January 17, 2013

Mr. Victor H. Romano, Quality Assurance Manager
ABB, Inc.
2300 Mechanicsville Road
Florence, SC 29501

SUBJECT: NUCLEAR REGULATORY COMMISSION INSPECTION REPORT
NO. 99901256/2012-201 AND NOTICE OF NONCONFORMANCE

Dear Mr. Romano:

From December 3-7, 2012, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the ABB, Inc., Medium Voltage Service (ABB) facility in Florence, South Carolina. The purpose of this limited-scope inspection was to assess ABB's compliance with the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21, "Reporting of Defects and Noncompliance," and selected portions of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities."

This technically focused inspection evaluated ABB's quality assurance (QA) activities associated with the design, assembly, inspection, and testing of low and medium voltage circuit breakers, components, and refurbishment services provided for U.S. nuclear power plants. The enclosed report presents the results of this inspection. This NRC inspection report does not constitute NRC endorsement of ABB's overall QA or 10 CFR Part 21 programs.

Based on the results of this inspection, the NRC inspection team found that the implementation of your QA program did not meet certain NRC requirements imposed on you by your customers or NRC licensees. Specifically, ABB failed to verify two critical characteristics for a K-Line breaker and failed to assure all measuring and test equipment used in the inspections of K-Line and HK breaker refurbishments were properly controlled. The enclosed Notice of Nonconformance (NON) cites these nonconformances, and the circumstances surrounding them are described in detail in the enclosed inspection report.

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 NON. The NRC will consider extending the response time if you show good cause for the agency to do so.

In accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding," 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 Public Document Room or from 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 (and if applicable), your response should not include any personal privacy, proprietary, or Safeguards Information (SGI) 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, please provide a bracketed copy of your response that identifies the information that should be protected, as well as 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 SGI 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 Branch
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket No.: 99901256

Enclosures:
1. Notice of Nonconformance
2. Inspection Report No. 99901256/2012-201
   and Attachment

To the extent possible (and if applicable), your response should not include any personal privacy, proprietary, or Safeguards Information (SGI) 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, please provide a bracketed copy of your response that identifies the information that should be protected, as well as 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 SGI 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 Branch
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket No.: 99901256

Enclosures:
1. Notice of Nonconformance
2. Inspection Report No. 99901256/2012-201
   and Attachment

DISTRIBUTION:
KKavanagh TSakadales ERoach
RidsNroDcipCevb RidsNroDcipCmvb RidsNroDcipCqab RidsNroDcip
victor.h.romano@us.abb.com john.layne@us.abb.com

ADAMS Accession No.: ML13009A028 ***via e-mail** **NRO-002**

OFFICE	NRO/DCIP/CEVB	QTE	NRO/DCIP/CEVB	NRO/DCIP/CMVB	NRO/DCIP/CEVB
NAME	GNewman	CHsu	SSmith	MVaaler	EHuang
DATE	01/09 /2013	01/14/2013	01/14/2013	01/11/2013	01/11/2013
OFFICE	RII/DCI/CIB1	NRO/DCIP/CAEB	NRO/DCIP/CEVB		
NAME	DTerry-Ward*	TFrye	RRasmussen		
DATE	01/09/2013	01/14/2013	01/17/2013		

OFFICIAL RECORD COPY

NOTICE OF NONCONFORMANCE

ABB, Inc.
2300 Mechanicsville Road
Florence, South Carolina 29501

Docket No. 99901256
Report No. 2012-201

Based on the results of a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the ABB, Inc., Medium Voltage Service (ABB), facility in Florence, South Carolina, from December 3 through December 7, 2012, it appears that certain activities were not conducted in accordance with NRC requirements that were contractually imposed upon ABB by its customers or by NRC licensees.

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, "Measures shall be also established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems, and components."

   Contrary to the above, as of December 7, 2012, ABB failed to perform a review for suitability of application of materials and processes essential to the safety-related functions of the structures, systems, and components as part of commercial grade dedication of a K-Line circuit breaker. Specifically, ABB failed to verify two critical characteristics relating to dielectric strength as required from WI-INSP-56, "K-Line Circuit Breaker Inspection and Test," that would demonstrate that the K-Line circuit breaker would be able to perform its safety function.

   This issue has been identified as Nonconformance 99901256/2012-201-01.

B. Criterion XII, "Control of Measuring and Test Equipment," to 10 CFR 50, Appendix B, states, "Measures shall be established to assure that tools, gages, instruments, and other measuring and testing devices used in activities affecting quality are properly controlled, calibrated, and adjusted at specified periods to maintain accuracy within necessary limits."

   QAP Section 12, "Control of Measuring and Test Equipment," Revision 9, dated January 5, 2012, Subsection 5.9, states, "Equipment used by quality control personnel for inspection and test shall be recorded within the inspection record."

   Contrary to the above, as of December 7, 2012, ABB failed to assure all measuring and test equipment used in the inspections of K-Line and HK breaker refurbishments were recorded within the inspection record to assure only qualified equipment was used. Specifically, ABB did not record the following equipment used for safety-related inspections:

   - Go or no-go gauges used to measure contact wipe for Book Nos. 1986, 2001, 2018, and 2075.
   - Torque wrenches for bridge pivot torque and bridge plate bolts for Books Nos. 2001 and 2075

This issue has been identified as Nonconformance 99901256/2012-201-02.

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 further noncompliance; and (4) the date when the corrective action will be completed. Where good cause is shown, consideration will be given to extending the response time.

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 (ADAMS), 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 (SGI) 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 SGI is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Requirements for the Protection of Safeguards Information."

Dated this 17th day of January 2013.

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

Docket No.:	99901256	
Report No.:	99901256/2012-201	
Vendor:	ABB, Inc. Medium Voltage Service 2300 Mechanicsville Road Florence, SC 29501	
Vendor Contact:	Mr. Victor H. Romano Quality Assurance Manager Telephone: 843-472-0511 E-mail: victor.h.romano@us.abb.com	
Nuclear Industry Activity:	The ABB, Inc., Medium Voltage Service (ABB) facility provides legacy and replacement low and medium voltage circuit breakers, components, and refurbishment services to U.S. nuclear power plants.	
Inspection Dates:	December 3-7, 2012	
Inspection Team Leaders:	Garrett Newman Stacy Smith	NRO/DCIP/CEVB NRO/DCIP/CEVB
Inspection Team Members:	Eugene Huang Marlayna Vaaler Denise Terry-Ward	NRO/DCIP/CEVB NRO/DCIP/CMVB R-II/DCI/CIB1
Approved by:	Richard A. Rasmussen, Chief Electrical Vendor Branch Division of Construction Inspection and Operational Programs Office of New Reactors	

EXECUTIVE SUMMARY

ABB, Inc., Medium Voltage Service
99901256/2012-201

The U.S. Nuclear Regulatory Commission (NRC) conducted this inspection to verify that the ABB, Inc., Medium Voltage Service (ABB) facility 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 ABB 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 at the ABB facility in Florence, South Carolina, on December 3, 2012, through December 7, 2012. The NRC conducted its previous inspection at ABB's facility in Florence, South Carolina, in September 2006, and documented the results of the inspection in Inspection Report 99901256/2006-201, dated September 28, 2006. The previous report did not document any violations or nonconformances of NRC requirements.

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

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

The NRC inspection team implemented Inspection Procedure 43002, "Routine Inspections of Nuclear Vendors," dated April 25, 2011; Inspection Procedure 43004, "Inspection of Commercial-Grade Dedication Programs," dated April 25, 2011; and Inspection Procedure 36100, "Inspection of 10 CFR Parts 21 and Programs for Reporting Defects and Noncompliance," dated February 13, 2012, during the conduct of this inspection.

This technically focused inspection evaluated ABB's QA activities associated with the design, assembly, inspection, and testing of low and medium voltage circuit breakers, components, and refurbishment services provided for U.S. nuclear power plants. This inspection specifically evaluated ABB's implementation of quality activities associated with the K-Line and HK low and medium voltage circuit breakers. The NRC identified these product lines because they are safety-significant components with recent operating experience in the U.S. nuclear reactor fleet.

In addition to reviewing programs, procedures, and associated documentation, the NRC inspection team specifically observed:

- inspections supporting commercial-grade dedication activities
- in-process refurbishment activities for a K-Line low voltage breaker
- calibration of measuring and test equipment
- receipt inspections

In addition to observing these activities, the NRC inspection team walked down ABB's assembly floor and verified that ABB had properly identified, marked, and segregated nonconforming materials to ensure they were not reintroduced into the production processes.

The results of this inspection are summarized below:

10 CFR Part 21 Program Implementation

The NRC inspection team concluded that ABB is implementing its procedures that govern its 10 CFR Part 21 evaluation and reporting programs consistent with the regulatory requirements of 10 CFR Part 21, "Reporting of Defects and Noncompliance."

Design Control and Commercial-Grade Dedication

The NRC inspection team reviewed ABB policies and implementing procedures that govern ABB's design control and commercial-grade dedication programs 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 NRC inspection team issued Nonconformance 99900100/2012-201-01 in association with ABB's failure to implement the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. Specifically, ABB failed to verify two critical characteristics relating to dielectric strength for a K-Line breaker to demonstrate that the circuit breaker would be able to perform its safety function.

Assembly, Refurbishment, Inspection, and Testing

The NRC inspection team reviewed ABB policies and implementing procedures that govern its assembly, refurbishment, inspection, and testing activities to verify compliance with the requirements of Criterion V, "Instructions, Procedures, and Drawings," Criterion X, "Inspection," Criterion XI, "Test Control," and Criterion XII, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50.

Based on this review, the NRC inspection team issued Nonconformance 99900100/2012-201-02 in association with ABB's failure to implement the regulatory requirements of Criterion XII, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50. Specifically, ABB failed to record go / no-go gauges and torque wrenches used in the inspections of K-Line and HK breaker refurbishments to assure only qualified equipment was used.

Oversight of Contracted Activities

The NRC inspection team concluded that ABB is implementing its policies and implementing procedures that govern its oversight of contracted activities consistent 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.

Control of Measuring and Test Equipment

With the exception of Nonconformance 99900100/2012-201-02 identified above, the NRC inspection team concluded that ABB is implementing its policies and implementing procedures that govern the measuring and test equipment program consistent with the regulatory requirements of Criterion XII, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50.

Nonconforming Materials, Parts, or Components

The NRC inspection team concluded that ABB is implementing its policies and implementing procedures that govern its nonconforming materials, parts, or components program consistent with the regulatory requirements of Criterion XV, “Nonconforming Materials, Parts, or Components,” of Appendix B to 10 CFR Part 50.

Corrective Action

The NRC inspection team concluded that ABB is implementing its policies and implementing procedures that govern its corrective action program consistent with the regulatory requirements of Criterion XVI, “Corrective Action,” of Appendix B to 10 CFR Part 50.

Internal Audits

The NRC inspection team concluded that ABB is implementing its policies and implementing procedures that govern its internal audit program consistent with the regulatory requirements of Criterion XVIII, “Audits,” of Appendix B to 10 CFR Part 50.

REPORT DETAILS

1. 10 CFR Part 21 Program

a. Inspection Scope

The NRC inspection team reviewed ABB's policies and implementing procedures that govern its program under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21, "Reporting of Defects and Noncompliance," to verify compliance with this regulation. In addition, the NRC inspection team reviewed a sample of 10 CFR Part 21 evaluations completed since the previous NRC inspection and ABB's implementation of 10 CFR 21.21, "Notification of Failure to Comply or Existence of a Defect and Its Evaluation." To verify an adequate link to the 10 CFR Part 21 process, the NRC inspection team also reviewed ABB's process and procedures that govern corrective actions to verify adequate implementation of the regulatory requirements identifying items that cause conditions adverse to quality. Furthermore, the NRC inspection team discussed the 10 CFR Part 21 program with ABB management and technical staff. The attachment to this inspection report lists the documents that the NRC inspection team reviewed.

b. Observations and Findings

b.1 10 CFR Part 21 Policies and Procedures

The NRC inspection team verified that the ABB procedures provide the guidance and organizational structure necessary to implement the requirements of 10 CFR Part 21 and other related regulations associated with timely identification, evaluation, and reporting of defects and failures to comply that could create a substantial safety hazard. The NRC inspection team also verified that the procedures define applicable terms consistent with the terminology defined in 10 CFR 21.3, "Definitions," provide the necessary guidance to assess deviations and failures to comply in an effective and timely manner in accordance with 10 CFR 21.21(a)(1), (a)(3), (b), and (d), and provide appropriate guidance for interim reports in accordance with 10 CFR 21.21(a)(2).

The NRC inspection team reviewed the ABB procurement procedures as well as a sample of purchase orders and verified that the procurement process and each procurement document specified, when applicable, that the provisions for reporting of defects and noncompliances were required in accordance with 10 CFR 21.31, "Procurement Documents."

b.2 10 CFR Part 21 Evaluations

The NRC inspection team reviewed applicable nonconformance and corrective action reports to verify that ABB adequately screened issues for evaluation within the 10 CFR Part 21 program. The NRC inspection team reviewed a sample of 10 CFR Part 21 evaluations in which reporting was determined not to be required and verified that ABB adequately completed the evaluations within the required timeframes with sufficient technical justification. For evaluations that ABB determined a loss of safety function could exist, the NRC inspection team reviewed the internal and regulatory communications to verify that ABB made the appropriate notifications to inform their customers.

b.3 10 CFR Part 21 Postings

The NRC inspection team reviewed the content of the ABB Part 21 postings as well as the location of postings at the ABB facility. The NRC inspection team verified that the information that 10 CFR 21.6, "Posting Requirements," required was included on the postings. The NRC inspection team walked down the location and also verified that the required documents were posted in conspicuous locations consistent with the intent of 10 CFR 21.6.

c. Conclusion

The NRC inspection team reviewed ABB policies and implementing procedures that govern ABB's 10 CFR Part 21 evaluation and reporting programs. Based on the limited sample of documents reviewed, the NRC inspection team concluded that ABB adequately implemented its 10 CFR Part 21 programs. No findings of significance were identified.

2. Design Control and Commercial-Grade Dedication

a. Inspection Scope

The NRC inspection team reviewed ABB's policy, procedures, and implementation documents for design and commercial-grade dedication activities 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. The NRC inspection team reviewed design documentation to verify that the K-line and HK circuit breakers' applicable design inputs were translated correctly into specifications, drawings, procedures, or instructions. Additionally, the NRC inspection team reviewed dedication plans pertaining to the K-line and HK safety-related breakers, a sample of completed packages, and observed some dedication activities. Furthermore, the NRC inspection team discussed the commercial-grade dedication program with ABB management and technical staff. The attachment to this inspection report lists the documents that the NRC inspection team reviewed.

b. Observations and Findings

b.1 Design Control

The NRC inspection team sampled two design change packages relating to grease and motor equivalency evaluations and verified that the design activities and any related changes were accomplished in accordance with the approved procedures. The NRC inspection team verified that the engineering equivalency evaluations included all relevant considerations and specifications, including the results of the original equipment qualification. The NRC inspection team verified that individuals other than those who performed the original design performed design verification and that design changes underwent the same level of review as the original design.

The NRC inspection team also verified that ABB's engineering change database for design changes appropriately addressed selection and review for suitability of application of materials, parts, equipment, and processes essential to the safety-related functions.

b.2 Commercial-Grade Dedication

The NRC inspection team reviewed a sample of dedication packages to determine if the process identified in QAP-23, "Nuclear Safety Related Dedication Program," for dedicating its safety-related circuit breakers was being adequately implemented. The attached supplement to QAP-23 details the high-level commercial-grade dedication plan for ABB's medium and low voltage circuit breakers. QAP-23 details the main safety functions of the breakers, the failure mode and effect analysis, and the method that ABB uses to select critical design characteristics. The NRC inspection team noted that the medium and low voltage circuit breakers had a dedication plan that referenced subcomponents with their own dedication plans. The NRC inspection team verified that ABB dedication plans conform to the guidance contained in Electric Power Research Institute (EPRI) 5652, "Guideline for the Utilization of Commercial Grade Items in Nuclear Safety-Related Applications," issued June 1988, as conditionally endorsed by NRC Generic Letter 89-02, "Actions to Improve the Detection of Counterfeit and Fraudulently Marketed Products."

During review of the dedication package for PO 500565971, the NRC inspection team identified two critical characteristics relating to dielectric strength that were not verified in accordance with WI-INSP-56, "K-Line Circuit Breaker Inspection and Test." Specifically, Step 11.2, states, in part, to "Perform AC Hi-Pot test on each pole of breaker with breaker open and adjacent poles, frame and control wiring grounded for one minute at 2200VAC." Step 11.3 of the same work instruction states, in part, to "Perform AC Hi-Pot test on each phase of breaker with breaker closed and with adjacent poles, the frame and all control wiring grounded for one minute at 2200VAC." The completed dedication test documentation listed that Steps 11.2 and 11.3 were done at 2000VAC. The NRC inspection team determined that without verifying the critical characteristics at the required voltage of 2200VAC, ABB was unable to demonstrate that the dedicated breaker will be able to perform its safety function. This issue is identified as Nonconformance 99901256/2012-201-01. ABB initiated Action Request # 201200146 to address this issue.

The NRC inspection team observed the dedication of screws (Part Number 54384A02) and labels (Part Number 708914A00), on purchase order (PO) 45410064 for First Energy. In addition, the NRC verified that the quality control (QC) inspector selected an adequate sample size, verified the critical characteristics, and used calibrated measuring and test equipment (M&TE) in accordance with the appropriate part card from ABB's inspection database.

c. Conclusion

The NRC inspection team reviewed ABB policies and implementing procedures that govern ABB's design control and commercial-grade dedication programs 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 NRC inspection team issued Nonconformance 99900100/2012-201-01 in association with ABB's failure to verify two critical characteristics relating to dielectric strength for a K-Line breaker to demonstrate that the circuit breaker would be able to perform its safety function.

3. Assembly, Refurbishment, Inspection, and Testing

a. Inspection Scope

The NRC inspection team reviewed ABB's quality assurance (QA) policies, procedures, and instructions to verify that adequate controls have been established and implemented for assembly, refurbishment, inspection, and testing of new and refurbished circuit breakers consistent with the following regulatory requirements: 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," Criterion X, "Inspection," Criterion XI, "Test Control," and Criterion XII, "Control of Measuring and Test Equipment." The NRC inspection team observed, reviewed, and assessed in-process and historic assembly, refurbishment, inspection, and testing to verify these activities were conducted in accordance with current instructions and drawings. The NRC inspection team also reviewed inspection and test records to verify that they contained the appropriate information and that the results were adequately evaluated and accepted. Furthermore, the NRC inspection team discussed assembly, refurbishment, inspection, and testing with ABB management and technical staff. The attachment to this inspection report lists the documents that the NRC inspection team reviewed.

b. Observations and Findings

b.1 Assembly and Refurbishment

The NRC inspection team verified that the ABB assembly personnel were performing quality activities in accordance with approved and current procedures. The NRC inspection team performed an on-the-spot field inspection of one ongoing lubrication assembly activity detailed in procedure WI-PSC-01, "K-Line Circuit Breaker Service Procedure," Section 19, "Lubrication," for an ABB K-Line type 480VAC, 3 phase, circuit breaker, device number 06639A-01680, serial # 1VAFRA54362-004K12 identified in ABB Book # 2156, which was designated for a 480VAC Load Center.

The NRC inspection team verified that in-process inspection control documents WI-PSC-01, "K-Line Circuit Breaker Service Procedure," and WI-PSC-02, "HK Type Circuit Breaker Service Procedure," provided instructions to include the item inspected, inspection date, type of observation (if any), results of examination and tests, and the signature, initials, or stamp and date of the authorized representative for the activities witnessed. The NRC inspection team verified that instructions for mandatory hold points appeared in the controlling documents and were implemented. The NRC inspection team also verified that work did not proceed without appropriate approval, which was verified during the assembly lubrication activity.

The NRC inspection team selected a random sample of refurbished safety-related circuit breakers located in the assembly holding area awaiting final QC inspection and testing. The NRC inspection team reviewed the acceptability requirements detailed in POs relative to procedural requirements, witnessed test personnel perform physical wiring checks, and verified circuit breaker wiring against the "Lift and Land" sheet contained in ABB Book # 2168. The NRC inspection team also verified that the associated technical documents accompanying the breakers included test objectives, test requirements, applicable prerequisites, and acceptance criteria as specified in test procedure WI–PSC–02, "HK Type Circuit Breaker Service Procedure."

The NRC inspection team verified the training qualifications records for three ABB assembly test personnel qualified to perform and inspect the lubrication activities to verify that the inspections

for this activity would be performed by qualified persons other than those who performed or directly supervised the work being inspected. The NRC inspection team verified that procedure WI-PSC-01 provided measures for the generation of inspection control documents such as traveler RGA # 8203, process sheets, and associated checklist # F–PSC–01–01, all of which were located in Book # 2156.

b.2 Final Inspection and Testing

The NRC inspection team sampled the documentation supporting four safety-related refurbishment POs for two low voltage and two medium voltage circuit breakers including the customer's technical requirements and final inspection and test results. The NRC inspection team reviewed this documentation to verify, by sample, that:

1. Inspections and tests were performed by personnel other than those who performed or directly supervised the work being inspected or tested,
2. Inspection hold points were used adequately to control work
3. Inspection and test results were documented and evaluated against the acceptance criteria
4. Calibrated M&TE was used to perform inspections and tests
5. Replaceable components left in place were evaluated and accepted
6. Replacement components were correctly identified and installed

While touring the assembly area, the NRC inspection team requested to see the measuring equipment used for critical dimension checks such as contact wipe in the "Final Checks and Adjustments" sections of procedures WI-PSC-01, "K-Line Circuit Breaker Service Procedure," and WI-PSC-02, "HK Type Circuit Breaker Service Procedure." The technician showed the NRC inspection team go or no-go gauges and a feeler gauge used to ensure that the measurement was within specification. The NRC inspection team noted that the gauges did not display M&TE stickers. When asked, ABB personnel stated that the testing individuals used calibrated gauges for these dimensional checks. The NRC inspection team confirmed that calibrated gauges were located in the testing area. However, when reviewing the completed work pages for Books # 1986, 2001, 2018, and 2075, the NRC inspection team noted that this go or no-go gauge and a torque wrench were not listed in the "Calibrated Test Equipment Record." ABB was unable to assure that calibrated equipment was used to verify these critical dimensions. ABB's QAP Section 12, "Control of Measuring and Test Equipment," Subsection 5.9, states, "Equipment used by quality control personnel for inspection and test shall be recorded within the inspection record." This issue is identified as Nonconformance 99901256/2012-201-02. ABB initiated Action Request # 201200145 to address this issue.

c. Conclusion

The NRC inspection team reviewed ABB policies and implementing procedures that govern ABB's assembly, refurbishment, inspection, and testing activities to verify compliance with the requirements of Criterion V, "Instructions, Procedures, and Drawings," Criterion X, "Inspection," and Criterion XI, "Test Control," of Appendix B to 10 CFR Part 50.

Based on this review, the NRC inspection team issued Nonconformance 99900100/2012-201-02 in association with ABB's failure to record go / no-go gauges and torque wrenches used in the inspections of K-Line and HK breaker refurbishments to assure only qualified equipment was used.

4. Oversight of Contracted Activities

a. Inspection Scope

The NRC inspection team reviewed the policies and implementing procedures that govern the implementation of ABB's oversight of contracted activities 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. The NRC inspection team reviewed a sample of POs and receipt inspection records to evaluate compliance with ABB's oversight program and technical requirements. In addition, the NRC inspection team reviewed the disposition of corrective actions to resolve deficiencies that audits identified for adequacy and timeliness. Furthermore, the NRC inspection team discussed ABB's oversight of contracted activities with ABB management and technical staff. The attachment to this inspection report lists the documents that the NRC inspection team reviewed.

b. Observations and Findings

b.1 Procurement Document Control

The NRC inspection team verified that the POs adequately documented the procurement requirements as established by ABB's governing policies and implementing procedures, which include task definitions and responsibilities; appropriate quality, technical, and regulatory requirements; and applicable codes and standards. The NRC inspection team found that these POs adequately defined contract deliverables, instructions for the disposition of nonconformances, access rights, and provisions for extending contractual requirements to subcontractors. The NRC inspection team also verified that when changes to approved procurement documents were needed, they received the same level of review and approval as the original documents.

b.2 Supplier Qualification Activities

The NRC inspection team verified that ABB's nuclear approved vendors list (NAVL) only listed qualified suppliers and that ABB made required revisions to the list in accordance with the quality assurance manual (QAM) and the applicable procedures. The NRC inspection team confirmed that the NAVL contained the applicable locations, the scope of qualification, limitations and restrictions, the date that reapproval is due, and the approved quality program for each qualified vendor. The NRC inspection team also verified that, for the sample of vendors selected, ABB performed supplier audits and surveys as required.

The NRC inspection team verified proper implementation of the audit and commercial-grade dedication programs through a sample of external audits and commercial-grade surveys. For audits, the NRC inspection team confirmed that the audit reports contained a review of the relevant QA criteria in Appendix B to 10 CFR Part 50 for the activities that individual suppliers performed, as well as documentation of pertinent supplier guidance associated with each criterion. For commercial-grade surveys, the NRC inspection team ensured that the survey reports contained a review of applicable commercial quality controls over associated critical characteristics. For audits and commercial-grade qualification activities that resulted in findings, the NRC inspection team verified that the supplier had established a plan for a supplier corrective action request and that ABB had reviewed and approved the corrective actions and verified satisfactory completion and proper documentation in a timely manner.

b.3 Receiving Inspections

The NRC inspection team verified that ABB was using appropriate methods to accept a basic component or commercial item from a supplier, such as certificates of conformance (COCs) and receipt inspections. The NRC inspection team also verified that during receipt inspection activities, ABB appropriately specified and inspected for the quality attributes and critical characteristics that must be verified for each component. Specifically, the NRC inspection team reviewed ABB PO 4500859132 for an order of 50 metallic bushings from Sims Machining and witnessed ABB performing physical receipt inspections and certified material test report (CMTR) checks of the chemical and physical characteristics against the required specifications for an adequate sample of parts.

The NRC inspection team confirmed that ABB ensured COCs conformed to the PO requirements such as the identification of specific procurement requirements that have been met and those that have not been met. The NRC inspection team verified that suppliers submitted deviations from POs and that ABB appropriately dispositioned the deviations. The NRC inspection team also verified that receipt items to-be-inspected and nonconforming items were stored in accordance with the ABB procedures.

c. Conclusion

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

5. Control of Measuring and Test Equipment

a. Inspection Scope

The NRC inspection team reviewed the policies and implementing procedures that govern the implementation of ABB's control of measuring and test equipment (M&TE) to verify compliance with the requirements of Criterion XIIV, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed documentation for selected M&TE and witnessed in-process calibration activities to verify the equipment was properly qualified for use in safety-related inspection and testing. Furthermore, the NRC inspection team discussed ABB's control of M&TE with ABB management and technical staff. The attachment to this inspection report lists the documents that the NRC inspection team reviewed.

b. Observations and Findings

The NRC inspection team selected ten M&TE test equipment samples from ABB's "Engage Plus Calibration Management Program Software" database and verified that calibration data were current and that the instrumentation range and accuracy were adequate for the application. The NRC inspection team selected four M&TE test equipment samples from the database and verified that the actual M&TE calibration stickers were consistent.

The NRC inspection team verified that the M&TE calibration records were traceable to a nationally recognized standard administered by the National Institute of Standards and Technology and controlled from receipt to destruction. The NRC inspection team verified that

the tools, instruments, and gauges used for safety-related activities contained calibration and due dates and were uniquely identified for traceability. The NRC inspection team also verified the qualification of the individual performing the calibration and the acceptability of adjustments and results to maintain accuracy and tolerance. Specifically, the NRC inspection reviewed the following ABB COCs:

- ABB Certificate of Conformance for PO 500565971, dated October 26, 2012
- Megger Certificate of Compliance for PO 1105739, dated May 24, 2012

The NRC inspection team observed the receipt inspection and test of a circuit breaker. The NRC inspection team subsequently verified that ABB appropriately calibrated and controlled the following pieces of equipment used for those activities:

- Fluke 287 "Multimeter" Serial # ETE-1797
- AC High Pot Tester Serial #ETE-1779
- AC Dielectric Test set, Serial # ETE-1851

The NRC inspection team also reviewed condition reports for M&TE found out-of-calibration or overdue for calibration and verified that ABB segregated devices to prevent inadvertent use and considered historic impacts.

c. Conclusion

The NRC inspection team reviewed ABB policies and implementing procedures that govern ABB's measuring and test equipment program and concluded that ABB established a program consistent 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 concluded that ABB adequately implemented its measuring and test equipment program. No findings of significance were identified.

6. Control of Nonconforming Materials, Parts, or Components

a. Inspection Scope

The NRC inspection team reviewed ABB's policies and implementing procedures that govern the control of nonconformances to verify compliance with the requirements of Criterion XV, "Nonconforming Materials, Parts, or Components," of Appendix B to 10 CFR Part 50. Specifically, the NRC inspection team verified that the applicable ABB procedures provide for documentation and disposition of nonconforming items including instructions for repair and rework activities, reinspection of repaired and reworked items, and notification to affected organizations of nonconforming conditions. The NRC inspection team reviewed a sample of nonconformance reports (NCRs) and Customer Complaint Response Program reports (CCRPs) and verified that the disposition and control of nonconformances was in accordance with the ABB procedural guidelines. Furthermore, the NRC inspection team discussed the nonconformance program with ABB's management and technical staff. The attachment to this inspection report lists the documents that the NRC inspection team reviewed.

b. Observations and Findings

The NRC inspection team witnessed a receipt inspection and verified the procedures used when a nonconformance is present. Specifically, during the dedication inspection for round head self-tapping screws, the ABB dedication inspector found three of the five screws sampled out of tolerance. The dedication inspector promptly generated an NCR to identify the nonconforming condition (NCR # 123732JL). The NRC inspection team also toured the shop floor to verify that there were designated areas to segregate and control the various classes of nonconforming materials. ABB also properly dispositioned nonconforming items as accept, reject, rework, hold, scrap, or use-as-is, and provided adequate documented technical justification.

For the NCR and CCRP samples reviewed, the NRC inspection team verified that ABB implemented an adequate program to assess and control nonconforming items, including appropriate identification, documentation, segregation, evaluation, and disposition of these items. For NCRs requiring a more in-depth review, engineering or inspection personnel were assigned, as necessary, to evaluate and disposition the nonconformance and provide adequate documentation of the evaluation. The NRC inspection team observed that NCRs were trended regularly.

c. Conclusion

The NRC inspection team reviewed ABB policies and implementing procedures that govern ABB's nonconforming materials, parts, or components program and concluded that ABB established a program consistent with the regulatory requirements of Criterion XV, "Nonconforming Materials, Parts, or Components," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team concluded that ABB adequately implemented its nonconforming materials, parts, or components program. No findings of significance were identified.

7. Corrective Actions

a. Inspection Scope

The NRC inspection team reviewed ABB's policies and implementing procedures that govern the corrective action program to verify compliance with the requirements of Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed a sample of the 2012 corrective action reports (CARs) and verified that the CARs disposition provided adequate documentation and description of conditions adverse to quality. The NRC inspection team also verified that the reports specified the cause of these conditions and the corrective actions taken to prevent recurrence. Furthermore, the NRC inspection team discussed the corrective action program with ABB's management and technical staff. The attachment to this inspection report lists the documents that the NRC inspection team reviewed.

b. Observations and Findings

The NRC inspection team verified that ABB established implementing procedures that provide assurance that conditions adverse to quality are promptly identified, documented, and corrected in accordance with ABB procedures and practices. The procedures also ensured that repetition is precluded for significant conditions adverse to quality.

The NRC inspection team also verified that the corrective action process provides an effective interface to ABB's 10 CFR Part 21 program, and that a management system has been established for the overview of trends for conditions adverse to quality.

c. Conclusion

The NRC inspection team reviewed ABB policies and implementing procedures that govern ABB's corrective action program and concluded that ABB established a program consistent 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 concluded that ABB adequately implemented its corrective action program. No findings of significance were identified.

8. Internal Audits

a. Inspection Scope

The NRC inspection team reviewed the ABB policies and implementing procedures that govern its internal audit program to verify compliance with the requirements of Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50. Specifically, the NRC inspection team reviewed a sample of internal audit reports to evaluate compliance with the ABB program requirements and adequate implementation of those requirements. In addition, the NRC inspection team reviewed the disposition of audit findings and observations for adequacy and timeliness. Furthermore, the NRC inspection team discussed the internal audit program with ABB management. The attachment to this inspection report lists the documents that the NRC inspection team reviewed

b. Observations and Findings

The NRC inspection team reviewed the ABB internal audits for 2011 and 2012 and verified that they were planned and performed using the applicable procedures, documented with objective evidence, and distributed to the appropriate management within the timeframes that the applicable ABB procedures prescribe. The NRC inspection team verified that the audit team was appropriately qualified.

The NRC inspection team confirmed that the audit reports contained a review of the relevant QA criteria in Appendix B to 10 CFR Part 50, as well as the applicable ABB procedures and policies associated with each area. The NRC inspection team verified that appropriate corrective actions were taken for the identified audit findings.

c. Conclusion

The NRC inspection team concluded that ABB's internal audit program is consistent 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 concluded that ABB adequately implemented its internal audit program. No findings of significance were identified.

9. Entrance and Exit Meetings

On December 3, 2012, the NRC inspection team discussed the scope of the inspection with Mr. Jay Lavrinc, General Manager; Mr. Victor Romano, Quality Assurance Manager; and other members of the ABB management and staff. On December 7, 2012, the NRC inspection team presented the inspection results and observations during an exit meeting with Mr. Lavrinc, Mr. Romano, and other ABB staff. In addition, on January 9, 2013, the NRC inspection team contacted ABB to provide clarification on a potential finding. The attachment to this report lists the entrance and exit meeting attendees, as well as those individuals the NRC inspection team interviewed.

ATTACHMENT

1. ENTRANCE / EXIT MEETING ATTENDEES AND PERSONS CONTACTED

Name	Title	Affiliation	Entrance	Exit	Interviewed
Garrett Newman	Inspector	NRC	X	X	
Stacy Smith	Inspector	NRC	X	X	
Eugene Huang	Inspector	NRC	X	X	
Marlayna Vaaler	Inspector	NRC	X	X	
Denise Terry-Ward	Inspector	NRC	X	X	
Vic Romano	Quality Manager	ABB	X	X	X
Karen Smith	Sr. Operations Specialist	ABB	X		
David Ringley	Customer Service Manager	ABB	X	X	
John Layne	Nuclear BDM	ABB	X	X	
Tim Fricano	Production Engineering Mgr	ABB	X	X	X
Tom Burnham	Operations Supervisor	ABB	X	X	
Shawn Shockey	Operations Manager	ABB	X		X
Jay Laverinc	General Manager	ABB	X	X	
Gautham Kasargod	Associate QA Engineer	ABB	X	X	X
Mary Jane Weir	Business Excellence Manager	ABB	X	X	
Keith Berte	Controller	ABB	X	X	
Doug Blesie	Senior Buyer	ABB	X	X	
Tim Carraway	Supply Chain Manager	ABB	X	X	
John Webb	R&D Manager	ABB	X	X	X
Michael Martin	Facility Manager	ABB	X		
Henry Woodbury	QA Engineer	ABB	X	X	X
Terry Malloy	Nuclear Program Manager	ABB	X	X	X
David Brown	QA Engineer	ABB	X	X	X
Ken Cottingham	Assembly Manager	ABB			X
Elaine Eaddy	QA Technician	ABB			X
Pauline Faison	Senior Technician	ABB			X
Jonothan Samuels	Lead Product Support Technician	ABB			X
Samuel Huggins	Electrical Tester	ABB			X
Julius Pear	Senior Inspector	ABB			X
Phillip Thompson	Product Engineer	ABB			X
William Weishuhm	Product Engineer	ABB			X
Sammy Coe	Receipt Inspector	ABB			X
Kai Zheng	Buyer	ABB			X

2. INSPECTION PROCEDURES USED

Inspection Procedure 43002, "Routine Inspections of Nuclear Vendors," dated April 25, 2011.

Inspection Procedure 43004, "Inspection of Commercial-Grade Dedication Programs," dated April 25, 2011.

Inspection Procedure 36100, "Inspection of 10 CFR Parts 21 and 50.55(e) Programs for Reporting Defects and Noncompliance," dated February 13, 2012.

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Status	Type	Description
99901256/2009-201-01	Closed	NON	Criterion III
99901256/2009-201-02	Closed	NON	Criterion XII

4. DOCUMENTS REVIEWED

- #F-PSC-02-05, "Lead lift and land sheet,", Revision 2, dated October 26, 2011
- 1VAFPH40152-001I12, "K-line inspection & test form", dated October 24, 2012
- 1VAF-T0003-100465, "Control of Nonconforming Materials," Revision 5, dated September 10, 2012
- 1VAF-T0003-100489, "Corrective Action," Revision 3, dated August 3, 2011
- 1VAF-T0005-100703, "Legacy quality assurance trailer," Revision 1, dated November 30, 2012
- 1VAF-Y0003-100524, "Reporting of Product Defects (Part 21)," Revision 9, dated December 5, 2011
- ABB Certificate of Conformance for PO 500565971 from Arizona Public Service / Palo Verde, dated October 26, 2012
- ABB Nuclear Quality Assurance Manual, Revision 1, dated March 1, 2012
- ABB part card for Part #191921t06, "Control device (125VDC HK)," Revision 11
- ABB Service Training System report dated December 06, 2012
- ABB Service Training System report dated December 07, 2012
- ABB, Custom Quick Report, Lost Equipment Report, dated December 04, 2012
- AR # 201100106, dated September 1, 2011
- AR # 201200048, dated April 30, 2012
- AR # 201200069, dated June 20, 2012
- AR # 201200145, dated December 6, 2012
- AR # 201200146, dated December 6, 2012
- AR # 201200147, dated December 6, 2012
- Assembly training for Paulene Faison
- Audit # VHRO-8DP5DA, "Qual Tech NP Nuclear Vendor Audit Checklist," dated February 25, 2011
- Audit # VHRO-8ET5FA, "Tool and Gage House Nuclear Industry Assessment Committee (NIAC) Calibration Audit Checklist," dated March 14, 2011
- Audit # VHRO-8P3RUD, "Piedmont Bushings and Insulators Commercial Grade Item Survey Checklist," dated December 13, 2011

- Audit # VHRO-8URGEP, “AVO-Megger Source Inspection Report,” dated May 24, 2012
- Audit # VHRO-8URGEP, “Source Inspection Report for Programma Model MA-31 Computer Aided Circuit Breaker Motion Analyzer Type TM1600,” dated May 24, 2012
- Audit #KAGE-85S2PS, “QA Program: Procurement,” dated March 8-15, 2011
- Audit #VHRO-8EZ4YT, “QA Program: Tests and Inspections,” dated June 2-13, 2011
- Audit #VHRO-8EZ4ZW, “QA Program: Procurement,” dated March 14–16, 2011
- Audit #VHRO-8EZ4ZW, “QA Program: Shipping, Packaging, Handling,” dated July 18, 2012
- Audit #VHRO-8LA4BR, “QA Program: Full Scope,” dated December 5-8, 2011
- Audit #VHRO-8Q6GRB, “QA Program: Calibration,” dated January 3, 2012
- Audit #VHRO-8Q6H4H, “QA Program: Organization / Program,” dated October 22, 2012
- Audit #VHRO-8Q8GY3, “QA Program: Document Control,” dated February 16, 2012
- Audit #VHRO-8ZENT2, “QA Program: Commercial Grade Dedication,” dated November 19, 2012
- Audit #VHRO-8ZENZL, “QA Program: Calibration,” dated November 30, 2012
- Book # 2001, MV Refurb 1E/ PSEG PO # 4500689836
- Book # 2075, 5HK0250 1200A Refurb for First Energy PO # 47377077
- CAR # 201200010, dated January 13, 2012
- CAR 201100151, dated January 3, 2012
- CAR 20110048, dated May 10, 2011
- CAR 20110078, dated July 30, 2012
- CAR 201200027, dated October 3, 2012
- CAR 201200030, dated October 3, 2012
- CAR 2012-00044, dated March 22, 2012
- CAR 201200053, dated May 4, 2012
- CAR 201200055, dated May 10, 2012
- CAR 201200063, dated May 23, 2012
- CAR 201200083, dated August 17, 2012
- CAR 201200106, dated October 2, 2012
- CAR 201200107, dated October 3, 2012
- CAR 201200130, dated November 12, 2012
- CAR-2012-00006, dated January 13, 2012
- CAR-2012-00013, dated January 24, 2012
- CAR-2012-00016, dated February 1, 2012
- CAR-2012-00017, dated February 6, 2012
- CAR-2012-00019, dated February 9, 2012
- CAR-2012-00022, dated February 15, 2012
- CAR-2012-00023, dated February 17, 2012
- CAR-2012-00027, dated March 6, 2012
- CAR-2012-00028, dated March 9, 2012
- CAR-2012-00048, dated April 20, 2012
- CAR-2012-00056, dated May 14, 2012
- CAR-2012-00069, dated June 20, 2012
- CAR-2012-00070, dated June 20, 2012

- CAR-2012-00074, dated July 18, 2012
- CAR-2012-00076, dated July 25, 2012
- CAR-2012-00077, dated July 26, 2012
- CAR-2012-00078, dated July 30, 2012
- CAR-2012-00084, dated August 21, 2012
- CAR-2012-00087, dated August 23, 2012
- CAR-2012-00089, dated August 28, 2012
- CAR-2012-00090, dated September 11, 2012
- CAR-2012-00091, dated September 12, 2012
- CAR-2012-00100, dated September 17, 2012
- CAR-2012-00107, dated October 3, 2012
- CAR-2012-00113, dated October 9, 2012
- CAR-2012-00117, dated October 15, 2012
- CAR-2012-00118, dated October 17, 2012
- CAR-2012-00123, dated October 22, 2012
- CAR-2012-00133, dated November 19, 2012
- CCRP #US-608902, dated February 7, 2012
- CCRP #US-612394, dated March 8, 2012
- CCRP #US-613809, dated March 21, 2012
- CCRP #US-628880, dated June 21, 2012
- CCRP #US-631459, dated November 7, 2102
- CCRP #US-635173, dated August 13, 2012
- Certificate of Calibration for SN # 1613, "7/64 Go x 3/16 NoGo, Plug Gage" dated 2/27/12
- Certificate of conformance – customer purchase order 500565971. K-line. 1VAFPH40152—001I12, dated October 26, 2012
- Certificate of conformance – HK 250 -1200A 1E dedication, serial #1VAFRA38947001a12, dated March 8, 2012
- Certificate of conformance process for pre-dedicated items-sales order HOT 8889 for STP, Part #1457c80a01, December 5, 2012
- Circuit BKR Kit #716656T03, "Refurbishment Kit 600 E0/DO 716656T03", Revision 16
- Circuit BKR Kit #716656T08, "Refurbishment Kit 5HK250/3501200/200A", Revision 17
- CWBR-82SQ5W, ABB Pinetops Commercial Grade Survey Checklist, dated March 10, 2010
- DCBN-8MQHTV, Surtronics Commercial Grade Survey Checklist, dated October 27, 2011
- DCR No. VHRO-92QG8C, dated December 6, 2012
- DCR WHWN-92QMTZ, "Quality Management System Documents – K-Line Service Procedure", submitted December 6, 2012
- DCR WHWN-92QMUP, "Quality Management System Documents – K-Line Circuit Breaker Inspection and Test", submitted December 06, 2012
- Dedication certificate of conformance for part 708392T07, ABB RA 39456, control device k-line, November 9, 2012
- Document change request-VHRO-92pm17, for document 1VAF-T0005-100659, "Quality management system forms – k-line circuit breaker inspection and test," Revision 8, dated December 5, 2012

- Document change request-WHWN-92plwe, for document 1vaf-t0005-100658, “Quality management system forms – hk type circuit breaker inspection and test form,” Revision 7, dated December 5, 2012
- Document change request-WHWN-92qmup for document 1vaf-t0004-100970, “Quality management system documents – k-line circuit breaker inspection and test,” Revision 3, dated December 6, 2012
- Drawing #193381, “15HK nozzle tube,” Revision 11
- Drawing #197182, “Upper terminal assembly-5HK 350-3000 amps,” Revision 5
- Drawing #51042, “Zinc Plate,” Revision 19, dated May 10, 2012
- Drawing #51042, “Zinc Plate”, Revision 19
- Drawing #51042, Zinc Plate, Revision 19, dated May 10, 2012
- Drawing #54384, “Round head self-tapping screw,” Revision 5, September 28, 1978
- Drawing #702250, “Operating coil shop assembly. Type k4, k8, k16 breakers & hk,” Revision 42
- Drawing #703968k01, “Insulated connector,” Revision 11
- Drawing TC-6968ABB “Ground Function Supplied on I-T-E Types SS-3G & 13 Long Time Instantaneous, SS4G & 14G Short-time & Ground, SS-5G & 25 Short-Time & Ground”, Revision 2
- Drawing TD-9001, “Solid State Trip Device General Purpose, ABB Time Current Characteristic Curves (TCC)”. Revision 3, dated 5-1-89
- ECN #10981, November 29, 2012
- ECR #10981, dated May 10, 2012
- ECR #11188, October 12, 2012
- Engineering Report 2008-5, “Evaluation of the wuxi motor as a suitable replacement for the ryobi motor,” Revision 2, dated August 31, 2009
- Engineering Report 2009-01, “Lubricant evaluation of C/GC 757 vs. anderol 757,” dated January 28, 2009
- F-INSP-25-01, “Hk/vhk mech test and checklist,” Revision 3, dated April, 4, 2007
- F-INSP-25-01, “HK/VHK mech test and checklist,” Revision 3, dated April 4, 2007
- F-INSP-44-02, “Medium voltage checklist form,” Revision 3, dated March 26, 2009
- F-INSP-44-02, “Medium voltage checklist form,” Revision 3, dated March 26, 2009
- F-INSP-63-01, “Production testing form LV CIC breaker using an E-max circuit breaker,” Revision 3, dated November 21, 2012
- F-MIS49-01, 201100106, 9/1/11. QAP section 16, WI-MIS-49
- F-PSC-02-05, “Lead lift and land sheet,” Revision 2, dated October 26, 2011
- IB 6.1.12.1-1E, “Low voltage air-magnetic power circuit breakers. K-line 225A through 2000A,” Revision E, dated May 15, 2009
- IB 6.1.2.7-2E, ABB, “Installation/Maintenance Instructions”, Revision E
- IB 6.1.2.7-4D, ABB, “Solid State trip Device and test set Power shield-Solid State trip device (Gray Case) and type 504 test set”, Revision D
- IB 6.2.1.7D, “Medium-voltage power circuit breakers, type 5HK 1200 thru 3000 Amperes 5000 volts.”
- IB 6.2.2.7-1G, “Medium voltage power circuit breakers, type 7.5HK500, 15HK500, and 15HK750, 1200 thru 3000 amperes 7500 and 15000 volts.”
- IB 6.2.3.7B, “Medium voltage power circuit breakers, type 15hk 1000, 1200 thru 3000 amperes. 15000 volts”
- Installation/Maintenance Instructions, IB 6.2.1.7D, “Type 5HK 1200 thru 3000 Amperes 5000 Volts,”

- Internal Quality Program Audit Report, “Plating to E1 Bake Process,” dated November 20, 2012
- Lead Auditor Training records for David Brown dated May 16, 2011
- Lead Auditor Training records for Doug Blesie dated October 9, 2009
- Lead Auditor Training records for Victor Romano dated January 20, 2009
- M&TE, 5-1350, Rain Thread Gauge, Calibration due date May 14, 2013
- M&TE, ETE-0554, Digital Multimeter, Calibration Due date May 3, 2013
- M&TE, ETE-0843, Megger, Calibration due date November 14, 2013
- M&TE, ETE-0901, Welding Power Source, Calibration Due date March 8, 2013
- M&TE, ETE-1535, 15HK Circuit Breaker Test Cell, Calibration Due date June 12, 2013
- M&TE, ETE-1779, AC Hi-Pot tester, Calibration due date August 1, 2013
- M&TE, ETE-1851, AC Dielectric Test Set, Calibration due date May 30, 2013
- Megger Certificate of Compliance for PO 1105739 from The Tool and Gage House, dated May 24, 2012
- Megger Certificate of Compliance for PO 1105739 from The Tool and Gage House, dated May 24, 2012
- MT&E, ETE-1797, “Fluke 287 Multimeter, Calibration due date February 7, 2013
- MT&E, PTS-1630, Zinc Plating, Calibration due date May 11, 2013
- MT&E, PTT-1690, Fisherscope, Calibration due date September 11, 2013
- NCR 123208JL, dated November 29, 2012
- NCR 123793JL, dated December 5, 2012
- Part Card (Critical Characteristics) for Part 163392A00
- PO 4500775444, ABB Coral Springs, dated July 11, 2012
- PO 4500832850, ABB Coral Springs, dated October 1, 2012
- PO 4500852412, ABB Bland, dated October 29, 2012
- PO 4500859928, Laserform and Machine, Inc., dated November 8, 2012
- PO 4500877459, ABB Coral Springs, dated December 5, 2012
- PO 484522-C, Book Number 1986, Release 5
- PO 500565971, dated April 12, 2012
- PO 70238306, Book 2018, Release 0
- QAP Section 10, “Inspection,” Revision 4, dated September 1, 2012
- QAP Section 11, “Test Control,” Revision 2, dated September 1, 2012
- QAP Section 12, “Control of Measuring and Test Equipment,” Revision 9, dated January 5, 2012
- QAP Section 12, 1VAF-T0003-100485, “Control of Measuring and Test Equipment,” Revision 9, dated January 5, 2012
- QAP Section 15, 1VAF-T0003-100465, “Control of Nonconforming Materials,” Revision 5, dated September 10, 2012
- QAP Section 18, “Audits,” Revision 3, dated December 1, 2011
- QAP Section 22, “Training,” Revision 2, dated September 1, 2012
- QAP Section 4, 1VAF-T0003-100473, “Procurement Document Control,” Revision 2, dated December 1, 2011
- QAP Section 7, 1VAF-T0003-100494,”Control of Purchased Material, Equipment and Services,” Revision 4, dated November 29, 2011
- Quality Assurance Manual, Revision 1, dated March 1, 2012
- Report Number ABB001-10-24-81089, “Fractured Hex Stud Bolts,” dated October 26, 2012

- Source inspection report – VHRO-8URGEP, Vendor Avo-Megger, May 24, 2012
- TPMY-822KEJ, ABB Coral Springs Florida Nuclear Vendor Audit Checklist, dated February 4, 2010
- Vendor Restriction Management Sheet, dated November 29, 2012
- WI-ASSY-45, 1VAF-T0004-100898, “Static mag latch assembly and test,” Revision 1, dated August 17, 2012
- WI-CAL-01, “Plating and Painting Thickness Tester Verification and Calibration”, Revision 19, dated March 07, 2011
- WI-CAL-02, “Outsourced Equipment Repair and Calibration Services”, Revision 16, dated February 02, 2012
- WI-CAL-03, Measurement and Test Equipment Calibration Procedure, Revision 16, dated November 21, 2012
- WI-CAL-04, “Using Calibration Database (Engage)”, Revision 0, dated July 8, 2011
- WI-ENG-01, 1VAF-T0004-100963, “Design and development planning,” Revision 4, dated January 9, 2012
- WI-ENG-02, 1VAF-T0004-100806, “Technical document/proposal,” Revision 1, dated August 9, 2010
- WI-ENG-04, 1VAF-T0004-100808, “Design outputs,” Revision 1, dated August 9, 2010
- WI-ENG-05, 1VAF-T0004-100809, “Design reviews,” Revision 2, dated September 7, 2011
- WI-ENG-06, 1VAF-T0004-100812, “Design verification,” Revision 3, dated August 9, 2010
- WI-ENG-07, 1VAF-T0004-100811, “Design validation,” Revision 3, dated August 9, 2010
- WI-ENG-14, 1VAF-T0004-100933, “Commercial grade dedication plan: HK and VHK-X medium voltage circuit breaker,” Revision 0, dated May 27, 2009
- WI-ENG-15, 1VAF-T0004-100934, “Commercial grade dedication plan: k-line low voltage circuit breaker,” Revision 1, dated June 15, 2012
- WI-ENG-19, 1VAF-T0004-100962, “Commercial grade dedication plan for circuit breaker primary disconnect assemblies (finger clusters),” Revision 2, dated May 29, 2012
- WI-ENG-20, 1VAF-T0004-100965, “Commercial grade dedication plan for circuit breaker refurbishment kits and other repair, upgrade, or installation kits,” Revision 1, dated October 15, 2012
- WI-ENG-24, 1VAF-T0004-100971, “Commercial grade dedication plan for circuit breaker control devices (191921 K-line) (708392 HK),” Revision 1, dated December 22, 2011
- WI-ENG-50, 1VAF-T0004-100999, “Commercial grade dedication plan for current, control power and potential transformers,” Revision 0, dated September 30, 2012
- WI-ENG-51, 1VAF-T0004-101001, “Commercial grade dedication plan for circuit breaker overload trip devices (OD’s),” Revision 0, dated October 19, 2012
- WI-ENG-52, 1VAF-T0004-101002, “Commercial grade dedication plan for circuit breaker under voltage trip devices,” Revision 0, dated October 19, 2012
- WI-HR-05, Internal Quality Assurance Auditor Qualifications, Revision 5, dated September 14, 2006
- WI-HR-06, Lead Quality Assurance Auditor Qualifications, Revision 5, dated August 8, 2011

- WI-INSP-05, 1VAF-t0004-100379, “Receiving inspection – CGD of parts,” Revision 16, dated January 6, 2012
- WI-INSP-05, 1VAF-T0004-100379, “Receiving Inspections – CGD of Parts,” Revision 16, dated January 6, 2012
- WI-INSP-56, 1VAF-T0004-100970, “K-line circuit breaker inspection and test,” Revision 3, January 27, 2012
- WI-INSP-57, 1VAF-T0004-100910, “HK type circuit breaker inspection and test,” Revision 3, dated August 25, 2011
- WI-INSP-60, “Document Review and Generation of Certificate of Conformance”, Revision 0, dated August 6, 2009
- WI-INSP-60, 1VAF-T0004-100939, “Document review and generation of certificate of conformance,” Revision 0, dated August 6, 2009
- WI-MATL-01, “Processing Returned Material Requests (RMR) and Returned Goods Authorizations (RGA), Revision 3, dated February 16, 2012
- WI-MATL-02, 1VAF-T0004-100360, “ID and Control of Materials, Parts and Components,” Revision 9, dated July 13, 2009
- WI-MATL-04, 1VAF-T0004-100855, “Processing of dedicated commercial grade items (CGIs),” Revision 6, dated January 4, 2012
- WI-MIS-07, 1VAF-T0004-100677, “Using the engineering change database system,” Revision 7, dated April 1, 2008
- WI-MIS-48, 1VAF-T0004-100408, “Florence Inspection and NCR Database System,” Revision 3, dated March 22, 2011
- WI-MIS-49, “CARS and PARS Database System,” Revision 2, dated May 30, 2012
- WI-PSC-01, “K-Line Circuit Breaker Service Procedure”, Revision 29, dated January 06, 2012
- WI-PSC-02, “HK Type Circuit Breaker Service Procedure”, Revision 14, dated April 27, 2012
- WI-PUR-01, 1VAF-T0004-100342, “Purchase Order Control – Requirements for Safety Related Items,” Revision 7, dated October 15, 2012
- WI-PUR-02, 1VAF-T0004-100339, “Purchase Order Control – Commercial Grade Items,” Revision 6, dated November 16, 2006
- WI-PUR-11, 1VAF-T0004-100904, “Supplier Qualification Process,” Revision 6, dated December 8, 2010
- WI-QUAL-04, 1VAF-T0004-100861, “Conducting Supplier Audits, Surveys and Source Verifications,” Revision 4, dated January 19, 2012