September 7, 2011

Ms. Lisa Plante, Quality Systems Supervisor
Westinghouse Electric Company, LLC
Newington Operations
178 Shattuck Way
Newington, NH 03801

SUBJECT: NRC INSPECTION REPORT NO. 99901392/2011-201

Dear Ms. Plante:

From July 18 - 22, 2011, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Westinghouse Electric Company (WEC) facility in Newington, New Hampshire. The enclosed report presents the results of this inspection. This was a limited scope inspection, which focused on assessing WEC'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 Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities." This NRC inspection report does not constitute NRC endorsement of WEC's overall quality assurance or 10 CFR Part 21 programs.

Within the scope of this inspection, no violations or nonconformances were identified.

In accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding," a copy of this letter and its enclosure 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 public website at http://www.nrc.gov/reading-rm/adams.html.

Sincerely,

/RA/ G. Galletti for

Juan D. Peralta, Chief
Quality and Vendor Branch 1
Division of Construction Inspection
& Operational Programs
Office of New Reactors

Docket No. 99901392

Enclosure:
1. Inspection Report No. 99901392/2011-201 and Attachment

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DATE	9/6/2011	8/31//2011	9/6/2011	9/1/2011	9/6/2011
OFFICE	NRO/DCIP/CQVA	NRO/DE/EMB1	QTE		NRO/DCIP/CQVA
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DATE	9/6/2011	9/6/2011	9/2/2011		/ /2011

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

Docket No.:	99901392	
Report No.:	99901392/2011-201	
Vendor:	Westinghouse Electric Company, LLC Newington Operations 178 Shattuck Way Newington, NH 03801	
Vendor Contact:	Ms. Lisa Plante Quality Systems Supervisor Telephone: (603) 433-1064 E-mail: plantelm@westinghouse.com	
Nuclear Industry:	The Westinghouse Electric Company, Newington Operations (WEC) facility is a major supplier of safety related control rod drive mechanisms and reactor vessel internals for the WEC AP1000 pressurized water reactor design.	
Inspection Dates:	July 18 - 22, 2011	
Inspection Team Leader:	Robert Prato	NRO/DCIP/CQVA
Inspection Team Members:	Marlayna Vaaler	NRO/DCIP/CQVA
	Garrett Newman	NRO/DCIP/CQVB
	Raju Patel	NRO/DCIP/CQVA
	Thomas Kendzia	NRO/DCIP/CQVA
	Brent Clarke	NRO/DCIP/CQVA
	Jason Huang	NRO/DE/EMB1
Approved by:	Juan D. Peralta, Branch Chief Quality and Vendor Branch 1 Division of Construction Inspection & Operational Programs Office of New Reactors	

Enclosure

EXECUTIVE SUMMARY

Westinghouse Electric Company, Newington Operations
99901392/2011-201

The U.S. Nuclear Regulatory Commission (NRC) conducted this inspection to verify that Westinghouse Electric Company, Newington Operations (WEC) implemented an adequate quality assurance (QA) program that complies with the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants." The inspection also verified that WEC implemented a program under 10 CFR Part 21, "Reporting of Defects and Noncompliance," that meets the NRC's regulatory requirements. The inspection team conducted the inspection at the WEC facility in Newington, New Hampshire from July 18 - 22, 2011.

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 used Inspection Procedure 43002, "Routine Inspections of Nuclear Vendors," dated April 25, 2011, and Inspection Procedure 36100, "Inspection of 10 CFR Parts 21 and 50.55(e) Programs for Reporting Defects and Noncompliance," dated April 25, 2011, during this inspection.

The NRC conducted its last inspection at the WEC Newington facility in July 1999 when it was owned by ABB Combustion Engineering Nuclear Power, Inc. (ABB), and documented the results of the inspection in Inspection Report 72-0017/99-202, dated August 31, 1999. During this inspection, the NRC inspected ABB's management practices and fabrication activities for compliance with 10 CFR Part 21, Appendix B to 10 CFR Part 50, and 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High Level Radioactive Waste." The 1999 inspection identified one violation against 10 CFR 72.154, "Control of purchased material, equipment, and services." Subsequent to that NRC inspection, the Westinghouse Electric Company purchased the Newington, NH facility in 2000. As part of the scope of the current inspection, the NRC inspection team inspected quality assurance activities related to design control; procurement; contractor oversight (including external audits); inspections; corrective actions; nonconformances; instructions, procedures, and drawings; training; and document control. The inspection team also inspected the WEC Newington Operations Part 21 program.

The NRC inspection team concluded that WEC's QA policies and procedures comply with the applicable requirements of 10 CFR Part 21 and Appendix B to 10 CFR Part 50, and that WEC personnel are implementing these policies and procedures effectively. The results of this inspection are summarized below.

10 CFR Part 21 Program

The NRC inspection team concluded that WEC appropriately translated the requirements contained in 10 CFR Part 21 into implementing procedures and for those activities reviewed by

the NRC inspection team, implemented them as required by the WEC procedures. No significant findings were identified.

Training and Qualification of Personnel

The NRC inspection team concluded that the training and qualification of WEC personnel conform to the regulatory requirements of Criterion II, "Quality Assurance Program," of Appendix B to 10 CFR Part 50, and that WEC was effectively implementing its Quality Assurance Manual (QAM) and associated training and qualification procedures. No significant findings were identified.

Design Control

The NRC inspection team concluded that WEC's design control policies and procedures are consistent with Criterion III, "Design Control," of Appendix B to 10 CFR Part 50 and the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III, Subsections NB and NG. The NRC inspection team concluded that WEC's implementation of these practices relative to the AP1000 control rod drive mechanisms and reactor vessel internals provided appropriate design controls. No significant findings were identified.

Procurement Document Control

The NRC inspection team concluded that the WEC procurement document control program conforms to the regulatory requirements of Criterion IV, "Procurement Document Control," of Appendix B to 10 CFR Part 50. The NRC inspection team concluded that WEC's implementation of these policies and procedures provided appropriate controls for issuing and revising procurement documents. No significant findings were identified.

Control of Purchased Material, Equipment, and Services

The NRC inspection team concluded that the WEC procurement and material acceptance programs conform to the regulatory requirements of Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50. The NRC inspection team concluded that WEC's implementation of these policies and procedures provided appropriate oversight of its suppliers and control of purchased material, equipment, and services. No significant findings were identified.

Internal and External Audits

The NRC inspection team concluded that WEC's external and internal audit programs conform to the regulatory requirements of Criterion VII, "Control of Purchased Material, Equipment, and Services," and Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50. The NRC inspection team concluded that WEC adequately implemented its internal and external audit programs. No significant findings were identified.

Control of Special Processes

The NRC inspection team concluded that WEC's program for the control of special processes conforms to the regulatory requirements of Criterion IX, "Control of Special Processes," of Appendix B to 10 CFR Part 50. The NRC inspection team concluded that the WEC QAM and

associated fabrication and special process procedures and activities were adequate and effectively implemented by qualified personnel, using qualified equipment and processes. No significant findings were identified.

Test Control

The NRC inspection team concluded that WEC's process for control of the testing program conforms to the regulatory requirements of Criterion XI, "Test Control," of Appendix B to 10 CFR Part 50. The NRC inspection team concluded that the WEC QAM and associated test control procedures and activities were adequate and effectively implemented by qualified personnel, using qualified equipment and processes. No significant findings were identified.

Control of Measuring and Test Equipment

The NRC inspection team concluded that WEC's measuring and test equipment program requirements are consistent with the regulatory requirements of Criterion XII, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50. The NRC inspection team concluded that WEC established appropriate and effective means to control measuring and test equipment. No significant findings were identified.

Nonconforming Materials, Parts, or Components

Based on the sample of nonconformances reviewed, the NRC inspection team concluded that WEC's process for the control of nonconforming materials, parts, or components is consistent with the regulatory requirements of Criterion XV, "Nonconforming Materials, Parts, or Components," of Appendix B to 10 CFR Part 50. The NRC inspection team concluded that WEC effectively implemented its QA policies and implementing procedures that govern the control of nonconformances. No significant findings were identified.

Corrective Action

Based on the sample of corrective action reports reviewed, the NRC inspection team concluded that the implementation of WEC's program for corrective actions was consistent with the regulatory requirements of Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50. No significant findings were identified.

REPORT DETAILS

1. 10 CFR Part 21 Program

   a. Inspection Scope

   The NRC inspection team reviewed the WEC facility's policies and implementing procedures that govern the programs and activities used to establish and verify compliance with the requirements of 10 CFR Part 21. In addition, the NRC inspection team evaluated the 10 CFR Part 21 postings as well as a sample of WEC purchase orders, internal audit results, and training matrices in order to evaluate WEC's compliance with the requirements of 10 CFR 21.6, "Posting Requirements," 10 CFR 21.21, "Notification of Failure to Comply or Existence of a Defect and its Evaluation," and 10 CFR 21.31, "Procurement Documents," respectively.

   Within the scope of this area of the inspection, the NRC inspection team reviewed the following policies, procedures, and associated documentation established by WEC:

   - Quality Assurance Manual, Westinghouse Electric Company LLC, Newington Operations (QAM), Revision 10, dated February 7, 2011
   - Westinghouse Policy/Procedure WEC 21.0, "Identification and Reporting of Conditions Adverse to Safety, " Revision 6, dated August 3, 2009
   - Westinghouse Policy/Procedure WEC 16.2, "Westinghouse Corrective Action Process, " Revision 2, dated February 8, 2010
   - Westinghouse, Newington Operations, Policy/Procedure PP-15-01, "Nonconformance Reports – Inprocess," Revision 6, dated May 28, 2010
   - Westinghouse, Newington Operations, Policy/Procedure PP-15-02, "Supplier Deviation of Contract Requirement," Revision 3, dated December 15, 2010
   - Westinghouse, Newington Operations, Policy/Procedure PP-16-08, "Customer Satisfaction," Revision 0, dated November 3, 2008
   - 2011 Internal Audit (WEC-11-35) Exit Notes, "Audit of Nuclear Components Manufacturing," date not specified
   - List of 10 CFR Part 21 posting locations
   - Issues Report 09-236-M026, "Drive Rod Blanks Stored Outside," dated August 24, 2009
   - Issues Report 10-189-W007, "Seal 3 Assembly-Pump 1128-1A," dated July 8, 2010
   - Issues Report 09-202-W011, "Nozzle Weldment - Orifice," dated July 7, 2010

b. Observations and Findings

b.1 10 CFR Part 21 Policies and Procedures

The NRC inspection team reviewed the WEC QAM and WEC 21.0 to verify that WEC had effectively implemented the requirements in 10 CFR 21.21(a)(1) for evaluating deviations and failures to comply associated with substantial safety hazards and that WEC's procedures incorporated the appropriate timelines for evaluation and reporting identified in 10 CFR Part 21. In addition, the inspection team verified that (1) WEC's nonconformance and corrective action procedures provided a link to the 10 CFR Part 21 program, and (2) WEC's 10 CFR Part 21 procedures implemented the requirements in 10 CFR 21.21(d) in regard to directors or responsible officers notifying the NRC of identified defects or failures to comply associated with substantial safety hazards.

The WEC QAM provides for the evaluation of defects and failures to comply, and notification of customers regarding any defects and failures to comply that might reasonably result in a substantial safety hazard. The QAM also requires that the quality assurance program (QAP) identify items and activities affecting quality to which the WEC QAP applies and prescribe controls over the items and activities to an extent consistent with their importance to safety and/or the applicable requirements of Appendix B to 10 CFR Part 50.

WEC 21.0 is the primary procedure used to implement the requirements of 10 CFR Part 21 for reporting defects and failures to comply. The procedure includes (1) purpose, policy, and applicability statements; (2) definitions, references, organizational responsibilities, and general information; (3) applicable flow diagrams for the discovery of potential conditions adverse to safety; (4) provisions for the evaluation and reporting of potential conditions adverse to safety; and (5) provisions for the posting of Federal laws and regulations related to 10 CFR Part 21.

The NRC inspection team verified that WEC 21.0 provides 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 inspection team also verified that WEC 21.0 defines applicable terms consistent with the terminology defined in 10 CFR 21.3, "Definitions," provides 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 provides appropriate guidance for interim reports in accordance with 10 CFR 21.21(a)(2).

The inspection team reviewed the WEC 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 of 10 CFR Part 21 apply in accordance with 10 CFR 21.31.

The NRC inspection team reviewed WEC 16.2, PP-15-01, PP-15-02, and PP-16-08, relating to the corrective action program, nonconformance program, supplier deviation of contract requirement, and customer satisfaction process, respectively. The inspection team verified that each of these procedures provide adequate guidance for evaluating deficiencies, as appropriate, for 10 CFR Part 21 applicability. In addition, the NRC inspection team reviewed numerous corrective action reports, nonconformance reports,

and quality notifications to verify that WEC is implementing each of the programs which can be used to identify defects and failures to comply consistent with the requirements of 10 CFR Part 21 and the WEC procedures.

b.2 10 CFR Part 21 Evaluations

The NRC inspection team reviewed the 10 CFR Part 21 reports submitted to the NRC and determined that WEC Newington Operations has not reported any defects or failures to comply which could create a substantial safety hazard. The inspection team reviewed the WEC QAM and the implementing procedures for the corrective action, nonconformance, customer satisfaction (concerns identification), and supplier deviation programs and verified that each of these programs provide adequate instructions to identify any defects or failures to comply that could create a substantial safety hazard.

The NRC inspection team reviewed the WEC Part 21 evaluation process and determined that once an item is identified as requiring an evaluation for Part 21 reportability, WEC Cranberry Township (Westinghouse headquarters) is automatically notified of the issue. The remaining 10 CFR Part 21 evaluation and reporting activities are performed by WEC Cranberry Township with technical support, as applicable, from WEC Newington Operations. The NRC inspection team reviewed three issue reports that were identified as requiring an evaluation for 10 CFR Part 21 reportability and verified that the evaluation and determination, as documented in the applicable issue reports, appeared reasonable and consistent with the requirements of 10 CFR Part 21.

b.3 10 CFR Part 21 Postings

The NRC inspection team reviewed the content of the WEC 10 CFR Part 21 postings as well as the location of each posting at the WEC Newington Operations facilities. The inspection team verified that the information required by 10 CFR 21.6 was included on each of the postings distributed in 10 locations of the 5 buildings that comprise the Newington, New Hampshire complex. The inspection team walked down each of the 10 locations and also verified that the required documents were posted in conspicuous locations consistent with the intent of 10 CFR 21.6(2).

The NRC inspection team observed that the 2011 WEC internal audit (WEC-11-35) exit notes state, in part, that three of six individuals interviewed in the office and machine shop areas during the WEC internal audit were not aware of any of the locations where the 10 CFR Part 21 postings were placed. All employees receive indoctrination training on WEC 21.0 which requires each employee to review WEC 21.0 and observe a PowerPoint presentation that provides an overview and additional description of 10 CFR Part 21. However, WEC 21.0 and the associated PowerPoint presentation do not identify the locations of the 10 CFR Part 21 postings.

The final report for WEC-11-35 was not complete prior to the exit meeting for this inspection and, therefore, final corrective actions were not identified. However, the exit meeting included a recommendation to require all employees to complete 10 CFR Part 21 refresher training that incorporates the location of all 10 CFR 21.6 postings.

c. Conclusions

The NRC inspection team concluded that WEC appropriately translated the requirements contained in 10 CFR Part 21 into implementing procedures and, for those activities reviewed by the NRC inspection team, implemented them as required by the WEC procedures and in accordance with the regulatory requirements. No significant findings were identified.

2. Training and Qualification of Personnel

a. Inspection Scope

The NRC inspection team reviewed the WEC implementing policies and procedures that govern personnel training and qualification. The inspection team reviewed the personnel training and qualification process with respect to conformance with the requirements of Criterion II, "Quality Assurance Program," of Appendix B to 10 CFR Part 50. In addition, the NRC inspection team discussed personnel training and the qualification process with WEC management and technical staff.

Within the scope of this area of the inspection, the NRC inspection team reviewed the following policies, procedures, and associated documentation established by WEC:

- WEC QAM, Section 2, "Quality Assurance Program," Revision 10, dated February 7, 2011
- Westinghouse Policy/Procedure WEC 2.8, "Qualification of Audit Personnel, " Revision 0, dated November 12, 2008
- Westinghouse Policy/Procedure WEC 2.10, "Qualification, Training and Certification of Nondestructive Testing Personnel, " Revision 2, dated April 26, 2011
- Westinghouse, Newington Operations, Policy/Procedure PP-02-01, "Indoctrination and Training," Revision 5, dated January 13, 2011
- Westinghouse, Newington Operations, Policy/Procedure PP-02-03, "Written Procedure for the Certification of Inspection and Test Personnel," Revision 2, dated January 29, 2009
- Westinghouse, Newington Operations, Policy/Procedure PP-02-04, "Certification Training Program for Mechanical and Optical Inspection Personnel," Revision 0, dated January 20, 2003
- Westinghouse, Newington Operations, Policy/Procedure PP-02-05, "Korea Contracts Nuclear Quality Assurance Program Requirements," Revision 1, dated October 26, 2007
- Westinghouse, Newington Operations, Policy/Procedure NSNP 2.11, "Registered Professional Engineer Qualifications," Revision 1, dated February 15, 2010

b. Observations and Findings

b.1 Personnel Indoctrination and Training

The NRC inspection team reviewed Section 2 of the WEC QAM, as well as the procedures associated with indoctrination, training, and qualification of personnel. The inspection team interviewed the Level III nondestructive examination (NDE) examiner and Level III inspection and test (I&T) examiner regarding applicable certification requirements, and interviewed several WEC employees on the means for tracking the status, completion, and frequency of training activities in effect at the Newington facility.

The NRC inspection team reviewed Section 2.2 of the WEC QAM and WEC PP-02-01, which describe the responsibilities and authority for establishing training and qualification requirements for WEC personnel, including the maintenance of training records. The inspection team verified that the QAM directs that the extent of indoctrination and training be commensurate with the scope, complexity, and importance of the activity being conducted and the education, experience, and proficiency of the person, and requires that personnel be indoctrinated and trained prior to assuming full, unsupervised responsibility for their job functions.

The NRC inspection team verified that the training requirements for several employees had been met and are being maintained in the Electronic Training and Procedure System (ETAPS) database. The inspection team also verified that the training records of several NDE, inspection, and test personnel were correct and up to date (including eye exams as necessary). The qualifications of QA auditors and lead auditors were also verified to be complete and in accordance with the requirements set forth in the WEC QAM, as outlined below.

b.2 Qualification and Training of Auditors and Lead Auditors

The NRC inspection team reviewed the guidance in Section 2.3 of the WEC QAM and WEC 2.8 for the indoctrination and training of auditors and lead auditors. The QAM prescribes the minimum experience and training requirements for auditors and lead auditors and provides that they be certified by QA staff based upon education, experience, training, examination, audit participation, and communication skills. Each auditor is trained to the applicable QA procedures, the American Society of Mechanical Engineers Boiler and Pressure Vessel (ASME Code), ASME's NQA-1, "Quality Assurance Requirements for Nuclear Facility Applications," and other applicable codes, standards, regulations, and regulatory guides, as applicable, and maintains proficiency by participating in audits on a regular basis, by reviewing procedures, and/or by participating in auditor training programs.

The NRC inspection team reviewed the training and qualification records for six auditors and lead auditors. The records included training, experience, qualification credits, audit participation, examination scores, and annual performance evaluations approved by the QA manager. The inspection team verified that WEC documented and maintained complete auditor training records on the appropriate training record forms in accordance with the WEC procedures.

b.3 Qualification and Training of Inspection and Test Personnel

The NRC inspection team reviewed the guidance in Section 2.4 of the WEC QAM, WEC PP-02-03, and WEC PP-02-04 for the indoctrination and training of inspection and test personnel. The QAM requires that personnel selected to perform inspection and test activities have the experience, training, and qualification commensurate with the scope, complexity, or special nature of the activities to be performed. The inspection team verified that indoctrination and training consists of on-the-job training with emphasis on firsthand experience gained through actual performance of inspections and tests. The NRC inspection team also verified that the qualification of inspection and test personnel was certified by a Level III I&T examiner on an appropriate certification record.

The NRC inspection team reviewed training and qualification records for two mechanical and inspection personnel, two calibration personnel, and two test personnel. The records reviewed included education, experience, classroom training and on-the job training information, initial capability demonstration results, and triennial performance evaluations reviewed and approved by the Level III I&T examiner. The inspection team also reviewed eye examination records, which were found to be current and in conformance with procedural requirements. The NRC inspection team verified that the qualification records of the inspection and test personnel were complete, current, and in accordance with the WEC procedural requirements.

b.4 Qualification and Training of Nondestructive Testing Personnel

The NRC inspection team reviewed the guidance in Section 2.5 of the WEC QAM and WEC 2.10 for training, qualification, and certification of nondestructive testing (NDT) personnel in accordance with American Society for Nondestructive Testing (SNT)-TC-1A, Personnel Qualification and Certification in Nondestructive Testing, 1992 Edition, and the applicable requirements of the ASME Code. WEC 2.10 describes the administration, education, training, examination, and certification requirements for WEC NDT personnel associated with the ASME Code, Sections I, III, V, and VIII, as well as the specifications of SNT-TC-1A.

The NRC inspection team reviewed the responsibility and qualification requirements for NDT personnel and identified that the QA manager has the overall responsibility for qualification and certification of NDT personnel. The inspection team verified that WEC NDT personnel are qualified as Level I, Level II, or Level III to a WEC established standard practice that is based on the guidance of SNT-TC-1A. The Level II and Level III individuals must be able to set up and calibrate equipment, read and interpret indications, and evaluate indications with reference to the applicable codes and specifications. The WEC Level III individual has the responsibility for establishing NDE techniques, interpreting specifications and codes, and designating the particular test method and techniques to be used. The QA manager, who is also a qualified Level III examiner, is responsible for implementing the WEC NDT training, qualification, and certification program. The NRC inspection team reviewed WEC 2.10 and verified that all NDT personnel are required to pass an annual eye examination, that NDT Level I and II personnel are required to requalify every 3 years, and NDT Level III personnel are required to requalify every 5 years.

The NRC inspection team reviewed the training and qualification records for a sample of NDT personnel. The inspection team verified that qualification records included

on-the-job minimum hours, written examination results, and annual eye examination records. The inspection team also verified that the training records reviewed were accurate, complete, current, and met the requirements of the ASME Code, Section III, as well as SNT-TC-1A. In addition, the eye examination records of NDT personnel were current and conformed with the requirements of the WEC implementing procedures.

c. Conclusions

The NRC inspection team concluded that the training and qualification of WEC personnel conform to the regulatory requirements of Criterion II, "Quality Assurance Program," of Appendix B to 10 CFR Part 50. Based on the sample of training records reviewed, the inspection team concluded that WEC's QAM and associated training and qualification procedures were adequate and effectively implemented. No significant findings were identified.

3. Design Control

a. Inspection Scope

The NRC inspection team reviewed the WEC policies and implementing procedures that govern design control. The inspection team reviewed the configuration control process, interviewed WEC personnel associated with design and configuration control activities for the control rod drive mechanism (CRDM) and reactor vessel internal (RVI) manufacturing processes, reviewed welding specification process and acitivities, and witnessed the hydrostatic testing of certain components of the AP1000 CRDM assemblies in order to evaluate WEC's compliance with the requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50, as well as the applicable WEC processes and procedures.

The NRC inspection team focused its review on AP1000 CRDM and RVI activities. The inspection team reviewed the work authorization and quality plans for the Vogtle Units 3 & 4 and V.C. Summer Units 2 & 3 CRDMs, as well as the Vogtle Units 3 & 4 RVIs. The inspection team reviewed deviation notices and nonconformances for the AP1000 RVIs for Sanmen Unit 1 and Vogtle Units 3 & 4, and selected customer engineering change notices (including design change authorizations and engineering and departure change requests (E&DCRs)) related to the AP1000 CRDMs and RVIs. The inspection team also reviewed the completed owners record package (including the certificate of conformance) for the CRDMs supplied to Sanmen Unit 1, the AP1000 CRDM design specification, and the AP1000 CRDM test specification.

Within the scope of this area of the inspection, the NRC inspection team reviewed the following policies, procedures, and associated documentation established by WEC:

- APP-MV11-Z0-001, "AP1000 Control Rod Drive Mechanism (CRDM) Design Specification," Revision 3, dated May 27, 2010

- APP-MV11-T1-031, "AP1000 Control Rod Drive Mechanism Latch Assembly Pre-Production and Production Test Specification," Revision 3, dated July 7, 2010

- E&DCR APP-MV11-GEF-002, “Correct CRDM Application of ASME Code Case 2142,” Revision 0, dated January 31, 2011

- E&DCR APP-MV11-GEF-004, “Clarify CRDM Rod Travel Housing Hydrostatic Testing Requirements” Revision 0, dated January 31, 2011

- E&DCR APP-MV11-GEF-001, “Change to CRDM Material Procurement Specification’s Cobalt Limits,” Revision 0, dated January 31, 2011

- SM1-MV11-VQQ-003, “AP1000 CRDM Rod Travel Housing, Latch Assembly, and Guide Sleeve,” Revision 0, dated April 25, 2011

- CPP-MV11-GEF-004, “CRDM Shim Surface Finish Change,” Revision 0, dated June 16, 2010

- SM1-MV11-GNR-008, “SM1 AP1000 CRDM Deviation Notice 20070705-08” (including nonconformance report (NCR) #11855 and NCR #11935), Revision 0, date not specified

- APP-MV11-GEN-033, “Design Change Authorization of AP1000 CRDM Movable and Stationary Latch Support Drawings,” Revision 0, dated February 3, 2010

- APP-MV11-GEN-034, “Design Change Authorization of AP1000 CRDM Material Procurement Specification,” Revision 0, dated February 3, 2010

- APP-MV11-GEN-035, “Design Change Authorization of AP1000 CRDM Latch Assembly Chrome Plating Tolerances,” Revision 0, dated February 3, 2010

- APP-MV11-GEN-036, “Design Change Authorization of AP1000 CRDM Coil Stack Assembly Production Test Requirements,” Revision 0, dated July 16, 2010

- APP-MV11-GEN-037, “Design Change Authorization to Eliminate the AP1000 CRDM Supplemental 92 HRB Restriction (spec change 7.4.12 materials),” Revision 0, dated July 16, 2010

- APP-MV11-GEN-038, “Design Change Authorization to Eliminate Coil Trace Recordings in Step Length and Load Transfer Test Specification,” Revision 0, dated July 16, 2010

- E&DCR CPP-MV11-GEN-001, “Quality Assurance Data Package Requirements,” Revision 0, dated February 8, 2010

- E&DCR CPP-MV11-GEF-004, “CRDM Shim Surface Finish Change,” Revision 0, dated June 15, 2010

- E&DCR CPP-MV11-GEF-005, “Clarification on CRDM Chrome Plating, Thread Relief, and NDE Requirements,” Revision 0, dated June 25, 2010

- E&DCR HY1-MV11-GEF-002, “Replacement CRDM Latch Housing Assembly for Haiyang Unit 1 Reactor Vessel,” Revision 0, dated June 17, 2011

- E&DCR HY1-MV11-GEF-003, “Replacement CRDM Latch Housing Assembly for Haiyang Unit 1 Reactor Vessel,” Revision 0, dated June 20, 2011
- E&DCR SM1-MI01-GEF-001, “BOM Correction for Core Shroud Ring Brace,” Revision 0, dated January 1, 2010
- E&DCR SM1-MI01-GEF-002, “Locking Bar Design Change Request,” Revision 0, dated January 8, 2010
- E&DCR SM1-MI01-GEF-003, “Hardness of Austenitic Stainless Steel Raw Materials,” Revision 0, dated January 8, 2010
- E&DCR SM1-MI01-GEF-004, “Upper Support Column Alternate Weld Process,” Revision 0, dated January 8, 2010
- E&DCR SM1-MI01-GEF-005, “Upper Core Barrel Cylinder and Flange Weld Preps,” Revision 0, dated January 8, 2010
- E&DCR SM1-MI01-GEF-006, “Drawing APP-MI01-V6-355,” Revision 0, dated January 8, 2010
- E&DCR SM1-MI01-GEF-007, “Lower Guide Tube Enclosure Weld Joints,” Revision 0, dated January 8, 2010
- E&DCR SM1-MI01-GEF-008, “Upper Support Weldment Alternate Weld Process,” Revision 0, dated February 3, 2010
- E&DCR SM1-MI01-GEF-009, “Core Barrel and LCSP Weld Preps,” Revision 0, dated May 7, 2010
- E&DCR SM1-MI01-GEF-010, “Upper Support Weldment Alternate Weld Process and Weld Preps,” Revision 0, dated May 7, 2010
- E&DCR SM1-MI01-GEF-013, “Change Request for APP-MI01-V2-520,” Revision 0, dated November 9, 2010
- E&DCR SM1-MI01-GEF-014, “Change Request for APP-MI01-V6-309,” Revision 0, dated July 11, 2011
- NCR #12360, Stationary Latch, dated May 15, 2011
- NCR #12364, G06 Latch Housing, dated May 18, 2011
- NCR #12369, G04 Latch Housing, dated May 25, 2011
- NCR #12391, Guide Tube, dated June 24, 2011
- NCR #12393, Latch Assembly Key, dated June 24, 2011

b. Observations and Findings

b.1 Design Activities for the AP1000 CRDM and RVI Components

The NRC inspection team determined that AP1000 CRDM and RVI design activities are performed by WEC, Cranberry Township, however, WEC, Newington Operations, implements the design activities associated with manufacturing and manufacturer's testing in accordance with the AP1000 CRDM and RVI design specifications established by WEC Cranberry Township. The NRC inspection team reviewed the WEC processes and procedures used to implement the AP1000 CRDM and RVI purchase orders, including design requirements and testing specifications, and verified that they provide for interface arrangements with the primary design organization when needed to resolve questions or concerns.

The NRC inspection team reviewed the purchase order requirements include the drawings and specifications necessary to fabricate AP1000 CRDM and RVI components, as well as appropriate provisions for the purchase of materials and services related to fabrication and manufacturing activities. The inspection team also reviewed deviations from the initial design specifications and verified that they were assessed using the deviation notice or the customer engineering change notice process and were dispositioned in accordance with the applicable WEC procedures. The inspection team verified that WEC deviation notices and customer engineering change notices include multiple reviews at both WEC Cranberry Township and WEC Newington Operations, including review by engineering, management, QA staff, and the authorized nuclear inspector (ANI).

The NRC inspection team reviewed the AP1000 CRDM and RVI purchase orders and associated documents and verified that WEC Newington Operations is adequately implementing its procedures consistent with the requirements of Appendix B to 10 CFR Part 50 and the design requirements established by WEC Cranberry Township. The inspection team verified that procedures implement appropriate organizational interfaces between vendors, suppliers, customers, WEC Cranberry Township, and WEC Newington Operations. For all changes reviewed by the NRC inspection team, the design, specification, and purchase requirements for the AP1000 CRDMs and RVIs were reviewed to an extent comparable with the original review.

b.2 Specific Inspection Observations

The NRC inspection team reviewed design and purchase order specifications for AP1000 CRDM and RVI activities. During its review, the NRC inspection team noted that there were multiple deviation notices associated with the failure of SA 193 grade bolting material to meet the design specification yield strength of 80 to 90 kilo-pounds per square inch. At least one supplier identified that the WEC specification is too restrictive for the material to be successfully fabricated with the desired yield strength.

WEC Cranberry Township evaluated the related deviation notices, and consistently accepted these deviations using the justification that the SA 193 grade bolting material meets the applicable ASME Code Case for minimum yield and ultimate strength, and that the maximum inservice load has been determined to be less than 65 kilo-pounds per square inch. The inspection team determined that the applicable specification was tighter than necessary, resulting in repetitive deviations that were consistently accepted

by the design entity. The inspection team observed that this is poor engineering practice and is not fully consistent with Criterion VII, “Control of Purchased Material, Equipment and Services,” of Appendix B to 10 CFR Part 50. The design entity (WEC Cranberry Township) should revise the material specification to remain within code but to include a more consistently achievable yield strength in order to ensure that adequate quality requirements are suitably included or referenced in procurement documents.

In addition, the NRC inspection team noted that there were multiple customer engineering change notices requiring revisions to various AP1000 drawings and specifications. In several cases, WEC Cranberry Township identified these changes as possible AP1000 generic changes but chose to implement drawing corrections for only one application, Sanmen Unit 1. The inspection team observed that this is poor engineering practice and is not fully consistent with Criterion VI, “Document Control,” of Appendix B to 10 CFR Part 50. The design entity should revise these drawing in order to ensure that the applicable drawings which are approved for release and used at the location where the prescribed activity is performed are adequate.

The NRC inspection team witnessed a Vogtle CRDM latch housing hydrostatic test and verified that the test was being conducted in accordance with the applicable WEC test procedures and ASME Section III design pressure requirements. The inspection team reviewed the CRDM latch assembly WEC functional test procedure and the production test specification that details the required functional testing. The test procedure is performed at ambient temperature and pressure, and then at normal operating pressure and temperature using a test weight to simulate the drive rod and rod control cluster assembly weight. However, the test is not also performed at the maximum design temperature and load limits. While this is consistent with the procurement specification and the functional testing requirements, the NRC inspection team observed that this is a poor engineering practice as performing functional tests at normal operating conditions and not at the design limit conditions does not ensure functionality for the full range of design conditions.

The NRC inspection team observed that although the design specification and test specification both identify an objective to test a latch assembly to 5000 steps, the test procedure only specifies testing to 2500 steps, and then performing the rod drop tests. The procedure does not specify the need to continue stepping the latch assembly to 5000 steps following the rod drop tests. However, the WEC lead test engineer stated that the test engineers do continue stepping the latch assemblies to 5000 steps after the rod drop tests, because it is specified in the objectives section of the test procedure. The inspection team noted that this is an area for potential procedure improvement.

c. Conclusions

The NRC inspection team concluded that the WEC Newington Operations design control process and activities are being implemented consistent with Criterion III, “Design Control,” of Appendix B to 10 CFR Part 50 and the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section III, Subsections NB and NG. The NRC inspection team concluded that WEC’s implementation of these practices relative to the AP1000 CRDMs and reactor vessel internals provided appropriate design controls. No significant findings were identified.

4. Procurement Document Control

a. Inspection Scope

The NRC inspection team reviewed the WEC policies and implementing procedures that govern the control of procurement documents to verify compliance with the requirements of Criterion IV, "Procurement Document Control," of Appendix B to 10 CFR Part 50. The inspection team reviewed a sample of purchase requisitions (PRs) and purchase orders (POs) in order to evaluate compliance with the WEC program requirements and adequate implementation of those requirements. In addition, the NRC inspection team reviewed the disposition of supplier deviations and PO changes for adequacy and timeliness.

Within the scope of this area of the inspection, the NRC inspection team reviewed the following policies, procedures, and associated documentation established by WEC:

- WEC QAM, Section 4, "Procurement Document Control," Revision 5, dated October 22, 2007
- Westinghouse, Newington Operations, Policy/Procedure PP-04-01, "Procurement Document Control," Revision 7, dated December 15, 2010
- PO 4500358462, issued to Quality Plus, Inc., dated August 30, 2010
- PO 4500323118, issued to Patriot Forge, Inc., dated November 3, 2009
- PO 4500374900, issued to Honematic Machine Corporation, dated January 23, 2011
- PO 4500343810, issued to Dubose National Energy Services, dated April 25, 2010
- PO 4500337129, issued to Forge Monchieri, dated May 28, 2010
- PO 4500331516, issued to Hoosier Spring Co., dated January 24, 2010

b. Observations and Findings

b.1 Policies and Procedures

The NRC inspection team reviewed Section 4 of the WEC QAM, which establishes controls to ensure that appropriate requirements are included in WEC procurement documents. The QAM states that PRs are initiated by an engineering organization and reviewed and approved by the QA staff in order to ensure that all necessary requirements have been specified. PRs are required to contain information such as: (1) the description of work to be performed; (2) technical requirements based on reference drawings, specifications, or instructions, as well as code requirements; (3) subtier supplier controls; (4) access rights for inspection and audit; (5) requirements for nonconformance reporting; (6) Part 21 applicability specifications; and (7) receipt inspection requirements. The supply chain management organization prepares POs in

accordance with the PR requirements. Changes from the purchase requisition incorporated into the purchase order, as well as any subsequent changes to the PR or PO, are subject to the same controls and level of review as the original documents.

The NRC inspection team reviewed WEC procedure PP-04-01, which details the implementation of the procurement document controls identified in Section 4 of the QAM. The inspection team verified that PP-04-01 describes the PR change notice process used to make technical and quality changes to approved PRs and POs, and specifies that PR change notices go through the same PR approval process involving engineering and QA organizations as the initial PR and PO.

b.2 Implementation of Procurement Document Control

The NRC inspection team reviewed a sample of procurement documents, which included PRs, POs, and supplier deviation reports, in order to verify that WEC adequately implemented its procurement document control process. These procurement documents supported the CRDMs and RVIs for Vogtle Units 3 & 4, as well as the CRDMs for V.C. Summer Units 2 & 3.

The NRC inspection team reviewed a sample of procurement documents and verified that the appropriate technical and quality requirements were included as required by the WEC QAM and PP-04-01 such as deliverables, instructions for the disposition of nonconformances, access rights, and provisions for the extension of 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.

In addition, the NRC inspection team verified that all of the safety-related POs reviewed included clauses invoking the provisions of 10 CFR Part 21 and requiring the vendor or supplier to conduct safety-related work under its approved QA program.

c. Conclusions

The NRC inspection team concluded that the WEC procurement document control process and activities are being implemented consistent with Criterion IV, “Procurement Document Control,” of Appendix B to 10 CFR Part 50. Based on the sample of activities reviewed, the NRC inspection team concluded that WEC’s implementation of these policies and procedures provided appropriate controls for issuing, revising, and maintaining procurement documents. No significant findings were identified.

5. Control of Purchased Material, Equipment, and Services

a. Inspection Scope

The NRC inspection team reviewed the WEC policies and implementing procedures that govern the control of purchased material, equipment, and services to verify compliance with the requirements of Criterion VII, “Control of Purchased Material, Equipment, and Services,” of Appendix B to 10 CFR Part 50. The inspection team reviewed a sample of purchase requisitions and purchase orders in order to evaluate compliance with the WEC program requirements and adequate implementation of those requirements. In

addition, the inspection team reviewed the disposition of corrective actions to resolve deficiencies identified by audit findings for adequacy and timeliness.

Within the scope of this area of the inspection, the NRC inspection team reviewed the following policies, procedures, and associated documentation established by WEC:

- WEC QAM, Section 7, “Control of Purchased Items and Services,” Revision 10, dated February 7, 2011
- WEC QAM, Section 8, “Identification and Control of Items,” Revision 10, dated February 7, 2011
- WEC QAM, Section 15, “Control of Nonconforming Items,” Revision 15, dated January 4, 2011
- Westinghouse Policy/Procedure WEC 7.1, “Supplier Qualification and Evaluation,” Revision 2, dated February 8, 2010
- Westinghouse Policy/Procedure WEC 7.3, “Commercial Grade Surveys,” Revision 0, dated November 3, 2008
- Westinghouse, Newington Operations, Policy/Procedure PP-08-01, “Goods Receipt Slip,” Revision 6, dated December 15, 2010
- Westinghouse, Newington Operations, Policy/Procedure PP-07-01, “Dedication of Commercial Grade Items and Services,” Revision 3, dated October 14, 2010
- 103 Goods Receipt Slip 5000930388/0003 for Forge Monchieri, dated March 24, 2011
- 105 Goods Receipt Slip 5000966973/0001 for Forge Monchieri, dated June 3, 2011
- 103 Goods Receipt Slip 50008526/0001 for Hoosier Spring Co., dated March 24, 2011
- 105 Goods Receipt Slip 5000853655/0001 for Hoosier Spring Co., dated June 3, 2011
- 103 Goods Receipt Slip 5000900554/0001 for Patriot Forge, dated January 13, 2011
- 105 Goods Receipt Slip 5000915335/0001 for Patriot Forge, dated February 17, 2011
- 103 Goods Receipt Slip 5000955801/0001 for Honematic Machine Corp., dated May 10, 2011
- 105 Goods Receipt Slip 5000957923/0001 for Honematic Machine Corp., dated May 13, 2011

- 103 Goods Receipt Slip 5000970162/0001 and 5000970162/0002 for Dubose National Energy Services, dated June 13, 2011

- 105 Goods Receipt Slip 5000975066/0001 for Dubose National Energy Services, dated June 23, 2011

- 105 Goods Receipt Slip 5000975067/0001 for Dubose National Energy Services, dated June 23, 2011

b. Observations and Findings

b.1 Policies and Procedures

The NRC inspection team reviewed Section 7 of the WEC QAM, which establishes controls to ensure that purchased items and services conform to the procurement documents and other applicable requirements. The QAM states that purchase orders shall only be awarded to suppliers on the Qualified Suppliers' List (QSL) when required by the purchase requisition. The NRC inspection team verified that a documented process is in place for adding and maintaining suppliers on the QSL such as successful completion of a qualification audit. Annual supplier performance assessments are conducted in order to evaluate the supplier's continued capability to provide acceptable items or services. The QAM also discusses requirements for certified material test reports (CMTRs) and certificates of conformance.

The NRC inspection team reviewed Section 8 of the WEC QAM that provides guidance for receiving inspection requirements and establishes controls to promote material traceability throughout fabrication activities, as well as to ensure that only accepted items are used during the fabrication process. The inspection team verified that the QAM describes the process of initiating and completing goods receipt slips in order to document receipt inspection status and related activities. Quality notifications are issued for items that do not conform to the PO requirements and are processed through the nonconformance process. Once items are accepted via a receipt inspection, the items are assigned a WEC control number that is kept with the item through production.

The NRC inspection team reviewed WEC 7.1, which prescribes the activities for evaluating and qualifying suppliers. This procedure also provides guidance for conducting supplier audits. The inspection team verified that WEC safety-related suppliers are typically qualified by successful completion of a qualification audit prior to being placed on the QSL. Supplier qualifications are maintained by periodically assessing the supplier's capability to supply acceptable items and services and by conducting, at a minimum, a triennial audit.

The NRC inspection team reviewed PP-08-01, which prescribes the activities for receiving, inspecting, and controlling items received from suppliers. A goods receipt slip is initiated for items that quality inspection, which is distributed to quality materials engineering staff. The quality materials engineering organization reviews the provided certification documentation, and the quality inspection staff performs any inspections required by the purchase order. A quality notification is issued if any nonconformances from the purchase order are discovered. The NRC inspection team verified that this process is being implemented consistent with the WEC QAM, PP-08-01, and related activities, and is consistent with the applicable requirements.

The NRC inspection team reviewed PP-07-01, which prescribes the activities necessary to verify the acceptability of commercial grade items and services for safety-related applications. The inspection team verified that the project engineering organization identifies the critical characteristics of an item or service and selects the appropriate acceptance method. The NRC inspection team verified that PP-07-01 also provides the adequate guidance and reference documents necessary to use the different acceptance methods, including special tests and inspections, surveys, source verification, and acceptable performance. In addition, the inspection team verified that this procedure provides standard commercial grade dedication evaluations for certain services by defining the critical characteristics of the service and the methods for acceptance.

b.2 Implementation of Control of Purchased Material, Equipment, and Services

The NRC inspection team reviewed a sample of qualified supplier list entries, supplier assessment and evaluation summaries and audit and survey reports to verify that WEC had appropriately approved suppliers prior to receipt of items or services. The inspection team verified that WEC assessed its suppliers' performance with annual assessments and provided adequate maintenance of its approved suppliers list. The NRC inspection team verified that supplier audits and surveys were performed as required; audits and surveys are discussed in Section 6 of this inspection report.

The NRC inspection team reviewed the method used to accept a basic component from a supplier, such as certificates of conformance and receipt inspections and verified that those methods are being applied and implemented consistent with the WEC QAM, procedures, and applicable requirements. The inspection team reviewed a sample of goods receipt slips and production orders and observed a receipt inspection of AP1000 dowel pins (including measuring, material identification, and counting) and verified that it was conducted in accordance with the QAM and applicable procedures.

The NRC inspection team also verified that WEC ensures that certificates of conformance correctly identify the material, equipment, or service being supplied; identify specific procurement requirements that have been met and those that have not been met; and identify the quality program used to control the product or service. The inspection team verified that deviations from POs were submitted by suppliers and appropriately dispositioned by WEC, and that "ready receipt," "to-be-inspected," and "rejected" items were being stored in accordance with the WEC procedures.

The NRC inspection team reviewed PP-07-01 to evaluate commercial grade dedication of services and observed a successful commercial grade survey, as well as a special test and inspection upon receipt, and verified that WEC performed these activities in accordance with the WEC QAM and applicable procedures for CG machining services.

c. Conclusions

The NRC inspection team concluded that the WEC procurement and material acceptance process and activities are being implemented consistent with Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50. Based on the sample of activities reviewed, the NRC inspection team concluded that WEC's implementation of these policies and procedures provided appropriate oversight of its suppliers and control of purchased material, equipment, and services. No significant findings were identified.

6. External and Internal Audits

a. Inspection Scope

The NRC inspection team reviewed the WEC policies and implementing procedures that govern internal and external audits to verify compliance with the requirements of Criterion VII, "Control of Purchased Material, Equipment, and Services," and Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed a sample of internal and external audit reports in order to evaluate compliance with the WEC program requirements and adequate implementation of those requirements. In addition, the inspection team reviewed the disposition of audit findings and observations for adequacy and timeliness.

Within the scope of this area of the inspection, the NRC inspection team reviewed the following policies, procedures, and associated documentation established by WEC:

- WEC QAM, Section 7, "Control of Purchased Items and Services," Revision 10, dated February 7, 2011
- WEC QAM, Section 18, "Audits," Revision 10, dated February 7, 2011
- Westinghouse Policy/Procedure WEC 7.1, "Supplier Qualification and Evaluation," Revision 2, dated February 8, 2010
- Westinghouse Policy/Procedure WEC 18.1, "Internal Audit," Revision 1, dated August 3, 2009
- Report of Internal Audit WEC-10-45 – Nuclear Components Manufacturing, dated July 21, 2010
- WES-2011-084, Audit Package, Babcock & Wilcox, Canada, Ltd. – Manufacturing, dated March 3, 2011
- WES-2010-118, Commercial Grade Survey Package, Honematic Machine Corp., November 22, 2010, dated December 2, 2010
- WES-2009-065, Audit Package, Hoosier Spring, South Bend, Indiana, accepted June 9, 2009
- WES-2009-011, Audit Package, Exelon Power Labs, Plattsburgh, New York, accepted March 19, 2009

b. Observations and Findings

b.1 Policies and Procedures

The NRC inspection team reviewed Section 7 of the WEC QAM, which establishes controls to ensure that purchased items and services conform to the procurement documents and other applicable requirements. The QAM provides methods to place suppliers on the QSL such as successful completion of an audit.

The NRC inspection team reviewed WEC 7.1, which prescribes the activities for evaluating and qualifying suppliers. This procedure also provides guidance for conducting supplier audits. The inspection team verified that WEC safety-related suppliers are typically qualified by successful completion of a qualification audit prior to being placed on the QSL. Supplier qualifications are maintained by periodically assessing the supplier's capability to supply acceptable items and services and by conducting, at a minimum, a triennial audit.

The NRC inspection team reviewed Section 18 of the WEC QAM, which provides guidance for verifying compliance with, and assessing the effectiveness of, the WEC quality assurance program. The QAM requires independent internal audits be performed annually in order to assess all parts of the WEC quality assurance program and includes the requirements for performing supplier audits. The QAM also provides the criteria for auditor qualification, audit team composition, audit planning, audit scheduling, audit reporting, communication, and corrective actions.

The NRC inspection team reviewed WEC 18.1, which contains the activities for planning, coordinating, performing, and reporting WEC internal audits. The procedure also describes requirements for verifying the adequacy of corrective actions taken to address audit findings. The inspection team verified that internal audits are performed annually by knowledgeable personnel who have no direct responsibility for the areas under review. The NRC inspection team also verified that issues identified during the course of an audit are entered into the Corrective Action Program (CAP) system, that audit reports are typically issued within 30 days, and that the results are communicated to responsible WEC management.

b.2 Implementation of Internal Audits

The NRC inspection team reviewed the WEC internal audits for 2009 and 2010 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 prescribed by WEC 18.1. The inspection team noted that the 2011 internal audit had been completed, but WEC had not yet issued the report and therefore the NRC inspection team could not review it.

The NRC inspection team verified that the authorized nuclear inspector is performing third-party oversight, as required, and that the ANI has reviewed and signed the ASME Code, Section III, data report for the Sanmen project.

b.3 Implementation of External Audits

The NRC inspection team reviewed a sample of external audits as well as a commercial grade survey for components and services procured in relation to the Vogtle and V.C. Summer CRDM and Vogtle RVI projects. The inspection team verified that the external audits and surveys reviewed were planned and performed using applicable procedures, checklists, and qualified auditors. The inspection team verified that audits and surveys were conducted in accordance with the WEC implementing procedures, documented with objective evidence, and the resolutions of corrective actions were communicated to suppliers in a timely manner. The NRC inspection team also verified that external audits and surveys were performed commensurate with the required

frequencies specified in the QAM, associated procedures, and the applicable section of the ASME Code.

The NRC inspection team reviewed third-party audits and verified that WEC reviewed and accepted the supplied third-party audit documentation before taking credit for the audit results. For all external audits, regardless of source, WEC initiates an issue report in the corrective action program to track the disposition and completion of open supplier corrective actions generated in response to audit findings.

c. Conclusions

The NRC inspection team concluded that WEC's external and internal audit process and activities are being implemented consistent with Criterion VII, "Control of Purchased Material, Equipment, and Services," and Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50. Based on the sample of activities reviewed, the NRC inspection team concluded that WEC effectively implemented its internal and external audit programs. No significant findings were identified.

7. Control of Special Processes

a. Inspection Scope

The NRC inspection team reviewed the WEC policies and implementing procedures that govern the control of special processes to verify compliance with the requirements of Criterion IX, "Control of Special Processes," of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed a sample of WEC activities related to special processes, including welding, heat treatment, nondestructive testing, and plating. In addition, the inspection team reviewed the qualifications of various personnel involved in special processes to verify that the records were adequate and accurate.

Within the scope of this area of the inspection, the NRC inspection team reviewed the following policies, procedures, and associated documentation established by WEC:

- WEC QAM, Section 9, "Control of Special Process," Revision 10, dated February 2, 2011
- Westinghouse, Newington Operations, Policy/Procedure PP-05-05, "Weld Map," Revision 2, dated September 17, 2009
- Westinghouse, Newington Operations, Policy/Procedure PP-05-06, "Quality Plans," Revision 5, dated March 31, 2011
- Westinghouse, Newington Operations, Policy/Procedure PP-05-08, "NDE Matrix," Revision 0, dated September 26, 2007
- Westinghouse, Newington Operations, Policy/Procedure PP-04-02 "Control of Consumables," Revision 7, dated December 15, 2010
- Westinghouse, Newington Operations, Policy/Procedure PP-09-01, "Production Order," Revision 11, dated May 12, 2011

- Westinghouse, Newington Operations, Policy/Procedure PP-09-04, "Welding and Welding Operator Training and Qualification," Revision 3, dated October 20, 2010

- Westinghouse, Newington Operations, Policy/Procedure PP-09-05, "Welding Materials Control," Revision 12, dated January 13, 2011

- Westinghouse, Newington Operations, Policy/Procedure PP-09-06, "Planning and Control of Welding Functions," Revision 3, dated October 20, 2010

- Westinghouse Policy/Procedure WEC 2.10, "Qualification, Training, Certification of Nondestructive Testing Personnel," Revision 2, dated February 29, 2011

- Technical Manual (TM)-VT-001, "Visual Examination," Revision 16, dated May 25, 2011

- TM-PT-001, "Liquid Penetrant Examination," Revision 17, dated May 25, 2011

- TM-RT-001, "Radiographic Examination," Revision 17, dated May 25, 2011

- Visual Procedure Qualification Record for TM-VT-001, Revision 12, dated October 22, 2002

- Liquid Penetrant Qualification Record for TM-PT-001, Revision 14, demonstrated to and approved by the ANI on March 5, 2004

- Radiographic Procedure Qualification Record for TM-RT-001, Revision 5, demonstrated to and approved by the ANI on November 24, 1998

- Ultrasonic Procedure Qualification Record for TM-UT-001, Revision 0, demonstrated to and approved by the ANI on June 23, 2009

- Welding Procedure Qualification Record (PQR) GTA-8.43-1G-2, Revision 0, dated December 5, 2007

- Ultrasonic Examination Report No. NDE-014467 – G09 Latch Housing Assembly S/N 1428 for Production Order No. 40045759, dated June 2, 2011

- Liquid Penetrant Examination Report No. NDE-014674 – G09 Latch Housing Assembly S/N 1428 on Production Order No. 40045759, dated July 19, 2011

- Welder/Welding Operator Performance Qualification Lists, dated July 13, 2011

b. Observations and Findings

b.1 Policies and Procedures

The NRC inspection team reviewed Section 9 of the WEC QAM, which provides the policies and process activities relating to the control of special processes including welding, heat treatment, and NDE. The QAM, Section 9.2.1, documents the process for

the preparation, issue, distribution, and implementation of production orders related to fabrication activities. Section 9.2.2 describes the general welding process activities and limitations. Section 9.2.3 documents the process for the control of heat treating activities. Section 9.2.4 documents the controls for the performance of NDE activities, as well as for the qualification and certification of NDE personnel.

The NRC inspection team reviewed PP-04-02, which describes the process for controlling weld consumable items that come into contact with stainless steel, stellite, Inconel, cobalt, and nickel based alloys to verify that the halogen (i.e., chlorine, fluorine, bromine, and iodine), halide, and sulfur levels in consumables such as NDE materials are limited to prevent contamination and potential deleterious effects. The procedure also specifies that low melting point metals are not allowed in the formulation of consumables used on fabrication materials.

The NRC inspection team reviewed PP-05-05 to verify that the process for preparing, approving, distribution, control, and retention of weld maps for all contracts requiring fabrication are performed in accordance with the ASME Code. The inspection team verified that all welding activity related to a production order is processed in accordance with a unique weld map which is issued and approved for the applicable component or assembly. The inspection team also verified that, at a minimum, a weld map includes all weld joints for a component or assembly and contains the weld joint identification information, the joint location, the type and size of the weld joint, a detailed welding procedure specification for each weld joint, and a reference to the applicable design drawing(s). The NRC inspection team verified that weld maps are prepared, reviewed, and approved the project engineering, weld engineering, and QA organizations and are listed as a part of the weld map manual in accordance with the WEC QAM, PP-05-05, and related activities, and is consistent with the applicable requirements.

The NRC inspection team reviewed PP-05-06, which describes the process for the preparation, review, approval, and distribution of quality plans, and verified that quality plans incorporate witness / hold / review points. The inspection team verified that quality plans are prepared by the project engineering organization upon receipt of a work authorization to outline the key activities in the manufacturing process including the preparation of production orders and purchase documents consistent with the WEC QAM and applicable implementing procedures.

The NRC inspection team reviewed PP-05-08, which describes the process for the preparation, approval, distribution, control, and retention of an NDE matrix for all contracts requiring fabrication in accordance with the ASME Code. The inspection team verified that the project engineering organization prepares an NDE matrix that provides an overview of the NDE requirements for a specific component or assembly, identifies all NDE requirements for each weld joint defined in the weld map including, at a minimum, the weld joint identification number, the number of weld joint locations, the material number, the NDE requirements and applicable NDE procedures.

The NRC inspection team reviewed PP-09-01, which describes the methodology for controlling production orders from initial conception to final closeout. The inspection team verified that a master production order is used to describe the fabrication steps necessary to ensure that manufacturing and quality inspectors can perform, verify, and document those functions that are required to comply with the contract requirements. The inspection team verified that any changes made to a production order require the

same review, approval, and control as the original issue, ensuring that code and contractual requirements are not violated.

The NRC inspection team also reviewed the implementing procedures for special process activities performed by WEC, including PP-09-04, PP-09-05, PP-09-06, and WEC 2.10. The inspection team verified that these procedures provide adequate guidance for welding operator qualification, control of weld material, weld planning processes, and control of welding functions, as well as appropriate specifications for the qualification of welding and NDE personnel. The inspection team also verified that WEC's implementing procedures provide adequate guidance for the performance of welding and NDE, appropriate provisions for calibration checks, and the applicable acceptance criteria for welding and NDE activities.

The NRC inspection team reviewed the applicable special process procedures, as well as observation of specific manufacturing activities for the Vogtle Units 3 & 4 and V.C. Summer Units 2 & 3 CRDM latch housing assemblies. The inspection team verified that the WEC manufacturing process uses production orders as the method for controlling production activities. The production orders incorporate witness and hold points for customer, ANI, and WEC quality control review, as applicable, and identify the drawings, material specifications, work instructions, and procedures pertinent to the fabrication activity being performed. Proper implementation of the production order ensures that the fabrication activities are accomplished in accordance with the specified requirements and conducted in the correct operational sequence. The production order also functions as a work identification and check system for each fabrication operation performed.

The NRC inspection team observed a sample of fabrication and special process activities, as discussed below, for the manufacturing activities previously mentioned in order to verify adequate implementation of the WEC processes and procedures.

b.2 Welding Process

The NRC inspection team reviewed WEC WE-P-001, which describes the responsibilities and minimum controls necessary to ensure that all welding, including weld / base metal material repairs, will be accomplished in accordance with the applicable contract requirements.

The NRC inspection team reviewed the WEC welding and examination control program (WECP), a computer database that (1) tracks active and inactive jobs by production order; (2) lists the current welder qualification status and any limitations related to the DWPS; (3) gives the latest revision of the DWPS, including referencing the applicable procedure qualification record (PQR); and (4) provides the approved weld materials and qualified welders list. The inspection team verified through a review of selected production orders that the welding operator qualification status by process, position, and limitation, the revision of the DWPS listed, and the traceability of approved weld materials released for the production order were accurate and up to date.

The NRC inspection team interviewed the lead welding engineer regarding qualification of welding personnel, as well as the associated processes and procedures, and confirmed that WEC has established a welding program for qualifying the DWPS through procedure qualification records. In addition, the inspection team verified that the welding process and welding operators were qualified in accordance with the requirements of the

ASME Code, Section IX, “Welding and Brazing Qualification,” and Section III, “Rules for Construction of Nuclear Facility Components.”

The inspection team witnessed a machine gas tungsten arc welding process for a V.C. Summer Units 2 & 3 G08 Latch Housing Assembly. The NRC inspection team verified that the welding process was performed in accordance with the ASME Code, Section IX, qualified DWPS listed on Weld Map WM-2404840-01 by a qualified welding operator on the approved welder list, using approved and appropriately released weld wire on a calibrated welding machine. Based on the review of a sample of weld records and through interviews with several welding operators, the NRC inspection team verified that the WEC welding program was effectively implemented and complied with the requirements of Section IX of the ASME Code.

b.3 Control of Weld Material

The NRC inspection team reviewed WEC PP-09-05, which describes the requirements for controlling weld consumables from receipt through consumption in a manufacturing process. The inspection team reviewed and verified that Attachment 7.7, “Controls for Covered Electrodes Holding Ovens, Issue and Return Guidelines (Tool Room),” contains the requirements for environmental (moisture) control, specifies the appropriate holding and baking temperatures and out-of-oven exposure time for each class of material, and provides the covered electrode conditioning requirements.

The NRC inspection team verified that acceptable weld materials are identified with a unique WEC identification number, traceable to an approved vendor’s material test report, and are listed on the WEC approved weld material control list (AWMCL) and in the WECP database. The inspection team reviewed a sample of weld material test reports and weld material withdrawal forms (WMWFs), performed a walkthrough of the WEC tool room, interviewed the tool room supervisor, and verified that weld materials are being controlled in accordance with the WEC QAM and implementing procedures.

The NRC inspection team observed that welding materials were clearly identified and that the identification of acceptable material was retained during storage, handling, and use until the material was actually consumed in the welding process. The inspection team also observed that covered weld electrodes and flux were stored in moisture controlled environments, and that the process for conditioning of electrodes was being implemented. The NRC inspection team reviewed WEC’s WECP, current AMWCL, and a sample of WMWFs, and verified that the WEC weld material control program was being effectively implemented in accordance with the WEC QAM and the applicable implementing procedures.

b.4 Welder Qualification Records

The NRC inspection team interviewed the lead welding engineer regarding the process for qualifying and maintaining welding operator qualifications in accordance with the requirements of Section IX of the ASME Code. The inspection team selected a sample of qualification records for welders and welding operators who performed welding activities related to Vogtle Units 3 & 4 and V.C. Summer Units 2 & 3 production orders and compared them to the applicable ASME Code acceptance criteria. The NRC inspection team verified that the welding operators were qualified in accordance with the

applicable acceptance criteria of Section IX of the ASME Code, and that welding engineering adequately maintained the welder performance qualification list.

b.5 Nondestructive Testing

The NRC inspection team reviewed WEC's program and procedures for the control of nondestructive examination in order to verify that they met the requirements of Criteria IX of Appendix B to 10 CFR Part 50, were qualified in accordance with the requirements of Section V of the ASME Code, and that NDE personnel were qualified as specified by the WEC standard practice, which meets the guidance of SNT-TC-1A.

The inspection team also reviewed WEC's policy and procedures for the control of nondestructive examination, the visual examination procedure, liquid penetrant examination procedure, and radiographic examination procedure, which are being used during the fabrication process for CRDM latch housing assemblies for Vogtle Units 3 & 4 and V.C. Summer Units 2 & 3. The NRC inspection team verified that the NDE procedure variables met the requirements of the ASME Code, Section V, and were qualified through demonstration to the ANI.

The NRC inspection team reviewed the visual and liquid penetrant testing procedures specified in the production orders for the CRDM latch housing assemblies, and witnessed visual and liquid penetrant testing of weld joints on two assemblies. During the performance of visual testing on a G09 CRDM latch housing assembly, burrs were identified in the internal threads, causing the fabrication of the assembly to be placed on hold pending evaluation by the project engineering organization. The inspection team discussed the discrepancy, the acceptance criteria, and the process for evaluation and disposition with the Level II NDE inspector and the QA manager. The NRC inspection team verified that WEC has a process to rework discrepancies on production orders provided that the discrepancy is within the design drawing tolerances.

The NRC inspection team verified that both the visual and liquid penetrant testing processes were performed using qualified procedures, certified NDE inspectors, approved NDE materials, and calibrated measuring and test equipment. The inspection team verified that the NDE inspector had followed the necessary visual and liquid penetrant testing process parameters, interpreted the indications against the acceptance criteria specified in the applicable production order and NDE procedure, and documented the results in accordance with the implementing procedure.

The NRC inspection team also witnessed the radiographic examination a of weld joint for a G06 latch housing assembly, performed in accordance with the radiographic procedure as specified in the production order. The inspection team verified that a shooting sketch for the weld joint was prepared and that the Level II NDE inspector performed the pre-radiographic examination test requisites such as surface preparation, selection of image quality indicator (IQI) material, sample designation, determination of thickness and hole size, and position of the IQI with respect to the beam, all of which was performed in accordance with the requirements of the radiographic procedure.

c. Conclusions

The NRC inspection team concluded that WEC's program for the control of special processes is being implemented consistent with Criterion IX, "Control of Special

Processes," of Appendix B to 10 CFR Part 50. Based on the sample of activities reviewed, the NRC inspection team concluded that the WEC QAM and associated fabrication and special process procedures and activities were adequate and being effectively implemented by qualified personnel, using qualified equipment and processes. No significant findings were identified.

8. Test Control

a. Inspection Scope

The NRC inspection team reviewed the WEC policies and implementing procedures that govern test control processes to verify compliance with the requirements of Criterion XI, "Test Control," of Appendix B to 10 CFR Part 50. Specifically, the NRC inspection team reviewed a sample of WEC test control activities related to the AP1000 CRDM assemblies and witnessed the hydrostatic testing for a latch housing assembly.

Within the scope of this area of the inspection, the NRC inspection team reviewed the following policies, procedures, and associated documentation established by WEC:

- WEC QAM, Section 11, "Test Control," Revision 10, dated February 2, 2011
- APP-MV11-Z0-001, "AP1000 Control Rod Drive Mechanism (CRDM) Design Specification," Revision 3, dated May 27, 2010
- TM-TH-062, "Hydrostatic Testing of CRDM Latch Housing Assembly," Revision 1, dated June 24, 2009
- TM-TL-042, "Test Procedure for Step Length and Load Transfer Length Testing of AP1000 CRDM Latch Assembly," Revision 0, dated January 25, 2010

b. Observations and Findings

b.1 Policies and Procedures

The NRC inspection team reviewed Section 11 of the WEC QAM, which describes the test control process and activities for compliance with the applicable ASME Code and contract requirements. Testing requirements and acceptance criteria are specified in production orders or test procedures, and include minimum prerequisites, test instrumentation requirements, test and data acquisition instructions, witness requirements, environmental conditions, acceptance criteria, expected test results, and specifications for the use of calibrated equipment. For ASME Code testing, the tests are witnessed by the ANI. The inspection team reviewed the test control implementing procedures and supporting documentation and verified that they provide adequate guidance for performing the hydrostatic testing activities related to the AP1000 CRDM latch housing assemblies.

The NRC inspection team reviewed WEC design specification APP-MV11-Z0-001, which is supported by a series of testing procedures that provide guidance for key activities associated with the testing of CRDM latch housing assemblies. The sample of implementing procedures reviewed by the NRC inspection team included the following:

- TM-TL-062 provides the necessary guidance for the hydrostatic testing of AP1000 CRDM latch housing assemblies.

- TM-TL-042 provides the necessary guidance for step length and load transfer length testing of AP1000 CRDM assemblies.

- TM-TL-037 provides the necessary guidance for the production testing of AP1000 CRDM latch assemblies and coil stack assemblies.

The inspection team observed a sample of testing activities, as discussed below, and verified adequate implementation of the WEC test control processes and procedures.

b.2 AP1000 CRDM Latch Housing Assembly Hydrostatic Test

The NRC inspection team reviewed the implementing procedures and supporting documentation for hydrostatic testing related to Vogtle latch housing assemblies, and witnessed the testing of a G09 latch housing assembly. The NRC inspection team verified that the hydrostatic test was performed by qualified test personnel, witnessed by a quality control inspector and the ANI, used calibrated test gauges, and certified Grade A water. The inspection team verified that the tester followed the test parameters as outlined in the test procedure.

The NRC inspection team reviewed the test analysis results from the hydrostatic test, as well as the pre-test calibration information from the pressure test gauge and verified that the hydrostatic test was performed in accordance with the requirements of the WEC specifications and the ASME Code, Section III. In addition, the NRC inspection team verified that the pressure test gauge used during testing was calibrated prior to and after the hydrostatic test in accordance with the requirements of the ASME Code and the WEC technical manual.

c. Conclusions

The NRC inspection team concluded that WEC's process for control of the testing program is being implemented consistent with Criterion XI, "Test Control," of Appendix B to 10 CFR Part 50. Based on the sample of activities reviewed, the NRC inspection team concluded that the WEC QAM and associated test control procedures and activities were adequate and being effectively implemented by qualified personnel, using qualified equipment and processes. No significant findings were identified.

9. Control of Measuring and Test Equipment

a. Inspection Scope

The NRC inspection team reviewed the WEC policies and implementing procedures that govern the measuring and test equipment (M&TE) program to verify compliance with the requirements of Criterion XII, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed a sample of WEC M&TE activities related to the AP1000 CRDM assemblies and verified the calibration status of the related equipment.

Within the scope of this area of the inspection, the NRC inspection team reviewed the following policies, procedures, and associated documentation established by WEC:

- WEC QAM, Section 12, “Control of Measuring and Test Equipment,” Revision 10, dated February 2, 2011
- Westinghouse, Newington Operations, Policy/Procedure PP-12-01, “Measuring and Test Equipment Calibration and Issue,” Revision 9, dated July 6, 2011
- Calibration Procedure 11.11, “Calibration of Weld Material Baking and Holding Ovens,” Revision 3, dated September 17, 2010
- Calibration Procedure 11.08, “Calibration of Welding Ammeters and Voltmeters,” Revision 3, dated August 13, 2003
- Calibration Procedure 11.17, “Calibration of Astro Arc-Polysoude AUTOTIG 600 PC,” Revision 0, dated April 20, 2006
- Calibration Procedure 20.02, “Ultrasonic Instrument Linearity Verification,” Revision 4, dated September 12, 2003
- Calibration Procedure 20.03, “Calibration and Operation of Transmission Densitometer,” Revision 4, dated February 27, 2008
- Calibration Procedure 20.07, “Calibration of Image Quality Indicators,” Revision 0, dated March 28, 2011

b. Observations and Findings

b.1 Policies and Procedures

The NRC inspection team reviewed Section 12 of the WEC QAM, which defines the control system used to assure that M&TE necessary for verifying activities affecting quality is maintained, controlled, and calibrated at specified periods to maintain accuracy. The QAM provides details describing the general requirements, equipment control, calibration control, the necessary calibration records and services, and the methods available for dispositioning discrepancies related to M&TE.

The NRC inspection team reviewed PP-12-01, which provides the provisions for M&TE control, calibration, and maintenance of calibration records, as well as for documenting and evaluating discrepant equipment and issuing M&TE for use. The inspection team verified that if M&TE is found to be discrepant (i.e., worn, damaged, or out of calibration), the procedure specifies that a "Hold” tag is placed on the M&TE, the M&TE is segregated when physical size and shape permit, a Measuring and Test Equipment Discrepancy Report is initiated, and an entry is added to the M&TE Discrepancy Report Log. In addition, all items inspected or tested since the last valid calibration for that M&TE are reevaluated for acceptability. The quality inspection supervisor or quality engineering staff evaluates the deficiency, provides a technical justification for acceptance, ensures that all applicable requirements have been met or that the items have been re-inspected or re-tested with M&TE known to be accurate, and documents

the disposition on a Measuring and Test Equipment Discrepancy Report. M&TE Discrepancy Reports are reviewed, evaluated, and approved within 30 days. If a nonconformance is identified on shipped items, a nonconformance report is initiated and the affected customer(s) are notified.

The NRC inspection team reviewed Calibration Procedure 11.11 and verified that the process for performing and documenting calibration, maintaining calibration frequency, and specifying the calibration standards used for calibrating weld material baking and holding ovens is documented and being implemented.

b.2 Implementation of Calibration Activities

The NRC inspection team interviewed the WEC tool crib supervisor regarding the M&TE program, as well as and evaluating a limited sample of calibration records and reviewing the controls established within the WEC calibration laboratory. The inspection team also reviewed the WEC process for control of discrepant M&TE. The NRC inspection team verified that the M&TE sampled at the test facility, welding facility, liquid penetrant inspection and radiographic examination facility had appropriate calibration identification numbers and current calibration dates, including the calibration due date. The NRC inspection team selected a sample of the M&TE used by the quality control inspectors for conducting the final inspections identified on in-process job orders and verified the calibration records for consistency and compliance with procedural requirements.

The NRC inspection team verified that a sample of weld material ovens in the tool crib were identified with unique WEC identification numbers, were calibrated on a three month cycle by qualified maintenance personnel using calibrated standards, and had the as-found and as-left conditions documented in the calibration reports. The NRC inspection team also verified that the calibration status labels on various measuring devices used for manufacturing and testing activities were current.

The NRC inspection team observed activities at the WEC gauge calibration laboratory and verified that the gauge laboratory M&TE were calibrated using procedures and standards traceable to known industry standards. The inspection team also verified that WEC maintained appropriate environmental controls for M&TE. In addition, through interviews with several calibration personnel and review of their qualification records, the NRC inspection team verified that the calibration personnel were knowledgeable and qualified to perform M&TE calibration activities.

The NRC inspection team observed the radiographic examination of a weld joint on a G06 latch housing assembly, which was performed in accordance with Radiographic Procedure TM-RT-001. The Level II NDE inspector verified the calibration status of the M&TE devices used to perform the NDT using the following calibration procedures:

- 20.07, Calibration of Image Quality Indicators
- 20.03, Calibration and Operation of Transmission Densitometer

The inspection team verified that all M&TE devices were identified by a unique M&TE identification number and had a calibration due date within the date range for conducting the radiographic examination. The NRC inspection team observed that the Level II NDE inspector confirmed the calibration status label due dates for the densitometers, IQIs, and step wedge calibration film prior to use. The NRC inspection team also confirmed

with the Level II NDE inspector that periodic verification of the densitometer and step wedge calibration film was performed as required by Section V of the ASME Code.

The NRC inspection team reviewed the WEC process for identification, segregation, and documentation of out-of-calibration equipment. The inspection team verified that out-of-tolerance M&TE are identified, segregated, and controlled using the WEC M&TE database. The NRC inspection team also reviewed a sample of M&TE records for out-of-tolerance equipment, as documented in M&TE discrepancy reports, and verified that the equipment was reviewed and evaluated to determine the validity of previous inspection or test results, as well as to establish the acceptability of those items previously inspected or tested.

c. Conclusions

The NRC inspection team concluded that WEC's M&TE program is being implemented consistent with Criterion XII, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50. Based on the sample of M&TE activities reviewed, the NRC inspection team concluded that WEC established appropriate and effective means to control measuring and test equipment. No significant findings were identified.

10. Control of Nonconforming Materials, Parts, or Components

a. Inspection Scope

The NRC inspection team reviewed the WEC 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. The NRC inspection team reviewed a sample of nonconformance reports, quality notifications, and supplier deviations from contract requirements, and verified that the disposition and control of nonconformances was in accordance with the WEC policies and procedures.

Within the scope of this area of the inspection, the NRC inspection team reviewed the following policies, procedures, and associated documentation established by WEC:

- WEC QAM, Section 15, "Control of Nonconforming Items," Revision 10, dated February 2, 2011
- Westinghouse, Newington Operations, Policy/Procedure PP-15-01, "Nonconformance Reports – Inprocess," Revision 6, dated May 28, 2010
- Westinghouse, Newington Operations, Policy/Procedure PP-15-02, "Supplier Deviation of Contract Requirements (SDCR)," Revision 3, dated December 15, 2010
- Westinghouse, Newington Operations, Policy/Procedure PP-15-03, "Quality Notifications – Incoming," Revision 3, dated April 8, 2011
- Nonconformance Report (NCR) 12391 – Nonconformance Regarding Guide Tubes, dated June 24, 2011

- NCR 12433 – Nonconformance Regarding Core Shroud Vertical Plates, dated July 13, 2011
- NCR 12423 – Nonconformance Regarding Core Shroud Vertical Plates, dated July 1, 2011
- NCR 12360 – Nonconformance Regarding Stationary Latch Plunger, dated May 15, 2011
- NCR 12364 – Nonconformance Regarding Latch Housing Assembly and CAP 11-166-W010, dated May 18, 2011
- NCR 12369 – Nonconformance Regarding Latch Housing Assembly, dated May 25, 2011
- NCR 12264 – Nonconformance Regarding Flux Ring Test , dated May 23, 2011
- NCR 12393 – Nonconformance Regarding Latch Assembly Key, dated June 27, 2011
- Quality Notification (QN) 60041281 – VC Summer unit 2 CRDMs, dated September 29, 2010
- QN 60041946 – Rod Travel Housing Shop, dated November 16, 2010
- QN 60045025 – Latch Housing M&S Shop Labor, dated May 27, 2011
- QN 60041920 – Upper Guide Tube Assembly M&S, dated November 15, 2010
- QN 60042801 – Upper Internals Assembly M&S, dated January 17, 2011
- QN 60041182 – Core Shroud Assembly M&S, dated September 21, 2010
- QN 60044423 – Core Shroud Assembly M&S, dated April 13, 2011
- Supplier Deviation of Contract Requirement List

b. Observations and Findings

b.1 Policies and Procedures

The NRC inspection team reviewed Section 15 of the WEC QAM, which establishes controls to prevent the inadvertent use of nonconforming items or activities. The inspection team verified that these controls provide for the identification, documentation, evaluation, segregation when practical, disposition, and notification to affected organizations of nonconformances. The NRC inspection team also verified that the QA organization initiates a QN or an NCR upon completion of any inspection that identifies a nonconformance, or upon notification from a customer that a deficiency has been identified. A QN is initiated for all nonconformances identified during receipt inspections performed in association with a purchase order. An NCR is initiated for all

nonconformances identified during in-process and final inspections performed in association with a production order.

The NRC inspection team verified that the project engineering organization reviews each QN or NCR, indicates a disposition of "Use-As-Is," "Repair," "Scrap," "Limbo," “Other,” or "Reject – Return to Supplier," clearly defines any required action that is to be taken, and forwards the QN or NCR to the QA organization for verification that the disposition meets the applicable AMSE Code, contract, and QA requirements. The QA staff coordinates a review of the dispositioned QN or NCR with the ANI for all ASME Code work. In addition, the inspection team verified that while the final disposition is being made, the nonconforming material is labeled with a “Hold” tag and, when physical size constraints do not inhibit movement, the nonconforming item is moved to a clearly identified and segregated Hold area in accordance with the WEC QAM and applicable procedures.

The NRC inspection team reviewed Section 15 of the QAM, which requires that suppliers on the QSL maintain a documented system for identifying, documenting, and controlling items which do not conform to WEC purchase order requirements. The inspection team verified that the system is periodically audited during WEC audit and surveillance activities, consistent with the WEC QAM and implementing procedures. The QAM also specifies that suppliers are required to document nonconformances on a supplier deviation of contract requirements (SDCR) form and submit it to supply chain management when requesting acceptance of items that are not in compliance with the WEC purchase order requirements. The NRC inspection team verified that the project engineering and QA organizations dispositioned the SDCRs in accordance with the applicable ASME Code and contract requirements. If the nonconformance violated design requirements, the inspection team also verified that it was submitted to the design engineering organization or the customer for evaluation.

The NRC inspection team reviewed Procedures PP-15-01, PP-15-02, and PP-15-03, which provide the detailed guidance necessary to implement the requirements of Section 15 of the QAM, including the appropriate review of nonconformances, supplier deviations, and quality notifications for potential 10 CFR Part 21 applicability. The inspection team verified that these procedures provide adequate guidance for effectively implementing the applicable requirements of the WEC QAM.

b.2 Implementation of the Nonconformance Process

The NRC inspection team witnessed a receipt inspection and verified the procedures used when an SDCR or a QN is present, as well as touring the shop floor to verify that there are designated areas to segregate and control the various classes of nonconforming materials. For the sample of NCRs, QNs, and SDCRs reviewed, the NRC inspection team verified that the WEC QA processes and procedures implement an adequate program to assess and control nonconforming items, including the identification, documentation, segregation, evaluation, and disposition of these items.

The inspection team also verified that this process properly applies the principles of acceptable, reject, repair, limbo, scrap, or use-as-is, and provides for the applicable technical justifications to be adequately supported and properly documented, including the need for additional design control measures as necessary, commensurate with those applied to the original design. The inspection team verified that NCRs are trended on a

semi-annual basis, and observed that the NCR database functionality allows for repeat occurrences to be noted during the initiation of a nonconformance report.

c. Conclusions

The NRC inspection team concluded that WEC's process for the control of nonconforming materials, parts, or components is being implemented consistent with Criterion XV, "Nonconforming Materials, Parts, or Components," of Appendix B to 10 CFR Part 50. The NRC inspection team concluded that WEC's implementation of the nonconformance process and performance of the activities reviewed as a part of this inspection were adequate and effective. No significant findings were identified.

11. Corrective Actions

a. Inspection Scope

The NRC inspection team reviewed the WEC policies and implementing procedures that govern the corrective action program to verify compliance with the requirements of Criterion XVI, "Corrective Actions," of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed a sample of corrective action program (CAP) issue reports and verified that the CAP provides adequate control of conditions adverse to quality, as well as the means to determine the cause of these conditions and the ability to verify implementation of corrective actions to prevent recurrence.

Within the scope of this area of the inspection, the NRC inspection team reviewed the following policies, procedures, and associated documentation established by WEC:

- WEC QAM, Section 16, "Corrective Action," Revision 10, dated February 2, 2011
- Westinghouse Policy/Procedure WEC 16.2, "Westinghouse Corrective Actions Process," Revision 2, dated February 15, 2010
- Westinghouse Policy/Procedure WEC 16.3, "Corrective Action Review Board," Revision 1, dated July 16, 2009
- Westinghouse Policy/Procedure WEC 16.4, "Root Cause Analysis," Revision 1, dated July 16, 2009
- Westinghouse Policy/Procedure WEC 16.5, "Apparent Cause Analysis," Revision 0, dated November 6, 2008
- Westinghouse, Newington Operations, Policy/Procedure NSNP 16.6, "Long-Term CAP Commitments," Revision 0, dated November 6, 2008
- Westinghouse Policy/Procedure WEC 16.7, "Preventive Action," Revision 1, dated July 16, 2009
- Westinghouse Policy/Procedure WEC 16.8, "Customer Satisfaction," Revision 0, dated February 15, 2010

- Westinghouse Policy/Procedure WEC 16.9, “Trending Process,” Revision 0, dated February 15, 2010

- Westinghouse, Newington Operations, Policy/Procedure PP-12-01, “Measuring and Test Equipment Calibration and Issue,” Revision 7, dated January 23, 2007, Revision 8, dated January 13, 2011, and Revision 9, dated July 6, 2011

- CAP 11-180-W006 – M&TE Items Found Out of Calibration, dated June 29, 2011

- CAP 10-202-W005 – Control of Measuring and Test Equipment, dated July 21, 2010

- CAP 09-190-W005 – Control of Measuring and Test Equipment, dated July 9, 2009

- CAP 11-166-W010 – G06 Latch Housing Machined Too Long, dated June 15, 2011

- CAP 11-197-W001 – 1 Side of UGS Keyway in FAP Cut Off Location, dated July 16, 2011

- CAP 11-197-W002 – Parts Released to Floor Prior to Incoming Inspection, dated July 16, 2011

- CAP 11-197-W003 – Operations Performed Out of Sequence, Past ANI, dated July 16, 2011

- CAP 11-197-W005 – CATPR on RCA 10-236-W010, Not Accepted by the Commitment Owner and Past Due Date, dated July 16, 2011

- CAP 11-199-W001 – ETAPS Notification, dated July 18, 2011

- CAP 10-225-W014 – Improper Packaging of the Vogtle AP1000 Drive Rods, dated August 13, 2010

- CAP 11-024-W007 – B&G Manufacturing Company, dated January 24, 2011

- CAP 11-180-W007 – Improper Tagging of Items in Quality Control Inspection Hold Areas, dated June 29, 2011

b. Observations and Findings

b.1 Policies and Procedures

The NRC inspection team reviewed Section 16 of the WEC QAM, which describes the general requirements for the implementation of a corrective action system. The inspection team verified that the established implementing procedures provide adequate guidance to ensure that conditions adverse to quality are promptly identified, documented, and corrected or otherwise handled in accordance with the WEC procedures and practices and the applicable requirements. The procedures also ensure

that the causes of the conditions adverse to quality are identified and that timely corrective or preventive action is taken to preclude recurrence.

The QAM requires that issue reports be designated with a significance level including Watch/Trend, Medium, or High. The significance level determines the degree of causal analysis and corrective actions taken in response to the item identifed. High significance issues merit an in-depth investigation of cause (root cause analysis) and implementation of corrective actions to prevent recurrence. Level 1 or Level 2 high significance issues receive graduated levels of analysis depth and oversight. Medium significance issues merit causal investigation (apparent cause analysis) and remedial and/or interim corrective actions. Watch/Trend issues neither require root cause or apparent cause analysis; however, remedial corrective actions are taken. The NRC inspection team verified that for each CAP reviewed, the appropriate significance level was assigned and the prescribed level of causal analysis was conducted and documented in accordance with the WEC QAM and applicable procedures.

The NRC inspection team reviewed WEC 16.2, WEC 16.3, NSNP 16.6, WEC 16.7, WEC 16.8, and WEC 16.9, which provide the detailed guidance necessary to implement the requirements of Section 16 of the QAM, including the appropriate review of CAPs for potential 10 CFR Part 21 applicability. Collectively, these procedures also define a process and assign responsibilities to ensure that prompt action is taken throughout all phases of the activities performed by WEC to identify conditions adverse to quality and correct such conditions as soon as practical in order to prevent recurrence. The inspection team verified that these procedures provide adequate guidance for effectively implementing the applicable requirements of the WEC QAM.

The NRC inspection team reviewed the corrective action processes for conditions adverse to quality identified at both WEC and WEC's vendors / suppliers. The inspection team verified that conditions adverse to quality are identified through various means, including, but not limited to, the evaluation of nonconformances identified in NCRs, QNs, or SDCRs, internal and external quality audit results, monitoring reports, field service reports, customer or outside agency audits, or source surveillances. The NRC inspection team also verified that WEC QA engineers evaluate a subcontractor's proposed corrective actions before the subcontractor completes the corrective actions.

b.2 Implementation of the Corrective Action Program

The NRC inspection team verified that the WEC QA processes and procedures implement an adequate program to promptly assess and correct conditions adverse to quality, including the identification, documentation, and disposition of corrective action items, to include a description, cause, current status, and corrective actions taken to prevent recurrence. The NRC inspection team also verified that WEC subcontractors must submit nonconformance reports and proposed corrective actions for approval before implementing corrective actions, and that WEC adequately assesses deficiencies identified or reported by its customers, vendors, or suppliers, and enters them into the nonconformance or corrective action programs, as appropriate.

The NRC inspection team reviewed a sample of WEC CAPs related to both internal and vendor conditions adverse to quality. The inspection team verified that the CAPs provide (1) adequate documentation and description of conditions adverse to quality; (2) an appropriate analysis of the cause of these conditions and the corrective actions taken

to prevent recurrence; (3) direction for review and approval by the responsible authority; (4) a description of the current status of the corrective actions; and (5) the follow-up actions taken to verify timely and effective implementation of the corrective actions. The inspection team also verified that the corrective action process provides an effective interface to WEC's 10 CFR Part 21 program and procedure, and that a management system has been established for the overview of trends for conditions adverse to quality.

The inspection team made an initial observation that there was a potential failure to take adequate corrective action to maintain appropriate calibration status for numerous instruments and machines based on M&TE observations made in three successive WEC internal audits. However, the inspection team subsequently received additional information regarding the newly implemented Welding and Examination Control Process database, and conducted a review of the ongoing activities related to the M&TE corrective actions, which resulted in this observation being invalidated.

c. Conclusions

The NRC inspection team concluded that WEC's process for corrective actions is being implemented consistent with Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50. The NRC inspection team concluded that WEC's implementation of the corrective action process and performance of the activities reviewed as a part of this inspection were adequate and effective. No significant findings were identified.

12. Entrance and Exit Meetings

On July 18, 2011, the NRC inspection team discussed the scope of the inspection with Mr. Michael Lattin, WEC Newington Operations Plant Manager, and other members of the WEC management and staff. On July 22, 2011, the NRC inspection team presented the inspection results and observations during an exit meeting with Mr. Michael Lattin and other WEC staff. The attachment to this report lists the entrance and exit meeting attendees, as well as those individuals interviewed by the NRC inspection team.

ATTACHMENT

1. ENTRANCE / EXIT MEETING ATTENDEES

Name	Title	Affiliation	Entrance	Exit	Interviewed
Alan Friend	RVI Project Team Lead	WEC	X	X	X
Bill Wallace	Engineering Manager, RVIs	WEC	X		
Carl Tyson	Test Engineer	WEC			X
Carrie Monaco	NPP Quality and Continuous Improvement	WEC Cranberry	X	X*	
Christopher Andrews	NDE Level II NDE Inspector	WEC			X
Dan Labbe	Quality Assurance Engineer, RVIs	WEC	X	X	X
David Atkins	QC Inspection Supervisor and M&TE Manager	WEC	X		X
Erik Neff	RT Level II NDE Inspector	WEC			X
Frank Murray	Engineering Manager, CEDMs and CRDMs	WEC	X	X	
Gary Bailey	Manufacturing Tester	WEC			X
Greg Jeanson	Maintenance / Tool Crib Supervisor	WEC			X
James McShane	CRDM Project Team Lead	WEC	X	X	X
Joel Plante	EH&S Manager	WEC	X	X	
Jonathan Booth	Welder	WEC			X
Jonathan Leavitt	Engineering Manger, RCP Design	WEC	X		
Kenneth Fortin	Lead Quality Assurance Engineer	WEC			X
Lisa Plante	Quality Systems Supervisor	WEC	X	X	X
Lonny Pygman	Quality Assurance Engineer	WEC	X	X	X
Lynne Michaud	Document Control / Records	WEC			X
Mark Coburn	Manufacturing Manager	WEC	X	X	X
Mark Hanson	Supply Management Lead	WEC		X	
Mark Kachmar	VP New Plant Operations / Services and Integration	WEC Cranberry		X*	
Mike Lattin	Plant Manager	WEC	X	X	
Ramon Serrano	Engineering Manager, RCPs	WEC		X	
Richard Brillon	Quality Assurance Manager / Level III NDE	WEC	X	X	X
Richard Roberg	Quality Assurance Engineer	WEC	X	X	X
Richard Talbot	Manager IS Regional Services	WEC		X	
Robert Guy	Welding Engineer	WEC			X
Sharon Carignan	Administrative Assistant	WEC			X
Steven Russell	Lead Weld Engineer	WEC	X		X
				* by conference call	

2. INSPECTION PROCEDURES USED

Inspection Procedure 43002, “Routine Inspections of Nuclear Vendors”

Inspection Procedure 36100, “Inspection of 10 CFR Parts 21 and 50.55(e) Programs for Reporting Defects and Noncompliance”