



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

December 31, 2024

Mr. Brad Gladson  
Quality Assurance Manager, Nuclear  
Sulzer Pumps, Inc.  
4126 Caine Ln  
Chattanooga, TN 37421

SUBJECT: NUCLEAR REGULATORY COMMISSION INSPECTION REPORT OF  
SULZER PUMPS, INC. NO. 99901361/2024-201

Dear Mr. Gladson:

On November 18-22, 2024, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Sulzer Pumps, Inc. (hereafter referred to as Sulzer) facility in Chattanooga, TN. The purpose of this limited-scope routine inspection was to assess Sulzer'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 Sulzer's implementation of quality activities associated with the design, fabrication, testing, and commercial-grade dedication of ASME and non-ASME safety-related pumps, and replacement parts and/or appurtenances for NRC's regulated facilities. The enclosed report presents the results of the inspection. This NRC inspection report does not constitute NRC's endorsement of Sulzer's overall quality assurance (QA) or 10 CFR Part 21 programs.

Within the scope of this inspection, no violations or nonconformances were identified.

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

Enclosure:  
Inspection Report No. 99901361/2024-201  
and Attachment

B. Gladson

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Sincerely,



Signed by Kavanagh, Kerri  
on 12/31/24

Kerri Kavanagh, Chief  
Quality Assurance and Vendor Inspection Branch  
Division of Reactor Oversight  
Office of Nuclear Reactor Regulation

Docket No.: 99901361

EPID No.: I-2024-201-0058

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SULZER PUMPS, INC. NO. 99901361/2024-201  
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**NRR-106**

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<b>NAME</b>	RRomero-Devore	KKavanagh	
<b>DATE</b>	12/31/2024	12/31/2024	

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

Docket No.: 99901361

Report No.: 99901361/2024-201

Vendor: Sulzer Pumps, Inc.  
4126 Caine Ln  
Chattanooga, TN 37421

Vendor Contact: Mr. Brad Gladson  
Quality Assurance Manager, Nuclear  
Phone: (423) 296-1954  
Email: Brad.Gladson@sulzer.com

Nuclear Industry Activity: Sulzer Pumps, Inc. (hereafter referred to as Sulzer) scope of supply includes design, fabrication, testing, and commercial-grade dedication of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code and non-ASME safety-related pumps, and replacement parts and/or appurtenances.

Inspection Dates: November 18-22, 2024

Inspectors: Aixia Belen NRR/DRO/IQVB, Team Leader  
Dong Park NRR/DRO/IQVB  
Michael Fitzgerald NRR/DRO/IQVB  
Rebecca Romero-Devore NRR/DRO/IQVB, (Trainee)

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

Enclosure

## **EXECUTIVE SUMMARY**

Sulzer Pumps, Inc.  
99901361/2024-201

The U.S. Nuclear Regulatory Commission (NRC) staff conducted a limited-scope routine vendor inspection at the Sulzer Pumps, Inc.'s (hereafter referred to as Sulzer) facility in Chattanooga, TN, to verify 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." The NRC inspection team conducted this inspection on-site from November 18 - 22, 2024. This was the third NRC inspection at this facility.

This technically-focused inspection specifically evaluated Sulzer's implementation of the quality activities associated with design, fabrication, testing, and commercial-grade dedication of ASME and non-ASME safety-related pumps, and replacement parts and/or appurtenances for NRC regulated facilities.

The following regulations served as the bases 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 February 10, 2023; IP 43004, "Inspection of Commercial-Grade Dedication Programs," dated February 10, 2023; and IP 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting of Defects and Noncompliance," dated February 10, 2023.

The NRC inspection team observed the following specific activities:

- Receipt Inspection of 1" Diameter Stainless Steel Bar Stock
- Machining and in-Process Dimensional Check of an Upper Gland Seal Assembly
- Penetrant Testing of a Heat-Treated Shaft Sleeve
- Pump Performance Testing of 38GMCX Model Pump
- Hydrostatic Test of a Discharge Head Assembly

The results of the inspection are summarized below.

### **Inspection Areas**

The NRC inspection team determined that Sulzer established its programs for Procurement Document Control, Supplier Oversight, Internal Audits, Design Control, Commercial-Grade Dedication, Control of Measuring and Test Equipment, Material Traceability, Control of Special Process, Inspection, Test Control, Part 21, Nonconforming Material, Parts, or Components, and Corrective Actions, in accordance with the applicable regulatory requirements of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed and activities observed,

the NRC inspection team also determined that Sulzer is implementing its policies and procedures associated with these programs. No findings of significance were identified in these areas.

#### 10 CFR Part 21 Program

The NRC inspection team concluded that Sulzer 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 Sulzer is adequately implementing its policies and procedures associated with the 10 CFR Part 21 program. No findings of significance were identified.

## REPORT DETAILS

### 1. 10 CFR Part 21 Program

#### a. Inspection Scope

The U.S. Nuclear Regulatory Commission (NRC) inspection team reviewed Sulzer Pumps, Inc.'s (hereafter referred to as Sulzer) 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. The NRC inspection team evaluated the 10 CFR Part 21 postings and a sample of Sulzer's purchase orders (POs) to verify compliance with the requirements of 10 CFR 21.6, "Posting Requirements," and 10 CFR 21.31, "Procurement Documents," respectively.

Furthermore, NRC the inspection team reviewed 10 CFR Part 21 evaluations performed by Sulzer to verify that Sulzer had effectively implemented the requirements for evaluating deviations and failures to comply. The NRC inspection team also verified that Sulzer's nonconformance and corrective action procedures provide a link to its 10 CFR Part 21 program.

The NRC inspection team discussed the 10 CFR Part 21 program with Sulzer'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 Sulzer 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 Sulzer is adequately 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 Sulzer's policies and procedures that govern the implementation of its design control program to verify compliance with the regulatory requirements of Criterion III, "Design Control," of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities."

The NRC inspection team reviewed Duke Energy PO #03134128, for rotating element assembly of a Sulzer Bingham Reactor Coolant Pump. The NRC inspection team verified that the customer requirements were adequately translated into the applicable Sulzer's drawings, instructions, procedures, bill of material, and specifications. The NRC inspection

team also verified the documentation included the applicable technical and regulatory requirements as required by customer specifications, Sulzer's procedures, and the applicable ASME B&PV Code requirements. In addition, the NRC inspection team verified that the materials of construction and components for the rotating element assembly of a Sulzer Bingham Reactor Coolant Pump conformed to the appropriate material specification, design specification, and ASME B&PV Code requirements.

The NRC inspection team also discussed the design control program with Sulzer'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 Sulzer 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 Sulzer is implementing its policies and procedures associated with its design control program. No findings of significance were identified.

3. Commercial-Grade Dedication

a. Inspection Scope

The NRC inspection team reviewed Sulzer'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 dedication packages for (1) calibration of ultrasonic testing (UT) flaw detector, (2) heat treatment for stress relief of a seal sleeve, (3) finish grinding for a shaft, and (4) tube bearing bushing to assess the different elements of the commercial-grade dedication (CGD) program which included POs, the commercial-grade item evaluations, receipt inspection reports, certificates of compliance, design drawings, and technical information. The NRC inspection team evaluated the criteria for the identification of an item's safety functions, failure modes/mechanisms, selection of critical characteristics and acceptance criteria, and the identification of verification methods to verify effective implementation of Sulzer's dedication process.

The NRC inspection team also reviewed Sulzer's measures established for the use of the International Laboratory Accreditation Cooperation (ILAC) accreditation process in lieu of performing commercial-grade surveys for procurement of calibration and testing services as part of the CGD process. Sulzer currently implements this process as described in the Nuclear Energy Institute Document No. 14-05A, "Guidelines for the Use of Accreditation in Lieu of Commercial Grade Surveys for Procurement of Laboratory Calibration and Test Services," Revision 1, dated September 2020, which was recognized for use by the NRC in a safety evaluation dated November 23, 2020 (Agencywide Documents Access Management System Accession No. ML20322A019).



The NRC inspection team discussed the CGD program with Sulzer'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 Sulzer 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, the NRC inspection team determined that Sulzer is implementing its policies and procedures associated with the CGD program. No findings of significance were identified.

4. Procurement Document Control and Supplier Oversight

a. Inspection Scope

The NRC inspection team reviewed Sulzer's policies and implementing procedures that govern the implementation of its procurement document control and supplier oversight programs to verify compliance with the regulatory requirements of Criterion IV, "Procurement Document Control," and Criterion VII of Appendix B to 10 CFR Part 50.

The NRC inspection team reviewed a sample of POs, Sulzer's Approved Vendor List (AVL), supplier audit reports and annual evaluations. For the sample of POs, the NRC inspection team verified that the POs included, as applicable: the scope of work, right to access to the supplier's facilities, extension of contractual requirements to sub-suppliers, and the quality and technical requirements. The NRC inspection team observed a demonstration of the procurement process and verified that POs were approved by qualified individuals.

The NRC inspection team selected a sample of suppliers from the AVL to review the methodology for conducting and documenting audits to verify adequate evaluation of the suppliers' controls for meeting the applicable requirements of Appendix B to 10 CFR Part 50. For the sample of supplier audits reviewed, the NRC inspection team verified that the audits reports included, as applicable: (1) an audit plan; (2) any findings identified; and (3) adequate documented objective evidence of compliance with the applicable requirements. In addition, the NRC inspection team verified that the audits were performed in accordance with the established frequency and by qualified lead auditors and auditors. Furthermore, the NRC inspection team reviewed Sulzer's use of third-party audits to qualify their suppliers and reviewed the third-party audit package to determine if it covered the scope for the specific supplier. Sulzer supplemented the audits with annual evaluations.

The NRC inspection team also discussed the procurement document control and supplier oversight programs with Sulzer'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

The NRC inspection team identified that Sulzer's instructions and procedures had no information or directions on how to track and close the corrective actions from supplier's third-party audit findings, i.e., the corrective action follow up was not included as part of the annual evaluations. For the sample of third-party audits reviewed, the NRC inspection team noted that the audit packages did not include the objective evidence of the supplier findings' corrective actions. However, the final audit report review forms were completed and signed stating that the corrective actions for the audits were satisfactory.

In addition, the NRC inspection team reviewed the 2023-year end semi-annual NCR [nonconformance reports] & CAR [corrective action request] trend report and the MO [Material Organization]/ASME Supplier Review completed on January 29, 2024. The NRC inspection team observed that the provided documents had no objective evidence that all the safety-related suppliers requiring an annual evaluation in 2023 were evaluated per Sulzer's procedures.

The NRC inspection team reviewed the NCR log for the suppliers requiring an annual assessment in 2023 and the suppliers from third-party audits reviewed; and noted that those suppliers had one or two NCRs each in 2023. The NRC Inspection team used Inspection Manual Chapter (IMC) 0617, Appendix E, Section 8, Control of Purchased Material, Equipment and Services to evaluate these issues. The NRC inspection team determined this issue was not significant enough to be more than minor because 1) it does not impact the product or services provided by Sulzer; 2) the third-party audit provided objective evidence that the sub-supplier's quality assurance program met Appendix B to 10 CFR 50; and 3) Sulzer receipt inspection was found adequate. Sulzer documented this issue in CAPA-0444.

No findings of significance were identified.

c. Conclusion

The NRC inspection team concluded that Sulzer is implementing its procurement document control and supplier oversight programs in accordance with the regulatory requirements of Criterion IV and Criterion VII of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that Sulzer is adequately implementing its policies and procedures associated with the procurement document control and supplier oversight programs. No findings of significance were identified.

5. Material Traceability

a. Inspection Scope

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

The NRC inspection team performed a walk-down of Sulzer's manufacturing and assembly areas and reviewed a sample of work orders for in-process and completed work. The NRC inspection team reviewed the customer's POs, job travelers, receiving tags, receipt

inspection reports, and the Certified Material Test Reports (CMTRs) and/or Certificate of Conformances (CoCs) associated with gland, finished machine seal; sleeve, pre-machine; line shaft, machined line shaft, machined; discharge head; and 38GMCX model pump located in Sulzer's shop floor. The NRC inspection team confirmed that the physical markings in these components matched the original heat numbers in the job travelers and the heat numbers were traceable to the initial receiving tag. The NRC inspection team verified that traceability was maintained starting with the creation of the receiving tags and assignment of a unique Sulzer identification number, and throughout the manufacturing process with the use of job travelers, and finally through shipment and the issuance of CoCs, including customer supplied materials. For instances when specific items within these work orders were sent to suppliers on Sulzer's AVL, Sulzer's POs had specific instructions to ensure traceability was adequately maintained.

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

6. Control of Special Processes

a. Inspection Scope

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

For manufacturing activities, the NRC inspection team reviewed a sample of ASME B&PV Code Data Reports, shop travelers, work instructions, and the calibration certificates of the M&TE. For non-destructive examination (NDE) activities, the NRC inspection team observed penetrant testing of a shaft sleeve and reviewed the procedures for penetrant testing, magnetic particle testing, ultrasonic testing, and visual examination, inspector qualifications, and the calibration certificates. The NRC inspection team reviewed qualified weld procedures, welder qualifications, and the weld procedure continuity log.

The NRC inspection team also discussed control of special processes with Sulzer'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 Sulzer is implementing its control of special processes 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 Sulzer is implementing its policies and procedures associated with the control of special processes. No findings of significance were identified.

7. Inspection

a. Inspection Scope

The NRC inspection team reviewed Sulzer's policies and implementing procedures that govern the implementation of its quality control program to verify compliance with the requirements of Criterion X, "Inspection" of Appendix B to 10 CFR Part 50.

The NRC inspection team reviewed the implementation and changes to procedures and instructions supporting activities affecting quality during receipt inspection, in-process quality checks, and final quality checks. Specifically, the NRC inspection team reviewed the inspection procedures, conducted interviews with quality control personnel, observed the receipt inspection of 1" stainless steel (ASTM A479) bar stock, in-process dimensional check of an upper gland seal assembly, and reviewed the training and qualification records associated with the observed activities.

The NRC inspection team also discussed the inspection program with Sulzer'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 Sulzer is implementing 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 NRC inspection team also determined that Sulzer is implementing its policies and procedures associated with the inspection program. No findings of significance were identified.

## 8. Test Control

### a. Inspection Scope

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

The NRC inspection team verified that Sulzer's test procedures adequately included the applicable technical, quality, and regulatory requirements. The NRC inspection team observed pump performance testing of a 38GMCX model pump and hydrostatic testing of a discharge head for a non-code component. The NRC inspection team also confirmed that the following testing elements were satisfied, verified, and recorded, as appropriate: (1) test parameters and initial conditions, (2) test acceptance criteria, (3) test prerequisites, (4) test instrument range, accuracy, and uncertainty appropriate for the test; (5) current calibration; and (6) proper procedure sequence followed, and any deviations documented and evaluated.

The NRC inspection team also confirmed that the tests were performed using properly calibrated measuring and test equipment (M&TE). In addition, the NRC inspection team reviewed the training and qualification records of the test technicians identified in the reports and confirmed that testing personnel had completed all the required training and had maintained the applicable qualification and certification in accordance with Sulzer's policies and procedures.

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

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

### a. Inspection Scope

The NRC inspection team reviewed Sulzer's policies and implementing procedures that govern the implementation of its 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.

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

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

a. Inspection Scope

The NRC inspection team reviewed Sulzer'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 regulatory 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 Sulzer'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, reject, use-as-is.

The NRC inspection team observed Sulzer's operations and verified that nonconforming materials, parts, or components were properly identified, marked, and segregated, when practical. The NRC inspection team reviewed a sample of nonconforming material reports (NCRs) that were associated with the safety-related items to verify that Sulzer dispositioned the nonconforming materials in accordance with the applicable procedures, documented an appropriate technical justification for various dispositions, and took adequate corrective action regarding the nonconforming items, as appropriate.

The NRC inspection team also reviewed a sample of Corrective and Preventative Action Reports (CAPAs) to verify: (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 actions taken to verify timely and effective implementation of the corrective actions.

The NRC inspection team discussed the nonconforming materials, parts, or components and corrective action programs with Sulzer'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 Sulzer 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 Sulzer is implementing its policies and procedures associated with its nonconforming materials, parts, or components and corrective action programs. No findings of significance were identified.

11. Internal Audits

a. Inspection Scope

The NRC inspection team reviewed Sulzer's policies and implementing procedures that govern the implementation of its internal audits program to verify compliance with the regulatory requirements of Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed Sulzer's internal audit plans, internal audit reports, and CARs generated during internal audits, when applicable. The NRC inspection team verified that the audit documents reviewed were adequately completed and that Sulzer adequately corrected the conditions identified in CARs generated during internal audits. The NRC inspection team verified that Sulzer's procedures described the scope and purpose of audits to be performed, the frequency, audit criteria, and corrective actions when required. The NRC inspection team verified that the audit teams were selected using qualified auditors and that they were not auditing their own work. The NRC inspection team verified that internal audits were performed using checklists.

The NRC inspection team discussed the internal audits program with Sulzer'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 Sulzer is implementing its internal audits 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 NRC inspection team determined that Sulzer is adequately implementing its policies and procedures associated with the internal audits program. No findings of significance were identified.

## 12. Entrance and Exit Meetings

On November 18, 2024, the NRC inspection team discussed the scope of the inspection during the entrance meeting with Julie Thompson, Sulzer's General Manager and other members of Sulzer's management and technical staff. On November 22, 2024, the NRC inspection team presented the inspection results during an exit meeting with Julie Thompson and other members of Sulzer'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>Position</b>	<b>Affiliation</b>	<b>Entrance</b>	<b>Exit</b>	<b>Interviewed</b>
Brad Gladson	Quality Assurance (QA) Manager	Sulzer, Inc. (Sulzer)	X	X	X
Julie Thompson	General Manager	Sulzer	X	X	X
Kim Wade	QA Engineer	Sulzer	X	X	X
Jocelyn Garrett	QA Engineer	Sulzer	X	X	
Chris Ray	Nuclear Operations Manager	Sulzer	X	X	
James Holloway	Engineering Manager	Sulzer	X		X
Tyler Parker	Shop Supervisor	Sulzer	X	X	
Art Washburn	Nuclear Technical Support Manager	Sulzer	X	X	
Abby Hand	Business Process Manager	Sulzer	X	X	
Nicholas Poe	Quality Control Lead Inspector	Sulzer	X	X	X
James Lusk	Quality Control Inspector	Sulzer			X
Gary Wade	Level III NDE Technician	Sulzer			X

Name	Position	Affiliation	Entrance	Exit	Interviewed
James Adam Brian	Test Engineer	Sulzer			X
Brandon Ray	Quality Control Inspector	Sulzer			X
Kerri Kavanagh	Branch Chief	NRC		X	
Aixa Belen	Inspection Team Leader	NRC	X	X	
Dong Park	Inspector	NRC	X	X	
Michael Fitzgerald	Inspector	NRC	X	X	
Rebecca Romero-Devore	Inspector	NRC	X	X	

2. INSPECTION PROCEDURES USED:

- Inspection Procedure (IP) 43002, "Routine Inspections of Nuclear Vendors," dated February 10, 2023
- IP 43004, "Inspection of Commercial-Grade Dedication Programs," dated February 10, 2023
- IP 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting of Defects and Noncompliance," dated February 10, 2023

3. DOCUMENTS REVIEWED

Quality Assurance Procedures (QAP)

- Sulzer Pumps (US) Inc. Procedure Index, Revision 78, dated October 18, 2024
- Sulzer Pumps Quality Assurance Manual QAM, Edition 10, Revision 0, dated October 25, 2024
- CHB-001, "ANI Contract Protocol and SNSC Responsibility Procedure," Revision 1, dated June 20, 2023
- CHE-001, "Design Control and Reconciliation," Revision 5, February 18, 2016
- CHE-002, "Drawings," Revision 5, November 12, 2012
- CHE-003, "Design Reconciliation," Revision 1, January 13, 2010
- CHE-004, "Design Analysis," Revision 4, January 3, 2018

- CHE-007, "Bill of Material Preparation, Review and Approval," Revision 3, January 3, 2018
- CHE-008, "Hydrostatic Testing," Revision 6, dated July 1, 2022
- CHE-010, "Qualification of Certifying Engineers," Revision 2, dated December 13, 2018
- CHE-014, "Impeller, Volute and Bowl Hydraulic Passage Cleaning," Revision 4, dated November 13, 2012
- CHE-038, "Stress Relief and Furnace Relaxation of Weldments and Castings," Revision 0, dated October 20, 2015
- CHE-042, "Pump Performance Testing," Revision 0, dated January 24, 2020
- CHM-002, "Order Review, Acceptance and Entry," Revision 3, dated June 8, 2023
- CHM-003, "Preparation and Control of Production or Service Orders," Revision 6, dated November 28, 2023
- CHM-006, "Cleaning of Nuclear Components," Revision 4, dated January 17, 2022
- CHM-007, "Packaging and Shipping," Revision 5, dated June 8, 2023
- CHM-010, "Management Risk, Revision 3," dated June 8, 2023
- CHM-50.4, "Nuclear Approved Product Requirements for ASME Section III, Safety Related and NQA-1," Revision 1, dated June 8, 2023
- CHQ-001, "Compliance with 10 CFR Part 21," Revision 4, dated December 3, 2018
- CHQ-002, "Straightness Inspection of Shafts," Revision 3, dated August 4, 2011
- CHQ-004, "Receipt Inspection," Revision 12, dated March 9, 2023
- CHQ-005, "Qualification and Certification of Nondestructive Examination Personnel, Revision 9, dated September 17, 2024. CHQ-007, "Commercial Grade Dedication Program," Revision 11, dated March 9, 2023
- CHQ-009, "Quality Assurance Records," Revision 6, dated October 9, 2023
- CHQ-012, "Qualification & Certification of Inspection & Test Personnel," Revision 3, dated December 30, 2019.
- CHQ-015, "Conducting Audits," Revision 3, dated September 7, 2018
- CHQ-016, "Material Traceability," Revision 5, dated May 11, 2022
- CHQ-018, "Calibration Control," Revision 18, October 2, 2024
- CHQ-019, "Calibration of Measuring and Test Equipment," Revision 7, May 7, 2021
- CHQ-021, "Control of Nonconforming Items or Activities," Revision 16, July 24, 2023
- CHQ-022, "Liquid Penetrant Examination," Revision 9, dated December 15, 2023
- CHQ-023, "Magnetic Particle Examination," Revision 7, dated December 15, 2021
- CHQ-024, "Ultrasonic Thickness Measurement," Revision 6, dated December 15, 2023
- CHQ-025, "Visual Weld Inspection," Revision 7, dated January 4, 2023
- CHQ-025.1, "Visual Examination of Castings," Revision 2, dated December 15, 2021
- CHQ-028, "Corrective and Preventive Actions," Revision 9, dated December 15, 2015
- CHQ-028 S1, "Corrective Action Guideline Supplement," Revision 0, dated May 26, 2016
- CHQ-031, "Conducting Commercial Grade Surveys (Method 2)," Revision 4, dated April 26, 2018
- CHQ-032, "Conducting Review of Accreditation for Calibration Services," Revision 4, dated October 2, 2023
- CHQ-036, "Niton Material Analyzer Usage," Revision 1, dated March 15, 2013
- CHQ-041, "Wet Fluorescent Magnetic Particle Examination," Revision 3, dated December 15, 2021
- CHQ-042, "Nameplate and Certification Mark Stamping," Revision 1, dated June 30, 2015

- CHQ-043, "Lead Auditor Qualification," Revision 3, dated July 9, 2024
- CHQ-044, "Management Review," Revision 5, dated February 5, 2022
- CHQ-045, "Surveillance/Inspection," Revision 4, dated May 11, 2023
- CHQ-046, "Approved Vendor List Maintenance," Revision 3, dated May 11, 2023
- CHQ-047, "Inspection," Revision 5, May 11, 2023
- CHQ-050 "Certification of Material or Services," Revision 4, dated December 7, 2023
- CHQ-055 "Upgrade/Certification of Material Process," Revision 6, dated June 13, 2024
- WPS AS-3, "GTAW: 300 Series Stainless Steel ASME IX Procedure," Revision 19, dated June 27, 2013

#### Design Control

- DWG D15319, Rev A, dated July 17, 1973
- DWG J1936, Rev 00, dated August 9, 2019
- DWG 71727-A, Rev 5, dated June 29, 2016
- DWG D-19071, Rev A
- DWG B-504602094, Revision A – Line Shaft Bottom, dated November 24, 2015
- DWG B-504601415, Revision A – Line Shaft, dated June 2, 2022 Bill of Material (BOM) for SO 100451635

#### Commercial Grade Dedication (CGD) Records

- CGD Plan Number CGD10838 for PO #4502115877-1 Calibration of UT Flaw Detector
- CGD Plan Number CGD10166 for PO #4502229469-0
- CGD Plan Number GD10188 for PO #4502144097-1
- CGD Plan Number CGD10511 for PO #4502148433-1
- Commercial Grade Item/Service Check List Survey No CY2024-004, dated June 13, 2024,

#### Audit/Survey

- Audit Plan, Sulzer Pumps – Nuclear Service Center, Rev 2, dated January 23, 2023
- Audit Report, Sulzer Nuclear Service Center 2023 Internal Audit, Audit #23-01, dated March 20, 2023
- Audit Plan, Sulzer Pumps Internal Audit-2024, dated March 10, 2024
- Audit Report, Sulzer Nuclear Service Center Internal Audit 2024, dated April 3, 2024
- Audit Checklist, Sulzer Pumps Internal Audit 2024, dated April 17, 2024
- Third-party audit package for Supplier No. 103632, dated February 24, 2023
- Third-party audit package for Supplier No. 102165, dated June 7, 2024
- Third-party audit package for Supplier No. 104215, dated May 15, 2024
- Third-party audit package for Supplier No. 112452, dated September 06, 2022
- Third-party audit package for Supplier No. 162061, dated April 5, 2022
- Third-party audit package for Supplier No. 101429, dated July 15, 2024
- MO/ASME Supplier Review dated January 29, 2024

#### Purchase Orders (PO)

- PO #03134128, Rev. 001 dated October 6, 2021 (Duke Oconee for rotating element assembly of a Sulzer Bingham Reactor Coolant Pump)

- PO #4000033873, Version 2 dated November 13, 2024 (Xcel Energy Monticello stud and nut)
- PO#03173632, Rev. 001 dated November 30, 2023 (Duke Energy Oconee upper seal gland of a Sulzer Bingham Reactor Coolant Pump)

#### Supplier Purchase Orders (PO)

- PO #4501834920-1
- PO #4502115877-1
- PO #4502241285-1
- PO #4502229469-0
- PO #4502144097-1
- PO #4502148433-1
- PO #4502150649-0

#### Manufacturing Control Documents

- WO #11913767 – Gland, Finished Machine Seal
- WO #11974865 – Sleeve, Pre-Machine
- WO #11915619 – Line shaft, Machined
- WO #11917842 – Line Shaft, Machined
- WO #11889800 – Discharge Head
- WO #10366917 – 38GMCX Model Pump

#### Test Control Documents

- Hydrostatic Test – S/N 11838540 – Stuffing Box
- Hydrostatic Test – S/N 11913921 – Relief Valve Plug
- Hydrostatic Test – S/N 11913920 – Relief Valve Plug
- Hydrostatic Test – WO #11889800 – Discharge Head, dated November 21, 2024
- Pump Performance Test – WO #100366917, dated November 20, 2024
- Test Report 400109 – Water Quality, dated June 1, 2023

#### Measuring and Test Equipment Documents

- Sulzer M&TE List
- ATS COC No. 3725292
- JWJ COC No I04249261
- ATS COC No. 3753483
- ATS COC No. 3399005
- ATS COC No. 3725292
- ATS COC No. 3737402
- ATS COC No. 3706410
- ATS COC No. 3557652
- ATS COC No. 3557527
- ATS COC No. 3738768
- ATS COC No. 3738771

- ATS COC No. 3166354
- ATS COC No. 3705557
- ATS COC No. 3705580
- ATS COC No. 3705491
- ATS COC No. 3705578
- ATS COC No. 3555340
- ATS COC No. 3725292
- JWJ COC No E13249180

#### Nonconformance Reports (NCRs)

- 200262069
- 200261178
- 200248693
- 200260329
- 200256775
- 200249064
- 200249006
- 200356626
- 200233596
- 200261728
- 200261527
- 200261347
- NCR log (2022 – 2024)

#### Corrective and Preventative Action Reports (CAPAs)

- 0386
- 0396
- 0403
- 0408
- 0418
- 0427
- 0432
- 0433
- 0440

#### Corrective and Preventative Action Reports Opened During the Inspection

- 0442
- 0443
- 0444
- 0445

#### Training Records

- Record of Lead Auditor Qualification for Brad Boothe dated January 23, 2023.
- Record of Lead Auditor Qualification for Daryl Montie dated March 11, 2024.
- Record of Lead Auditor Qualification for Daryl Jeffrey, Kim Wade dated January 3, 2024.

- Record of Lead Auditor Qualification for Jocelyn Garrett dated January 3, 2024.
- Personnel Qualification Records – Brandon Ray, Nicholas Poe, Kim Wade, Jocelyn Garrett, James Lusk, Gary Wade
- Welders Qualification Records – Byron Hicks, Ethan Murphy, Rafaiel Madruga, Rodney Murphy
- Certifying Engineer Qualification Records – Julie Thompson, PE, Arthur Thompson, PE, James Holloway, PE

Miscellaneous/Other

- Semi Annual NCR and CAR Trend Report January thru July 2023
- Semi Annual NCR and CAR Trend Report July thru December 2023
- Semi Annual NCR and CAR Trend Report January thru June 2024
- Weld Procedure Continuity Log
- Sulzer Pumps Inc., 10 CFR Part 21 Evaluation Memo to File, Document 2022-001, dated April 7, 2022
- Sulzer Pumps Inc., 10 CFR Part 21 Evaluation Memo to File, Document 2024-001, dated September 12, 2024
- Training Session Report, 2024-Q078, CARB Review, dated November 6, 2024
- Training Session Report, 2024-Q071, CARB Review, dated October 10, 2024
- Training Session Report, 2024-Q58, CARB Review, dated September 12, 2024
- Training Session Report, 2024-Q53, CARB Review, dated August 8, 2024