

June 15, 2016

Ms. Anne Sullivan, Quality Manager  
GE Oil & Gas  
8011 Shreveport Highway  
Pineville, LA 71360

SUBJECT: NUCLEAR REGULATORY COMMISSION VENDOR INSPECTION OF GE OIL &  
GAS REPORT NO. 99901468/2016-201

Dear Ms. Sullivan,

On May 2-6, 2016, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the GE Oil & Gas facility in Pineville, LA. The purpose of this limited-scope routine inspection was to assess GE Oil & Gas'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 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 GE Oil & Gas's implementation of quality activities associated with the fabrication and inspection of the PV-65 Main Steam Safety Valves for the Westinghouse Electric Company AP1000 reactor design, as well as relief valves for the operating reactor fleet. The enclosed report presents the results of the inspection.

During this inspection, the NRC staff looked at documents, drawings, and procedures associated with the inspections, tests, analyses, and acceptance criteria (ITAAC) from Revision 19 of the approved AP1000 Design Control Document (DCD), Tier 1. Specifically, these activities were associated with ITAAC 2.2.04.02a, 2.2.04.04a, 2.2.04.08a.i, and 2.2.04.08a.ii. The inspectors did not identify any findings associated with the ITAAC contained in Section 4 of the attachment to this report. This NRC inspection report does not constitute NRC endorsement of your overall quality assurance (QA) or Part 21 programs.

During this inspection, NRC inspectors found that the implementation of your QA program failed to meet certain NRC requirements imposed on you by your customers. The inspectors determined that GE Oil & Gas was not fully implementing its QA program in the areas of design control, related to commercial-grade dedication. Specifically, GE Oil & Gas failed to adequately identify and verify the specified critical characteristic of tensile strength during the dedication of valve spindles. 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), GE Oil & Gas 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 explanation or statement within 30 days of this letter in accordance with the instructions specified in the enclosed NONs. We will consider extending the response time if you show good cause for us to do so.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response, (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, 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 is 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 will 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.

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.: 99901468

Enclosures:

1. Notice of Nonconformance
2. Inspection Report No. 99901468/2016-201  
and Attachment

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response, (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, 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 is 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 will 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.

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/RA/

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and Attachment

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<b>OFC</b>	NRO/DCIP/QVIB-2	NRO/DCIP/QVIB-3	RII/DCI/CIB3
<b>NAME</b>	RPatel	AThomas	PCarman*
<b>DATE</b>	06/10/16	06/10/16	06/14/16
<b>OFC</b>	NRO/DCIP/QVIB-2	NRO/DCIP	NRO/DCIP/QVIB-2
<b>NAME</b>	LMicewski	TFrye*	RMcIntyre
<b>DATE</b>	06/13/16	06/13/16	06/14/16

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## NOTICE OF NONCONFORMANCE

GE Oil & Gas  
8011 Shreveport Highway  
Pineville, LA 71360

Docket No. 99901468

Based on the results of a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the GE Oil & Gas facilities located in Pineville, LA, on May 2, 2016, through May 6, 2016, certain activities were not conducted in accordance with NRC requirements which were contractually imposed on GE Oil & Gas by its customers or NRC licensees.

- A. Criterion III, "Design Control," 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," states, in part, that "measures shall 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."

Contrary to the above, as of May 6, 2016, GE Oil & Gas failed to adequately review certain parts that are essential to the safety-related functions of components for suitability of application, as evidenced by the following examples. Specifically GE Oil & Gas:

1. Failed to adequately verify the material property critical characteristic of tensile strength during the commercial-grade dedication of valve spindles. For safety-related valve spindles supplied on purchase order (PO) SNG10078319 with Georgia Power for Edwin I. Hatch Nuclear Plant, PO 00713094 with Duke Energy Corporation for H.B. Robinson Steam Electric Plant, and one spare spindle on GE/Dresser production order 20040774, the value of tensile strength, a critical characteristic, was calculated rather than tested. This calculation was performed using a formula that correlates the measured Brinell hardness test value to tensile strength. This methodology is commonly used for steel materials, but the formula is not applicable for the ASTM B637 Type 2 (Inconel) material specified in the above examples. GE Oil & Gas did not perform a technical evaluation to justify the use of the calculation formula for stainless steel in an Inconel alloy application. This resulted in inadequate verification of the material's tensile strength property to provide reasonable assurance that the spindles have sufficient mechanical strength to perform the intended safety function. GE Oil & Gas has fabricated and shipped four spindles as part of safety-related valves and has one spindle fabricated and in stock that is available for a future customer order.
2. Failed to provide a technical evaluation to justify the hardness margin tolerance, used to accept a hardness value, a critical characteristic used during commercial-grade dedication for a valve spindle. GE Oil & Gas applied a 10 percent margin tolerance, with no technical justification. This resulted in inadequate verification of the material's hardness property to provide reasonable assurance that the spindle has sufficient hardness to perform its intended safety function. The spindle is in stock that is available for a future customer order.

These issues have been identified as Nonconformance 99901468/2016-201-01.

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, Mechanical Vendor Inspection Branch, Division of Construction 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 taken and the results achieved, (3) the corrective steps that will be taken to avoid noncompliances, and (4) the date when your corrective action will be completed. Where good cause is shown, consideration will be given to 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 document system (ADAMS), 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 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, 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 withholding of such material, 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 will 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."

Dated this the 15th 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.: 99901468

Report No.: 99901468/2016-201

Vendor: GE Oil & Gas  
8011 Shreveport Highway  
Pineville, LA 71360

Vendor Contact: Ms. Anne Sullivan, Quality Manager  
E-mail: anne.sullivan@ge.com  
Phone: (318) 640-6013

Nuclear Industry Activity: GE Oil & Gas manufactures the PV-65 Main Steam Safety Valves for the Westinghouse Electric Company AP1000 reactor design, as well as relief valves for operating nuclear reactors.

Inspection Dates: May 2-6, 2016

Inspectors: Laura Micewski NRO/DCIP/QVIB-2 Team Leader  
Raju Patel NRO/DCIP/QVIB-2  
Ashley Thomas NRO/DCIP/QVIB-3  
Paul Carman RII/DCI/CIB3

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**

GE Oil & Gas  
99901468/2016-201

The U.S. Nuclear Regulatory Commission (NRC) staff conducted a vendor inspection at the GE Oil & Gas facility 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 inspectors also verified that GE Oil & Gas implemented a program under 10 CFR Part 21, "Reporting of Defects and Noncompliance," that met the NRC's regulatory requirements. The inspectors conducted the inspection from May 2-6, 2016. This was the second NRC vendor inspection at this facility, the previous inspection was in 2009 when the facility was owned and operated by Dresser, Inc.

This inspection specifically evaluated GE Oil & Gas's implementation of quality activities associated with the fabrication and inspection of the PV-65 Main Steam Safety Valves for the Westinghouse Electric Company AP1000 reactor design, as well as relief valves for the operating reactor fleet.

Some of the specific activities observed by the inspectors included:

- Functional test of a ¾-inch relief valve
- Hydrostatic pressure test of a disc for a 6-inch main steam safety valve
- Liquid penetrant test (PT) examination of discs for 6-inch main steam safety valves
- Shielded metal arc welding of an outlet flange assembly for a 6-inch solenoid operated valve
- Walkdown of the welding material storage area and verification of weld rod storage conditions

The following 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 inspectors implemented Inspection Procedure (IP) 43002, "Routine Inspections of Nuclear Vendors"; IP 43004, "Inspection of Commercial-Grade Dedication Programs"; and IP 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance."

The information below summarizes the results of this inspection.

### Commercial-Grade-Dedication

The inspectors issued Nonconformance 99901468/2016-201-01 for failure to implement the requirements of Criterion III, "Design Control," to provide objective evidence that technical evaluations had been performed to justify that the associated acceptance methods selected for valve spindles would provide reasonable assurance that the valves would perform their intended safety functions. Specifically, GE Oil & Gas failed to perform a technical evaluation to justify the use of a formula to calculate critical characteristic of tensile strength for components made of ASTM B637 Type 2 (Inconel), for which the formula is not applicable. GE Oil & Gas also failed to perform a technical evaluation to justify the margin used to accept an out-of-tolerance tested value of hardness, a critical characteristic used during commercial-grade dedication, of a safety-related valve spindle.

### Other Inspection Areas

The inspectors determined that GE Oil & Gas is implementing its design control; supplier oversight of contracted activities; control of special processes; inspection; test control; control of measuring and test equipment; nonconforming material, parts, or components; corrective action; and internal audit programs in accordance with the applicable regulatory requirements of Appendix B to 10 CFR Part 50. In addition, the inspectors determined that GE Oil & Gas 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.

### Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)

The inspectors reviewed documents, drawings, and procedures associated with the ITAAC from revision 19 of the approved AP1000 Design Control Document (DCD), Tier 1. Specifically, these activities were associated with ITAAC 2.2.04.02a, 2.2.04.04a, 2.2.04.08a.i, and 2.2.04.08a.ii. The inspectors did not identify any findings associated with these ITAAC.



## **REPORT DETAILS**

### **1. Design Control**

#### **a. Inspection Scope**

The inspectors reviewed GE Oil & Gas's policies and implementing procedures that govern the design control program to verify compliance with the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50 as well the requirements of Section III, "Rules for Construction of Nuclear Facility Components," of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, and ASME Standard QME-1-2007, "Qualification of Active Mechanical Equipment used in Nuclear Power Plants." Specifically, the inspectors evaluated the implementation of the GE Oil & Gas's design control process associated with the AP1000 PV-65 Main Steam Safety Valves (MSSVs). The inspectors reviewed the drawings for the MSSVs that are associated with ITAAC 2.2.04.08a.i and 2.2.04.08a.ii from the AP1000 Design Control Document (DCD), Tier 1, Revision 19.

The inspectors reviewed GE Oil & Gas's procedures for its process to control design changes and examples of their implementation, as well as a sample of engineering drawings, design reports, contract reviews, design qualification plans, test and inspection plans, valve application reports and the associated purchase orders (POs). The inspectors evaluated the adequacy of the equipment qualification procedure for environmental qualification.

The inspectors interviewed GE Oil & Gas engineering staff to verify that their review of design changes considered the original design and qualification of the safety-related PV-65 MSSVs, and that an independent review was conducted prior to issuance of the change. The inspectors discussed the design control program with GE Oil & Gas's management and technical staff. The documents reviewed by the inspectors are included in the attachment to the inspection report.

#### **b. Observations and Findings**

The inspectors reviewed drawings for 8" 3700 series MSSVs for V.C. Summer Units 2 and 3 and Vogtle Units 3 and 4. The inspectors verified that the set pressures, overpressure, tolerances, and capacities documented on the drawings meet the requirements of ASME B&PV Code, Section III and Westinghouse design specifications. The valve data identified on these drawings is associated with ITAAC 2.2.04.08a.i and 2.2.04.08a.ii from the AP1000 DCD, Tier 1, Revision 19. During the time of the inspection, the valve test reports documenting the actual set pressures and capacities were not available because no production AP1000 MSSVs had been tested or fabricated.

No findings of significance were identified.

c. Conclusion

The inspectors determined that GE Oil & Gas established a program that adequately controls design in accordance with the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the inspectors determined that GE Oil & Gas is also effectively implementing its design control processes. No findings of significance were identified.

2. Commercial-Grade Dedication

a. Inspection Scope

The inspectors reviewed GE Oil & Gas's policies and implementing procedures that govern the Commercial-Grade Dedication (CGD) program to verify compliance with the regulatory requirements of Criterion III, "Design Control," and Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50.

The inspectors reviewed a sample of dedication packages to assess the different elements of the CGD program which included POs, the technical evaluation process including the commercial-grade item evaluations, receipt inspection reports, certificates of compliance, various design drawings, and technical information. The inspectors evaluated the criteria for the identification of the safety function(s) of an item, credible failure mechanisms/modes, selection of critical characteristics and acceptance criteria, and the identification of verification methods to verify effective implementation of GE Oil & Gas's dedication process.

The inspectors discussed the CGD program with GE Oil & Gas's staff. The documents reviewed by the inspectors are included in the attachment to the inspection report.

b. Observations and Findings

The inspectors reviewed GE Oil & Gas engineering guidance (EG)-037, "Commercial Grade Dedication Program for Nuclear Pressure Relief Valves," Revision 24, dated May 2, 2012, which references technical report (TR)-0643, "Technical Evaluation of Pressure Relief Valves, Parts and Services for Commercial Grade Application," which is the integral part of commercial-grade dedication plan. TR-0643 specifies the quality class, safety function, the critical characteristics and the verification methods.

At the time of the inspection, GE Oil & Gas was not performing any specific commercial-grade dedication activities for commercially procured items. The inspectors reviewed a sample of completed dedication packages and acceptance activities for valve sub-components performed as part of supply of basic components to domestic utilities. This included the description of the application/usage, the identification of the safety-function, the identification of credible failure mechanism/modes, the identification of the critical characteristics and acceptance criteria, and the identification of the acceptance/verification methods.

The inspectors reviewed TR-0643 and discussed with GE Oil & Gas engineering personnel, the technical evaluation and engineering justification related to using the hardness test value as a measure to verify critical mechanical characteristics. GE Oil & Gas technical staff provided the inspectors with additional engineering

guidance EG-504, "Hardness Calculation For Safety-Related Materials," Revision 4, dated June 30, 2014. EG-504 provides a formula to calculate the minimum tensile strength using a Brinell hardness values for steel materials. EG-504 also includes a table of material specifications with minimum hardness values on both the Brinell and Rockwell scales, tensile strength for both steel and non-steel material specifications, and included a note that provides for the use of 10 percent margin for final hardness acceptance. The inspectors noted that EG-504 did not include any technical evaluation or engineering justification for calculating tensile strength based on hardness value for non-steel alloys, or the basis for use of 10 percent margin for final acceptance of a hardness value. Technical evaluations identify the necessary technical and quality requirements that ensure the item will meet the intended design conditions. This resulted in inadequate verification of material properties in the examples listed below:

1. PO SNG10078319 with Georgia Power and PO 00713094 with Duke Energy Corporation, each for two safety-related pressure relief valves, called for part number (P/N) 4840405CGD, which is a spindle made of ASTM B637 Type 2 nickel alloy specification. GE Oil & Gas procured commercial-grade spindles and used the hardness test value as the basis to calculate the critical characteristic, tensile strength, as a basis for acceptance. However the calculation used a formula for correlating hardness to tensile strength that is applicable to stainless steel alloys, but not ASTM B637 Type 2 nickel alloy. The valves were subsequently shipped to Georgia Power's Edwin I. Hatch Nuclear Plant and Duke Energy Corporation's H.B. Robinson Steam Electric Plant. GE Oil & Gas also dedicated one spare spindle, of the same part number and material specification, under GE Oil & Gas production order 20040774. This spare spindle is currently held in stock, and available for a future customer order.
2. Nonconformance report (NCR) number 147560, dated July 21, 2015, dispositioned one spare spindle, part No. 4840405CGD, as acceptable based on use of 10 percent margin tolerance on final hardness value. The spindle hardness value was below the specified EG-504 value. This spare spindle is currently in stock, and available for a future customer order.

The inspectors identified this issue as Nonconformance 99901468/2016-201-01.

c. Conclusion

The inspectors issued Nonconformance 99901468/2016-201-01 in association with GE Oil & Gas's failure to implement Criterion III, of Appendix B to 10 CFR Part 50. Nonconformance 99901468/2016-201-01 cites GE Oil & Gas for failure to adequately verify valve spindle material property critical characteristics for the dedication of commercial-grade items as basic components to provide reasonable assurance that the basic component will perform their intended safety functions.

### 3. Oversight of Contracted Activities

#### a. Inspection Scope

The inspectors reviewed GE Oil & Gas's policies and implementing procedures that govern the implementation of its oversight of contracted activities program to verify compliance with the requirements of Criterion IV, "Procurement Document Control," Criterion VII, "Control of Purchased Material, Equipment, and Services," and Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50.

Specifically, the inspectors verified that applicable quality requirements, including technical, regulatory, and reporting requirements, were specified in the procurement documents reviewed and extended to lower-tier suppliers when necessary. Additionally, the inspectors reviewed the procedures and implementation for the selection and qualification of vendors supplying basic components and services, through a sample of certificates of calibration, audit reports, commercial-grade survey reports, and receiving inspections.

The inspectors reviewed GE Oil & Gas's critical approved suppliers list to ensure that qualified and approved suppliers were listed, that authorized personnel maintained, distributed, and periodically updated the list, and that any revisions to the list were implemented following the applicable procedures. The inspectors verified that, for the sample of vendors selected, GE Oil & Gas performed supplier audits as required and that the corrective actions related to these audits were implemented and closed in audit reports in a timely manner. The inspectors also reviewed a sample of training and qualification records for GE Oil & Gas's lead auditors and auditor personnel to verify that these individuals were trained and qualified in accordance with GE Oil & Gas's policies and procedures, the ASME NQA-1 requirements and that the qualification records were current.

The inspectors reviewed a sample of documents for the MSSVs associated with ITAAC 2.2.04.02a from the AP1000 DCD, Tier 1, Revision 19.

The documents reviewed by the inspectors are included in the attachment to the inspection report.

#### b. Observations and Findings

The inspectors reviewed a sample of documents for raw material used for the fabrication of pressure boundary and structural parts for the MSSVs for V.C. Summer Units 2 and 3, and Vogtle Units 3 and 4. The specific parts inspected were the base (P/N 60989010S712), bonnet (P/N 61000010S712), disc (P/N 75060010S712), spindle (P/N 75059010S712), and compression screw (P/N 75067010S712).

For the parts sampled, the inspectors verified the material was purchased from approved suppliers, and the material met the requirements of ASME B&PV Code; Westinghouse design specifications; and approved drawings. The inspectors reviewed a sample of certificates of compliance and certified material test reports (CMTRs) to verify the material specifications for chemical composition, mechanical properties, and heat treatment meet ASME B&PV Code, Section III requirements. For pressure boundary parts, the inspectors reviewed a sample of dimensional and ultrasonic testing reports

included in certificates of compliance to verify ASME B&PV Code, Section II requirements were met. The attachment to this inspection report lists the heat numbers from the certificates of compliance and CMTRs reviewed by the inspectors.

The inspection efforts of the MSSVs documented in this section are associated with ITAAC 2.2.04.02a from the AP1000 DCD, Tier 1, Revision 19. During the time of the inspection, no AP1000 MSSVs had been fabricated, so it was not possible for the inspectors to identify a specific component or reactor site for the samples inspected, nor was it possible to inspect the final as-built component as discussed in the ITAAC.

No findings of significance were identified.

c. Conclusion

The inspectors concluded that GE Oil & Gas is implementing its oversight of contracted activities 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 inspectors also determined that GE Oil & Gas is implementing its policies and procedures associated with the oversight of contracted activities. No findings of significance were identified.

4. Control of Special Processes

a. Inspection Scope

The inspectors reviewed GE Oil & Gas's policies and implementing procedures that govern 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.

The inspectors witnessed welding on an outlet flange assembly for a 6-inch solenoid operated valve for use in US nuclear power plants to verify that welding was performed in accordance with the requirements of the ASME B&PV Code. Specifically, the inspectors verified welding was performed above the minimum interpass temperature, the weld area was kept clean and protected from wind and moisture, the welder used proper techniques to achieve acceptable weld quality, surfaces being welded were clean and free of harmful contaminants, and the welding filler metal was properly labeled and traceable to a heat number. The inspectors reviewed CMTRs for the weld filler metal used to verify the material specifications for chemical composition and mechanical properties meet ASME B&PV Code requirements.

The inspectors performed a walk down of the weld filler metal storage area to verify filler metal was controlled to prevent degradation, inadvertent use, or loss of traceability in accordance with GE Oil & Gas approved procedures.

The inspectors reviewed the welding procedure specification and associated procedure qualification record to verify the procedure used was qualified in accordance with ASME B&PV Code requirements. The inspectors reviewed welder qualification records for the welder performing the weld. The inspectors verified the welder was qualified for the welding technique and material used, and the welder maintained continuity of qualifications in accordance with ASME B&PV Code requirements.

The inspectors witnessed liquid penetrant (LP) nondestructive examination (NDE) of discs for two 6-inch MSSVs for use in US nuclear power plants to verify that the examination was performed in accordance with approved NDE procedures. Specifically, the inspectors verified proper penetrant temperature, penetrant wash temperature and pressure, penetrant dryer temperature, cleanliness of the surface prior to examination, light requirements, penetrant application time, developer dwell time, calibration of equipment, and techniques used by the Level II examiner. The inspectors reviewed certificates of compliance for the penetrant and developer to ensure approved material was being used during the examination. The inspectors reviewed the LP inspection report to ensure the materials and examinations were properly documented and reviewed by qualified personnel.

The inspectors reviewed GE Oil & Gas's procedure for personnel qualification and certification in NDE processes to ensure it contained the requirements of ASME B&PV Code and SNT-TC-1A, "Personnel Qualification and Certification in Nondestructive Testing." The inspectors reviewed a sample of qualification records for Level II LP examiners to verify they completed required education, training courses, practical experience, tests, and examination continuity.

The inspectors discussed the special processes program with GE Oil & Gas's management and technical staff. The documents reviewed by the inspectors are included in the attachment to the inspection report.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The inspectors determined that GE Oil & Gas is implementing its manufacturing and special processes programs 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 inspectors also determined that GE Oil & Gas is implementing its policies and procedures associated with the control of special processes program. No findings of significance were identified.

5. Inspection

a. Inspection Scope

The inspectors reviewed GE Oil & Gas's policies and implementing procedures that govern the inspection program to verify compliance with the regulatory requirements of Criterion X, "Inspection," of Appendix B to 10 CFR Part 50.

The inspectors verified that GE Oil & Gas's procedures for inspection activities provided measures for the generation of inspection documents, such as travelers, instructions, checklists, or other appropriate means. For a sample of inspection documents, the inspectors verified that these documents included the appropriate information as

required by GE Oil & Gas procedures such as the inspection date, type of observation, results of examination and tests, and the initials of the quality control (QC) inspector. The inspectors also verified that mandatory hold points were indicated and that work did not proceed without appropriate approval.

The inspectors reviewed a sample of material inspection reports and receipt inspections for material used for the fabrication of AP1000 MSSVs for V.C. Summer Units 2 and 3 and Vogtle Units 3 and 4. The inspectors verified the inspections were performed by qualified personnel and followed approved policies and procedures, and specific part numbers and heat numbers were traceable to the raw material purchased from the suppliers and maintained throughout the production order operation list.

The inspectors discussed the inspection program with GE Oil & Gas's management and technical staff. The documents reviewed by the inspectors are included in the attachment to the inspection report.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspectors determined that GE Oil & Gas is implementing its inspection program in accordance with the regulatory requirements of Criterion X of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the inspectors also determined that GE Oil & Gas is implementing its policies and procedures associated with the inspection program. No findings of significance were identified.

6. Test Control

a. Inspection Scope

The inspectors reviewed GE Oil & Gas's policies and implementing procedures that govern test control to verify compliance with the requirements of Criterion XI, "Test Control," of Appendix B to 10 CFR Part 50.

The inspectors observed a functional test of a ¾-inch relief valve for use in US nuclear power plants. Specifically, the inspectors verified the test was conducted using approved procedures, the production order operation list contained hold points to ensure quality control personnel and an authorized nuclear inspector were present during the test, test setup was in accordance with procedures, the test equipment was in calibration, and the tester used proper techniques to ensure the test was conducted in accordance with procedures. The inspectors reviewed the set pressure and tolerances tested during the functional test to ensure they meet the requirements of ASME B&PV Code and valve drawings.

The inspectors also observed a hydrostatic pressure test of a disc for a 6-inch MSSV for use in a domestic nuclear power plant. The inspectors ensured the test was conducted using approved procedures, the production order operation list contained hold points to ensure quality control personnel were present during the test, and test equipment was in calibration. During the test, the inspectors witnessed proper technique by the tester to

ensure proper test pressure and hold time. The inspectors reviewed the water analysis performed for the hydrostatic test medium to ensure the water purity requirements were met. The inspectors reviewed the test results to verify test parameters were documented and meet ASME B&PV Code requirements, and the test was performed by qualified personnel and inspected by quality control personnel.

The inspectors reviewed a sample of qualification records for the personnel conducting valve function and hydrostatic pressure tests, as well as QC personnel inspecting these tests.

The inspectors reviewed the procedure that will be used for the hydrostatic pressure test associated with ITAAC 2.2.04.04a from the AP1000 DCD, Tier 1, Revision 19.

The documents reviewed by the inspectors are included in the attachment to the inspection report.

b. Observations and Findings

The inspectors reviewed the approved hydrostatic test procedure that will be used for the hydrostatic test of the AP1000 MSSVs for V.C. Summer Units 2 and 3 and Vogtle Units 3 and 4. The inspectors verified the test pressure, hold time, and gauge range identified in the procedure meets ASME B&PV Code, Section III requirements and Westinghouse design specifications. The hydrostatic pressure test is associated with ITAAC 2.2.04.04a from the AP1000 DCD, Tier 1, Revision 19. During the time of the inspection, the hydrostatic pressure test of the AP1000 MSSVs were not performed because no AP1000 MSSVs had been fabricated.

No findings of significance were identified.

c. Conclusion

The inspectors concluded that GE Oil & Gas is implementing test control 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 inspectors also determined that GE Oil & Gas is implementing its policies and procedures associated with test control. No findings of significance were identified.

7. Control of Measuring and Test Equipment (M&TE)

a. Inspection Scope

The inspectors reviewed GE Oil & Gas'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 inspectors performed a walkdown to ensure that equipment located in the M&TE storage area, M&TE hold area and fabrication shop were labeled, handled, and stored in a manner that indicated the calibration status of the instrument and ensured its traceability to calibration test data. The inspectors observed the use of M&TE associated with functional testing of a ¾-inch relief valve, liquid penetrant nondestructive examination of a 6-inch MSSV disc, and welding of an outlet flange assembly of a 6-inch



solenoid-operated valve were marked with the calibration date, next calibration due date, identification number, and identification of the individual who calibrated it. The inspectors observed the calibration of two pressure transducer modules used in the hydrostatic test machine prior to the hydrostatic testing of a 6-inch main steam valve disc. The inspectors verified the pressure transducers were calibrated in accordance with procedures. The inspectors reviewed the calibration records for the hydraulic deadweight tester used to calibrate the pressure transducers to verify that the dead weight tester was within the prescribed calibration interval and calibrated against nationally recognized standards.

For the sample of M&TE observed in the fabrication shop, testing area, and storage area, the inspectors determined that the M&TE had the appropriate calibration stickers and current calibration dates, including the calibration due date. The inspectors also verified that the M&TE had been calibrated, adjusted, and maintained at prescribed intervals prior to use. The inspectors reviewed the electronic records for M&TE equipment to ensure no equipment that was out of calibration was in use, and for M&TE out of calibration, verified a selection of the M&TE was properly marked and segregated.

The inspectors discussed the M&TE program with GE Oil & Gas's management, technical staff, and craft personnel. The documents reviewed by the inspectors are included in the attachment to the inspection report.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The inspectors determined that GE Oil & Gas has established a program for control of M&TE 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 inspectors also determined that GE Oil & Gas is implementing its policies and procedures associated with the control of M&TE. No findings of significance were identified.

8. Nonconforming Materials, Parts, or Components

a. Inspection Scope

The inspectors reviewed GE Oil & Gas'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," of Appendix B to 10 CFR Part 50.

The inspectors reviewed the GE Oil & Gas Nonconformance Report (NCR) log and several NCR's related to safety-related products for domestic nuclear power plants to ensure that GE Oil & Gas implemented an adequate program to assess and control nonconforming items, including appropriate identification, documentation, segregation, evaluation, and disposition. Additionally, the inspectors interviewed GE Oil & Gas personnel and verified that there were designated areas to segregate and control nonconforming materials. The inspectors observed a Material Review Board (MRB) meeting in which the Quality Manager, Requisition Engineer, and other technical staff

reviewed and dispositioned nonconforming items. Finally, the inspectors verified that the GE Oil & Gas nonconformance process provided a link to the 10 CFR Part 21 program.

The inspectors discussed the nonconforming materials, parts, or components program with GE Oil & Gas's management and technical staff. The documents reviewed by the inspectors are included in the attachment to the inspection report.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The inspectors concluded that GE Oil & Gas has established a program for the control of nonconforming items in accordance with the regulatory requirements of Criterion XV of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the inspectors also determined that GE Oil & Gas is implementing its policies and procedures associated with the nonconformances program. No findings of significance were identified.

9. Corrective Action

a. Inspection Scope

The inspectors reviewed GE Oil & Gas's policies and implementing procedures that govern the Corrective Action Program (CAP) to verify compliance with the requirements of Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50.

The inspectors reviewed GE Oil & Gas's CAP log and reviewed several corrective action reports to verify the reports included a description of the condition adverse to quality, the planned measures established to correct the condition, and the status of the corrective action. The inspectors also verified the implementation of the corrective actions associated with the four Notices of Violation (NOVs) and eight Notices of Nonconformance (NONs) issued as a result of the NRC inspection of GE Oil & Gas (formerly Dresser, Inc.) conducted in 2009 and documented in inspection report 99900054/2009-201, dated April 27, 2009.

The inspectors discussed the CAP with GE Oil & Gas's management and technical staff. The documents reviewed by the inspectors are included in the attachment to the inspection report.

b. Observations and Findings

b.1 Notice of Violation 99900054/2009-201-01

During an NRC inspection conducted at GE Oil & Gas (formerly the Dresser, Inc. facility) in 2009, the NRC issued Notice of Violation (NOV) 99900054/2009-201-01 for failure to adopt appropriate procedures to address 10 CFR Part 21 requirements. Specifically GE Oil & Gas's procedures did not include measures to notify the director or responsible officer within five working days after completion of evaluation that a basic component fails to comply or contains a defect; measures to inform purchasers

or affected licensees within five days of determination that the entity does not have the capability to perform the evaluation; and inclusion on the written notification informing the NRC of the reporting entity's name and address, and number and location of all basic components in use at facilities.

In response to the NRC, GE Oil & Gas's corrective actions included a revision to Quality Control Procedure (QCP) 031, "Evaluation and Reporting of Defects and Noncompliance as Required by NRC Regulation 10 CFR Part 21."

Based on the review of QCP031, Revision A dated April 14, 2016, the inspectors determined that the corrective actions implemented were adequate to address the identified violation. Based on the inspectors' review, NOV 99900054/2009-201-01 is closed.

#### b.2 Notice of Violation 99900054/2009-201-02

The NRC issued NOV 99900054/2009-201-02 for failure to include appropriate requirements in Quality Assurance Manual (QSM) 1000N and/or Quality System Procedure (QSP) 2006, "Supplier Selection Evaluation and Approval," that provide instructions for determining when the requirements of 10 CFR Part 21 are applicable and must be in GE Oil & Gas's procurement documents to suppliers on its Approved Nuclear Supplier List.

In response to the NRC, GE Oil & Gas's corrective actions included a revision to QSP2006 to specify that the provisions of 10 CFR Part 21 apply to Nuclear Class A and B materials and parts. GE Oil & Gas also revised QSM1000N to reference 10 CFR Part 50 Appendix B, 10 CFR Part 21, ASME Section III NCA-4000, and ASME NQA-1.

Based on the review of QSP2006, Revision A, dated April 26, 2016, and QSM1000N, Revision C, dated April 8, 2016, the inspectors determined that the corrective actions implemented were adequate to address the identified violation. Based on the inspectors' review, NOV 99900054/2009-201-02 is closed.

#### b.3 Notice of Violation 99900054/2009-201-03

The NRC issued NOV 99900054/2009-201-03 for failure to include appropriate requirements in the QSM, QCP031, or other quality procedures for the maintenance of 10 CFR Part 21 records in accordance with regulations.

In response to the NRC, GE Oil & Gas's corrective actions included a revision to QCP031 to specify permanent record requirements for records relating to 10 CFR Part 21.

Based on the review of QCP031, Revision A, dated April 14, 2016, the inspectors determined that the corrective actions implemented were adequate to address the identified violation. Based on the inspectors' review, NOV 99900054/2009-201-03 is closed.

#### b.4 Notice of Violation 99900054/2009-201-04

The NRC issued NOV 99900054/2009-201-04 for failure to provide initial notification to the NRC of GE Oil & Gas 10 CFR 21 File No. 2007-02 within two days as required by the regulation and QCP031.

In response to the NRC, GE Oil & Gas corrective actions included a revision to QCP031 to include a timeline chart for Part 21 reporting times. In addition, GE Oil & Gas added responsibilities for the Quality Engineer to be responsible for record maintenance of Part 21 evaluations/investigations.

Based on the review of QCP031, Revision A, dated April 14, 2016, the inspectors determined that the corrective actions implemented were adequate to address the identified violation. Based on the inspectors' review, NOV 99900054/2009-201-04 is closed.

#### b.5 Notice of Nonconformance 99900054/2009-201-05

The NRC issued Notice of Nonconformance (NON) 99900054/2009-201-05 for failure of GE Oil & Gas procedures and practices to provide reasonable assurance that all commercial-grade items received from its suppliers conformed to the applicable specifications requirements.

In response to the NRC, GE Oil & Gas's corrective actions included revision to the engineering guidance (EG) documents that govern the commercial-grade dedication program in alignment with Electric Power Research Institute (EPRI) 5652, "Guideline for the Utilization of Commercial Grade Items ins Nuclear Safety Related Applications."

Based on the review of EG037, "Commercial Grade Dedication Nuclear Pressure Relief Valves," Revision 24, dated May 2, 2012; EG490, "Final Inspection of Nuclear Products," Revision 7, dated February 4, 2014; EG059, "Preparation of Customer NC Drawings," Revision 3, dated October 16, 2013; and EG368, "Reconciliations of Replacement Parts, Items, and Materials," Revision 4, dated June 16, 2014, the inspectors determined the corrective actions were adequate to address the identified nonconformance. Based on the inspectors' review, NON 99900054/2009-201-05 is closed.

#### b.6 Notice of Nonconformance 99900054/2009-201-06

The NRC issued NON 99900054/2009-201-06 for failure to include the dynamic valve discharge actuation load in the Dresser design report as required by design specifications for a North Anna pressurizer safety valve.

In response to the NRC, GE Oil & Gas's corrective actions included a revision to Form AE901-05, "Rework/Repair Routing, ASME Section III & Section XI." In addition, GE Oil & Gas conducted an analysis of the Pressurizer Safety valve for the North Anna design report.

GE Oil & Gas has since revised its process and Form AE901-05 is no longer in use. Based on the review of the current work flow process, which incorporates all design inputs during the contract review process, and the objective evidence available, the inspectors determined that the corrective actions were adequate to address the identified nonconformance. Based on the inspectors' review, NON 99900054/2009-201-06 is closed.

b.7 Notice of Nonconformance 99900054/2009-201-07

The NRC issued NON 99900054/2009-201-07 for failure to include adequate instructions in QSP2006 to include the appropriate quality assurance requirements in GE Oil & Gas procurement documents to its suppliers on its Approved Nuclear Supplier List.

In response to the NRC, GE Oil & Gas corrective action included updating the quality control program requirements (QCPR)-1 to add Appendix B to the requirements of supplier quality programs.

Based on the review of the superseding procedure to QCPR-1, QPM-1004, "Supplier Quality Assurance Manual," Revision 12, dated February 26, 2015, the inspectors determined the corrective actions were adequate to address the identified nonconformance. Based on the inspectors' review, NON 99900054/2009-201-07 is closed.

b.8 Notice of Nonconformance 99900054/2009-201-08

The NRC issued NON 99900054/2009-201-08 for failure to include NCRs 120581, 121238, and 12305, related to a 2007 supplier audit of American Foundry Group (AFG), in the supplier file for AFG.

In response to the NRC, GE Oil and Gas placed copies of the NCRs into the AFG supplier file.

Based on the review of the objective evidence available, the inspectors determined the corrective actions were adequate to address the identified nonconformance. Based on the inspectors' review, NON 99900054/2009-201-08 is closed.

b.9 Notice of Nonconformance 99900054/2009-201-09

The NRC issued NON 99900054/2009-201-09 for failure to perform testing in accordance with requirements defined in ASME Section III. Specifically, during hydrostatic testing conducted at 750 psi using a pressure gauge with a range of 0-20,000 psi, the combined error for the pressure gauge exceeded ASME code requirements.

In response to the NRC, GE Oil & Gas revised CAL009, "Calibration of Pressure Gauges (Digital and Dial Type)" to include requirements for working test gauges used for in-process hydrostatic testing (digital & dial type).

Based on the review of CAL009, Revision 4, dated November 18, 2014, and the observance of calibration of M&TE used for hydrostatic testing, the inspectors determined the corrective actions were adequate to address the identified nonconformance. Based on the inspectors' review, NON 99900054/2009-201-9 is closed.

b.10 Notice of Nonconformance 99900054/2009-201-10

The NRC issued NON 99900054/2009-201-10 for failure to properly store corrosion resistant steel materials to prevent them from deterioration due to contamination by contact with carbon steel or other low alloy steel materials. Also, GE Oil & Gas used unqualified masking tape on austenitic stainless and nickel-base alloy material and used cardboard material as an isolating material between stainless stored material and carbon steel storage racks.

In response to the NRC, GE Oil & Gas installed Teflon sleeving over the storage racks used for corrosion-resistant steel materials.

The inspectors performed a walk down of the shop storage areas. The inspectors identified one storage rack, in use for temporary storage of prototype spindles, which did not have Teflon sleeving. GE Oil & Gas promptly entered this observation into the CAP, installed the Teflon sleeving on the temporary storage rack, and performed a walk down to ensure all other nuclear storage racks had Teflon sleeving. Based on a subsequent walk down of the shop storage areas and review of the corrective action report written to address the observation, the inspectors determined the corrective actions were adequate to address the identified nonconformance. Based on the inspectors' review, NON 99900054/2009-201-10 is closed.

b.11 Notice of Nonconformance 99900054/2009-201-11

The NRC issued NON 99900054/2009-201-11 for failure of GE Oil & Gas procedures to provide guidance on how to properly complete the Supplier Audit Assessment Checklists.

In response to the NRC, GE Oil & Gas developed a work instruction for the completion of the audit checklist.

Based on a review of a sample of audit reports and completed audited checklists, the inspectors determined the corrective actions were adequate to address the identified nonconformance. Based on the inspectors' review, NON 99900054/2009-201-11 is closed.

b.12 Notice of Nonconformance 99900054/2009-201-12

The NRC issued NON 99900054/2009-201-12 for failure to provide adequate procedural guidance for interfaces among GE Oil & Gas 10 CFR Part 21 evaluation process, corrective action and preventative action program, control of nonconforming items process, and repair/replacement activities processes.

In response to the NRC, GE Oil and Gas corrective actions included a revision to QCP031 to reference the 10 CFR Part 21 and corrective action programs. In addition GE Oil & Gas corrective actions included a revision to QSP2014, "Continuous Improvement," to reference 10 CFR Part 21.

Based on a review of QSP2014, Revision 3, dated June 2, 2015, and the current procedures governing the CAP, control of nonconforming items process, and repair/replacement processes, the inspectors determined the corrective actions were adequate to address the identified nonconformance. Based on the inspectors' review, NON 99900054/2009-201-12 is closed.

No findings of significance were identified.

c. Conclusion

The inspectors concluded that GE Oil & Gas has established a CAP in accordance with the regulatory requirements of Criterion XVI of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the inspectors also determined that GE Oil & Gas is implementing its policies and procedures associated with the CAP. No findings of significance were identified. Also, the inspectors reviewed all four NOVs and eight NONs from the 2009 NRC inspection report 99900054/2009, and all are considered closed.

10. Internal Audits

a. Inspection Scope

The inspectors reviewed GE Oil & Gas's policies and implementing procedures that govern the internal audit program to verify compliance with the requirements of Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50.

The inspectors reviewed a sample of internal audits and the qualifications of the GE Oil & Gas and contracted auditors to verify the implementation of the GE Oil & Gas audit program. The inspectors verified that audit teams were comprised of qualified auditors, and that auditors were not auditing their own work. The inspectors reviewed the indoctrination, training and qualification of lead auditors and auditors to ensure that proficiency was achieved and maintained. The inspectors also reviewed the disposition of audit findings for adequacy and timeliness. Finally, the inspectors interviewed GE Oil & Gas personnel.

The inspectors discussed the internal audits program with GE Oil & Gas's management and technical staff. The documents reviewed by the inspectors are included in the attachment to the inspection report.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The inspectors concluded that GE Oil & Gas is implementing its internal audit program in accordance with the regulatory requirements of Criterion XVIII of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the inspectors also determined that GE Oil & Gas is implementing its policies and procedures associated with the internal audits program. No findings of significance were identified.

11. 10 CFR Part 21 Program

a. Inspection Scope

The inspectors reviewed GE Oil & Gas's policies and implementing procedures that govern the facility's compliance with the requirements of 10 CFR Part 21, "Reporting of Defects and Noncompliance." In addition, the inspectors evaluated the 10 CFR Part 21 postings and a sample of GE Oil & Gas'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." Furthermore, the inspectors discussed the 10 CFR Part 21 program with GE Oil & Gas's management and technical staff. No 10 CFR Part 21 evaluations were processed since the 2009 inspection. The documents reviewed by the inspectors are included in the attachment to the inspection report.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The inspectors determined that GE Oil & Gas 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 inspectors also determined that GE Oil & Gas is implementing its policies and procedures associated with the 10 CFR Part 21 program. No findings of significance were identified.

12. Entrance and Exit Meetings

On May 2, 2016, the inspectors discussed the scope of the inspection with Ms. Anne Sullivan, Quality Manager, and other members of GE Oil & Gas's management and technical staff, with Mr. Reggie Watty, the Plant Manager, participating telephonically. On May 6, 2016, the inspectors presented the inspection results and observations during an exit meeting with the Plant Manager, Mr. Reggie Watty, and other members of GE Oil & Gas'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 inspectors interviewed.



## ATTACHMENT

### 1. ENTRANCE AND EXIT MEETING ATTENDEES

Name	Title	Affiliation	Entrance	Exit	Interviewed
Laura Micewski	Team Leader	NRC/NRO	X	X	
Ashley Thomas	Inspector	NRC/NRO	X	X	
Raju Patel	Inspector	NRC/NRO	X	X	
Paul Carman	Inspector	NRC/RII	X	X	
Terry Jackson	Branch Chief	NRC/NRO		X	
Steve Barer	Mfg. Ops Ldr	GE	X		
John Watz	QMS Specialist	GE	X	X	
David Smart	Quality Engineer	GE	X		
Jay Hudson	Quality Engineer	GE	X		
George Walker	Quality Engineer	GE	X	X	X
Brandon LaCombe	Quality Inspector	GE	X		X
Ben Doshier	ANI	HSBGS	X		
J-Marie Cantrell	TRS Engineer	GE	X		
Ralph Foster	Manufacturing	GE	X	X	
Kevin Hendrix	Project Manager	GE	X		
Tim Arnold	QA Docs Specialist	GE	X	X	X
Lynne Basco	QA Docs Supervisor	GE	X	X	
Hilton Kip Smith	Lead Nuclear Inspector	GE	X	X	
Colton Carpenter	Lead Nuclear Requisition Engineer	GE	X	X	X
Tuan Doan	Nuclear Requisition Engineer	GE	X		
Anne Sullivan	Quality Manager	GE	X	X	
Glenn Thomas	Supplier Quality Manager	GE	X*		

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>	<b>Entrance</b>	<b>Exit</b>	<b>Interviewed</b>
Scott Hammatt	Sourcing Manager	GE	X*		X
Nayem Jahinger	Engineering Manager	GE	X*	X*	
John O'Neal	Manufacturing	GE		X	
Greg Boyer	Manufacturing	GE		X	
Jeremy Dickson	Principal Engineer	Dresser		X	
Reggie Watty	Plant Manager	GE	X*	X	
David Harvey	Lead Requisition Engineer	GE		X	X
Jim Avery		GE			X
Rusty Dalgliesh		GE			X
Mark Devine		GE			X
Marleen Collin		GE			X
Eric Johnson	Master Scheduler	GE			X
Richard Cave	Supplier Quality Engineer	GE			X

\*Participated via teleconference

## 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 July 15, 2013.

IP 43004, "Inspection of Commercial-Grade Dedication Programs," dated November 29, 2013.

### 3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Item Number</u>	<u>Status</u>	<u>Type</u>	<u>Description</u>	<u>Applicable ITAAC</u>
99901468/2016-201-01	Opened	NON	Criterion III	N/A
99900054/2009-201-01	Closed	NOV	10CFR21	N/A
99900054/2009-201-02	Closed	NOV	10CFR21	N/A
99900054/2009-201-03	Closed	NOV	10CFR21	N/A
99900054/2009-201-04	Closed	NOV	10CFR21	N/A
99900054/2009-201-05	Closed	NON	Criterion III	N/A
99900054/2009-201-06	Closed	NON	Criterion III	N/A
99900054/2009-201-07	Closed	NON	Criterion IV	N/A
99900054/2009-201-08	Closed	NON	Criterion V	N/A
99900054/2009-201-09	Closed	NON	Criterion XI	N/A
99900054/2009-201-10	Closed	NON	Criterion XIII	N/A
99900054/2009-201-11	Closed	NON	Criterion XVIII	N/A
99900054/2009-201-12	Closed	NON	Criterion V, XV, XVI	N/A

### 4. INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA

The NRC inspectors identified the following inspections, tests, analyses, and acceptance criteria (ITAAC) related to components being fabricated and tested by GE Oil & Gas. At the time of the inspection, GE Oil & Gas had received raw material and was preparing for the machining of parts of the main steam safety valves (MSSVs) for the AP1000 reactor design. GE Oil & Gas developed approved procedures and design drawings to be used during future testing upon completion of valve fabrication. 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 inspectors reviewed GE Oil & Gas'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 inspectors did not identify any findings associated with the ITAAC identified below.

Source Document	ITAAC Index No.	ITAAC	Acceptance Criteria
Appendix C from the Combined License for Vogtle Units 3 and 4 and V.C. Summer Units 2 and 3	No. 220	2.2.04.02a	The ASME Code Section III design report exist for the as-built components identified in Table 2.2.4-1 as ASME Code Section III.
Appendix C from the Combined License for Vogtle Units 3 and 4 and V.C. Summer Units 2 and 3	No. 224	2.2.04.04a	A report exists and concludes that the results of the hydrostatic test of the components identified in Table 2.2.4-1 as ASME Code Section III conform with the requirements of the ASME Code Section III.
Appendix C from the Combined License for Vogtle Units 3 and 4 and V.C. Summer Units 2 and 3	No. 235	2.2.04.08a.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.
Appendix C from the Combined License for Vogtle Units 3 and 4 and V.C. Summer Units 2 and 3	No. 236	2.2.04.08a.ii	A report exists to indicate the set pressure of the valves is less than 1305 psig.

## 5. LIST OF ACRONYMS USED

A2LA	American Association for Laboratory Accreditation
ADAMS	AgencyWide Document Access Management System
AFG	American Foundry Group
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
B&PV	boiler and pressure vessel
CAP	corrective action program
CGI	commercial-grade item
CGD	commercial-grade dedication
CMTR	certified material test report
CoC	certificate of calibration
CAR	corrective action report
CFR	<i>Code of Federal Regulations</i>
DCD	design control document
ECN	engineering change notice
EG	engineering guidance
EPRI	Electric Power Research Institute
GE	General Electric
ID	identification
IP	inspection procedure
IR	inspection report
ITAAC	inspections, tests, analyses, and acceptance criteria

LP	liquid penetrant
MCD	master control document
MSSV	main steam safety valve
M&TE	measuring and test equipment
NCR	nonconformance report
NDE	nondestructive examination
NON	notice of nonconformance
NOV	notice of violation
NQA	nuclear quality assurance
NRC	U.S. Nuclear Regulatory Commission
No.	number
NVLAP	National Voluntary Laboratory Accreditation
PMI	positive material identification
P/N	part number
PO	purchase order
PSI	pressure per square inch
PXS	Passive Core Cooling System
QA	quality assurance
QAM	quality assurance manual
QAP	quality assurance procedure
QC	quality control
QCP	quality control procedure
QCPR	quality control program requirements
QME	qualification of mechanical equipment
QP	qualification plan
QSM	quality system manual
QSP	quality system procedure
QSWI	quality system work instruction
RMA	return material authorization
TR	technical report
U.S	United States
WEC	Westinghouse Electric Corporation

## DOCUMENTS REVIEWED

### Procedures:

CAL 001, "General Rules for Calibration of Measuring & Testing Equipment," Revision 15, dated December 17, 2015

CAL 009, "Calibration of Pressure Gauges (Digital and Dial Type)" Revision 4, dated November 18, 2014

CAL 070, "Calibration of Hydrostatic Test Machines using Pressure Transducer Modules – CA3043, CA34044, CA3045, CA3046," Revision 1, dated July 8, 2014

CL1012, "Cleaning Instruction, Nuclear Safety and Safety Relief Valves," Revision 13, dated August 20, 2012

EG-029, "Qualifications and Duties of Personnel Engaged in ASME Boiler & Pressure Vessel Code, Section III, Division I Certifying Activities," Revision 11, dated June 7, 2010

EG-037, "Commercial Grade Dedication Program Nuclear Pressure Relief Valves," Revision 24, dated May 2, 2012

EG-039, "Control of Engineering Computer Programs & Lifecycle Management," Revision 15, dated December 23, 2015

EG 059, "Preparation of Customer NC Drawings," Revision 3, dated October 16, 2013.

EG-068, "Preparation of Valve Application Reports," Revision 3, dated February 28, 2007

EG 368, "Reconciliations of Replacement Parts, Items, and Materials," Revision 4, dated June 16, 2014

EG-374, "Design Reports," Revision 2, dated May 27, 2008

EG 428, "Reference Guidelines for QCP005," Revision 6, dated January 10, 2012

EG 490, "Final Inspection of Nuclear Products," Revision 7, dated February 4, 2014

EG-504, "Hardness Calculation for Safety Related Materials," Revision 4, dated June 30, 2014

OGQ-017.2, "Audit Finding Creation, Closure, and Verification," Revision 2.2

OCQ-0127.2, "Audit Finding Creation, Closure and Verification," Revision 2.2, dated February 11, 2016

OS-712, "Nuclear Order Control Instructions for AP1000 PWR (Vogtle & V.C. Summer)," Revision 8, dated March 8, 2016

QAM 1000 "Quality Assurance Manual ASME B&PV Code Section I, VIII, Division 1, & NBIC (VR) Program, Revision A, dated April 20, 2016

QCP-005, "Positive Material Identification," Revision 5, dated October 15, 2012

QCP 031, "Evaluation and Reporting of Defects and Noncompliance as Required by NRC Regulation 10 CFR Part 21," Revision A, dated April 14, 2014

QPM 1004, "Supplier Quality Assurance Manual," Revision 12, dated February 26, 2015

QSM-1000N, "Quality Assurance Manual ASME B&PV Code Section III & NR Program," Revision 4, dated October 6, 2015

QSM-1000N, "Quality Assurance Manual ASME B&PV Code Section III & NR Program," Revision C, dated April 8, 2016

QSP-2003, "Contract Review," Revision 1, dated July 12, 2014

QSP-2004, "Design Control," Revision 0, dated June 28, 2014

QSP-2006, "Supplier Selection Evaluation and Approval," Revision A, dated April 26, 2016

QSP-017, "Quality System Audits," Revision 1, dated April 30, 2015

QSP-018, "Training, Indoctrination and Qualification," Revision 3, dated February 17, 2015

QSP-2001, "Management Responsibility," Revision 4, dated December 18, 2014

QSP-2008, "Material/Product Identification and Traceability," Revision 4, dated October 7, 2015

QSP2011, "Inspection, Measuring and Test Equipment," Revision 0, dated March 30, 2014

QSP2013, "Control of Nonconforming Item," Revision 4, dated July 30, 2015

QSP2014, "Continuous Improvement," Revision 3, dated June 2, 2015

QSP-2015, "Handling, Storage, Packaging, Preservation and Delivery," Revision 5, dated February 22, 2013

QSP-2021, "Quality Management Review," dated February 8, 2013

QSP-2022, "Testing New Construction Nuclear Valves at a Testing Laboratory," Revision 0, dated January 29, 2015

QSWI-3002, "Weld Filler Material Control," dated April 11, 2012

QSWI-3011, "Material Review Board Process," Revision 3, dated April 25, 2014

QSWI-3020, "Procedure for Hardness Testing of Components for Commercial Grade Dedication," Revision 2, dated July 31, 2013

#### Corrective Action Reports:

Finding ID 342, "Use of incorrect torque sheet," dated January 6, 2006

Finding ID 354, "Use of an isolation Valve between hydro test machines and gauge" dated March 10, 2006

Finding ID 172, "Lack of Annual Performance Assessment for American Foundry Group," dated February 6, 2014

Finding ID 176, "Supplier Qualification Records for Energy y& Process, Charles Larson & Sons, Patriot Forge and American Foundry Group," dated March 19, 2014

Finding 336, "NRC Safety Evaluation for Acceptance of Accreditation of Commercial Grade Dedication Services," dated June 29, 2015

Finding ID 361, "Storage of Austenitic Stainless Steel and Nickel base Alloy Materials," dated May 2, 2016

Finding ID 367, "Incorrect procedure: CAL070 Rev 1, Calibration of hydrostatic Test Machines using Pressure Transducer Modules," dated May 5, 2016

Corrective Action Reports Generated During Inspection:

Finding ID 361, Inadequate procedure or work instruction for preservation of product, dated May 2, 2016

Finding ID 362, Process or action not completed for design inputs, dated May 3, 2016

Finding ID 363, Inadequate procedure or work instruction for monitoring and measurement processes, dated May 4, 2016

Nonconformance Reports

NCR 147651, "Bonnet Assembly –Undersized Weld; Indention Weld," dated November 25, 2015

NCR 147683, "Rough Machine Base – RT Performed By unapproved Company," dated December 16, 2015

NCR 147823, "Spindle Assembly – Failed Hardness Test," dated February 21, 2016

NCR 147829, "Seating Ring – O.D. Undersized," dated March 2, 2016

NCR 147831, "Base Assembly – Dye Checked to Wrong Procedure; Welder Not Qualified," dated March 3, 2016

NCR 147836, "Guide Retaining Plug – Hole Not Centered," dated March 9, 2016

NCR 147846, "Base- Nozzle Thread Bore Oversized; Outlet Flanges Too Thick," March 16, 2016

NCR 147847, "Spindle Assembly – Failed hardness" Test," dated March 17, 2016

NCR 147607, "Bonnet Flange O.D. Undersized," dated March 29, 2016

NCR 147604, "Disc Holder – O-Ring Retainer Counterbore Undersized; Impression in Bottom of O-ring Chamber from Hydro Fixture," dated March 21, 2016

Commercial-Grade Dedication Documents

CGD Package for Georgia Power PO No. SNG10078319, GE/Dresser PO 642332, MCD No. 3NC3142, for ¾" 19126MCO-1-CC-DA-33-10-05-LA-NC3142 Valve Serial No. SR15003

CGD Package for Duke Energy Oconee PO No. 03005215 GE/Dresser PO 709984, MCD No. 0S353, S/O No. 20245318, Part No. VAH834CGD Spring Guide Assembly



CGD Package for Duke Energy Oconee PO No. 03005215, Item 3000 GE/Dresser PO 709984, MCD No. 0S353, S/O No. 20245318, Part No. VAH834ACGD Spindle Guide Assembly

CGD Package for Exelon Generation Company LLC, Dresden, PO No. 00550535, GE/Dresser PO 680109, MCD 3NC3158, Valve Serial No. SR15037 – ASME Section VIII safety-related valve Model No. 19110LCF-2, Part No. 19110LCF-2-CC-MS-33-05-05-LA-NC3158

CGD Package for Spindle Part No. 4840405CGD, S/N AKK21 on Production Order No. 20040774, for 2 pieces to ASTM B637 Type 2 nickel alloy, with S/N AKK22 scrapped on NCR 147560

CGD Package for Exelon Dresden PO No. 00569175, GE/Dresser PO 748886, MCD 0S333, Part No. 0735701CGD, for 2 spring cover 1S2SVX

Contract Order Review Workflow Form for Request No. 146194513 for Exelon dated February 2, 2016

Commercial Grade Calibration Services Supplier Calibrated M&TE Equipment Checklist for Dead Weight Tester ID 216278-D/216278 with C of Calibration certificate from Tinus Olsen, performed on receipt as part of CGD on May 3, 2016

Commercial Grade Calibration Services Supplier Calibrated M&TE Equipment Checklist for Wilson Hardness 524R Tester ID 80569503 with C of Calibration certificate from Instron, performed on receipt as part of CGD on March 11, 2016

Commercial Grade Calibration Services Supplier Calibrated M&TE Equipment Checklist for Test Gauge ID 8060011/40606/Master with C of Calibration certificate from JM Test System, performed on receipt as part of CGD on April 7, 2016

Commercial Grade Calibration Services Supplier Calibrated M&TE Equipment Checklist for Torque Tester ID 0814605628 with C of Calibration certificate from JM Test Systems, performed on receipt as part of CGD on December 7, 2015

Commercial Grade Calibration Services Supplier Calibrated M&TE Equipment Checklist for Temperature/Humidity Meter ID HYGRO002 with C of Calibration certificate from JM Test Systems, performed on receipt as part of CGD on February 1, 2016

#### Purchase Orders:

PO 2J5030-2, Purchase Order issued to General Equipment & Mfg. DBA TOPOWORX, for procurement of P/N 4298866, TOPOWORX Switch Model No. SV7-1X52X-E made from Topoworx switch model SV7-1X52X-E25-SV7 Switch with quick disconnect requiring seismically qualified to conform to IEEE 382-1996, IEEE-572-1985, IEEE-323-2003, IEEE-344-2004, IEEE-383-2003, with statement of Conformance to AP1000, dated July 5, 2012

PO 5050449103 Purchase Order issued to ZDAS A.S. for procurement of rough machined forgings ASME SA105, dated November 15, 2013

PO 7738271, Purchase Order from Nine Mile Point Nuclear Station for Electrometric Relief Valve, Revision 0, dated June 20, 2014

PO 5050585578, Purchase Order issued to Tinus Olsen Testing Machine Co, Inc., for calibration of 4 Dead Weight Tester machine, dated February 23, 2015

PO 5050621751, Purchase Order issued to Weldstar Company for procurement of 300 pounds of 3/16" SFA 5.1 AWS E7018/H4R weld rods, dated June 22, 2015

PO 03005215, Purchase Order from Duke Energy for Oconee Nuclear Station, for cotter pin, spring plunger, spring guide, dated September 14, 2015

PO 00557778, Purchase Order from Exelon Generation Company for Relief Valve, Revision 2, dated September 24, 2015

PO 5050667337 Purchase Order issued to TW Metals Inc., for procurement of 2 cap screws 1/4"-20 UNC-2 x 0.3125 ASME SA 449, Type 1 carbon steel, dated October 16, 2015

PO 5050669074, Purchase Order issued to Charles E. Larson & Sons Inc. for 3 forgings to ASME SA 182 Gr. 316L, dated October 21, 2015

PO 5050628832, Purchase Order issued to AREVA NP GMBH, Germany, for AP1000 MSSV Qualification Test per ASME QME-1-2007, dated January 6, 2016

PO 00569175, Purchase Order from Exelon Dresden for Spring Cover SA 479 Type 304 for Valve Model No. 1525vx-3, dated January 28, 2016

PO 505070461, Purchase Order issued to JM Test System Inc., for calibration of Sperian Biosystem Multipurpose, dated February 9, 2016

PO 1010128641, Purchase Order issued to Illinois Tool Works Inc. dba Instron for calibration services of Twin Tester, Rockwell Tester, dated February 19, 2016

PO 6098010S712, Purchase Order issued to Shapes Group LTD Co, for machining services of base Class 2, Qty 12 pieces for GE Oil & Gas supplied forged material to drawing, with 100 percent dimensional inspection, Revision 2, dated April 1, 2016

PO 5050726805, Purchase Order to Goel, Inc. for Part Number 61008010S712, Class A nozzle, Revision 3, dated April 6, 2016

PO 5050729054, Purchase Order issued to Energy & Process Corporation, for 4 heavy hex nuts 0.625"-11 UNC ASME SA194 Gr. 6, dated April 7, 2016

PO 5050730738, Purchase Order issued to ANA Laboratories Corporation, for conduct of demineralization water analysis, dated April 12, 2016

PO 5050726856, Purchase Order to Shapes Group Limited for Part Number 60989010S712, Class A base, Revision 2, dated April 20, 2016

PO 5050726432, Purchase Order to Goel, Inc. for Part Number 61000010S712, Class A bonnet, Revision 2, dated April 20, 2016

PO 5050729583, Purchase Order to Shapes Precision Manufacturing for Part Number 75064010S712, Class C upper adjusting ring, Revision 2, dated April 21, 2016

PO 5050729585, Purchase Order to Shapes Precision Manufacturing for Part Number 75067010S712, Class B compression screw, Revision 2, dated April 21, 2016

PO 5050737256, Purchase Order to Goel, Inc. for Part Number 75063010S712, Class C lower adjusting ring, dated April 27, 2016

Westinghouse Electric Corporation (WEC) PO 4500365096, "Purchase Order No. 4500365096 for AP1000 PV65-Z0D-100 Main Steam Safety Valves for V.C. Summer 2 & 3," Revision 0, dated October 25, 2010

WEC PO 4500365096, "Purchase Order No. 4500365096 for AP1000 PV65-Z0D-100 Main Steam Safety Valves for Vogtle 3 & 4," Revision 0, dated October 25, 2010

WEC PO 4500365096, "Purchase Order No. 4500365096 Change Notice No. 1, for AP1000 PV65 Main Steam Safety Valves for Vogtle 3 & 4," Change No. 1, dated January 24, 2011, invokes APP-PV65-VFX-001, Revision 2 that supersedes previous document.

WEC PO 4500365096, "Purchase Order No. 4500365096 Change Notice No. 2, for AP1000 PV65 Main Steam Safety Valves for Vogtle 3 & 4," Change No. 2, dated July 3, 2012, change of scope to add seismically qualified Topworx switches for valves including modified bracketing and engineering expenses and releases Revision 5 of Released Document List APP-PV65-VFX-001

WEC PO 4500365096, "Purchase Order No. 4500365096 Change Notice No. 3, for AP1000 PV65 Main Steam Safety Valves for Vogtle 3 & 4," Revision 2, dated August 13, 2012

WEC PO 4500365096, "Purchase Order No. 4500365096 Change Notice No. 4, for AP1000 PV65 Main Steam Safety Valves for Southern Vogtle 3 & 4," dated January 28, 2013, invokes APP-PV65-VFX-001, Revision 7

WEC PO 4500365096, "Purchase Order No. 4500365096 Change Notice No. 5, for AP1000 PV65 Main Steam Safety Valves for Vogtle 3 & 4," dated March 7, 2013, invokes APP-PV65-VFX-001, Revision 8

WEC PO 4500365096, "Purchase Order No. 4500365096 Change Notice No. 6, for AP1000 PV65 Main Steam Safety Valves for Vogtle 3 & 4," dated May 22, 2013, invokes APP-PV65-Z5-003, Revision 0 Appendix 3, "Technical and Quality Requirements for the Procurement and Delivery of PV65 MSSV, ASME Section III, Class 2 for AP1000 plants

### Training and Qualification Records

Cantrell, J., Lead Auditor, dated April 29, 2015  
Cave, R., Lead Auditor, dated April 16, 2012  
Dickson, J., Registered Professional Engineer, dated March 4, 2016  
Raila, M., Auditor, dated March 16, 2015  
Smalls, J., Lead Auditor, dated November 11, 2015  
Weis, M., Auditor, dated April 29, 2015  
Vailane, G., Auditor, dated May 7, 2015  
Watz, J., Lead Auditor, dated April 29, 2015

### Drawings

GE Oil & Gas design report (DR)11-003, "Design Report  
DR11-003 3707SA-RT-25-AP-XTF-NC2051 Main Steam Safety Valve for WEC V.C.  
Summer, Vogtle Purchase Order," Revision 02, date

AREVA Report No. PTCTC-G/2015/en/0111, "Test Report on the Qualification Tests for  
GE Oil & Gas Main Steam Safety Valve performed at the Large Valve Test Facility GAP,"  
Revision A, dated January 29, 2016

GE Oil & Gas Engineering Change Notification (ECN) No. 500000205903, "8"  
3707SA-RT25-AP-XTP1NC2050/NC2051," for Traveler No. 147541291 for WEC,  
Revision 0, dated March 15, 2016

GE Oil & Gas Master Control Document No. 3NC3158. "Quality Control Plan Section VIII,"  
Valve Code 19119LCF-2-CC-MS-33-05-LA-NC3158

GE Oil & Gas Drawing No. 4NC2051, "Valve Code 8"3707SA-RT25-AP-XTF1-NC2051,  
Valve Type 3700 Series, Bill of Material 90030803, Vogtle," Revision v0, dated  
April 22, 2016

GE Oil & Gas Drawing No. 4NC2051, "Valve Code 8"3707SA-RT25-AP-XTF1-NC2051,  
Valve Type 3700 Series, Bill of Material 90030803, V.C. Summer," Revision 0, dated  
April 22, 2016

GE Oil & Gas Contract Review Form QA173, for Exelon Generation Company PO  
No. 00550535 Revision 0, accepted as written on May 22, 2015, for Dresser Order  
No. 680109 Item 001 3NC3158 ASME Section VIII

### External Audits/Supplier Surveys

GE Oil & Gas calibration\_on-site\_survey of JM Test Systems performed on May 4, 2013, by  
Richard Cave

GE Oil & Gas ASME Section III audit of Areva NP GMBH, Germany test facility performed  
from May 28-29, 2015, by Richard Cave, approved for ASME QME-1 main steam safety  
valve qualification test facility

GE Oil & Gas ASME Section III NCA 3800 audit of TW Metals performed from March 5-6, 2013 by Richard Cave, approved for material organization provider of ASME Section III materials

GE Oil & Gas Appendix B limited scope audit of Shapes Precision Machining performed on March 14- 16, 2016, approved for machining of items to GE Oil & Gas supplied materials and drawings

GE Oil & Gas limited scope ASME NCA-3800 audit of Goel Inc., dba Hardy Machine & Design performed on May 13-14, 2015

GE Oil & Gas limited scope Appendix B audit of Savoy D Services performed on May 21-22, 2015 by Richard Cave, approved for NDE services

GE Oil & Gas ASME NCA 3800 audit of Energy & Process performed on June 18-20, 2014, performed by Richard Cave, approved as a material organization

GE Oil & Gas ASME NCA 3800 audit of ZDAS a.s. Metallurgy performed on October 29-31, 2014, approved as a material organization

GE Oil & Gas ASME NCA 3800 audit of American Foundry Group performed on February 16-17, 2016, approved as ASME NCA 3800 material organization supplying castings

Other documents:

Calibration Record for Pressure Transducer Modules, Machine Number CA3044, Pressure Transducer Serial Number 05131318, calibrated by Mark Devine on January 4, 2016

Calibration Record for Pressure Transducer Modules, Machine Number CA3044, Pressure Transducer Serial Number 06040806, calibrated by Mark Devine on January 4, 2016

Calibration Record for Pressure Transducer Modules, Machine Number CA3044, Pressure Transducer Serial Number 05131318, calibrated by Mark Devine on February 1, 2016

Calibration Record for Pressure Transducer Modules, Machine Number CA3044, Pressure Transducer Serial Number 06040806, calibrated by Mark Devine on February 1, 2016

Calibration Record for Pressure Transducer Modules, Machine Number CA3044, Pressure Transducer Serial Number 05131318, calibrated by Mark Devine on March 10, 2016

Calibration Record for Pressure Transducer Modules, Machine Number CA3044, Pressure Transducer Serial Number 06040806, calibrated by Mark Devine on March 10, 2016

Calibration Record for Pressure Transducer Modules, Machine Number CA3044, Pressure Transducer Serial Number 05131318, calibrated by Mark Devine on March 16, 2016

Calibration Record for Pressure Transducer Modules, Machine Number CA3044, Pressure Transducer Serial Number 06040806, calibrated by Mark Devine on March 16, 2016

Calibration Record for Pressure Transducer Modules, Machine Number CA3044, Pressure Transducer Serial Number 06040806, calibrated by Mark Devine on March 21, 2016

Calibration Record for Pressure Transducer Modules, Machine Number CA3044, Pressure Transducer Serial Number 05131318, calibrated by Mark Devine on March 21, 2016

Calibration Record for Pressure Transducer Modules, Machine Number CA3044, Pressure Transducer Serial Number 05131318, calibrated by Mark Devine on March 29, 2016

Calibration Record for Pressure Transducer Modules, Machine Number CA3044, Pressure Transducer Serial Number 06040806, calibrated by Mark Devine on March 29, 2016

Calibration Record for Pressure Transducer Modules, Machine Number CA3044, Pressure Transducer Serial Number 06040806, calibrated by Mark Devine on May 4, 2016

Calibration Record for Pressure Transducer Modules, Machine Number CA3044, Pressure Transducer Serial Number 05131318, calibrated by Mark Devine on May 4, 2016

Certificate of Calibration for Hydraulic D/W Tester (6611-91) by JM Test Systems, dated May 17, 2011

Certificate of Calibration for Hydraulic D/W Tester (6611-91) by JM Test Systems, dated May 6, 2013

Certificate of Calibration for Hydraulic D/W Tester (6611-91) by JM Test Systems, dated April 27, 2015

Internal/Self Audit Plan for Complete Review of Nuclear and Commercial Audit Program, dated February 2, 2015

Internal/Self Audit Plan for Management & Training, dated February 8, 2016

Internal/Self Audit Summary for Management & Training, dated February 29, 2016

Internal/Self Audit Plan for Material Handling, dated March 1, 2016

Internal/Self Audit Summary for Material Handling, dated March 31, 2016

Internal/Self Audit Plan for Traceability, dated April 14, 2016

Order Review Workflow Form – Request #138999607 for Exelon Generating Co., dated August 24, 2015

GE Oil & Gas Order Review Workflow Form Request No. 140047455 for Duke Energy PO No. 03005215 dated, September 15, 2015

Return Material Authorization (RMA) 2000045813, “Spring Assemble Replacement” dated October 8, 2014

RMA 2000029988, “Seat Bushing Returned” for Burrs,” dated December 5, 2014

RMA 2000064029, "PT not performed on 46590704OS358," dated November 20, 2015  
Certified Material Test Report from Energy & Process Corporation for Disc Blank  
P/N 4697068N, dated December 8, 2015

Task details for Audit of Traceability Requirements in Gensuite Compliance Calendar, dated  
April 26, 2016

2015-FW10-IndSys-Alexandria-MC-FPT Independent System Audit, Summary of Major  
Finding #1 from closing meeting presentation, dated March 6, 2015

Continuous Improvement Plan #125, Audit Findings, dated May 14, 2015

WEC Document No. APP-PV65-Z0-001, "Design Specification- PV65 Main Steam Safety  
Valves ASME Section III, Class 2," Revision 8, dated January 31, 2013

WEC Document No. APP-PV65-Z0R-001, "Main Steam Safety Valves (MSSV), Section III,  
Class 2, Valve Data Sheet Report," Revision 6, dated February 26, 2015

GE Oil & Gas Test Procedure No. PTCTC-G2015/en/0082, "Test Procedure for the  
Qualification Test accordance to ASME QME-1-2007 for a 8" Class 1500 Spring loaded  
safety valve," Revision A, dated October 8, 2015

GE Oil & Gas VA-292, "Valve Application Report," Revision 2, dated May 2, 2016

GE Oil & Gas Qualification Plan (QP)-15-01, "Qualification Plan for Main Steam Safety  
Valve For Westinghouse Electric Company LLC., V. C. Summer, Vogtle Purchase Order  
No. 4500365095, Dresser Project: 1AX-1810-000001 & 1AX-1810-000002," Revision 2,  
dated March 3, 2016

GE Oil & Gas Inspection and Test Plan, 712, "Nuclear Order Control Instructions,"  
Revision 8, dated March 8, 2016

TOPWORX Test Report (TR)-SV7-GL2010S, "Safety-Related Class Outside Containment  
High Energy Line Break (HELB) Qualification Report for TOPWORX Model SV7,"  
Revision 2, dated November 2, 2012

GE Oil & Gas TR-0643, "Technical Evaluation of Pressure Relief Valves and Parts for  
Commercial Grade Application," Revision 3, dated January 10, 2013

GE Oil & Gas TR-0657, "Design Methodology for Safety Valves, Safety Relief Valves and  
Pilot Operated Valves," Revision 1, dated June 29, 2012

GE Oil & Gas Production Order/Operation List for Production Order No. 19938029 for  
Georgia Power PO No. SNG10078319, Valve Serial No. SR15003, GE/Dresser PO 642332

GE Oil & Gas VA-236, "Valve Application Report for MCD 3NC3142, Valve Code ¾" 19126  
MCO-1-CC-DA-33-10-05-LA-NC3142 ASME Section VIII Pressure Relief Valve," Revision 0,  
dated October 22, 2007

National Voluntary Laboratory Accreditation Program (NVLAP) No. 200301-0 for Instron  
Calibration Laboratory, expiration March 31, 2017

American Association for Laboratory Accreditation (A2LA) No. 0637.01 for ANA-Lab May Corporation, expiration May 31, 2017

A2LA Certification No. 0887.01, for Tinius Olsen, expiration August 31, 2017

A2LA Certification No. 1995.02, dated January 8, 2015, for JM Test Systems, Inc. for calibration services of mechanical, electrical, pressure, flow and temperature

A2LA Certification No. 1995.01, dated December 22, 2014, for JM Test Systems, Inc. for calibration services,

Certification of Calibration from JM Test Systems for Torque Wrench ID 8060141/163, for GE Oil & Gas Po No. 1010122633, dated November 23, 2015

Certification of Calibration from JM Test Systems for Test Gauge ID 8060011/40606 Master for GE Oil & Gas PO No. 101030556, dated April 5, 2016

Certification of Calibration from JM Test Systems for Temperature/Humidity Meter ID HYGRO002 for GE Oil & Gas PO No. 1010126193, dated January 26, 2016

Certification of Calibration Report from Instron for Wilson hardness tester ID 80569503 for GE Oil & Gas PO No. dated March 11, 2016,

Certification of Calibration Report from Tinius Olsen for Dead Weight Tester S/Ns 216278-d. 216278, 216278 for GE Oil & Gas PO No. 101028631, dated March 31, 2016

Verification and Validation Report of 2013 Solidworks simulation (Finite Element Analysis) and 2013 Solidworks Flow simulation (Computational Fluid Dynamics) software performed in accordance with GE Oil & Gas TR-0657 and EG-039 dated January 2013

Validation and Verification Report of VIB, Revision 1 computer software performed by Engineer and reviewed and approved by Requisition Engineering manager October 16, 2012, per EG039 and program verification independent verification of Revision 1 on June 17, 2015

Validation and Verification Report for FLANGE VERSION, Revision 6 computer software performed by Engineer and reviewed and approved by Requisition Engineering manager July 29, 2009, per EG039 and program verification independent verification of Revision 1 on June 17, 2015