

January 16, 2015

Mr. David Colegrove, Quality Assurance Manager
Reuter-Stokes Inc., a Division of GE Measurement and Control
8499 Darrow Road
Twinsburg, OH 44087-2398

SUBJECT: NUCLEAR REGULATORY COMMISSION INSPECTION OF GENERAL ELECTRIC
REUTER-STOKES REPORT NO. 99901454/2014-202

Dear Mr. Colegrove:

On December 8, 2014 to December 12, 2014, the U.S. Nuclear Regulatory Commission (NRC) conducted an inspection at the GE Reuter-Stokes (GERS) manufacturing facility in Twinsburg, OH. The purpose of this limited-scope inspection was to assess GERS' compliance with the provisions of selected portions 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."

This technically-focused inspection specifically evaluated GERS' implementation of quality activities associated with the fabrication and testing of safety-related local power range monitors (LPRM) supplied to U.S. operating reactor plants. The enclosed report presents the results of this inspection. This NRC inspection report does not constitute NRC endorsement of your overall quality assurance (QA) or 10 CFR Part 21 programs.

Within the scope of this inspection, no violations or nonconformances were identified and no response is necessary.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response (if applicable) will be made available electronically for public inspection in the NRC's Public Document Room or through the NRC's document system, Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material is withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of

D. Colegrove

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information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

Sincerely,

/RA/

Richard A. Rasmussen, Chief
Electrical Vendor Inspection Branch
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket No.: 99901454

Enclosure:
Inspection Report: 99901454/2014-202
and Attachment

D. Colegrove

- 2 -

information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

Sincerely,

/RA/

Richard A. Rasmussen, Chief
Electrical Vendor Inspection Branch
Division of Construction Inspection
and Operational Programs
Office of New Reactors

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and Attachment

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NRO-002

OFFICE	NRO/DCIP/MVIB	NRO/DCIP/EVIB	NRO/DCIP/QVIB
NAME	NMcMurray*	JJimenez*	FTalbot*
DATE	01/07/2015	12/22/2014	12/18/2014
OFFICE	NRO/DCIP/EVIB	NRO/DCIP/EVIB	
NAME	GLipscomb*	RRasmussen	
DATE	01/08/2015	01/16/2015	

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

Vendor Docket No.: 99901454

Inspection Report No.: 99901454/2014-202

Vendor: Reuter-Stokes Inc., a Division of GE Measurement and Control
8499 Darrow Rd.
Twinsburg, OH 44087

Vendor Contact: Dave Colegrove, Quality Assurance Manager
david.colegrove@ge.com
(330) 963-2495

Nuclear Industry Activity: General Electric Reuter-Stokes (GERS) is a manufacturer of nuclear instrumentation and detectors. GERS is the primary supplier of Local Power Range Monitoring (LPRM) system in-core probes, dry tubes, and area radiation detectors for GE Hitachi and the GE operating fleet of boiling water reactors.

Inspection Dates: December 8-12, 2014

Inspectors: George Lipscomb NRO/DCIP/EVIB Team Leader
Jose Jimenez NRO/DICP/EVIB
Frank Talbot NRO/DCIP/QVIB
Nicholas McMurray NRO/DCIP/MVIB

Approved by: Richard A. Rasmussen, Chief
Electrical Vendor Inspection Branch
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Enclosure

EXECUTIVE SUMMARY

Reuter-Stokes Inc.
99901454/2014-202

The NRC staff conducted a vendor inspection at the General Electric Reuter-Stokes (GERS) facility to verify that it implemented an adequate quality assurance (QA) program that complies with the requirements of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities." In addition, the NRC inspection also verified that GERS implemented a program under 10 CFR Part 21, "Reporting of Defects and Noncompliance," that met the NRC's regulatory requirements. The NRC inspection team conducted the inspection from December 8-12, 2014. This was the first NRC inspection at the GERS facility.

This technically-focused inspection specifically evaluated GERS' implementation of quality activities associated with the fabrication, inspection, and testing, of a sample of local power range monitoring (LPRM) system in-core probes, dry tubes, and area radiation detectors. In addition to observing these activities, the NRC inspection team evaluated design change control and its effect on component environmental qualification (EQ), supplier controls, commercial-grade dedication (CGD), audits, problem resolution and reporting, and control of measuring and test equipment (M&TE).

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

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

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

The information below summarizes the results of this inspection.

10 CFR Part 21 Program

The NRC inspection team determined that GERS established a 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 GERS is implementing its policies and procedures associated with the 10 CFR Part 21 program. No findings of significance were identified.

Training Records

The NRC inspection team determined that GERS established an adequate training program for Level II and Level III manufacturing, inspection, and test technicians in accordance with the regulatory requirements of Criterion II, "Quality Assurance Program," of Appendix B to

10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also concluded that GERS is implementing an effective training program for GERS manufacturing, inspection, and test personnel. No findings of significance were identified.

Design Control and Commercial-Grade Dedication

The NRC inspection team determined that GERS established a program that adequately controls design changes and CGD in accordance with the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team determined that GERS is also effectively implementing its design change control and CGD processes. No findings of significance were identified.

Procurement and Supplier Control

The NRC inspectors determined that GERS established a program that adequately controls procurement of equipment and services in accordance with the regulatory requirements of Criterion IV, "Procurement Document Control," and VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50. Based on the limited sample of procurement documents reviewed, the NRC inspection team also determined that GERS is effectively implementing its procurement program in support of safety-related component manufacturing. No findings of significance were identified.

Control of Special Processes

The NRC inspection team concluded that GERS established a special process control program in accordance with the regulatory requirements of Criterion IX, "Control of Special Processes," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed and special processes observed, the NRC inspection team also determined that GERS is implementing its policies and procedures associated with its special process control program. No findings of significance were identified.

Manufacturing – Inspection and Test Controls

The NRC inspection team determined that GERS established an adequate program for inspection and test controls in accordance with the regulatory requirements of Criterion X, "Inspections," and Criterion XI, Test Control," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed and inspection and testing observed, the NRC inspection team also concluded that GERS is effectively implementing its inspection and test control program. No findings of significance were identified.

Measuring and Test Equipment Controls

The NRC inspection team determined that GERS established a program that adequately controls M&TE activities in accordance with the regulatory requirements of Criterion XII, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also concluded that GERS is effectively implementing its M&TE program. No findings of significance were identified.

Nonconformance Reports

The NRC inspection team determined that GERS established a program for nonconformance control in accordance with the regulatory requirements of Criterion XV, "Nonconforming Material, Parts and Components," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also concluded that GERS is effectively implementing its nonconformance program. No findings of significance were identified.

Corrective Action Program

The NRC inspection team concluded that GERS established a corrective action program (CAP) in accordance with the regulatory requirements of Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that GERS is implementing its policies and procedures associated with its CAP. No findings of significance were identified.

Internal Audits

The NRC inspection team concluded that GERS established an internal audit program in accordance with the regulatory requirements of Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that GERS is implementing its policies and procedures associated with its internal audits 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 GERS' policies and implementing procedures that govern the facility's compliance with the requirements of 10 CFR Part 21, "Reporting of Defects and Noncompliance". In addition, the NRC inspection team evaluated the 10 CFR Part 21 postings and a sample of GERS' 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 verified the content of GERS' 10 CFR Part 21 postings, as well as the location of each posting. The NRC inspection team also verified that GERS' nonconformance and corrective action procedures provide a link to the 10 CFR Part 21 program. The inspection team reviewed several Corrective Action Reports (CARs) and Potential Reportable Condition Reports (PRCs) with the technical staff to understand their process. The documents reviewed by the inspectors are included in the attachment to this inspection report.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The NRC inspection team determined that GERS established a 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 GERS is implementing its policies and procedures associated with the 10 CFR Part 21 program. No findings of significance were identified.

2. Training Records

a. Inspection Scope

The NRC inspectors reviewed GERS' policies and procedures related to training of GERS Level II and Level III personnel performing inspections and tests (i.e., dimensional inspections; electrical, functional, and installation tests; American Society of Mechanical Engineers (ASME) Section III pressure boundary tests; and non-destructive examinations (NDE) – Radiographic Testing (RT) and Liquid Penetrant Testing (PT)).

The NRC inspectors reviewed welding, inspection, and testing training records for a sample of personnel at the GERS facility in Twinsburg, OH, in accordance with requirements for PT, RT and NDE inspection. The NRC inspectors also reviewed records for test personnel performing Source Range Monitor (SRM), Intermediate Range Monitor (IRM), LPRM, and Traversing In-Core Probes (TIPs) manufacturing, inspection, and testing activities.

Specifically, the inspectors sampled four GERS personnel training records and evaluated their ability to perform Level II and Level III NDE, RT, and PT, including vision test records, to verify that GERS technicians can perform manufacturing, inspection, and test activities on LPRMs. The NRC inspectors verified that training records were adequate and interviewed GERS Level II technicians performing LPRM manufacturing, inspection, and test activities. The documents reviewed by the inspectors are included in the attachment to this inspection report.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The NRC inspection team determined that GERS established an adequate training program for Level II and Level III manufacturing, inspection, and test technicians in accordance with the regulatory requirements of Criterion II, "Quality Assurance Program," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also concluded that GERS is implementing an effective training program for GERS manufacturing, inspection, and test personnel. No findings of significance were identified.

3. Design Control and Commercial-Grade Dedication

a. Inspection Scope

The NRC inspection team reviewed design control policies and procedures to determine if GERS' controls were in compliance with the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. In addition, the inspectors reviewed commercial-grade dedication (CGD) policies and procedures to determine if controls met Criterion III requirements and CGD requirements in 10 CFR Part 21.

Design Control

The inspectors focused on control of design changes in their review of GERS' design control program and guidelines for control of design changes. The inspectors discussed design change control with GERS personnel and reviewed completed design change documentation to verify design change implementation. Original qualification activities for the GERS LPRMs were generally conducted by GE Nuclear Energy in the mid 1980's.

GERS typically used engineering analysis to show that features or design changes are bounded by the original component qualification. Specifically, the inspectors evaluated the disposition of multiple engineering change notices (ECNs) related to the NA250 and NA300 LPRMs. The inspectors reviewed ECNs regarding the impact of solder material and chemical surface treatment changes on the original qualification for the LPRM connector assemblies. Additionally, the inspectors also evaluated the qualification of

current design features compared to the original qualification testing. The reviewed design features were the NA300 flow holes, the NA300 stainless steel sensor bands and longitudinal support ribbon, and a non-metallic cable connector sub-component.

Commercial-Grade Dedications

The inspectors reviewed GERS CGD program and guidelines for establishing suitability for commercial components used in fabrication. The inspectors discussed the CGD process with GERS personnel and reviewed completed CGD documentation to verify implementation. The sample of completed documentation included evaluation of GERS safety function assessment, failure modes and effects analysis (FMEA), determination of critical characteristics, and designation of methods of acceptance.

Specifically, the inspectors evaluated multiple CGD activities supporting the LEMO environmentally qualified LPRM (EQL) connector assemblies, which are fabricated from a combination of dedicated sub-components. The inspectors also observed GERS personnel assemble LEMO EQL connectors and conduct the leak and electrical tests. Observations were compared to GERS drawings, travelers, specifications, and manufacturing and test requirements.

In addition, the inspectors evaluated the inspections, tests, and supplier surveys associated with three previously dedicated sub-components from the LEMO EQL connector build. The selected connector features were the O-rings, the metal collet, and the base LEMO connector which is modified during GERS fabrication. A selection of commercial supplier surveys associated with the LEMO EQL connector build was also compared with CGD requirements. This evaluation included verification of lead auditor initial qualification and maintenance of proficiency in accordance with GERS program requirements. The documents reviewed by the inspectors are included in the attachment to this inspection report.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The NRC inspection team determined that GERS established a program that adequately controls design changes and CGD in accordance with the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team determined that GERS is also effectively implementing its design change control and CGD processes. No findings of significance were identified.

4. Procurement and Supplier Control

a. Inspection Scope

The NRC inspectors reviewed procurement and supplier related procedures, a sample of purchasing records, and interviewed related personnel to determine if GERS procurement and supplier controls were in compliance with the regulatory requirements of Criterion IV, "Procurement Document Control," and Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50.

The inspectors reviewed Section 7, "Supplier Qualification," of GE Reuter-Stokes, Inc. Quality Assurance Manual (QAM), which stated the requirements for supplier source evaluation and selection to validate a supplier's capability to provide items or services under procurement specifications. The inspectors also reviewed Section 8, "Procurement Control," which describes the processes and controls established to ensure purchased items and services meet applicable technical and quality requirements. The inspectors also selected a sample of POs, associated approved supplier list entries, and other related GERS documents for evaluation. The inspectors reviewed the audits of three 10 CFR Appendix B suppliers and two commercial-grade purchases including their respective POs to ensure the audit program was being implemented in accordance with GERS procedures.

The inspectors verified that the technical requirements of GERS were transferred to related POs and issued to suppliers, confirmed that technical requirements were transferred to the relevant POs without modification or amendment, and confirmed a sample of supplier qualifications were appropriately reflected on the GERS approved supplier list. The inspectors also interviewed a lead auditor and supply chain personnel for the sample audits to assess their knowledge of supplier control and purchasing control procedures. The documents reviewed by the inspectors are included in the attachment to this inspection report.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The NRC inspectors determined that GERS established a program that adequately controls procurement of equipment and services in accordance with the regulatory requirements of Criterion IV, "Procurement Document Control," and VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50. Based on the limited sample of procurement documents reviewed, the NRC inspection team also determined that GERS is effectively implementing its procurement program in support of safety-related component manufacturing. No findings of significance were identified.

5. Control of Special Processes

a. Inspection Scope

The NRC inspection team reviewed GERS welding, brazing, NDE, and uranium plating policies and procedures to determine if GERS' controls were in compliance with the regulatory requirements of Criterion IX, "Control of Special Processes," of Appendix B to 10 CFR Part 50. In addition, the inspectors discussed the requirements of each specific process with personnel responsible for the planning and implementation of those activities.

The NRC inspection team reviewed a sample of welding, brazing, and NDE documents associated with the fabrication of the NA-250 and NA-300 LPRMs, and verified that the applicable process data, such as weld material identification number, welding specification, and in-process inspection results were recorded on the respective work travelers.

The inspectors also witnessed various welding, brazing, and NDE activities for NA-250 and NA-300, and verified that these activities were performed using appropriately qualified procedures and personnel in accordance with GERS requirements. The documents reviewed by the inspectors are included in the attachment to this inspection report.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The NRC inspection team concluded that GERS established a special process control program in accordance with the regulatory requirements of Criterion IX, "Control of Special Processes," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed and special processes observed, the NRC inspection team also determined that GERS is implementing its policies and procedures associated with its special process control program. No findings of significance were identified.

6. Manufacturing – Inspection and Test Controls

a. Inspection Scope

The inspectors observed and assessed a series of inspections and tests for NA250 and NA300 LPRM as follows:

- Radiograph Test (RT) for a seal/gland weld on a NA300 LPRM. The seal/gland weld is a Gas Tungsten Arc Weld (GTAW), American Society of Mechanical Engineers (ASME) Section III pressure boundary weld. Specifically, the inspectors witnessed the technician line up the RT X-ray for six shots, and observed two sets of RT X-ray Films.

- Installation and GERS inspection of a pilot and sleeve on a NA-250 Cable Detector Assembly.
- Hydrostatic Test on two NA-300 assemblies. The inspectors verified test prerequisites prior to the test, proper execution of the test, and proper annotation of anomalies; no leakage past the welded ASME Section III pressure boundary glad seal, calibration tube, and end plug sections; and Authorized Nuclear Inspector (ANI) attendance.
- Installation and connector tests on QLN (Meggit) and LEMO environmental qualified LPRM (EQL) Connectors on NA-300 assemblies.
- PT on a NA300 End Plug.
- Final ASME NPT stamp labeling and packaging of eight NA300 LRPM detector assemblies.

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

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The NRC inspection team determined that GERS established an adequate program for inspection and test controls in accordance with the regulatory requirements of Criterion X, "Inspections," and Criterion XI, Test Control," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed and inspection and testing observed, the NRC inspection team also concluded that GERS is effectively implementing its inspection and test control program. No findings of significance were identified.

7. Measuring and Test Equipment Controls

a. Inspection Scope

The NRC inspector reviewed the GERS M&TE control procedure and verified during GERS inspections and tests that GERS inspectors recorded required information and used calibrated M&TE equipment. The inspectors also assessed the GERS M&TE calibration lab control of M&TE and the disposition of out of calibration equipment. The inspectors sampled three NCRs related to M&TE devices with failed calibration tests. The documents reviewed by the inspectors are included in the attachment to this inspection report.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The NRC inspection team determined that GERS established a program that adequately controls M&TE activities in accordance with the regulatory requirements of Criterion XII, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also concluded that GERS is effectively implementing its M&TE program. No findings of significance were identified.

8. Nonconformance Reports

a. Inspection Scope

The NRC inspector reviewed GERS nonconformance controls and sampled several Nonconformance Reports (NCRs) generated between July and December 2014. The inspectors verified that the NCRs relating to LPRM subcomponents or M&TE devices were either rejected, repaired, reworked, scraped, or used-as-is in accordance with requirements. The inspectors also verified that NCRs dispositioned 'used-as-is' provided independent verification justified by a GERS engineer that the LPRM sub-component could perform its intended safety function or the M&TE device was within acceptable calibration ranges. The three NCRs regarding M&TE devices were correctly dispositioned as recalibrated or 'used-as-is'. The documents reviewed by the inspectors are included in the attachment to this inspection report.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The NRC inspection team determined that GERS established a program for nonconformance control in accordance with the regulatory requirements of Criterion XV, "Nonconforming Material, Parts and Components," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also concluded that GERS is effectively implementing its nonconformance program. No findings of significance were identified.

9. Corrective Action Program

a. Inspection Scope

The NRC inspection team reviewed GERS' policies and implementing procedures that govern the CAP to verify compliance with the requirements of Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50, and discussed the CAP with GERS'

management and technical staff. The NRC inspection team reviewed a sample of the Corrective Action Reports (CARs) associated with customer returns, internal audit findings, and fabrication of LPRMs, dry tubes, and area radiation monitors. In addition, inspectors verified that GERS' CAP provides a connection to the 10 CFR Part 21 program. The documents reviewed by the inspectors are included in the attachment to this inspection report.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The NRC inspection team concluded that GERS established a corrective action program (CAP) in accordance with the regulatory requirements of Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that GERS is implementing its policies and procedures associated with its CAP. No findings of significance were identified.

10. Internal Audits

a. Inspection Scope

The NRC inspection team reviewed GERS' policies and implementing procedures that govern the implementation of its internal audit program to verify compliance with Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50, and discussed the internal audit program with GERS' management and technical staff. The inspectors reviewed a sample of recent internal audit reports, audit checklists, and lead auditor qualification records. The inspection team also reviewed the disposition of corrective action reports to resolve deficiencies identified in audit findings for adequacy and timeliness, and confirmed that the audits were performed in accordance with GERS' program and regulatory requirements. The documents reviewed by the inspectors are included in the attachment to this inspection report.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The NRC inspection team concluded that GERS established an internal audit program in accordance with the regulatory requirements of Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that GERS is implementing its policies and procedures associated with its internal audits program. No findings of significance were identified.

11. Entrance and Exit Meetings

On December 8, 2014, the NRC inspection team discussed the scope of the inspection with Mr. Jim Vogel, General Manager, and other members of GERS' management and technical staff. On December 12, 2014, the NRC inspection team presented the inspection results and observations during an exit meeting with Mr. Jim Vogel and other members of GERS' management and technical staff. The attachment to this report lists the attendees at the entrance and exit meetings, as well as those individuals whom the NRC inspection team interviewed.

ATTACHMENT

1. ENTRANCE AND EXIT MEETING ATTENDEES

Name	Title	Affiliation	Entrance	Exit	Interviewed
George Lipscomb	Inspection Team Leader	NRC	X	X	
Frank Talbot	Inspector	NRC	X	X	
Jose Jimenez	Inspector	NRC	X	X	
Nicholas McMurray	Inspector	NRC	X	X	
Jim Vogel	General Manager	GERS	X	X	
Sean Donahue	Plant Manager	GERS	X	X	
Dave Colegrove	Manager of Quality Assurance	GERS	X	X	X
Jack Doyle	Nuclear Engineering Manager	GERS	X	X	X
Russell Bastyr	Nuclear Fuels and Service Quality Assurance Manager	GEH	X		X
Art Leifson	Radiation Safety Engineering Manager	GERS	X		
Bill Gibb	Materials Manager	GERS	X		
Bobbi Vannoy	Manager of Shop Operations	GERS	X	X	X
Brandon Bradley	Advanced Manufacturing Engineer	GERS	X	X	
Chad Morrison	EHS Manager	GERS	X		
Charles Slabaugh	Nuclear Project Manager	GERS	X	X	
David Hopkins	Quality Engineer	GERS	X	X	
David Jackson III	Quality Engineer	GERS	X	X	X
David Rae	Commercial Director	GERS	X		
David Ryzner	Lead Engineer	GERS	X	X	X
Dwayne Reid	Lead Engineer / Technologist	GERS	X	X	X
Greggor Nallo	Lead Engineer	GERS	X	X	

Name	Title	Affiliation	Entrance	Exit	Interviewed
James Lastig	Lead Engineer	GERS	X	X	
Kimberly Kuhls	Radiation Safety Officer	GERS	X	X	
Nathan Crowe	Sourcing Manager	GERS	X	X	
Rick Creer	Quality Assurance Engineer	GERS	X	X	X
Scott Betschman	Mechanical Engineer	GERS	X	X	X
Shanna Boveington	Warehouse/Logistics	GERS	X		
Timothy Kniss	Senior Engineer	GERS	X		X
Becky Boggs	QC Technician	GERS			X
Bert Berkey	Manufacturing Technician	GERS			X
Chris Simmers	Manufacturing Technician	GERS			X
Christa Kalcic	Senior Chemist	GERS			X
Dean Linc	Manufacturing Technician	GERS			X
Frank Miller	Nuclear Inspector	GERS			X
James J. Halliday	Authorized Nuclear Inspector	Hartford Steam Boiler Global Standards, Code Services			X
Jeremy Stephan	Measuring and Test Equipment Owner	GERS			X
Mike Buinetta	Manufacturing Technician	GERS			X
Nick Slabaugh	Shop Floor Leader	GERS			X
Rich Sambor	Manufacturing Technician	GERS			X
Robert Lunney	Radiographic Testing and Hydro Technician	GERS			X
Shamika Smith	Manufacturing Technician	GERS			X

2. INSPECTION PROCEDURES USED

IP 43002, "Routine Inspections of Nuclear Vendors"

IP 43004, "Inspection of Commercial-Grade Dedication Programs"

IP 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance"

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

None

4. LIST OF ACRONYMS USED

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ANI	Authorized Nuclear Inspector
ASME	American Society of Mechanical Engineers
CAP	Corrective action program
CAR	Corrective action report
CGD	Commercial grade dedication
ECN	Engineering change notice
EQL	Environmental qualified LPRM
FMEA	Failure modes and effects analysis
GE	General Electric
GEH	General Electric-Hitachi
GERS	General Electric Reuter-Stokes
GTAW	Gas Tungsten Arc Welding
IP	Inspection Procedure
IRM	Intermediate range monitor
LPRM	Local power range monitor
M&TE	Measuring and test equipment
NDE	Non-destructive examination
NCR	Nonconformance Report
NRC	Nuclear Regulatory Commission
PRC	Potential Reportable Condition Report
PO	Purchase order
PT	Liquid Penetrant Testing
QA	Quality Assurance
RT	Radiographic Testing
SRM	Source range monitor
TIP	Traversing In-Core Probes

5. DOCUMENTS REVIEWED

Commercial-Grade Dedication Documents

DA209A4117, "Rubber O-Ring Type Round Seals – Safety-related," Revision 14, dated March 28, 2011

Dimensional Inspection Report for Production order 19708552, dated October 29, 2014

Element Test Report for 5 EQI collets, dated October 15, 2014

FMEA, "NA250," dated November 5, 2010

FMEA, "RS-E3-0021, RS-E3-0042, RS-E3-0039 IRM LEMO Collet to MI Cable," dated November 5, 2010

Material Component Specification CN28-32, "Free Receptacle, Cable Collet," Revision A, dated February 24, 2010

TR 2010-17, "Safety Classification Guidelines for Reuter-Stokes Products," Revision C, dated November 25, 2014

TR 2010-20, "NA250 FEMA Report," Revision 0, dated November 5, 2010

Corrective Action/Non-Conformance Reports

2013 List of Corrective Action Reports

2014 List of Corrective Action Reports

CAR 11-006, dated February 15, 2011

CAR 11-030, dated February 16, 2011

CAR 13-004, dated March 11, 2013

CAR 13-005, dated March 27, 2013

CAR 13-008, dated May 21, 2013

CAR 13-009, dated May 21, 2013

CAR 13-010, dated May 21, 2013

CAR 13-011, dated May 23, 2013

CAR 13-012, dated May 23, 2013

CAR 13-013, dated May 23, 2013
CAR 13-018, dated May 31, 2013
CAR 13-030, dated November 20, 2013
CAR 13-035, dated December 6, 2013
CAR 13-036, dated December 6, 2013
CAR 14-007, dated March 7, 2014
CAR 14-009, dated August 15, 2014
CAR 14-010, dated February 15, 2011
CAR 14-017, dated July 11, 2014
CAR 14-021, dated October 14, 2014
CAR 14-023, dated November 10, 2014
CAR 14-034, dated November 10, 2014

Drawings

209A4117, "O-Ring (Rubber O-Ring Type Round Seals)," Revision 52, February 3, 1968
152D8479, "Gland seal housing," Revision 0, dated May 23, 1984
E3-0021-2DA, "Collet IRM/SRM Receptacle," Revision 0, dated February 12, 2010
E3-0021, "EQI Receptacle Assembly," Revision N, dated March 2, 2010

Engineering Change Notices (ECN)

ECN 9625, dated March 18, 1998
ECN 12723, dated March 31, 2003
ECN 41005804, dated July 30, 2010
ECN 44916839, dated October 29, 2010

External Audit and Survey Documents

Audit of Thermocoax – RS-13-G, dated September 9, 2013

Audit of TISI – RS-12-D, dated April 20, 2012

Audit report RS-12-P for LEMO USA, dated December 5, 2012

Audit report RS-13-E for LEMO SA and REDEL, dated March 26, 2013

LEMO SA and REDEL RS-13-E, “NIAC commercial grade item / service checklist,” dated February 27, 2013

LEMO USA RS-12-P, “NIAC commercial grade item / service checklist,” dated November 6, 2012

NIAC (Nuclear Industry Assessment Company) audit no.E12-02 of Element Materials Technology, dated January 17, 2012

NIAC audit no.17012 of Dubose National Energy Services, dated May 21, 2012

NIAC audit no.17028 of Nova Machine Products, Inc., dated May 16, 2012

GERS Nonconformance Reports (NCRs) dated between July and December 2014

NCR 118721270, “Connector Replaced due to Argon Seal Leakage Past Connector”

NCR 116967936, “Force Gage, Asset Number A-1923 Out of Calibration”

NCR 117546554, “Connector seal tube length”

NCR 117627606, “LRPM cable is an inch short”

NCR 118711212, “Connector Seal Leak”

NCR 118715669, “Anodes have Gouges”

NCR 118715681, “Pressure Gauge, Asset Number D-625”

NCR 118717085, “Clear Coating Scratches/Defective”

NCR 118718492, “Two missing Serial Numbers”

NCR 118718850, “Blown Hole Adapter End of Weld”

NCR 118719414, “LPRM Cable Assay, Voltage Breakdown”

NCR 118723606, “Detector Collar Not Brazed”

NCR 118724478, “Fission Chamber Plating Not Acceptable”

NCR 118725259, “Weld exposing MI Cable Insulation”

NCR 118725336, "Weld has Indications at X-Ray"

NCR 118725379, "Caliper - Micrometer"

NCR 118727756, "Rejection of Ball Weld"

NCR 118728486, "Detector, Low Voltage Breakdown on the detector"

NCR 118728648, "After Desplicing Voltage Breakdown Low"

Internal Audit Documents

2010-2014 List of Audits

2012 Internal Audit Checklist and Findings

2013 Internal Audit Checklist and Findings

2014 Internal Audit Checklist and Findings

GE-Hitachi Lead Auditor Qualification Record: Gaby Francis, dated July 21, 2012

GE-Hitachi Lead Auditor Qualification Record: Russell A. Bastyr, dated August 17, 2013

GE-Hitachi Lead Auditor Qualification Record: Youssef (Joe) Eid, dated September 4, 2012

Internal Audit NQA-2012-09, Revision 1, dated May 10, 2013

Internal Audit NQA-2013-15, dated December 3, 2013

Measuring and Test Equipment

MOHR CT100 Automatic Metallic TDR Cable Tester: S/N: A-3188, Calibration Due Date: June 15, 2015

Thorton Deionizing Water Chemistry Control Gage: S/N: 1817, Calibration Due Date: August 7, 2015

Metal Weight: S/N: A-524, Calibration Due Date: December 17, 2014

Hasting Vacuum Gage: S/N: D-636, Calibration Due Date: February 3, 2015

Hydro Thermometer: S/N: A-4140, Calibration Due Date: February 13, 2015

Light Meter: S/N: A-3315, Calibration Due Date: April 3, 2015

Master Gage: S/N: NP-023, Calibration Due Date: May 15, 2015

Working Gage: S/N: A-1599, Calibration Due Date: May 15, 2015

Digital Indicator: S/N: A-1237, Calibration Due Date: May 19, 2015

Digital Indicator: S/N: A-1237, Calibration Due Date: May 19, 2015

Source Measure Unit: S/N: B-496, Calibration Due Date: June 26, 2015

Go/NoGo Gage: S/N: A-4109, Calibration Due Date: July 10, 2015

Torque Wrench: S/N: A-3687, Calibration Due Date: July 13, 2015

Go/NoGo Gage: S/N: A-4119, Calibration Due Date: August 8, 2015

Metal Tape, A-4252: S/N: A4252, Calibration Due Date: October 7, 2015

METEK Tensile Test Machine: S/N: D-494, Calibration Due Date: November 10, 2015

Mitatoyo Digimatic Micrometer: S/N: 1092, Calibration Due Date: November 20, 2015

Miscellaneous Documents

List of Customer Returns 2010-2014

Potential Reportable Condition Reports

PRC 07-45, dated February 15, 2008

PRC 09-35, dated October 29, 2009

PRC 11-62, dated December 11, 2011

Procedures and QA Implementing Records

“GE Reuter-Stokes Inc. Quality Assurance Manual,” Document No. 113036, Revision AG, dated November 4, 2014

CP-18-100, “Quality Assurance Internal Audit Requirements,” Revision 3.0, dated August 4, 2014

GERS 23A1281, “NA-205 and NA-300 Detector Cathode Plating,” Revision 18, dated September 17, 2012

ISO-SOP-10.2, “In-Process Inspection and Test Procedure,” Revision C, dated September 20, 2002

ISO-SOP-10-3, “Final Inspection and Test Procedure,” Revision C, dated October 18, 2000

ISO-SOP-16.1, "Records Control," Revision L, dated September 10, 2014

M-01-017, "Bar and Plate – Stainless Steel XM19 Nuclear Grade" Revision C, dated October 1994

M-01-021, "Bar Type 304 L Austenitic Stainless Steel," Revision H, dated March 2013

M-01-023, "Supplemental Specification for 304 S.S.," Revision B, dated November 2001

MP-C6-0340-20X, "NA-250 Cable Detector Assembly MP-C6-0340-20X," Revision W, dated December 8, 2014

MP-C6-0350-20X-27, "NA-300 Lower Cable Assembly," Revision G, dated July 27, 2011

MP-C6-C-1100-281, "Manufacturing Procedure Number MP-C6-C-1100-281, LPRM in-Core Detectors Assembly," Revision J, dated May 6, 2008

MP-E3-0007, "Procedure for Connector Assembly of E3-007 and E3-0011 (NA300 LEMO Connectors)," Revision AB, dated January 4, 2014

MP-E3-0021, "Connector Assembly Procedure for E3-0211," Revision D, dated March 28, 1994

OGQ-0127.3, "Auditor and Lead Auditor Qualification and Certification," Revision 1.2, dated November 26, 2014

P15.75.1, "Detailed Spot Welding Procedure," Revision G, dated June 2001

QAPR-1, "ASME Code – Raw Material," Revision B, dated October 2014

QAPR-12, "Commercial Grade Procurement," Revision A, dated October 2014

QAPR-14, "Dedicated Item Requiring Testing," Revision A, dated October 2014

QAPR-3, "Safety Related Items," Revision B, dated October 2014

QAPR-9, "Safety Related Raw Materials," Revision D, dated October 2014

SOP 290.19.8, "Quality Assurance Instructions Covering Sampling Plans," Revision C, dated February 2, 2012

SOP 5290.7.2, "Traveler Preparation," Revision M, dated May 12, 2011

SOP C-5243.2, "Hydrostatic Pressure Test Log; No: F5243.1," Revision D

SOP-240.0.8, "Operation of MS-50 Argon Leak Detector," Revision O, dated January 24, 2007

SOP-244.3, "Testing LEMO Connectors for Safety-related Applications," Revision B, dated December 5, 2011

SOP-250.2.1, "Indoctrination and Training," Revision F, dated August 30, 2012

SOP-264, "Material Control Using Portable XRF," Revision F, dated October 28, 2014

SOP-290.15.1, "Exhibit 4, Rejection Tag," dated March 12, 2014

SOP-290.15.1, "Nonconformance Report (NCR) Procedure," Revision Y, dated March 12, 2014

SOP-291.1, "Processing of Returned goods," Revision H, dated November 6, 2014

SOP-35.1, "Weld/Braze/Solder Performance Qualification," Revision K, dated January 2014

SOP-35.2 "Weld/Braze Qualification Procedure," Revision M, dated August 2014

SOP-370.0, "Supplier Evaluation," Revision D, dated March 2014

SOP-421, "Traveler/Log Procedure," Revision C, dated April 18, 2013

SOP-5242.4, "Radiographic Examination of Welds," Revision H, dated May 16, 2014

SOP-5470.2, "Receiving Inspection Procedure," Revision Y, dated August 1, 2012

SOP-727.4.5, "Installation of QLN Receptacle onto 1/8" MI Cable," Revision J, dated July 23, 2012

SOP-810, "IR and VBD Test Procedure," Revision B, dated November 21, 2014

SOP-812, "TDR CT 100 Test Procedure," Revision A, dated June 14, 2013

SOP-891.2, "Dedication of Commercial Grade Items," Revision F, dated November 26, 2014

SOP-C-5101.2, "Product Quality Certification Process," Revision R, dated September 10, 2014

SOP-C-5120.1, "Design Control (Code and Safety-related Products)," Revision F, dated November 25, 2014

SOP-C-5230.10, "Computer Access Control Calibration Data," Revision H, dated November 19, 2014

SOP-C-5230.9, "Inspection, Measuring and Test Equipment Calibration," Revision AL, dated July 24, 2013

SOP-C-5242.3 "Liquid Penetrant Examination Procedure," Revision J dated January 2013

SOP-C-5242.3, "Liquid Penetrant Examination Procedure," Revision J, "Exhibit 1, Liquid Penetrant Examination Report," dated January 17, 2013

SOP-C-5242.4, "Radiographic Examination of Welds," Revision H dated May 2014

SOP-C-5243.2, "Four Chamber Hydrostatic Test Stand Procedure," Revision M, dated April 4, 2014

SOP-C-5247.0, "Visual Examination of Brazed and Welded Joints Procedure," Revision G, dated April 2004

SOP-C-5250.3, "Qualification of Inspection/Test Personnel and other QA personnel," Revision Y, dated October 31, 2014

SOP-C-5252.1, "Written Practice for Training Examination and Certification of NDE Personnel," Revision H, dated July 3, 2013

SOP-C-5254.1.1, "GTAW-Weld Procedure and Welder/Welding Operator Qualification Procedure," Revision J, dated May 2014

SOP-C-5255.1.1, "Brazing Procedure and Operator Qualification Procedure," Revision H, dated January 2014

SOP-C-5290.13.2, "Corrective Action Procedure," Revision AC, dated November 25, 2014

SOP-C-5290.14.9, "Stop Work Procedure," Revision G, dated July 30, 2013

SOP-C-5290.16.2, "Identification and Control of Parts and Materials," Revision J, dated August 16, 2011

SOP-C-5290.23, "QA Audits, Revision AE," dated November 14, 2014

SOP-C-5290.24, "Qualification and Certification of Audit Personnel," Revision U, dated November 24, 2014

SOP-C-5291, "Records Control," Revision Y, dated September 10, 2014

SOP-C-5470.2, "Receiving Inspection Procedure," Revision Y, dated August 1, 2012

SOP-C-5865.1, "Final Acceptance Test for LPRM Assemblies (Electrical Test)," Revision H, dated July 24, 2013

WI-16-108-07, "Reporting of Defects and Noncompliance under 10 CFR Part 21," Revision 1.1, dated May 5, 2014

Procurement Documents

PO 190208295 – Solder

PO 5050131243 – Mega Fluidline Products for Parker seals, Revision 0, dated August 9, 2007

PO 5050359326-10 – Brazing Rings large

PO 5050396926 – Seal Assembly

PO 5050454337-10 – Coated Gland

PO 5050463660-10 – Brazing Rings small

PO 5050497320 – Apollo Manufacturing for EQI collets, Revision 0, dated April 30, 2014

PO 5050506215 – Uranium 234 Powder

PO 5050508356 – Titanium Tubing

PO 5050541040 – Elements Materials Technology for collet material analysis, Revision 0, dated September 22, 2014

PO 5050545496 – LEMO USA for receptacles, Revision 0, dated October 6, 2014

Production Travelers

Production order 18504929, “720 safety-related O-rings,” dated April 8, 2010

Production order 19708552, “100 Collets,” dated November 4, 2014

Production order 19815860, “EQI IRM/SRM Receptacle, RS-E3-0021” (in-process)

SO 1599405 – LaSalle County Station – Exelon Generation Co.

SO 609408 – Monticello Nuclear Generating Plant – Northern States Power Company

WO 19739832 – Limerick Generating Station – Exelon Generation Co.

Qualification Documents

Design and Performance Specification 272A7097, “Bottom Entry Power Range Detector (NA-250),” Revision 12, dated April 8, 2003

TR 2010-14, Validation Tests for Lead Free Solder in LEMO Connector Assemblies,” dated August 19, 2010

GE Nuclear Energy NEDC-31042P, “Environment Qualification Report, QLN Connector,” Revision 0, dated June 1986

GE Nuclear Energy NEDC-30178, “Environment Qualification Report, Power Range Detector, C23, Perry,” Revision 4, dated July 1985

GE Nuclear Energy NEDC-30178, "Environment Qualification Report, Power Range Detector, C23, Perry," Revision 0, dated May 1983

GE Nuclear Energy NEDC-31560, "NA300 Environment Qualification Report," Revision 0, dated December 1988

GE Nuclear Energy NEDC-31863P, "Power Range Detector Assembly RS200 Environment Qualification Report," Revision 0, dated September 1990

GE Nuclear Energy NEDC-31944P, "EQ Connector Pairs and Under-vessel Cables Environment Qualification Report," Revision 0, dated September 1991

Material Component Specification AD2-44, "Loctite #2432," Revision 0, dated October 22, 2010