April 22, 2010

Mr. David Barry, President
Nuclear Division, Shaw Power Group
128 South Tryon Street, Suite 400
Charlotte, NC 28202

SUBJECT: NRC INSPECTION REPORT NO. 99901387/2009-201, NOTICE OF VIOLATION, AND NOTICE OF NONCONFORMANCE

Dear Mr. Barry:

On March 1 - 5, 2010, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Shaw Nuclear Services (hereafter referred to as Shaw) facility in Charlotte, NC. The purpose of the inspection was to perform a limited scope inspection to assess Shaw'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." The enclosed report presents the results of this inspection. This NRC inspection report does not constitute NRC endorsement of your overall quality assurance (QA) or 10 CFR Part 21 programs.

Based on the results of this inspection, the NRC staff determined that a violation of NRC requirements occurred. The violation is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding it are described in detail in the subject inspection report. The violation in the Notice is being cited because Shaw did not provide adequate procedural guidance to evaluate deviations and failures to comply associated with substantial safety hazards consistent with the requirements of 10 CFR Part 21.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

During this inspection, NRC inspectors found that the implementation of your QA program failed to meet certain NRC requirements imposed on you by your customers. Specifically, the NRC inspection team determined that Shaw was not implementing its design control process, internal and external audit processes, and corrective action program consistent with regulatory requirements or the Shaw "Standard Nuclear Quality Assurance Program (SWSQAP 1-74A)." The specific findings and references to the pertinent requirements are identified in the enclosures to this letter.

Please provide a written statement or explanation within 30 days from the date of this letter in accordance with the instructions specified in the enclosed Notice of Nonconformance. We will consider extending the response time if you show good cause for us to do so.

In addition, the NRC inspection team identified an unresolved item. Specifically, the NRC inspection team noted that design specification SVO-000-T1-001, "Soil and Concrete Testing," did not reference Regulatory Guides (RGs) 1.132, "Site Investigations for Foundations of Nuclear Power Plants," and 1.138, "Laboratory Investigations of Soils and Rocks for Engineering Analysis and Design of Nuclear Power Plants." Therefore, during the exit meeting conducted with Shaw management, the NRC inspection team requested that Shaw determine whether or not the NRC-endorsed standards and regulatory positions in RGs 1.132 and 1.138 had been imposed in Subcontract No. 132175-1004-1421, "MACTEC Engineering and Consulting, Inc. Soil and Concrete Testing," consistent with the scope of the design specification. Please provide a response to this unresolved item within 30 days from the date of this letter.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response, (if applicable), should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material is withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

Sincerely,
/RA/

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

Docket No. 99901387

Enclosures:
1. Notice of Violation
2. Notice of Nonconformance
3. Inspection Report No. 99901387/2010-201 and Attachment

In addition, the NRC inspection team identified an unresolved item. Specifically, the NRC inspection team noted that design specification SVO-000-T1-001, "Soil and Concrete Testing," did not reference Regulatory Guides (RGs) 1.132, "Site Investigations for Foundations of Nuclear Power Plants," and 1.138, "Laboratory Investigations of Soils and Rocks for Engineering Analysis and Design of Nuclear Power Plants." Therefore, during the exit meeting conducted with Shaw management, the NRC inspection team requested that Shaw determine whether or not the NRC-endorsed standards and regulatory positions in RGs 1.132 and 1.138 had been imposed in Subcontract No. 132175-1004-1421, "MACTEC Engineering and Consulting, Inc. Soil and Concrete Testing," consistent with the scope of the design specification. Please provide a response to this unresolved item within 30 days from the date of this letter.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response, (if applicable), should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material is withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

Sincerely,
/RA/

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

Docket No. 99901387
Enclosures:
1. Notice of Violation
2. Notice of Nonconformance
3. Inspection Report No. 99901387/2010-201 and Attachment

DISTRIBUTION:

RidsNroDcipCQVA	RidsNroDcipCQVB	RidsNroDcip	KKavanagh	RPrato	MValentin
SCrane	FTalbot	VThomas	SSoto	robert.otis@shawgrp.com	
geoffgrant@shawgrp.com		RidsNrrDeEQVB	AIssa		

ADAMS Package Accession No.: *concurred via email

OFFICE	NRO/DCIP/CQVA	NRO/DCIP/CQVB	NRO/DE/SEB1	NRO/DE/SEB1	NRO/DCIP/CQVA
NAME	SSoto	SCrane	MValentin	VThomas	FTalbot
DATE	4/2/2010*	4/5/2010	4/5/2010	3/31/2010*	4/5/2010
OFFICE	RII/DCP/CPB3	NRO/DCIP/CQVA	NRO/DCIP/CQVA	NRO/DCIP/CAEB/BC	NRO/DCIP/CQVA/BC
NAME	AIssa	RPrato	KKavanagh	TFrye	JPeralta
DATE	4/2/2010*	4/5/2010	4/7/2010*	4/8/2010	04/22/2010

OFFICIAL RECORD COPY

NOTICE OF VIOLATION

Shaw Nuclear Services
Charlotte, NC 28202

Docket Number 99901387
Inspection Report Number 2010-201

During a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the Shaw Nuclear Services (Shaw), facility in Charlotte, North Carolina on March 1 - 5, 2010, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

> Title 10, Section 21.21, "Notification of Failure to Comply or Existence of a Defect and Its Evaluation," of the *Code of Federal Regulations* (CFR), paragraph 21.21(a), requires, in part, that each individual, corporation, partnership, or other entity subject to 10 CFR Part 21 shall adopt appropriate procedures to evaluate deviations and failures to comply associated with substantial safety hazards as soon as practicable.
>
> Paragraph 21.21(a)(1) requires that deviations and failures to comply be evaluated within 60 days of discovery in order to identify a reportable defect or failure to comply that could create a substantial safety hazard were it to remain uncorrected.
>
> Contrary to the above, as of March 5, 2010, Shaw's implementing procedure Quality Standard (QS) 16.3, "Identifying and Reporting Defects and Failures to Comply Under 10CFR21," did not provide procedural guidance for evaluating deviations and failures to comply associated with substantial safety hazards within 60 days of discovery. Specifically, the NRC inspection team determined that procedure QS 16.3 allowed for an evaluation outside of the 60-day evaluation period required by 10 CFR 21.21(a)(1), and included definitions that differed from those provided in 10 CFR 21.3, "Definitions," and altered the intended meaning of the terms.

This issue has been identified as Violation 99901387/2010-201-01.

This is a Severity Level IV Violation (Supplement VII).

Pursuant to the provisions of 10 CFR 2.201, "Notice of Violation," Shaw is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Chief, Quality and Vendor Branch 1, Division of Construction Inspection and Operational Programs, Office of New Reactors, within 30 days of the date of the letter transmitting this Notice of Violation. This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. 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, accessible at http://www.nrc.gov/reading-rm/adams.html, to the extent possible, it should not include any personal privacy, proprietary, or Safeguards Information so that it can be made available to the public without redaction. If personal privacy or proprietary information is

necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Requirements for the Protection of Safeguards Information."

Dated this the 22nd day of April 2010.

NOTICE OF NONCONFORMANCE

Shaw Nuclear Services
Charlotte, NC 28202

Docket Number 99901387
Inspection Report Number 2010-201

Based on the results of a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the Shaw Nuclear Services (Shaw), facility in Charlotte, North Carolina on March 1 - 5, 2010, certain activities were not conducted in accordance with NRC requirements which were contractually imposed on Shaw by NRC licensees:

A. Criterion III, "Design Control," of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR Part 50), "Domestic Licensing of Production and Utilization Facilities," states, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. These measures shall include provisions to assure that appropriate quality standards are specified and included in appropriate design documents.

   Criterion III also states, in part, that design changes shall be subject to design control measures commensurate with those applied to the original design and be approved by the original design organization.

   "Standard Nuclear Quality Assurance Program," SWSQAP 1-74A, Revision B, Section 3, "Engineering and Design Control," states, in part, that design activities, documents, and interfaces shall be controlled to assure that applicable inputs such as design bases, regulatory requirements, codes, and standards are correctly translated to the final design. Changes to design documents shall be approved by the same individuals or groups that are responsible for approval of the documents.

   Contrary to the above, Shaw did not utilize the design change process to obtain prior Westinghouse approval for the use of the different revisions of the industry standards and the regulatory guide in Design Specification APP-CC01-Z0-026, "Safety-Related Mixing and Delivering Concrete," Revision 2, Design Specification APP-CC01-Z0-027, "Safety-Related Concrete Testing Services," Revision 1, and Calculation APP-G1-EWC-002, "Calculation, Development of Power Cable Ampacities," Revision 1. In addition, Shaw did not specify the correct revisions or editions of industry standards and a regulatory guide in the design documents above.

   This issue is identified as Nonconformance 99901387/2010-201-02.

B. Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50 states, in part, that measures shall be established to assure that purchased material, equipment, and services 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.

   SWSQAP 1-74A, Section 7, "Control of Purchased Material, Equipment, and Services," states, in part, that controls to ensure that purchased material, equipment, and services conform to procurement documents and shall include supplier evaluation and selection

including quality evaluations and ratings, periodic source assessments and inspections, audits, and site receiving inspections as applicable.

Contrary to the above, Shaw placed a safety-related purchase order for calibration services of measuring and test equipment without performing a supplier qualification audit.

This issue is identified as Nonconformance 99901387/2010-201-04.

C. Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50 states, in part, that measures shall be established to assure that purchased material, equipment, and services 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.

Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50 states 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.

Criterion V, "Instructions, Procedures, and Drawings," of Appendix B to 10 CFR Part 50 states that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

SWSQAP 1-74A, Sections 7, "Control of Purchased Material, Equipment, and Services," states, in part, that controls to ensure that purchased material, equipment, and services conform to procurement documents and shall include supplier evaluation and selection including quality evaluations and ratings, periodic source assessments and inspections, audits, and site receiving inspections as applicable. SWSQAP 1-74A, Section 18, "Audits and Surveillances," states, in part, that an audit program shall be established to ensure that quality activities comply with SWSQAP 1-74A and related procedures, to determine the effectiveness of the quality assurance program. SWSQAP 1-74A, Section 5, "Instructions, Procedures, and Drawings," states, in part, that quality activities shall be based on specifications, drawings, procedures, and instructions. These documents shall indicate any necessary special process controls, the applicable codes and standards, and qualitative and quantitative acceptance criteria.

Contrary to the above, the Shaw audit process for external and internal audits does not have implementing procedures governing the scheduling and processing of internal and external audits, including the tracking of audit open items to closure.

This issue is identified as Nonconformance 99901387/2010-201-05.

D. Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50 states that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. The identification of the significant

condition adverse to quality, the cause of the condition, and the corrective action taken shall be documented and reported to appropriate levels of management.

SWSQAP 1-74A, Section 16, "Corrective Action," states that the corrective action program shall provide for prompt identification, documentation, classification, and correction of the conditions. Section 16 further states, in part, that corrective action taken to correct deficient conditions discovered by inspection, test, or audits shall be verified by reinspection, retesting, subsequent audits including corrective action audits, or the review of corrective action documentation to assure that the agreed upon corrective action has been satisfactorily implemented. The area of concern shall be re-audited in a timely manner to assure that the corrective action has been accomplished.

Quality Standard (QS) 16.5, "Corrective Action System," defines roles and responsibilities, internal reviews, and timeliness requirements to address non-hardware discrepant conditions such as inconsistencies, failures to comply, omissions, or deficiencies. In addition, QS 16.5 contains detailed instructions on how to classify discrepancies as 1) a significant condition adverse to quality (SCAQ), 2) a condition adverse to quality (CAQ), 3) a non-condition adverse to quality, and 4) a negligible consequence non-condition adverse to quality and contains detailed implementing instructions on how to evaluate each class of deficiency.

Contrary to the above, Shaw's corrective action program lacks measures to ensure that 1) CAQs and SCAQs identified through the internal audit process are classified, and evaluated, consistent with QS 16.5, and 2) corrective actions for internal audit findings are received and promptly corrected. In addition, Shaw failed to implement effective corrective actions related to engineering good practices and attention to detail as identified in two different internal audits and failed to address and correct the identified CAQ in CAR 2009-03-19-85.

This issue is identified as Nonconformance 99901387/2010-201-06.

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, Quality and Vendor Branch 1, Division of Construction Inspection and Operational Programs, Office of New Reactors, within 30 days of the date of the letter transmitting this Notice of Nonconformance. This reply should be clearly marked as a "Reply to a Notice of Nonconformance" and should include for each noncompliance: (1) the reason for the noncompliance, or if contested, the basis for disputing the noncompliance; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken to avoid noncompliance; and (4) the date when your 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 so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material be withheld, you must specifically identify the portions of your response that you seek to have withheld and provide

in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

Dated this the 22nd day of April 2010.

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

Docket No.:	99901387
Report No.:	99901387/2010-201
Vendor:	Shaw Nuclear Services 128 South Tryon Street, Suite 400 Charlotte, NC 28202
Vendor Contact:	Mr. Robert Otis, Manager Quality Assurance (704) 343-7628 E-mail: robert.otis@shawgrp.com
Nuclear Industry Activities:	Shaw Nuclear Services (Shaw) provides new plant design and construction services worldwide. Shaw is a member of the AP1000 Consortium with Westinghouse Electric Company.
Inspection Dates:	March 1 - 5, 2010

Inspectors:		
	Kerri Kavanagh	NRO/DCIP/CQVA, Team Leader
	Robert Prato	NRO/DCIP/CQVA
	Frank Talbot	NRO/DCIP/CQVA
	Alfred Issa	RII/DCP/CPB3
	Samantha Crane	NRO/DCIP/CQVB
	Soly Soto	NRO/DCIP/CQVA
	Vaughn Thomas	NRO/DE/SEB1
	Milton Valentin	NRO/DE/SEB1

Approved by:	Juan Peralta, Chief Quality and Vendor Branch 1 Division of Construction Inspection & Operational Programs Office of New Reactors

EXECUTIVE SUMMARY

Shaw Nuclear Services, Inc.,
99901387/2010-201

The purpose of this inspection was to verify that Shaw Nuclear Services (Shaw) implemented an adequate quality assurance (QA) program that complied 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." The inspection also verified that Shaw implemented a program under 10 CFR Part 21, "Reporting of Defects and Noncompliance" (hereafter referred to as 10 CFR Part 21), that met the regulatory requirements of the U.S. Nuclear Regulatory Commission (NRC). The inspection was conducted at the Shaw facility in Charlotte, NC, during the period March 1 - 5, 2010.

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

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

The NRC inspection team implemented Inspection Procedure (IP) 43002, "Routine Inspections of Nuclear Vendors," and IP 36100, "Inspection of 10 CFR Part 21 and 50.55(e) Programs for Reporting Defects and Nonconformance," during the conduct of this inspection.

The NRC had not previously performed an inspection at the Shaw facility in Charlotte, NC. The results of this inspection are summarized below.

With the exception of one violation, four nonconformances, and one unresolved item described below, the NRC inspection team concluded that the Shaw QA policies and procedures comply with the applicable requirements of 10 CFR Part 21 and Appendix B to 10 CFR Part 50. The NRC inspection team further concluded that Shaw personnel were implementing these policies and procedures effectively.

10 CFR Part 21

With the exception of Violation 99901387/2010-201-01, the NRC inspection team found that Shaw's 10 CFR Part 21 program met the requirements of 10 CFR Part 21. The NRC inspection team issued Violation 99901387/2010-201-01 for Shaw's failure to adopt appropriate procedures pursuant to 10 CFR 21.21, "Notification of Failure to Comply or Existence of a Defect and its Evaluation." Specifically, the NRC inspection team determined that Shaw implementing procedure Quality Standard (QS) 16.3 allowed for an evaluation outside of the 60-day evaluation period required by 10 CFR 21.21(a)(1), and included definitions that differed from those provided in 10 CFR 21.3, "Definitions," which altered the intended meaning of the terms.

Design Control

The NRC inspection team identified one nonconformance associated with Shaw's failure to meet the requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. Nonconformance 99901387/2010-201-02 identifies Shaw's failure to reference the correct revisions for two industry standards and one regulatory guide (RG) as approved by

Westinghouse Electric Company (WEC) in the original design, without utilizing the design change process to obtain prior approval from WEC. With the exception of these issues, the NRC inspection team concluded that Shaw's design control process conforms to regulatory requirements and has been implemented in accordance with the applicable Shaw policies and procedures.

Procurement Document Control

With the exception of Unresolved Item 99901387/2010-201-03, the NRC inspection team found that Shaw's procurement document control was in compliance with Criterion IV, "Procurement Document Control," of Appendix B to 10 CFR Part 50 and was effectively implemented. The NRC inspection team documented in Unresolved Item 99901387/2010-201-03 the observation that design specification SVO-000-T1-001 did not reference RGs 1.132, "Site Investigations for Foundations of Nuclear Power Plants," and 1.138, "Laboratory Investigations of Soils and Rocks for Engineering Analysis and Design of Nuclear Power Plants." Therefore, the endorsed standards and regulatory positions in RGs 1.132 and 1.138 may not have been imposed in Subcontract No. 132175-1004-1421.

Control of Purchased Material, Equipment, and Services and Audits

The NRC inspection team concluded that Shaw is not implementing control of purchased materials, equipment, and services and its audit requirements consistent with the regulatory requirements of Criterion VII and Criterion XVIII of Appendix B to 10 CFR Part 50, respectively, as identified in Nonconformances 99901387/2009-201-04 and 99901387/2009-201-05. However, based on the sample of external and internal audits reviewed, the NRC inspection team determined that Shaw has been effectively implementing its policies and associated procedures.

Corrective Action

The NRC inspection team found that Shaw's corrective action program did not conform to the requirements of Criterion XVI of Appendix B to 10 CFR Part 50. The NRC issued Nonconformance 99901387/2010-201-06 for failure to provide appropriate, timely, and effective corrective actions. The NRC inspection team identified that Shaw's corrective action program lacks measures to ensure that 1) CAQs and SCAQs identified through the internal audit process are classified, and evaluated, consistent with QS 16.5; 2) corrective actions for internal audit findings are received and promptly corrected; and 3) ineffective corrective actions related to engineering good practices and attention to detail are prevented.

REPORT DETAILS

1. 10 CFR Part 21 Program and 10 CFR 50.55(e) Program

   a. Inspection Scope

   The NRC inspection team reviewed Shaw's policies and implementing procedures that govern their 10 CFR Part 21 (Part 21) and 10 CFR 50.55(e) processes to verify compliance with the requirements of 10 CFR Part 21, "Reporting of Defects and Noncompliance," and 10 CFR 50.55, "Conditions of Construction Permits, Early Site Permits, Combined Licenses, and Manufacturing Licenses," respectively. In addition, the NRC inspection team reviewed a sample of Shaw's purchase orders (POs) for compliance with the requirements of 10 CFR 21.31, "Procurement Documents," reviewed nine Part 21 evaluations, reviewed Shaw's implementation of posting requirements in accordance with 10 CFR 21.6, "Posting Requirements," and Shaw's records retention schemes in accordance with 10 CFR 21.51, "Inspection and Maintenance of Records," and 10 CFR 50.55(e)(9), "Records Retention." Specifically, the NRC inspection team reviewed the following Shaw policies, procedures, and supporting documentation:

   - Quality Standard (QS) 16.2, "Notifying Clients of Potentially Reportable Deficiencies Under 10CFR50.55(e)," Revision B, January 12, 2010
   - QS 16.3, "Identifying and Reporting Defects and Failures to Comply Under 10CFR21," Revision K, January 12, 2010
   - QS 16.5, "Corrective Action System," Revision D, March 1, 2010
   - QS 14.2, "Inspection Report System," Revision H, July 14, 2000
   - QS 16.1, "Problem Report System," Revision F, January 14, 2010
   - QS 15.1, "Nonconformance and Disposition Report," Revision F, March 4, 2010
   - QS 17.1, "Quality Assurance Records," Revision F, March 4, 2010
   - Shaw PO 527358 – Shaw Modular Solutions, LLC, Manufacturing of Modules CA01 through CA05, and CA20
   - Shaw PO No. 546009, ESSCO Calibration Laboratory/Walsh Engineering Services, Measuring and Testing Equipment
   - Shaw PO Subcontract No. 132175-1004-1421, MACTEC Engineering and Consulting, Inc, Soil and Concrete Testing
   - 10CFR21 Report 96-1, "Pipe Stress Analysis of Recirculation Spray & Quench Spray Systems – Millstone 3"
   - 10CFR21 Report 96-2, "Use of Potentially Nonconservative Assumptions in SWEC Calculations to Determine the Radiological Consequences to an Operator in the Control Room for Various Design Basis Accidents – Ft. Calhoun"
   - 10CFR21 Report 97-1 "Suction Line Flashing – Millstone 3"
   - 10CFR21 Report 97-2, "Expansion Joint Modeling & Qualification – Millstone 3"
   - 10CFR21 Report 97-3, "Small Bore Pipe Support Anchors for 2" and 1 ½" Stainless Steel Piping – Beaver Valley 1"
   - 10CFR21 Report 98-01, "Lack of 1E to Non 1E Isolation Within 7300 Process Control Cabinets – Beaver Valley 2"
   - 10CFR21 Report 01-01, "Corrective Action Report No. 01-53 – James A. Fitzpatrick"
   - 10CFR21 Report 05-01, "NRC Statements of Diffusiophoresis – H.B, Robinson"

- 10CFR21 Report 07-01, “Identification of Potential Nonconformance on Outside Containment Main Steam Piping – Monticello”

b. Observations and Findings

b.1 Postings

The NRC inspection team observed that Shaw had posted a notice in a bulletin board in a hallway on a floor where nuclear work was performed, and in two break rooms. Shaw informed the NRC inspection team that there were several additional posting locations throughout the facility. Each posting included a copy of Section 206 of the Energy Reorganization Act of 1974, as amended; a copy of 10 CFR Part 21; a copy of 10 CFR 50.55(e); a copy of QS 16.2; and a copy of QS 16.3.

b.2 10 CFR Part 21 Procedure

The NRC inspection team reviewed QS 16.3 which provides definitions and outlines the responsibilities to identify, control, document, and resolve conditions used for reporting of deviations and failures to comply discovered at the Shaw facility. During its review of the procedure, the NRC inspection team determined that QS 16.3 did not contain sufficient guidance to ensure adequate implementation of 10 CFR Part 21 requirements. To better understand Shaw’s implementation of its Part 21 process, the NRC inspection team interviewed personnel with responsibility for the review of potential 10 CFR Part 21 issues. In these discussions, the NRC inspection team learned that the procedure described in QS 16.3 includes an identification phase, initial review phase, evaluation phase, review phase, and reporting phase. Shaw personnel informed the NRC inspection team that the 60-day evaluation time as required by 10 CFR 21.21(a)(1) does not begin until the completion of the initial review phase. For the identification phase, QS 16.3, Section 4.3.1 states, in part, that any Shaw Nuclear employee having information that indicates the existence of a potential defect or potential failure to comply shall immediately report this condition to the appropriate initial reviewer. This notification shall include all relevant information pertaining to the condition and how it may relate to a substantial safety hazard. However, QS 16.3 states that this identification phase is performed outside of the 60 day evaluation period required by 21.21(a)(1). Since the notification includes how the condition may relate to a substantial safety hazard, the NRC inspection team considers this activity to be a part of the 60-day evaluation period described in 10 CFR 21.21(a)(1). This issue is identified as an example of Violation 99901387/2010-201-01.

Additionally, QS 16.3, Section 4.3.2 describes the initial review and states, in part, that for conditions which may be potential defects or potential failures to comply, the initial reviewer shall conduct a review to determine whether the condition meets the criteria for potential defect or potential failure to comply, and if the criteria are met, determine whether the condition may be potentially associated with a substantial safety hazard. If the results of this review are positive, the initial reviewer shall document this determination on the review/evaluation form and the date of this determination shall be documented as the discovery date. The initial review phase, as described in QS 16.3 allows for an indeterminate time period to perform the initial review as part of “discovery” before the formal evaluation is started.

The regulation in 10 CFR 21.21(a)(1) states that each entity shall adopt appropriate procedures to evaluate deviations and failures to comply to identify defects and failures to comply associated with substantial safety hazards as soon as practicable, and in all cases within 60 days of discovery, in order to identify a reportable defect or failure to comply that could create a substantial safety hazard. The regulation in 10 CFR 21.3 also defines "discovery" as the completion of the documentation first identifying the existence of a deviation or failure to comply potentially associated with a substantial safety hazard within the evaluation procedures discussed in 10 CFR 21.21.(a). The NRC inspection team acknowledged that 10 CFR Part 21, as written, allows for a discovery phase in which potential deviations or failures to comply may not be assessed in a timely manner to determine whether additional evaluation (in accordance with Part 21) is warranted. Although this discovery phase provides for further assessment to gain more information on a potential deviation or failure to comply, the regulation as written does not impose a deadline on the completion of the documentation first identifying the existence of the deviation or failure to comply. Accordingly, the NRC is assessing the need to initiate rulemaking to resolve this deficiency and ensure that deviations or failures to comply are promptly identified and evaluated in accordance with 10 CFR 21.21(a)(1).

The NRC inspection team also identified that some of the definitions provided in QS 16.3 were not consistent with the regulations. Specifically, QS 16.3 provides definitions including, but not limited to, discovery, potential defect, and potential noncompliance. These definitions differed from those provided in 10 CFR 21.3 and altered the intended meaning of the terms. This is identified as another example of Violation 99901387/2010-201-01.

Before the exit of the inspection, Shaw initiated corrective action report (CAR) 2010-03-05-469 to address the use of nonverbatim definitions in QS 16.3.

b.3 10 CFR 50.55(e) Procedure

The NRC inspection team reviewed QS 16.2 which provides definitions and outlines the responsibilities to identify, control, document, and resolve conditions used for reporting of deviations and failures to comply associated with a substantial safety hazard that occur during the construction or manufacture of nuclear power plants. During its review of the procedure, the NRC inspection team determined that QS 16.2 met the requirements of 10 CFR 50.55(e) as they relate to vendors. The NRC inspection team did note that the definitions provided in QS 16.3 revised the definitions provided in 10 CFR 21.3 to be more specific to 10 CFR 50.55(e); however, the definitions only identified that 50.55(e) was applicable to construction permit holders. The definitions did not provide the complete list of entities to whom the regulation is applicable, specifically to combined license (COL) holders, and manufacturing license holders.

b.4 10 CFR Part 21 Implementation

The NRC inspection team requested copies of the records pertaining to all Shaw 10 CFR Part 21 (Part 21) evaluations. The NRC inspection team learned that Shaw had performed only nine Part 21 evaluations as a result of an identified deviation and none at the Charlotte facility. None of the nine Part 21 reports resulted in a Part

21 notification because either 1) Shaw had actual knowledge that the Commission had been adequately informed of such defect or failure to comply that was supported by documentary evidence, 2) Shaw could not complete the evaluation and notified its customer, or 3) the defect or failure to comply was not associated with a substantial safety hazard. Shaw performed all evaluations within the appropriate timeframes specified in 10 CFR Part 21.

The NRC inspection team also reviewed a select sample of CARs and nonconformance and deviation reports to verify that Shaw had adequate guidance in place to evaluate such reports for their applicability to 10 CFR Part 21. The NRC inspection team determined that both the nonconformance and corrective action processes contain the necessary guidance to evaluate applicability to 10 CFR Part 21 requirements.

b.5 Purchase Orders

The NRC inspection team noted that the Shaw procurement process imposes the requirements of 10 CFR Part 21 on its qualified safety-related suppliers by incorporating supplier quality requirements into all POs for nuclear safety-related materials, items, and services.

The NRC inspection team reviewed a sample of Shaw POs and verified that Shaw had implemented its 10 CFR Part 21 program in a manner consistent with the requirements described in 10 CFR 21.31 for basic components.

b.6 Records Retention

Both 10 CFR 21.51, and 10 CFR 50.55(e)(9) have specific retention periods for the retention of evaluations, notifications sent to purchasers, and records of purchasers of basic components. The NRC inspection team noted that Shaw did not have a formalized process for specifying the retention period of the records mentioned above. Before the exit of the inspection, Shaw issued a revision to QS 17.1 that specified that all records relating to 10 CFR Part 21 or 10 CFR Part 50.55(e) shall be maintained as lifetime records as defined in ASME NQA-1-1994, “Quality Assurance Requirements for Nuclear Facility Applications.”

c. Conclusions

The NRC inspection team found that Shaw’s 10 CFR 50.55(e) program met the requirements of 10 CFR 50.55(e) as they relate to vendors. With the exception of Violation 99901387/2010-201-01, the NRC inspection team found that Shaw’s 10 CFR Part 21 program met the requirements of 10 CFR Part 21. The NRC inspection team identified Violation 99901387/2010-201-01 for Shaw’s failure to adopt appropriate procedures pursuant to 10 CFR 21.21. Specifically, the NRC inspection team determined that procedure QS 16.3 allowed for an evaluation outside of the 60 day evaluation period required by 21.21(a)(1), and included definitions that differed from those provided in 10 CFR 21.3 which altered the intended meaning of the terms.

2. Training and Qualification of Personnel

a. Inspection Scope

The NRC inspection team reviewed Shaw's policies and procedures to verify that Shaw was implementing training activities in a manner consistent with regulatory requirements and industry standards. The NRC inspection team reviewed the personnel training and qualification process to verify 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 the personnel training and qualification process with Shaw management and technical staff.

Specifically, the NRC inspection team reviewed the following policies and procedures:

- Shaw Nuclear QS 16.2, Notifying Clients of Potentially Reportable Deficiencies under 10 CFR 50.55(e), January 12, 2010
- SWSQAP 1-74A, Standard Nuclear Quality Assurance Program, Section 2, Quality Assurance Program, Revision B, June 1, 2009
- Shaw Nuclear QS 16.3, Identifying Reporting Defects and failures to Comply under 10 CFR 21, Revision K, January 25, 2010
- Shaw Nuclear QS 16.5, Corrective Action System, Revision D, March 1, 2010
- Nuclear Construction Startup Procedure (NCSP) 3-6-2, Personnel Qualification and Training, February 3, 2010
- Shaw, Quality Assurance Study Record, Assignment Record for Lead Auditor Maintenance of Proficiency, Study Assignments – FY 2003, Employee: 406774, January 28, 2003
- Shaw, Quality Assurance Study Record Assignment Record for Lead Auditor Maintenance of Proficiency, Study Assignments – FY 2004, Employee: 406774, January 26, 2004
- Shaw Stone & Webster Inc, Quality Assurance Department, Records of Assigned Reading, Employee Number: 406774, QA Auditor, dated October 18, 2004, April 10, 2006, October 26, 2006, October 4, 2007, April 22, 2008, November 6, 2008, November 7, 2008, December 23, 2008, April 22, 2009, April 23, 2009, August 3, 2009, August 27, 2009, September 15, 2009
- Shaw Development and Training of Procurement Personnel, Employee Numbers 1197441 and 1070394
- Shaw Record of Assigned Reading, Employee Number 1124150, Engineers 3-6, dated April 6, 2009, July 7, 2009, August 6, 2009, October 29, 2009
- Shaw Stone & Webster inc, Training Attendance Reports, Course Number NU-CIVSTR-0046, High Strength Bolting, 22 Shaw Employees, dated September 23, 2009, November 18, 2009
- Shaw Stone & Webster Inc, Quality Assurance Department, Training Attendance Report, Course Number NU-QADPT-0001, Orientation – Standard Nuclear Quality Program, Employee Numbers: 406240, 406381, 406431, 406774, 406321, dated October 21, 2004
- Shaw Stone & Webster Inc, Quality Assurance Department, Training Attendance Report, ASME Section III Code, NQA-1, and QA Program Orientation, Employee Numbers: 16 Shaw employees, dated May 31, 2006
- Shaw Stone & Webster Inc, Quality Assurance Department, Training Attendance Report, Course Number NU-QADPT-0001, Orientation – Standard Nuclear Quality Program, Employee Numbers: 6 Shaw employees, dated March 3, 2009

- Shaw Stone & Webster Inc, Quality Assurance Department, Training Attendance Report, Course Number NU-QADPT-0003, Orientation to ASME Section III & NQA-1
- Shaw Stone & Webster Inc, Quality Assurance Department, Training Attendance Report, Course Number SWQADP-0004, Shaw Safety Conscious Work Environment, Employee Number: 6 employees, dated February 1, 2010
- Shaw Stone & Webster Inc, Quality Assurance Department, Training Attendance Report, Course Number NU-QADP-0004, Nuclear Safety Conscious Work Environment, Employee Number: 6 employees, dated March 11, 2009

b. Observations and Findings

The NRC inspection team reviewed SWSQAP 1-74A, Section 2, and noted that Shaw schedules training of its personnel on applicable quality policies, manuals and procedures as determined by the responsible organization. Shaw personnel receive indoctrination and training on quality assurance/quality control (QA/QC) activities, including tests, inspections, and audits. SWSQAP 1-74A requires that Shaw personnel performing QA/QC functions must be qualified, certified and recertified as required by applicable codes and standards.

The NRC inspection team reviewed NCSP 3-6-2 for personnel qualification and training and verified that the procedure establishes the requirements and responsibilities for implementing the qualification and training program for Shaw construction personnel. NCSP 3-6-2 applies to nuclear construction projects undertaken by Shaw. The scope of the training includes indoctrination, qualification, certification and continuing education for Shaw direct-hire craft and non-manual personnel assigned to site and office locations.

NCSP 3-6-2 lists specialized personnel qualifications/certifications required in accordance with specific documents, e.g., welders and welding operators will be qualified/certified in accordance with NCSP 3-66, “Welder Qualification Program;” personnel applying protective coatings will be qualified/certified in accordance with NCSP 3-51, “Qualification of Protective Coating Applications;” and personnel who perform test program activities will be qualified/certified in accordance with NCSP 4-7, “Test Personnel Qualification and Certification.”

The NRC inspection team reviewed training records related to the implementation of the Shaw QA and Part 21 training program. The NRC inspection team sampled the training records and reading assignments for two Shaw QA auditors, two Shaw procurement engineers, and four Shaw engineers implementing design control activities. The NRC inspection team did not identify any issues with Shaw QA training records and certificates of qualification.

c. Conclusions

The NRC inspection team concluded that Shaw’s program requirements for training and qualification of personnel are consistent with the requirements of Criterion II of Appendix B to 10 CFR Part 50. The NRC inspection team also concluded that SWSQAP 1-74A and the associated training and qualification procedures were adequate and effectively implemented. The NRC inspection team did not identify any significant findings.

3. Design Control

a. Inspection Scope

The NRC inspection team reviewed Shaw's policies and implementing procedures that govern the design control activities to verify compliance with the requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. For the design finalization project, Shaw is a subcontractor to Westinghouse Electric Company (WEC) supplying design services under the Shaw SWSQAP 1-74A and the WEC engineering procedures. Shaw's domestic AP1000 project procedures (DAPPs) implements this relationship. Because of the unique working relationship with WEC regarding the design finalization of the AP1000 project, the NRC inspection team also reviewed related WEC policies, documents and implementing procedures. The NRC inspection team reviewed the implementation of these policies and procedures by inspecting activities related to the domestic AP1000 design finalization project and the AP1000 standard plant electrical design project. The design finalization project covers the engineering services to support the systems' design within the scope of the Shaw Division of Responsibility (DOR). This includes the engineering and design for systems and structures released to Shaw by WEC along with project management, information systems management, and administrative support. The safety-related portions of the electrical design project focus on activities related to the design of the Class 1E uninterruptible direct current power supply system.

Specifically, the NRC inspection team reviewed the following:

- SWSQAP 1-74A, Standard Nuclear Quality Assurance Program, Section 3, Engineering and Design Control, Revision B, June 1, 2009
- APP-GW-GL-700, AP1000 Design Control Document, Revision 17, September 22, 2008
- APP-GW-GEP-001, Technical and Administrative Requirements for Engineering Services for the AP1000 Nuclear Power Plant, Revision 6, July 01, 2009
- APP-GW-G8Y-001, AP1000 Standard Plant Division of Responsibility – US Projects, Revision 0, April 8, 2008
- APP-GW-G1-001, Plant Design Criteria, Revision 3, January, 2010
- APP-GW-G1X-001, Governing AP1000 Codes and Standards, Revision 4, August 24, 2009
- DAPP 5-2-1, Quality Marking of AP1000 Documents, July 22, 2008
- DAPP 5-9-2, Preparation and Control of Manual and Computerized Calculations, October 12, 2009
- DAPP 5-11-2, Project Specifications, September 17, 2008
- NEPP 4-43-1, Verification of Design Documents, October 22, 2009
- NSNP 3.4.1, Change Control for the AP1000 Program, Revision 1, August 3, 2009
- PP 4-1-6, Management Plan for Project Quality (MPPQ), Domestic AP1000 Design Finalization Project, February 3, 2010
- PP 4-2-2, Management Plan for Project Quality (MPPQ), Shaw AP1000 Standard Plant Electrical Design Project, February 3, 2010
- Purchase Order 4500229857, Change Notice 17, issued by Westinghouse to Stone & Webster, Inc. October 7, 2009
- QS 2.7, Computer Software, Revision F, July 13, 2009
- WEC 3.2.1, Safety Classification, Revision 1, August, 03, 2009

- APP-CC01-Z0-026, Design Specification, Safety Related Mixing and Delivering Concrete, Revision 2, February 11, 2010
- APP-CC01-Z0-027, Design Specification, Safety Related Concrete Testing Services, Revision 1, January 26, 2010
- App-G1-EWC-002, Calculation, Development of Power Cable Ampacities, Revision 1, January 18, 2009
- APP-CR01-Z0-011, Furnishing of Safety Related Reinforcing Steel, Revision 2, December 21, 2009
- APP-GW-GEE-731, VWS P&ID Changes to Support RRAS Calculations, Revision A, December 31, 2009
- APP-GW-GEE-731, AP1000 Design Change Review Form for VWS P&ID Changes to Support RRAS Calculations, Revision A, February 8, 2010
- Software Notification email for the AFT Fathom Computer Code, October 12, 2009
- Software Notification email for the AFT Fathom Computer Code, November 19, 2009
- Technical Bid Analysis for Specification APP-CR01-Z0-011, January 28, 2010

In addition, the NRC inspection team reviewed Shaw's policies and procedures that govern the construction activities related to safety-related structures to verify compliance with the requirements of Criterion III of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed the work in progress regarding the construction sequence of the AP1000 standard plant structures. Specifically, the NRC inspection team requested that Shaw describe the logic behind the construction sequence and how Shaw is considering design information, code requirements, and acceptable construction practices in the development of a construction sequence for safety-related structures. The NRC inspection team also reviewed the following nuclear construction startup procedures (NCSP), policies, and supporting documents:

- NCSP Project Manual, NCSP 2-4-0, "Design Control Change," August 21, 2007
- Shaw Quality Assurance & 10 CFR 21 Programs Implementation Presentation, March 1, 2010
- NCSP 4-13-0, "Design Change Control," October 1, 2009
- NCSP 3-6-2, Personnel Qualification and Training," February 3, 2010
- NCSP 3-2-0, "On-site Modular Assembly," January 13, 2010
- NCSP 3-75-0, "Installation of Prefabricated Modules," January 15, 2010
- APP-GW-GBH-320, "AP1000 Module Management Plan," May 16, 2008
- NCSP 3-31-0, "Concrete Placement," May 17, 2008
- NCSP 3-60-0, "Structural Welding," November 08, 2007
- NCSP 2-3-0, "Constructability Standards," April 18, 2007
- NCSP 3-8-0, "Rigging and Lifting," November 5, 2007
- NCSP 3-30-0, "Concrete Mixing and Delivery," May 7, 2008
- NCSP 3-23-0, "Waterproof Membrane," May 7, 2008
- NCSP 2-2-0, "Construction Execution Plan," April 18, 2007
- NCSP 2-12-1, "Construction Quality Completion Program," November 30, 2009
- NCSP 3-3-0, "Construction Engineering," May 9, 2008
- NCSP 3-5-0, "Control of Site Activities for ASME Section III Construction," February 25, 2008
- NCSP 3-21-0, "Installation of Concrete, Steel and Timber Piles," May 7, 2008
- NCSP 3-61-0, "Stud Welding," March 20, 2008

- NCSP 3-66-0, “Welder Qualification Program,” November 10, 2009
- NCSP 1-30-0, “Concrete Mixing and Delivery,”
- Module Prep and Assembly Schedule – Unit 3, JJS – Assembly Layout
  CA01 SG Compartments and Refueling Canal
  CA02 IRWST / Pressurizer Wall M Module
  CA03 IRWST Southwest Steel Wall M Module
  CA04 Reactor Vessel Cavity / RCDT
  CA05 CVS / Access Tunnel / PXS-B Walls
  CA20 Aux Bldg Area 5 & 6 M20 Module
- Standard Plant Master File (construction schedule) – With Ties to Startup
  Building 10: Nuclear Island
  Building 11: Containment
  Building 12: Aux Building
- AP1000 Construction Readiness Team (matrix)
- STD 1-8-0, “Construction Input to Early Design Constructability Reviews,” December 28, 2009
- STD 1-6-0, “Design Review Meetings,” October 30, 2009
- NEPP 4-6-0, “Drawings and Diagrams,” November 12, 2008
- EAP 4.13, “Engineering Assurance Procedure,” June 15, 2000
- QS 10.3, “Construction Quality Completion Program,” May 29, 2009

b. Observations and Findings

b.1 Domestic AP1000 Design Finalization and Electrical Design Projects

b.1.1 Design Control Requirements and Implementation

The NRC inspection team reviewed the Shaw and WEC policies and procedures which delineate design activities in a planned, controlled and orderly manner and provide controls for design inputs, outputs, design analyses, and organizational interfaces. The documents properly identified the interfaces between design organizations, design verification, and the handling of design changes.

PP 4-1-6 and Change Notice 17 to PO No. 4500229857 issued by WEC to Shaw, Stone & Webster, Inc., reference the use of WEC procedure APP-GW-GEP-001, Revision 6. APP-GW-GEP-001 requires the use of the top level design requirements for the AP1000 program, as specified in APP-GW-G1-001, Revision 3.

APP-GW-G1-001 provides the AP1000 principal design criteria and requires retaining the “licensing basis” of the AP600 design. It further specifies that the plant design comply with all applicable regulatory codes by referencing APP-GW-G1X-001. The NRC inspection team reviewed all available safety-related design documents. The NRC inspection team identified several design documents in which Shaw failed to correctly specify the correct revisions or editions of industry standards and a regulatory guide as required by APP-GW-G1-001 and Criterion III to Appendix B. Specifically, the NRC inspection team identified errors in the following design documents:

- APP-CC01-Z0-026, Design Specification, Safety-Related Mixing and Delivering Concrete, Revision 2, dated February 11, 2010, references American Society for Testing and Materials (ASTM) C 150-09. Westinghouse's APP-GW-G1X-001, Revision 4, requires the use of ASTM C 150-02. In addition, this specification invokes the use of Regulatory Guide 1.29, Revision 4 while the AP1000 Design Control Document (DCD), Revision 17, requires the use of Regulatory Guide 1.29, Revision 3.
- APP-CC01-Z0-027, Design Specification, Safety-Related Concrete Testing Services, Revision 1, dated January 26, 2010, references ASTM C 150-08. Westinghouse's APP-GW-G1X-001, Revision 4, requires the use of ASTM C 150-02. In addition, this specification invokes the use of Regulatory Guide 1.29, Revision 4 while the AP1000 DCD, Revision 17, requires the use of Regulatory Guide 1.29, Revision 3.
- APP-G1-EWC-002, Calculation, Development of Power Cable Ampacities, Revision 1, dated January 18, 2009, references ICEAP-54-440, 1994 edition. Westinghouse's APP-GW-G1X-001, Revision 4, requires the use of ICEAP-54-440, 1986 edition.

These are identified as examples of Nonconformance 99901387/2010-201-02.

In response to the above, Shaw initiated the following CARs:

- CAR 2010-03-04-464, Standards Effective Years Listed Within Specifications Are Contrary to WEC Codes and Standards Specification, dated March 4, 2010.
- CAR 2010-03-05-471, Specifications Reference Regulatory Guide Revision that Does Not Match DCD, dated March 5, 2010.

b.1.2 Design Change Control and Verification

The Shaw design finalization group uses a WEC satellite document control system which includes the latest revisions of WEC procedures and design requirements, such as the DCD, to be used for the project. The design requirements are maintained and managed via the WEC design change process. Appendix D to APP-GW-GEP-001 requires the mandatory verbatim compliance with WEC Level II procedure NSNP 3.4.1. No revision level or date is specified since Shaw is required to use WEC's document control system which provides the latest revision of record at the time the activity is performed. The NRC has previously inspected the WEC change control process as documented in Inspection Report 05200006/2008-201. During its review, the NRC inspection team identified that Shaw did not utilize the design change process to obtain prior Westinghouse approval for the use of the different revisions of the industry standards and the RG described in Section b.1.1, above. This is identified as another example of Nonconformance 99901387/2010-201-02.

The NRC inspection team noted that when the design change process was utilized, Shaw complied with the requirements of NSNP 3.4.1. Shaw

obtained the required reviews for design changes, which were approved by the Change Control Board. Impactees completed the AP1000 design change review form and calculations were revised to incorporate the design changes as required. These revisions were subjected to design control measures commensurate with those applied to the original design and were approved by the organization that performed the original design.

In addition, Shaw documented reviews of exceptions to procurement technical requirements by bidders in technical bid analyses. These analyses were subjected to design control measures commensurate with those applied to the original design and were approved by the organization that performed the original design.

Internal design interfaces are controlled through sign-off of design documents. PP 4-1-6 delineates the design interfaces between Shaw and WEC and requires the use of various WEC procedures and processes related to design control activities. Design output documents issued by Shaw are transmitted to WEC. When required, WEC's reviews of these documents are documented through sign-off.

NEPP 4-43-1 describes the design verification process and the allowed verification methods. QS 2.7 describes the verification and validation process for computer software. The NRC inspection team noted that all reviewed documents were design verified by individuals other than those performing the work and identified the design verification method used. However, the NRC inspection team identified the following exceptions:

- While reviewing software control implementation, the NRC inspection team noted that the approved software list, hyperlinked to QS 2.7, was not verified to specify the applicability of the software to nuclear projects (i.e., neither Yes nor No was entered in the appropriate column). This issue was entered into the Corrective Action Program as CAR 2010-00-04-463, "Missing Information on Approved Software List," dated March 4, 2010.
- The closure of corrective actions for software error notifications did not appear to be formally documented (i.e., emails were sent from Shaw's Stoughton facility to Shaw's Charlotte facility requesting that certain reviews be performed but they did not require a confirmation that the reviews took place and that required corrective actions were taken).

The NRC inspection team did not identify actual problems with issued calculations.

b.2 Design Constructability

The NRC inspection team reviewed Shaw's constructability approach for all AP1000 standard plant buildings. To support nuclear construction activities, Shaw has developed a series of NCSPs. Shaw will use these procedures to provide general guidance for quality control in all activities related to construction engineering and modular assemblies.

The NRC inspection team reviewed NCSP 2-3-0 which establishes the guidelines for the approach and methodology for implementing an integrated constructability program. The procedure is applicable to Shaw projects and delineates Shaw's interaction with WEC engineers in developing project specifications and construction drawings for all buildings and modules. According to Shaw's definition, constructability is defined as the optimum use of construction knowledge and experience in planning, design and engineering, procurement, and field construction operations to achieve overall project objectives. The NRC inspection team was informed that the interaction between WEC and Shaw occurs in biweekly meetings in which Shaw's construction experts discuss best practices, tolerances, lessons learned from nuclear construction in China, AP1000 requirements, and codes and standards requirements. The main objective of these discussions is to interpret design information in order to make it clear and constructible for the on site construction team. However, the NRC inspection team noted that NCSP 2-3-0 did not adequately address the approach for the development of project specifications and design drawings, procurement, scheduling, and construction issues that affect the constructability standard. The NRC inspection team interviewed members of the Shaw construction group to discuss the procedures associated with NCSP 2-3-0. Shaw personnel stated that the NCSP 2-3-0 procedure is a living document that will be refined to capture the appropriate approach and methodology necessary for implementing an integrated constructability program.

The NRC inspection team reviewed STD 1-6-0 which requires that design review meetings be conducted in accordance with Shaw's Design Finalization Project Engineering Plan, and NEPP 4-6-0 which establishes the requirements for the preparation of engineering drawings and related diagrams. Shaw stated that the joint effort between WEC and Shaw will continue throughout the construction phase. Shaw explained that WEC will produce construction documents (e.g., final construction drawings, construction specifications) for safety-related structures using Shaw's constructability assessments. Shaw will produce similar documentation for their non-safety structures. Either Shaw or WEC will document the constructability assessments for each building and module, as needed.

The NRC inspection team reviewed NCSP 3-31-0 for concrete placement which describes the preparation, placement, consolidation, testing, and curing of structural concrete on projects such as the nuclear island base mat, shield wall, and other significant structures. In interviews with the Shaw construction group, the NRC inspection team learned that NCSP 3-31-0 is not applicable for placement, consolidation, and testing of self-consolidating concrete and should not be used for concrete containments that are required to comply with American Society of Mechanical Engineers (ASME) Code, Section III, Division 2 (ACI 359).

During the review of NCSP 3-31-0, the NRC inspection team noted that Shaw did not develop a procedure for self-consolidating concrete placement for structural modules. NRC inspection staff interviewed Shaw representatives to discuss the issue, and Shaw indicated that it will update NCSP 3-31-0 to include the procedure for self-consolidating concrete placement for structural modules.

The NRC inspection team also noted that NCSP 3-31-0 and NCSP 1-30-0 did not reference APP-CC01-Z0-026. Shaw indicated that it will update the NCSP procedures to reference the Westinghouse document. The NRC inspection team

determined that these observations were not significant since the procedures had not been implemented.

b.3 Construction Sequence

The NRC inspection team noted that the design review meetings held between Shaw and WEC are the main vehicles used by Shaw to develop the construction sequence for AP1000 structures and modules. To gain a better understanding of the development of the construction sequence, the NRC inspection team requested samples of construction sequence documentation. Shaw provided preliminary schedules for modular assembly and construction of the auxiliary building, nuclear island foundation, and containment internal structures for Vogtle Units 3 and 4. The NRC inspection team noted that preliminary schedules were developed for all safety-related structures except for the shield building and steel container cylinder. Additionally, the preliminary schedules for modules took into account transportation to the assembly area on site, measurements, welding, non-destructive examinations (NDE), and moving the assembly to its final location.

The NRC inspection team requested a more detailed explanation on the use of the constructability assessments of all modules and structures to complement the construction sequence of each structure of the AP1000 standard plant. Shaw expects multiple construction activities, such as the construction of the foundation and the assembly of modules, to occur at the site simultaneously. NCSP 3-2-0 states that there will be an onsite modular assembly area (co-located site) for each of the structural modules (i.e., CA-20, CA-01, CA-04/CA-05, CA-03, CA-02, floors, and ceiling modules). The assembly area consists of multiple closed buildings in which the different modules will be assembled. Shaw presented planning and scheduling documents and related construction procedures to the NRC inspection team to demonstrate its effort to consider constructability information. In addition, Shaw is following the construction sequence and lessons learned developed from the AP1000 plants that are being built in China. Shaw presented multiple flowcharts and supporting documents that demonstrated its effort towards an organized transition between design and construction phases.

The NRC inspection team asked how Shaw is developing modular construction and building construction sequences with respect to the AP1000 design requirements. Shaw responded that it will implement the NCSPs to satisfy the AP1000 design requirements for construction. The NRC inspection team compared the modular construction schedules against the construction schedules for the safety-related structures. The schedules for safety-related structures consider modular installation, concrete pouring and cure time, rebar, piping, electric cable installation and other important milestones for construction. Shaw reiterated that these time frames are early estimates, which will be refined with the final design documents.

APP-GW-GBH-320 provides project plans and strategies for module development including design, procurement, fabrication, assembly, schedule, delivery and outfitting of both structural and mechanical modules. Shaw explained that modular assemblies will follow a process similar to that in China, with the only difference being that the modules will be installed vertically. Shaw stated that this approach results from lessons learned from the nuclear modular construction in China, where issues have been identified with horizontal welding and handling of the modules.

For domestic plants, welding will be done with a mechanical arm which will have the capability of switching the welding head for the NDE device.

c. Conclusions

The NRC inspection team identified one nonconformance associated with Shaw's failure to meet the requirements of Criterion III of Appendix B to 10 CFR Part 50. Nonconformance 99901387/2010-201-02 identifies Shaw's failure to reference the correct revisions for two industry standards and one RG as approved by WEC in the original design, and its failure to utilize the design change process to obtain prior WEC approval.

In addition, the NRC inspection team made two observations regarding the control of software to be utilized in engineering calculations and one observation regarding a procedure for self-consolidating concrete for structural modules. The NRC inspection team noted that Shaw did not always verify that the approved software list, hyperlinked to QS 2.7, specified the applicability of the software to nuclear projects. The NRC inspection team also noted that the closure of corrective actions for software error notifications did not appear to be formally documented.

With the exception of the above issues, the NRC inspection team concluded that Shaw's design control process conforms to regulatory requirements and has been implemented in accordance with applicable Shaw's policies and procedures. However, it should be noted that because of the limited availability of safety related documents to review, the NRC inspection team could not verify the implementation adequacy of all aspects of the design control process.

4. Procurement Document Control

a. Inspection Scope

The NRC inspection team reviewed the Shaw policies and procedures for procurement document control to verify compliance with Criterion IV, "Procurement Document Control," of Appendix B to 10 CFR Part 50. More specifically, the NRC inspection team reviewed SWSQAP 1-74A and the applicable implementing procedures that govern the establishment of measures to assure that applicable regulatory requirements, design basis, and other requirements, which are necessary to assure adequate quality are suitably included or referenced in the procurement documents. In addition, the NRC inspection team reviewed a sample of POs to verify proper implementation of the Shaw procurement program. The NRC inspection team reviewed the following:

- SWSQAP 1-74A, Revision B, Standard Nuclear Quality Assurance Program, Section 4.0, Procurement Document Control, June 1, 2009
- QS 4.1, Site Procurement, Revision C, July 14, 2000
- QS 4.2, Inspection Planning System, Revision D, March 1, 2000
- QS 4.3, Preparation of Engineering Office Procurement Documents and Selection of Sellers, Revision E, May 5, 2005
- Nuclear Worldwide Procurement Manual (WPP) 9.0, Nuclear Procurement, Revision 2, June 10, 2009

- WPP 9.1, Procurement Department Charter Nuclear Projects, Revision 3, June 1993
- WPP 9.2, Procurement Department Records Management, Revision 0, October 2005
- WPP 9.3, Nuclear Inspection System, Revision 1, June 2003
- WPP 9.4, Inspection Planning, Revision 2, June 2003
- WPP 9.5, Inspection at Supplier Facilities, Revision 1, June 2003
- WPP 9.5, Inspection at Supplier Facilities, Revision 1, June 2003
- WPP 9.6, Inspection and Review of Supplier Documentation, Revision 6, June 2003
- WPP 9.6, Inspection and Review of Supplier Documentation, Revision 6, June 2003
- NEPP 4-8, Support of Procurement, June 12, 2009
- NEPP 4-32, Preparation and Control of Engineering Services and Scopes of Work, September 4, 2007
- VC Summer Units 3 and 4 Project, Phase 1, South Carolina Electric & Gas Company, Project No. 132177, Shaw Project Procedure (PP) 4-1-4, June 18, 2009
- Vogtle Units 3 and 4 Project – Phase 1 and 2, Southern Nuclear Operating Company, Project No. VOGTLEEPC, Shaw Project Procedure (PP) 4-1-8, Management Plan for Project Quality, June 25, 2009
- PO No. 527358, Equipment and Services, CA01, CA02, CA03, CA04, CA05, and CA20 Modules, August 28, 2009
- Shaw Subcontract No. 1321751004-09-00273, Vogtle Units 3 &4 Project, Essco Calibration Laboratory, Subject of Inquiry, Measuring & Testing Equipment Calibration Services, November 4, 2009
- Shaw Nuclear Procurement Record, Vendor: Walsh Engineering Services, Inc, Scope of Work for Off-Site Measurement & Testing Equipment, November 5, 2009
- Shaw Nuclear Procurement Record, Purchase Order 546009, Vendor: Walsh Engineering Services, Inc, Agreement of Services for Independent Contractor, November 5, 2009
- Shaw Subcontract No. 132175-1004-1421, Vogtle Generating Plant, Units 3&4, Vendor: MACTEC Engineering & Consulting Inc, Concrete & Soil Testing Services, February 15, 2010
- Shaw AP1000 Project Specification, SVO-000-T1-001, “Soil and Concrete Testing,” Revision 0, February 3, 2010.

b. Observations and Findings

b.1 Procedural Controls for the Release of Procurement Documents

The NRC inspection team verified that SWSQAP 1-74A and lower tier Shaw procedures implement proper QA controls for the release of procurement documents and subsequent changes to POs. Specifically, PPs 4-1-4 and 4-1-8 provide procedural requirements for implementing QA and Part 21 requirements for procuring parts and services for Vogtle Units 3 and 4 and Summer Units 2 and 3. NEEP 4-32 establishes measures for the preparation, review, and issuance of engineering services scope of work (ESSOW) for QA Category I engineering services. NEEP 4-32 also describes development of ESSOW documents, including

the technical and QA requirements for the procurement of engineering services on basic components used in safety-related applications. NEEP 4-8 establishes requirements for engineering preparation, review, approval, revision, and control of activities to support procurement of equipment, materials or services. The NRC inspection team did not identify any issues with these procedures.

b.2 Implementation of Shaw Purchase Orders

The NRC inspection team verified that Shaw implemented technical, regulatory, and reporting requirements (i.e., specifications, codes, standards, tests, inspections, special processes, witness and hold points, and applicability of 10 CFR Part 21 reporting) in procurement documents. As part of this review, the NRC inspection team reviewed the following POs:

Shaw PO No. 527358, Shaw Modular Solutions, LLC, Manufacturing of Modules CA01 through CA05, and CA20

PO No. 527358 procures fabrication and assembly services for AP1000 modules CA01, CA02, CA03, CA04, CA05, and CA20 from Shaw Modular Solutions (SMS) for the Vogtle Unit 3 project. The NRC inspection team noted that PO No. 527358 identifies the following AP1000 inspections, tests, analysis, and acceptance criteria (ITAAC) to be within the SMS scope of work: ITAAC ID Nos. 77, 195, 395, 396, 722, 723, 726, 727, and 730. In addition, the NRC inspection team verified that PO No. 527358 invokes the requirements of 10 CFR Part 21, 10 CFR 50.55(e), Appendix B to 10 CFR Part 50, and 10 CFR 50.7, "Employee Protection," on SMS.

PO No. 527358 specifies that changes to the SMS QA program shall be submitted to Shaw for review before implementation. In addition, the PO requires that SMS identify all applicable QA requirements imposed by PO No. 527358 on the sub-supplier purchase documents and that SMS ensure compliance. SMS shall maintain QA records on the modules to furnish evidence of the quality of items within the scope of work.

Shaw PO No. 546009, ESSCO Calibration Laboratory/Walsh Engineering Service, Measuring and Testing Equipment (M&TE)

PO No. 546009 procures calibration services for M&TE and provides specific requirements related to control of M&TE tagging, documentation, and examples of M&TE devices that will be calibrated for the Vogtle Unit 3 project. The NRC inspection team reviewed PO No. 546009 and verified that the PO imposes the requirements of 10 CFR Part 21 and Appendix B to 10 CFR Part 50.

Shaw PO Subcontract No. 132175-1004-1421, MACTEC Engineering and Consulting, Inc, Soil and Concrete Testing

Subcontract No. 132175-1004-1421 procures soil and concrete testing services in support of the Vogtle Units 3 and 4 project. Subcontract No. 132175-1004-1421 requires that work related to nuclear safety shall be performed in accordance with QA requirements defined in Shaw AP1000 Project Specification, SVO-000-T1-001. The NRC inspection team noted that SVO-000-T1-000 references ASME NQA-1, "Quality Assurance Requirements for Nuclear Facility Applications," 1994 Edition

with 1995 Addenda, 79 ASTM standards, and 6 ACI standards related to soil and concrete testing of engineering fill material and building concrete installation over the fill material. In addition, the NRC inspection team noted that while SVO-000-T1-001 provides a cross reference to relevant NRC RGs, the following RGs had been omitted:

- RG 1.132, Revision 2, issued October 3, 2003.
- RG 1.138, Revision 2, issued December 2003.

These RGs contain technical requirements from ASTM and ACI which SVO-000-T1-001 does not appear to address. Therefore, during the exit meeting conducted with Shaw management, the NRC inspection team requested that Shaw determine whether or not the NRC-endorsed standards and regulatory positions in RGs 1.132 and 1.138 had been imposed in Subcontract No. 132175-1004-1421 consistent with the scope of the design specification. The NRC inspection team identified this as Unresolved Item 99901387/2010-201-03.

c. Conclusions

With the exception of Unresolved Item 99901387/2010-201-03, the NRC inspection team found that Shaw's procurement document control was in compliance with Criterion IV of Appendix B to 10 CFR Part 50 and was effectively implemented. The NRC inspection team documented in Unresolved Item 99901387/2010-201-03 Shaw's need to address the applicability of RGs 1.132 and 1.138 to design specification SVO-000-T1-001.

5. Control of Purchased Material, Equipment, and Services and Audits

a. Inspection Scope

The NRC inspection team reviewed Shaw policies and procedures that govern the control of 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 POs and associated internal and external audit reports to evaluate compliance with program requirements and adequate implementation of those requirements. In addition, the NRC inspection team reviewed corrective actions that address deficiencies identified by the audit findings for adequacy and timeliness.

Documents reviewed for this area of inspection include the following:

- SWSQAP 1-74A, "Standard Nuclear Quality Assurance Program," Revision B, June 1, 2009, Section 7 – "Control of Purchased Material, Equipment, and Services"
- SWSQAP 1-74A, "Standard Nuclear Quality Assurance Program," Revision B, June 1, 2009, Section 18 – "Audits"
- QS 1.1, "Qualification and Experience Requirements for Shaw QA/QC; Procurement and/or QA/QC Source Inspection; and Start-Up Services Personnel," Revision O, June 8, 2009
- QS 4.1, "Site Procurement," Revision C, July 14, 2000
- QS 4.2, "Inspection Planning System," Revision D, July 14, 2000

- QS 4.3, “Preparation of Engineering Office Procurement Documents and Selection of Seller,” Revision F, November 5, 2007
- QS 6.1, “Document Control,” Revision H, July 14, 2000
- QS 7.1, “Receiving Process,” Revision G, July 14, 2000
- QS 7.10, “Control of Purchased Material, Equipment, and Offsite Services for Safety Related Applications,” Revision E, July 14, 2000
- QS 7.11, “Review of Sellers’ Nondestructive Examination Procedures,” Revision O, March 1, 2010
- QS 10.67, “Inspection Plan,” Revision O, March 1, 2010
- QS 14.2, “Inspection Report System,” Revision H, July 14, 2000
- QS 17.1, “Quality Assurance Records System,” Revision H, July 14, 2000
- QS 18.1, “Quality Audit Program,” Revision H, July 14, 2000
- Nuclear Construction Startup Procedures (NCSP) 2-11, “Construction Subcontract Administration,” Revision 0, May 27, 2008
- Quality Assurance Directive (QAD) 7.11, “Process and Product Sampling,” Revision A, December 5, 2008
- QAD 7.14, “Receiving Inspection,” Revision A, December 14, 2009
- QAD 7.17, “Supplier and Contractor QA Program Manual Reviews and Qualification Audits,” Revision H, January 19, 2010
- QAD 7.19, “Shaw Nuclear Use of Nuclear Industry Assessment Committee (NIAC) Member Audits,” Revision O, November 5, 2007
- QAD 7.20, “Shaw Nuclear Responsibilities when Performing Audits as a Member of NIAC,” Revision O, November 5, 2007
- QAD 18.1, “Quality Assurance Internal Audits,” Revision L, July 30, 2009
- QAD 18.2, “Quality Audit Plans,” Revision H, March 1, 2005
- QAD 18.11, “Post Award QA Audits of Sellers and Site Contractors,” Revision R, August 14, 2009
- QAD 18.12, “QA Surveillances,” Revision A, December 3, 2009
- Engineering Assurance Procedure (EAP) 4.1 – “Procurement System,”
- EAP 4.13, “Processing of Project Specification,” Revision 2, June 15, 2000
- NEPP 4-32, “Preparation and Control of Engineering Service Scopes of Work,” Revision 0, August 31, 2007
- NEPP 4-52, “Commercial Grade Items,” Revision 0, August 31, 2009
- Worldwide Procurement Procedure (WPP) 4.1, “Source Inspection and Expediting Coordination Procedure,” Revision 1, December 2001
- WPP 9.0, “Nuclear Procurement,” Revision 2, June 10, 2009
- WPP 9.3, “Nuclear Inspection System,” Revision 1, June 1, 2003
- WPP 9.4, “Inspection Planning,” Revision 1, June 1, 2003
- WPP 9.5, “Inspection at Supplier’s Facilities,” Revision 1, June 1, 2003
- WPP 9.6, “Inspection and Review of Supplier Documentation,” Revision 1, June 1, 2003
- DAPIP 4-4, “Consortium Quality Council/Management Assessment,” Revision 1, December 14, 2009
- DAPIP 4-5, “Witness and Hold Point Program,” Revision 0, November 6, 2008
- DAPIP 4-6, “Supplier Audit Performance and Purchaser Participation,” Revision 0, July 30, 2008
- Vogtle Units 3 and 4 Project Manual, Section 4, “Quality Assurance,” Subsection 2.0, “Requirements,” Item Number VII, “Control of Purchased Material Equipment, and Services, Revision 8, June 25, 2009

- The most current version of Quality Rating List (QRL) that included a unique vendor number, vendor name and address, audit date, evaluation dated, certificate type, certification expiration date, Class, QA categories, and exemptions and remarks.
- Internal QA Audit, Audit No. CT-07-02, QA Audit of Charlotte Office Nuclear Project Activities performed July 30 through August 2, 2007 in support of the domestic AP1000 Design Finalization Project and related projects
- Internal QA Audit, Audit No. 2009-04, QA Audit of Charlotte Office Nuclear Project Activities performed April 20 - 24, 2009 in support of the domestic AP1000 Design Finalization Project and related projects.
- External QA Audit, Audit No. 2009-02, QA Audit of Shaw Modular Solutions (SMS) performed by Shaw during the period of May 12-14, 2009
- External QA Audit, Audit No. 2009-09, QA Audit of SMS performed by Shaw during the period of December 1-3, 2009
- PO No. 546009, November 5, 2009, with Walsh Engineering Services, also known as Essco Calibration Laboratory.
- PO No. MPA-CR01, August 21, 2009, with Gerdau Ameristeel
- PO No. 1321751004-1421, February 15, 2010, with MACTEC
- PO No. 527358, August 28, 2009, with SMS

b. Observations and Findings

The NRC inspection team reviewed SWSQAP 1-74A, Sections 7 and 18. Section 7 establishes the controls to ensure that purchased material, equipment, and services conform to procurement documents. These controls include supplier evaluations and selections through quality evaluation and rating, periodic source assessments and inspections, audits, and receipt inspections, as applicable. Section 18 establishes an internal audit program to ensure that quality activities comply with the requirements of the SWSQAP 1-74A, and related procedures, and to determine the effectiveness of the quality assurance program.

b.1 External Audits

The NRC inspection team reviewed QS 7.10 which establishes the program and controls for purchased materials, equipment, and services for safety-related applications from the time the POs and contracts are issued up to and including the time materials or equipment are released for shipment or completion of offsite services. QAD 18.11 requires QA audits of sellers and site contractors after the award of a PO or contract. Although SWSQAP 1-74A and the QSs and QADs effectively addressed many of the program requirements, the NRC inspection team noted that Shaw did not have external audit implementing procedures that addressed overall audit controls, scheduling, processing, tracking and closing of audit findings for items and activities affecting quality. The NRC inspection team determined that Shaw had only one audit program for both internal and external audits.

b.1.1 Shaw Modular Solutions

The NRC inspection team reviewed two external audits performed by Shaw associated with PO No. 527358, which includes work associated with AP1000 module fabrication for domestic nuclear power plant (NPP) applications and requires a quality program that meets the provisions of Appendix B to 10 CFR Part 50. During May 12-14, 2009, Shaw performed Audit No. 2009-02 which indicated that SMS was effectively implementing its nuclear QA program specific to procurement activities. The audit identified 10 audit observations that required evaluation and response by SMS and offered four recommendations. The NRC inspection team reviewed the audit, as well as the audit observations and recommendations, and concluded that Shaw performed a limited scope audit which effectively verified that SMS performed procurement activities consistent with quality requirements that met the provisions of Appendix B. The NRC inspection team reviewed a sample of SMS responses to the audit observations as well as Shaw's evaluations and acceptance of the resolutions provided by SMS. No issues were identified.

Shaw conducted a second audit of SMS (Audit No. 2009-09) from December 1-3, 2009. The purpose of this audit was to evaluate the adequacy and implementation of the SMS QA program for AP1000 module fabrication for domestic NPP applications. The results of the audit indicated that SMS had neither fully developed implementing procedures nor completed training of personnel. In addition, implementation activities available for audit team review in the shop were limited to receipt inspection and initial processing of material. Since the extent of activities and processes available for evaluation was limited, a follow up audit was needed to verify implementation of the SMS QA program for fabrication. The audit identified an additional 14 audit observations that required evaluation and response by SMS. The NRC inspection team reviewed the SMS responses to the audit observations as well as Shaw's evaluation of those responses. No issues were identified.

b.1.2 Essco Calibration Laboratory

The NRC inspection team reviewed PO No. 546009 with Essco Calibration Laboratory. The scope of work for this PO is safety-related calibration services and requires a quality program that meets the requirements of Appendix B, and 10 CFR Part 21. In response to its request for the audit report of this supplier, Shaw informed the NRC inspection team that an audit had not been performed and was currently not planned. Instead, Shaw provided the NRC inspection team with a copy of a certificate from the American Association for Laboratory Accreditation (A2LA) to justify its decision to issue a safety-related PO to Essco Calibration Laboratory without performing a QA audit.

The NRC inspection team also reviewed the Shaw quality rating list (QRL). The QRL lists Essco Calibration Laboratory as a Category I, ll, and lll provider and identifies A2LA accreditation as the bases for Essco's designation as an "approved supplier." SWSQAP 1-74A requires a supplier evaluation and selection including quality evaluation and rating, periodic source assessments

and inspections, audits, and receipt inspections. A supplier evaluation includes an evaluation of historical performance relating to a similar product, review of supplier quality records supported by documented qualitative and quantitative information that can be objectively evaluated, and a survey or audit to directly evaluate technical and quality requirements. An evaluation of supplier's QA program and completion of a supplier qualification survey or audit are required before an order is placed. The NRC inspection team identified the placement of a safety-related PO with Essco Calibration Laboratory without having performed a supplier qualification audit as Nonconformance 99901387/2010-201-04.

b.2 Internal Audits

b.2.1 Implementing Procedure

The NRC inspection team reviewed QS 18.1, which establishes the program for performing internal and external audits to evaluate the effectiveness of and compliance with SWSQAP 1-74A, and the evaluation and selection of sellers or contractors. QAD 18.1, which describes the system for conducting internal QA audits and QAD 18.2 which describes the procedure for preparing, revising and controlling audit plans to be used for performing internal and post-award audits of sellers, implements the provisions of QS 18.1. Although SWSQAP 1-74A and the QSs and QADs effectively address some of the audit program requirements, the NRC inspection team was unable to find internal and external audit implementing procedures that addressed overall audit controls for the scheduling, processing, tracking and closing of audit findings for items and activities affecting quality.

The NRC inspection team observed that Shaw combined the internal and external audit programs into a single, self contained, manually implemented program. During interviews with Shaw personnel, the NRC inspection team learned that all audit are manually scheduled and tracked to closure. Audit documents are scanned into Shaw's "Documentum" record retention database upon receipt. The QA manager for audits retains the original copies, manually enters them into a log, and files them until all issues are resolved. Shaw documents, tracks, evaluates, and resolves open items independent of its corrective action program. A separate "Audit Finding Report" is prepared and presented to Shaw management annually. Shaw was unable to provide any implementing procedures that govern the scheduling and tracking of audits and their associated corrective actions.

In preparing for its 2009 internal QA audit, Shaw determined that the 2008 internal QA audit of its Charlotte office nuclear project activities had not been performed. Additionally, the 2008 annual "Audit Finding Report" did not identify that the 2008 Internal QA audit of its Charlotte office nuclear project activities was not performed. The NRC inspection team identified these issues as Nonconformance 99901387/2009-201-05.

b.2.1 Review of Internal Audits

The NRC inspection team reviewed two internal audits performed by Shaw. Shaw performed the 2007 internal QA audit, Audit No. CT-07-02, during the

period of July 30 through August 2, 2007, in support of the ongoing U.S. domestic AP1000 project. The audit addressed management plans for project quality and project procedures, design control, procurement, document control, QA records, training, corrective actions, and surveillances. CT-07-02 identified 12 observations. The NRC inspection team reviewed the audit and the audit observations and concluded that Shaw performed an effective internal audit. The NRC inspection team also reviewed a sample of the responses to the audit observations as well as Shaw's evaluation and acceptance of the proposed resolution. No issues were identified.

The second internal audit reviewed by the NRC inspection team was the 2009 internal QA audit. Shaw performed Audit No. 2009-04 during the period of April 20 through April 24, 2009 in support of the ongoing U.S. domestic AP1000 project. The audit addressed management plans for project quality and project procedures, design control, procurement, document control, QA records, training, corrective actions, and surveillances. Audit No. 2009-04 identified several areas of implementation that need improvement and 20 audit observations requiring responses. The NRC inspection team reviewed the audit and the audit observations and concluded that Shaw performed an effective internal audit. The NRC inspection team also reviewed a sample of the responses to the audit observations, as well as Shaw's evaluation and acceptance of the proposed resolution. No issues were identified.

c. Conclusions

The NRC inspection team concluded that Shaw is not implementing control of purchased materials, equipment, and services and its audit requirements consistent with the regulatory requirements of Criterion VII and Criterion XVIII of Appendix B to 10 CFR Part 50, respectively, as identified in Nonconformances 99901387/2009-201-04 and 99901387/2009-201-05. However, based on the sample of external and internal audits reviewed, the NRC inspection team determined that Shaw has been effectively implementing its policies and associated procedures.

6. Control of Nonconforming Materials, Parts, or Components

a. Inspection Scope

The NRC inspection team reviewed Shaw policies and procedures for control of nonconforming materials, parts, or components to verify compliance with 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 initiated for domestic AP1000 COL projects. These nonconformance reports documented deficiencies identified by Shaw personnel. The NRC inspection team discussed the nonconformance process with responsible Shaw management and staff to confirm that applicable regulatory requirements are being effectively implemented.

Within the scope of this inspection, the NRC inspection team reviewed the following Shaw documents:

- QS 15.1, "Nonconformance and Disposition Report," Revision F, March 4, 2010

- QS 15.3, “Risk Release of Unsat/Nonconforming Material/Equipment,” Revision E, July 14, 2000
- QS 14.2, “Inspection Report System,” Revision H, July 14, 2000
- QAD 14.1, “Inspection Report System Type "A" Inspection Report,” Revision O, February 3, 2010
- N&D V-ND-09-0007, “Replacement of Unit #4 Automated Total Station (AMTS),” January 23, 2009
- N&D V-ND-09-0008, “M&TE Calibration out of tolerance,” November 16, 2009
- N&D V-ND-09-0009, “M&TE Calibration out of tolerance,” November 16, 2009
- N&D V-ND-09-0010, “Heave and Settlement monitor DMP 3-4 was damaged while being lowered,” November 30, 2009

b. Observations and Findings

The NRC inspection team reviewed QS 15.1, which describes the general requirements for implementing the Shaw nonconforming material control system, including identification, documentation, evaluation, re-inspection of repair or reworked items, and notification to affected organizations of nonconforming conditions. QS 15.1 specifies the responsibility and authority for reviewing and dispositioning nonconforming items. The NRC inspection team also reviewed QAD 14.1, which describes the initial tagging process, segregation, and re-inspection. QS 15.3 describes the processes used for the risk release of nonconforming or unsatisfactory material or equipment, including controls for further processing, delivery, and installation of nonconforming items until dispositioned as complete.

The NRC inspection team verified that Shaw’s process for controlling nonconforming materials is linked to the 10 CFR Part 21 reporting requirements as part of the design engineering’s disposition activities. The process is also linked to Shaw’s corrective action program.

The NRC inspection team reviewed a sample of nonconformance reports which addressed nonconforming materials, parts, or components at the Vogtle site. The NRC inspection team verified that Shaw reviewed nonconforming items in accordance with documented procedures for materials, parts, and components that were scrapped, repaired, reworked, or dispositioned as used-as-is. The disposition documentation contained technical justifications for items that were repaired or dispositioned used-as-is. The NRC inspection team verified that repaired or used-as-is items with design requirements were subject to design control measures commensurate with those applied to the original design.

As part of its nonconformance process, Shaw reviews nonconformance reports to identify conditions adverse to quality and opens CARs for those items categorized as conditions adverse to quality.

c. Conclusions

The NRC inspection team concluded that the Shaw was effectively implementing the process for the control of nonconforming materials, parts, or components, consistent with the requirements of Criterion XV of Appendix B to 10 CFR Part 50. The NRC inspection team did not identify any significant findings.

7. Corrective Actions

a. Inspection Scope

The NRC inspection team reviewed Shaw's policies and procedures that govern the corrective action process to ensure that they adequately describe the process and implement the requirements of Criterion XVI, "Corrective Actions," of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed a sample of CARs to determine whether they document and adequately describe conditions adverse to quality (CAQs), the cause of these conditions, and the corrective actions taken to prevent recurrence. The NRC inspection team discussed the corrective action process with responsible Shaw management and staff to verify that applicable regulatory requirements are being effectively implemented.

The NRC inspection team reviewed the following Shaw documents:

- QS 16.5, Corrective Action System, Revision L, July 30, 2009
- SWSQAP 1-74A, Standard Nuclear Quality Assurance Program, Section 16, Corrective Actions, Revision B, June 1, 2009
- QS 16.6, Root Cause Analysis
- QS 14.2, Inspection Report System, Revision H, July 14, 2000
- QAD 18.1, Quality Assurance Internal Audits, Revision L, July 30, 2009
- QAD 18.12, Quality Assurance Surveillances, Revision A, December 3, 2009
- QS 15.1, Nonconformance and Disposition Report, Revision F, March 4, 2010
- CAR 2009-03-19-85
- CAR 2009-04-28-113
- CAR 2009-09-15-231
- CAR 2009-01-14-48
- CAR 2009-04-14-104
- CAR 2009-03-03-71
- CAR 2009-11-13-300
- CAR 2009-11-02-281
- CAR 2009-05-07-131
- CAR 2009-05-07-315

b. Observations and Findings

b.1 Implementing Procedures

The NRC inspectors noted that the corrective action program is captured in a series of procedures for both hardware and non-hardware conditions that warrant evaluation, documentation, and corrective/preventative action. The corrective action system, as described in QS 16.5, is an online system used for evaluating, documenting, and developing actions for non-hardware conditions that are not in accordance with established requirements and are considered discrepancies or conditions that are potentially problematic and warrant evaluation for corrective/preventative action. QS 16.5 describes non-hardware discrepant conditions as inconsistencies, failures to comply, omissions, or deficiencies. QS

16.5 details roles and responsibilities, internal reviews, and timeliness requirements to address identified deficiencies. In addition, QS 16.5 contains detailed instructions on how to classify discrepancies as 1) a significant condition adverse to quality (SCAQ), 2) a CAQ, 3) a non-condition adverse to quality, and 4) a negligible consequence non-condition adverse to quality and contains detailed implementing instructions on how to evaluate each class of deficiency. For SCAQ, QS 16.5 requires a root cause analysis to be performed in accordance with the detailed procedure in QS 16.6.

Hardware related conditions and audit findings are identified in procedures QS 14.2, "Inspection Report System," QS 15.1, "Nonconformance and Disposition Report ," QAD 18.1, "Quality Assurance Internal Audits ," or QAD 18.12, "Quality Assurance Surveillances." With the exception of QAD 18.1 for quality assurance internal audits, each of the procedures contains a step that directs a responsible manager to initiate a CAR for CAQs and SCAQs.

QAD 18.1 does not require the initiation of a CAR for CAQs and SCAQs. QS 14.2 directs the responsible manager to review nonconformance and disposition reports for CAQ and SCAQs, and to open a CAR for any identified CAQ or SCAQ. QS 15.1 directs the responsible manager to open a CAR for any unsatisfactory inspection reports. In similar manner, QAD 18.12 directs the responsible manager to open a CAR for any identified issues during surveillances of nuclear project activities and department/division activities. The NRC inspection team noted that once a CAR is opened, it is evaluated and tracked consistent with QS 16.5.

QAD 18.1 describes the internal audit process which includes a high level description of the process for reviewing corrective actions associated with internal quality assurance audits. It states, in part, that an auditor shall evaluate each response to verify that reported conditions have been appropriately addressed as to cause, extent of conditions, corrective action, and action to prevent recurrence; and that the time frames specified for completion of committed actions are reasonable and appropriate for the reported conditions. The NRC inspection team noted that QAD 18.1 does not require a CAR to be opened to address internal audit findings, and as such, the responses are not evaluated and tracked consistent with QS 16.5. In addition, QAD 18.1 does not provide the implementing procedures for the classification and evaluation of CAQ or SCAQ identified through internal audits. In interviews with Shaw staff, the NRC inspection team learned that while Shaw performs a causal analysis for internal audit findings when required, these causal analyses are not proceduralized and not performed to the same level of rigor as that required in QS 16.5 for SCAQ. The NRC inspection team identified the lack of procedural guidance for classifying and evaluating CAQs and SCAQs as an example of Nonconformance 99901387/2010-201-06.

In addition, the NRC inspection team observed that Shaw did not promptly correct CAQs associated with internal audits as required by Criterion XVI to 10 CFR Appendix B. QAD 18.1 states, in part, that the audit report shall include the date by which replies are due and that this date shall not exceed 30 days from the date of the audit report. The lead auditor shall monitor the due dates for responses to audit observations, follow-up on delinquent responses, and issue a written delinquency notice when the due dates have been exceeded by more than 7 days. The NRC inspection team determined that no additional measures are in place to ensure that

corrective actions from internal audit findings are received and promptly corrected as required by regulations. The NRC inspection team identified the following two cases in which Shaw did not implement corrective actions to internal audit findings in a timely manner:

- 2007 internal QA audit, Audit No. CT-07-02, identified 12 observation that required responses by November 16, 2007. Shaw issued CAR 2009-05-07-131 on May 6, 2009, to document the failure to implement timely corrective and preventive actions for some of the observations from Audit No. CT-07-02.
- 2009 internal QA audit, Audit No. 2009-04, identified 20 observation that required responses by August 6, 2009. Shaw issued CAR 2009-05-07-315 on November 20, 2009, to document the failure to implement timely corrective and preventive actions for several of the observations from Audit No. 2009-04.

The NRC inspectors identified the lack of measures to ensure that corrective actions for audit findings are received and promptly corrected as another example of Nonconformance 99901387/2010-201-06.

The NRC inspection team also noted that Shaw internal audits, Audit No. CT-07-02 and Audit No. 2009-04, identified the same issues with engineering practices and attention to detail. Specifically, Audit No. CT-07-02, Observation No.12, documented concerns with good engineering practices and attention to details. Audit No. 2009-04 identified several areas of implementation that need improvement, including increasing concerns relating to engineering good practices and attention to details. The NRC inspection team has identified this failure to implement effective corrective actions as another example of Nonconformance 99901387/2010-201-06.

b.2 Review of Corrective Action Reports

The NRC inspection team reviewed 10 CARs and noted that with the exception of CAR 2009-03-19-85, the CARs describe the CAQ, cause and corrective action taken, review and approval by the responsible authority, follow-up action if needed, and the completion date. The NRC inspection team identified that CAR 2009-03-19-85 was not dispositioned in accordance with Shaw's procedural requirements. Specifically, CAR 2009-03-19-85 failed to address and correct the identified CAQ. The detailed description in this CAR states, "Nonconformance and Disposition report was not initiated prior to correcting deficiency." The NRC inspection team determined that the CAR was closed based on the hardware issue being resolved without addressing the failure to issue a nonconformance report. This is identified as another example of Nonconformance 99901387/2010-201-06.

c. Conclusions

The NRC inspection team found that Shaw's corrective action program did not conform to the requirements of Criterion XVI of Appendix B to 10 CFR Part 50. The NRC issued Nonconformance 99901387/2010-201-06 for failure to provide appropriate, timely, and effective corrective actions. The NRC inspection team identified that Shaw's corrective action program lacks measures to ensure that 1) CAQs and SCAQs identified through the internal audit process are classified, and evaluated, consistent with QS 16.5; 2) corrective actions for internal audit findings are received and promptly corrected; 3)

ineffective corrective actions related to engineering good practices and attention to detail are prevented; and 4) the identified CAQ in CAR 2009-03-19-85 is addressed and corrected.

10. Entrance and Exit Meetings

On March 1, 2010, the NRC inspection team discussed the scope of the inspection with Mr. David Barry, President, Shaw Nuclear Services, and with the Shaw management, engineering, and administrative staff. On March 5, 2010, the NRC inspection team presented the inspection results and observations during an exit meeting with Mr. Geoff Grant, Shaw's Director of Quality Assurance, and other Shaw management and engineering staff. The attachment to this report lists the entrance and exit meeting attendees, as well as those interviewed by the NRC inspection team.

ATTACHMENT

1. ENTRANCE/EXIT MEETING ATTENDEES

Name	Title	Affiliation	Entrance	Exit	Interviewed
Geoff Grant	Director, QA	Shaw Nuclear	X	X	X
Charlie Cronan	VP Engineering	Shaw Nuclear	X	X	
David Barry	President	Shaw Nuclear	X		
James Butts	Construction Manager	Shaw Nuclear	X		
Hal Thornberry	VP Nuclear Construction	Shaw Nuclear	X	X	
Chuck Richards	Sr. Director Construction	Shaw Nuclear	X	X	X
Steve S. Nance	Vogtle Project Engineer	Shaw Nuclear	X	X	X
David McCorkle	PQAM	Shaw Nuclear	X	X	
Charles E. Fisher	PQAM	Shaw Nuclear	X	X	X
Dan Shutt	Nuclear Licensing Engineer - Vogtle	Shaw Nuclear	X	X	
Rick Stevenson	Chief Engineer – QA Stoughton	Shaw Nuclear	X	X	X
Randy Vigor	Sr. Director Operations	Shaw Nuclear	X		
James Carr	HUP Program Manager	Shaw Nuclear	X	X	
Carlos Fonseca	Levy Project Manager	Shaw Nuclear	X		
Penny Fleming	Director, Record Information	Shaw Nuclear	X		
Darlyne Rosado	QA Assistant	Shaw Nuclear	X		
Jim Johnson	VC Summer Project Manager	Shaw Nuclear	X		
Larry Walsh	QA Dept. Manager	Shaw Nuclear	X	X	X
William R. Curtis	QA Dept. Manager	Shaw Nuclear	X	X	X
Don Leach	Project Manager	Shaw Nuclear	X		
Bruce Williams	Compliance	Shaw Nuclear	X	X	
Ken Pitser	Project Engineer	Shaw Nuclear	X		X
Richard Boyd	PQAM DDF	Shaw Nuclear	X	X	
Monte Velardi	APM	Shaw Nuclear	X		
Kenneth Allison	Project Manager	Shaw Nuclear	X		
Ronald Jackson	Engineer	Shaw Nuclear	X		
David Marcelli	VC Summer Project Manager	Shaw Nuclear	X	X	
Rob Otis	Office QA Manager	Shaw Nuclear	X	X	X
Keyes Niemer	Modules Project	Shaw Nuclear	X		X

	Manager				
Chris Hartz	Procurement QA Manager	Shaw Nuclear	X	X	
Kimberly Harsley	QA Specialist/ CAR Coordinator	Shaw Nuclear	X	X	X
Ronald Wittschen	Licensing Engineer	Shaw Nuclear	X	X	X
John M. Oddo	Nuclear Licensing Manager	Shaw Nuclear	X	X	X
Natalie Kettredge	HR Manager	Shaw Nuclear	X	X	
Ed Terres	Director, Procurement	Shaw Nuclear	X	X	
Loretta Visconti	Subcontract Administrator	Shaw Nuclear	X	X	
Gene Voci	AP1000 Domestic Design Finalization	Shaw Nuclear	X	X	
Brad Burton	Sr. Subcontract Manager	Shaw Nuclear	X	X	
Trena Atterberry	Compliance Officer	Shaw Nuclear	X		
William Hutchins	VC Summer Licensing Manager	Shaw Nuclear	X	X	
Don MacKenzie	Director, Subcontracts	Shaw Nuclear		X	
Mike Vaughn	Project Procurement Manager	Shaw Nuclear		X	X
Bob Smith	Project Subcontracts Manager - Vogtle	Shaw Nuclear		X	
Jim McAnally	Modular Construction	Shaw Nuclear			X
Jon Liech	Nuclear Design	Shaw Nuclear			X
R. Kent Ryan	Nuclear Construction	Shaw Nuclear			X
Mike Mckey	Nuclear Construction	Shaw Nuclear			X
Everett M. Washer	Project Engineer – Geotechnical Supervisor	Shaw Nuclear			X
Amy Messerli	Records and Information Management Systems Supervisor	Shaw Nuclear			X

The following individuals observed the inspection from July 20 – July 24, 2009:

T. Wilson, Senior Management Analyst, USNRC Office of Inspector General (OIG)
S. Miotla, Team Leader, USNRC OIG

2. INSPECTION PROCEDURES USED

IP 43002, “Routine Inspections of Nuclear Vendors”

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

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

No previous NRC inspections had been performed at Shaw's facility in Charlotte, NC, before this inspection.

The following items were found during this inspection:

Item Number	Status	Type	Description
99901387/2010-201-01	Open	NOV	21.21
99901387/2010-201-02	Open	NON	Criterion III
99901387/2010-201-03	Open	URI	Criterion IV
99901387/2010-201-04	Open	NON	Criterion VII
99901387/2010-201-05	Open	NON	Criteria XVIII and V
99901387/2010-201-06	Open	NON	Criterion XVI