

December 7, 2012

Mr. Gian Marco Lupi, Quality Assurance Manager  
Mangiarotti S.p.A  
Via Timavo, 59  
34704 - Monfalcone (GORIZIA) - Italy

SUBJECT: NUCLEAR REGULATORY COMMISSION INSPECTION REPORT  
NO. 99901416/2012-201 AND NOTICE OF NONCONFORMANCE

Dear Mr. Lupi:

From October 22 - 26, 2012, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Mangiarotti S.p.A (hereafter referred to as Mangiarotti) facility in Monfalcone, Italy. The purpose of this limited-scope routine inspection was to assess Mangiarotti's compliance with the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21, "Reporting of Defects and Noncompliance," and selected portions of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities."

This technically focused inspection evaluated Mangiarotti's quality assurance activities associated with the design, fabrication, assembly, and testing of the accumulators, core makeup tank, passive residual heat removal heat exchanger, and pressurizer for the Westinghouse Electric Company AP1000 reactor design. Some of the activities observed by the NRC inspection team are associated with or directly affect closure of inspections, tests, analyses, and acceptance criteria from Revision 19 of the certified AP1000 design. The NRC inspection team did not identify any findings associated with the ITAAC contained in Section 4 of the attachment to this report. Currently, these ITAAC are incorporated into the combined licenses of Vogtle Units 3 and 4 and V. C. Summer Units 2 and 3. The enclosed report presents the results of this inspection. This NRC inspection report does not constitute the NRC's endorsement of Mangiarotti's overall quality assurance or 10 CFR Part 21 programs.

During this inspection, the NRC inspection team found that Mangiarotti's quality assurance program complies with the applicable requirements of 10 CFR Part 21 and Appendix B to 10 CFR Part 50; however, it did not meet certain NRC requirements that were contractually imposed on Mangiarotti by its customers or NRC licensees. Specifically, the NRC inspection team determined that Mangiarotti was not implementing aspects of its control of purchased equipment, materials, and services program consistent with regulatory requirements. The specific finding and references to the pertinent requirements are identified in the enclosed notice of nonconformance (NON) to this letter, and the enclosed inspection report describes in detail the circumstances surrounding it.

Please provide a written statement or explanation within 30 days from the date of this letter in accordance with the instructions specified in the enclosed NON. The NRC will consider extending the response time if Mangiarotti shows good cause for the agency to do so.

In accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System, which is accessible from the NRC Web site at: <http://www.nrc.gov/reading-rm/adams.html>.

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

Sincerely,

*/RA/*

Edward H. Roach, Chief  
Mechanical Vendor Branch  
Division of Construction Inspection  
and Operational Programs  
Office of New Reactors

Docket No.: 99901416

Enclosures:

1. Notice of Nonconformance
2. Inspection Report No. 99901416/2012-201 and Attachment

In accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System, which is accessible from the NRC Web site at: <http://www.nrc.gov/reading-rm/adams.html>.

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Docket No.: 99901416

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2. Inspection Report No. 99901416/2012-201  
and Attachment

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**NRO-002**

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<b>NAME</b>	YDiaz-Castillo	AArmstrong	DBollock	TSteadham
<b>DATE</b>	11/26/2012	11/26/2012	11/26/2012	11/26/2012
<b>OFFICE</b>	NRO/DCIP/CAEB	NRO/DCIP/CITB	NRO/DCIP/CMVB	
<b>NAME</b>	TFrye	MKowal	ERoach	
<b>DATE</b>	11/29/2012	12/07/2012	12/04/2012	

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## NOTICE OF NONCONFORMANCE

Mangiarotti S.p.A  
Via Timavo, 59  
34074 - Monfalcone (GORIZIA) - Italy

Docket No. 99901416  
Report No. 2012-201

Based on the results of a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the Mangiarotti S.p.A (hereafter referred to as Mangiarotti) facility in Monfalcone, Italy, from October 22 through October 26, 2012, it appears that Mangiarotti did not conduct certain activities in accordance with NRC requirements that were contractually imposed upon Mangiarotti by its customers or by NRC licensees.

Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B, "Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," states, in part, that "measures shall be established to ensure that purchased material, equipment, and services conform to the procurement documents. These measures shall include provisions, as appropriate, for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor, inspection at the contractor or subcontractor source, and examination of products upon delivery. The effectiveness of the control of quality by contractors and subcontractors shall be assessed by the applicant or designee at intervals consistent with the importance, complexity, and quantity of the product or services."

Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50 states, in part, that "a comprehensive system of planned and periodic audits shall be carried out to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program."

Contrary to the above, as of October 26, 2012, Mangiarotti failed to perform an adequate evaluation of its commercial calibration suppliers and failed to adequately verify that its suppliers complied with all aspects of its quality assurance program.

Specifically,

1. Mangiarotti placed its international commercial calibration suppliers on its safety-related qualified vendors list based on the accreditation provided through ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories," by the American Association for Laboratory Accreditation or another domestic accrediting body. ISO/IEC 17025 accreditation shall not be used as the sole basis for qualifying safety-related calibration services. As stated in Section L.8.h of NRC's "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition – Quality Assurance," dated March 2007, NRC's recognition of the International Laboratory Accreditation Cooperation accreditation process is only limited to U.S. domestic calibration service suppliers, not to international calibration suppliers.
2. Mangiarotti did not document the objective evidence necessary to confirm that the relevant quality criteria of external audits performed of a filler material and two forging providers were adequately verified.

These issues have been identified as Nonconformance 99901416/2012-201-01.

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

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

Dated this 7th day of December 2012.

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

Docket No.: 99901416

Report No.: 99901416/2012-201

Vendor: Mangiarotti S.p.A  
Via Timavo, 59  
34074 - Monfalcone (GORIZIA) - Italy

Vendor Contact: Mr. Gian Marco Lupi, Quality Manager  
E-mail: lupi.gianmarco@mangiarotti.it  
Phone: (+39) 0481-254628

Nuclear Industry Activity: Mangiarotti S.p.A (hereafter referred to as Mangiarotti) is an American Society of Mechanical Engineers (ASME) Nuclear Stamp Holder currently manufacturing ASME Class 1 components under contract to Westinghouse Electric Company for use in future AP1000 commercial nuclear power plants in the United States. Previously, Mangiarotti provided replacement steam generators and other components to U.S. utilities.

Inspection Dates: October 22 - 26, 2012

Inspection Team Leader: Yamir Diaz-Castillo NRO/DCIP/CMVB

Inspection Team Members: Aaron R. Armstrong NRO/DCIP/CMVB  
Douglas R. Bollock NRO/DCIP/CEVB  
Timothy Steadham RGN II/DCP/CPB4

Approved by: Edward H. Roach, Chief  
Mechanical Vendor Branch  
Division of Construction Inspection  
and Operational Programs  
Office of New Reactors

## EXECUTIVE SUMMARY

Mangiarotti S.p.A  
99901416/2012-201

The U.S. Nuclear Regulatory Commission (NRC) conducted this inspection to verify that Mangiarotti S.p.A (hereafter referred to as Mangiarotti) implemented an adequate quality assurance (QA) program that complies with the requirements of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities." In addition, the NRC inspection also verified that Mangiarotti implemented a program under 10 CFR Part 21, "Reporting of Defects and Noncompliance," that met the NRC's regulatory requirements. The NRC inspection team conducted the inspection at the Mangiarotti facility in Monfalcone, Italy from October 22 - 26, 2012.

This technically focused inspection evaluated Mangiarotti's quality assurance activities associated with the design, fabrication, assembly, and testing of the accumulators (ACC), core makeup tank (CMT), passive residual heat removal heat exchanger (PRHRHX), and pressurizer (PZR) for the Westinghouse Electric Company (WEC) AP1000 reactor design. Some of the activities observed by the NRC inspection team are associated with or directly affect closure of inspections, tests, analyses, and acceptance criteria (ITAAC) from Revision 19 of the certified AP1000 design. The NRC inspection team did not identify any findings associated with the ITAAC contained in Section 4 of the attachment to this report. Currently, these ITAAC are incorporated into the combined licenses of Vogtle Units 3 and 4 and V. C. Summer Units 2 and 3.

Some of the specific activities observed by the NRC inspection team include:

- Daily CMT production meeting in which the nonconformances or hold points on each CMT component currently being manufactured are reviewed
- Receipt inspection of the PZR's shell components for Levy County Nuclear Power Plant (hereafter referred to as Levy County) Unit 1
- Manual gas tungsten arc welding (GTAW) of the CMT's closure port of the cap and nozzle for VC Summer Nuclear Generating Station (hereafter referred to as VC Summer) Unit 2
- Manual shield metal arc welding (SMAW) of the PRHRHX's lower tube sheet for VC Summer Unit 3
- Mechanized GTAW of the PZR's shell head for Levy County Unit 1
- Nozzle welding of the CMT for Levy County Unit 2
- Tensile test of a sample of stainless steel material used in the PRHRHX
- Dye penetrant testing of the ACC's manway nozzle internal surface after machining for VC Summer Unit 3

- Dye penetrant testing of the internal cladding for the Vogtle Electric Generating Plant (hereafter referred to as Vogtle) Unit 4 CMT
- Magnetic particle testing of the circumferential shell weld for the Vogtle Unit 3 ACC

In addition to observing these activities, the NRC inspection team verified that measuring and test equipment (M&TE) was properly identified, marked, calibrated and used within its calibrated range. In addition, the NRC inspection team walked down Mangiarotti's assembly floor and verified that nonconforming components were properly identified, marked, and segregated when practical, to ensure that they were not reintroduced into the manufacturing processes.

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

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

During the course of this inspection, the NRC inspection team implemented Inspection Procedure (IP) 43002, "Routine Inspections of Nuclear Vendors," dated April 25, 2011, and IP 36100, "Inspection of 10 CFR Part 21 Programs for Reporting Defects and Noncompliance," dated February 13, 2012.

This was the first NRC inspection of Mangiarotti's facility in Monfalcone, Italy. The NRC conducted an inspection at Mangiarotti's facility in Sedegliano, Italy, in July 2010, and it documented the results in Inspection Report 99901393/2010-201, dated September 29, 2010. The report documented three nonconformances to NRC requirements that were contractually imposed upon Mangiarotti by its customers. This inspection report documents the NRC's followup on Mangiarotti's implementation of corrective actions for these issues.

With the exception of the nonconformance described below, the NRC inspection team concluded that Mangiarotti's quality assurance policies and procedures comply with the applicable requirements of 10 CFR Part 21 and Appendix B to 10 CFR Part 50, and that Mangiarotti's 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 Mangiarotti is implementing its 10 CFR Part 21 program in accordance with the regulatory requirements of 10 CFR Part 21. Based on the limited sample of documents reviewed, the NRC inspection team also determined that Mangiarotti is implementing its policies and procedures associated with the 10 CFR Part 21 program. No findings of significance were identified.

#### Design Control

The NRC inspection team concluded that Mangiarotti is implementing its design control program in accordance with the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that Mangiarotti is implementing its policies and procedures associated with the design control program. No findings of significance were identified.



### Oversight of Contracted Activities

The NRC inspection team issued Nonconformance 99901416/2012-201-01 in association with Mangiarotti's failure to implement the regulatory requirements of Criterion VII, "Control of Purchased Equipment, Material, and Services," and Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50. Nonconformance 99901416/2012-201-01 cites Mangiarotti for failing to control its suppliers adequately. Specifically, Mangiarotti placed its commercial calibration suppliers on its safety-related approved suppliers list based on the accreditation provided by ISO/IEC 17025 and did not document the objective evidence necessary to confirm that the relevant quality criteria of external audits performed on a filler material and two forging providers were verified adequately.

### Control of Special Processes

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

### Control of Measuring and Test Equipment

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

### Nonconforming Materials, Parts, or Components

The NRC inspection team concluded that Mangiarotti is implementing its nonconforming materials, parts, or components program in accordance with the regulatory requirements of Criterion XV, "Nonconforming Materials, Parts, or Components," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that Mangiarotti is implementing its policies and procedures associated with the control of nonconforming materials, parts, or components. No findings of significance were identified.

### Corrective Action

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

## **REPORT DETAILS**

The U.S. Nuclear Regulatory Commission (NRC) inspection team observed various activities related to Mangiarotti's quality assurance activities associated with the design, fabrication, assembly, and testing of the accumulators (ACC), core makeup tank (CMT), passive residual heat removal heat exchanger (PRHRHX), and pressurizer (PZR) for the Westinghouse Electric Company (WEC) AP1000 pressurized water reactor design. Some of the activities observed by the NRC inspection team are associated with or directly affect closure of inspections, tests, analyses, and acceptance criteria (ITAAC) from Revision 19 of the certified AP1000 design. The NRC inspection team did not identify any findings associated with the ITAAC contained in Section 4 of the attachment to this report. Currently, these ITAAC are incorporated into the combined licenses of Vogtle Units 3 and 4 and V. C. Summer Units 2 and 3. The NRC inspection team performed field measurements and reviewed documentation that may be used to determine acceptable closure of ITAAC.

Some of the specific activities observed by the NRC inspection team include:

- Daily CMT production meeting in which the nonconformances or hold points on each CMT component currently being manufactured are reviewed
- Receipt inspection of the PZR's shell components for Levy County Nuclear Power Plant (hereafter referred to as Levy County) Unit 1
- Manual gas tungsten arc welding (GTAW) of the CMT's closure port of the cap and nozzle for V.C. Summer Nuclear Generating Station (hereafter referred to as VC Summer) Unit 2
- Manual shield metal arc welding (SMAW) of the PRHRHX's lower tube sheet for VC Summer Unit 3
- Mechanized GTAW of the PZR's shell head for Levy County Unit 1
- Nozzle welding of the CMT for Levy County Unit 2
- Tensile test of a sample of stainless steel material used in the PRHRHX
- Dye penetrant testing of the ACC's manway nozzle internal surface after machining for VC Summer Nuclear Generating Station Unit 3
- Dye penetrant testing of the internal cladding for the Vogtle Electric Generating Plant (hereafter referred to as Vogtle) Unit 4 CMT
- Magnetic particle testing of the circumferential shell weld for the Vogtle Unit 3 ACC

In addition to observing these activities, the NRC inspection team verified that measuring and test equipment (M&TE) was properly identified, marked, calibrated and used within its calibrated range. In addition, the NRC inspection team walked down Mangiarotti's assembly floor and verified that nonconforming components were properly identified, marked, and segregated when practical, to ensure that they were not reintroduced into the manufacturing processes.

## 1. 10 CFR Part 21 Program

### a. Inspection Scope

The NRC inspection team reviewed Mangiarotti's policies and implementing procedures that govern Mangiarotti's Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21, "Reporting of Defects and Noncompliance," program to verify compliance with the regulatory requirements. In addition, the NRC inspection team evaluated the 10 CFR Part 21 postings and a sample of Mangiarotti's purchase orders (POs) for 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." Furthermore, the NRC inspection team discussed the 10 CFR Part 21 program with Mangiarotti's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

### b. Observations and Findings

#### b.1 10 CFR Part 21 Policies and Procedures

The NRC inspection team verified that Mangiarotti has effectively implemented the requirements in 10 CFR 21.21 for evaluating deviations and failures to comply associated with substantial safety hazards, and that Mangiarotti's procedures incorporated the appropriate timelines for evaluation and reporting identified in 10 CFR Part 21. In addition, the NRC inspection team verified that Mangiarotti's nonconformance and corrective action procedures provided a link to the 10 CFR Part 21 program as applicable. Mangiarotti's procedures contain the requirements in 10 CFR 21.21 for directors or responsible officers to notify the NRC of identified defects or failures to comply associated with substantial safety hazards.

The NRC inspection team verified that Mangiarotti's procedures provide the guidance and organizational structure necessary to implement the requirements of 10 CFR Part 21 and associated with timely identification, evaluation, reporting of defects and failures to comply which could create a substantial safety hazard. The NRC inspection team also verified that the procedures define applicable terms consistent with the terminology defined in 10 CFR Part 21 and provide the necessary guidance to assess deviations and failures to comply in an effective and timely manner in accordance with the regulatory requirements.

The NRC inspection team reviewed a sample of nonconformance and corrective action reports to verify that each of the programs that can be used to identify defects and failures to comply is being implemented consistently with the requirements of 10 CFR Part 21. The NRC inspection team noted that Mangiarotti's procedures provided links to the 10 CFR Part 21 program.

In addition, the NRC inspection team also reviewed a sample Mangiarotti purchase orders (POs) and verified that each procurement document specified, when applicable, that the provisions for reporting of defects and noncompliances were required in accordance with 10 CFR Part 21.

#### b.2 10 CFR Part 21 Evaluations

Mangiarotti informed the NRC inspection team that Mangiarotti has not shipped any safety related components at the time of this inspection; therefore, Mangiarotti has not performed 10 CFR Part 21 evaluations. The NRC inspection team discussed with Mangiarotti's management

and technical staff the 10 CFR Part 21 program and verified that Mangiarotti's quality assurance manual (QAM) and implementing procedures for corrective action and nonconformance provide adequate instructions to identify any defects or failures to comply that could create a substantial safety hazard.

### b.3 10 CFR Part 21 Postings

The NRC inspection team verified the content of Mangiarotti's 10 CFR Part 21 postings, as well as the location of each posting. The NRC inspection team verified that the information required by 10 CFR 21.6 was included on the postings distributed throughout the Monfalcone, Italy complex. The NRC inspection team walked down each of the locations and also verified that Mangiarotti posted the required documents in conspicuous locations consistent with the intent of 10 CFR 21.6(2).

### c. Conclusion

The NRC inspection team concluded that Mangiarotti is implementing its 10 CFR Part 21 program in accordance with the regulatory requirements of 10 CFR Part 21. Based on the limited sample of documents reviewed, the NRC inspection team also determined that Mangiarotti is implementing its policies and procedures associated with the 10 CFR Part 21 program. No findings of significance were identified.

## 2. Design Control

### a. Inspection Scope

The NRC inspection team reviewed Mangiarotti's policies and implementing procedures that govern the design control program to verify compliance with the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50, as well as the requirements of Section III, "Rules for Construction of Nuclear Facility Components," Subsection NCA, "General Requirements for Division 1 and Division 2 Rules for Construction of Nuclear Facility Components," Subsection NB, "Class 1 Components," 1998 Edition, 2000 Addenda of the American Society of Mechanical Engineers (ASME) Code. In addition, the NRC inspection team reviewed documentation and observed activities associated with ITAACs 2.2.03.08c.xi and 2.2.03.08c.vi.02. Furthermore, the NRC inspection team also discussed the design control program with Mangiarotti's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

### b. Observations and Findings

#### b.1 Design Control Process

Mangiarotti's QAM describes the design control process in accordance with the applicable regulatory and ASME Code requirements. The NRC inspection team confirmed that Mangiarotti's design control process provides controls for design inputs, outputs, analyses, records, and interface between WEC and Mangiarotti.

Mangiarotti's design control process includes the development of quality control plans (QCPs), design control plans (DCPs) and fabrication control plans (FCPs). Each component being fabricated receives a QCP, a DCP, and an FCP. QCPs include a listing of the appropriate drawings and the specific DCP and FCP for each subcomponent. Mangiarotti's staff uses the

DCPs and FCPs during the fabrication process of each subcomponent for specific jobs such as nozzle weld work, grinding or nondestructive examination (NDE). The NRC inspection team verified that these documents are properly controlled and staged with each subcomponent on the production floor and are easily accessible.

The NRC inspection team verified that the WEC AP1000 procurement specifications were properly translated into Mangiarotti's specification sheets, drawings, procedures, analyses, calculations, and instructions and that engineering data supported this information. The specifications verified included material specifications, applicable ASME Code construction requirements, qualification reports, test requirements, and test reports. All documents reviewed contained the appropriate technical details and met the WEC AP1000 procurement specifications.

During Mangiarotti's fabrication of the AP1000 components, any deficiencies in the design, or design enhancements are first determined by Mangiarotti's engineering and quality assurance staff. Since WEC controls the design for all the AP1000 components, any noted deficiencies or enhancements are recorded in a WEC Engineering and Design Coordination Report (EDCR). Mangiarotti's engineering and quality assurance staff review the EDCRs and then send them to WEC for further review and approval. Once WEC approves the design changes, they are returned to Mangiarotti and incorporated into the DCPs and FCPs as applicable. The NRC inspection team reviewed an EDCR related to the level measurement nozzle for the ACC. Although WEC did not approve this design enhancement at the time of the inspection, the NRC inspection team confirmed that the EDCR contained all the required information in accordance with Mangiarotti's procedures.

During the review of the QCP for the welding process used for the PRHRHX tube sheet to channel head, the NRC inspection team noted a discrepancy. As part of its verification process, Mangiarotti used design calculation report HX-CNP-10-001, "Thermal and Thermomechanical Analysis of the Welding Joint 'CW005' Between Tubesheet and Channel Head during the PWHT." The NRC inspection team reviewed the calculation and noted that the software used to perform the calculations was ANSYS 11.0, a commercial software. The NRC inspection team reviewed Mangiarotti's qualification of the software and confirmed that it was performed in accordance with PGE.27, "Design Computer Software and Program Management," Edition 1, Revision 0, and "ANSYS 11.0 SP1 Computer Program Qualification Windows XP Professional INTEL 586 Processor," Revision 0, dated June 19, 2008. The NRC inspection team verified that these procedures assured that the calculation program was adequately validated and verified by manual verification as documented in calculation W1-SPG-00-00-038 "Post Weld Heat Treatment for the Circumferential Weld of the Channel Head to the Tubesheet," Revision 3, dated March 29, 2011. In addition, the NRC inspection team confirmed that the process allows for any error notices affecting issued documents to be evaluated for reportability under Mangiarotti's 10 CFR Part 21 program.

The NRC inspection team confirmed that (1) design documents specified and included the appropriate quality standards, (2) WEC and Mangiarotti were coordinating sufficiently on the design of the AP1000 components, (3) Mangiarotti was integrating and performing independent verifications and checks into the process; and (4) it was effectively controlling and implementing design changes.

## b.2 Inspections, Testing, Analyses, and Acceptance Criteria

The flow area of the CMT inlet diffuser is associated with ITAAC 2.2.03.08c.xi, which states that “The CMT inlet diffuser has a flow area  $\geq 165$  in<sup>2</sup> [square inches].” The NRC inspection team measured accessible dimensions associated with the inlet flow area for the Vogtle Unit 3 CMTs inlet flow diffusers. All dimensions measured were within allowable tolerances as specified in the applicable drawing. In addition, the NRC inspection team reviewed the results of completed dimensional tests associated with the inlet flow area for the CMT for Vogtle’s Unit 3 inlet flow diffuser as documented on inspection report N021-DT-W3-PCF-30-09-007-02, “Dimensional Test Report for Vogtle-3, Core Make-Up Tank 1 Inlet Diffuser,” Revision 0, dated December 28, 2011, to determine if the NRC inspection team’s measurements were consistent with the measurements that Mangiarotti documented. Based on information above, the NRC inspection team verified that the as-built flow areas for the Vogtle Unit 3 CMTs exceeded 165 in<sup>2</sup> as ITAAC 2.2.03.08c.xi requires.

The NRC inspection team also reviewed the results of the dimensional test report for the VC Summer Unit 3 ACC to determine if the external diameter was in compliance with the specified tolerances, associated with ITAAC 2.2.03.08c.vi.02, which states, in part, that “The calculated volume of each of the following tanks is as follows: 2. Accumulators  $\geq 2000$  ft<sup>3</sup>.” The NRC inspection team noted that although the external diameter was within the required tolerances, Mangiarotti did not record the actual internal diameter as its customer did not require it. To ascertain the approximate internal volume, the NRC inspection team reviewed the shell plate material thicknesses as documented on CoC 210029-16, dated October 24, 2011, and found no discrepancies.

## c. Conclusion

The NRC inspection team concluded that Mangiarotti is implementing its design control program in accordance with the regulatory requirements of Criterion III, “Design Control,” of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that Mangiarotti is implementing its policies and procedures associated with the design control program. No findings of significance were identified.

## 3. Oversight of Contracted Activities

### a. Inspection Scope

The NRC inspection team reviewed Mangiarotti’s policies and implementing procedures that govern the implementation of Mangiarotti’s oversight of contracted activities to verify compliance with the requirements of Criterion IV, “Procurement Document Control,” 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 POs, external and internal audits, and receipt inspection records to evaluate compliance with Mangiarotti’s program and technical requirements. In addition, the NRC inspection team reviewed the disposition of corrective actions to resolve deficiencies that audit findings identified for adequacy and timeliness. Furthermore, the NRC inspection team discussed the oversight of contracted activities with Mangiarotti’s management and technical staff. The NRC inspection also reviewed documentation and observed activities associated with ITAACs 2.2.03.02a and 2.1.02.02a. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

## b. Observations and Findings

### b.1 Procurement Document Control

The NRC inspection team verified that the POs adequately documented the procurement requirements that Mangiarotti's governing policies and implementing procedures established, which include (1) imposition of appropriate quality, technical, and regulatory requirements, and (2) identification of the applicable codes and standards. The NRC inspection team also found that these POs adequately defined contract 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 confirmed that all of the safety-related POs reviewed included clauses invoking the provisions of 10 CFR Part 21, and required that the vendor or supplier to conduct safety-related work under its approved quality assurance program.

### b.2 Maintenance of the Qualified Vendors List

The NRC inspection team reviewed Mangiarotti's qualified vendors list (QVL), to ensure that (1) qualified and approved suppliers were listed, (2) authorized personnel maintained, distributed, and periodically updated the list, and (3) any revisions to the list were implemented following the process specified in the QAM and the applicable procedures. The NRC inspection team confirmed that the QVL documented (1) the vendor's name, (2) the scope of qualification, (3) limitations and restrictions, if necessary, (4) the date that reapproval is due, and (5) the vendor's quality program. The NRC inspection team also confirmed that, for the sample of vendors selected, Mangiarotti performed supplier audits and surveys as required and implemented corrective actions related to these audits in a timely manner.

However, during the review of Mangiarotti's QAM; the NRC inspection team noted that it does not require calibration service suppliers to be evaluated before acceptance of material, equipment, or services. Specifically, Mangiarotti's QAM states, in part, that "Calibration laboratories certified in accordance with ISO-17025:2005 by an organization recognized by the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) may be used as suppliers of calibration services without survey or audit providing the following requirements are met: (a) The accreditation is to ANSI/ISO/IEC 17025:2005, "General Requirements for the Competence of Testing and Calibration Laboratories"; (b) The published scope of accreditation for the calibration laboratory covers the needed measurement parameters, ranges and uncertainties; (c) Procurement documents shall specify that the calibration certificate/report shall include identification of the laboratory equipment/standards used and shall include as-found and as-left data; and (d) Laboratory Personnel shall be responsible for reviewing objective evidence for conformance to procurement documents. "

The accreditation provided by ILAC shall not be used as the sole basis for qualifying safety-related calibration services. The NRC staff has determined that, for procurement of commercial-grade calibration services for safety-related applications, laboratory accreditation programs administered by any of the U.S. domestic accreditation services provided by a domestic accrediting body, as recognized through the ILAC MRA, are acceptable in place of a commercial-grade survey as part of the commercial-grade dedication process when all of the requirements described in the Arizona Public Service (APS) Company safety evaluation report (SER) (Agencywide Documents Access and Management System (ADAMS) Accession No.

ML052710224) are met. The NRC expanded this guidance to include the use of domestically accredited calibration laboratories by suppliers and subsuppliers in a letter from the agency to Ms. Sherry Grier, Nuclear Procurement Issues Committee (NUPIC) Chairman, dated June 6, 2006 (ADAMS Accession No. ML061580350). This letter provides the same guidance for augmenting the laboratories' domestic accreditation when using their services in activities governed by the requirements of Appendix B to 10 CFR Part 50, and 10 CFR Part 21.

The requirements for invoking this alternative are:

- The alternative method is documented in the quality assurance description
- Accreditation is provided by one of the six ILAC domestic accrediting bodies
- The scope of the accreditation covers the contracted services
- Purchase documents should: (1) require the use of the laboratory's ISO 17025, "General Requirements for the Competence of Testing and Calibration Laboratories" accredited quality program, (2) impose additional technical requirements identified in the evaluation, (3) require reporting of as-found calibration data when calibrated items are found to be out-of-tolerance, and (4) require identification of the laboratory equipment and standards used.

The NRC inspection team verified that Mangiarotti met the conditions described in the APS SER for using the ILAC accreditation in lieu of commercial-grade surveys as part of a commercial-grade dedication process. However, as stated in Section L.8.h of NRC's "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition – Quality Assurance," dated March 2007, NRC's recognition of the ILAC accreditation process is only limited to U.S. domestic calibration service suppliers, not to international calibration suppliers. The NRC inspection team identified this issue as an example of Nonconformance 99901416/2012-201-01 for Mangiarotti's failure to control its suppliers adequately. Mangiarotti initiated CAR No. 318 to address this issue.

### b.3 External Audits

The NRC inspection team reviewed a sample of external and internal audits to verify the implementation of Mangiarotti's audit program. The NRC inspection team verified that audit plans identifying the audit scope, focus, and applicable checklist criteria were prepared and approved before the initiation of the audit activity. In addition, the NRC inspectors verified that qualified lead auditors and auditors performed the external audits. During the checklists review, the NRC inspection team noted that for three of the seven external audits reviewed, the checklists failed to document the objective evidence necessary to confirm that the relevant quality criteria were verified adequately. The audits for which there was no objective evidence were for two forging suppliers and one filler material supplier. This issue has been identified as another example of Nonconformance 99901416/2012-201-01 for Mangiarotti's failure to control its suppliers adequately. Mangiarotti initiated CAR No. 336 to address this issue.

For audits that resulted in findings, the NRC inspection team verified that the supplier established a plan of corrective action and that Mangiarotti reviewed and approved the corrective action(s) and verified satisfactory completion and proper documentation in a timely manner.



The NRC inspection team also confirmed that Mangiarotti performed external audits commensurate with the required frequencies specified in Mangiarotti's QAM, associated procedures and the applicable section of the ASME Code.

#### b.4 Receiving Inspection

Mangiarotti performs receiving inspections on all incoming material to ensure that all of the PO requirements have been met. Initial receipt inspection confirms that the material delivered is consistent with the supplier's documentation, that all required paperwork, such as certified of material test reports (CMTRs) or certificates of conformance (CoCs) are included, and that the shipment is free of any signs of shipping damage that may affect the quality of the components being received. Other characteristics include, but are not limited to, configuration, identification, dimensional, physical characteristics, and cleanliness. Documented results of this inspection, including the item quantity, receiver number, lot number, and receipt date, as applicable, are recorded

The NRC inspection team witnessed the receiving inspection of the shell components to be used in the fabrication of the PZR for Levy County Unit 1. The NRC inspection team discussed the inspection plan with the quality control inspector (QCI) and observed that the QCI verifies dimensional aspects of the components, identifies item heat number and part number, and verifies the existence of a CoC and a CMTR for the chemical and physical analyses for each specimen.

The NRC inspection reviewed eight CMTRs on the following items that were receipt inspected and determined that the chemical composition and mechanical properties met the requirements of Subsection NB and Section III of the ASME Code:

- Hydrostatic test closure port cap (heat number 116165) and nozzle (heat number NFOR010142) for the VC Summer Unit 2 CMT as indicated on weld map W3-WB-00-00-001, Revision 6, associated with ITAAC 2.2.03.02a; which states that "The ASME Code Section III design reports exist for the as-built components identified in Table 2.2.3-1 as ASME Code Section III."
- Manway nozzle item 14-04/1 (heat number H10000199) for the VC Summer Unit 3 ACC as indicated on drawing W4-DWF-00-00-002, Revision 8, associated with ITAAC 2.2.03.02a,
- Sphere shell plates (6 petals) for the VC Summer Unit 3 ACC, as described on CoC 210029-16, dated October 24, 2011, associated with ITAAC 2.2.03.08c.vi.02,
- Welding electrode (lot number 1121011) being used on the Vogtle Unit 4 PRHRHX, associated with ITAAC 2.2.03.02a;
- Welding electrode (lot number 1121011) being used on the Levy County CMTs, associated with ITAAC 2.2.03.02a,
- Welding electrode (lot number 0281012) being used on the Levy County CMT, associated with ITAAC 2.2.03.02a,

- Welding electrode (lot number 132283) being used on the Levy County PZR, associated with ITAAC 2.1.02.02a; which states that “The ASME Code Section III design report exists for the as-built components identified in Table 2.1.2-1 as ASME Code Section III.”
- Welding electrode (lot number 341461008) being used on the Levy County PZR, associated with ITAAC 2.1.02.02a.

#### b.5 Qualification and Training of Auditors and Lead Auditors

The NRC inspection team reviewed a sample of the training and qualification records of Mangiarotti’s lead auditors and auditors and confirmed that auditing personnel had completed all required training and maintained qualification and certification in accordance with Mangiarotti’s policies and procedures. The NRC inspection team also verified that audit teams that Mangiarotti selected were sufficiently qualified to evaluate areas within the scope of the audit.

#### c. Conclusion

The NRC inspection team issued Nonconformance 99901416/2012-201-01 in association with Mangiarotti’s failure to implement the regulatory requirements of Criterion VII, “Control of Purchased Equipment, Material, and Services,” and Criterion XVIII, “Audits,” of Appendix B to 10 CFR Part 50. Nonconformance 99901416/2012-201-01 cites Mangiarotti for failing to control its suppliers adequately. Specifically, Mangiarotti placed its commercial calibration suppliers on its safety-related approved suppliers list based on the accreditation provided by ISO/IEC 17025 and did not document the objective evidence necessary to confirm that the relevant quality criteria of external audits performed on a filler material and two forging providers were verified adequately.

#### 4. Control of Special Processes

##### a. Inspection Scope

The NRC inspection team reviewed Mangiarotti’s policies and implementing procedures that govern the control of special processes to verify compliance with the regulatory requirements of Criterion IX, “Control of Special Processes,” of Appendix B to 10 CFR Part 50, Section III, Section V, “Nondestructive Examination,” and Section IX, “Welding and Brazing Qualification,” of the ASME Code, 1998 Edition, 2000 Addenda. Specifically, the NRC inspection team reviewed a sample of activities related to special processes, including welding and nondestructive testing. In addition, the NRC inspection team discussed the control of special processes program with Mangiarotti’s management and technical staff. Furthermore, the NRC inspection team reviewed documentation and observed activities associated with ITAAC 2.2.03.03a. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

##### b. Observations and Findings

###### b.1 Welding Process

The NRC inspection team observed various production welding activities, which included (1) manual GTAW of the CMT’s closure port of the cap and nozzle, (2) manual SMAW of the PRHRHX’s lower tube sheet, (3) mechanized GTAW of the PZR’s shell head, and (4) Nozzle

welding of the CMT. The NRC inspection team determined that these welding activities were performed within the parameters permitted in the applicable welding procedure specification (WPS) and in accordance with the controlled weld traveler, which included the appropriate references to procedures, drawings, and quality control (QC) points.

The NRC inspection team also selected a sample of WPS and the applicable procedure qualification records (PQRs) and determined that they were prepared in accordance with the requirements of Section IX of the ASME Code and the applicable Mangiarotti policies and procedures. The NRC inspection team also verified that the WPSs specified all the applicable essential variables referenced in Section IX of the ASME Code and that the specific range of values of the WPS variables were obtained from one or more PQRs.

The NRC inspection team interviewed QC personnel to ensure that adequate checks were performed on the weld joints before welding. The NRC inspection team also verified the weld monitoring logs to confirm that the required measurements were taken to ensure that essential variables such as heat input were monitored, recorded, reviewed and within allowable ranges in accordance with the applicable WPS.

The NRC inspection team determined that welding on ASME Code materials and fabrication of ASME Code items is performed by qualified welders in accordance with approved WPSs. The NRC inspection team also confirmed that for a sample of CMTRs; the reports complied with the chemical composition and mechanical properties as required by Subsection NB and Section III of the ASME Code.

#### b.2 Control of Weld Material

The NRC inspection team observed that Mangiarotti clearly identified the welding materials and that it retained identification of acceptable material throughout storage, handling, and use until the material was actually consumed in the welding process. The NRC 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.

Based on interviews with craft personnel and welding operators, as well as direct observation and review of Mangiarotti's PGE.29, "Storage, Maintenance, and Distribution of Welding Materials," the NRC inspection team determined that Mangiarotti is effectively implementing its weld material control program in accordance with Section IX of the ASME Code and Mangiarotti's its procedures.

#### b.3 Nondestructive Examination

The NRC inspection team witnessed a number of NDE processes, including dye penetrant testing for the manway nozzle of the ACC for VC Summer Unit 3, dye penetrant testing for the internal cladding of the CMT for Vogtle Unit 4, and magnetic particle testing for the circumferential shell weld for the ACC for Vogtle Unit 3.

For each of the tests witnessed, the NRC inspection team confirmed that Mangiarotti performed the NDE processes using qualified procedures, certified NDE inspectors, approved NDE materials, and calibrated M&TE.

The NRC inspection team also reviewed final X-ray films (including film density and geometric contrast) and radiography reports signed by a Level II examiner for the full penetration butt joint

weld numbers CW029/1 and CW029/2 on the Vogtle Unit 3 PRHRHX to determine if X-ray radiography was performed and accepted in accordance with Subsection NB and Section III of the ASME Code. The NRC inspection team also reviewed a sample of completed NDE test reports, including three completed dimensional, three completed penetrant testing, and 12 completed visual test reports and determined that all tests were completed satisfactorily. The test data described is associated with ITAAC 2.2.03.03a, which states that “A report exists and concludes that the ASME Code Section III requirements are met for nondestructive examination of pressure boundary welds.”

#### b.4 Qualification and Training of Welding Personnel

The NRC inspection team selected a sample of training and qualification records for Mangiarotti’s welders and welding operators who performed welding activities on the ACC, CMT, PRHRHX, and the PZR, including those who performed the welding activities observed by the NRC inspection team, and compared them to the applicable ASME Code acceptance criteria. The NRC inspection team confirmed that these individuals completed all required training and maintained qualification and certification in accordance with Mangiarotti’s policies and procedures, and that the welding operators were qualified in accordance with the applicable acceptance criteria of Section III and Section IX of the ASME Code.

#### b.5 Qualification and Training of Nondestructive Testing Personnel

The NRC inspection team selected a sample of training and qualification records for Mangiarotti’s Level II and Level III NDE personnel who performed NDE work on the ACC, CMT, PRHRHX, and the PZR. The NRC inspection team confirmed that Mangiarotti’s personnel was trained and qualified in accordance with the American Society for Nondestructive Testing (SNT)-TC-1A, “Personnel Qualification and Certification in Nondestructive Testing,” 1992 edition, and the applicable requirements of Section V of the ASME Code.

#### c. Conclusion

The NRC inspection team concluded that Mangiarotti is implementing its control of special processes program in accordance with the regulatory requirements of Criterion XII of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that Mangiarotti is implementing its policies and procedures associated with the control of special processes program. No findings of significance were identified.

### 5. Control of Measuring and Test Equipment

#### a. Inspection Scope

The NRC inspection team reviewed Mangiarotti’s policies and implementing procedures that govern the 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. In addition, the NRC inspection team discussed the M&TE program with Mangiarotti’s management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

The NRC inspection team verified the M&TE requirements provided in Mangiarotti's QAM and associated procedures, which provide a system for the control of measuring and testing equipment and devices. The M&TE program ensures that devices used in activities that affect quality are of the proper range, type, and accuracy to verify conformance with the established requirements.

The NRC inspection team also performed a visual sample inspection of several M&TE devices at Mangiarotti's calibration laboratory. The NRC inspection team found that the sampled M&TE devices all had appropriate calibration stickers and current calibration dates, including the calibration due date. In addition, the calibration records reviewed by the NRC inspection team indicated the as-found or as-left conditions, accuracy required, calibration results, calibration dates, and the due date for recalibration. The NRC inspection team also verified that the selected M&TE was calibrated using procedures traceable to known industry standards.

The NRC inspection team witnessed a tensile test on a sample of stainless steel material used in the PRHRHX and verified that the calibration on the equipment used during the test was valid and current and verified that the test was conducted in accordance with the test specimen plan.

In addition, through interviews with several calibration personnel and reviews of their qualification records, the NRC inspection team concluded that the calibration personnel were knowledgeable and qualified.

c. Conclusion

The NRC inspection team concluded that Mangiarotti is implementing its M&TE program in accordance with the regulatory requirements of Criterion XII of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that Mangiarotti is implementing its policies and procedures associated with the M&TE program. No findings of significance were identified.

6. Control of Nonconforming Materials, Parts, or Components

a. Inspection Scope

The NRC inspection team reviewed Mangiarotti's policies and implementing procedures that govern the control of nonconformances to verify compliance with the requirements of Criterion XV, "Nonconforming Materials, Parts, or Components," of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed a sample of nonconformance reports and verified that the disposition and control of nonconformances was in accordance with Mangiarotti's procedural guidelines. In addition, the NRC inspection team discussed the nonconformance program with Mangiarotti's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

The NRC inspection team verified that the applicable Mangiarotti's procedures associated with the nonconformance process provide for (1) reference to instructions or procedures for repair and rework activities (where required), reinspection of repaired and reworked items, and notification to affected organizations of nonconforming conditions; (2) deficiencies or

nonconformances identified by customers to be entered into the corrective action program, adequately assessed, and properly dispositioned; and (3) the applicable procedures to appropriately identify the responsibility and authority for review and disposition of nonconforming items, and control further processing, delivery, and installation of nonconforming items until disposition is completed.

The NRC inspection team witnessed Mangiarotti's nonconformances "HOLD" tag process on AP1000 components N021.06, "CMT Top Head," and N021.02, "CMT Shell." This process properly applies the principles of use-as-is acceptable, reject, repair or rework, or scrap 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 NRC inspection team performed walk-downs of the shop floor to verify that there are designated areas to segregate and control the various nonconforming materials.

For the sample nonconformance reports (NCRs) reviewed, the NRC inspection team verified that Mangiarotti implemented an adequate program to assess and control nonconforming items, including appropriate identification, documentation, segregation, evaluation, and disposition of these items.

The NRC inspection team also discussed the nonconformance process with Mangiarotti's personnel, including quality assurance engineers, and shop floor technicians, and verified that Mangiarotti's personnel are aware of the nonconformance process, recognize when and how to enter nonconformances into the process, and understand the types of disposition that can result from an NCR. The NRC inspection team concluded that all of the Mangiarotti's personnel interviewed had adequate knowledge of the Mangiarotti's NCR program.

#### c. Conclusion

The NRC inspection team concluded that Mangiarotti is implementing its nonconforming materials, parts, or components program in accordance with the regulatory requirements of Criterion XV of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that Mangiarotti is implementing its policies and procedures associated with the control of nonconforming materials, parts, or components. No findings of significance were identified.

### 7. Corrective Actions

#### a. Inspection Scope

The NRC inspection team reviewed the current status of the corrective actions implemented in response to the findings from the 2010 NRC inspection at Mangiarotti's Sedegliano facility. The NRC inspection team also reviewed Mangiarotti's policies and implementing procedures that govern the corrective action program to verify compliance with the requirements of Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed a sample of CARs and verified that the CARs' disposition and control provide adequate documentation and description of conditions adverse to quality, and specify the cause of these conditions and the corrective actions taken to prevent recurrence. In addition, the NRC inspection team discussed the corrective action program with Mangiarotti's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

## b. Observations and Findings

### b.1 Corrective Action Associated with Nonconformance 99901393/2010-201-01

The NRC issued Nonconformance 99901393/2010-201-01 for Mangiarotti's failure to include or reference the audit checklist that was to be used during the program implementation review of three forging suppliers located in Italy. Instead of using the audit checklist that the QAM requires, the lead auditor used a copy of the supplier's quality assurance manual as the checklist and recorded audit annotations and findings directly on the supplier's QAM in place of using the formal audit checklist. As a result, a formal quality record of the supplier audit was not developed in accordance with the written requirements of the Mangiarotti QAM.

In its response to the NRC, Mangiarotti stated that it issued CAR No. 064 to address this issue. It revised procedure PGE.08, "Managing the Auditing Activities," to indicate that use of the checklist is only allowed. Mangiarotti trained the auditors and completed a re-auditing campaign of main suppliers, including those whose report was reviewed during that time.

The NRC inspection team reviewed the documentation that provided the objective evidence for completion of the corrective action. The NRC inspection team determined that Mangiarotti's corrective actions were adequate to address the identified finding. Based on its review, the NRC inspection team closed Nonconformance 99901393/2010-201-01.

### b.2 Corrective Action Associated with Nonconformance 99901393/2010-201-02

The NRC issued Nonconformance 99901393/2010-201-02 for Mangiarotti's failure to calibrate adequately a contact pyrometer over the entire working range of the instrument or the actual operational temperature range used during the welding fabrication.

In its response to the NRC, Mangiarotti stated that it issued CAR No. 055 to address this issue. Mangiarotti revised procedure PGE.06, "Managing the Equipment Calibration," to indicate that the placement of new calibration stickers over old ones is longer allowed. The calibration is performed at the usable limits of the equipment and these are indicated on a new calibration label posted in the equipment. Mangiarotti also re-checked thermometers in accordance with the revised PGE.06 instructions.

The NRC inspection team reviewed the documentation that provided objective evidence for completion of the corrective action. The NRC inspection team determined that Mangiarotti's corrective actions were adequate to address the identified finding. Based on its review, the NRC inspection team closed Nonconformance 99901393/2010-201-02.

### b.3 Corrective Action Associated with Nonconformance 99901393/2009-201-03

The NRC issued Nonconformance 99901393/2010-201-03 for Mangiarotti's failure to promptly enter conditions adverse to quality into its corrective action program. Specifically, Mangiarotti failed to initiate a corrective action request resulting from a self-identified instance of the use of improper material for temporary welding supports. In addition, Mangiarotti failed to promptly initiate a corrective action request related to the identification of an inadequate quality plan that did not contain all of the desired surveillance inspection and hold points that one of its subsuppliers developed.

In its response to the NRC, Mangiarotti stated that it issued CAR No. 056 to address this issue. Mangiarotti initiated training on its corrective action program to ensure a proactive approach by all the employees in work practices and added new, qualified quality engineering personnel.

The NRC inspection team reviewed the documentation that provided objective evidence for the completion of the corrective actions. The NRC inspection team determined that Mangiarotti's corrective actions were adequate to address the identified finding. Based on its review, the NRC inspection team closed Nonconformance 99901393/2010-201-03.

#### b.4 Implementation of Mangiarotti's Corrective Action Program

The NRC inspection team verified that Mangiarotti established implementing procedures that provide assurance that significant conditions adverse to quality are promptly identified, documented and corrected or otherwise handled in accordance with the established requirements. The procedures also ensure that the causes of the conditions adverse to quality are identified and that corrective or preventive action is taken to preclude recurrence.

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

The NRC inspection team reviewed a sample of Mangiarotti's CARs related conditions adverse to quality. The NRC inspection team verified that the CARs reviewed provide (1) adequate documentation and description of significant 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 followup actions taken to verify timely and effective implementation of the corrective actions.

Each CAR is reviewed by the responsible quality assurance, engineering, welding, and inspection personnel before it is closed. The Managing Director (MD) assigns the appropriate personnel in these areas to evaluate and propose CAR disposition. The MD and appropriately assigned personnel also determine the requirement for evaluation of potential 10 CFR Part 21 issues.

The NRC inspection team also conducted discussions with Mangiarotti's engineers, quality assurance engineers, and shop floor technicians to verify that all Mangiarotti personnel are aware of the CAR process, recognize when and how to enter into the process, and understand the types of disposition that can result from a CAR. The NRC inspection team concluded that all of Mangiarotti's personnel interviewed have adequate knowledge of its CAR program.

#### c. Conclusion

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



## 8. Entrance and Exit Meetings

On October 22, 2012, the NRC inspection team discussed the scope of the inspection with Mr. David Vanin, Mangiarotti's Managing Director, and other members of Mangiarotti's management and technical staff. On October 26, 2012, the NRC inspection team presented the inspection results and observations during an exit meeting with Mr. Paolo Vincenzo Di Salvio, Mangiarotti's President, and other members of Mangiarotti's management and technical staff. The attachment to this report lists the entrance and exit meeting attendees, as well as those individuals whom the NRC inspection team interviewed.

## ATTACHMENT

### 1. ENTRANCE AND EXIT MEETING ATTENDEES AND PERSONS CONTACTED

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>	<b>Entrance</b>	<b>Exit</b>	<b>Interviewed</b>
Paolo Vincenzo Di Salvio	President	Mangiarotti		X	
David Vanin	Managing Director	Mangiarotti	X	X	
Claudio Angeli	Director of Operations	Mangiarotti		X	
Gian Marco Lupi	Quality Manager	Mangiarotti	X	X	X
Christopher Castleton	Operational Excellence Manager	Mangiarotti	X	X	X
Fabio Berra	Nuclear Component Engineering Department Manager	Mangiarotti			X
Luca Lotti	Welding Engineering Manager	Mangiarotti	X	X	X
Ismail El Sayed	Quality Control NDE Manager	Mangiarotti			X
Matteo Molaro	Quality Inspection Manager	Mangiarotti			X
Dott. Ing. Massimo Polo	Engineering Department Coordinator	Mangiarotti	X		
Francesco Vatri	Purchasing Manager	Mangiarotti	X	X	X
Gian Batista Fachin	Production Manager	Mangiarotti	X	X	X
G.P. Rinaldi	Commercial Manager	Mangiarotti	X		
Gianpaolo Cecchini	Health & Safety Environment Manager	Mangiarotti	X	X	
Dott. Federico Mior	Human Resources Manager	Mangiarotti	X		
Veronica Zanelli	Quality Assurance Engineer	Mangiarotti	X	X	X
Laura Gereon	Quality Assurance Engineer	Mangiarotti	X	X	X
Pietro Gianquinto	Quality Assurance Engineer	Mangiarotti			X

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>	<b>Entrance</b>	<b>Exit</b>	<b>Interviewed</b>
Diego Mario Mancanini	Project Engineer	Mangiarotti			X
Matteo Moscardo	Welding Engineer	Mangiarotti			X
Prvin Jovica	Welder	Mangiarotti			X
Paron Mauro	NDE Level III Inspector	Mangiarotti			X
Vasile Ungureanu	NDE Level II Inspector	Mangiarotti			X
Andrea Olivo	NDE Level II Inspector	Mangiarotti			X
Sergio Infanti	NDE Level II Inspector	Mangiarotti			X
Gianpietro Calvazara	Quality Control Inspector	Mangiarotti			X
Luca Venudo	Laboratory and Testing	Mangiarotti			X
Davide Pezzarini	Project Manager	Mangiarotti	X	X	
Luca Tonut	Project Manager	Mangiarotti		X	
Rosario Antonio Trevato	Project Manager	Mangiarotti		X	
Jeremiah Richardson	Delivery Stream Program Manager	Westinghouse		X	X
John R. Stafford	Senior Product Engineer	Westinghouse	X		X
Andrea Montani	Supplier Oversight	Westinghouse			X
Dominique Dubois	Project Manager – Vendor Oversight	Southern Nuclear Company	X	X	X
Kevin Guyton	Supplier Oversight	SCE&G		X	
Yamir Diaz-Castillo	NRC's Lead Inspector	NRC	X	X	
Douglas R. Bollock	NRC Inspector	NRC	X	X	
Aaron R. Armstrong	NRC Inspector	NRC	X	X	
Timothy Steadham	NRC Inspector	NRC	X	X	

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>	<b>Entrance</b>	<b>Exit</b>	<b>Interviewed</b>
Paola Varaschini	Translator	USA Consulate	X	X	
Fulvia Andri	Translator	USA Consulate	X	X	

2. INSPECTION PROCEDURES USED

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

Inspection Procedure 36100, "Inspection of 10 CFR Part 21 Programs for Reporting Defects and Noncompliance," dated February 13, 2012.

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<b>Item Number</b>	<b>Status</b>	<b>Type</b>	<b>Description</b>	<b>Applicable Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) from the AP1000 Design Control Document, Tier 1, Revision 19</b>
99901393/2010-201-01	Closed	NON	Criterion V, VII, & XVIII	N/A
99901393/2010-201-02	Closed	NON	Criterion XII	N/A
99901393/2010-201-03	Closed	NON	Criterion XVI	N/A
99901416/2012-201-01	Opened	NON	Criterion VII & XVIII	N/A

4. INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA

The NRC inspection team identified the following Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) related to components being manufactured by Mangiarotti. Specifically, at the time of the inspection Mangiarotti was involved in manufacturing the accumulator, core makeup tank, passive residual heat removal heat exchanger, and the pressurizer for the AP-1000 design. For the ITAAC listed below, the NRC inspection team performed a review of Mangiarotti’s quality assurance controls in the areas of design control, training, and measuring and test equipment. Specific information for ITAAC inspected in detail is provided in the body of the inspection report. The ITAACs referenced below are for future use by the NRC staff during the ITAAC closure process and by no means constitute that the ITAAC have been met and closed. The NRC inspection team did not identify any findings associated with the ITAAC identified in the tables below.

<b>Levy County Nuclear Power Plant Unit 1 Core Pressurizer</b>		
AP1000 Design Control Document, Tier 1, Revision 19	Table 2.1.2-4	ITAAC 2.a
<b>Levy County Nuclear Power Plant Unit 1 Core Makeup Tank</b>		
AP1000 Design Control Document, Tier 1, Revision 19	Table 2.2.3-4	ITAAC 2.a

<b>Accumulator</b>		
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 159	ITAAC 2.2.03.02a
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 161	ITAAC 2.2.03.03a
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 163	ITAAC 2.2.03.04a
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 166	ITAAC 2.2.03.05a.ii
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 167	ITAAC 2.2.03.05a.iii

Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 190	ITAAC 2.2.03.08c.vi.02
<b>Core Makeup Tank</b>		
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 159	ITAAC 2.2.03.02a
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 161	ITAAC 2.2.03.03a
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 163	ITAAC 2.2.03.04a
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 166	ITAAC 2.2.03.05a.ii
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 167	ITAAC 2.2.03.05a.iii
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 189	ITAAC 2.2.03.08c.vi.01
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 196	ITAAC 2.2.03.08c.xi
<b>Passive Residual Heat Removal Heat Exchanger</b>		
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 159	ITAAC 2.2.03.02a

Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 161	ITAAC 2.2.03.03a
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 163	ITAAC 2.2.03.04a
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 166	ITAAC 2.2.03.05a.ii
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 167	ITAAC 2.1.02.05a.iii
<b>Pressurizer</b>		
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 13	ITAAC 2.1.02.02a
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 15	ITAAC 2.1.02.03a
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 17	ITAAC 2.1.02.04a
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 20	ITAAC 2.1.02.05a.ii
Appendix C from the Combined License for Vogtle Units 3 and 4 and VC Summer Units 2 and 3	No. 21	ITAAC 2.1.02.05a.iii

5. DOCUMENTS REVIEWED

- Mangiarotti's Quality Assurance Manual, Edition 2, Revision 1, dated October 12, 2012
- PGE.02, "Design Control," Edition 7, Revision 0

- PGE.03, "Suppliers Selection and Assessment," Edition 4, Revision 3, dated July 18, 2011
- PGE.04, "Receiving Inspection and Qualification of Base Material," Edition 5, Revision 0, dated May 7, 2012
- PGE.05, "Controls During Fabrication: The Quality Control Plan," Edition 4, Revision 2
- PGE.06, "Calibration Manual," Edition 4, Revision 1
- PGE.07, "Control of Nonconformities," Edition 4, Revision 2, dated September 14, 2012
- PGE.08, "Internal & External Audits," Edition 4, Revision 1, dated September 14, 2012
- PGE.09 "Contract Review", Edition 4, Revision 0
- PGE.10, "Identification and Traceability of Base Materials," Edition 1, Revision 0
- PGE.11, "Procurement Control," Edition 5, Revision 0, dated June 15, 2012
- PGE.15, "Production Process," Edition 3, Revision 0
- PGE .18, "Corrective and Preventive Actions," Edition 3, Revision 0, dated September 30, 2012
- PGE.20, "Use of Certificate, Marks, and Personal Identification Stamps," Edition 2, Revision 0
- PGE.22, "Qualification of Audit Personnel," Edition 1, Revision 1, dated August 16, 2011
- PGE.23, "Inspection and Test Personnel Qualification," Edition 2, Revision 1
- PGE.25, "Design Specification, Design Report and Fabrication Specification for ASME Section III Division 3," Edition 1, Revision 1
- PGE.26, "Design Specification, Design Report for ASME Section III, Div. 1 Components," Edition 1, Revision 1
- PGE.27, "Design Computer Software and Program Management," Edition 1, Revision 0
- PGE.28, "Written Practice for Personnel Qualification and Certification in NDE," Edition 2, Revision 0
- PGE.29, "Storage, Maintenance, and Distribution of Welding Materials," Edition 1, Revision 2
- PGE.30, "Reporting of Defects and Noncompliance as required by 10 CFR Part 21," Edition 1, Revision 4, dated December 14, 2011
- PGE.31, "Quality Classification of Nuclear Items," Edition 1, Revision 0



- PGE.32, “Managing of Material Subjected to Laboratory Testing,” Edition 1, Revision 1
- PGE.33, “Commercial Grade Dedication,” Edition 1, Revision 3
- Westinghouse Electric Company (WEC) 3.2.6 “Design Analysis,” Rev 0.0, dated August 22, 2012
- WEC 3.2.7 “Design Process,” Revision 0.1, dated August 14, 2012
- WEC 3.3.1 “Design Reviews,” Revision 4.0, dated October 3, 2012
- W4-DWF-00-00-010, “AP1000 Accumulator Tank Outlet Nozzle Penetration,” Revision 2, dated October 11, 2012
- APP-MT02-V6-003, “AP1000 Accumulator Tank Tap and Nozzle Details,” Revision 2, dated February 4, 2010
- W1-DWF-11-00-025, “AP1000 Passive Residual Heat Removal Heat Exchanger- Channel and Tubesheet Assembly,” Revision 3, dated November 29, 2011
- W1-SPG-00-00-038, “Post Weld Heat Treatment for the Circumferential Weld of the Channel Head to the Tubesheet,” Revision 3, dated March 29, 2011
- HX-CNP-10-001 “Thermal and Thermo Mechanical Analysis of the Welding Joint ‘CW005’ Between Tubesheet and Channel Head During the PWHT,” Revision 2
- Engineering Design Change Request, “New Joint Design for ACC Level Measurement Nozzle,” Revision 0
- Fabrication Control Plan W4-PCF-10-09-002, “Lower Head Preparation Item No. 25-05/1,” Revision 4, dated August 2, 2010
- Fabrication Control Plan W1-PCF-00-09-001, “Tubesheets and Channel Heads Assembly,” Revision 3, dated May 25, 2011
- Design Plan No 24, “PRHRHX for Vogtle 3&4,” Revision 1, dated October 26, 2011
- Design Plan No 24, “ACC for Vogtle 3&4,” Revision 1, dated October 20, 2011
- Test Specimen Plan PRP-PCQ- NLAM010174-4 Job No 24-25-26, Revision 0
- Source /Reviewing Inspection Report N020-INR-09, “Upper Shell Item 2-02, Intermediate Shell Item 3-02, and Lower Shell Item 4-02,” Revision 0, dated February 25, 2009
- Purchase Order (PO) OA-201201326 to Trescal SRL for calibration of extensometer
- PO OA-201101439 to Zwick GMBH & Co for calibration of impact test machine
- PO OA-201101046 to Delta Ohm SRL for calibration of irradiator

- PO OA-201102233, 201200902 to Bohler Welding Group
- PO OA-201101782 to ESAB Saldatura
- PO OA-201200820, 201102278, to ETC Oerlikon SPA
- PO 201101766 to Sandvik Italia SPA
- POs OA-201100664, 201000150, 201000314 to Forgiatura Morandini SRL
- PO OA-200900129 to Forge Monchieri SPA
- PO OA-201000253, OA-201101537 to IBF SPA
- PO OA-200900133 to Forgiatura Vienna SAS
- PO OA-201100950 to Valinox Nucleaire
- POs OA-201000164, 201201186 to Voestalpine Grobblech GMBH
- POs OA-201000114, 201100609, 200900148, 201101853 to Deform AB
- WEC PO 4500273230 (Summer) to Mangiarotti for the Accumulator Tank
- WEC PO 4500278950 (Vogtle) to Mangiarotti for the Core Make Up Tank
- WEC PO 4500274162 (Vogtle) for the Pressurizer
- WEC PO 4500274213 (Vogtle) for the Passive Residual Heat Removal Heat Exchanger
- External audit of Voest Alpine dated September 15, 2010
- External audit of Forgiatura A. Vienna dated October 13, 2010
- External audit of Forge Monchieri dated October 21, 2010
- External audit of AB Sandvik Materials Technology dated November 25, 2010
- External audit of Forgiatura Morandini SRL dated December 16, 2010
- External audit of Bohler Welding Group dated November 23, 2011
- External audit of ETC Oerlikon dated March 27, 2012
- "ANSYS 11.0 SP1 Computer Program Qualification Windows XP Professional INTEL 586 Processor," Revision 0, dated June 19, 2008
- Procedure Qualification Record (PQR) for WPS 1337, dated July 7, 2012

- PQR for WPS 1888, dated April 14, 2008
- PQR for WPS 1373, dated October 5, 2010
- W2-WB-00-00-001, "Welding List for AP1000 Pressurizer," Revision 9, dated September 14, 2012
- Welding Operator Qualification and Welding Operator Performance Qualifications for Welder No. GM59, dated February 27, 2012
- W3-SPG-00-00-003, "AP1000 Core Makeup Tanks: Liquid Penetrant Examination Procedure," Revision 2
- W3-SPG-00-00-004, "AP1000 Core Makeup Tanks: Ultrasonic Examination Procedure," Revision 4
- W3-SPG-00-00-008, "AP1000 Core Makeup Tanks: Magnetic Examination Procedure," Revision 2
- WPS W2-WPS-00-00-005, "SAW SFA 5.9 Type 309L+308L Cladding," No. 1337, Revision 4, dated February 13, 2012
- WPS W2-WPS-00-00-007, "SMAW SFA 5.4 and SAW SFA 5.9 Type 309L and 308L Buttering," No. 1373, Revision 5, dated February 14, 2011
- WPS W2-WPS-00-00-011, "SMAW Type 308L Fillet Weld," No. 1888, Revision 2, dated March 22, 2011
- WPS W2-WPS-00-00-017, "GTAW SFA 5.14 ERNiCrFe7 Buttering and Butt Weld," No. 1426, Revision 6, dated October 26, 2011
- Laboratory Test Report (LTR)-12684 for the Weld Overlay and Type: First Layer 308L, Joint CL-013/2, Revision 0, dated February 9, 2012
- LTR-12686 for the Weld Overlay and Type: First Layer 308L, Joint CL-013/2, Revision 0, dated February 13, 2012
- Certified Material Test Report (CMTR) 102, No. 1316, Welding Filler Metal Qualification Certificate, SFA 5.4, E309L-16, Supranox RS 309L, 4.0mm Diameter, Heat No. 341461008, Revision 1, dated May 2, 2012
- CMTR 1100038, IBF CMTR for ASME Sect II SA182 F316LN for Accumulator Test Port, Heat No. 05169, dated July 15, 2012
- CMTR 139, No. WQW 11843B, Welding Filler Metal Qualification Certificate, SFA 5.14, ERNiCrFe-7, Sanrico 68HP, 1.2mm Diameter, Heat No. 132283, Revision 0, dated August 27, 2012

- CMTR 17, Doc No. PCQ-CMTR17, Welding Filler Metal Qualification Certificate, SFA 5.4, E309L-16, Supranox RS 309L, 3.2mm Diameter, Heat No. 0281012, Revision 2, dated July 27, 2012
- CMTR 82, Doc No. CMTR 30-075, Welding Filler Metal Qualification Certificate, SFA 5.4, E308L-16, Supranox RS 309L, 3.25mm Diam, Heat No. 1121011, Revision 1, dated October 12, 2012
- CMTR 341461008, Welding Filler Metal Qualification Certificate, SFA 5.4, E309L-16, Supranox RS 309L, 4.0mm Diam, Heat No. 341461008, Revision 1
- Certificate of Conformance 210029-16 for Accumulator Summer-3, Sphere Plates (6 petals), dated October 24, 2011
- N021-DT-W3-PCF-30-09-007-02, Dimensional Test Report for Vogtle-3, Core Make-Up Tank 1 Inlet Diffuser, Revision 0, dated December 28, 2011
- N026-DT-W1-PCF-11-07-006-05, Dimensional Test Report, Tubesheet item 3/2-04, dated June 3, 2012
- N026-DT-W1-PCF-11-07-006-27, Dimensional Test Report of CW-006/2 Weld Preparation, dated June 15, 2012
- N026-DT-W1-PCF-11-07-006-44, Dimensional Test Report of Tubesheet item 3/2-04 – Second Day Side Machining, dated February 27, 2012
- N026-PT-PCF-11-07-006-05, Penetrant Testing (PT) Test Report, Item No. 3/2-04, dated June 3, 2012
- N026-PT-W1-PCF-11-07-006-09, PT Exam of BT-016/2 and BT-017/2, dated June 20, 2012
- N026-PT-W1-PCF-11-07-006-27, PT Exam of Chamfer Tubesheet Side, dated October 15, 2012
- N026-VT-W1-PCF-11-07-006-06, Visual Testing (VT) Test Report, Primary Side Cleaning & Check of Cleanliness, dated March 20, 2012
- N026-VT-W1-PCF-11-07-006-09, VT Exam of BT-016/2 and BT-017/2, dated June 20, 2012
- N026-VT-W1-PCF-11-07-006-09.2, VT Exam After First Layer of Clad CL-015/3, dated July 11, 2012
- N026-VT-W1-PCF-11-07-006-11, VT Exam After Each Layer CL-004/2, dated June 8, 2012
- N026-VT-W1-PCF-11-07-006-14, VT Exam After Each Layer CL-0015/2, dated July 19, 2012
- N026-VT-W1-PCF-11-07-006-16, VT Exam, Second Day Side Cleaning and Check of Cleanliness, dated February 9, 2012

- N026-VT-W1-PCF-11-07-006-18, VT Exam Before Post Weld Heat Treatment (PWHT) of Tubesheet Item 3/2-04 - CL013/2 Cladding, dated February 20, 2012
- N026-VT-W1-PCF-11-07-006-21, VT Exam before PWHT of Tubesheet Item 3/2-04 - CL014/2 Cladding, dated February 20, 2012
- N026-VT-W1-PCF-11-07-006-24, VT Exam Before PWHT of Tubesheet Item 3/2-04 - CL010/2 Cladding, dated February 16, 2012
- N026-VT-W1-PCF-11-07-006-46, VT Exam Before PWHT of Tubesheet Item 3/2-04 - CL018/2 Cladding, dated September 27, 2012
- N026-VT-W1-PCF-11-07-006-48, VT Exam Before PWHT of Tubesheet Item 3/2-04 Buttering BT-012/2, dated September 27, 2012
- N026-VT-W1-PCF-11-07-006-9.3, VT Exam After First Layer of Clad CL-015/4, dated July 13, 2012
- Electro Magnet 3M6S- AC Linear, calibrated October 3, 2012
- Galdabini Charpy Impact 450, calibrated August 6, 2012
- Zwick/Roell 300kN Tensile Tester, Serial #822726111, calibrated April 18, 2012
- Micrometer 92C, calibrated October 16, 2012
- Liquid Penetrant Code 0208700, Lot 311/11
- Spring Loaded Electronic Micrometer 1EST, Serial # 0921246, calibrated April 18, 2012
- Correction Action Reports: 87, 159, 183, 184, 187, 188, 230, 241, 261, 290, 308, 318, 321, 322, 327, 332, 333, 336,
- Nonconformance Reports: 1015, 1184, 1243, 1252, 1275, 1283, 1302, 1318, 1347, 1351, 1377, 1419, 1437, 1438, 1441, 1450, 1460, 1466,