October 2, 2013

Mr. George Ardolino, Division VP Business
Unit Manager
Ametek Solidstate Controls, Inc.
875 Dearborn Drive
Columbus, OH 43085

SUBJECT: NUCLEAR REGULATORY COMMISSION INSPECTION REPORT NO. 99901427/2013-201 AND NOTICE OF VIOLATION AND NOTICE OF NONCONFORMANCE

Dear Mr. Ardolino:

From August 19 to August 23, 2013, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Ametek Solidstate Controls, Inc., (Ametek) facility in Columbus, OH. The purpose of the limited-scope inspection was to assess Ametek's 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 inspection specifically evaluated Ametek's design control, seismic and equipment qualification testing, commercial grade dedication (CGD), oversight of suppliers, part 21, and corrective action activities for operating reactor plants. The enclosed report presents the results of the inspection. This NRC inspection report does not constitute NRC endorsement of your overall quality assurance (QA) or 10 CFR Part 21 programs.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. The NRC evaluated the violation in accordance with its enforcement policy, which is available on the NRC's Web site at http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html.

The enclosed Notice cites the violation, and the subject inspection report details the circumstances surrounding it. The violation is cited because Ametek did not evaluate and report a defect within 60 days of discovery or file an interim report. The end result was that Ametek delayed notifying the NRC and customers until 110 days later that Tyco/Potter & Brumfield relays represented a substantial safety hazard and replacement was recommended.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. If you have additional information that you believe the NRC should consider, you may provide it in your response to the Notice. The NRC's review of your response to the Notice will also determine if further enforcement action is necessary to ensure compliance with regulatory requirements.

During the inspection, the NRC inspectors also found that the implementation of your QA program failed to meet certain NRC requirements imposed on you by your customers or NRC licensees in the areas of CGD, corrective action, and control of purchased material, equipment, and services. Specifically, Ametek failed to use a suitable testing program to verify the adequacy of the design of multiply battery chargers and inverters. Additionally, Ametek failed to provide adequate oversight of their suppliers through procurement documents, audits, and records to ensure that safety-related services comply with all aspects of its quality assurance program. In addition, Ametek also was not implementing its corrective action program to identify and correct conditions adverse to quality as the inspectors found two such examples of failure to identify and correct in a timely manner. The specific findings and references to the pertinent requirements are identified in the enclosure to this letter.

Please provide a written statement or explanation within 30 days from the date of this letter in accordance with the instructions specified in the enclosed Notice of Nonconformance. Where applicable, please include your assessment of the issue on the quality of previous work. We will consider extending the response time if you show good cause for us to do so.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC's Public Document Room or through the NRC's document system, Agencywide Documents Access and Management System (ADAMS), accessible 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 be withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

Sincerely,

/RA/

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

Docket No.: 99901427

During the inspection, the NRC inspectors also found that the implementation of your QA program failed to meet certain NRC requirements imposed on you by your customers or NRC licensees in the areas of CGD, corrective action, and control of purchased material, equipment, and services. Specifically, Ametek failed to use a suitable testing program to verify the adequacy of the design of multiply battery chargers and inverters. Additionally, Ametek failed to provide adequate oversight of their suppliers through procurement documents, audits, and records to ensure that safety-related services comply with all aspects of its quality assurance program. In addition, Ametek also was not implementing its corrective action program to identify and correct conditions adverse to quality as the inspectors found two such examples of failure to identify and correct in a timely manner. The specific findings and references to the pertinent requirements are identified in the enclosure to this letter.

Please provide a written statement or explanation within 30 days from the date of this letter in accordance with the instructions specified in the enclosed Notice of Nonconformance. Where applicable, please include your assessment of the issue on the quality of previous work. We will consider extending the response time if you show good cause for us to do so.

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Sincerely,

/RA/

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

Docket No.: 99901427

ADAMS ACCESSION No.: ML13259A314 *Concurred via email NRO-002

OFFICE	NRO/DCIP/EVIB	NRO/DCIP/EVIB	NRO/DCIP/MVIB	NRO/DCIP/MVIB
NAME	EHuang	SEdmonds	PCoco	AArmstrong
DATE	09/25/2013	09/25/2013	09/25/2013	09/26/2013
OFFICE	NRO/DCIP	NRO/DCIP/EVIB		
NAME	TFrye	RRasmussen		
DATE	09/27/2013	10/02/2013		

OFFICIAL RECORD COPY

SUBJECT: NUCLEAR REGULATORY COMMISSION INSPECTION REPORT NO. 99901427/2013-201 AND NOTICE OF VIOLATION AND NOTICE OF NONCONFORMANCE

DISTRIBUTION:
ASakadales
ERoach
KKavanagh
JWiebe
RGuzman
George.Ardolino@ametek.com

NOTICE OF VIOLATION

Ametek Solidstate Controls, Inc.
875 Dearborn Drive
Columbus, OH 43085

Docket No.: 99901427
Inspection Report No.: 99901427/2013-201

During a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the Ametek Solidstate Controls, Inc. (Ametek), facility in Columbus, OH, on August 19–23, 2013, inspectors identified a violation of NRC requirements. In accordance with the NRC Enforcement Policy, the violation is listed below:

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 21.21,"Notification of failure to comply or existence of a defect and its evaluation," paragraph 21.21(a), states that, "Each individual, corporation, partnership, dedicating entity, or other entity subject to the regulations in this part shall adopt appropriate procedures to evaluate deviations and failures to comply to identify defects and failures to comply associated with substantial safety hazards as soon as practicable, and, except as provided in paragraph (a)(2) of this section, in all cases within 60 days of discovery, in order to identify a reportable defect or failure to comply that could create a substantial safety hazard, were it to remain uncorrected."

Ametek's procedure 01-090145, "Failure Investigation/Part 21 Reporting", Section 2.0, states, in part, that "Evaluations shall be performed as soon as practicable, and in all cases within sixty (60) days of discovery, in order to identify a reportable defect of failure to comply that could create a substantial safety hazard."

Contrary to the above, as of August 23, 2013, Ametek failed to report a defect associated with substantial safety hazards as soon as practicable within 60 days of discovery or file an interim report. Specifically, Ametek was notified of a deviation with Tyco/Potter & Brumfield relays on October 8, 2008. Ametek assessed the deviation and concluded that the issue was a substantial safety hazard, however Ametek did not notify the NRC, effected licensees, and customers until 110 days later on January 26, 2009 to replace all effected Tyco/Potter & Brumfield relays.

This issue has been identified as Violation 99901427/2013-201-01.

This is a Severity Level IV violation (Section 6.9.d of the NRC Enforcement Policy).

Pursuant to the provisions of 10 CFR 2.201, "Notice of Violation," Ametek is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-001, with a copy to the Chief, Electrical Vendor Inspection Branch, Division of Construction Inspection and Operational Programs, Office of New Reactors, within 30 days of the date of the letter transmitting this Notice of Violation. This reply should be clearly marked as a "Reply to a Notice of Violation;" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken, and (4) the date when full compliance will be achieved. Your response may refer to or include previous docketed correspondence if the correspondence adequately addresses the required response. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you also should provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System, accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html, to the extent possible, it should not include any private personal or proprietary information or Safeguards Information so that it can be made available to the public without redaction. If private personal or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

NOTICE OF NONCONFORMANCE

Ametek Solidstate Controls, Inc.
875 Dearborn Drive
Columbus, OH 43085

Docket No.: 99901427
Inspection Report No.: 99901427/2013-201

Based on the results of a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the Ametek Solidstate Controls, Inc. (Ametek) facility in Columbus, OH, on August 19–23, 2013, certain activities were not conducted in accordance with NRC requirements that NRC licensees contractually imposed on Ametek:

A. Criterion III, "Design Control," of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," states, in part, that "The design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program. The verifying or checking process shall be performed by individuals or groups other than those who performed the original design, but who may be from the same organization. Where a test program is used to verify the adequacy of a specific design feature in lieu of other verifying or checking processes, it shall include suitable qualifications testing of a prototype unit under the most adverse design conditions."

Ametek's quality assurance manual, section 4.0, "Design Control," Revision E, dated January 15, 2013, states, in part, "Testing shall demonstrate adequacy of performance under the most adverse design conditions," for the adequacy of the design. Section 10, "Inspection and Test," further states, in Test Control for nuclear "Control Jobs," "Test requirements and acceptance criteria are based on requirements applicable and pertinent to the technical documents."

Contrary to the above, as of August 23, 2013, Ametek failed to use a suitable testing program to verify the adequacy of the design of multiply battery chargers and inverters. Specifically, Ametek did not identify or test surge withstand capability as a critical characteristic for two battery chargers, which required surge protection capability per the customer specifications. Ametek also did not verify or validate a critical characteristic of synchronization testing which was outside of the acceptance criteria in eight out of nine battery chargers/inverters.

This issue has been identified as Nonconformance 99901427/2013-201-02.

B. Criterion VII, " Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50 states, in part, that "Measures shall be established to assure that purchased material, equipment, and services, whether purchased directly or through contractors and subcontractors, conform to the procurement documents. These measures shall include provisions, as appropriate, for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor, inspection at the contractor or subcontractor source, and examination of products upon delivery. The effectiveness of the control of quality by contractors and subcontractors shall be assessed by the applicant or designee at intervals consistent with the importance, complexity, and quantity of the product or services."

Criterion XVII, “Quality Assurance Records,” of Appendix B to 10 CFR Part 50 states, in part, that “Sufficient records shall be maintained to furnish evidence of activities affecting quality. The records shall include at least the following: Operating logs and the results of reviews, inspections, tests, audits, monitoring of work performance, and materials analyses. Records shall be identifiable and retrievable.”

Ametek’s procedure 01-090065, “Supplier Approval”, Section 3.0, states, in part, that “Materials and Services may only be purchased from suppliers found on the approved supplier database.” Section 7.0, states, in part, that “Supplier audits or surveys will be carried out by trained auditors under the guidance of a certified lead auditor, using the appropriate supplier quality assurance system evaluation checklist. Completed reports and associated documentation will be maintained in the supplier file. Nonconformances found during the audit will be reported on the completed report, which shall also serve as the corrective action report. Written corrective action plans shall be required from the supplier within thirty days after the report is issued. The auditor will evaluate actions and notify suppliers of acceptance and closure.”

Contrary to the above, as of August 22, 2013:

- Ametek failed to provide adequate oversight of their suppliers through procurement documents, audits, and records to ensure that safety-related services comply with all aspects of its quality assurance program. Specifically, Ametek issued a purchase order to Qualtech to perform seismic and environmental testing on dedicated equipment without conducting an audit of Qualtech’s 10 CFR 50 Appendix B program. As a result, equipment was shipped to Ametek’s customer without having sufficient evidence to conclude that Qualtech was able to perform 10 CFR Part 50 Appendix B seismic and environmental testing on uninterruptable power supply (UPS) systems.

- Ametek also issued a purchase order for fabrication of safety-related 1E lead acid batteries from C&D Technologies without completing an audit of C&D’s 10 CFR 50 Appendix B program. Corrective actions relating to C&D’s measuring and test equipment program resulting from the audit were not completed before the batteries were shipped to Ametek’s customer. As a result, equipment that was not calibrated may have been used during the fabrication and testing of the safety-related 1 E lead acid batteries supplied from C&D Technologies.

This issue has been identified as Nonconformance 99901427/2013-201-03

C. Criterion XVI, “Corrective Action,” of Appendix B, “Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants,” to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, “Domestic Licensing of Production and Utilization Facilities,” states that “Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. The identification of the significant condition adverse to quality, the cause of the condition, and the corrective action taken shall be documented and reported to appropriate levels of management.”

Ametek's Quality Policy Manual, Section 14.0, "Corrective and Preventative Action," Revision E, dated January 10, 2010, states, in part, that, "Pertinent managers are responsible for ensuring that implementation of the necessary corrective and preventative action takes place and the actions are effective." Section 14.0 also states, "The Director of Quality is responsible for tracking the resulting corrective action, corrective action implementation, and follow-up on effectiveness."

Ametek's System Management Procedure, "Corrective Action," Revision K, dated October 5, 2011, states in, part, that, "Actions shall be taken without undue delay." In addition, it states that, "Quality assurance periodically reviews the complaint database to track problem reports and corrective action investigations, monitor trends, and assure timely closure to problem reports and actions."

Contrary to the above, as of August 23, 2013:

- Ametek's corrective action program failed to assure that conditions adverse to quality are promptly identified and corrected. Specifically, Ametek's Report Number 316, dated April 11, 2011 identified that all cabinets did not have a drip shield put in place during heat run testing. Report Number 316 identified that work instructions need to be amended to ensure that heat run testing would be performed with temporary sides and a drip shield installed to ensure that adequate internal temperatures in the cabinet would be reached. As of August 23, 2013, Ametek's heat run testing results quality is indeterminate because the work instructions still lack procedural guidance to ensure that all heat run tests are performed with temporary sides and a drip shield installed and there was no documented evidence of past test setups to ensure that the tests were adequately performed.

- Also, as of August 23, 2013, a 2012 internal audit finding report identified multiple examples of failures to incorporate technical requirements or pass down Part 21 requirements in purchase orders (PO) did not have corrective actions implemented as evident by 20 out of 25 POs in 2013 with the same outstanding issue after the corrective action was supposedly completed.

This issue has been identified as Nonconformance 99901427/2013-201-04

Please provide a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Chief, Construction Electrical Vendor Branch, Division of Construction Inspection and Operational Programs, Office of New Reactors, within 30 days of the date of the letter transmitting this notice of nonconformance. This reply should be clearly marked as a "Reply to a Notice of Nonconformance" and should include for each noncompliance: (1) the reason for the noncompliance, or if contested, the basis for disputing the noncompliance, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid noncompliance, and (4) the date when the corrective action will be completed. Where good cause is shown, the NRC will consider extending the response time.

Because your response will be made available electronically for public inspection in the NRC's Public Document Room or through the NRC's Agencywide Documents Access and Management System, which is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html, to the extent possible, it should not include any

personal privacy, proprietary, or Safeguards Information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material be withheld, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

Dated this the 10th day of October 2013.

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

Docket No.:	99901427
Report No.:	99901427/2013-201
Vendor:	Ametek Solidstate Controls, Inc. 875 Dearborn Drive Columbus, OH 43085
Vendor Contact:	Mr. George Ardolino, Division VP Business Unit Manager George.Ardolino@ametek.com
Background:	Ametek Solidstate Controls, Inc., located at 875 Dearborn Drive, Columbus, OH 43085, provides Class 1E protection equipment, nuclear battery chargers, fusible panelboards, static inverters, terminal blocks, and commercial-grade dedication services to U.S. nuclear power plants.
Inspection Dates:	August 19–23, 2013
Inspection Team Leader:	Eugene Huang, NRO/DCIP/EVIB
Inspectors:	Shavon Edmonds, NRO/DCIP/EVIB Aaron Armstrong, NRO/DCIP/MVIB Paul Coco, NRO/DCIP/MVIB
Approved by:	Richard A. Rasmussen, Chief Electrical Vendor Inspection Branch Division of Construction Inspection and Operational Programs Office of New Reactors

EXECUTIVE SUMMARY

Ametek Solidstate Controls, Inc.
99901427/2013-201

The U.S. Nuclear Regulatory Commission (NRC) conducted this vendor inspection to verify that Ametek Solidstate Controls, Inc., (hereafter referred to as Ametek), 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." This inspection specifically evaluated Ametek's design, production, testing, and dedication of safety-related electrical components. The inspectors reviewed the procurement, design, equipment qualification, commercial grade dedication (CGD), inspection and testing of the Ametek's battery chargers, power supplies, and static inverters. The NRC conducted this inspection at Ametek's facility in Columbus, OH.

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

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

The inspectors used Inspection Procedure (IP) 43002, "Routine Inspections of Nuclear Vendors," dated July 15, 2013, IP 43004, "Inspection of Commercial-Grade Dedication Programs," dated April 25, 2011, and IP 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance," dated February 13, 2012.

The information below summarizes the results of this inspection.

10 CFR Part 21 Program

The inspectors concluded that Ametek's implementation of 10 CFR Part 21 did not meet the requirements of 10 CFR Part 21. The inspectors identified Violation 99901427/2013-201-01 for Ametek's failure to report a defect associated with substantial safety hazards as soon as practicable within 60 days of discovery or file an interim report. Specifically, Ametek was notified of a deviation with Tyco Potter & Brumfield relays on October 8, 2008, and failed to notify the NRC, effected licensees, and customers until 110 days later on January 26, 2009 to replace all effected Tyco/Potter & Brumfield relays.

Commercial Grade Dedication

The inspectors concluded that Ametek has not established a program that adequately controls CGD in accordance with the regulatory requirements of Appendix B to 10 CFR Part 50. Specifically, Ametek is not effectively implementing its CGD program in a way consistent with the requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. The inspectors issued Nonconformance 99901427/2013-201-02, for Ametek's failure to use a suitable testing program to verify the adequacy of the design of multiple battery chargers and inverters. Specifically, Ametek did not identify or test surge withstand capability as a critical characteristic for two battery chargers, which required surge protection capability per the customer specifications.

Ametek also did not verify or validate a critical characteristic of synchronization testing which was outside of the acceptance criteria in eight out of nine battery chargers/inverters.

Design Control

The inspectors concluded that, with the exception of the items identified under CGD, above, Ametek's design control activities conformed to the requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. No findings of significance were identified.

Procurement Document Control and Oversight of Contract Activities

The inspectors concluded that Ametek has not established a program that adequately implements the requirements of Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50. The inspectors issued Nonconformance 99901427/2013-201-03, for Ametek's failure to provide adequate oversight of Qualtech and C&D Technologies through procurement documents, audits, and records to ensure that safety-related fabrications and testing services comply with all aspects of the quality requirements of 10 CFR 50 Appendix B.

Measuring and Test Equipment

The inspectors concluded that Ametek has established a program that adequately controls calibration and use of measuring and test equipment in accordance with the regulatory requirements of Criterion XII, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50. No findings of significance were identified.

Nonconformance Program

The inspectors concluded that the implementation of Ametek's programs for control of nonconforming material, parts, or components and corrective action were consistent with the regulatory requirements in Criterion XV, "Nonconforming Materials, Parts, or Components," of Appendix B to 10 CFR Part 50. No findings of significance were identified.

Corrective Action Program

The inspectors concluded that Ametek has not established a program that adequate implements the requirements of Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50. The inspectors issued Nonconformance 99901427/2013-201-04 for Ametek's failure to ensure conditions adverse to quality are promptly identified and corrected.

REPORT DETAILS

1. Part 21

a. Inspection Scope

The inspectors reviewed Ametek's policies and implementing procedures that govern its Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21 program to verify compliance with the requirements of 10 CFR Part 21, "Reporting of Defects and Noncompliance." Specifically, the inspectors reviewed Ametek's procedure that describes the authorities and responsibilities for reporting defects and noncompliance. The inspectors also interviewed the quality assurance (QA) director and staff members of Ametek, on the implementation of the Part 21 program and reviewed a sample of 10 CFR Part 21 evaluations. As required by 10 CFR Part 21.6, "Posting Requirements," the inspectors verified that Ametek had posted notices that included (1) a copy of Section 206 of the Energy Reorganization Act of 1974, (2) a copy of 10 CFR Part 21, and (3) a description of the Ametek's procedure that implements the regulation.

b. Observations and Findings

The inspectors noticed that Ametek received a letter from Beaver Valley Power Station, dated October 8, 2008, which identified that Tyco/Potter & Brumfield Relays may produce potential unstable output voltages caused by intermittent high relay resistance. These relays were used for alarm functions and control circuitry that could create nuisance alarming or erratic operation of the equipment. Similar relays are used throughout other operating plants. Ametek assessed the Beavey Valley letter and concluded that the issue was a substantial safety hazard. However, Ametek did not report this defect until January 26, 2009, 110 days later. In the notification made to the NRC and customers, Ametek recommended that all licensees and customers replace all the effected Tyco/Potter & Brumfield relays. The inspectors discussed with Ametek's QA manager that Ametek failed to evaluate this deviation as soon as practicable within 60 days of discovery. This issue is identified as Violation 99901427/2013/201-01

c. Conclusions

The inspectors issued Notice of Violation 99901427/2013-201-01 for Ametek's failure to evaluate deviations and failures to comply associated with substantial safety hazards within 60 days of Discovery. Specifically, Ametek failed to report a defect associated with substantial safety hazards as soon as practicable within 60 days of discovery or file an interim report. Specifically, Ametek was notified of a deviation with Tyco Potter & Brumfield relays on October 8, 2008 and the NRC, effected licensees, and customers were notified 110 days later on January 26, 2009.

2. Commercial Grade Dedication

a. Inspection Scope

The inspectors reviewed Ametek's implementing policy and procedures that govern the commercial grade dedication (CGD) process to ensure that those guidelines adequately described the process as required by 10 CFR Part 21. The inspectors reviewed a

sample of CGD packages to determine if the process used by Ametek's for dedicating its electrical components was being adequately implemented. The inspectors also observed the CGD of a voltage sense board and a battery charger by Ametek staff and evaluated samples of test packages of systems (e.g. UPS, inverter, battery charger or Isolimiter) and parts which were tested for CGD. The inspectors discussed the dedication process with Ametek's quality and technical staff associated with performance of the CGD process.

The inspectors reviewed Ametek's customer orders to ensure each system (e.g. UPS, inverter, battery charger, or Isolimiter) is designed to the order's requirements. Ametek's procedure 01-090102, "Commercial Grade Dedication," which states in part, "Design criteria will follow the guidelines of Institute of Electrical and Electronic Engineers (IEEE) 323 and 344 and/or the customer's order/specification, as appropriate."

The inspection team also reviewed a sample of 10 CGD packages for replacement parts. Each package identified the parts and listed the critical characteristics, verification, and acceptance methods used as stated in procedure 01-090102, "Commercial Grade Dedication." The inspection team also looked at the dedication of 125 VDC/300A battery chargers, purchased by Duke Energy in PO A3PB-6-0008-00-Q1 dated, April 20, 2009, for two battery chargers.

The inspectors also witnessed CGD activities for a PCB 130vdc voltage sense board purchased by Excelon under PO 0050946, dated July 18, 2013, to be used at Clinton Nuclear Station. The inspection team verified the test engineers qualifications and the calibration of the equipment used during the testing. The inspection team also observed the CGD activities for a battery charger/rectifier purchased by TVA under PO 00072332 dated June 5, 2013, to be used at Sequoyah nuclear plant. The inspection team also witnessed portions of a loaded 50 hour burn-in test.

b. Observations and Findings

The critical characteristics for the dedication of 125 VDC/300A battery chargers purchased by Duke were based upon customer specifications and IEEE testing guidance to verify overall functionality. IEEE 650, "Standard for Qualification of Class 1E Static Battery Chargers and Inverters for Nuclear Power Generating Stations," describes the class 1E performance characteristics for battery chargers and inverters. As discussed with Ametek staff, Ametek does not specifically list a series of critical characteristics for each system but uses functional performance testing to verify compliance with IEEE guidelines and customer order/specifications. The IEEE guidance and customer specifications were tested in accordance with procedure No. C97559, Revision C, date August 1, 2012. However, the Inspection team noted that the PO requested surge protection installed in the battery chargers, but testing its capability was excluded from C97559 and was not listed as a critical characteristic. Additionally, IEEE 650 lists surge withstand capability as a suggested performance requirement to be considered in acceptance testing for class 1E performance characteristics. Ametek was unable to provide objective evidence of the functionality of the battery chargers surge withstand capability. Ametek staff showed that the surge capability was installed but could not provide documented justification or evaluation to assure the systems functionality in the battery chargers. The battery chargers were required to be certificated for class 1E operation and were shipped to Oconee Nuclear in Oconee

County, SC. Ametek failed to review the adequacy of the design of these battery chargers by not testing or evaluating the surge withstand capability.

This issue has been identified as one example of Nonconformance 99901414/2013-201-02.

The inspection team also reviewed the dedication of inverter and battery charger sets of nine units in PO 00484791, dated January 18, 2012 purchased by Exelon. The inverter and battery charger sets were required to be certificated for class 1E operation and used in Briadwood and Byron Nuclear Stations. The defined testing for acceptance included dielectric test, temperature rise test, burn-in, synchronization, performance efficiency, harmonic content, and auxiliary device testing as required by the customer specifications and IEEE 650. The testing was documented and done in accordance with procedure No. C103552, Revision A, September 7, 2011. The inspection team noted that the PO requested surge protection be installed in the inverter and battery charger sets, but testing its capability was excluded from C103552 and not listed as a critical characteristic. The inspection team also noted that the acceptance criteria for synchronization testing were not met in 8 of the 9 units. The 8 units tested 0.1 to 0.3 Hz above or below the acceptable 0.4 Hz band to meet the testing criteria. Ametek staff did not perform an evaluation of the results that were outside the acceptance band. Ametek failed to review the adequacy of the design of these 8 units by not evaluating test results that were outside of the acceptance criteria for synchronization testing.

This issue has been identified as another example of Nonconformance 99901414/2013-201-02.

c. Conclusions

The inspectors reviewed Ametek's policies and implementing procedures that govern the CGD program to verify compliance with the requirements of Criterion III, "Design Control," and Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50.

Based on this review, the inspectors issued Nonconformance 99901427/2013-201-02 because Ametek failed to identify or test surge withstand capability as a critical characteristic for two battery chargers, which required surge protection capability per the customer specifications. Ametek also did not verify or validate a critical characteristic of synchronization testing which was outside of the acceptance criteria in eight out of nine battery chargers/inverters.

3. Design Control

a. Inspection Scope

The inspectors reviewed Ametek's policies and implementing procedures that govern the design control program to verify compliance with the regulatory requirements in Criterion III, "Design Control," of Appendix B, "Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities."

The inspectors evaluated the adequacy of design inputs and requirements on a sample of equipment qualification packages relating to: dc power supplies; uninterruptable power supplies; relays; battery chargers; and other inverters. The inspectors evaluated a sample of seismic qualification reports and verified the design input and test results were consistent with the guidance established in the IEEE 344 standard. The inspectors also reviewed a sample of electromagnetic interference (EMI) reports and verified that testing was done to the correct technical requirements and specifications.

The inspectors also reviewed a sample of procurement and component design specification documents, seismic, EMI, equipment qualification reports, and associated Ametek's POs. The inspectors also discussed the design control program with Ametek's management and technical staff. The attachment to this inspection report lists the documents reviewed by the inspectors.

b. Observations and Findings

No findings of significance in this area.

d. Conclusions

Based on the samples reviewed, the inspectors determined that Ametek's policies and implementing procedures that govern the design control program were consistent with the requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. No findings of significance were identified.

4. Procurement/ Supplier Control

a. Inspection Scope

The inspectors reviewed Ametek's policies and implementing procedures that govern the implementation of Ametek oversight of contracted activities to verify compliance with Criterion IV, "Procurement Document Control," and Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50. Specifically, the inspectors reviewed methods used by the purchasing organizations to qualify suppliers of safety-related items and services by reviewing a sample of POs, internal and external audits, and supplier calibration certifications. In addition, the inspectors discussed supplier control and procurement processes with Ametek's management and technical staff.

b. Observations and Findings

b.1. Procurement Document Control

The inspection team evaluated Ametek's December 2012 internal audit report which included audit finding 12-003-01 that identified missing technical requirements such as 10 CFR Part 21 regulation and technical QA requirements passed down to lower tier suppliers in safety-related POs issued from Ametek. The inspection team evaluated the corrective actions that resulted from audit finding 12-003-01, which indicated that the actions to prevent reoccurrence and had been marked complete as of January 2013. However, the inspection team identified 20 out of 25 sampled PO's after January 2013

that still lacked Part 21 requirements for Appendix B suppliers. Ametek failed to ensure that this corrective action would not reoccur after it was marked complete.

This issue is one example of Nonconformance 99901427/2013-201-04, which is also discussed in section 7 of this report.

b.2. Supplier Qualification Activities

While reviewing audit documentation of Ametek's vendors from their approved vendors list, the inspection team identified that Ametek had not completely verified all applicable criteria to the services provided by their sub-suppliers. Specifically, Qualtech, a subsupplier that provides safety-related environmental and seismic qualification testing and CGD services for Ametek's UPS systems and equipment, had been issued a PO by Ametek for seismic testing on dedicated equipment before completing an audit of their services and 10 CFR Part 50 Appendix B program. The inspectors discovered that a completed audit was not available to review and therefore, the inspectors determined that there was not enough sufficient evidence to conclude that Qualtech was qualified to perform safety related qualification on testing on this dedicated equipment. Ametek failed to provide adequate oversight of Qualtech in the procurement of safety-related environmental and seismic qualification testing and CGD services.

This issue has been identified as an example of Nonconformance 99901414/2013-201-03.

Ametek also issued a PO for fabrication and testing of safety-related 1E Lead acid batteries from C&D Technologies before completing an audit of their 10 CFR Part 50 Appendix B program. While reviewing the 10 CFR 50 Appendix B audit of C&D technologies, the inspection team noted that one audit finding had been issued resulting from the identification of two separate oven controllers that shared the same identification number and a voltage monitor with a calibration sticker that displayed two separate calibration due dates. In response to the audit finding, C&D technologies wrote a corrective action request as a response to the audit finding which indicated that a number of additional nonconformances were found related to the calibration program and that a full extent of condition analysis had to be performed to identify all other incidence of calibration equipment and records. As a result, C&D issued a Part 21 notification to the NRC and effected licensees and customers. Ametek's management indicated that at the time of the audit the battery cells were in a forming tank and had not completed the final testing and acceptance. The shipment of these safety-related 1E lead acid batteries arrived before the extent of condition of C&D's M&TE program was completed. Ametek did not track or verify C&D's corrective action to Ametek's audit finding so they did not ensure that the same M&TE that was in C&D's extent of condition was not used as part of the fabrication and testing of the battery cells. As a result, equipment that was not calibrated could have been used during the fabrication and testing of the safety-related 1E lead acid batteries supplied from C&D Technologies. Ametek failed to provide adequate oversight of C&D in the procurement of safety-related 1E lead acid batteries.

This issue has been identified as another example of Nonconformance 99901414/2013-201-03.

b. Conclusions

The inspectors reviewed Ametek's implementing procedures governing the supplier approval process to verify compliance with the 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.

Based on this review, the inspectors issued Nonconformance 99901427/2013-201-03 because Ametek failed to provide adequate oversight of Qualtech and C&D Technologies through procurement documents, audits, and records to ensure that safety-related fabrications and testing services comply with all aspects of the quality requirements of 10 CFR 50 Appendix B.

5. Measuring and Test Equipment

a. Inspection Scope

The inspectors reviewed Ametek's policies and implementing procedures in compliance with the regulatory requirements of Criterion XII, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50. Specifically, the inspectors sampled Ametek's M&TE calibration records for test equipment to ensure that all requirements of instruments and testing devices used in activities affecting quality are properly controlled and satisfactory. The inspection team reviewed certificates of calibration services and samples of POs for calibrated equipment. In addition, the inspectors discussed M&TE processes with Ametek's management and technical staff.

The inspection team evaluated the oversight of Ametek's M&TE program by reviewing Ametek's certifications for calibration labs to ensure that the services that are procured are traceability to National Institute of Standards and Technology standards and the American Association for Laboratory Accreditation (A2LA) programs. The inspection team interviewed personnel responsible for the storage, control, and calibration of M&TE. In addition, the inspection team evaluated records from Ametek's equipment database which classifies all M&TE current calibration status and record history. The inspectors evaluated a sample of M&TE from seismic and environmental qualification test reports and traced the calibration records of the test equipment to the supplier's accreditation records which covered the ranges of parametric values for which these devices were used during testing. The inspection team confirmed that instruments were calibrated and appropriate for each activity being performed during a walkdown of the facility. The inspectors verified that the M&TE had appropriate calibration stickers and current calibration dates, including calibration due dates, and that the associated calibration records were current and available for review.

b. Observations and Findings

No findings of significance identified in this area.

c. Conclusions

The inspectors determined that the implementation of Ametek's programs for control of calibration and use of M&TE were consistent with the regulatory requirements of

Criterion XII of Appendix B to 10 CFR Part 50. No findings of significance were identified.

6. Nonconformances

a. Inspection Scope

The inspectors reviewed policies, implementing procedures, and records that governed the control of nonconforming materials, parts, and components to verify compliance with Criterion XV, "Nonconforming Materials, Parts, or Components," of Appendix B to 10 CFR Part 50. To verify that Ametek's implementation and control over these processes were adequate, the inspectors reviewed Ametek's procedures that govern corrective action and control and correction of nonconforming items and nonconformance logs.

The inspectors verified that Ametek had programs in place to address nonconforming material, parts, or components. The inspectors reviewed the nonconformance log process and the disposition of the nonconformance in the logs. The inspectors also discussed the requirements for training conducted for personnel responsible for completing the nonconformance logs.

The inspectors verified that Ametek's procedures address the requirement that nonconforming material, parts, or components shall be segregated, and verified the implementation of this requirement. The inspectors discussed Ametek's hold process and observed the hold area to understand how the Ametek's staff segregated items in the shop for dispositioning.

b. Observations and Findings

No findings of significance identified in this area.

c. Conclusions

The inspectors concluded that Ametek is implementing its nonconforming material, parts, or components program in accordance with Criterion XV of Appendix B to 10 CFR Part 50. Based on the sample of documents reviewed, the inspectors also determined that Ametek is implementing its policies and procedures associated with its nonconforming material, parts, and components. No findings of significance were identified.

7. Corrective Actions

a. Inspection Scope

The inspectors reviewed policies, implementing procedures, and records that govern corrective actions to verify compliance with Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50. In addition, the inspectors conducted several interviews of Ametek's management and technical staff about the evaluation process of corrective actions. The inspectors reviewed the following items:

- Ametek's procedures that govern corrective action and nonconforming items

- the corrective action log, the nonconformance log, and several corrective action reports

b. Observations and Findings

During review of a sample of corrective action reports, the inspectors noted that Ametek Report Number 316, dated April 11, 2011 identified that cabinets did not have a drip shield put in place during heat run testing. Report Number 316 identified that work instructions need to be amended to ensure that heat run testing would be performed with temporary sides and a drip shield installed to ensure that adequate internal temperatures in the cabinet would be reached. The inspectors questioned whether Ametek did an evaluation on the cabinet in question and past cabinets to ensure that heat run tests were set up correctly, but Ametek was not able to provide any documentation that they evaluated or assessed this concern. The inspectors observed and questioned one test engineer who performed a heat run test correctly, however test setups were not documented to ensure that test runs were performed with the temporary sides and drip shield. As of August 23, 2013, Ametek's heat run testing results quality is indeterminate because the work instructions still lack procedural guidance or documentation of the actual test configuration to ensure that all heat run tests are performed with temporary sides and a drip shield installed.

c. Conclusions

The inspectors reviewed Ametek's implementing procedures governing the supplier approval process to verify compliance with the requirements of Criterion XI, "Corrective Action," of Appendix B to 10 CFR Part 50.

Based on this review, the inspectors issued Nonconformance 99901427/2013-201-04 because of Ametek's failure to ensure conditions adverse to quality are promptly identified and corrected as noted by examples in this section and section 4 of this report.

8. Entrance and Exit Meetings

On August 19, 2013, the inspectors presented the inspection scope during an entrance meeting with Mr. George Ardolino, Division VP Business Unit Manager, and other Ametek personnel. On August 23, 2013, the inspectors presented the inspection results during an exit meeting with Mr. George Ardolino, Division VP Business Unit Manager, and other Ametek personnel.

ATTACHMENT

1. PERSONS CONTACTED AND NRC STAFF INVOLVED

Name	Title	Affiliation	Entrance	Exit	Interviewed
G. Ardolino	Division VP Business Unit Manager	Ametek	X	X	
B. George	Director of Quality Assurance	Ametek	X	X	X
J. LaRosa	Test Department Supervisor	Ametek	X		X
E. Muladorb	Director of Operations	Ametek	X		
P. Irwin	Director of R&D	Ametek	X	X	
D. Johnson	Consultant		X	X	X
D. Dellinger	Project Engineer	Ametek	X	X	X
N. Yarnell	Contracts Manager	Ametek	X	X	
J. Amicon	Sales Manager	Ametek	X		
E. Huang	Inspection Team Leader	NRC	X	X	
S. Edmonds	Inspection Team Member	NRC	X	X	
A. Armstrong	Inspection Team Member	NRC	X	X	
P. Coco	Inspection Team Member	NRC		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. ITEMS OPENED, CLOSED, AND DISCUSSED:

Item Number	Status	Type	Description
99901427/2013-201-01	OPEN	NOV	Part 21
99901427/2013-201-02	OPEN	NON	Criterion III
99901427/2013-201-03	OPEN	NON	Criterion VII and XVII
99901427/2013-201-04	OPEN	NON	Criterion XVI

4. DOCUMENTS REVIEWED:

QA Procedures

- 01-190025, “Quality & manufacturing plan,” Revision B, dated July 6, 2010
- 01-090040, “Design control,” Revision G, dated June 20, 2011
- Ametek’s Quality Assurance Manual, Revision E, dated January 15, 2013
- 01-090102, “Commercial Grade Dedication,” Revision D, dated July 13, 2011
- 01-090060, “Purchasing”, Revision H , dated May 31, 2012
- 01-090065, “Supplier Approval”, Revision N , dated June 25, 2013
- 01-090080, “Product Identification & Traceability”, Revision D , dated June 20, 2011
- 01-090068, “Procurement Document Control”, Revision F , dated May 31, 2012
- 01-090101, “Receiving QA Inspections”, Revision C , dated July 29, 2011
- 01-090100, “Inspection and Testing”, Revision C , dated May 30, 2003
- 01-090110, “Control of Inspection, Measuring and Test Equipment”, Revision N , dated July 13, 2011
- 01-090000, “Ametek Solidstate Controls Quality Policy Manual,” Revision E, dated January 15, 2010
- 01-090130, “Control of Nonconforming Product,” Revision J, dated September 15, 2010
- 01-090141, “Corrective Action,” Revision K, dated October 10, 2011
- 01-190145, “Substantial Safety Hazard Determination,” Revision A, dated November 11, 2011
- 01-090145, “Failure Investigation/Part 21 Reporting,” Revision K, dated May 31, 2012
- 01-090135 , “Return Material Authorization,” Revision E, dated 5, 2012

Certificates of Conformance

- COC for DC power supplies to Exelon/Braidwood, dated November 23, 2011

Commercial Grade Dedication Packages for Systems

- C97559
- C103552
- C98266
- C101820

Commercial Grade Dedication Packages of Replacement Parts

- 07-600151-00
- 03-788230-20
- 80-316199-90
- 80-316204-90
- 80-901616-90
- 80-901439-90
- 80-316201-90
- 03-040008-00
- 07-880601-00
- 07-750511-00

- 07-750521-00
- 80-9215911-90
- 07-730107-00

Condition Report Forms

- CAR No. 0341, “Corrective Action Report on GE circuit breakers special testing shipment,” dated August 4, 2012
- CAR No. 1541, “Corrective Action Report from C&D Technologies on M&TE Audit Finding,” dated October 29, 2012
- CAR No. 306, “Purchase order issued to non Appendix B supplier,” dated April 21, 2010
- CAR No. 310, “Vendor refurbished equipment part did not agree with vendor manual,” dated September 22, 2010
- CAR No. 311, “Breakers will not reset after extend hours of operation,” dated October 25, 2010
- CAR No. 313, “Client discovered that inverter output breaker and Bypass Breakers were switched,” dated January 13, 2011
- CAR No. 316, “Heat run testing performed without drip shields and temporary sides,” dated April 11, 2011
- CAR No. 318, “Safety Related purchase orders missing requirement for QA/QC review,” April 20, 2011
- CAR No. 321, “CPC Regulating Transformer does not meet +/-3% as required by spec,” August 29, 2011
- CAR No. 331, “ Control job C103552 pulled chock 80-13402-90 from stock and substituted it for choke 80312706-90,” dated February 17, 2012
- CAR No. 332, “Eaton breakers install in 60KV Dooson KHNP job without being shipped Wyle labs for qualification testing,” dated March 6, 2012
- CAR No. 339, “Nicked wire on power cables for project C103552 is potential in excess of Ametek’s workmanship limits,” dated August 31, 2012
- CAR No. 340, “Project C96000037, the wrong DC filter capacitors were issued and install in the cabinet and not found until assembly was complete,” dated August 31, 2012
- CAR No. 344, “Three ARs were issued to address AMEC quality issues concerning fabrication and testing practices,” dated September 17, 2012
- CAR No. 345, “C103552, Units required ring lugs, client identified locking fork lugs used,” November 1, 2012
- CAR No. 347, “C96000039 mounting plates for production unit was received with 4 prototype holes in accordance with drawing,” dated December 20, 2012
- CAR No. 348, “Four minor findings as a result of 1/13 nuclear internal audit,” dated January 15, 2013
- CAR No. 350, “Nuclear Fuse dedication specification in adquete identified by NUPIC auditor,” dated March 12, 2013

10 CFR 21 Evaluations and Reports

- Ametek letter U.S. Nuclear Regulatory Commission (NRC), “10 CFR 21 Reporting - Arvan electrical terminal blocks, part number MS27212-x-xx, Revision P, sizes -3-xx and -5-xx, any length,” dated March 14, 2012

- Ametek letter U.S. Nuclear Regulatory Commission (NRC), “10 CFR 21 Reporting - International Rectifier and Vishay clamp diodes, 150 amps, forward and reverse bias,” dated September 30, 2012
- Ametek letter U.S. Nuclear Regulatory Commission (NRC), “10 CFR 21 Reporting -, Ametek 10 KVA inverter Model 86VC0100-15, 3 pase 480 VAC output. Limited to systems supplied to Exelon Byron and Braidwood units. Capacitors C10 through C15 part number 03-040060-00,” dated September 7, 2012
- Ametek letter U.S. Nuclear Regulatory Commission (NRC), “10 CFR 21 Reporting – Tyco/Potter & Brumfield Relays, dated January 26, 2009

Engineering Change Orders

- ECO #12-035, dated October 26, 2012
- ECO #10-032, dated June 14, 2010
- ECO #12-013, dated April 10, 2012
- ECO #08-072, dated November 6, 2008
- ECO #08-013, dated March 5, 2008
- ECO #01-100050, dated June 19, 2013

Purchase Orders

- PO #C103803, Ametek to Wyle laboratories, inc., Revision 2, dated September 13, 2011
- PO #C103552, Exelon to Ametek, dated March 3, 2011
- PO #00476953, Exelon to Ametek, dated July 1, 2011
- PO # C122074, Ametek to C&D Technologies Battery arrangement, Revision 17, dated June 14, 2013
- PO #C103803, Ametek to Wyle Labs EMI/RFI Testing, Revision 2, dated January 25, 2012
- PO #C138217, Ametek to Wyle Labs Special Testing, Revision 2, dated April, 24, 2013
- PO # C105542, Ametek to Wyle Labs Breaker Testing, Revision 0, dated October 18, 2011
- PO # C108621, Ametek to Rockbestos Wire Qualification Report, Revision 0, dated December 05, 2011
- PO # C107199, Ametek to General Electric NEMA AB1/UL489 Certified testing on Circuit Breaker, Revision 0, dated December 16, 2011
- PO # C145292, Ametek to General Electric NEMA AB1/UL489 Certified testing on Circuit Breaker, Revision 0, dated August 13, 2013
- PO # C124906, Ametek to General Electric NEMA AB1/UL489 Certified testing on Circuit Breaker, Revision 0, dated December 29, 2012
- PO #C136298, Ametek to GE, Revision 0, dated March 6, 2013
- PO #C138397, Ametek to GE, dated April 10, 2013
- PO # C1 PO # C124906, Ametek to General Electric NEMA AB1/UL489 Certified testing on Circuit Breaker, Revision 0, dated August 29, 2012
- PO # C135164, Ametek to Qualtech Seismic Testing, Revision 0, dated September 8, 2010
- PO # C135583, Ametek to Qualtech Seismic Testing, Revision 0, dated October 12, 2010

- PO # C137523, Ametek to Qualtech Seismic Testing, Revision 0, dated March 25, 2011
- PO # C137621, Ametek to Qualtech Seismic Testing, Revision 0, dated April 1, 2011
- PO # C145611, Ametek to Qualtech Seismic Testing, Revision 0, dated August 19, 2013
- PO # C145708, Ametek to Qualtech Seismic Testing, Revision 0, dated August 20, 2013
- PO # C133748, Ametek to Accu-Check Equipment Calibration, Revision 0, dated January 22, 2013
- PO # C135641, Ametek to Unitek Equipment Calibration, Revision 0, dated February 25, 2013
- PO # C141455, Ametek to Unitek Equipment Calibration, Revision 0, dated June 05, 2013
- PO # C145469, Ametek to Unitek Equipment Calibration, Revision 0, dated August 15, 2013
- PO # C145241, Ametek to Unitek Equipment Calibration, Revision 0, dated August 12, 2013

Test procedures

- C97559, "Electrical test procedure addendum 300 amp battery charger," Revision A, dated October 6, 2009
- C103552, "Inverter & battery charger test procedure for SCI project C103552," Revision A, dated September 7, 2011
- 30-900044, "Test procedure series 85-RP26XX production units 22-26 VDC power supply," Revision I, dated April 4, 2002
- 30-100006, "Standard Test Procedure for Chargers and Rectifiers," Revision 13, dated June 1, 2006
- Test Procedure C97559, Revision C, dated August 1, 2012
- Test Procedure C103552, Revision A, dated September 7, 2011
- Test Procedure C98266, Revision B, dated September 4, 2009
- Test Procedure 2108XX, "Voltage Sense board," Revision C, dated May 10, 2011
- 30-100006, "Standard Test Procedure for Chargers and Rectifiers," Revision 13, dated June 1, 2006

Equipment Qualification and Test Reports

- C97559-TRC, "Test report certification for project C97559 300 amp battery chargers," Revision C, dated August 1, 2012
- 02-190383, "Battery charger/rectifier final test report," Revision C, dated June 20, 2007
- 57183R09, "Certification test report for stress and seismic testing of a 300 ampere battery charger," Revision B, dated August 17, 2010
- 5718R09, "Mild environment aging analysis report for a 300 A battery charger," dated December 3, 2009
- 02-190381, "Analog inverter final test report," Revision B, dated January 13, 2011
- T58872-01, "Electromagnetic interference (EMI) test report on inverter cabinet," dated January 16, 2012
- 58943R11-1, "Seismic test report for an uninterruptible power supply," dated December 19, 2011

- 54408R07-2, “Certification test report for seismic testing of relays,” dated February 28, 2007
- 45846-1, “Seismic simulation test report for a DC power supply,” dated November 7, 1996
- 45211-01, “Electromagnetic interference (EMI) test report on the solidstate controls, inc. and the north electric power supplies,” dated May 6, 1996

Supplier Audits, Surveys, and Surveillances

- Quality Assurance system evaluation audit supplier checklist for Curtiss Wright (QualTech), dated September 15-16, 2010
- Quality Assurance system evaluation audit supplier checklist for C&D Technologies, dated December 12, 2012
- Quality Assurance system evaluation audit supplier checklist for Wyle Labs, dated July 23-24, 2013
- Ametek Internal audit, dated October 25-28, 2011
- Ametek Internal audit, dated January, 2013

Miscellaneous Documents

- C103552, “Design review committee report,” dated June 2, 2011
- C102800, “Design review committee report,” dated November 29, 2010
- C102812, “Design review committee report,” dated December 1, 2010
- C101820, “Design review committee report,” dated July 20, 2010
- C97559, “Nuclear charger data sheet”, dated June 16, 2009
- Ametek Approved Nuclear Supplier List, dated August 8, 2013
- 01-090000, Ametek Solidstate Controls Quality Policy Manual, Revision E, dated January 15, 2010
- C9755990112, Final Acceptance test instrument check for battery chargers, dated October 30, 2009
- C1035520111, Final Acceptance test instrument check for post-seismic analog inverter, December 18, 2011
- 1009.01, A2LA (ILAC) Accreditation for Accu-Check Instrument Services, dated September 1, 2012
- 48246, Perry Johnson Lab Accreditation, dated September 13, 2011
- 02-090060, C&D technologies battery cell critical characteristics, dated December 12,2012
- 3394308, GE test reports for Circuit Breaker Testing, dated September 6, 2012
- 17080042, Calibration Record for 87-5 Fluke, dated August 31, 2012
- 8915-00, Calibration Record for Hipotronics HD115, dated August 15,2013
- 57430232, Calibration Record for 87 Fluke, dated July 31, 2013
- 01-191304, Work Instruction “Calibration of Measuring and Test Equipment”, Revision D September 28, 2011

5. ACRONYMS USED:

ADAMS	Agencywide Documents Access and Management System
CFR	Code of Federal Regulations
CGD	commercial grade dedication
IP	inspection procedure
NON	Notice of Nonconformance
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission
QA	quality assurance