summer & Vogtle," Revision 2, dated September 14, 2017

- Valve Test Report, Component No. JX-16-CN0025, November 28, 2017 Test Report No. TR-SV7-GL2010S, "Safety-Related Class Outside Containment High Energy Line Break (HELB) Qualification Report for model SV7," Revision 4, dated February 16, 2016.

- General Electric Hitachi Nuclear Energy, "GEH Proposal for ANSYS Technical Services for Valve Applications," dated March 28, 2016

- Digital Pressure Gage No. 211H16180038, calibrated October 3, 2017, due April 3, 2018

- Hydrostatic Test Report Valve 3707SA-RT, Production Order No. 20901862, dated June 30, 2017

- Certificate of Calibration No. A2519068 for a digital thickness ultrasonic gage, dated June 20, 2017

- Certificate of Calibration No. A2427214 for a go-no go thread plug, dated March 10, 2017

- Certificate of Calibration No. A2691971 for a pressure gauge, dated December 21, 2017

- Certificate of Calibration No. A2686672 for a bimetal thermometer, dated December 15, 2017

- Certificate of Calibration No.A2530581 for a hardness tester, dated July 5, 2017

- Certificate of Calibration No. A2680079 for a digital caliper, dated December 8, 2017

- Certificate of Calibration No. A2406607 for a thread ring, dated February 17, 2017

- Certificate of Calibration No. A2488616 for a go-no go set plug, dated May 17, 2017

- Certificate of Calibration No. A2553763 for a digital caliper, dated July 28, 2017

- Certificate of Calibration No. A2706643 for a digital caliper, dated January 10, 2018

- Certificate of Calibration No. A2434857 for a gage block set, dated March 21, 2017

- Certificate of Calibration No. A2394253 for a gage block, dated February 2, 2017

- Certificate of Calibration No. A2391669 for a gage block, dated February 3, 2017

- Certificate of Calibration No. A2418475 for an analog pressure gage, dated March 2, 2017

- Certificate of Calibration No. A2656921 for a torque wrench, dated November 14, 2017
- Certificate of Calibration No. 75-170927142823 for a 36V lithium battery gun, dated September 27, 2017
- Certificate of Calibration No. 75-170927141959 for a 36V lithium battery gun, dated September 27, 2017
- Certificate of Calibration No. 75-170929102313 for a torque wrench, dated September 29, 2017
- Certificate of Calibration No. 75-171002112347 for an air gun, dated October 2, 2017
- Certificate of Calibration No. 75-171000122750 for an air gun, dated October 9, 2017
- Certificate of Calibration No. 25855 for a weld heat treater, dated March 7, 2017
- Certificate of Calibration No. 224326/A160129 for the heat treat oven, dated January 9, 2018
- Receipt Inspection/Verification of calibration equipment for PO No. 9000011860, dated September 21, 2017
- Receipt Inspection/Verification of calibration equipment for PO No. 9000011984, dated December 22, 2017
- Receipt Inspection/Verification of calibration equipment for PO No. 5050885967, dated April 25, 2017
- Receipt Inspection/Verification of calibration equipment for PO No. 9000011984, dated December 22, 2017
- Dimensional Inspection Report for one piece of nuclear bar, dated January 26, 2018
- Heat Treat Report for 12 Nozzles, dated August 9, 2016
- Liquid Penetrant (LP) Report for one machined surface of a valve body, January 23, 2018
- LP Report for a machined surface of inlet flange face and radius of a base inlet face, dated April 20, 2017
- LP Report for a nozzle, dated February 3, 2017
- LP Report for a surface disc, dated January 27, 2017
- Magnetic Particle (MP) Report for 12 pieces of top and bottom spring washers, dated May 15, 2017
- MP Report for 12 pieces of nut heavy hex, dated March 28, 2017

- MP Report for 28 pieces of nut heavy hex, dated April 13, 2017
- MP Report for 30 studs, dated March 17, 2017

Purchase Orders, Audit Reports, and Commercial-Grade Dedication

- Dresser's Nuclear Internal Audits for 2016 and 2017
- Purchase Order (PO) No. 5051006946 for a carbon steel base casting, dated November 14, 2017
- PO No. 1010131769 for computer code technical services, Revision 2, dated April 29, 2016
- PO No. 5050969908 for a steel bottom flange casting, dated September 5, 2017
- PO No. 5050897728 for heat treating services, dated April 6, 2017
- PO No. 5051024413 for a lapped flange, dated December 18, 2017
- PO No. 5051033958 for springs, dated January 9, 2018
- PO No. 5051036298 for gaskets, dated January 12, 2018
- PO No. 5051031381 for machining services, dated January 4, 2018
- PO No. 5050996180 for springs, dated October 23, 2017
- PO No. 5051039529 for plating services, dated January 18, 2018
- PO No. 5050956170 for weld material. Dated August 4, 2017
- PO No. 5051038464 for machining services, dated January 17, 2018
- PO No. 5051023407 for forgings, December 14, 2017
- PO No. 5051039441 for diaphragms, dated January 18, 2018
- PO No. 5051005003 for bellows, dated November 9, 2017
- PO No. 5051035540 for springs, dated January 11, 2018
- PO No. 5051024426 for calibration services, dated December 18, 2017
- PO No. 5051024427 for calibration services, dated December 18, 2017
- PO No. 5051025099 for calibration services, dated December 19, 2017
- PO No. 5051036931 for non-destructive examination services, dated January 15, 2018

- PO No. 5051026704 for bellows, dated December 21, 2017
- PO No. 9000011860 for calibration services, dated July 10, 2017
- PO No. 5050991444 for quad rings, Revision 14, dated December 5, 2017
- PO No. 5051040949 for diaphragms, Revision 2, dated January 23, 2018
- Audit report and checklist for a supplier of castings, dated July 17, 2017
- Audit report and checklist for a supplier of castings, dated April 10, 2017
- Audit report and checklist for a supplier of heat treating services, dated April 23, 2015
- Audit report and checklist for a supplier of heat treating services, dated August 21, 2017
- Audit report and checklist for a supplier of forgings, dated October 16, 2017
- Audit report and checklist for a supplier of castings, dated November 15, 2017
- Audit report and checklist for a supplier of springs, dated February 7, 2017
- Audit report and checklist for a supplier of gaskets and seals, dated May 22, 2017
- Audit report and checklist for a supplier of machining services, dated August 18, 2016
- Audit report and checklist for a supplier of springs, dated April 29, 2015
- Audit report and checklist for a supplier of plating services, dated November 10, 2015
- Audit report and checklist for a supplier of weld material, dated January 26, 2016
- Audit report and checklist for a supplier of machining services, dated November 2, 2017
- Audit report and checklist for a supplier of machining services, dated April 1, 2014
- Audit report and checklist for a supplier of forgings, dated June 23, 2017
- Audit report and checklist for a supplier of diaphragms, dated November 8, 2016
- Audit report and checklist for a supplier of springs, dated July 5, 2017
- Audit report and checklist for a supplier of castings, dated September 1, 2015
- Audit report and checklist for a supplier of non-destructive examination (NDE) services, dated January 27, 2017
- Audit report and checklist for a supplier of NDE material, dated July 17, 2013

- Audit report and checklist for a supplier of metal bellows and hoses, dated December 15, 2016

- Commercial-grade Survey of a diaphragm manufacturer, dated November 22, 2016

- Commercial-grade Survey of a machining service supplier, dated August 31, 2017

- Commercial-grade Survey of a O-ring distributor, dated July 14, 2015

- Commercial-grade Survey of a peening service supplier, dated September 15, 2016

- WEC Quality Release & Certificate of Conformance Purchase Order No. 4500724257, "Quality Release & Certificate of Conformance for PV65-MSSV's," dated December 20, 2017

Nonconformance Reports

200026249, 200026250, 200026335, 200026501, 200027074, 200027915, 200027984, 200027992, 200028270, 200028984, 200030552, 200032662, 200035215, 200035515, 200033090, 200037434, 200037520, 200037890, 200038385, 200041533, 200046568, 200047001, 200047618, 200048899, 200050527, 200050288, 200050742, 200050758, 200050879, 200050933, 200051126, 200051351, 200051813, 200051941, 200053097, 200053798, 200054082, 200054553, 200055469, 200055800, 200055807, 200056036, and 200056168

Corrective Action Reports

202, 208, 209, 215, 268, 269, 270, 369, 372, 374, 377, 404, 407, 418, 419, 420, and 445

Corrective Action Requests Opened During the NRC Inspection

450, 451, 452, 453, 454, 455, 456, and 457

Training Records

- Nuclear Lead Auditor training and qualification records for Michael Cullen, Senthilnathan Gurusamy, John Kerr, Laurie Luckhardt, Joseph Mann, Glenn Thomas, and Virgil Titrea

- NDE Qualification records for Michael Barrie, Frank Marchant as LP and MP Level II

- Annual Eye examination records for Michael Barrie, Frank Marchant

- Welder Performance Qualifications for Michael Califano and Juanita Lee

- Chad York, Nuclear Hydrostatic Tester, Bi-Annual Employee Review of Quality Inspector, dated January 11, 2018

- Memorandum from John A. Kerr, Dresser Nuclear Quality Leader, "Registered Professional Engineer for Dresser Jacksonville - Rajesh Krithivasan," dated October 18, 2016