June 22, 2012

Mr. William E. Berger, Jr., Senior Vice-President
for Nuclear Services
Fauske & Associates, LLC
16W070 83rd Street
Burr Ridge, IL 60527

SUBJECT: NRC VENDOR INSPECTION REPORT NO. 99901413/2012-201 AND NOTICE OF NONCONFORMANCE

Dear Mr. Berger:

On April 16-20, 2012, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Fauske & Associates, LLC (FAI) facility in Burr Ridge, IL. The purpose of this limited-scope routine inspection was to assess FAI's compliance with 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 FAI's quality assurance activities associated with the environmental qualification type testing of instrument cable in support of AP1000 licensing activities, specifically the postulated loss-of-coolant accident design-basis event. These tests, including qualification and functional tests are associated with or directly impact closure of inspections, tests, analyses, and acceptance criteria (ITAAC) from Revision 19 of the certified AP1000 design. Currently, these ITAAC are incorporated into the combined licenses of Vogtle Units 3 and 4 and V.C. Summer Units 2 and 3. The enclosed report presents the results of this inspection. This inspection report does not constitute the NRC's endorsement of your overall quality assurance or 10 CFR Part 21 programs.

During this inspection, the NRC inspection team found that the implementation of your quality assurance program failed to meet certain NRC requirements contractually imposed on you by your customers or NRC licensees. Specifically, the NRC inspection team determined that FAI failed to review the suitability of the application of commercially calibrated measuring and test equipment for use in activities affecting quality as part of a commercial-grade dedication process. Additionally, FAI's nonconformance procedure was inadequate in that it did not provide a clear connection to a formal corrective action process or a formal 10 CFR Part 21 process. The specific findings and references to the pertinent requirements are identified in the enclosures 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. We will consider extending the response time if you show good cause for us 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, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material is withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

Sincerely,

/RA/

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

Docket No.: 99901413

Enclosures:
1. Notice of Nonconformance
2. NRC Inspection Report No. 99901413/2012-201 with Attachment

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, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material is withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

Sincerely,

/RA/

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

Docket No.: 99901413

Enclosures:
1. Notice of Nonconformance
1. 2. NRC Inspection Report No. 99901413/2012-201 with Attachment

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NOTICE OF NONCONFORMANCE

Fauske & Associates, LLC
16W070 83rd Street
Burr Ridge, IL 60527

Docket No. 99901413
Report No. 2012-201

Based on the results of a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the Fauske & Associates, LLC facility (FAI) in Burr Ridge, IL, from April 16, 2012, through April 20, 2012, it appears that certain activities were not conducted in accordance with NRC requirements that were contractually imposed upon FAI 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, that "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 April 20, 2012, FAI failed to review the suitability of the application of commercially calibrated measuring and test equipment (M&TE) for use in activities affecting quality as part of a commercial-grade dedication process. Specifically, FAI did not conduct a technical evaluation to identify additional technical requirements for the specific M&TE being calibrated, did not specify the critical characteristics of acceptance associated with the commercial grade dedication of commercial calibration services, which, once satisfied, would provide reasonable assurance that the M&TE calibrated by the laboratory would adequately perform its intended safety function, and did not review the calibration records as part of receipt inspection to verify that the critical characteristics had been met.

   This issue has been identified as Nonconformance 99901413/2012-201-01.

B. Criterion XVI, "Corrective Actions," of Appendix B to 10 CFR Part 50, states, in part, that "Measures shall be established to ensure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, and nonconformances are promptly identified and corrected."

   Section 1.0 of FAI's Quality Assurance Program Test and Calibration Procedure FAI-TC 1.0, "Nonconformances," Revision 0, dated May 12, 1994, states, in part, that "The purpose of this procedure is to delineate the system for documenting, controlling, and dispositioning nonconformances associated with materials and components to be used in the performance of nuclear safety-related activities." Section 2.0 of FAI-TC 1.0 states, in part, that "It is FAI policy to implement this procedure for any item or material that is being used for a customer contract, which imposes quality assurance requirements, such as Appendix B to 10 CFR Part 50 or ANSI/ASME NQA-1, "Quality Assurance Requirements for Nuclear Facilities."

   Contrary to the above, as of April 20, 2012, the NRC inspection team concluded that FAI's processes fail to establish and implement adequate measures to ensure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, and nonconformances, would be promptly identified and corrected. Specifically, the NRC

inspection team concluded that identified conditions adverse to quality entered into the FAI nonconformance process via FAI-TC 1.0 would not be promptly reviewed, corrected or reported. The NRC inspection team also concluded that there was no clear connection for identified conditions adverse to quality entered into the FAI nonconformance process via the same procedure to be entered into WEC's formal processes (Westinghouse Policy/Procedure WEC 16.2, Westinghouse Corrective Action process, or WEC 21.0, "Reporting of Defects and Noncompliance,") as contractually agreed upon between FAI and Westinghouse.

This issue has been identified as Nonconformance 99901413/2012-201-02.

Please submit 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, 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 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 Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), to the extent possible, do not include any personal privacy, proprietary, or safeguards information so that the response can be made available to the public without redaction. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html). 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 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."

Dated at Rockville, MD, this 22nd day of June 2012.

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

Docket No.:	99901413
Report No.:	99901413/2012-201
Vendor:	Fauske & Associates, LLC 16W070 83rd Street Burr Ridge, IL 60527
Vendor Contact:	Mr. William E. Berger, Jr. Senior Vice-President for Nuclear Services Telephone: (630) 887-5242 Email: berger@fauske.com
Nuclear Industry Activity:	Fauske & Associates, LLC, (FAI) is a wholly owned but independently operated subsidiary of the Nuclear Services (NS) business unit of Westinghouse Electric Company, LLC (WEC). FAI supports the commercial nuclear power industry as a provider of engineering consulting services in several diverse disciplines including, but not limited to physics, chemical engineering, mechanical engineering, nuclear engineering, and computer science. Additionally, FAI provides advanced training, research services, design basis accident (DBA) modeling, and component qualification activities for analyzing severe accidents in commercial nuclear power plants.
Inspection Dates:	April 16-20, 2012
Inspectors:	Daniel Pasquale, NRO/DCIP/CEVB, Team Leader Yamir Diaz-Castillo, NRO/DCIP/CMVB Leigh Trocine, NRO/DCIP/CQAB
Approved By:	Richard A. Rasmussen, Chief Electrical Vendor Branch Division of Construction Inspection and Operational Programs Office of New Reactors

EXECUTIVE SUMMARY

Fauske & Associates, LLC
99901413/2012-201

The U.S. Nuclear Regulatory Commission (NRC) conducted this inspection to verify that Fauske & Associates, LLC, (FAI) implemented a program under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21, "Reporting of Defects and Noncompliance," and to verify that FAI implemented an adequate quality assurance (QA) program that complied with the provisions of 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." FAI is a wholly owned but independently operated subsidiary of the Nuclear Services (NS) business unit of Westinghouse Electric Company, LLC (WEC), that operates under the WEC NS Policies and Procedures Manual, including the WEC quality management system (QMS) and top-level procedures that apply to all WEC business units (Level II procedures). FAI developed specific procedures under FAI's instructions and guidance (I&G) manual and test and calibration (T&C) manual that supplement or supersede the WEC Level II procedures. This technically focused inspection specifically evaluated FAI's QA activities related to the environmental qualification-type testing of instrument cable in support of AP1000 licensing activities, as well as to the effectiveness and implementation of the 10 CFR Part 21 program for evaluating deviations and reporting of defects and nonconformances that could cause substantial safety hazards.

The safety-related activities inspected by the NRC inspection team related to the WEC contract with FAI to qualify shielded mineral insulated (MI) in-core instrumentation system (IIS) cables, their associated electrical connectors, and simulated instrument connector shields to withstand the effects of the anticipated environmental conditions before, during, and following the design basis event (DBE) loss of coolant accident (LOCA) presented in Revision 19 of the Westinghouse AP1000 design control document.

These tests, including qualification and functional tests are associated with or directly impact closure of inspection, tests, analyses and acceptance criteria (ITAAC) from Revision 19 of the certified AP1000 design. Currently, these inspection, tests, analyses and acceptance criteria (ITACC) are incorporated into the combined licenses of Vogtle Units 3 and 4 and V.C. Summer Units 2 and 3.

The following regulations served as the bases for this inspection:

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

During this inspection, the NRC inspection team implemented Inspection Manual Chapter (ICM) 2507, "Construction Inspection Program Vendor Inspections," dated April 25, 2011; Inspection Procedure (IP) 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance," dated February 13, 2012; IP 35034; "Design Certification Testing Inspection," dated January 27, 2010; IP 43002, "Routine Inspections of Nuclear Vendors," dated April 25, 2011, IP 43004; "Inspection of Commercial-Grade Dedication Programs," dated April 25, 2011; IP 51080, "Part 52 Environmental Qualification (EQ) Under 10 CFR 50.49," dated November 7, 2011; and IP 65001.E, "Inspection of the ITAAC-Related Qualification Program," dated August 19, 2008.

The NRC had not previously performed any inspection at the FAI facility in Burr Ridge, IL.

The results of the inspection are summarized below.

10 CFR Part 21 Program

The NRC inspection team concluded that FAI is implementing its 10 CFR Part 21 program through WEC, consistent with the regulatory requirements of 10 CFR Part 21. No findings of significance were identified.

Test Control

The NRC inspection team, in reviewing FAI's test control capabilities, evaluated aspects needed to verify if FAI's testing services and final test results would meet the WEC-supplied test objectives. The NRC inspection team evaluated the FAI design-basis accident (DBA) simulation facility, the test specimen arrangement, its handling of the test specimen and the applicable FAI policies and procedures governing test control, configuration control, personnel qualification, and data collection and reporting methods to provide reasonable assurance that FAI could adequately qualify the specimen for the DBE referenced in the WEC test plan. The NRC inspection team also assessed a representative sample of installed equipment, test drawings, procedures, data collection techniques, and data reporting methods to determine if key design attributes of the WEC test plan were correctly translated to FAI's contracted materials and services supporting the qualification test. The NRC inspection team concluded that the test facility's design and construction were consistent with the specified requirements in the WEC test plan and were appropriately supported by engineering data and calculations, and that they complied with applicable regulatory requirements and industry standards as described in Revision 19 to the AP1000 Design Certification Document (DCD).

While it was the NRC inspection team's intent to witness critical portions of the qualification test run, FAI senior management suspended testing because of issues identified by the NRC inspection team regarding FAI's failure to review the suitability of the application of commercially calibrated measuring and test equipment (M&TE) for use in activities affecting quality as part of a commercial grade dedication process. (Refer to Nonconformance 99901413/2011-202-01).

The NRC inspection team concluded from the aspects they reviewed that, had the test proceeded as planned, a high degree of confidence exists that FAI's test control program would have satisfied the regulatory requirements of Criterion XI, "Test Control," of Appendix B to 10 CFR Part 50 for analyzing the test specimen's capabilities to perform under the AP1000 DBE LOCA event. No findings of significance were identified.

Control of Measuring and Test Equipment

The NRC inspection team concluded that with the exception noted in Nonconformance 99901413/2011-201-01, FAI is implementing its control of 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. No findings of significance were identified.

Nonconforming Material, Parts, or Components and Corrective Action

The NRC inspection team issued Nonconformance 99901413/2011-201-02 associated with FAI's failure to implement the regulatory requirements of Criterion XVI, "Corrective Actions," of

Appendix B to 10 CFR Part 50. Specifically, this nonconformance cited FAI for an inadequate internal nonconformance procedure in that it did not provide controls or a clear connection to a formal corrective action process or a formal 10 CFR Part 21 process. FAI did not generate any nonconformances that should have been reported in accordance with 10 CFR Part 21.

Oversight of Contracted Activities

The NRC inspection team issued Nonconformance 99901413/2011-201-01 to FAI for their failure to implement the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. Specifically, Nonconformance 99901413/2011-202-01 cited FAI for failing to review the suitability of the application of commercially calibrated M&TE for use in activities affecting quality as part of a commercial-grade item dedication.

Quality Assurance Records

The NRC inspection team concluded that FAI is implementing its quality assurance records program consistent with the regulatory requirements of Criterion XVII, "Quality Assurance Records," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that FAI is implementing its policies and procedures associated with its quality assurance records program. No findings of significance were identified.

Training and Qualification of Personnel

The NRC inspection team concluded that FAI is implementing its training and qualification program consistent with the regulatory requirements of Criterion II, "Quality Assurance Program," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that FAI is implementing its policies and procedures associated with their training and qualification program. There were no findings of significance identified.

REPORT DETAILS

The NRC inspection team evaluated the Fauske & Associates Inc., LLC (FAI), quality assurance (QA) program associated with environmental qualification type testing of instrument cable in support of AP1000 licensing activities, as well as to the effectiveness and implementation of their 10 CFR Part 21 program for evaluating deviations and reporting of defects and nonconformances that could cause substantial safety hazards. The tests inspected, including the qualification and functional tests, are associated with or directly impact closure of inspections, tests, analyses, and acceptance criteria (ITAAC) from Revision 19 of the certified AP1000 design. Currently, these ITAAC are incorporated into the combined licenses of Vogtle Units 3 and 4 and V.C. Summer Units 2 and 3.

1. 10 CFR Part 21 Program

   a. Inspection Scope

      The NRC inspection team reviewed various policies, implementing procedures, and records that govern and document FAI's program under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21, "Reporting of Defects and Noncompliance," to verify compliance with NRC regulatory requirements. The NRC inspection team reviewed the following:

      - The formal Westinghouse Electric Company (WEC) procedures that govern corrective action and control and correction of nonconforming items to verify that FAI's implementation and control over these processes were effective and to verify an adequate link to the 10 CFR Part 21 process.

      - FAI's internal nonconformance and design basis accident (DBA) test facility procedures, audits, and FAI nonconformance log, a limited sample of FAI nonconformance reports, audits, and the test deviations and anomalies portion of the FAI DBA test facility log to verify that FAI's implementation and control over these processes were adequate and to verify whether any deviations to technical requirements occurred that should have been evaluated for 10 CFR Part 21 applicability.

      FAI had not processed any 10 CFR Part 21 notifications through the formal WEC procedures. Additionally, the NRC inspection team evaluated the 10 CFR Part 21 postings for compliance with the requirements of 10 CFR 21.6, "Posting Requirements." The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

   b. Observations and Findings

      (i) 10 CFR Part 21 Procedures

      Section 1.0, "Nonconformances" of FAI-TC 1.0, "Quality Assurance Program Test and Calibration Procedure," contains guidance for recording issues affecting quality. FAI, however, does not have specific guidance for evaluating issues consistent with the requirements of 10 CFR 21. Instead, FAI has agreed to enter issues affecting quality requiring corrective or preventive action, directly into the WEC process.

The NRC inspection team noted that WEC developed and FAI agreed to, the "Westinghouse Nuclear Services/Fauske Interface Agreement," Revision 1, dated November 3, 2008, which defines the overall responsibilities and interface requirements between WEC and FAI. This agreement requires that issues affecting quality that require corrective or preventive action will be controlled in accordance with WEC procedure, "Westinghouse Corrective Actions Process," effective August 1, 2011, and that conditions adverse to safety shall be identified and reported in accordance with WEC procedure, "Identification and Reporting of Conditions Adverse to Safety," effective August 3, 2009. The NRC inspection team was informed that safety-related work performed by FAI is done under WEC's QMS Level II procedures, and FAI's "General Project Quality Plan" and that corrective action reports are processed and maintained by WEC. In their assessment of this process, the NRC inspection team reviewed both FAI and WEC procedures, their interface agreement, and examples of FAI generated nonconformances. Additionally, the NRC inspection team attempted to locate examples of FAI nonconformances that either had been, or should have been reported in accordance with 10 CFR Part 21, however no examples were found. (Refer to Section 4, "Nonconforming Material, Parts, or Components and Corrective Action," of this inspection report for additional related information).

(ii) Postings

The NRC inspection team verified that FAI had posted notices in two conspicuous locations and that the postings 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 FAI procedure that implements the regulation.

c. Conclusions

Based on a review of the FAI implementing procedures and the WEC/FAI interface agreement, the NRC inspection team concluded that FAI as augmented by the WEC/FAI interface agreement, is implementing its 10 CFR Part 21 program consistent with the regulatory requirements of 10 CFR Part 21. However, the NRC inspection team issued Nonconformance 99901413/2011-201-02 for FAI's failure to implement an adequate internal stand-alone procedure that provides a clear connection to document FAI nonconformances in either the WEC formal corrective action process or the WEC 10 CFR Part 21 process. The NRC inspection team also concluded that FAI met the 10 CFR Part 21 posting requirements. No findings of significance were identified.

2. Test Control

a. Inspection Scope

FAI's scope of services associated with this contract were limited to performing environmental qualification type testing of shielded mineral insulated (MI) in-core instrumentation system (IIS) cables, their associated electrical connectors, and simulated instrument connector shields to withstand the effects of the anticipated environmental conditions before, during, and following the design basis event (DBE) loss of coolant accident (LOCA) presented in Revision 19 of the WEC AP1000 design control document. The scope included design and construction of an adequate test facility

capable of meeting the parameters specified in the WEC test plan, executing the test, recording the test data to support the qualification and electronically delivering that data to WEC. WEC's PO also required that any modifications to the test facility performed by FAI after WEC'S approval of the configuration would receive WEC concurrence.

The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

For this test, WEC provided FAI with the actual test specimen as well as the corresponding test plan, WEC Procedure EQ-TP-241-APP, Revision 0/APP-JS94-VPP-007, Revision 0, "Harsh Environment Test Procedure for the AP1000 In-core Instrumentation System (IIS) Cable and Connector Assemblies," dated March 2012. The NRC inspection team reviewed and verified the capability of FAI's test control policies and procedures to accurately simulate and control the test conditions specified in the WEC test plan, capture key test data accurately and consistently, and to accurately export the test data to Westinghouse for their final analysis.

b.1 Test Program

The objective of FAI's test control program in support of this testing was to simulate the test conditions specified in the WEC qualification test plans, subject the test specimen to those conditions for the full duration of the DBE, effectively monitor the test, correctly record the necessary test data, and accurately export that data back to WEC. Subsequent functional tests of the equipment under test (EUT) components following the DBE LOCA testing are performed by WEC as an input into its final qualification conclusions for the test specimen.

The NRC inspection team verified those FAI activities specified in contractual obligations with WEC for performing this test, specifically for the environmental qualification type testing capabilities of shielded MI IIS cables, the associated electrical connectors, and simulated examples of connector shields to withstand the effects of the anticipated environmental conditions before, during, and following the postulated DBE LOCA presented in Revision 19 of the WEC AP1000 Design Control Document (DCD), as contracted by WEC. To assess FAI's test control capabilities, the NRC inspection team was given access to all relevant WEC and FAI equipment, documentation, and personnel needed to complete the inspection. The NRC inspection team observed the FAI DBA test facility, the WEC test specimen, the WEC purchase order (PO 4500420553), the WEC test plan (Westinghouse Procedure EQ-TP-241-APP/APP-JS94-VPP-007), and FAI's test procedure, FAI-TC-4.10. The FAI test procedure is used to transfer WEC's test specifications into actionable steps for FAI test personnel.

The NRC inspection team's review of the capability of the DBA facility's hardware to meet the test parameters specified in the WEC test plan included a review of a sample of key components required to perform this test. Specifically, the NRC inspection team assessed the test chamber to accommodate the test specimen, to adequately simulate the DBE conditions, to provide and record steam temperature and pressure characteristics and to record boron flow characteristics. The facility's equipment was compared against the WEC test plan requirements to make this assessment. The NRC

inspection team reviewed FAI's abilities to adequately sustain the test for the full event duration by reviewing the boiler water make-up and boron addition systems configuration against the requirements specified in the WEC test plan. The NRC inspection team reviewed a sample of FAI drawings to verify that the appropriate technical and quality requirements had been carried throughout the entire process, and reviewed the FAI test procedure to assure that appropriate test perquisites, operating conditions and critical test milestones specified in the WEC test plan (e.g. heat-up, event durations, chemical spray, and de-energize) were identified and included in the procedure. FAI's abilities to record the test data, present it in a logical format and electronically deliver the data to WEC were also evaluated.

b.2 Test Plan and Processes

The NRC inspection team reviewed several aspects of FAI's testing program to assess their ability to effectively perform this test as specified in the WEC test plan including a review of FAI's test procedures, calibration activities for the data acquisition software, qualification of the test personnel, and the a review of the methods employed to generate and export the final report data. The NRC inspection team also observed examples of FAI's Proof of Concept (POC) performance checks to determine if the test apparatus would meet the temperature conditions to run the test and if the data was suitable to conclude if the test was adequately executed. The NRC inspection team noted that the WEC environmental engineers were working closely with FAI, and that they also had a thorough knowledge of the test facility, the specimen, and the test plan. In reviewing FAI-TC-4.10, the NRC inspection team observed that the procedure provides step-by-step guidance to FAI's test personnel for ensuring instrumentation readiness, establishing correct test conditions, performing the test in accordance with the WEC test plan, and for documenting any identified test anomalies. It was also noted that FAI documented test deviations and anomalies in FAI-TC-4.10, Attachment 4, "FAI DBA Test Facility Log," and that the procedure requires the noted anomalies to be evaluated by FAI management.

While it was the NRC inspection team's intent to witness portions of the qualification test being performed, FAI senior management suspended testing because of issues identified by the NRC inspection team regarding FAI's failure to review the suitability of the application of commercially calibrated M&TE for use in activities affecting quality as part of a commercial grade dedication process. (Refer to Nonconformance 99901413/2011-202-01).

The inspectors concluded from their review of procedure FAI-TC-4.10 that it adequately captures the appropriate requirements to test the EUT in accordance with the test plan supplied by WEC. The NRC inspection team also concluded that FAI's ability to simulate the test conditions specified in the WEC test plan, and its ability to measure, record, and handle test data accurately are consistent with the regulatory requirements of Criterion XI, "Test Control" of Appendix B to 10 CFR Part 50.

b.2.1 Software Verification & Validation

The NRC inspection team's review of FAI's test control process included an assessment of FAI's procedures and processes for performing verification and validation (V&V) of the software used by the three FAI computers to satisfy Appendix B to 10 CFR Part 50

requirements for performing this test. Two computers, the industrial computer, and the IOTECH process control computer, acquire real-time test data as well as operating and monitoring DBA facility process equipment during the DBE LOCA test. A third personal computer is used to capture functional test data taken during the post-DBE LOCA functional testing by WEC. Functional testing measures the actual effects of the DBE LOCA test on the EUT test specimen. While these tests are performed by the on-site WEC engineers, the calibration of the instruments used to measure the test parameters and the V&V of the software used to record the data is the responsibility of FAI. Control of measuring and test equipment is addressed in Section 3 of this report.

All three computers applied to this test use standard commercial off-the-shelf software (COTS) to perform the safety-related functions, and all use the same FAI V&V process to validate performance. Before a test run, a series of simulated inputs is entered into each safety-related instrument channel, and both its displayed value and its recorded value are manually compared against the specified anticipated result. Since FAI exports its final data sets to WEC via an ASCII export file, a hard copy of the data printed from the ASCII export file is also manually compared against the anticipated test results. FAI's implementing procedures require that any identified deviations from the V&V tests be entered into the WEC corrective action program. The NRC inspection team reviewed a representative sample of a V&V test being performed by FAI, and concluded that FAI's method of COTS V&V was adequate for the software's intended safety function. No findings of significance were identified in this area.

b.2.2 Configuration Management of the Equipment under Test

WEC provided FAI with the actual test specimen to be used in performing this test. The test specimen, commonly referred to as the EUT, consisted of a representative sample of 48 shielded MI instrumentation cables of varying lengths and diameters, connected together into several individual cable runs using associated electrical connectors. Simulated connector shields were also included to represent specific installation configurations. The cables were mounted onto a simulated cable tray configuration consisting of two representative lengths of cable trays stacked one on top of the other, with equivalent mass specimens added to simulate the weight of the anticipated disconnect panels.

Section 6.3.2, "Test Sequence" of Institute of Electrical and Electronics Engineers (IEEE) Standard 323-1974, "Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations," requires that environmental qualification type tests be run on the equipment to be qualified in the order specified in the standard. The NRC inspection team selected a random cable grouping consisting of four individual cable lengths and their associated connectors, and verified by documentation provided from WEC that the EUT had successfully completed all of the required testing in the correct sequence before the actual test specimen arrived at FAI for DBE LOCA testing. The four cables reviewed were:

1. APP-JE90-T4-001, Assembly 19, (4.9 m or 16 ft)
2. APP-EW25-V2-041/042, Assembly 1, (8.7 m or 28.5 ft)

3. APP-EW25-V2-051/052, Assembly 7, (12.3 m or 40.5 ft)
4. D-CET-155-002, Assembly 26, (3.0 m or 10 ft)

The NRC inspection team did not observe FAI personnel's handling of the test specimen. All observed handling of the specimen was performed by WEC personnel. Since WEC engineers at the FAI facility are tasked with performing the functional tests following completion of the DBE LOCA test on each of the individual components of the EUT specimen, the procedures guiding these tests and WEC's performance of them were not reviewed by the NRC inspection team. The NRC inspection team noted that the specimen was appropriately stored inside a secured warehouse with restricted access.

b.3 Test Implementation

Direct observation of FAI test personnel during performance of the qualification test by the NRC inspection team was included in the scope of this inspection. However, as previously indicated, FAI senior management suspended testing due to issues identified by the NRC inspection team (Refer to Nonconformance 99901413/2011-202-01). In response, the NRC inspection team performed a review of FAI's test controls based solely upon reviews of the DBA facility's as-built configuration, FAI's approved test procedure (FAI-TC-4.10), the POC test data results generated during heat-up and FAI's ability to satisfy the documentation requirements stated in their PO with WEC. Additional information about the qualification of FAI test personnel can be found in Section 7, "Training and Qualification of Personnel."

c. Conclusions

The NRC inspection team verified that FAI has established and implemented an appropriate testing program including an adequate test facility, test control policies and procedures, data acquisition/control processes, and qualified staff necessary to ensure that for the type of Class IE equipment tested, their program will provide a high degree of confidence that future equipment of the same type will perform as required.

The NRC inspection team concluded from the objective evidence reviewed, that had the test proceeded as planned, a high degree of confidence exists that Fauske's test control program would have satisfied the regulatory requirements of Criterion XI, "Test Control," of Appendix B to 10 CFR Part 50 for analyzing the test specimen's capabilities to perform under the AP1000 DBE LOCA event. No findings of significance were identified.

3. Control of Measuring and Test Equipment

a. Inspection Scope

The NRC inspection team reviewed the implementation of FAI's measuring and test equipment (M&TE) program in support of the environmental qualification testing of the in-core instrumentation cable system and cable connector assemblies for WEC's AP1000 reactor design. Specifically, the NRC inspection team reviewed the policies and procedures governing the implementation of FAI's M&TE program to verify compliance with Criterion XII, "Control of Measuring Test and Equipment," of Appendix B to

10 CFR Part 50. In addition, the NRC inspection team discussed the control of the M&TE program with FAI management and technical staff. Furthermore, the NRC inspection team reviewed the calibration records for a sample of M&TE. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

The NRC inspection team reviewed FAI's program for issuing and controlling M&TE in support of environmental qualification testing, and noted that the instrumentation issued by FAI, contained appropriate calibration stickers including current calibration dates and calibration due dates, and that the associated calibration records were current and available for review. The NRC inspection team verified that the M&TE records supporting the calibrations used in the DBA test facility included references to being calibrated using procedures traceable to known industry standards and that calibration results had been recorded, reviewed, and verified by test personnel. The calibration records reviewed by the NRC inspection team also indicated the calibration procedure used included, as found and as left conditions, accuracy required, date of calibration and due date for recalibration, and the applicable National Institute of Standards and Technology reference for the equipment used in the calibration. While the NRC inspection team concluded that FAI adequately controlled the M&TE, the NRC inspection team issued Nonconformance 99901413/2011-201-01 to FAI for failing to review the suitability of the application of commercially procured calibration services of the calibration laboratory that calibrated the instruments and generated the calibration records.

c. Conclusions

The NRC inspection team concluded that the FAI is implementing its control of its M&TE 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 also determined that FAI is implementing its policies and procedures associated with its control of the M&TE program. No findings of significance were identified.

4. Nonconforming Material, Parts, or Components and Corrective Action

a. Inspection Scope

The NRC inspection team reviewed various policies, implementing procedures, and records that govern the control of nonconforming material, parts, and components as well as the FAI and WEC policies and procedures that govern corrective actions to verify the compliance with Criterion XV, "Nonconforming Materials, Parts, and Components," and Criterion XVI," Corrective Action," of Appendix B to 10 CFR Part 50. To verify that FAI's implementation and control over these processes were adequate, the NRC inspection team reviewed the following:

- The formal WEC procedures that govern corrective action and control and correction of nonconforming items

- FAI's internal nonconformance and DBA test facility procedures, audits, an FAI

nonconformance log, a limited sample of FAI nonconformance reports, and the test deviations and anomalies portion of the FAI DBA test facility log

The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

FAI developed implementing procedures under FAI's I&G and T&C manuals to meet unique FAI applications that supplement or supersede the WEC Level II procedures. Specific applications were noted in FAI's use of internal procedures to document nonconformances and test anomalies. FAI traditionally uses internal procedure, FAI-TC-1.0, "Nonconformances," dated May 12, 1994, to document, control, and disposition nonconformances associated with materials and components used in the performance of nuclear safety-related activities, and it is FAI's policy to implement this procedure for any item or material that is being used for a customer contract which imposes QA requirements, such as Appendix B to 10 CFR Part 50, or ANSI/ASME NQA-1, "Quality Assurance Requirements for Nuclear Facilities." It was also noted that FAI documents test deviations and anomalies in Attachment 4, "FAI DBA Test Facility Log," of internal FAI T&C procedure FAI-TC-4.10, "W-IIS Cable, FAI DBA Test Facility." The NRC inspection team's review of these procedures, as stand-alone processes indicated that, as such, they do not require evaluation of deviations and failures to comply to identify defects and failures to comply associated with substantial safety hazards as soon as practical as required by 10 CFR Part 21, or that adequate measures have been established to assure that conditions adverse to quality, such as deviations, defective materials and equipment, and nonconformaances are promptly identified and corrected, as required by Criterion XVI of Appendix B to 10 CFR 50.

The NRC inspection team also noted that WEC attempted to augment FAI's internal procedures by instituting the "Westinghouse Nuclear Services/Fauske Interface Agreement," Revision 1, dated November 3, 2008. This agreement defines the overall responsibilities and interface requirements between WEC and FAI. It also requires that issues affecting quality that require corrective or preventive action will be controlled in accordance with WEC procedure, WEC 16.2, "Westinghouse Corrective Actions Process," effective August 1, 2011, and that conditions adverse to safety shall be identified and reported in accordance with WEC procedure WEC 21.0, "Identification and Reporting of Conditions Adverse to Safety," effective August 3, 2009. The NRC inspection team was informed that any safety-related work performed by FAI is done under WEC's QMS, Level II procedures, and FAI's "General Project Quality Plan" and that all formal corrective action reports are processed and maintained by WEC.

At the time of the inspection, FAI had not entered any issues into either of the WEC processes allowing the inspectors to perform an implementation effectiveness assessment of the interface agreement, nor were any process requirements noted in the FAI internal procedures requiring the use of the WEC processes. It should be noted that the adequacy of WEC's formal corrective action program or their 10 CFR 21 program were not evaluated during this inspection. Based on a review of the FAI implementing procedures, the NRC inspection team determined that with FAI's internal nonconformance procedure lacking requirements for FAI to use the WEC processes, FAI's program failed to establish and implement adequate measures to assure that

conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, and nonconformances are promptly identified and corrected in accordance with Criterion XVI of Appendix B to 10 CFR Part 50. The NRC inspection team identified this issue as Nonconformance 99901413/2011-202-02. At FAI's request, WEC opened Issue Report No. 12-111-W002 to address this issue. The NRC inspection team did not, however, observe any examples of FAI identified nonconformances that should have been reported in accordance with 10 CFR Part 21.

c. Conclusions

The NRC inspection team issued Nonconformance 99901413/2011-201-02 associated with FAI's failure to implement the regulatory requirements of Criterion XVI of Appendix B to 10 CFR Part 50. Specifically, this nonconformance cited FAI for an inadequate internal nonconformance procedure in that it did not provide controls or a clear connection to a formal corrective action program or 10 CFR Part 21 process. However, there were no nonconformances identified that should have been reported in accordance with 10 CFR Part 21, or Criterion XVI of Appendix B to 10 CFR Part 50. With the exception of Nonconformance 99901413/2011-201-02, the inspectors concluded that the implementation of FAI's programs for control of nonconforming material, parts, and components and for corrective action was consistent with the regulatory requirements of Criteria XV and XVI of Appendix B to 10 CFR Part 50.

5. Oversight of Contracted Activities

a. Inspection Scope

The NRC inspection team reviewed the implementation of FAI's oversight of contracted activities in support of the environmental qualification testing of the IIS system and cable connector assemblies for WEC's AP1000 reactor design. Specifically, the NRC inspection team reviewed the policies and procedures governing the implementation of FAI's procurement document control and control of purchased material, equipment and services programs 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, respectively. The NRC inspection team reviewed a sample of purchase orders (POs) and receipt inspection records associated with the environmental qualification testing to evaluate compliance with FAI's program and technical requirements. In addition, the NRC inspection team discussed the oversight of contracted activities with FAI's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

WEC developed a "Westinghouse Nuclear Services/Fauske Interface Agreement," Revision 1, dated November 3, 2008, that defines the overall responsibilities and interface requirements between WEC and FAI. In addition, FAI developed a "General Project Quality Plan," Revision 7, dated September 2009, that defines the relationship and exceptions taken between the WEC's Level II procedures and FAI's I&G and T&C procedures. The NRC inspection team was informed that any safety-related work

performed by FAI is done under WEC's QMS, Level II procedures, and FAI's "General Project Quality Plan."

Because FAI works under WEC's QMS, any safety-related items and services required for the environmental qualification testing were procured from suppliers on the WEC's Qualified Suppliers List (QSL). This list is controlled and maintained by WEC.

b.1 Control of Suppliers

WEC contracted FAI to perform the environmental qualification testing of the IIS system and cable connector assemblies for WEC's AP1000 reactor design in accordance with the requirements of PO 4500420553. This PO specified that WEC is responsible for providing the equipment under test (EUT), and performing all necessary functional tests of the EUT during and after the test. FAI's scope of work included providing an adequate design basis accident (DBA) test facility capable of executing the test, performing the test, and documenting the test results in a test report consistent with WEC's methodology document APP-GW-G1-002, "AP1000 Plant Equipment Qualification Methodology," Revision 2. WEC's PO also required that any modifications to the test facility performed by FAI after WEC'S approval of the configuration would receive WEC concurrence. The NRC inspection team confirmed that WEC's PO to FAI included all the quality, technical, and regulatory requirements.

In addition, the NRC inspection team also reviewed a sample of POs issued by FAI to their sub-suppliers associated with the environmental qualification testing to determine whether the necessary technical and quality requirements were imposed on the applicable purchasing documents as required by PO 4500420553. The NRC inspection team concluded that with the exception of the issue documented in Nonconformance 99901413/2011-201-01, FAI's POs adequately documented the procurement requirements as established by the governing FAI policies and procedures including: (1) task definitions and responsibilities, (2) imposition of the appropriate quality, technical and regulatory requirements, and (3) identification of applicable codes and standards. The NRC inspection team also found that the safety-related POs adequately defined contract deliverables, disposition of nonconformances, access rights to sub-tier suppliers, and extension of contractual requirements to subcontractors.

During the review of a sample of FAI's POs, the NRC inspection team noted that FAI had issued a PO to JH Metrology, a commercial calibration laboratory, for calibration of measuring and test equipment (M&TE) to be used during testing. JH Metrology is commercial laboratory that provides calibration services and was placed in WEC's QSL at FAI's request. WEC's justification for placing JH Metrology on the QSL was based solely on the laboratory's accreditation status provided by the American Association of Laboratory Accreditation (A2LA). A2LA accreditation may not be used as the only basis for qualifying the laboratory for safety-related calibration services. The NRC staff has determined that, for procurement of commercial-grade calibration services for safety-related applications, laboratory accreditation programs administered by A2LA or any other accreditation service provided by a domestic accrediting body, as recognized through the mutual recognition arrangement of the International Laboratory Accreditation Program, are acceptable in place of a commercial-grade survey or in-process surveillance as part of the commercial-grade dedication process when all of the requirements described in the Arizona Public Service (APS) Company safety evaluation

report (SER) (Agencywide Documents Access and Management System (ADAMS) Accession No. ML052710224) are met. This guidance was expanded to include the use of domestically accredited calibration laboratories by suppliers and sub-suppliers in an NRC Letter to Ms. Sherry Grier, NUPIC Chairman dated June 6, 2006, (ML061580350). This letter provides the same guidance for augmenting the laboratories' domestic accreditation when using their services in activities governed by the requirements of Appendix B to 10 CFR 50, and 10 CFR Part 21. The requirements for invoking this alternative are:

- The alternative method is documented in the quality assurance description.
- Accreditation is to ANSI/ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories."
- The scope of the accreditation covers the contracted services.
- Purchase documents should: (1) impose additional technical requirements identified in the evaluation, (2) require reporting of as-found calibration data when calibrated items are found to be out-of-tolerance, (3) require identification of the laboratory equipment and standards used.

The NRC inspection team noted that FAI failed to include the following technical requirements in their purchase order to JH Metrology : (1) accreditation to ANSI/ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories;" (2) verification that the laboratory's scope of accreditation covers the contracted services, (3) report the as-found calibration data when calibrated items are found to be out-of-tolerance; and (4) identification of the laboratory equipment and standards used. The NRC inspection team finds that FAI's omission of these technical requirements from their contract with a commercial supplier performing safety related activities to be of concern for the following reasons: (1) failing to specify that accreditation must be to ANSI/ISO/IEC 17025 – currently, this is the only standard evaluated as an alternative by the NRC staff, (2) verification that the laboratory's scope of accreditation covers the contracted services - it is uncertain whether JH Metrology's competency for calibrating the required instrumentation was verified by the accreditation process; (3) failing to require the supplier to report the as-found calibration data when calibrated items are found to be out-of-tolerance - it is uncertain if the identification of out-of-tolerance instrumentation would be communicated back to the dedicating entity for evaluation of reportability in accordance with the requirements of 10 CFR Part 21, (4) failing to require documentation identifying the laboratory equipment and standards used – without specifying the standards used to calibrate the equipment, it's uncertain if the standards are traceable to NIST.

Additionally the NRC inspection team noted that FAI failed to (1) perform a technical evaluation to identify the services' safety function, and (2) failed to identify the critical characteristics associated with the calibration service. By not performing a technical evaluation, FAI failed to assure that the correct technical requirements were specified in the procurement document as described above, and by not verifying critical characteristics, FAI failed to provide reasonable assurance that adequate calibration services had been performed. Examples of critical characteristics that should be verified in a commercial grade dedication of a commercial calibration supplier include, but are

not limited to, calibration standards traceable to the National Institute of Standards and Technology, tolerances, accuracies, and calibrated ranges. Furthermore, FAI failed to identify the acceptance methods to verify the critical characteristics. For dedication of commercial calibration services, special tests and inspection is an acceptable method to verify the critical characteristics. Failure to dedicate the commercial calibration service could result in equipment being out of calibration causing failure to accurately measure or actuate at the proper time. The NRC inspection team identified this issue an example of Nonconformance 99901413/2011-202-01 for the failure of FAI to review the suitability of the application of commercially calibrated M&TE for use in activities affecting quality as part of a commercial-grade item dedication. FAI issued Corrective Action Request (CAR) No.12-111-W001 to address this issue.

In addition, WEC's Quality Assurance Manual (FAI uses WEC's Quality Assurance Manual) did not contain a description of the alternate quality assurance program for using the calibration laboratory accreditation provided by one of the domestic accrediting bodies in lieu of performing a commercial grade survey as required by the APS SER.

b.2 Receiving Inspection

The NRC inspection team reviewed a sample of receipt inspection reports for the EUT and several calibrations and testing equipment and verified that the inspection checklists were adequately completed and that there was enough objective evidence to verify that the items conformed to the purchase specifications.

c. Conclusion

The NRC inspection team issued Nonconformance 99901413/2011-201-01 associated with FAI's failure to implement the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. Specifically, Nonconformance 99901413/2011-202-01 cited FAI for failing to review the suitability of the application of commercially calibrated M&TE for use in activities affecting quality as part of a commercial-grade item dedication.

The NRC inspection team also concluded that FAI is implementing its control of suppliers 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. Based on the limited sample of documents reviewed, the NRC inspection team also determined that FAI is implementing its policies and procedures associated with its control of suppliers. No findings of significance were identified.

6. Quality Assurance Records

a. Inspection Scope

The NRC inspection team reviewed the implementation of FAI's quality assurance records program in support of the environmental qualification testing of the IIS cables and cable connector assemblies for WEC's AP1000 reactor design. Specifically, the NRC inspection team reviewed the policies and procedures governing the implementation of FAI's quality assurance records program to verify compliance with

Criterion XVII, "Quality Assurance Records," of Appendix B to 10 CFR Part 50. In addition, the NRC inspection team discussed the quality assurance records program with FAI's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

FAI uses WEC's Electronic Data Management System (EDMS) as a lifetime records single storage repository. Once a quality assurance record is created, a PDF file is entered into WEC's EDMS. Hard copies of original files are also maintained under locked storage at FAI for a minimum of 1 year for informational purposes only.

The NRC inspection team reviewed a sample of several FAI quality assurance records, including training and qualification records, calibration records, and logs used for identification, receipt control; processing, retention, and safekeeping for all documented records generated as part of the environmental qualification testing of the IIS cables and cable connector assemblies for WEC's AP1000 reactor design. During this review, the NRC inspection team verified that FAI had implemented a QA records program that provided adequate measures for the identification, classification, validation, and distribution controls of records. The NRC inspection team noted that FAI's policies and implementing procedures provided the necessary guidance for the administration, identification, receipt, storage, preservation, safekeeping, and disposition of all records.

c. Conclusions

The NRC inspection team concluded that FAI is implementing its quality assurance records program consistent with the regulatory requirements of Criterion XVII of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that FAI is implementing its policies and procedures associated with its quality assurance records program. No findings of significance were identified.

7. Training and Qualification of Personnel

a. Inspection Scope

The NRC inspection team reviewed the implementation of FAI's training and qualification program in support of the environmental qualification testing of the IIS cables and cable connector assemblies for WEC's AP1000 reactor design. Specifically, the NRC inspection team reviewed the policies and procedures governing the implementation of FAI's training and qualification program to verify compliance with Criterion II, "Quality Assurance Program," of Appendix B to 10 CFR Part 50. In addition, the NRC inspection team discussed the training and qualification program with FAI's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

The NRC inspection team verified that FAI had established and implemented a training and qualification program for the training and qualification of inspection and test

personnel involved in the environmental qualification testing of IIS cables and cable connector assemblies for the AP1000 reactor design. The inspector noted that FAI qualifies inspection and test personnel based on an evaluation of their education, experience, proficiency, and capability to perform the required task. In addition, FAI performs an eye examination of all testing and inspection personnel at intervals not to exceed one year. Each member of the test team receives additional training on the specific technical objectives and quality requirements of each project. This training includes a review and understanding of the required test plans and procedures and a successful demonstration of each individual's ability to execute their specific duties and responsibilities.

The NRC inspection team reviewed a sample of training and qualification records, conducted interviews of FAI's testing and inspection personnel, and verified that the qualification records documented any certifications required by industry and contract requirements. The NRC inspection team confirmed that all personnel performing activities affecting the quality of the qualification testing had completed the required training and met all the specified requirements in accordance with FAI's policies and procedures.

c. Conclusions

The NRC inspection team concluded that FAI is implementing its training and qualification program consistent with the regulatory requirements of Criterion II, of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that FAI is implementing its policies and procedures associated with its training and qualification program. No findings of significance were identified.

8. Entrance and Exit Meetings

On April 16, 2012, the inspectors discussed the scope of the inspection with Mr. H. Kristian Fauske, Acting FAI President, FAI management and staff; and a representative from WEC. On April 20, 2012, the inspectors presented the inspection results and observations during an exit meeting with Mr. Fauske, FAI management and staff, and WEC representatives. The attachment to this report lists the entrance and exit meeting attendees as well as those interviewed by the inspectors.

ATTACHMENT

1. Entrance and Exit Meeting Attendees and Individuals Interviewed

Name	Title	Affiliation	Entrance	Exit	Interviewed
H. Kristian Fauske	Acting President	FAI	X	X	X
William E. Berger, Jr.	Acting Senior Vice President	FAI	X	X	X
Robert W. Reeves	Manager, MAAP Maintenance and QA Services	FAI	X	X	X
James C. Raines	Project Manager	FAI	X	X	X
Kevin B. Ramsden	Consulting Engineer	FAI			X
Alfredo Garcia	Test Engineer	FAI			X
Jill Brandt	Mechanical Engineer	FAI			X
Suresh Channarasappa	Fellow Engineer, Equipment Qualification	WEC	X	X	X
Gary S. Bloomquist	Principal Quality Engineer, Global Quality Programs	WEC		X	X
Tom Robertson	Test Engineer	WEC			X
John Kearn	Test Engineer	WEC			X
Ronald P. Wessel	Principal Engineer, AP1000 COL Licensing Support	WEC			X
Daniel Pasquale	Inspection Team Leader	NRC	X	X	
Yamir Diaz-Castillo	Inspector	NRC	X	X	
Leigh Trocine	Inspector	NRC	X	X	

2. Inspection Procedures Used

- Inspection Manual Chapter (ICM) 2507, “Construction Inspection Program Vendor Inspections,” dated April 25, 2011
- Inspection Procedure (IP) 36100, “Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance,” dated February 13, 2012
- IP 35034, “Design Certification Testing Inspection,” dated January 27, 2010
- IP 43002, “Routine Inspections of Nuclear Vendors,” dated April 25, 2011
- IP 43004, “Inspection of Commercial-Grade Dedication Programs,” dated April 25, 2011

- IP 51080, “Part 52 Environmental Qualification (EQ) Under 10 CFR 50.49,” dated November 7, 2011

- IP 65001.E, “Inspection of the ITAAC-Related Qualification Program,” dated August 19, 2008

3. List of Items Opened, Closed, and Discussed

Item Number	Status	Type	Description
99901413/2012-201-01	Open	NON	Criterion XII
99901413/2012-201-02	Open	NON	Criterion XV

4. Documents Reviewed

- Fauske & Associates, LLC, (FAI) “General Project Quality Plan,” Revision 7, dated September 2009

- FAI-IG-2.0, “Training,” Revision 6, dated July 16, 2010

- FAI-IG-2.5, “Order Entry and Work Authorization/Planning,” Revision 6, dated March 29, 2012

- FAI-IG-2.7, “Customer Satisfaction/Corrective Action,” Revision 3, dated August 10, 2011

- FAI-IG-3.2, “Computer Software Verification & Validation,” Revision 3, dated December 13, 2011

- FAI-IG-6.0, “Records Management,” Revision 7, dated July 16, 2010

- FAI-IG-7.0, “Procurement Document Control,” Revision 1, dated December 18, 2007

- FAI-TC-1.0, “Nonconformances,” Revision 0, dated May 12, 1994

- Attachment 1, “Nonconformance Log,” of Procedure FAI-TC-1.0, “Nonconformances,” for nonconforming condition, “Pressure transducer was found out of calibration at 150+ psig,” dated April 16, 2012

- Attachment 2, “Westinghouse Form PD0594 B (7/89), ASME Nonconformance Report NCR” of Procedure FAI-TC-1.0, “Nonconformances,” for nonconforming condition, “Pressure transducer was found out of calibration at 150+ psig,” dated April 16, 2012

- FAI-TC-2.0, “Receipt Inspection,” Revision 1, dated December 5, 2005

- FAI-TC-3.0, “Qualification of Inspection and Test Personnel,” Revision 0, dated May 5, 1994

- FAI-TC-4.2, “Calibration of Data Recording Devices,” Revision 0, dated March 1, 2012

- FAI-TC-4.3, “Calibration of Pressure Gages and Pressure Transducers,” Revision 3, dated October 22, 2007

- FAI-TC-4.4, “Verification of Thermocouple Accuracy,” Revision 2, dated October 10, 2007

- FAI-TC-4.6, “Calibration of Thermal Activity Monitor (TAM),” Revision 0, dated March 1, 2012

- FAI-TC-4.8, “Calibration of pH Sensor,” Revision 0, dated March 20, 2012

- FAI-TC-4.10, “W-IIS Cable, FAI DBA Test Facility,” Revision B, dated April 16, 2012

- FAI-TC-4.12, “Flow Rate and/or Dosing Rate Calibration Procedure,” Revision 0, dated April 1, 2012

- FAI-TC-4.13, “Time Measuring Device Calibration Procedure,” Revision 0, dated April 1, 2012

- FAI-TC-5.0, “Test Plan Control,” Revision 2, dated May 22, 2007

- Calibration Records for the following equipment: Ashcroft Digital Pressure Indicator, Fluke 45 Multimeter, and Agilent Wavefront Generator

- Westinghouse Procedure EQ-TP-241-APP, Revision 0/APP-JS94-VPP-007, Revision 0, “Harsh Environment Test Procedure for the AP1000 In-core Instrumentation System (IIS) Cable and Connector Assemblies,” dated March 2012

- Westinghouse Policy/Procedure WEC 16.2, Westinghouse Corrective Actions Process, Revision 3, effective August 1, 2011

- WEC 21.0, “Identification and Reporting of Conditions Adverse to Safety,” Revision 6, effective August 3, 2009

- WEC 23.15, “Westinghouse Nuclear Services/Fauske Interface Agreement,” Revision 1, effective November 3, 2008

- WEC Issue Report No. 10-239-W008, “Change Control for Computer Software Configuration,” opened August 27, 2010 and closed on December 20, 2010

- WEC Issue Report No. 12-111-W001, “Incorrect Use of Calibration Supplier without Dedication,” opened April 20, 2012

- WEC Issue Report No. 12-111-W002, “Improvements Needed in Nonconformance Reporting System,” opened April 20, 2012

- WEC Issue Report No. 12-111-W003, “Roles of WEC QA and FAI QA in FAI Contract Order Entry,” opened April 20, 2012

- Purchase Order No. 4500420553 from Westinghouse Electric Company to FAI dated January 9, 2012.
- Purchase Order No. 125509 from FAI to Exelon Power Labs dated July 13, 2010
- Purchase Order No. 4500342665 from FAI to JH Metrology dated April 15, 2010
- Contract Review for the AP1000 Cable Environmental Testing for Westinghouse Electric Company dated January 25, 2012
- Receipt Inspection Report for the In-core Instrumentation System and Cable Connector Assemblies under Purchase Order No. 4600420553 dated January 13, 2012
- Receipt Inspection Report for Calibrated Equipment under Purchase Order No. 125509 dated August 10, 2010
- Receipt Inspection Report for Calibrated Equipment under Purchase Order No. 4500385857 dated July 15, 2011
- FAI Annual Review of FAI I&G Procedures, February 21, 2012
- Mission Support Alliance – Supplier Audit, December 6, 2011
- FAI Annual Review of FAI I&G Procedures, February 16, 2011
- 2011 WEC Internal Audit of FAI, February 10–11, 2011
- LRQA Surveillance, UQA 0102062/0143, ISO 9001:2000/ISO 9001:2008, December 2010
- 2010 WEC Internal Audit of FAI, January 12–14, 2010
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- IEEE Std 323-1974, “IEEE Standard for Qualifying Class IE Equipment for Nuclear Power Generating Stations”
- IEEE Std 572-1985, “IEEE Standard for Qualification of Class IE Connection Assemblies for Nuclear Power Generating Stations”
- AP1000 Design Basis Document, Revision 19
- Arizona Public Service (APS) Company safety evaluation report (ML052710224)
- NRC letter to Ms. Sherry Grier, NUPIC Chairman dated June 6, 2006, “Palo Verde Nuclear Generating Station, Units 1, 2, and 3 Approval of Change to Quality Assurance Programs (Commercial Grade Calibration Services)” (ML061580350)