



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

July 28, 2021

Ms. Memarie Burke  
Director of Quality Assurance  
Trillium Valves USA  
29 Old Right Road  
Ipswich, MA 01938

SUBJECT: NUCLEAR REGULATORY COMMISSION VENDOR INSPECTION REPORT OF  
TRILLIUM VALVES USA, NO. 99902092/2021-201

Dear Ms. Burke:

From June 14 through June 18, 2021, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at Trillium Valves USA's (hereafter referred to as Trillium) facility in Ipswich, MA. The purpose of this limited-scope routine inspection was to assess Trillium's compliance with provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21, "Reporting of Defects and Noncompliance," and selected portions of Appendix B, "Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities."

This technically-focused inspection specifically evaluated Trillium's implementation of the quality activities associated with the design, fabrication, and testing of safety-related valves being supplied to U.S. nuclear power plants for operating reactors. The enclosed report presents the results of the inspection. This NRC inspection report does not constitute NRC endorsement of Trillium's overall quality assurance (QA) or 10 CFR Part 21 programs.

Based on the results of this inspection, the NRC inspection team found that the implementation of your QA program met the applicable technical and regulatory 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 and its enclosure through the NRC's 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>.

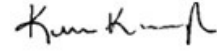
If you have any questions concerning this matter, please contact Mr. Aaron Armstrong of my staff at (301) 415-8396.

M. Burke

2

Sincerely,

Kerri A. Kavanagh, Chief



Signed by Kavanagh,  
on 07/28/21

Quality Assurance and Vendor Inspection Branch  
Division of Reactor Oversight  
Office of Nuclear Reactor Regulation

Docket No.: 99902092

EPID No.: I-2021-201-0044

Enclosures:

1. Inspection Report No. 99902092/2021-201  
and Attachment

SUBJECT: NUCLEAR REGULATORY COMMISSION VENDOR INSPECTION REPORT OF TRILLIUM VALVES USA, NO. 99902092/2021-201 Dated: July 28, 2021

**DISTRIBUTION:**

Memarie.Burke@trilliumflow.com

ASakadales

ConE\_Resource

CMiller

JNakoski

KMorgan-Butler

NRR\_DRO\_IQVB Distribution

**ADAMS Accession No.:** ML21201A328**NRR-106**

<b>OFFICE</b>	NRR/DRO/IQVB	NRR/DRO/IQVB	NRR/DRO/IQVB
<b>NAME</b>	AArmstrong	DPark	OAyegbusi
<b>DATE</b>	07/27/2021	07/27/2021	07/27/2021
<b>OFFICE</b>	NRR/DRO/IQVB	NRR/DEX/EMIB	NRR/DRO/IQVB
<b>NAME</b>	YDiaz-Castillo	ITseng	KKavanagh
<b>DATE</b>	07/27/2021	07/27/2021	07/28/2021

**OFFICIAL RECORD COPY**

**U.S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
DIVISION OF REACTOR OVERSIGHT  
VENDOR INSPECTION REPORT**

Docket No.: 99902092

Report No.: 99902092/2021-201

Vendor: Trillium Valves USA  
29 Old Right Road  
Ipswich, MA 01938

Vendor Contact: Ms. Memarie Burke  
Director of Quality Assurance  
Email: Memarie.Burke@trilliumflow.com  
Office: (978) 825-2553

Nuclear Industry Activity: Trillium Valves USA's (hereafter referred to as Trillium) is an American Society of Mechanical Engineers (ASME) nuclear Certificate Holder. Trillium's scope of supply for the U.S. nuclear power plants includes the design, manufacture, and testing of ASME safety-related valves for operating reactors.

Inspection Dates: June 14-18, 2021

Inspectors:	Aaron Armstrong	NRR/DRO/IQVB	Team Leader
	Dong Park	NRR/DRO/IQVB	
	Odunayo Ayegbusi	NRR/DRO/IQVB	
	Yamir Diaz-Castillo	NRR/DRO/IQVB	
Technical Specialists:	Ian Tseng	NRR/DEX/EMIB	Remote
	Thomas Scarbrough	NRR/DEX/EMIB	Remote
	Bedi Gurjendra	NRR/DEX/EMIB	Remote

Approved by: Kerri A. Kavanagh, Chief  
Quality Assurance and Vendor Inspection Branch  
Division of Reactor Oversight  
Office of Nuclear Reactor Regulation

Enclosure

## **EXECUTIVE SUMMARY**

Trillium Valves USA  
99902092/2021-201

The U.S. Nuclear Regulatory Commission (NRC) staff conducted a routine vendor inspection at the Trillium Valves USA's (hereafter referred to as Trillium) facility in Ipswich, MA, 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," and 10 CFR Part 21, "Reporting of Defects and Noncompliance." In addition, the NRC inspection team verified that Trillium had implemented a program in accordance with the applicable requirements of Section III, "Rules for Construction of Nuclear Facility Components," Section V, "Nondestructive Examination," and Section IX, "Welding, Brazing, and Fusing Qualifications," of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, and the American Society for Nondestructive Testing SNT-TC-1A, "Personnel Qualification and Certification in Nondestructive Testing." The NRC inspection team conducted the inspection on June 14-18, 2021. This was the third NRC inspection at Trillium's (formally known as Weir Valves & Controls USA, Inc.) facility in Ipswich, MA.

This technically-focused inspection specifically evaluated Trillium's implementation of quality activities associated with the design, manufacturing, and testing of safety-related valves provided to U.S. nuclear power plants for operating reactors.

The following regulations served as the basis for the NRC inspection:

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

During this inspection, the NRC inspection team implemented Inspection Procedure (IP) 43002, "Routine Inspections of Nuclear Vendors," dated January 27, 2017, IP 43004, "Inspection of Commercial-Grade Dedication Programs," dated January 27, 2017, and IP 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance," dated May 16, 2019.

The NRC inspection team observed the following specific activities:

- Plasma and gas tungsten arc hardsurfacing on a 24-inch poppet main steam isolation valve, SA105, Class 1, ASME B&PV Code Section III, 1971 edition
- Liquid penetrant testing (PT) of a body and ring for a 12-inch swing check valve, SA351, Class 1, ASME B&PV Code Section III, 1968 edition

The NRC inspection team concluded that Trillium's QA policies and procedures comply with the applicable requirements of Appendix B to 10 CFR Part 50 and 10 CFR Part 21, and that Trillium's personnel are implementing these policies and procedures effectively. The results of this inspection are summarized below.

### 10 CFR Part 21 Program

The NRC inspection team reviewed Trillium's policies and implementing procedures that govern the implementation of its 10 CFR Part 21 program to verify compliance with the requirements of 10 CFR Part 21. The NRC inspection team: (1) reviewed the 10 CFR Part 21 postings; (2) reviewed a sample of purchase orders (POs); and (3) verified that Trillium's nonconformance and corrective action procedures provide a link to the 10 CFR Part 21 program. No findings of significance were identified.

### Design Control

The NRC inspection team reviewed Trillium's policies and procedures that govern the implementation of its design control program to verify compliance with the requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50 and with the applicable requirements of Subsection NCA, "General Requirements for Division 1 and Division 2," Subsection NB, "Class 1 Components," Subsection NC, "Class 2 Components," and Subsection ND, "Class 3 Components," of Section III of the ASME B&PV Code. The NRC inspection team focused on the design review and design change processes to confirm design activities were performed consistent with NRC regulations and internal Trillium programs. The NRC inspection team reviewed a sample of Trillium's POs and valve drawings to confirm that the applicable requirements were satisfied and that comments were appropriately resolved. The NRC inspection team reviewed and discussed a sample of seismic qualification reports, including discussions with Trillium regarding its approach for demonstrating the seismic qualification of its manufactured valves, and the review of Trillium calculation procedures used for seismic qualification. No findings of significance were identified.

### Commercial-Grade Dedication

The NRC inspection team reviewed Trillium's policies and implementing procedures that govern the implementation of its commercial-grade dedication (CGD) program to verify compliance with the requirements of Criterion III and Criterion VII, "Control of Purchase Material, Equipment, and Services," of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed and evaluated a sample of completed CGD documentation including technical evaluations used to identify critical characteristics and acceptance criteria. No findings of significance were identified.

### Supplier Oversight and Internal Audits

The NRC inspection team reviewed Trillium's policies and implementing procedures that govern the implementation of its supplier oversight and internal audits programs 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. The NRC inspection team reviewed a sample of POs and confirmed that the POs contained the applicable technical and regulatory requirements. In addition, the NRC inspection team reviewed a sample of external and internal audit reports and confirmed that the external and internal audits were performed by qualified individuals using checklists and/or procedures, the checklists and/or procedures included an audit plan, documented objective evidence, audit results, and a review of audit results by responsible management. No findings of significance were identified.

### Control of Measuring and Test Equipment

The NRC inspection team reviewed Trillium's policies and implementing procedures that govern the implementation of its 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. The NRC inspection team observed that M&TE was calibrated, labeled, tagged, handled, stored, or otherwise controlled to indicate the calibration status and its traceability to nationally recognized standards. In addition, the NRC inspection team confirmed that when M&TE is found to be out of calibration, Trillium initiates an M&TE Report Form (i.e., nonconformance report) and performs an evaluation to determine the extent of condition. No findings of significance were identified.

### Manufacturing Control

The NRC inspection team reviewed Trillium's policies and implementing procedures that govern the implementation of its manufacturing control program to verify compliance with the requirements of Criterion IX, "Control of Special Processes," of Appendix B to 10 CFR Part 50, and the applicable requirements of Section III, Section V and Section IX of the ASME B&PV Code and SNT-TC-1A. The NRC inspection team witnessed the PT of a body and ring for a 12-inch swing check valve and plasma and gas tungsten arc hardsurfacing on a 24-inch poppet main steam isolation valve. The NRC inspection team also reviewed a sample of the training and qualification records for nondestructive examination and welding personnel. No findings of significance were identified.

### Nonconforming Material, Parts, or Components and Corrective Action

The NRC inspection team reviewed Trillium's policies and implementing procedures that govern the implementation of its nonconforming materials, parts, or components and corrective action programs 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 verified that the procedures contained sufficient guidance for evaluating non-conforming conditions and the procedures ensure that conditions are evaluated for possible corrective action or for 10 CFR Part 21 applicability. The NRC inspection team reviewed a sample of non-conforming reports (NCRs), corrective action reports (CARs) and supplier corrective actions (SCAs) to verify that they demonstrate compliance with regulatory requirements and adherence to Trillium's procedures.

In addition, the NRC inspection team reviewed the implementation and closure of the corrective actions opened to address the Notice of Nonconformances documented in the NRC's inspection report No. 99900746/2013-201, dated March 21, 2013. No findings of significance were identified.

## **REPORT DETAILS**

### 1. 10 CFR Part 21 Program

#### a. Inspection Scope

The NRC inspection team reviewed Trillium Valves USA's (hereafter referred to as Trillium) policies and implementing procedures that govern the implementation of its Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21, "Reporting of Defects and Noncompliance," program to verify compliance with the regulatory requirements. In addition, the NRC inspection team reviewed the 10 CFR Part 21 postings and a sample of Trillium'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 Trillium's nonconformance and corrective action procedures provide a link to the 10 CFR Part 21 program.

The NRC inspection team reviewed a sample of 10 CFR Part 21 evaluations performed within the past three years and confirmed that Trillium had effectively implemented the requirements for evaluating deviations and failures to comply. The NRC inspection team verified that Trillium's procedure directs notifications be performed in accordance with the requirements of 10 CFR 21.21, as applicable. Trillium provided sufficient documentation to support their engineering judgements regarding potential 10 CFR Part 21 reportability over the period of the past three years.

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

#### b. Observations and Findings

No findings of significance were identified.

#### c. Conclusion

The NRC inspection team concluded that Trillium is implementing its 10 CFR Part 21 program in accordance with the regulatory requirements of 10 CFR Part 21. Based on the limited sample of documents reviewed, the NRC inspection team also determined that Trillium 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 Trillium's policies and implementing procedures that govern the implementation of its design control program to verify compliance with the requirements of Criterion III, "Design Control," 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," and the requirements in Subsection NCA, "General Requirements for Division 1 and Division 2";



Subsection NC, "Class 2 Components"; and Subsection ND, "Class 3 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 reviewed a sample of POs for several valves for specific nuclear power plant licensees to confirm that the applicable requirements were satisfied. The NRC inspection team also reviewed a sample of Certified Material Test Reports, Hydrostatic Test Reports, Design/Seismic Reports, Weak Link Analysis, and Valve Drawings. Where the purchaser provided written comments on the Trillium documentation, the NRC inspection team reviewed a sample of the Trillium responses to confirm that the comments were appropriately resolved. The NRC inspection team reviewed and discussed the Trillium calculation procedure describing the static deflection testing to demonstrate the seismic qualification of the sampled butterfly valve. For the static deflection testing, the Trillium calculation procedure described the static load applied to the valve assembly, the location and axis of the applied static load, and the test acceptance criteria. These calculations were performed on an individual valve basis and not on a generic basis.

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

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The NRC inspection team concluded that Trillium is implementing 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 Trillium 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 Trillium's policies and implementing procedures that govern the implementation of its commercial-grade dedication (CGD) program to verify 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.

The NRC inspection team reviewed a sample of CGD plans, reports, and commercial-grade surveys of two commercial suppliers to assess the different elements of the CGD program. The NRC inspection team verified that the technical evaluations documented the criteria for the identification of item functions, credible failure mechanisms/modes, selection of critical characteristics and acceptance criteria, the identification of verification methods, and justification of the sampling methodologies as applicable. Furthermore, the NRC inspection team reviewed the CGD packages, associated drawings, and inspection reports for custom order package No. 20016100 for a piston seal and custom order package No. 20016103 for rod seals. The NRC inspection team verified that: (1) the critical characteristics and acceptance methods were correctly

specified; (2) the drawings and material specifications containing the associated acceptance criteria for each critical characteristic were referenced; and (3) the inspection reports adequately documented the acceptance of the critical characteristics to verify effective implementation of Trillium's CGD process.

The NRC inspection team also discussed the CGD program with Trillium's management and technical staff. The attachment to this inspection report lists the documents reviewed and personnel interviewed by the NRC inspection team.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The NRC inspection team concluded that Trillium is implementing 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 and activities observed, the NRC inspection team determined that Trillium 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 Trillium's policies and implementing procedures that govern the implementation of its supplier oversight and internal audits programs to verify compliance with the requirements of Criterion IV, "Procurement Document Control," and Criterion VII, "Control of Purchased Material, Equipment, and Services," and Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50.

The NRC inspection team reviewed a sample of external and internal audits, and the most recent POs for these suppliers, as applicable. For the sample of POs reviewed, the NRC inspection team verified that the POs included, as appropriate: the scope of work, right of access to facilities, and extension of contractual requirements to sub-suppliers. The NRC inspection team also confirmed that the POs adequately invoked the applicable technical, regulatory, and quality requirements.

For a 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 Trillium's responsible management. In addition, the NRC inspection team also verified that the audits were performed by a qualified auditor, 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 Trillium's lead auditors and confirmed that auditing personnel had completed all the required training and had maintained the applicable qualification and certification in accordance with Trillium's procedures.

The NRC inspection team also discussed the supplier oversight and internal audits programs with Trillium's management and technical staff. The attachment to this inspection report lists the documents reviewed and personnel interviewed by the NRC inspection team.

b. Observations and Findings

During the review of a sample of safety-related POs, the NRC inspection team noted that two POs did not invoke the applicable regulatory requirements. Specifically, the POs for mechanical and electropolishing services and for non-destructive testing services did not require the work to be performed under the suppliers' Appendix B to 10 CFR Part 50 and 10 CFR Part 21 programs. The NRC inspection team determined this issue to be minor because the POs did require the work to be performed under the suppliers' Appendix B Quality Assurance (QA) manual that was reviewed and approved by Trillium. In addition, the audit reports for these suppliers showed that Trillium verified that the suppliers were implementing a 10 CFR Part 21 program. Trillium initiated corrective action report (CAR) No. 1040 to address this issue.

c. Conclusion

The NRC inspection team concluded that Trillium is implementing 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 and activities observed, the NRC inspection team also determined that Trillium is implementing its policies and procedures associated with the supplier oversight and internal audits programs. No findings of significance were identified.

5. Control of Measuring and Test Equipment

a. Inspection Scope

The NRC inspection team reviewed Trillium's policies and implementing procedures that govern the implementation of its control of measuring and test equipment (M&TE) program to verify compliance with the regulatory requirements of Criterion XII, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50.

For a sample of M&TE, 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. Furthermore, the NRC inspection team also verified that the selected M&TE was calibrated using procedures traceable to known industry standards. The NRC inspection team confirmed that when M&TE equipment is found to be out of calibration, Trillium generates an M&TE nonconformance report (NCR) to identify items that have been accepted using this equipment since the last valid calibration date and to perform an extent of condition review.

The NRC inspection team performed a walk-down of Trillium's laboratories to observe that M&TE 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 NRC inspection team observed the calibration of an internal caliper and confirmed that the calibration was performed in accordance with Trillium's procedures.

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

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The NRC inspection team concluded that Trillium is implementing its control of 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 and activities observed, the NRC inspection team also determined that Trillium is implementing its policies and procedures associated with the control of M&TE program. No findings of significance were identified.

6. Manufacturing Control

a. Inspection Scope

The NRC inspection team reviewed Trillium's policies and implementing procedures that govern the implementation of its manufacturing control program to verify compliance with the regulatory requirements of Criterion IX, "Control of Special Processes," of Appendix B to 10 CFR Part 50, the applicable requirements of Section III, "Rules for Construction of Nuclear Facility Components," Section V, "Nondestructive Examination," and Section IX, "Welding and Brazing Qualification," of the ASME B&PV Code, and the American Society for Nondestructive Testing (ASNT) Recommended Practice SNT-TC-1A, "Personnel Qualification and Certification in Nondestructive Testing."

The NRC inspection team witnessed plasma and gas tungsten arc hardsurfacing on a 24-inch poppet main steam isolation valve, SA105, Class 1, ASME B&PV Code Section III, 1971 edition. The NRC inspection team also witnessed the liquid penetrant testing of a body and ring for a 12-inch swing check valve, SA351, Class 1, ASME B&PV Code Section III, 1968 edition. The NRC inspection team witnessed the application and removal of the liquid penetrant, the drying of the treated surface, the application of dry developer, and the surface examination and acceptance of the part. The NRC inspection team confirmed that the examination was performed in accordance with the applicable Trillium procedures the requirements of Section V of the ASME B&PV Code. The NRC inspection team verified that the non-destructive examination (NDE) inspector used calibrated equipment that was within the applicable inspection range.

In addition, the NRC inspection team reviewed Trillium's NDE and welding personnel training and qualification records and confirmed that the personnel had completed the required training and had maintained their qualifications in accordance with Trillium

procedures and the requirements of ASNT SNT-TC-1A, Section III, Section V, and Section IX of the ASME B&PV Code, as applicable.

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

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The NRC inspection team concluded that Trillium is implementing 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 Trillium is implementing its policies and procedures associated with the manufacturing control program. No findings of significance were identified.

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

a. Inspection Scope

The NRC inspection team reviewed Trillium's policies and implementing procedures that govern the control of nonconformances and corrective action 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 that Trillium's processes and procedures provide for the identification, documentation, segregation, evaluation, and disposition of nonconforming items. These processes also apply the principles of rework/repair, scrap, return to vendor (RTV), or "use as-is." The NRC inspection team also reviewed that Trillium's nonconformance process provides guidance to evaluate nonconformances for reportability under Trillium's 10 CFR Part 21 program. The nonconformance process is also linked to the corrective action program.

The NRC inspection team observed Trillium's assembly floor and verified that nonconforming materials were properly identified, marked, and segregated, when practical, to ensure that they were not reintroduced into the production processes.

The NRC inspection team reviewed the implementation of Trillium's new computer database system. Trillium personnel demonstrated the issue tracking and response capabilities of the system that was implemented after the last NRC inspection in 2013. The NRC inspection team reviewed a sample of NCRs associated with the production of safety related valves and confirmed that Trillium: (1) dispositioned the NCRs in accordance with the applicable procedures; (2) documented an appropriate technical justification for the dispositions; and (3) took adequate corrective action regarding the nonconforming items to prevent recurrence. The NRC inspection team reviewed that the system generated reports and accurately recorded the conditions of the material.

The NRC inspection team also reviewed a sample of CARs and confirmed: (1) adequate documentation and description of conditions adverse to quality; (2) an appropriate analysis of the cause of these conditions and the corrective actions taken to prevent recurrence; (3) direction for review and approval by the responsible authority; (4) a description of the current status of the corrective actions; and (5) the follow-up actions taken to verify timely and effective implementation of the corrective actions.

The NRC inspection team also discussed the nonconforming materials, parts, or components and corrective action programs with Trillium's management and technical staff. The attachment to this inspection report lists the documents reviewed and personnel interviewed by the NRC inspection team.

b. Observations and Findings

b.1 Corrective Action Associated with NON 99900746/2013-201-01

Following the February 2013 inspection of Trillium (previously known as Weir Valves & Controls USA, Inc.), the NRC issued Notice of Nonconformance (NON) 99900746/2013-201-01 for Trillium's failure to establish adequate measures for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of certain structures, systems, and components. Specifically, Trillium failed to: (1) adequately identify the acceptance methods (i.e., commercial-grade survey) to appropriately verify two of the critical characteristics (e.g., traceability and certificates of conformance) for the seat rings of a 20-inch gate valve; (2) perform an adequate engineering evaluation to document the sample population identified for the control of critical characteristics for a packing ring and a gasket spiral of a check valve and did not conduct a commercial-grade survey to verify that the supplier had lot and batch control to ensure traceability of material; and (3) identify the appropriate critical characteristics (e.g., material composition) and the associated acceptance methods for a packing ring and a gasket spiral of a check valve and an actuator of a fuel-handling valve.

In its responses dated April 26, 2013, June 28, 2013, and July 25, 2013 (Agency Documents Access and Management System (ADAMS) Nos. ML13128A142, ML13189A280, and ML13219A105, respectively), Trillium stated that it had initiated CAR Nos. 13-41 and 13-43 to address these issues. The response stated that CP-E-18, "Control of Commercial Grade Items To Be Dedicated for Use in Nuclear Safety-Related Applications," Revision 6, dated August 29, 2012, was revised to: (1) make it clear that all critical characteristics must be verifiable; (2) prohibit the use of commercial-grade surveys as a stand-alone method of dedication; and (3) describe the technical basis for sampling plans. The responses also stated that an extent of condition would be required and include a review of all dedication packages dating back to August 1, 2012. The review of parts included o-rings, gaskets, limit switch trip arms, and other standard parts dedicated by Trillium. Trillium wrote technical evaluations for all the parts on the list, and then compared these technical evaluations to the original dedication pages with the original technical justification on the page and confirmed that all the critical characteristics were properly captured. Although initially Trillium indicated the extent of condition would include dedication packages dating back to August 1, 2012, this date was changed to October 2002 when Trillium first began the dedication process in

response to a request for additional information by the NRC inspection team at the time. In addition, the response stated that both Engineering and QA staff will be trained on the changes to the procedure.

The NRC inspection team reviewed the documentation that provided the objective evidence for the completion of the corrective actions, including the review of CAR Nos. 13-41 and 13-43. The NRC inspection team confirmed that procedure CP-E-18 was revised as discussed above and that Trillium performed an extent of condition of about 770 dedication packages. In addition, the NRC inspection team reviewed the training log and confirmed that the applicable engineering and QA staff were trained. Furthermore, during its review of a sample of recent dedication packages during the inspection, the NRC inspection team did not identify any issues with Trillium's implementation of its dedication process.

The NRC inspection team determined that Trillium's corrective actions were adequate to address the NON. Based on the review of the corrective actions, the NRC inspection team closed NON 99900746/2013-201-01. No findings of significance were identified.

b.2 Corrective Action Associated with NON 99900746/2013-201-02

Following the February 2013 inspection of Trillium, the NRC issued NON 99900746/2013-201-02 for Trillium's failure to prescribe activities that affect quality in appropriate procedures and to accomplish activities that affect quality in accordance with instructions and procedures. Specifically, Trillium failed to: (1) include the appropriate definitions from 10 CFR 21.3, "Definitions," applicable to the dedication of commercial-grade items in procedure CP-E-18; (2) evaluate the use of out-of-calibration M&TE in accordance with step 10.2.3 of QC-C-1, "Control of Measuring and Test Equipment," Revision 32, dated August 7, 2012; (3) calibrate pressure gauges in accordance with its procedure CP-M-22 "Instruction for Calibration for Pressure Gauges with Dead Weight Tester," Revision 1, dated March 22, 2007; and (4) review and sign test reports as required by Section 11, "Test Control," of Weir's Quality Assurance Manual, Revision 7, dated August 7, 2012.

In its responses dated April 26, 2013 and June 28, 2013, Trillium stated that it had initiated CAR Nos. 13-41, 13-48, 13-53, and 13-62 to address this issue. The responses stated that procedure No. CP-E-18 was revised to include the key definitions from 10 CFR 21.3. The responses also stated that Trillium had reviewed all the calibration records for gages being used and those that were identified to be out of tolerance were documented in a nonconformance report and dispositioned accordingly. In addition, the responses stated that Trillium's engineering performed an evaluation to determine the impact of the false information listed on the weight chart and the effects this 1 psi error could have on products tested. The error was on the low-pressure tester which would be conservative as low-level leakage would increase with lower sealing pressures, and therefore, valves would have to have improved performance on testing using these gages. The weight chart was corrected to reflect the correct values to eliminate the 1 psi error that was showing.

In response to a request for additional information by the NRC inspection team at the time, Trillium clarified that after further review, it noted that the gages would be reading higher than the allowable test pressure. Reviewing the range for local leak rate tests (LLRT), where these gages are used, the defined error would be approximately 2%.

Based on the gage error and test pressure range, the additional error could create some potential concerns that some valves may have been tested with a pressure greater than allowed by the LLRT criteria. In accordance with CAR 13-62, Trillium performed a technical justification for all testing previously conducted. The responses also stated that the weight chart would be added to procedure CP-M-22, "Calibration of Pressure Gages with the Dead Weight Tester."

Furthermore, the responses stated that an extent of condition was performed to ensure that all test reports since August 1, 2012 were reviewed in accordance with the QA Manual requirements. In accordance with CAR 13-53, the QA Engineer would stamp the report with an approval stamp then sign and date the report after verifying that the gages have been recalibrated. Lastly, the responses stated that training was provided to the QA Engineering staff as well as the (ANI).

The NRC inspection team reviewed the documentation that provided the objective evidence for the completion of the corrective actions, including the review of CAR Nos. 13-41, 13-48, 13-53, and 13-62. The NRC inspection team confirmed that: (1) procedure CP-E-18 was updated; (2) Trillium is adequately opening nonconformance reports for measuring and test equipment found to be out of calibration; (3) a new dead weight tester chart was created and added to procedure No. CP-Q-48, "Issuing and Controlling Pressure Gages," Revision 2, dated October 10, 2013 and work instruction No. WI-Q-48-01, Revision 0, dated February 24, 2020 (both of these documents superseded CP-M-22); and (4) training was provided as applicable on the requirements for signing the test reports.

The NRC inspection team determined that Trillium's corrective actions were adequate to address the NON. Based on the review of the corrective actions, the NRC inspection team closed NON 99900746/2013-201-02. No findings of significance were identified.

### b.3 Corrective Action Associated with NON 99900746/2013-201-03

Following the February 2013 inspection of Trillium, the NRC issued NON 99900746/2013-201-03 for Trillium's failure to verify the effectiveness of the control of quality by contractors and subcontractors. Specifically, Trillium failed to perform annual evaluations of suppliers holding certificates of authorization from the American Society of Mechanical Engineers (ASME) Accreditation Program in accordance with the guidance in Regulatory Guide (RG) 1.28, "Quality Assurance Program Requirements (Design and Construction)," Revision 3, dated August 1985.

In its response dated April 26, 2013, Trillium stated that it had initiated CAR No. 13-47 to address this issue. The response stated that a review of the Westinghouse Design Specification identified in that the specification specifically invoked NRC RG 1.28, which specifies that "the applicant or licensee should perform or arrange for annual evaluations of suppliers." The response also stated that in accordance with procedure CP-Q-26, "Performance Assessment for Suppliers of Materials/Item," only non-accredited Material Organizations required an annual performance assessment/evaluation. In addition, the response stated that: (1) procedure CP-Q-26 was revised to include all suppliers of safety-related materials, items or services; (2) the Approved Suppliers List was updated to require all suppliers, except for commercial suppliers, to have annual performance assessments; and (3) performance assessments were performed as required.



The NRC inspection team reviewed the documentation that provided the objective evidence for the completion of the corrective actions, including the review of CAR No. 13-47. The NRC inspection team confirmed that procedure CP-Q-26 and the ASL were revised as discussed above. In addition, the NRC inspection team verified that annual performance assessments are being performed.

The NRC inspection team determined that Trillium's corrective actions were adequate to address the NON. Based on the review of the corrective actions, the NRC inspection team closed NON 99900746/2013-201-03. No findings of significance were identified.

b.4 Corrective Action Associated with NON 99900746/2013-201-04

Following the February 2013 inspection of Trillium, the NRC issued NON 99900746/2013-201-04 for Trillium's failure to ensure that nondestructive testing was controlled and accomplished in accordance with applicable codes. Specifically, Trillium failed to perform visual inspections of the fillet welds to verify that they met the requirements in Subsection NC-4427 of Section III of the ASME B&PV Code, 1998 Edition, 2000 Addenda.

In its responses dated April 26, 2013 and June 28, 2013, Trillium stated that it had initiated CAR No. 13-46 to address this issue. The responses stated procedure No. CP-Q-38, "Performing Visual Inspection of Materials and Items," Revision 0, dated October 8, 2003, was revised to include the inspection of fillet and tack welds in accordance with Subsection NC-4427 of Section III of the ASME B&PV Code. The response also stated that training was provided on the revised procedure and the requirements of the ASME B&PV Code with both the Quality Control (QC) inspection staff and all of Trillium welding personnel.

In response to a request for additional information by the NRC inspection team at the time, Trillium clarified that all Trillium welders were trained to remove all tack welds in lieu of incorporating them into the final weld. A re-inspection of approximately 100 fillet welds on the AP-1000 project was performed and found to be acceptable to the Engineering design documents.

The NRC inspection team reviewed the documentation that provided the objective evidence for the completion of the corrective actions, including the review of CAR No. 13-46. The NRC inspection team confirmed that Work Instruction No. WI-Q-38-01, Revision 0, dated April 18, 2019 (this document superseded CP-Q-38), was revised to include the inspection of fillet and tack welds in accordance with Subsection NC-4427 of Section III of the ASME B&PV Code. In addition, the NRC inspection team reviewed the training log and confirmed that the applicable QC inspection staff and the welders were trained.

The NRC inspection team determined that Trillium's corrective actions were adequate to address the NON. Based on the review of the corrective actions, the NRC inspection team closed NON 99900746/2013-201-04. No findings of significance were identified.

b.5 Corrective Action Associated with NON 99900746/2013-201-05

Following the February 2013 inspection of Trillium, the NRC issued NON 99900746/2013-201-05 for Trillium's failure to verify that all test requirements have been

satisfied. Specifically, Trillium failed to verify that the water quality for the test fluid met the specification requirements for chloride ion, fluoride, conductivity, and pH in accordance with Test Procedure 321-54536. Weir was unable to determine chloride ion and fluoride concentration and did not identify that conductivity and pH were out of tolerance.

In its response dated April 26, 2013, Trillium stated that it had initiated CAR No. 13-52 to address this issue. The responses stated that the test results provided showed both the conditions of the water prior to adding rust preventative and the results including rust preventative. The conditions showed as being nonconforming only when the rust preventative was added. The response also stated that Trillium Valves would install a "point of use" system for supply of deionized (DI) water to the test stands for testing valves. This system will comprise of a portable tank and transfer pump with quick disconnects at the stand. Used water will be transferred to waste tanks for disposal. Portable tanks will be filled with DI water from a main generation system at the time of need and transferred to the test stand for use. An extent condition review will be performed to determine the impact of using the DI water with rust preventative on all the WEC valves tested to date.

The NRC inspection team reviewed the documentation that provided the objective evidence for the completion of the corrective actions, including the review of CAR No. 13-52. The NRC inspection team confirmed the installation of the "point of use" system for supplying DI water for use during testing. The NRC inspection team noted that in its response to the NRC, Trillium made an additional commitment to the NRC to perform an extent of condition review but did not include it as part of CAR No. 13-52. During the inspection, Trillium could not find any objective evidence that the extent of condition review was performed. Trillium initiated CAR No. 1041 to address this issue. While at the time of the inspection there was no objective evidence that an extent of condition was performed, the NRC inspection team considered this issue to be minor as any valves that were tested with DI water would have been inspected prior to shipping as well as inspected again during the receiving and acceptance process. In addition, there have been no 10 CFR Part 21 notifications associated these valves.

The NRC inspection team determined that Trillium's corrective actions were adequate to address the NON. Based on the review of the corrective actions, the NRC inspection team closed NON 99900746/2013-201-05. No findings of significance were identified.

b.6 Corrective Action Associated with NON 99900746/2013-201-06

Following the February 2013 inspection of Trillium, the NRC issued NON 99900746/2013-201-06 for Trillium's failure to ensure that conditions adverse to quality were promptly identified and corrected. Specifically, Trillium failed to: (1) enter an issue related to Certificates of Compliance (C of Cs) into its corrective action program related to a commitment made to the NRC in a letter dated February 17, 2009; (2) perform an extent of condition to evaluate the effect of improperly dedicated commercial testing services from a supplier for items that had already been shipped; and (3) perform an extent of condition to evaluate how the inadequate dedication would affect the M&TE, where this equipment might have been used, and how it would affect safety-related components.

In its responses dated April 26, 2013 and June 28, 2013, Trillium stated that it had initiated CAR Nos. 13-51 and 13-63 to address these issues. The responses stated that Trillium did find where the QA Records Coordinator was maintaining a list certification issues by suppliers to identify all documentation issues, and that going forward, certification issues would be documented in the nonconformance reporting system. The responses also stated that the supplier of commercial testing services was only used once as a safety-related supplier so there was no need to perform an extent of condition review specific to the supplier. In addition, the responses stated that Trillium would: (1) establish critical characteristics and technical evaluations for the calibration suppliers and each of the family of M&TE; (2) perform appropriate commercial-grade surveys of these calibration suppliers, and perform an extent condition review to determine the impact of the M&TE used on previous orders.

The NRC inspection team reviewed the documentation that provided the objective evidence for the completion of the corrective actions, including a review of CAR Nos. 13-51 and 13-63. From the sample of documents reviewed, the NRC inspection team did not identify any issues with the review of C of Cs and confirmed that the commercial testing supplier was only used once. In addition, the NRC inspection team confirmed that Trillium appropriately developed technical evaluations, identified critical characteristics, and performed commercial-grade surveys of its calibration suppliers.

The NRC inspection team determined that Trillium's corrective actions were adequate to address the NON. Based on the review of the corrective actions, the NRC inspection team closed NON 99900746/2013-201-06. No findings of significance were identified.

c. Conclusion

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

5. Entrance and Exit Meetings

On June 13, 2021, the NRC inspection team discussed the scope of the inspection with Ms. Memarie Burke Trillium's Director of Quality Assurance, Mark Claffey Trillium's President, and other members of Trillium's management and technical staff. On June 18, 2021, the NRC inspection team presented the inspection results and observations during an exit meeting with Ms. Burke and other members of Trillium'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

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>	<b>Entrance</b>	<b>Exit</b>	<b>Interviewed</b>
Memarie Burke	Director of Quality Assurance (QA)	Trillium Valves USA (Trillium)	X	X	X
Mark Claffey	President	Trillium	X	X	
Jeff LeBlanc	Supply Chain Quality and Development	Trillium	X		
Vincent Titone	Director of Product Management	Trillium	X		
Karli Raymond	QA Manager	Trillium	X	X	
Kevin McPherson	Director of Operations	Trillium	X	X	
Donna Sewall	EHS Manager	Trillium	X	X	
Erika Masse	HR Generalist	Trillium	X		
Steve Szpak	Director of Sales and Marketing	Trillium	X	X	
Allen Fisher	Director of Engineering	Trillium	X	X	
Adam Curtis	Director of Customer Operations	Trillium	X	X	
Linda Gagnon	Global IT Director	Trillium		X	
Jack Zhang	Director of Finance	Trillium		X	
Kerri Kavanagh	Branch Chief	Nuclear Regulatory Commission (NRC)		X	
Aaron Armstrong	Team Leader	NRC	X	X	
Dong Park	Inspector	NRC	X	X	
Odunayo Ayegbusi	Inspector	NRC	X	X	
Yamir Diaz-Castillo	Inspector	NRC	X	X	
Ian Tseng*	Mechanical Engineer	NRC	X	X	

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>	<b>Entrance</b>	<b>Exit</b>	<b>Interviewed</b>
Thomas Scarbrough*	Senior Mechanical Engineer	NRC	X	X	
Gurjendra Bedi*	Mechanical Engineer	NRC	X		
Greg Suber	Deputy Director	NRC		X	

\* Present via telephone or computer

## 2. INSPECTION PROCEDURES USED

Inspection Procedure (IP) 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance," dated May 16, 2019.

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

<b>Item Number</b>	<b>Status</b>	<b>Type</b>	<b>Description</b>
99900746/2013-201-01	CLOSED	Notice of Nonconformance (NON)	Criterion III
99900746/2013-201-02	CLOSED	NON	Criterion V
99900746/2013-201-03	CLOSED	NON	Criterion VII
99900746/2013-201-04	CLOSED	NON	Criterion IX
99900746/2013-201-05	CLOSED	NON	Criterion XI
99900746/2013-201-06	CLOSED	NON	Criterion XVI

## 4. DOCUMENTS REVIEWED

### Part 21 Evaluation

- 10 CFR 21 041819, dated April 18, 2019
- 10 CFR 21 062119, dated June 21, 2019
- 10 CFR 21 011020, dated January 10, 2020
- 10 CFR 21 030520, dated March 5, 2020

### Design Review Reports and Drawings

- Inter-Departmental Document Transmittal document for Trillium Order No. 0010002345, dated December 14, 2020, transmitting Design Report Addenda DRA-304-50472-A (Revision 2) to Design Report 304-50472, Revision 3 and Assembly Drawing 10002345-10, Revision 1
- Atwood and Morrill Design Review Report No. 304-50472 “Design/Seismic Report for 30-in. Tricentric Valves for Entergy Operations P.O. No. RBY 01631 for River Bend Station,” Revision 3, dated July 18, 2001
- Weir Procedure No. 315-10001614 , “Static Seismic Test Procedure and Report for Tricentric Butterfly Valves, Talen – Susquehanna Hardened Containment Vent System,” Revision 1, dated April 25, 2016
- Weir- Atwood and Morrill Drawing No, 10001814 for 8-inch Gate Valve, Revision 4, dated July 25, 2018
- Tricentric - Atwood and Morrill Drawing No. 10002345 for 30-inch Class 150 Tricentric Valve, Revision 1, dated November 10, 2020
- Weir- Atwood and Morrill Drawing No, 10001987 for 1.5-inch-300 Swing Check Valve, Revision 1, dated November 28, 2020
- Tricentric - Atwood and Morrill Drawing No. 52182-A, for 8-inch 150 OSY Gate Valve Manual Drive Weld End, Revision 12, October 2, 2020

### Commercial Grade Dedication

- Customer Order (CO)No. 20016100, Piston Seal Peach Bottom Nuclear Stations, dated June 2, 2020
- CO No. 20016103, Rod Seal / Rush order Peach Bottom Nuclear Stations, dated June 5, 2020

### Policies and Procedures

- Company Procedure (CP)-Q-02, “Corrective Action Program,” Revision 18, dated August 10, 2020
- CP-Q-05, “Preparing and Processing the Non-Conformance Report,” Revision 8, dated December 21, 2020
- CP-E-20, “Reporting Defects and Noncompliance Under '10 CFR Part 21,” Revision 8, dated February 4, 2021
- CP-P-01, “Purchasing,” Revision 14, dated March 28, 2018
- CP-Q-04, “Auditor Qualification Program,” Revision 4, dated December 17, 2018
- CP-Q-29, “Procedure for Supplier Audit and Surveys,” Revision 6, dated January 31, 2019

- CP-Q-30, “Lead Auditor Training and Qualification,” Revision 5, dated April 30, 2012
- CP-Q-56, “Procedure for the Performance and the Documentation of Vision Exam,” Revision 1, dated May 6, 2020
- QC-C-1, “Control of Measuring and Test Equipment,” Revision 35, dated October 2, 2018
- Trillium Valves USA Quality Assurance Manual for American Society of Mechanical Engineers (ASME) Section III - Division 1, Class 1, 2, and 3, 10 CFR 50 Appendix B, Valves, Valve Parts & Appurtenances and Supplying Materials, Revision 4, dated February 28, 2020
- CP-E-11, “Controlling Changes to Engineering Documents,” Revision 7, dated December 16, 2020
- CP-E-13, “Preparing, checking and maintaining Bills of Material,” Revision 6, dated January 29, 2020
- CP-E-22, “Controlling Design of Products under ASME, Section III, Division 1 and 10 CFR 50 Appendix B,” Revision 13, dated February 1, 2021
- CP-E-18, “Control of Commercial Grade Items to Be Dedicated for use in Nuclear Safety Related Application,” Revision 11, dated May 20, 2020
- CP-E-26, “Qualifying of Certifying Engineers to Mandatory Appendix XXIII of ASME Section III Appendices,” Revision 6, dated January 29, 2020
- CP 90-61-014, “Procuring, Receiving, Storing, and In-Process Handling of Welding Electrodes, Wires, and Materials,” Revision 7, dated April 3, 2017
- CP No. 90-64-171, “Plasma Arc Hardsurfacing of Alloy #21 on Carbon Steel (P-1),” Revision 4, dated July 19, 2017

- CP No. 90-64-010, “Gas Tungsten ARC Hardsurfacing of Valve trim (P-1) material,” Revision 13, dated February 12, 2020
- CP No. 90-64-126, “Gas Tungsten ARC welding of Carbon Steel (P-1 group non-impact material),” Revision 13, dated May 17, 20217
- CP No. 90-67-028, “Visible Liquid Penetrant Examination Procedure in Accordance with ASME Section III, V, VIII, Division 1 and ASME B16.34,” Revision 16, dated April 28, 2020
- Work Instruction E-22-01, “Guide for Classification of Valve Parts,” Revision 1, dated September 3, 2020
- Weld Technique Record for Mark Leedham for weld procedure No. 90-64-171, Revision 4, for customer order No. 2-16942-10
- ASME Code Welder Qualification Master List, Revision 55, dated February 23, 2021
- Dedication Page for American National Standard Institute/International Organization for Standardization/International Electrotechnical Commission Standard No. 17025:2005 and/or 2017 accreditation for two suppliers of calibration services, Revision 2, dated January 24, 2020
- Purchase Order (PO) No. 2041855 for calibration services, Revision 0, dated August 5, 2020
- PO No. 2039835 for calibration services, Revision 0, dated December 19, 2019
- PO No. 2042919 for non-destructive testing services, Revision 1, dated December 11, 2020
- PO No. 2043466 for mechanical and electro polishing services, Revision 0, dated February 22, 2021
- Technical Evaluation (TE) No. TE-000042 for calibration services, Revision 2, dated January 22, 2020
  - Commercial-Grade Survey Report of a commercial supplier of calibration services performed on August 6, 2019
  - Commercial-Grade Survey Report of a commercial supplier of calibration services performed on November 14, 2018
  - Liquid penetrant (PT) non-destructive examination report of a body and ring for a swing check valve, class 1500, 12-inch body, SA351 material, Class 1, ASME B&PV Code, 1968 edition



- Certification of Contaminant Content for PT cleaner, batch No. 19E075, dated May 22, 2019
- Certification of Contaminant Content for PT penetrant, batch No. 17A061, dated January 19, 2017
- Manufacturing Order (MO) No. 0026601 for a body and ring for a 12-inch swing check valve, SA351, Class 1, ASME B&PV Code Section III, 1968 edition
- MO No. 0026987 for 24-inch poppet main steam isolation valve, SA105, Class 1, ASME B&PV Code Section III, 1971 edition
- Atwood and Morrill Procedure No. 308-50472 , “Weak Link Analysis for 30-inch Tricentric Valves for Entergy Operations P.O. No. RBY 01631 for River Bend Station,” Revision 1, dated May 9, 2001

#### Corrective Action Reports (CARs)

- Nonconformance (NCR), CAR & Customer Complaint List 072020 -Present
- CAR 13-35
- CAR 13-41
- CAR 13-43
- CAR 13-46
- CAR 13-47
- CAR 13-48
- CAR 13-51
- CAR 13-52
- CAR 13-53
- CAR 13-54
- CAR 13-62
- CAR 1009
- CAR 1011
- CAR 1029
- CAR 1030

- CAR 19-46
- CAR 20-18
- Supplier Corrective Action (SCA) 1011
- SCA 1012
- SCA 1013

Corrective Actions Opened During the NRC Inspection

- CAR 1039
- CAR 1040
- CAR 1041

Purchase Orders, Audit Reports, and Commercial-Grade Surveys

- CO No. 0020016841-10 dated July 30, 2018
- PO No. 2043285/1 dated January 29, 2021
- TE-000179, dated July 26, 2019
- TE-000042, . dated November 6, 2018
- NIAC Assessment Evaluation dated February 13, 2019
- WVC USA Commercial Grade Survey Report dated July 25, 2016
- Supplier Audit Report dated February 5, 2019
- Supplier Audit Report dated March 11, 2020
- Commercial Grade Supplier Survey Report dated April 3, 2019
- Internal Audit Report, dated October 29, 2018
- Internal Audit Report, dated May 17, 2019
- Internal Audit Report, dated October 14, 2020
- PO 2041813, Calibration Services, dated July 30, 2020
- PO 2043587
- PO 2044334

- Entergy PO No. 10604796, River Bend 30-inch Tricentric Butterfly Valve, Revision 4, dated January 27, 2021
- Georgia Power PO No. SNG10133303 , Hatch 8-inch Gate Valve, Revision 5, dated February 15, 2017
- Georgia Power Company PO , Vogtle Units 1 and 2 1.5-inch Swing Check Valve, Revision 2, dated July 28, 2017
- DTE Electric Company PO No. 4701277857 , Fermi-2 8-inch Gate Valve, PO change dated January 27, 2020
- Audit report for supplier No. 24029, audit performed on June 18-20, 2019
- Audit report for supplier No. 121561, audit performed on January 26-28, 2021
- Audit report for supplier No. 24018, audit performed on September 10-13, 2019
- Audit report for supplier No. 1702, audit performed on September 2-4, 2020
- Audit report for a supplier of machining services, audit performed on October 10, 2019

Nonconformance Reports (NCR)

- NCR 70148
- NCR 70149
- NCR 70272
- NCR 70279
- NCR 70280
- NCR 70281
- NCR 70285
- NCR 70536
- NCR 70495
- NCR 70500
- NCR 70502

- NCR 70503
- NRC 70506
- NRC 70513
- NCR 70505

Training and Qualification Records

- Lead auditor qualification records for Gil Valentine, Brian Sullivan, and Bruce Wheeler
- Non-Destructive Examination training and qualification records for James Collins for penetrant testing (PT) Level I, and David Turner, Anthony L'Italien, and Mark L'Italien for PT Level II
- Inspector Certification training and qualification records for Ted Smith, Mechanical Inspector Level II, Anthony L'Italien, Mechanical Inspector Level II, and Mark L'Italien, Mechanical Inspector Level II
- Welder qualification records for plasma arc hardsurfacing for Mark Leedham
- NDE Level III Examiner Appointment Letter - RE: Qualifications for Level III NDE Examiner for PT, MT, VT, and RT

Measuring and Test Equipment (M&TE):

- 2M162
- 1D46
- 1D56
- 1E100
- 1V20
- 2D70
- 3M1050
- 5E29
- 5E31
- 5E34