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

June 21, 2023

Michael Swirad
Quality Assurance Director
Valcor Engineering
2 Lawrence Road
Springfield, NJ 07081

SUBJECT: NUCLEAR REGULATORY COMMISSION VENDOR INSPECTION REPORT OF VALCOR ENGINEERING NO. 99900728/2023-201

Dear Mr. Swirad:

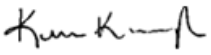
On May 8 - 12, 2023, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at Valcor Engineering (hereafter referred to as Valcor) facility in Springfield, NJ. The purpose of this limited-scope routine inspection was to assess Valcor's compliance with provisions of Title 10 of the *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 Valcor's implementation of quality activities associated with the design, manufacture, and testing of safety-related valves and components for U.S. nuclear power plants. The enclosed report presents the results of the inspection. This NRC inspection report does not constitute NRC endorsement of Valcor's overall quality assurance (QA) or 10 CFR Part 21 programs. In addition, the NRC inspection team evaluated Valcor's closure of the inspection findings documented in inspection report No. 99900728/2017-201, dated November 16, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17311A267).

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.

Sincerely,


Signed by Kavanagh, Kerri
on 06/21/23

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

Docket No.: 99900728

EPID No.: I-2023-201-0025

Enclosure:
Inspection Report No. 99900728/2023-201
and Attachment

SUBJECT: NUCLEAR REGULATORY COMMISSION VENDOR INSPECTION REPORT OF VALCOR ENGINEERING NO. 99900728/2023-201 DATE: June 21, 2023

DISTRIBUTION:
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ADAMS Accession No.: ML23166A368 **NRR-106**

OFFICE	NRR/DRO/IQVB	NRR/DRO/IQVB	NRR/DRO/IQVB	NRR/DRO/IQVB
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DATE	06/20/2023	06/20/2023	06/20/2023	06/20/2023
OFFICE	NRR/DEX/EMIB	NRR/DEX/EMIB	NRR/DRO/IQVB	
NAME	CBasavaraju	NHansing	KKavanagh	
DATE	06/20/2023	06/20/2023	06/21/2023	

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

Docket No.:	99900728
Report No.:	99900728/2023-201
Vendor:	Valcor Engineering Corporation 501 South 11th Street Springfield, NJ 62864
Vendor Contact:	Michael Swirad Quality Assurance Director Phone: 973-467-8400 x 7223 Email: mikeswirad@valcor.com
Nuclear Industry Activity:	Valcor Engineering Corporation's scope of supply includes safety-related valves and components and related services for U.S. nuclear power plants.
Inspection Dates:	May 8 - 12, 2023

Inspectors:		
	Aaron Armstrong	NRR/DRO/IQVB, Team Leader
	Dong Park	NRR/DRO/IQVB
	Yiu Law	NRR/DRO/IQVB (Remote)
	Rebecca Romero-Devore	NRR/DRO/IQVB, In-Training
	Chakrapani Basavaraju	NRR/DEX/EMIB (Remote)
	Nicholas Hansing	NRR/DEX/EMIB

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

Enclosure

EXECUTIVE SUMMARY

Valcor Engineering
99900728/2023-201

The U.S. Nuclear Regulatory Commission (NRC) staff conducted a limited-scope routine vendor inspection at the Valcor Engineering Corporation (hereafter referred to as Valcor) facility in Springfield, NJ , 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 May 8 - 12, 2023. The last inspection at this facility was conducted in October 2017.

This technically-focused inspection specifically evaluated Valcor's implementation of the quality activities associated with the design, manufacture, and testing of safety-related valves and components being supplied to U.S. nuclear power plants. In addition, the NRC inspection team evaluated Valcor's closure of the inspection findings documented in inspection report No. 99900728/2017-201, dated November 16, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17311A267).

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

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

The NRC inspection team observed the following specific activities:

- Commercial Grade Dedication of O-rings Part #S101Y22 and Stop Part #V52617-6040-5
- Walkdown of the receipt inspection and quality control inspection area
- Inspection of the calibration laboratory and nonconformance storage locker
- Liquid penetrant examination of a safety-related part for the US nuclear industry

During this inspection, the NRC inspection team implemented Inspection Procedure (IP) 43002, "Routine Inspections of Nuclear Vendors," dated February 10, 2023, IP 43003, "Reactive Inspections of Nuclear Vendors," dated April 08, 2020, 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 results of this inspection are summarized below.

10 CFR Part 21 Program

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

Nonconforming Materials, Parts, or Components and Corrective Action

The NRC inspection team reviewed the corrective actions that Valcor took to address Nonconformance No. 99900728/2017-201-02, documented in inspection report No. 99900728/2017-201, dated November 16, 2017 (ADAMS Accession No. ML17311A267). The NRC inspection team reviewed the documentation that provided the objective evidence that all the corrective actions were completed and adequately implemented. Based on this review, the NRC inspection team closed Nonconformance No. 99900728/2017-201-02.

Inspection Areas

The NRC inspection team determined that Valcor established its programs for nonconforming material, parts, or components, corrective action, design control and qualification, CGD, procurement document control and oversight of contracted activities, measuring and test equipment, and internal audits, in accordance with the applicable regulatory requirements of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed and activities observed, the NRC inspection team also determined that Valcor is implementing its policies and procedures associated with these programs. No findings of significance were identified in these areas.

REPORT DETAILS

1. 10 CFR Part 21 Program

   a. Inspection Scope

   The U.S. Nuclear Regulatory Commission (NRC) inspection team reviewed Valcor Engineering's (hereafter referred to as Valcor) 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 Valcor's purchase orders (POs) to verify 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 Valcor's nonconformance and corrective action procedures provide a link to the 10 CFR Part 21 program.

   Furthermore, for a sample of 10 CFR Part 21 evaluations performed by Valcor, the NRC inspection team verified that Valcor had effectively implemented the requirements for evaluating deviations and failures to comply. The NRC inspection team verified that the notifications were performed in accordance with the requirements of 10 CFR 21.21, as applicable.

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

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

   a. Inspection Scope

   The NRC inspection team reviewed Valcor'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, "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 verified that Valcor'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, use-as-is, scrap/salvage, return to vendor, or no defect found.

The NRC inspection team reviewed a sample of Nonconformance Reports (NCRs) and confirmed that Valcor: (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 also reviewed a sample of Corrective Action Reports (CARs) and confirmed that the CARs contain, as applicable: (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. In addition, the NRC inspection team verified that the corrective action process provides a link to the 10 CFR Part 21 program.

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

In addition, the NRC inspection team reviewed Valcor's corrective actions in response to the inspection findings identified in NRC inspection report (IR) No. 99900728/2017-201, dated November 16, 2017 (ADAMS Accession No. ML17311A267).

b. Observations and Findings

b1. Corrective Action Associated with Nonconformances 99900728/2017-201-02

Following the August 2017 inspection at Valcor as documented in NRC Inspection Report (IR) No. 99900728/2017-201, the NRC issued three Nonconformances: 99900728/2017-201-01, 99900728/2017-201-02 and 99900728/2017-201-03. Nonconformances 99900728/2017-201-01 and 99900728/2017-201-03 were closed in an August 2020 inspection as documented in IP No. 99900728/2020-201 (ADAMS Accession No. ML20216A590).

Nonconformance 99900728/2017-201-02 was cited for Valcor's failures to ensure the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of solenoid valves. In addition, Valcor failed to establish appropriate measures for source evaluation or inspection at the contractor or subcontractors. Specifically, Valcor 1) did not identify an appropriate set of critical characteristics for the voltage controller and the specified production testing was not adequate to fully verify the performance of the controller; 2) did not establish the technical basis to verify the suitability of the materials for the selection of the sample population for nondestructive and destructive testing of O-rings, helical springs, and stop springs and other commercial-grade items; 3) did not use the correct sample size to verify the suitability of the material of O-rings by a durometer and Fourier-transform infrared spectroscopy (FTIR) analysis; 4) did not establish the acceptance criteria for the verification of material hardness properties of the O-rings to ensure that they met the material specification; and 5) did not perform a commercial-grade survey or source surveillance of the commercial suppliers of

helical springs and top springs to verify the validity of the Certificates of Conformance provided by these suppliers for critical characteristics heat treatment and tensile strength.

In its response dated December 15, 2017 (ADAMS Accession No. ML17355A114), Valcor stated that it had initiated Corrective Action (CA) No. 2017-028 to address this issue. To address issue 1), Valcor stated in its response that critical characteristics were established in Q Drawings S1140-23-23Q and S1140-23-25Q. The 180 VDC plus minus 10% tolerance is justified in Engineering Document ER 045. In addition, Acceptance Test Reports TR1140-23-23 and TR1140-23-25 would be revised to add tests to fully verify the initial VCB output voltage as well as the holding voltage throughout the entire range of input voltages. The VCB would be tested under worst-case load condition to verify satisfactory operability.

To address issue 2), Valcor stated in its response that the procedure for dedication of commercial-grade items, S2002, had been revised to include tables identifying normal, reduced, and tightened plan sample size and destructive test sampling requirements. In addition, Valcor added fields to all Q-Drawings to document the sample plan and justification for each purchased lot.

To address issue 3), Valcor stated in its response that it had immediately stopped using only one sample for Durometer destructive testing and FTIR analysis. Inspectors were trained to follow the new sampling plan in S2002 regardless of if the supplier's documentation indicates that all of the parts are from the same heat number, production lot number, or batch number. In addition, 10 CFR Part 21 evaluation was initiated to evaluate the extent of the condition.

To address issue 4), Valcor stated in its response that the commercial-grade dedication plan, S101Q, was revised to include acceptance criteria for the material compounds based on critical characteristics defined by Valcor. In addition, an extent of condition was evaluated by reviewing all the receiving inspection records.

To address issue 5), Valcor stated in its response that one of the three spring suppliers utilized by Valcor had commercial grade survey performed in October 2017. In December 2017, Valcor obtained a NIAC audit and validated the second spring supplier as 10 CFR Appendix B compliant. Valcor would perform a commercial grade survey on the third spring supplier. In addition, an extent of condition was performed and concluded that all springs installed and supplied to Valcor's customers meet design drawing and will perform as designed.

The NRC inspection team reviewed the documentation that provided the objective evidence for the completion of the corrective actions. The NRC inspection team verified that Q Drawings S1140-23-23Q and S1140-23-25Q have been revised to include critical characteristics of 180V plus minus 10% output voltage, Acceptance Test Reports TR1140-23-23 and TR1140-23-25 have been revised to include tests to verify output voltage. The NRC inspection team verified that the procedure for dedication of commercial-grade items, S2002, has been revised to include tables identifying normal, reduced, and tightened plan sample size and destructive test sampling requirements, and Valcor personnels have been trained to use the latest sampling plan in S2002. The NRC inspection also reviewed a sample of receipt inspection records that showed that the new sampling plan was implemented. The NRC inspection team verified that the commercial grade dedication plan, S101Q, has been reviewed to include acceptance criteria for material compounds. In addition, the NRC inspection team reviewed the audit reports of the three spring suppliers and the extent of

condition evaluation Valcor performed to ensure the springs supplied and installed to Valcor's customers would perform as designed.

The NRC inspection team reviewed Valcor's objective evidence and determined that Valcor's corrective actions were adequately implemented to address Nonconformance 99900728/2017-201-02. Based on its review, the NRC inspection team closed Nonconformance 99900728/2017-201-02. No findings of significance were identified.

c. Conclusion

The NRC inspection team concluded that Valcor is implementing its nonconformance 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 Valcor is implementing its policies and procedures associated with its nonconformance and corrective action programs. No findings of significance were identified.

3. Design Control and Qualification

a. Inspection Scope

The NRC inspection team reviewed Valcor'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. The NRC inspection team selected a sample of Valcor's design packages for safety-related components provided to U.S. nuclear power plants and reviewed relevant design reports, customer specifications, drawings, test procedures, test reports, and qualification reports. The NRC inspection team verified that these documents contained the required technical information in accordance with Valcor's procedures and the applicable American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (BPV) Code requirements.

The NRC inspection team reviewed design packages for two solenoid valves, ensuring that the documents included the correct technical information per the customer specifications, Valcor's procedures, and the applicable ASME BPV Code requirements. The NRC inspection team reviewed a design change evaluation to qualify a replacement material for a discontinued O-ring material and verified that the design change was properly evaluated.

The NRC inspection team also observed a liquid penetrant examination of a safety-related part and verified that the testing and associated inspections were performed in accordance with Valcor's procedures. The NRC inspection team confirmed that the non-destructive examination (NDE) personnel were qualified in accordance with the applicable Valcor procedures. The NRC inspection team reviewed the test report associated with the observed activity and confirmed that the report recorded the required information in accordance with Valcor's procedures.

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

4. Commercial-Grade Dedication

a. Inspection Scope

The NRC inspection team reviewed Valcor'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, "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."

Valor's CGD process consists of developing CGD plans that include: (1) technical evaluation; (2) identification number; (3) intended environment; (4) safety functions; (5) credible failure mechanisms; (6) critical characteristics and verification methods for acceptance; and (7) supplier/manufacturer identification. The NRC inspection team reviewed a sample of CGD plans and commercial-grade surveys of commercial vendors on Valor's commercial approved vendors list. The sample of CGD plans included the following items: solenoid coil, O-rings, packing rings, guide clamps, MGT plates, cylinders. Within these CGD plans, the NRC inspection team reviewed: (1) purchase orders (POs); (2) technical evaluations; (3) checklists; (4) inspection and test reports; and (5) Certificates of Conformance and Certified Material Test Reports (CMTRs). The NRC inspection team evaluated the criteria for the identification of item functions, credible failure mechanisms and modes, selection of critical characteristics and acceptance criteria, identification of verification methods, and justification of the sampling methodologies, as applicable, to verify the effective implementation of Valor's CGD process In addition, the NRC inspection team verified that commercial-grade surveys contained the objective evidence necessary to demonstrate the commercial vendors adequately controls the critical characteristics during the service activities.

The NRC inspection team witnessed the verification of a sample of critical characteristics as part of the CGD for a batch of O-rings on PO 282005 and Stops for PO 281702. The NRC inspection team verified that Valor's test technician was adequately following the CGD plan and documenting the inspection results. In addition, the NRC inspection team confirmed the test technician was using calibrated measuring and testing equipment (M&TE) to take the appropriate measurements. Furthermore, the NRC inspection team reviewed the training records of the test technician and confirmed that he was adequately trained and qualified in accordance with Valor's policies and procedures.

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

5. Procurement Document Control and Supplier Oversight

a. Inspection Scope

The NRC inspection team reviewed Valcor'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 Valcor's approved vendor list (AVL), and a sample of POs, supplier audits, job travelers, and receipt inspection records. For the sample of POs reviewed, the NRC inspection team verified that the POs included, as appropriate: scope of work, right of access to the suppliers' facilities, and conditions and restrictions imposed to sub-suppliers. The NRC inspection team confirmed that the POs adequately invoked the applicable technical, regulatory, and quality requirements. In addition, the NRC inspection team verified that for the sample of receipt inspection records reviewed (e.g., receipt inspection reports, Certificates of Compliance, and Certificate of Calibration), these records were (1) reviewed by Valcor for compliance with the requirements of the POs, (2) the records were approved by qualified individuals, and (3) the records contained the applicable technical and regulatory information. The NRC inspection team performed a walkdown of the receipt inspection and quality control inspection area.

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 the following: the audit reports included an audit plan; audits were performed according to established frequency; audit reports included adequate documented objective evidence of compliance with the applicable requirements; and audit documentation was reviewed by Valcor's responsible management.

The NRC inspection team also discussed the procurement document control and supplier oversight programs with Valcor'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 Valcor 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 determined that Valcor is adequately implementing its policies and procedures associated with the procurement document control and supplier oversight programs. No findings of significance were identified.

6. Control of Measuring and Test Equipment

a. Inspection Scope

The NRC inspection team reviewed Valcor'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.

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 used in CGD for a batch order of O-rings was calibrated and labeled, and the associated certificate of calibration stated the traceability to a nationally recognized standard.

The NRC inspection team confirmed that when M&TE equipment is found to be out of calibration, a material rejection report (MRR) is initiated, and an evaluation is performed to determine if the M&TE was previously used. The NRC inspection team performed a walk-down of Valcor's calibration laboratory 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 discussed the control of M&TE with Valcor'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 Valcor 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 Valcor is implementing its policies and procedures associated with the M&TE program. No findings of significance were identified.

7. Internal Audits

a. Inspection Scope

The NRC inspection team reviewed Valcor's policies and implementing procedures that govern its internal audit program to verify compliance with the requirements of Criterion XVIII, "Audits" of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed Valcor's internal audit plans, internal audit reports, and corrective actions generated during internal audits.

The NRC inspection team verified that the audit documents reviewed were adequately completed and that Valcor adequately corrected the conditions identified in CARs generated during internal audits. The NRC inspection team verified that Valcor'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 Valcor'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 Valcor 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 Valcor is adequately implementing its policies and procedures associated with the internal audit program. No findings of significance were identified.

8. Entrance and Exit Meetings

On May 8, 2023, the NRC inspection team presented the inspection scope during an entrance meeting with Mr. John Trezza, Valcor's President, and other members of Valcor's management and technical staff. On May 12, 2023, the NRC inspection team presented the inspection results to Mr. Trezza and other members of Valcor's management and technical staff. The attachment to this report lists the attendees of the entrance and exit meetings, as well as those individuals whom the NRC inspection team interviewed.

ATTACHMENT

1. ENTRANCE/EXIT MEETING ATTENDEES

Name	Position	Affiliation	Entrance	Exit	Interviewed
Michael Swirad	Quality Assurance Director	Valcor Engineering Corporation (Valcor)	X	X	X
John Trezza	CEO / President	Valcor	X	X	
Tara Kolankoski	Senior Quality Assurance Engineer	Valcor	X	X	X
David Baarck	Junior Quality Assurance Engineer	Valcor	X	X	X
Christopher Lewis	Purchasing Manager	Valcor	X		
Thien Nguyen	Director Sales & Marketing	Valcor	X		
Al Lamastra	VP/ General Manager	Valcor	X		
Yesica Wong	Inventory Control Manager	Valcor	X*	X*	
Jim Phillips	Director of Operations and Supply Chain	Valcor	X		
Ashok Idiculla	QC Manager	Valcor			
Oza Rajuash	QC Inspector	Valcor			
Mona Patel	QC Inspector	Valcor			X
Wilfredo Zavala	Metrology Quality Control Inspector	Valcor			X

Barrett Matiez	Staff Engineer	Valcor			X
Michael Spressler	NDE Inspector	Valcor			X
Hemang Dave	Chief Engineer, Nuclear	Valcor		X	X
Patti Kemps		Valcor		X	
Paul Conforme		Valcor		X	
Aaron Armstrong	Inspection Team Leader	Nuclear Regulatory Commission (NRC)	X	X	
Dong Park	Inspector	NRC	X	X	
Yiu Law	Inspector	NRC	X*	X*	
Rebecca Romero-Devore	Inspector	NRC	X	X	
Chakrapani Basavaraju	Mechanical Engineer	NRC	X*	X*	
Nicholas Hansing	Mechanical Engineer	NRC	X	X	
Ami Agrawal	Deputy Director	NRC		X	
Kerri Kavanagh	Branch Chief	NRC		X	

2. INSPECTION PROCEDURES USED:

- Inspection Procedure (IP) 43002, “Routine Inspections of Nuclear Vendors,” dated February 10, 2023
- Inspection Procedure (IP) 43003, “Reactive Inspections of Nuclear Vendors,” dated April 8, 2020
- 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. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Status	Type	Description
99900728/2017-201-01	CLOSED	Nonconformance	Criterion III

4. DOCUMENTS REVIEWED

Quality Assurance Procedures (QAP):

- “Nuclear Quality Assurance Manual,” Fifth Edition, Revision 30, dated April 14, 2023
- S517, “Standard Procedure for Design Planning & Control, Nuclear Engineering,” Revision D, dated April 12, 2023
- S1120, “Liquid Penetrant Examination Procedure – Nuclear,” Revision AH, dated February 27, 2020
- S1477, “Acceptance and Burn-In Test Procedures for AC and DC Voltage Control Boxes & AC and DC Printed Circuit Boards,” Revision K, dated July 15, 2021
- S1519, “Inspection, Test Personnel Qualification Requirement,” Revision K, dated March 10, 2020
- S1559, “Audit Personnel Qualification Procedure - Nuclear,” Revision L, dated October 26, 2021
- S1613, “Qualification Procedure for Certifying Engineers,” Revision P, dated March 24, 2023
- S1843, “Procedure to Prepare, Check and Certify Nuclear Valve Design Specifications,” Revision D, dated February 22, 2022
- S1303, “Engineering Change Order (ECO) Procedure,” Revision W, dated July 27, 2022
- S2002, Dedication of Commercial Grade Items for Nuclear Safety Related Applications,” Revision Y, dated February 22, 2022
- S2110, “10CFR21 Defects and Non-Compliance Reporting Procedure,” Revision N, dated May 5, 2023
- SOP-QA-0001, “Training,” Revision D, dated April 4, 2023
- SOP-QC-0001, “Calibration,” Revision F, dated December 3, 2022
- SOP-QC-0002, “Incoming Inspection,” Revision B, dated May 13, 2020
- WI-SC-0001, “Quality Clauses for Suppliers,” Revision D, dated February 24, 2022
- WI-QA-0002, “Control of Nonconforming Items,” Revision I, dated January 12, 2023
- WI-QA-0003, “Corrective Action,” Revision G, dated January 15, 2023
- WI-QA-0007, “Internal Audit,” Revision I, dated December 14, 2020
- WI-QA-0008, “Liquid Penetrant Material Testing & Verification,” Revision K, dated

February 12, 2020
- WI-QA-0022, “Valcor Counterfeit Parts Material Prevention Plan,” Revision B, dated August 5, 2019
- WI-QA-0027, “Procurement of Calibration Services,” Revision B, dated April 30, 2023
- WI-QC-0012, “Calibration: Vernier,” Revision F, dated December 7, 2020

Design Documents:

- QR SKC26022-1, “Delta Qualification Report for E0515-80 O-Ring Material Replacement,” Revision A, dated January 7, 2020
- MR526-5631-45-1, “Design Report on Valve Solenoid, Class 150, 2 Inch, Sch. 40, N.C., A.C., Nuclear Service, Model V526-5631-45, P/N: 413175201,” Revision B, dated January 15, 2019
- MR526-5688-26-18, “Design Report on Valve Solenoid, Class 1792, ¼ in. x 0.065” Wall Thk., N.C., D.C., Nuclear Service, Model #V526-5688-26 and P/N: 208865325,” Revision D, dated December 7, 2020
- Valcor Memo for Review of Westinghouse design specification for MR526-5688-26-18
- Design Verification Sheet for MR526-5688-26-18
- Valcor Memo for Review of Duke Energy design specification for MR526-5631-45-1
- Design Verification Sheet for MR526-5631-45-1
- PeneCert Testing Service Report for PT Emulsifier water content, dated May 8, 2023
- PeneCert Testing Service Report for PT Penetrant ZL-27A fluorescent brightness, dated April 13, 2023
- 0177-LTR-0038, “INR Engineering Ltd Technical Letter,” dated May 3, 2021
- ASME QME-1 EQ Qualification Report for Solenoid Valve Model V526-5688-26 APP-PV13-Z0D-104 & 107, Revision G, dated October 18, 2016
- Drawing 208865325, Revision C, dated April 20, 2017
- Drawing 413175201, Revision D, dated March 18, 2021
- Penetrant Examination Record for Part Number V52602-5292-21 Seal
- ER 45, “Engineering Report for Westinghouse AP1000 Voltage Control Box P/Ns S1140-23-23 and S1140-23-25 Output Voltage Design Analysis,” Revision D, dated May 15, 2018

Commercial Grade Dedication Packages (CGD) and Critical Characteristics Attribute and Verification sheets:

- Commercial Grade Item Dedication Technical Evaluation
- S101Q, “O-Ring Standard,” Revision C, dated October 16, 2017
- S1140-23-23Q, “Solenoid Control Box,” Revision B, dated July 22, 2020
- S1140-23-25Q, “Solenoid Control Box AC,” Revision B, dated July 22, 2020
- Engineering Order 6539, Revision A, dated October 31, 2017
- Sales order 402322-001, “O-ring,” dated March 17, 2023
- PO Number 282005, “O-ring,” dated May,9 2023
- CGD S101Q, “O-ring,” Revision C, dated October 16, 2017
- Valcor Standard Procedure, S101-TAB S102-TAB, “O-Ring Standard Size and Compound,” dated March 1, 2023
- CGI Test and Inspection Record, “O-Ring Part S101Y22,” dated May 9, 2023
- Certificate of Conformance for Order number 669916, dated November 14, 2008

- Job Traveler 318720, “V52617-6040-5 Stop,” dated February 27, 2023
- PO 281702, “V52617-6040-5 Stop,” dated March 9, 2023
- Dwg V52617-6040-5, “Stop,” Revision B, dated October 1, 2009
- CGID Test and Inspection Record for, “Stop V52617-6040-5,” dated May 9, 2023
- CGD Plan No. V52617Q, dated January 2, 2018
- Engineering Report for Coil Shell Assembly Failure Investigation for V52653-6040-7, date August 24, 2022
- PO for Material Analysis and Verification for S101CB12 O-Ring, dated April 14, 2023
- Test report for Material Analysis and Verification for S101CB12 O-Ring, dated May 1, 2023
- PO No.270128 for Material Analysis and Verification, dated May 2023
- Job order 308829 for 107175201 V526-5295-187 Valve Solenoid, dated February 23, 2022
- Job order 308831 for V105-295-25-14 Solenoid Assembly, dated September 20, 2022
- Job order 308832 for S1140-11-73 Bracket Term Block Assembly, date August 2, 2022
- Job order 310297 for S1140-51-2 Guide Clamp, dated March 8, 2022
- CGID Test and Inspection Record for Guide Clamp Part number S1140-51-2, date June 7, 2022
- PO 2431487, “Valve, solenoid 3/8”, 300 class, 3/8 tube ends SA-213 TP 316, Body SA182 GR F316,” dated September 10, 2021
- PO 274109, “Guide Clamp,” dated May 10. 2023
- Dwg S1140-15-2, “Guide Clamp,” dated March 16, 1990
- CGD Plan No S1140-51-2, “Guide Clamp,” October 1, 2018
- Job Traveler 315370, “V52630-554 Solenoid Assembly,” dated January 25, 2023
- Job Traveler 315370, “V52630-555 Plate,” dated November 21, 2023
- CGID Test and Inspection Record for Plate MGT V52629-555, dated January 12, 2023
- PO 4500789853 for V52630-554 Solenoid 120VDC, 3way, dated August 9, 2023
- PO 278881 for V52629-55 Plate dated May 3, 2023
- Dwg V52629-555, “Plate MT’G,” Revision C, dated February 17, 2021

Internal Audit:

- IA-22-001, Assessment (Audit) Plan, dated November 29, 2022
- IA-22-001, Internal Audit Report, dated December 7, 2022
- Valcor 2021 Internal Nuclear QA Audit Plan, Revision 1
- 2021 Internal Audit Report, dated December 5, 2021

Supplier Oversight:

- Copy of Supplier Audit Survey List.xlsx
- Current Approved Vendor List, dated April 11, 2023
- 2023- Supplier Audit, dated January 18, 2023
- Supplier Performance Assessment Record, dated October 25, 2021
- Laboratory Testing, Inc. Supplier Audit Report, dated September 6, 2022
- Piping Inc. Audit Summary Report, dated August 2, 2021
- Inspection Report for Part Number 2618-6031 (PO #280445)
- Inspection Report for Part Number 2618-6042 (PO #281906)
- Inspection Report for Part Number 2195-0057 (PO #278664)
- Material Receiving Report for PO #280445

- Material Receiving Report for PO #281906
- Job Traveler 315323 for Inventory Number 2195-0057
- Quality Survey Report for a spring manufacturer, dated February 14, 2019
- Audit for a spring manufacturer, dated May 18, 2016
- Audit for a spring manufacturer, dated May 23, 2019
- Audit for a spring manufacturer, dated January 4, 2018

Purchase Orders:

- Purchase Order (PO) #276573
- PO #73776
- PO #281702
- PO #282005
- PO #280445
- PO #281906
- PO #278664

Measuring and Test Equipment Documents:

- Certificate of Calibration, HHG029, 23.0 / .00005 Digital Height Gage, Model No. V 602+, dated September 20, 2022
- Certificate of Calibration, KRW007, Wilson, Model/Serial No. R54-00-1072, dated June 2, 2022
- Certificate of Calibration, KRW009-V, Durometer, Model/Serial No. Type M-1442 / 1128616, dated March 8, 2023
- Certificate of Calibration, VER329, 0-6” / .0005 Digital Caliper, Model/Serial No. 200-196-30 / A18237564, dated October 27, 2022
- Certificate of Calibration, VEC0001-22-04-01652-1, WGB001, Gage Blocks, 88 PCS., Serial No. R6517, dated April 22, 2022
- Certificate of Calibration, VEC0001-21-05-02001-5, WRG073, Plain Ring Gage Master, Serial No. 7E09, dated June 17, 2021
- Certificate of Calibration, XOR001, Parker Size Gauge for O-Rings, dated June 4, 2021
- Certificate of Calibration, UXR006, Thermo Scientific Portable XRF Analyzers X-Ray Tube Radiation Survey Certificate, Survey Date: December 1, 2022
- Certificate of Calibration, UXR006, Thermo Scientific Portable XRF Analyzers X-Ray Tube Radiation Survey Certificate, Survey Date: March 21, 2023
- Service Report, SE-2207348011, dated February 7, 2023
- Service Report, SE-2303367333, dated April 5, 2023
- CGID Test & Inspection Record, 47879 S101Y113, dated December 22, 2021
- CGID Test & Inspection Record, 48407 S101CS48, dated January 4, 2023
- CGID Test & Inspection Record, 48409 S101Y112, dated January 6, 2023
- Test Report for P/N S1140-23-23, dated April 24, 2013
- Test Report for P/N S1140-23-25, dated August 10, 2016

NCRs:

- MRR 0796-2021
- MRR 1299-2021
- MRR 0069-2022
- MRR 0262-2022

- MRR 0331-2022
- MRR 0497-2022
- MRR 0626-2022
- MRR 0699-2022
- MRR 0711-2022
- MRR-0714-2022

Corrective Action Reports (CARs) Reviewed During the NRC Inspection:

- CA-2017-028
- CA-2019-045
- 129-2020-8D
- 144-2020-8D
- 191-2020-8D
- 362-2021-SCAR
- 367-2021-SCAR
- 369-2021-SCAR
- 399-2022-3D
- 400-2022-3D
- 401-2022-8D
- 402-2022-3D
- 403-2022-3D
- 404-2022-8D
- 405-2022-8D
- 445-2022-SCAR
- 446-2022-SCAR
- 464-2022-SCAR
- 497-2023-SCAR
- 510-2023-3D
- 533-2023-3D

10 CFR Part 21 Records

- S2110-2019-5
- S2110-2021-QA-1
- S2110-2021-QA-2
- S2110-2021-QA-3
- S2110 2021-QA-3, “O-Ring Sampling,” dated May 25, 2021

Training Records:

- Lead Auditor Qualifications and Certification Record of John Salasky
- Qualification Record of Michael Swirad
- Qualification Record of Mona Patel
- Qualification Record of Barrett W. Matiez
- Qualification Record of Mahfuja Begum
- Qualification Record of Michael Spressler
- S2002 Revision N and CFSI Training
- S2002 Revision R Training

- S2002 Revision U Training
- S2002 Revision V Training