June 25, 2015

Mr. Rick Davis, Quality Manager
National Technical Systems
7800 Highway 20 West
Huntsville, AL 35806

SUBJECT: NUCLEAR REGULATORY COMMISSION VENDOR INSPECTION OF NATIONAL TECHNICAL SYSTEMS, REPORT NO. 99900905/2015-202 AND NOTICE OF NONCONFORMANCE

Dear Mr. Davis:

On May 11 to 14, 2015, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the National Technical Systems (NTS) facility in Huntsville, Alabama. The purpose of this limited-scope inspection was to assess NTS's compliance with provisions of selected portions 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."

This technically focused inspection specifically evaluated the quality assurance (QA) program as it pertains to NTS's testing services to support the qualification testing of the 8-inch high pressure (HP) and the low pressure (LP) squib valves in the Passive Core Cooling System (PXS) of the AP1000 reactor design. The qualification testing was performed in accordance with the 2007 Edition of the American Society of Mechanical Engineers (ASME) Standard QME -1, "Qualification of Active Mechanical Equipment Used in Nuclear Power Plants," as accepted in NRC Regulatory Guide (RG) 1.100, Revision 3, "Seismic Qualification of Electrical and Active Mechanical Equipment and Functional Qualification of Active Mechanical Equipment for Nuclear Power Plants."

During this inspection, the NRC inspection team observed the functional and flow qualification testing of an 8-inch LP squib valve. This test is associated with inspections, tests, analyses, and acceptance criteria (ITAAC) from Revision 19 to the approved AP1000 Design Control Document, Tier 1. Specifically, these activities were associated with ITAACs 2.20.3.12.a.i (PXS squib valve testing) and 2.2.3.12a.ii (as-built PXS squib valve inspection). The NRC inspection team did not identify any findings associated with ITAAC contained in Section 4 of the attachment to this report. The enclosed report presents the results of the recent inspection. This NRC inspection report does not constitute NRC endorsement of your overall QA program.

The NRC inspection team found that the implementation of NTS' QA program failed to meet certain NRC requirements imposed on you by your customers. Specifically, the NRC inspection team determined that NTS was not fully implementing its QA program in the areas of test control

and control of purchased material, equipment, and services. In response to the enclosed Notice of Nonconformance (NON), NTS should document the results of the extent of condition review for this finding and determine if there are any effects on other safety-related components.

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

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

Sincerely,

/RA/

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

Docket No.: 99900905

Enclosures:
1. Notices of Nonconformance
2. Inspection Report No. 99900905/2015-202
   and Attachment

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

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

Sincerely,

/RA/

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

Docket No.: 99900905

Enclosures:
1. Notices of Nonconformance
2. Inspection Report No. 99900905/2015-202 and Attachment

DISTRIBUTION
See next page.

ADAMS ACCESSION No.: ML15152A080 *Concurred via e-mail NRO-002

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DATE	06/03/15	06/05/15	06/04/15	06/09/15
OFC	R-II/DCI/CIB3	NRO/DCIP/CAEB	NRO/DCIP/MVIB:BC	
NAME	TSteadham*	TFrye (ABelen for)	ERoach	
DATE	06/04/15	06/19/15	06/23/15	

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Letter to Rick Davis from Edward Roach dated June 25, 2015

SUBJECT: NUCLEAR REGULATORY COMMISSION VENDOR INSPECTION OF NATIONAL TECHNICAL SYSTEMS, REPORT NO. 99900905/2015-202

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NOTICE OF NONCONFORMANCE

National Technical Systems
7800 Highway 20 West
Huntsville, Alabama 35806

Docket No. 99900905

Based on the results of a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at National Technical Systems (NTS) facility in Huntsville, Alabama, on May 11, 2015, through May 14, 2015, certain activities were not conducted in accordance with NRC requirements which were contractually imposed on NTS by its customers or by NRC licensees.

A. Criterion XI, "Test 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 "Test procedures shall include provisions for assuring that all prerequisites for the given test have been met, that adequate test instrumentation is available and used."

   Criterion V, "Instructions, Procedures, and Drawings," of Appendix B to 10 CFR Part 50 states, in part, that "Activities affecting quality shall be prescribed by documented instructions, procedures, and drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished."

   Contrary to the above, as of May 14, 2015, NTS failed to ensure that test activities affecting quality were prescribed by documented instructions or procedures that shall include appropriate quantitative or qualitative acceptance criteria to assure that all prerequisites for the given test have been met.

   Specifically, NTS failed to establish a procedure in its test program for verifying that the data acquisition system (DAS) functioned as designed. NTS performed both pre-and post-test verification and validation of the DAS to verify that the DAS software was accurately calculating and reporting those temperature and pressure values that would be used to determine the qualification of the safety-related AP1000 8-inch low pressure squib valves. However, NTS activities to validate the proper function of the DAS, a testing activity affecting quality, were not performed in accordance with written procedures containing the requirements and acceptance limits of the design documents to assure that all prerequisites for the given test have been met.

This issue has been identified as Nonconformance 99900905/2015-202-01.

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, whether purchased directly or through contractors and subcontractors, conform to the procurement documents. These measures shall include provisions, as appropriate, for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor, inspection at the contractor or subcontractor source, and examination of products upon delivery. The effectiveness of the control of quality by contractors shall be assessed by the applicant or designee at intervals consistent with the importance, complexity, and quantity of the product or services."

   Contrary to the above, as of May 14, 2015, NTS failed to assure that the purchased services, purchased directly or through a contractor or subcontractors, conform to the procurement documents and failed to perform source evaluation and selection to verify the effectiveness of the control of quality by contractors and subcontractor at intervals consistent with the importance, complexity, and quality of the products and services.

   Specifically, NTS failed to perform a commercial-grade survey or source surveillance of NALCO, a commercial supplier of water and process services, to verify the effectiveness of quality controls used in testing of the demineralized water to support safety-related valve testing. Additionally, NTS failed to assure that the validity of NALCO's water chemical analysis upon receipt will provide reasonable assurance that pH, conductivity, fluoride, and chlorides met the demineralized water quality specifications invoked in procurement documents. If out of specification, these impurities could degrade the stainless steel components ability to perform their safety-related function during plant operations. NTS has been testing and delivering safety/relief valves to U.S. nuclear power plants using demineralized water tested by NALCO, since October 2011.

This issue has been identified as Nonconformance 99900905/2015-202-02.

Please provide a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Chief, Construction Mechanical Vendor Branch, Division of Construction Inspection and Operational Programs, Office of New Reactors, within 30 days of the date of the letter transmitting this Notice of Nonconformance. This reply should be clearly marked as a "Reply to a Notice of Nonconformance" and should include for each noncompliance: (1) the reason for the noncompliance or, if contested, the basis for disputing the noncompliance; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken to avoid further noncompliance; and (4) the date when the corrective action will be completed. Where good cause is shown, the NRC will consider extending the response time. Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System, which is accessible from the NRC Web site at http://www.nrc.gov/readingrm/adams.html, to the extent possible, it should not include any personal privacy, proprietary, or Safeguards Information (SGI) so that the NRC can make it available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material

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

Dated this 25th day of June 2015.

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

Docket No.:	99900905		
Report No.:	99900905/2015-202		
Vendor:	National Technical Systems (NTS) 7800 Highway 20 West Huntsville, Alabama 35806		
Vendor Contact:	Mr. Rick Davis, Quality Manager 416-716-4483 rick.davis@nts.com		
Nuclear Industry Activity:	NTS performs testing services to support the seismic, environmental, and functional qualification of safety-related components currently being supplied as part of the Westinghouse AP1000 design. NTS also performs testing services for NRC licensees and vendors that supply safety-related replacement components to U.S. nuclear power plants.		
Inspection Dates:	May 11 – 14, 2015		
Inspectors:	Raju Patel Richard McIntyre Edgardo Torres Tim Steadham Thomas Scarbrough	NRO/DCIP/MVIB NRO/DCIP/MVIB NRO/DCIP/MVIB R-II/DCI/CIB3 NRO/DE/MEB	Team Leader
Approved:	Edward H. Roach, Chief Mechanical Vendor Inspection Branch Division of Construction Inspection and Operational Programs Office of New Reactors		

DOCUMENT MIGHT CONTAIN PROPRIETARY INFORMATION

EXECUTIVE SUMMARY

National Technical Systems
99900905/2015-202

The U. S. Nuclear Regulatory Commission (NRC) staff conducted a limited scope inspection to verify that the National Technical Systems (NTS) facility in Huntsville, Alabama, implemented an adequate quality assurance (QA) program that complies with the requirements of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities." The NRC inspection team reviewed test control, control of purchased material, equipment, and services, control of measuring and test equipment (M&E), receipt inspection, corrective action response, and training and qualification of personnel. The NRC inspection team conducted the inspection from May 11-14, 2015.

This technically-focused inspection specifically evaluated NTS's implementation of QA activities as it pertains to NTS's testing services to support the qualification testing of the 8-inch high pressure (HP) and the low pressure (LP) squib valves in the Passive Core Cooling System (PXS) of the AP1000 reactor design. This testing was conducted in accordance with the 2007 Edition of the American Society of Mechanical Engineers (ASME) Standard QME-1, "Qualification of Active Mechanical Equipment Used in Nuclear Power Plants," as accepted in NRC Regulatory Guide (RG) 1.100, Revision 3, "Seismic Qualification of Electrical and Active Mechanical Equipment and Functional Qualification of Active Mechanical Equipment for Nuclear Power Plants." In addition, the NRC inspection team evaluated the status of NTS's corrective actions described in a letter dated April 14, 2015 (Agencywide Document Access and Management System Accession No. (ADAMS) ML15113A338), in response to NRC's Notice of Nonconformance (NON) specified in Inspection Report (IR) No. 99900905/2015-201.

Specific activities observed by the NRC inspection team included:

- Setup of test configuration for the AP1000 8-inch LP squib valve
- Installation of propellant charge assembly into the AP1000 8-inch LP squib valve
- ASME QME-1 functional and flow qualification testing of the AP1000 8-inch LP squib valve
- Preliminary analysis of functional capability and flow test results of the AP1000 8-inch HP squib valve by NTS personnel
- Performance of post-test validation of the DAS software used for the QME-1 qualification test of the AP1000 8-inch LP squib valve.

In addition to observing these activities, the NRC inspection team verified that measuring and test equipment (M&TE) were properly identified, marked, calibrated, and used within its calibrated range. The NRC inspection team also conducted a walk down of NTS's test facility, and verified that the test setup for the 8-inch LP squib valve appropriately modeled the postulated accident conditions.

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

- Appendix B to 10 CFR Part 50

The NRC inspection team implemented Inspection Procedure (IP) 43002, "Routine Inspections of Nuclear Vendors," IP 35034, "Design Certification Testing Inspection," and IP 65001.E "Inspection of the ITAAC-Related Qualification Program."

The results of the inspection are summarized below:

Test Control

The NRC inspection team issued Nonconformance 99900905/2015-202-01 in association with NTS's failure to implement the regulatory requirements of Criterion XI, "Test Control," and Criterion V, "Instructions, Procedures, and Drawings," of Appendix B to 10 CFR Part 50. Nonconformance 99900905/2015-202-01 cites NTS for failing to ensure that test activities affecting quality were prescribed by documented instructions or procedures that shall include appropriate quantitative or qualitative acceptance criteria to assure that all prerequisites for the given test have been met. Specifically, NTS failed to establish a procedure in its test program for verifying that the data acquisition system (DAS) functioned as designed. NTS performed both pre-and post-test verification and validation of the DAS to verify that the DAS software was accurately calculating and reporting those temperature and pressure values that would be used to determine the qualification of the safety-related AP1000 8-inch low pressure squib valves. However, NTS activities to validate the proper function of the DAS, a testing activity affecting quality, were not performed in accordance with written procedures containing the requirements and acceptance limits of the design documents to assure that all prerequisites for the given test have been met.

Control of Purchased Item, Equipment and Services

The NRC inspection team issued Nonconformance 99900905/2015-202-02 associated with NTS's failure to implement the regulatory requirements of Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50. Nonconformance 99900905/2015-202-02 cites NTS for failing to assure that the purchased services, purchased directly or through a contractor or subcontractors, conform to the procurement documents and failing to perform source evaluation and selection to verify the effectiveness of the control of quality by contractors and subcontractor at intervals consistent with the importance, complexity, and quality of the products and services. Specifically, NTS failed to perform a commercial-grade survey or source surveillance of NALCO, a commercial supplier of water and process services, to verify the effectiveness of quality controls used in testing of the demineralized water to support safety-related valve testing. Additionally, NTS failed to assure that the validity of NALCO's water chemical analysis upon receipt will provide reasonable assurance that pH, conductivity, fluoride, and chlorides met the demineralized water quality specifications invoked in procurement documents. If out of specification, these impurities could degrade the stainless steel components' ability to perform their safety-related function during plant operations. NTS has been testing and delivering safety/relief valves to U.S. nuclear power plants using demineralized water tested by NALCO, since October 2011.

Implementation of Corrective Actions

The Notice of Nonconformance No. 9990905/2015-201-01 will remain open until NTS completes its corrective actions. As described in its letter to the NRC dated April 14, 2015, NTS has committed to complete the proposed corrective actions by June 30, 2015. No findings of significance were identified.

Other Inspection Areas

The NRC inspection team determined that NTS is implementing its programs for personnel training and qualification, receipt inspection, and control of M&TE in accordance with the applicable regulatory requirements of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed and activities observed, the NRC inspection team also determined that NTS is implementing its policies and procedures associated with these programs. No findings of significance were identified.

REPORT DETAILS

1. Test Control

   a. Inspection Scope

   The U.S. Nuclear Regulatory Commission (NRC) inspection team reviewed National Technical Systems (NTS) policies and procedures governing the implementation of the test control program to verify compliance with Criterion XI, "Test 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."* The NRC previously conducted inspections at NTS in December 2013, December 2014, and February 2015, to observe component testing. The NRC inspection team reviewed qualification plans, test procedures, test setup, test data, and test reports to ensure that applicable NRC regulations; inspections, tests, analyses, and acceptance criteria (ITAAC); and Westinghouse Electric Corporation (WEC) requirements and documents were being adequately addressed for qualification testing of the AP1000 high pressure (HP) and low pressure (LP) 8-inch squib valves. The NRC inspection team reviewed preliminary test data for the 8-inch HP and LP squib valve tests, receipt inspection documentation, calibration records for the instrumentation used during the testing, and observed the 8-inch LP squib valve functional and flow qualification testing to the 2007 Edition of the American Society of Mechanical Engineers (ASME) Standard QME-1, "Qualification of Active Mechanical Equipment Used in Nuclear Power Plants." In addition, the NRC inspection team reviewed the NTS data acquisition system (DAS) to verify that test data was accurately captured, stored, and translated into test results that could be analyzed. The NRC inspection team discussed the test control program with NTS's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

   Specific 8-inch squib valve testing activities observed or evaluated by the NRC inspection team for compliance with Criterion XI of Appendix B to 10 CFR Part 50 are addressed below:

   (1) 8-inch LP Squib Valve Qualification Testing

   Qualification Plan and Test Procedure

   The NRC inspection team reviewed NTS's WLTP56415, "Qualification Plan for QME-1-2007 Qualification of 8-inch & 14-inch Squib Valve for Westinghouse Electric," Revision C, dated February 27, 2015, and NTS's test procedure WTP57622-01, "QME-1 Testing of an 8-inch HP and 8-inch LP Squib Valve," Revision B, dated February 26, 2015, for consistency with the requirements specified in WEC APP-PV70-VPH-001, "AP1000 Squib Valve Equipment Qualification Test Plan," Revision 4, dated February 11, 2015," and the ASME Standard QME-1-2007 as accepted in the NRC Regulatory Guide (RG) 1.100, Revision 3, "Seismic Qualification of Electrical and Active Mechanical Equipment and Functional Qualification of Active Mechanical Equipment for Nuclear Power Plants." Further, the NRC inspection team reviewed WEC specification APP-PV70-VPH-001, and

found that the qualification program includes testing of squib valves consistent with ASME QME-1-2007 as accepted in RG 1.100. The NRC inspection team reviewed the QME-1 functional and flow qualification testing of the 8-inch squib valve, as described in WEC Purchase Order (PO) Number (No.) 4500312838 (through Change Notice 17), dated February 23, 2015. The NRC inspection team compared the test acceptance criteria for the 8-inch LP and HP squib valves (including the two HP applications) in NTS documentations to the test acceptance criteria in the WEC specifications and determined that the acceptance criteria for the QME-1 tests were reasonable for demonstrating the safety functions of the applications of the 8-inch squib valves.

Test Configuration

The NRC inspection team performed walk-downs of the test setup (including the test control room) for actuation and flow testing of the 8-inch LP squib valve to verify that: (1) the test configuration was consistent with the test plans and procedures; (2) NTS was performing test activities consistent with those written instructions; and (3) NTS personnel were knowledgeable of the test requirements. The NRC inspection team observed that there was adequate straight pipe upstream and downstream of both the flow meter and the squib valve to obtain accurate results. Further, the NRC inspection team reviewed the NTS Squib Valve Flow Test schematic drawing which identified the instrumentation used to detect system temperature, pressure and differential pressure at the squib valve inlet and outlet and verified their location on the actual test loop. During observation of the 8-inch LP squib valve flow tests, the NRC inspection team verified that the test control panel accurately reflected the instrumentation identifications for the test loop. The NRC inspection team determined that the test setup, procedures, and knowledgeable personnel provided a reasonable method to demonstrate the capability of the 8-inch LP squib valve to open and perform its safety function.

8-inch LP Squib Valve Cartridge Loading

The NRC inspection team confirmed that the propellant cartridge used by NTS in the AP1000 8-inch LP squib valve was of proper identification and contained an 80 percent charge based on review of a photograph of the cartridge loaded into the squib valve, and the certification of cartridge loading received from the manufacturer. The inspection team also observed the installation of the propellant cartridge in the 8-inch LP squib valve.

8-inch Functional Pre-test Activities

The NRC inspection team observed pre-test activities and reviewed associated records to verify that the displayed calibrated unit parameters for pressure and temperature were within required tolerances displayed on the DAS. The NRC inspection team observed NTS personnel performing signal integrity verification activities, including input/output continuity checks on test instruments on the test fixture.

8-inch LP Squib Valve Opening Test

The NRC inspection team observed the performance of the opening test of the 8-inch LP squib valve. The NRC inspection team determined that the test personnel performed the opening test in an acceptable manner in accordance with the test procedure. Preliminary test results indicated that the valve opened upon initiation of the actuation signal in an acceptable time period, and satisfied the acceptance criteria for the initiation signal, inlet and outlet pressure, temperature, and differential pressure. Final results will need to be analyzed independently by WEC under its QA program to verify that the acceptance criteria were satisfied.

8-inch LP Squib Valve Flow Test

The NRC inspection team observed a series of flow tests of the AP1000 8-inch LP squib valve in support of its functional qualification using the ASME QME-1 standard to satisfy ITAAC 2.2.3.12a.i. The NRC inspection team observed that the flow test was conducted by NTS test personnel in an acceptable manner in accordance with the approved test procedure, and using calibrated equipment that was traceable to known standards and within their calibration frequency and range of use.

Preliminary results of several flow tests for the squib valve satisfied the acceptance criteria for inlet pressure, temperature, differential pressure, and flow rate while maintaining fluid temperature within the saturation limits as specified in NTS test procedure WTP57622-01 consistent with the WEC qualification test plan APP-PV70-VPH-001. Based on the preliminary test results and observations, the NRC inspection team determined the 8-inch LP squib valve flow testing was successful. Final results will need to be analyzed independently by WEC under its QA program to verify that the acceptance criteria were satisfied.

(2) 8-inch HP Squib Valve Qualification Testing

The NRC inspection team reviewed the preliminary test data for the ASME QME-1 functional and flow qualification testing of the 8-inch HP squib valve performed during the week of April 16, 2015. In particular, the NRC inspection team performed visual inspection of the internals of the 8-inch HP squib valve to the extent feasible without valve disassembly. The NRC inspection team found that the ends of the shear cap had been removed with minimal deformation to allow an apparent full flow area. In addition, the NRC inspection team did not identify any internal damage in the valve flow area. The NRC inspection team confirmed that the propellant cartridge used was specified as an 80 percent charge based on review of a photograph of the cartridge loaded into the squib valve and the certification of cartridge loading received from the manufacturer. The NRC inspection team performed measurements of the test assembly piping for the squib valve flow test to verify that the distances between the instrumentation taps were consistent with the test diagrams.

The NRC inspection team reviewed the preliminary test results being evaluated by NTS for the squib valve opening test. The NRC inspection team noted that the

temperature and differential pressure readings were slightly outside the acceptance criteria range. NTS had documented these test discrepancies in two notices of anomalies and submitted the anomalies to WEC for review and approval. The NRC inspection team reviewed the two notices of anomalies and confirmed that they were reviewed and approved based on review of WEC Procurement Advisory Releases (PARs). The NRC inspection team did not identify any concerns with the resolution of these anomalies.

Further, the NRC inspection team reviewed the preliminary test results of a series of flow tests of the 8-inch HP squib valve for its two applications in the AP1000 reactor. The NRC inspection team found that the preliminary test results indicated that the acceptance criteria for pressure, temperature, and differential pressure for the flow tests of the two applications of the 8-inch HP squib valve were satisfied. Final results will need to be analyzed independently by WEC under its QA program to verify that the acceptance criteria were satisfied.

(3) 8-inch LP Squib Valve Submergence Testing

The NRC inspection team evaluated the results of the recently completed submergence testing of the 8-inch LP squib valve to satisfy QME-1 qualification for its application in the AP1000 reactor. The NRC inspection team reviewed the preliminary results of a series of submergence tests of the 8-inch LP squib valve. The NRC inspection team found that the initial tests revealed significant leakage into the valve body. The NRC inspection team reviewed the modifications and adjustments made to the squib valve (such as thermal shields and sealing upgrades) in response to the initial submergence test results. Based on its review, the NRC inspection team found that the preliminary results of the submergence test following the most recent valve improvements indicated that the valve successfully passed the final submergence test. Further, the NRC inspection team reviewed the anomalies identified by NTS during the setup and performance for the 8-inch LP squib valve submergence tests. The test anomalies were being evaluated by WEC at the time of this inspection. The NRC inspection team did not identify concerns with the test anomalies. Final results will need to be analyzed independently by WEC under its QA program to verify that the acceptance criteria were satisfied.

b. Observations and Findings

During review of WEC specification APP-PXS-M3C-066, “Squib Valve Functional Requirements for PXS IRWST Injection and Containment Squib Valves, PXS-PL-V123B, V125B, and V120A,” Revision 3, dated May 17, 2012, the NRC inspection team found that it included an opening requirement for the 8-inch HP squib valve based on a probabilistic risk assessment (PRA) analysis that exceeded the opening test criteria. The NRC inspection team discussed this issue with WEC personnel, who indicated that this opening requirement had been re-evaluated to a lower value, and initiated WEC Discrete Issue No. 100299865 on May 13, 2015, to correct the specification. The NRC inspection team also identified typographical errors in WEC specification APP-PXS-M3C-040, “Squib Valve Functional Requirements for PXS Containment

Recirculation Isolation Squib Valves, PXS -PL-V118A/B," Revision 3, dated May 17, 2012, with WEC personnel initiating WEC Discrete Issue No. 100299703 on May 12, 2015, to correct those errors.

The NRC inspection team reviewed the NTS DAS to verify that the test data was accurately captured, stored, and translated into test results that could be analyzed. The NRC inspection team reviewed NTS's method to verify and validate the DAS software to verify that the system was reporting accurate data points from each instrument channel. The NRC inspection team reviewed portions of NTS's instrument spanning that they relied on to verify and validate the proper functionality of the DAS for each time use. The NRC inspection team witnessed the post-test temperature and pressure instrumentation data spanning performed in the test control room to verify and validate the proper function of the DAS software and document the results on the temperature and pressure spanning data sheet that were included in WLTP57622-01 procedure. The NRC inspection team noted that this safety-related activity was not being performed using a documented and approved NTS instruction or procedure.

NTS has performed both pre-and post-test verification and validation of the DAS, to verify that the DAS software was accurately calculating and reporting those temperature and pressure values that would be used to determine the qualification of the safety related AP1000 8-inch low pressure squib valve. However, NTS activities to validate the proper function of the DAS software, a testing activity affecting quality, were not performed in accordance with written procedures, containing the requirements and acceptance limits to the design documents to assure that all prerequisites for the given test have been met. The NRC inspection team identified this issue as Nonconformance 99900905/2015-202-01. NTS initiated a corrective and preventive action report (CPAR) No. 15-019 to address this issue.

c. Conclusions

The NRC inspection team issued Nonconformance 99900905/2015-202-01 associated with NTS's failure to implement the regulatory requirements of Criterion XI, "Test Control," and Criterion V, "Instructions, Procedures, and Drawings," of Appendix B to 10 CFR Part 50. Nonconformance 99900905/2015-202-01 cites NTS failed to ensure that test activities affecting quality were prescribed by documented instructions or procedures that shall include appropriate quantitative or qualitative acceptance criteria to assure that all prerequisites for the given test have been met. Specifically, NTS failed to establish a procedure in its test program for verifying the data acquisition system (DAS) functioned as designed. NTS performed both pre-and post-test verification and validation of the DAS to verify that the DAS software was accurately calculating and reporting those temperature and pressure values that would be used to determine the qualification of the safety-related AP1000 8-inch low pressure squib valves. However, NTS activities to validate the proper function of the DAS, a testing activity affecting quality, were not performed in accordance with written procedures containing the requirements and acceptance limits of the design documents to assure that all prerequisites for the given test have been met.

2. Control of Purchased Material, Equipment, and Services

a. Inspection Scope

The NRC inspection team reviewed NTS's policies and procedures that govern the implementation of its oversight activities to verify compliance with the requirements of Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed NTS's processes and management of its approved suppliers list (ASL). The NRC inspection team reviewed receipt inspection reports of customer supplied safety-related components, including the 8-inch LP squib valve, lock wires, flange nuts, low pressure seal assembly and low pressure connectors. The NRC inspection team discussed the oversight of contracted activities with NTS's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observation and Findings

During review and verification of the qualification testing of the 8-inch LP squib valve, the NRC inspection team noted that NTS test procedure WLTPR57622-01 and qualification plan WLTPL56415 specify the use of demineralized water. Upon request, the NTS project manager provided the NRC inspection team with a copy of the demineralized water analysis report dated April 9, 2015, from NALCO, a commercial supplier. The NRC inspection reviewed this report and noted that NTS had not reviewed NALCO's water analysis report to assure the validity of the water chemical analysis. NTS did not determine if the analysis would provide reasonable assurance that pH, conductivity fluorides, and chlorides met the demineralized water specification for safety-related applications. If out of specification, these impurities could degrade the ability of stainless steel components to perform their safety-function during plant operations. The NRC inspection team interviewed the NTS project manager and QA Manager regarding NTS's process of selecting and evaluating NALCO as an approved supplier for testing services of demineralized water. The NRC inspection team also asked how NTS ensured that NALCO's water chemical analysis results met NTS's procurement specification. The NTS QA Manager informed the NRC inspection team that NALCO was not on NTS's ASL.

Upon further investigation, NTS identified that a previous NTS purchasing manager had switched suppliers without informing the NTS Engineering and QA Managers and that NTS has been using NALCO for testing of demineralized water since October 2011. After discussions with NTS management and the review of NALCO's water analysis report, the NRC inspection team determined that NTS has been using NALCO, a commercial supplier, for demineralized water testing service without performing a commercial-grade survey or source surveillance. In addition, the NRC inspection team discussed this issue with WEC regarding whether they had concerns for not using qualified demineralized water per WEC specification. WEC informed the NRC inspection team that they were not concerned with NTS not using qualified demineralized water for squib valve, because the 8-inch squib valves are prototypes and will not be used in a nuclear power plant. However, the NRC inspection team was concerned because NTS has been testing and delivering safety-related valves in its

safety/relief valve (SRV) facility to the U.S. nuclear power plants using demineralized water tested by NALCO since October 2011. This issue has been identified as Nonconformance 99900905/2015-202-02. NTS initiated a CPAR No. 15-018 to address this issue.

c. Conclusion

The NRC inspection team issued Nonconformance 99900905/2015-202-02 associated with NTS's failure to implement the regulatory requirements of Criterion VII of Appendix B to 10 CFR Part 50. Nonconformance 99900905/2015-202-02 cites NTS for failing to ensure that the purchased services, purchased directly or through a contractor or subcontractors, conform to the procurement documents and failing to perform source evaluation and selection to verify the effectiveness of the control of quality by contractors and subcontractor at intervals consistent with the importance, complexity, and quality of the products and services.

Specifically, NTS failed to perform a commercial-grade survey or source surveillance of NALCO, to verify the effectiveness of quality controls used in testing of the demineralized water to support safety-related valve testing. Additionally, NTS failed to assure the validity of NALCO's water chemical analysis upon receipt, and failed to determine if the analyses will provide reasonable assurance that pH, conductivity, fluoride, and chlorides met the demineralized water quality specifications invoked in procurement documents. If out of specification, these impurities could degrade the stainless steel components ability to perform their safety-related function during plant operations. NTS has been testing and delivering safety/relief valves to U.S. nuclear power plants using demineralized water tested by NALCO, since October 2011.

3. Control of Measuring and Test Equipment

a. Inspection Scope

The NRC inspection team reviewed policies and procedures associated with the control of the equipment being utilized by NTS to perform the functional testing of the squib valves to verify compliance with the requirements of Criterion XII, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50. The NRC inspection reviewed calibration records for a sample of eight M&TE used during the functional qualification testing to verify that the equipment was being properly calibrated and controlled, and also discussed the M&TE program with NTS's management and technical staff. The specific instruments sampled were associated with the QME-1 functional testing of the 8-inch low pressure squib valve, including temperature thermocouples, pressure transducers, and a deadweight tester. The NRC inspection team reviewed the NTS Instrumentation Equipment Sheet for the 8-inch LP functional test and confirmed that all equipment was identified, recorded, and verified to be within the calibration frequency and the calibration range. The NRC inspection team confirmed that all test instrumentation was appropriate for the test use and was capable of conducting measurements to the precision required in the test plan.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

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

4. Corrective Action

a. Inspection Scope

The NRC inspection team reviewed NTS's policies and implementing procedures that govern the corrective action program to verify compliance with the regulatory requirements of Criterion XVI, "Corrective Actions," of Appendix B to 10 CFR Part 50. Specifically, the NRC inspection team reviewed the status of the corrective actions implemented in response to the findings from the previous NRC inspection at the NTS facility. The NRC inspection team discussed the corrective action program with NTS's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

Corrective Action associated with Nonconformance 99900905/2015-201-01

The NRC inspectors reviewed the documentation that provided objective evidence for the completion of the corrective action taken for Nonconformance 99900905/2015-201-01 and interviewed the responsible NTS personnel. The NRC inspection team discussed the status of the NTS response to the Nonconformance. NTS indicated that as part of its corrective action, a survey of the commercial vendor had been recently completed with no observation or findings, and that the survey report was in the process of being written. Further, NTS indicated that it is in the process of updating their Third-Party Qualification (TPQ) dedication program and implementation through training of personnel involved in the TPQ dedication process. NTS plans to complete the corrective action by June 30, 2015, as reported in its letter dated April 14, 2015. Based on the review of the corrective actions and interviews with NTS, the NRC inspection team determined that Nonconformance 99900905/2015-201-01 will remain open.

c. Conclusion

The NRC inspection team concluded that NTS is implementing its corrective action program in accordance with the regulatory requirements of Criterion XVI of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that NTS is implementing its policies and procedures

associated with the CAR program. No findings of significance were identified. Nonconformance 99900905/2015-201-01 will remain open until NTS completes its corrective actions in response to the nonconformance.

5. Personnel Training and Qualification

   a. Inspection Scope

      The NRC inspection team reviewed NTS's policies and implementing procedures that govern the training and qualification program to verify compliance with the requirements of Criterion II, "Quality Assurance Program," of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed qualification records for calibration technicians, test technicians, lead auditor and test engineers involved in the functional qualification testing of squib valves as well as implementing its corrective action to address NRC's Nonconformance 99900905/2015-201-01, to ensure that proficiency is achieved and maintained. The NRC inspection team verified that all personnel performing activities affecting quality had completed the required training and met all the specified requirements in accordance with NTS policies and implementing procedures and that their records were current. The NRC inspection team discussed the training and qualification program with NTS's management and staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

   b. Observations and Findings

      No findings of significance were identified.

   c. Conclusions

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

6. Entrance and Exit Meetings

   On May 11, 2015, the NRC inspection team discussed the scope of the inspection with Mr. Tom Brewington, Sr. Director North East & Technology, and other members of NTS's management. On May 14, 2015, the NRC inspection team presented the inspection results and observations during an exit meeting with Mr. Brewington, and other NTS management. The attachment to this report lists the attendees of the entrance and exit meetings, as well as those individuals whom the NRC inspection team interviewed.

DOCUMENT MIGHT CONTAIN PROPRIETARY INFORMATION

ATTACHMENT

1. Entrance/Exit Meeting Attendees and Individuals Interviewed

Name	Title	Affiliation	Entrance	Exit	Interviewed
Raju Patel	Reactor Operations Engineer - Team Lead	Nuclear Regulatory Commission (NRC)	X	X	
Richard McIntyre	Sr. Reactor Operations Engineer	NRC	X	X	
Edgardo Torres	Reactor Operations Engineer	NRC	X	X	
Thomas Scarbrough	Sr. Mechanical Engineer	NRC	X	X	
Tim Steadham	Sr. Mechanical Engineer	NRC	X	X	
Tom Brewington	Sr. Director, North East & Technology	National Technical Systems (NTS)	X	X	
Eric Loucks	Regional Quality Manager	NTS	X	X	
Rick Davis	Quality Assurance(QA) Manager	NTS	X	X	X
Patrick Turrentine	Manager Valve Department	NTS	X	X	X
Camron Muelling	Project Manager - Third Party Qualification (TPQ)	NTS			X
E. Reilly Schum	Engineering Manager - TPQ	NTS	X	X	X
Steven Felice	Manager Calibration	NTS	X	X	X
Serge M'Sadoques	Sr. Project Engineer	NTS	X	X	X
Brenda Morse	Sr. QA Technician	NTS	X	X	X
James Fussell	Test Specialist Level II	NTS			X
Steven Aguado	Calibration Test Specialist Level II	NTS			X

Joseph C. Metoyer	Calibration Test Specialist Level II	NTS			X
Brian Bedford	V.C. Summer ITAAC Manager	Westinghouse Electric Corporation (WEC)		X	
Ronald P. Wessel	Principal Engineer, AP 1000 Licensing	WEC	X	X	X
Preston Wock	Valve Engineering Manager	WEC	X	X	X
Peter Smith	Qualification Operations Engineer	WEC		X	X
John Arnold	Squib Valve Manager	WEC		X	
Richard Paese	Acting Manager AP1000 ITAAC & Inspection	WEC		X	
John Arnold	Squib Valve Manager	WEC		X	
Gerald Riegel	Valve Engineer	WEC			
Larry Cunningham	NND Quality System Manager	South Carolina Edison & Gas		X	

2. Inspection Procedures Used

- IP 35034, “Design Certification Testing Inspection,” dated January 27, 2010
- IP 43002, “Routine Inspections of Nuclear Vendors,” dated July 15, 2013
- IP 65001.E, “Inspection of the ITAAC-Related Qualification Program,” dated August 19, 2008

3. List of Items Opened, Closed, and Applicable ITAAC

Item Number	Status	Type	Description	Applicable ITAAC from AP1000 Design Control Document, Tier 1, Revision 19
*99900905/2015-201-01	Open	NON	Criterion XII	N/A
99900905/2015-202-01	Open	NON	Criterion XI, Criterion V	N/A
99900905/2015-202-02	Open	NON	Criterion VII	N/A

*NON 99900905/2015-201-01 remains open from a previous inspection

4. INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA

The NRC inspection team identified the following inspections, tests, analyses, and acceptance criteria (ITAAC) related to components being tested at NTS. At the time of the inspection, NTS was performing functional and flow qualification testing of the 8-inch squib valves to be used in the passive core cooling system for the AP1000 reactor design. This testing is part of the overall equipment qualification program for the squib valves and will be used to demonstrate that the below ITAAC acceptance criteria have been met. The ITAAC design commitments referenced below are for future use by the NRC staff during the ITAAC closure process; the listing of these ITAAC design commitments does not constitute that they have been met and/or are closed. The NRC inspectors did not identify any findings associated with the ITAAC identified below.

COL Source Document	ITAAC Reference No.	ITAAC
Appendix C from the Combined License for Vogtle Units 3 and 4 and V.C. Summer Unit 2 and 3	214	2.2.3.12a.i
Appendix C from the Combined License for Vogtle Units 3 and 4 and V.C. Summer Unit 2 and 3	215	2.2.3.12a.ii

5. Documents Reviewed

Policies and Procedures

- NTS Nuclear Quality Policy Manual, Revision 4, dated January 5, 2015
- NTS Quality Assurance Procedure (QAP) HSV 02.2, "Engineering, Verification, Quality Assurance, and Testing Personnel Qualification Program," Revision 1, dated March 25, 2015
- QAP HSV 8-1, "Control of Nuclear Safety Related Material, Items and Components," Revision 1, dated March 27, 2015
- QAP HSV 8-3, "Identification and Tagging Procedure," Revision 1, dated March 27, 2015
- QAP HSV 8-4, "Test Specimen Control," Revision 1, dated March 25, 2015
- QAP HSV 11-1, "Test Control Program," Revision 1, dated March 27, 2015
- QAP HSV 14.1, "Receiving Inspection," Revision 1, dated March 27, 2015
- NTS QAP Corporate (COR) 05, Control of Measuring, Inspection and Test Equipment, Revision 9, dated May, 12, 2011
- QAP COR 16, "Control of Non-Conforming Items and Activities," Revision 4, dated February 14, 2014
- QAP COR 19, "Auditor Training and Qualification," Revision 2, dated February 14, 2014
- QAP COR 21, "Data Recording Requirements," Revision 4, dated February 14, 2014
- QAP COR 24, "Commercial Grade Surveys," Revision 2, dated February 14, 2014
- QAP COR 28, "Control of Test And Analysis Related Software," Revision 3, dated January 10, 2013
- QAP COR 30, "Evaluation and Client Notification of Nonconforming Work," Revision 1, dated February 14, 2014
- Test Procedure WTPS57622-01, "QME-1 Testing of An 8"-HP And 8"-LP Squib Valve," Revision B, dated February 26, 2015
- Calibration Procedure number MISC-PRESS, "Metrology Calibration Procedures for Thermocouples," Revision 1, dated January 27, 2015
- Calibration Procedure No MICC-T/C, "Metrology GIDEP Calibration for Pressure Transducers," Revision 1, dated September 6, 2015

Purchase Orders

- Westinghouse Electric Corporation (WEC) Purchase Order (PO) number (No.) 4500312838, "Change Notice 17, to Purchase Order 4500312838 to NTS for ASME QME-1 Testing of AP1000 Squib Valve (PV70)," Change Notice 17, dated November 17, 2015

Test Plan, Specification, and Drawings

- NTS Qualification Plan WLTPL56415, "Qualification Plan for QME-1-2007 Qualification of 8" & 14" Squib Valve for Westinghouse Electric," Revision C, dated February 27, 2015
- WEC Document No. APP-PV70-VPH-001, "AP1000 Squib Valve Equipment Qualification Test Plan EQ-TP-222-APP," Revision 4, dated February 11, 2015
- WEC Document No. APP-GW-VP-010, Rev. 2, Equipment Qualification Methodology and Documentation Requirements for AP1000 Safety-Related Valves and Valve Appurtenances, dated April 2010
- WEC Document No. APP-PV70-VPR-001, "AP1000 Squib Valve Equipment Qualification Test Specimen Selection and Justification," Revision 0, dated January 2015
- WEC Document No. APP-PXS-M3C-040, "Squib Valve Functional Requirements for PXS Containment Recirculation Isolation Squib Valves, PXS-PL-V118A/B," Revision 3, dated May 17, 2012
- WEC Document No. APP-PXS-M3C-066, "Squib Valve Functional Requirements for PXS IRWST Injection and Containment Squib Valves, PXS-PL-V123B, V125B, and V120A," Revision 3, dated May 17, 2012
- WEC Document No. APP-GW-G1-002, Rev. 4, AP1000 Equipment Qualification Methodology, dated September 29, 2014
- WEC Document No. APP-PV70-Z0-001, Rev. 5, Squib Valves (Pyrotechnic Actuated), ASME Boiler and Pressure Vessel Code, Section III, Class 1, dated July 24, 2013
- SPX Drawing No. D-400966, "Cartridge Housing Assembly (8" HP)," Revision 13, dated October 7, 2012
- SPX Drawing No. D-399896, "Cartridge Housing Assembly (8" LP)," Revision 13, dated October 7, 2012
- SPX Drawing No. D-403678, "8" [200] HP-R Squib Valve Assembly," Revision 8, dated March 5, 2015
- SPX Drawing No. D-403125, "8" [200] HP-L Squib Valve Assembly," Revision 10, dated March 5, 2015
- SPX Drawing No. D-403676, "8" [200] LP Squib Valve Assembly," Revision 8, dated February 20, 2015

Calibration Certificate

- NTS Certificate of Calibration (CoC) for Honeywell pressure transducer - ID No. 01417 dated October 13, 2014, due October 13, 2015
- CoC for Honeywell pressure transducer - ID No. 01554, dated April 02, 2015 due April 01, 2016
- CoC for Sensotec pressure transducer - ID No. 015634
- CoC for Omega thermocouple - ID No. 01508, dated March 20, 2015 due March 20, 2016
- CoC for Omega thermocouple - ID No. 01979, dated September 05, 2014 due September 05, 2015
- Coc for Omega thermocouple - ID No. 01990, dated September 05, 2014 due September 05, 2015
- CoC for Sensotec pressure transducer - ID No. 02340, dated January 14, 2015, due July 14, 2015

- CoC for Sensotec pressure transducer - ID No. 02341 dated January 14, 2015, due July 14, 2015
- CoC for Heise digital pressure indicator - ID No. 02532, dated September 22, 2014
- Process instruments Inc. Report of Calibration for Ametek Deadweight tester ID No. 01368

Training and Qualification Records

- NTS Lead Auditor qualification record for Ron Kelly dated November 1, 2008, annual evaluation due November 2, 2015
- NTS Instrumentation/Test Specialist Level II qualification record for Adam C. Casey dated August 16, 2013, due August 13, 2016, with annual eye exam performed on July 3, 2014
- NTS Senior Test Specialist Level II qualification record for James Collins dated March 5, 2015, due March 18, 2018, with annual eye exam performed on February 6, 2015
- NTS Calibration Test Specialist Level II qualification record for James Fussell dated November 3, 2013, due November 3, 2016, with annual eye exam performed on October 2, 2014
- NTS Calibration Test Specialist Level II qualification record for Steven Aguado dated July 10, 2013, due July 10, 2016, with annual eye exam on August 28, 2014
- NTS Calibration Test Specialist Level II qualification record for Joseph C. Metoyer dated April 9, 2015, due April 9, 2018, with annual eye exam on January 7, 2015

Miscellaneous

- NTS Test Report No. WTRP57622-01, "QME-1 Testing of a 8"- 150 # SPX Provided Squib Valve," draft dated April 21, 2015
- NTS draft Test Report No. NTPR028955-02, "Test Report of QME Testing Performed on 8-inch HP Squib Valve," draft dated May 8, 2015
- NTS American Association for Laboratory Accreditation scope of accreditation to ISO 17025 for calibration services
- NTS Receiving Inspection Report for the 8-inch squib valve, serial No. 0920-164450-5-1 for Job No. PRO28945 dated March 28, 2015
- NTS Receiving Inspection Report for 6 cartridge housing assemblies, P/N 404064, P/N 413231, P/N 312346, P/N 404394-3, P/N 404067-12, P/N 403118-3, dated March 28, 2015
- NTS Instrumentation Equipment Sheet for 8-inch Squib valve LP testing, dated May 12, 2015
- Temperature Spanning Data Sheet, dated April 11, 2015, for Omega Type–k thermocouple, asset No. 00465 for pre-test ambient temperature for the 8-inch HP test
- Temperature Spanning Data Sheet, dated April 11, 2015, for Omega Type–k thermocouple, asset No. 01979 for pre-test tank temperature for the 8-inch HP test

- Temperature Spanning Data Sheet, dated April 11, 2015, for Omega Type–k thermocouple, asset No. 01990 for pre-test venturi fluid temperature for the 8-inch HP test Pressure Spanning Data Sheet, dated April 13, 2015, for Honeywell model Z pressure transducer, asset No. 01417 for pre-test valve differential pressure for the 8-inch HP test
- Pressure Spanning Data Sheet, dated April 13, 2015, for Honeywell model Z pressure transducer, asset No. 01554 for pre-test valve differential pressure for the 8-inch HP test
- NTS Hold point checklist, dated May 12, 2015, for 8-inch 150 pound squib valve functional testing set-up for serial No.0920-1644450-6-1
- NALCO Water Analysis report No. 1401268, dated April 9, 2015
- WEC Procurement Advisory Release (PAR) No. 4500312838-005-B, "Qualification Plan for QME-1-2007 Qualification of 8" & 14" Squib Valve for Westinghouse Electric WLTPL56415, Revision C," dated March 2, 2015
- WEC PAR No. 4500312838-016-0, "WLTP57622-01, Revision B," dated February 27, 2015
- WEC PAR No. 4500312838-017-0 dated May 7, 2015 approving NTS NOA No. 7 for Starting Temperature addressed 8" HP Squib valve Functional Test as part of the QME-1 Qualification program
- SPX Certification of Cartridge Loading, QME Squib Valve 8-inch LP Cartridge Test Specimen Assembly, December 11, 2013
- SPX Certification of Cartridge Loading, QME Squib Valve 14-inch ADS Cartridge Test Specimen Assembly, December 11, 2013
- SPX Certification of Cartridge Loading, QME Squib Valve 8-inch HP Cartridge Test Specimen Assembly, December 11, 2013

Notices of Anomaly

- NTS Notice of Anomaly (NOA) No.1, Submergence Test No. 2, dated November 7, 2014
- NOA No. 2, Submergence Test, dated April 27, 2012
- NOA No. 3, Submergence Test, dated February 26, 2014
- NOA No. 4, Submergence Test, dated February 21, 2014
- NOA No. 5, 8-inch LP QME, dated February 20, 2015
- NOA No.6, QME-1 8" LP, dated March 10, 2015
- NOA No. 7, QME-1 HP, dated April 15, 2015
- NOA No. 8, QME-1, 8-inch HP, dated April 16, 2015
- NOA No. 9, 8-inch LP Functional Test, dated May 7, 2015

Corrective Action /Preventive Action Report (C/PAR) Generated as Result of NRC Inspection

C/PAR No. - 15-018, 15-019

6. List of Acronyms Used

ADAMS	Access and Management System Accession
ASL	approved supplier list
ASME	American Society of Mechanical Engineers
CoC	certificate of calibration
COR	corporate
C/PAR	corrective and preventive action report
CFR	*Code of Federal Regulations*
DAS	data acquisition system
HP	high pressure
ID	identification
IP	inspection procedure
IR	inspection report
ISO	International Organization for Standardization
ITAAC	inspections, tests, analyses, and acceptance criteria
LP	low pressure
NRC	U.S. Nuclear Regulatory Commission
No.	number
PAR	procurement advisory release
P/N	part number
PO	purchase order
PXS	Passive Core Cooling System
QA	quality assurance
QAP	quality assurance procedure
QME	qualification of active mechanical equipment
RG	regulatory guide
NoA	notice of anomaly
NON	notices of nonconformance
NTS	National Technical Systems
TPQ	third-party qualification
WEC	Westinghouse Electric Corporation