October 4, 2016

Michael Lenio, Quality Assurance Director
ASCO Valve, Inc.
1561 Columbia Hwy N
Aiken, SC 29801

SUBJECT: ERRATA, NUCLEAR REGULATORY COMMISSION VENDOR INSPECTION REPORT OF ASCO VALVE, INC. NO. 99901054/2016-201

Dear Mr. Lenio:

The Nuclear Regulatory Commission (NRC) conducted an inspection at ASCO Valve, Inc. during the week of February 8-12, 2016, at their Aiken, SC facility. The NRC inspectors conducted two exit meetings with ASCO on February 12, 2016, and March 17, 2016. During the inspection and both exit meetings, the NRC was not informed that supplier's identity information in the inspector's possession was considered proprietary information by ASCO. On April 15, 2016, the NRC issued inspection report (IR) 99901054/2016-201, which identified some of ASCO's suppliers.

On June 9, 2016, the NRC received the first Reply to Notice of Nonconformance ASCO Valve Inc., Docket No. 99901054 Vendor Inspection Report No. 99901054/2016-201, ADAMS ML16169A140 (non-publicly available), requesting to withhold ASCO's suppliers' names and compound numbers from the letter pursuant to 10 CFR 2.390, "Public Exemptions, Request for Withholding." On July 5, 2016, the NRC issued Request for Withholding Information From Public Disclosure ASCO Valve Inc., ADAMS ML16176A070 (publicly available), requesting ASCO to resubmit the Reply to the Notice of Nonconformance letter to clarify the original request to withheld information from public disclosure. On September 1, 2016, ASCO resubmitted the Reply to Notice of Nonconformance, ADAMS ML16251A063 (non-publicly available). On September 27, 2016, ASCO resubmitted the Reply to Notice of Nonconformance, ML16273A277 (publicly available), after identifying that the September 1, 2016 letter was missing proprietary markings as required per 10 CFR 2.390. On October 4, 2016, the NRC issued NRC Approval of ASCO Valve Inc., Request for Withholding Information from Public Disclosure, ADAMS ML16273A097. Because of the decision made by the NRC to approve ASCO's proprietary information request, the NRC has reissued the IR 9901054/2016-201, removing the names of ASCO's suppliers of services, materials and components.

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 (Agencywide Documents Access and Management System), accessible at http://www.nrc.gov/reading-rm/adams.html.

Sincerely,

/RA/

Richard P. McIntyre, Acting Chief
Quality Assurance Vendor Inspection Branch 2
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket: 99901054

Enclosure:
ERRATA - Inspection Report No. 99901054/2016-201

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 (Agencywide Documents Access and Management System), accessible at http://www.nrc.gov/reading-rm/adams.html.

Sincerely,

Richard P. McIntyre, Acting Chief
Quality Assurance Vendor Inspection Branch 2
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket: 99901054

Enclosure:
ERRATA - Inspection Report No. 99901054/2016-201

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OFC	NRO/DCIP/QVIB-2	NRO/DCIP/QVIB-2
NAME	ETorres	RMcIntyre
DATE	09/30/16	10/04/16

OFFICIAL RECORD COPY

April 15, 2016

Mike Lenio, Quality Assurance Director
ASCO Valve, Inc.
1561 Columbia Hwy N
Aiken, SC 29801

SUBJECT: NUCLEAR REGULATORY COMMISSION VENDOR INSPECTION REPORT OF ASCO VALVE, INC. NO. 99901054/2016-201

Dear Mr. Lenio,

On February 8-12, 2016, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the ASCO Valve, Inc. (ASCO) facility in Aiken, SC. On February 12, 2016, the inspectors presented the inspection results and observations during an exit meeting with Mr. Edward Fox, and other members of ASCO's management and technical staff. On March 17, 2016, the inspectors conducted a re-exit to present inspection results and observations to Mr. Edward Fox and other members of ASCO's management and technical staff. The purpose of this limited-scope routine inspection was to assess ASCO's compliance with provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21, "Reporting of Defects and Noncompliance," and selected portions of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities."

This inspection specifically evaluated ASCO's implementation of quality activities associated with the fabrication and inspection of the safety-related solenoid valves and hydramotors for the operating nuclear power plants. In addition, the inspectors evaluated environmental qualifications for safety-related solenoid valves performed at ASCO for Westinghouse Electric Company (WEC) AP1000 reactors. The enclosed report presents the results of the inspection. This NRC inspection report does not constitute NRC endorsement of your overall quality assurance (QA) or Part 21 programs.

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. The inspectors determined that ASCO was not fully implementing its QA program in the area of Commercial-Grade Dedication (CGD). Specifically, 1) ASCO failed to conduct commercial-grade surveys at the manufacturer of commercial elastomers to verify the critical characteristic for material identification. 2) ASCO failed to verify identified critical characteristics through inspection and testing for a nuclear coil kit and a nuclear O-ring, as established in their acceptance method plan. 3) ASCO failed to provide the technical basis for selection and use of sampling plans for CGD of commercial elastomers for the critical characteristic material identification by destructive testing as part of their acceptance method plan. It is noted that both NRC and Electric Power Research Institute (EPRI) industry guidance is available that describes how to identify and accept critical characteristics, performance of commercial-grade surveys, and developing an adequate sampling plan for dedication acceptance testing when lot/batch control was not established through a commercial-grade survey. The specific finding is identified in the enclosure to this letter.

Please provide a written explanation or statement within 30 days of this letter in accordance with the instructions specified in the enclosed Notice of Nonconformance. We will consider extending the response time if you show good cause for us to do so. In accordance with 10 CFR 2.390 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 (Agencywide Documents Access and Management System), 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).

Sincerely,

/RA/

Richard P. McIntyre, Acting Chief
Quality Assurance Vendor Inspection Branch 2
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket No.: 99901054

Enclosures:
1. Notice of Nonconformance
2. Inspection Report No. 99901054/2016-201
   and Attachment

Please provide a written explanation or statement within 30 days of this letter in accordance with the instructions specified in the enclosed Notice of Nonconformance. We will consider extending the response time if you show good cause for us to do so. In accordance with 10 CFR 2.390 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 (Agencywide Documents Access and Management System), 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).

Sincerely,

/RA/

Richard P. McIntyre, Acting Chief
Quality Assurance Vendor Inspection Branch 2
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket No.: 99901054

Enclosures:
1. Notice of Nonconformance
2. Inspection Report No. 99901054/2016-201
   and Attachment

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NAME	LMicewski	RPatel	LDumont*
DATE	03/10/16	03/10/16	03/14/16
OFC	NRO/DCIP/QVIB-2	NRO/DCIP	NRO/DCIP/QVIB-2
NAME	ETorres*	TFrye (ABelen for)	RMcIntyre
DATE	03/09/16	04/14/16	04/15/16

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NOTICE OF NONCONFORMANCE

ASCO Valve, Inc.
1561 Columbia Hwy N
Aiken, SC 29801

Docket No. 99901054
Report No. 2016-201

Based on the results of a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the ASCO Valve Inc., (ASCO) facility in Aiken, SC, from February 8-12, 2016, it appears that ASCO did not conduct certain activities in accordance with NRC requirements that were contractually imposed on ASCO by its customers or NRC licensees:

A. Criterion III, "Design Control," of Appendix B to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 states, in part, that
"Measures shall also be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems and components."

Criterion VII, "Control of Purchased Material, Equipment and Services," of Appendix B to 10 CFR Part 50, states, in part, that states, in part, that "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."

Contrary to the above, as of February 12, 2016, ASCO failed to establish measures for the selection and review for suitability of application of materials and parts that are essential to the safety-related functions of components. In addition, ASCO failed to establish appropriate measures that included provisions for source evaluation, objective evidence of quality furnished by the contractor or subcontractor, and examination of products upon delivery. Specifically:

1. For commercial-grade dedication (CGD) of elastomers, ASCO failed to adequately translate identified critical characteristics to an acceptance method plan and therefore they were not verified. ASCO's commercial-grade surveys focused on general programmatic controls at the supplier, rather than on the control of critical characteristics for the elastomers being procured. Therefore, ASCO failed to identify and verify material critical characteristics in the commercial-grade surveys for the following examples:

   - PO 101504876 for four SB11AKR pressure switches and four TN10B42R pressure transducers called for Part # G039619-050-VI (nuclear O-ring), which is made of Viton A type material. This material type is required for components that will be in service in a harsh environment, including exposure to radiation. These O-rings were procured from [----------], who sourced them from [---------].

   - PO 1015054413 for twenty-three NP 8316 3-way solenoid valves for Areva, a distributor for domestic nuclear plants, called for O-rings,
   Part # G089834-005-HT (O-ring nuclear), Part # G031325-002-HT (O-ring nuclear), and Part # G039619-005-HT (nuclear O-ring). All are made of ethylene propylene. These O-rings were procured from [----------], who sourced them from [----------].

- PO 4500834520 with PSEG Nuclear for an NPX8223G131 solenoid valve for Hope Creek called for a rubber disc, Part # G064355-007 (Disc nuclear). The valve disc was procured commercially from [----------].

2. ASCO failed to verify the following identified critical characteristics: markings, inner diameter, outer diameter, length, turns, lead length, resistance, and the leads of a coil kit for Work Order A339448 (PO 1015038212), Part # G027502-001-K, Coil MXX Nuclear as required by the commercial-grade dedication testing acceptance plan. In addition, ASCO failed to verify the material identification critical characteristic for an O-ring for Work Order 797668-15, Part # 022525-007-90, by performing either a Fourier transform infrared spectroscopy (FTIR) or burn test, as required by the CGD receipt inspection acceptance plan.

3. ASCO failed to provide a documented technical basis for selection and use of sampling plans for CGD of commercial elastomers for the critical characteristic material identification by destructive testing as part of their acceptance method plan, when lot/batch control was not established through a commercial-grade survey. ASCO inspects only one item, independent of lot size, when performing destructive testing to verify material critical characteristics of the elastomers mentioned above, which is not in accordance with ASCO's procedure MP-I-026, "Sampling Plan for Product Acceptance," NRC regulatory guidance and Electric Power Research Institute (EPRI) industry standards.

This issue has been identified as Nonconformance 99901054/2016-201-01.

Please provide a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Chief, Quality Vendor Inspection Branch-2, 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 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 (ADAMS), which is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html, to the extent possible, it should not include any personal privacy, proprietary, or Safeguards Information (SGI) so that the NRC can make it 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, 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 the 15th day of April 2016.

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

Docket No.:	99901054	
Report No.:	99901054/2016-201	
Vendor:	ASCO Valve, Inc. 1651 Columbia Hwy N Aiken, SC 29801	
Vendor Contact:	Mike Lenio Quality Assurance Director E-mail: Mike.Lenio@emerson.com Phone: (803) 641-9205	
Nuclear Industry Activity:	ASCO Valve, Inc. manufactures safety-related solenoid valves and hydramotors for the operating reactor fleet.	
Inspection Dates:	February 8-12, 2016	
Inspectors:	Edgardo Torres Laura Micewski Raju Patel Louis Dumont	NRO/DCIP/QVIB-2, Inspection Leader NRO/DCIP/QVIB-2 NRO/DCIP/QVIB-2 RI/DRS
Approved by:	Richard P. McIntyre, Acting Chief Quality Vendor Inspection Branch-2 Division of Construction Inspection and Operational Programs Office of New Reactors	

EXECUTIVE SUMMARY

ASCO Valve, Inc.
99901054/2016-201

The U.S. Nuclear Regulatory Commission (NRC) staff conducted a vendor inspection at the ASCO Valve, Inc. (ASCO) facility to verify that it had implemented an adequate quality assurance (QA) program that complies with the requirements of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities." In addition, the inspectors also verified that ASCO implemented a program under 10 CFR Part 21, "Reporting of Defects and Noncompliance," that met the NRC's regulatory requirements. The inspectors conducted the inspection from February 8-12, 2016. This was the first NRC vendor inspection at ASCO Aiken, SC facility.

ASCO manufactures safety-related solenoid valves and hydramotors for the operating reactor fleet. Some of the specific activities observed by the inspectors included:

- Receipt inspection of disc Part Number (P/N) 192267-001, from Tri-Star Plastic Corp., to verify item met the PO requirements
- Receipt inspection of gasket cover P/N 172759, from Mueller Die Cut Solutions, to verify the item met the PO requirements
- Receipt inspection of housing assembly P/N N206745-001 from Tryco Tool Mfg. Co., to verify item met PO requirements
- Setup and performance of material identification of housing assembly P/N 206945-001 by X-Ray fluorescence (XRF) analysis to verify material meet ASTM A619 Type C1008.1010 specification
- XRF daily verification calibration of Bremor Tensor 27 analyzer using XRF standard AISI 316 IARM 511
- Setup and performance of material identification of gasket cover P/N 17 2759-001, using Fourier transform infrared spectroscopy (FTIR) technique on Bremor Tensor-27 FTIR analyzer to verify material to be Ethylene Propylene per ASCO drawing No. 172759
- Setup and performance of final Inspection of three, 3-way 8316 series solenoid valves Model No. NPL8316A054E125DCKD, to verify valve functioned as designed and met the test procedure acceptance criteria
- Setup and performance of assembly and functional testing (electric test, coil test, leakage test, noise test, and operational test) of two 3-way NP8320 series solenoid valves, Model No. NPL8320A195125/DCKD to assembly procedure AP-NP8320-2, and tested per TP-NP8320 procedure on work order No. 495357, to verify the valves functioned as designed and met all acceptance criteria
- Setup and performance of Hi-pot coil test of 2 coil kit assemblies P/N 258282-001-D prior to assembly of solenoid valve Model No. NP8320A195V per TP-NP8320 test procedure
- Setup and performance of dimensional and material verification inspection of 4 disc P/N G198959-004 for commercial-grade dedication (CGD) of valve assembly
- Setup and performance of functional testing (seat leakage, operational test, dielectric test and flow test) of three NP8316 series, 3-way solenoid valves Model No. NPL8316A054E125DCKD, performed to ASCO test procedure TP-NP8316 to verify the valve functioned as designed and met the acceptance criteria of the test procedure

- Setup and performance of assembly and functional test (dielectric test, proof test, flow test, and leakage test) of a Hydramotor pump assembly P/N 440251-502 to AP-NH90-007 and test procedure TP-9999-32852 on ASCO w/o# 498013
- Setup and performance of assembly and functional test (force coil test, stability test, test position and auto test) of Hydramotor control unit assembly Model No. 108681L, S/N A501627-001 per ASCO TP-9999-4052 procedures

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

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

During the course of this inspection, the inspectors implemented Inspection Procedure (IP) 43002, "Routine Inspections of Nuclear Vendors"; IP 43004, "Inspection of Commercial-Grade Dedication Programs"; and IP 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance."

The information below summarizes the results of this inspection.

Commercial-Grade Dedication (CGD)

The inspectors issued Nonconformance 99901054/2016-201-01 in association with ASCO's failure to implement Criterion III, "Design Control," and Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50. Nonconformance 99901054/2016-201-01 cites ASCO for failure to establish measures for the selection and review for suitability of application of materials and parts that are essential to the safety-related functions of components to assure that purchased material conforms to the procurement documents, including provisions 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. Specifically, ASCO failed to translate an identified critical characteristic for dedicated elastomers to an acceptance method plan. The inspectors identified that ASCO failed to adequately implement a commercial-grade dedication (CGD) acceptance method plan during dedication activities for a safety-related coil kit and an O-ring. Finally, the inspectors identified that ASCO failed to provide documented objective evidence to support sampling plans for testing, when lot/batch control was not established through a commercial-grade survey.

Other Inspection Areas

The inspectors concluded that ASCO is implementing its program for 10 CFR Part 21, as well as its programs for training and qualification of personnel, design control, test control, control of measuring and test equipment, control of nonconformances, corrective actions and internal audits 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 inspectors also determined that ASCO is implementing its policies and procedures associated with these programs. No findings of significance were identified.

REPORT DETAILS

1. 10 CFR Part 21 Program

   a. Inspection Scope

   The inspectors reviewed ASCO's policies and implementing procedures that govern its 10 CFR Part 21, "Reporting of Defects and Noncompliance," program to verify that the requirements had been effectively implemented for evaluating deviations and failures to comply. In addition, the inspectors evaluated 10 CFR Part 21 postings and a sample of ASCO purchase orders for compliance with the requirements of 10 CFR 21.21, "Notification of Failure to Comply or Existence of a Defect and its Evaluation," and 10 CFR 21.31, "Procurement Documents." The inspectors verified the content of ASCO's 10 CFR Part 21 posting, as well as the location of the posting. The inspectors also verified that ASCO's nonconformance and corrective action procedures provide a connection to the 10 CFR Part 21 program.

   The inspectors discussed the Part 21 program with ASCO's staff. The attachment to this inspection report lists the personnel interviewed and documents reviewed by the inspectors.

   b. Observations and Findings

   No findings of significance were identified.

   c. Conclusion

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

2. Training and Qualification of Personnel

   a. Inspection Scope

   The inspectors reviewed ASCO'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, "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 inspectors reviewed a sample of ASCO's quality control personnel auditors and lead auditors qualifications from Florham Park, NJ and Aiken, SC to ensure that proficiency is achieved and maintained. The inspectors verified that all personnel performing activities affecting quality had completed the required training and met all the specified requirements in accordance with ASCO's policies and implementing procedures.

The inspectors discussed the training and qualification program with ASCO's staff. The attachment to this inspection report lists the personnel interviewed and documents reviewed by the inspectors.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The inspectors concluded that ASCO is implementing its training and qualification 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 inspectors also determined that ASCO is implementing its policies and procedures associated with the training and qualification program. No findings of significance were identified.

3. Design Control

a. Inspection Scope

The inspectors reviewed ASCO's policies and implementing procedures that govern design control program to verify compliance with the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50.

The inspectors reviewed ASCO's engineering change methodologies and procedures associated with the qualification test specifications for ASCO's Red Hat II coils and quick disconnect connectors (QDCs) to ensure that procedures were implemented to control design changes.

The inspectors discussed the design control program with ASCO's staff. The attachment to this inspection report lists the personnel interviewed and documents reviewed by the inspectors.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The inspectors concluded that ASCO established a program that adequately controls design changes activities for safety-related components, outside of commercial-grade dedication, in accordance with the regulatory requirements of Criterion III of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the inspectors determined that ASCO is also effectively implementing its policies and procedures associated with design control program. No findings of significance were identified.

4. Commercial-Grade Dedication (CGD)

a. Inspection Scope

The inspectors reviewed ASCO's policies and implementing procedures that govern the CGD program to verify compliance with the regulatory requirements of Criterion III, "Design Control," and Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50.

The inspectors reviewed dedication packages to assess the different elements of the CGD program which included POs, the technical evaluation process including the commercial-grade item evaluations, commercial-grade surveys, receipt inspection reports, certificates of compliance, quality control source inspection reports, various design drawings, sampling plans, and technical information. The team evaluated the criteria for the identification of items safety functions, credible failure mechanisms/modes, selection of critical characteristics and acceptance criteria, and the identification of verification methods to verify effective implementation of ASCO's dedication process.

The inspectors discussed the CGD program with ASCO's staff. The attachment to this inspection report lists the personnel interviewed and documents reviewed by the inspectors.

b. Observations and Findings

The inspectors reviewed CGD activities for items such as springs, coatings, elastomers, AC and DC core assemblies, valve seats, and valve bodies. During this review, the inspectors assessed commercial-grade survey documentation, such as survey plans and results. The inspectors noted that ASCO's commercial-grade survey plans focus on programmatic controls at a supplier, rather than review of the vendor's commercial quality controls for the critical characteristics of the item or service being procured. Therefore, ASCO did not recognize that an essential part of the commercial-grade survey for elastomers would include verification of the material identification.

The inspectors reviewed ASCO's CGD activities for commercially-procured elastomers from [----------] and [----------]. ASCO designated material identification as a critical characteristic for dedicating commercially procured elastomers. ASCO used examination of products upon delivery to accept most critical characteristics of the elastomers, including dimensions and workmanship. ASCO also chose to perform commercial-grade surveys, to verify the material identification. However, ASCO's commercial-grade surveys did not identify critical characteristics expected to be controlled at the vendor. ASCO only performed lot/batch control commercial-grade surveys at distributers such as [----------] and overlooked the fact that a distributor has no role in controlling material identity. For suppliers such as [----------], ASCO overlooked the fact that the rubber was compounded at a different commercial facility that is not surveyed.

[----------] obtains O-rings from [----------], a domestic supplier, who in turn sources at least a portion of them from a manufacturer in Asia. [----------] also receives O-rings from other suppliers such as [----------], a supplier who also sources seals from Asia. [----------], who supplies rubber valve discs for ASCO, does not compound the rubber onsite, but procures it from other suppliers who are not surveyed by ASCO.

The examples below were chosen to be representative of the scope of the problem, however this is based on a limited inspection sample.

- PO 101504876 for four SB11AKR pressure switches and four TN10B42R pressure transducers called for Part # G039619-050-VI (nuclear O-ring), which is made of Viton A type material. This material type is required for components that will be in service in a harsh environment, including exposure to radiation. Material Identification was identified as a critical characteristic, but was not adequately verified during CGD inspection, because the O-ring supplier was not surveyed. These O-rings were procured from [----------], who sourced them from [----------].

- PO 1015054413 for twenty-three NP 8316 3-way solenoid valves for Areva, a distributor for operating nuclear power plants, called for O-rings, Part # G089834-005-HT (O-ring nuclear), Part # G031325-002-HT (O-ring nuclear), and Part # G039619-005-HT (nuclear O-ring). All are made of ethylene propylene. These O-rings were procured from [----------], who sourced them from [----------].

- PO 4500834520 with PSEG Nuclear for an NPX8223G131 solenoid valve for Hope Creek called for a rubber disc, Part # G064355-007 (Disc nuclear). The valve disc was procured commercially from [----------]. Material Identification was identified as a critical characteristic, but was not adequately verified during CGD inspection. ASCO only performed a commercial-grade survey at [----------], without verification of adequate control of other suppliers, where the rubber is compounded.

NRC Inspection Procedure (IP) 43004, “Inspection of Commercial-Grade Dedication Programs,” section 3.02.b provides guidance on CGD. The section states in part, “Commercial-grade survey plans should include the identification of the item or items for which the vendor is being surveyed and identification of the critical characteristics of these items that the vendor is expected to control.” It further states, “Acceptance Method 2 should not be employed as the basis for accepting items from distributors unless the survey includes the part manufacturer(s) and the survey confirms adequate controls by both the distributor and the part manufacturer(s).”

The inspectors determined that there is no objective evidence that these components are made of the correct material to assure reasonable assurance they will perform their intended safety function. For solenoid valves provided by ASCO as environmentally-qualified equipment, it is important to maintain material similarity between the elastomers installed in the valve subjected to qualification testing and constituent elastomers installed in subsequent valves manufactured by ASCO. Using the wrong type of material could shorten the service life of the elastomers, or could cause them to fail in the harsh environment of accident conditions; this failure could lead to leakage, which could cause the solenoid valve not to fulfill its designed

safety function. ASCO performed only a lot/batch control survey at [--------] and at [--------], and has not surveyed any sub-tier suppliers who would control material composition of the elastomers.

ASCO partially documented these multiple issues in their Corrective Action Program as Internal Corrective/Preventive Action Report (ICAR) #I-022216-11 on February 29, 2016. This ICAR focuses only on the lot/batch survey performed at [----------], with no verification of sub-tier suppliers.

This issue is identified as Nonconformance 99901054/2016-201-01, example 1.

The inspectors reviewed sampling activities to support dedication testing. In most cases, ASCO performed destructive testing during commercial receipt inspection activities to determine the material identity of an elastomer lot. ASCO's procedure MP-I-206, employs a sampling plan for destructive testing based on ANSI/ASQ Z1.4, "Sampling Procedures and Tables for Inspection by Attributes." However, ASCO's current sampling plans lack a documented technical basis for selection and use of sampling plans for CGD of commercial elastomers. ASCO could not provide objective evidence of a technical evaluation to justify the sampling plan based on ASQ Z1.4 for the items inspected. The inspectors observed that ASCO's current sampling practices consist of only one item, independent of lot size, to verify the material identification critical characteristic by destructive testing, during commercial receipt inspection. The inspectors noted examples of only one item being destructively tested for material identification for lot sizes of up to 2,000 items.

IP 43004, section 03.02.a, states in part, "Sampling plans for testing should be used in accordance with nationally recognized industry standards, and should have an adequate documented technical basis. This technical basis includes homogeneity, complexity of the item, lot/batch control for items, heat traceability for materials, and adequacy of the vendor's controls as confirmed by a survey. EPRI TR-017218-R1, "Guideline for Sampling in the Commercial-Grade Item Acceptance Process," dated on January 1999, section 2.4.2, also provides guidance for sampling population.

This issue is identified as Nonconformance 99901054/2016-201-01 example 3.

The inspectors reviewed records for both receipt inspections and CGD testing and inspections. The inspectors noted issues with ASCO's performance of specified tests in accordance with the CGD acceptance plan. The inspectors reviewed ASCO procedures MP-I-026 and QC-ER-8, "Material Verification," Revision AA, dated September 10, 2014.

The inspectors noted that ASCO failed to adequately implement a CGD acceptance method plan for Work Order A339448 (PO 1015038212) of a coil kit, Part # G027502-001-K, Coil MXX Nuclear. The inspectors identified that ASCO failed to verify eight out of nine critical characteristics listed as inspection requirements in their acceptance method plan for Work Order A339448. The only characteristic verified was "general workmanship," which required a visual inspection. The critical characteristics not verified were markings, inner diameter, outer diameter, length, turns, lead length, resistance, and a visual inspection of the leads. Potential failure modes of the component include an electrical short in the coil or shortened service life; verifying the critical characteristics of turns and resistance

are necessary to provide reasonable assurance these failure modes would not occur. The inspectors considered other inspections that could potentially be credited for verifying the critical characteristics and noted that all nine characteristics had been verified during receipt inspection, however, the receipt inspection is performed on a sampling basis and only two coil kits out of six received were sampled. ASCO had no documented engineering basis for using sampling methodology, rather than performing tests or inspections on 100% of the coils received. ASCO procedure MP-I-026 specifies 100 percent inspection for items at "Nuclear Pre-Assembly" inspection.

The inspectors also noted that ASCO failed to adequately implement a CGD acceptance method plan as prescribed in written instructions while conducting receipt inspection for Work Order 797668-15, on Part # 022525-007-90, which is an O-ring. The receipt inspection instructions specified verifying material identification using ASCO procedure QC-ER-008, which directed performance of either FTIR testing or a burn test and specific gravity. The receipt inspector did not perform the specified testing, and instead, signed off on the material identification based solely on observation of a Certificate of Conformance from the O-ring vendor. The receipt inspection written instructions also specified a durometer reading was required. Instead of performing the durometer test, ASCO signed off on this step of the receipt inspection based on the Certificate of Conformance from the O-ring supplier. As previously stated in example 1, ASCO provided no objective evidence that ASCO had conducted a commercial-grade survey for the services credited in the Certificate of Conformance at the O-ring supplier.

IP 43004, section 3.02.a, states in part, "When the verification of one or more critical characteristics is based on vendor-certified material test reports or certificates of conformance/compliance, the validity of these documents should be verified." The inspectors determined that ASCO did not verify that the vendor had established adequate traceability controls and that these controls were effectively implemented.

ASCO documented this issue in the Corrective Action Program ICAR # I-022216-07 on February 22, 2016.

This issue is identified as Nonconformance 99901054/2016-201-01 example 2.

c. Conclusion

The inspectors issued Nonconformance 99901054/2016-201-01 in association with ASCO's failure to implement Criteria III and VII of Appendix B to 10 CFR Part 50. Nonconformance 99901054/2016-201-01 cites ASCO for failing to establish measures for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems and components. Specifically, the inspectors identified that ASCO performed inadequate commercial-grade surveys in that the survey plans did not identify the critical characteristics of the product or service procured, and subsequently failed to verify the material identification critical characteristic for elastomers procured commercially and installed in safety-related solenoid valves. The inspectors identified that ASCO failed to adequately implement two CGD acceptance method plans for two commercially-procured items to be installed in safety-related solenoid valves. Finally, the inspectors identified that ASCO failed to

provide a documented technical basis for selection and use of sampling plans for CGD of commercial elastomers for critical characteristic material identification destructive testing as part of their acceptance method plan.

5. Test Control

   a. Inspection Scope

      The inspectors reviewed ASCO's policies and implementing procedures associated with a selection of manufacturing control processes to verify compliance with the regulatory requirements of Criterion XI, "Test Control," of Appendix B to 10 CFR Part 50.

      The inspectors observed several leakage and functional testing for three 3-way NP8316, two 3-way NP8320, and two hydramotors. The inspectors also assessed indoctrination and training of inspection and test personnel, and reviewed a sample of completed documentation from various portions of the manufacturing process to verify adherence to established procedures.

      The inspectors discussed the test control program with ASCO's staff. The attachment to this inspection report lists the personnel interviewed and documents reviewed by the inspectors.

   b. Observations and Findings

      No findings of significance were identified.

   c. Conclusion

      The inspectors concluded that ASCO is implementing its test control program consistent with the regulatory requirements of Criterion XI of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed the inspectors determined that ASCO is effectively implementing its policies and procedures associated with the test control program. No findings of significance were identified.

6. Control of Measuring and Test Equipment (M&TE)

   a. Inspection Scope

      The inspectors reviewed ASCO's policies and implementing procedures that govern the M&TE program to verify compliance with the requirements of Criterion XII, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50.

      The inspectors reviewed the use of M&TE during inspections and tests to ensure it was calibrated, controlled, and documented in accordance with the procedural requirements. The inspectors reviewed a sample of ten records to ensure documentation matched the observed use of M&TE, that M&TE was calibrated to a nationally recognized standard, and the calibration was current. The inspectors verified that ASCO staff properly segregated, documented and evaluated, in accordance with procedures, when M&TE was found out of calibration or broken.

The inspectors performed a walk-down to ensure that equipment located in the M&TE storage area, the M&TE hold area, inspection and test facility were labeled, handled, and stored in a manner that indicated the calibration status of the instrument and ensured its traceability to calibration test data.

The inspectors discussed the M&TE program with ASCO's staff. The attachment to this inspection report lists the personnel interviewed and documents reviewed by the inspectors.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

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

7. Nonconforming Materials, Parts, or Components and Corrective Action

a. Inspection Scope

The inspectors reviewed ASCO's policies and implementing procedures that govern the nonconformance and corrective action program (CAP) to verify compliance with the requirements of Criterion XV, "Nonconforming Materials, Parts, or Components," and Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50.

The inspectors reviewed ASCO's internal corrective/preventive action report (ICAR) and nonconforming material reports (NMCR) control logs and several NMCRs and ICARs to verify that ASCO implemented an adequate program to ensure that nonconforming items and conditions adverse to quality were promptly identified and corrected. The inspectors verified that nonconforming components were properly identified, marked, and segregated when practical, to ensure they were not reintroduced into the manufacturing processes. In addition, the inspectors reviewed several retuned material authorization (RMA) to ensure they were adequate evaluated. Finally, the inspectors verified that the ASCO nonconformance program CAP and RMA programs provided a connection to the 10 CFR Part 21 program.

The inspectors discussed the nonconformance, CAP and RMAs with ASCO's staff. The attachment to this inspection report lists the personnel interviewed and documents reviewed by the inspectors.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The inspectors concluded that ASCO is implementing its nonconformance and CAP in accordance with the regulatory requirements of Criterion XV and Criterion XVI of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the inspectors also determined that ASCO is implementing its policies and procedures associated with the nonconformance and CAP. No findings of significance were identified.

8. Internal Audits

a. Inspection Scope

The inspectors reviewed ASCO's policies and implementing procedures that govern the internal audit program to verify compliance with the requirements of Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50.

The inspectors reviewed a sample of internal audits and the qualifications of ASCO's auditors and Lead auditors to verify the implementation of the ASCO audit program. The inspectors verified that audit teams were comprised of qualified auditors, and that auditors were not auditing their own work. The inspectors also reviewed the disposition of audit findings for adequacy and timeliness. Finally, the inspectors interviewed ASCO personnel.

The inspectors discussed the internal audit with ASCO's staff. The attachment to this inspection report lists the personnel interviewed and documents reviewed by the inspectors.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The inspectors concluded that ASCO is implementing its internal audit program in accordance with the regulatory requirements of Criterion XVIII of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the inspectors also determined that ASCO is implementing its policies and procedures associated with the internal audits program. No findings of significance were identified.

9. Entrance and Exit Meetings

On February 8, 2016, the inspectors discussed the scope of the inspection with Mr. Edward Fox, Director of Operations, and other members of ASCO's management and technical staff. On February 12, 2016, the inspectors presented the inspection results and observations during an exit meeting with Mr. Edward Fox, and other members of ASCO's management and technical staff. On March 17, 2016, the inspectors conducted a re-exit to present inspection results and observations to Mr. Edward Fox and other members of ASCO's management and technical staff. The attachment to this report lists the attendees of the entrance and exit meetings, as well as those individuals whom the inspectors interviewed.

ATTACHMENT

1. ENTRANCE AND EXIT MEETING ATTENDEES

Name	Title	Affiliation	Entrance	Exit February 8, 2016	Exit March 17, 2016	Interviewed
Edgardo Torres	Team Leader	NRC/NRO	X	X	X*	
Laura Micewski	Inspector	NRC/NRO	X	X		
Raju Patel	Inspector	NRC/NRO	X	X		
Louis Dumont	Inspector	NRC/RI	X	X		
Mike Witt	Sr. Quality Engineer	ASCO	X	X	X*	
Cherry Hensley	Quality Manager	ASCO	X	X	X*	X
Cecil Melendez	Sr. Quality Engineer	ASCO	X	X	X*	X
Reed Call	Product Engineer	ASCO	X	X	X*	X
Chip Shuler	Manufacturing Engineer	ASCO	X	X	X*	X
Joe Cioffi	Navy/Nuclear Sup	ASCO	X	X		X
Joey Marshall	Assembly Manager	ASCO	X	X		X
Bob Wilson	Product Engineer Manager	ASCO	X	X		X
Bob Royer	Sr. Quality Engineer	ASCO	X	X		X
Mike Lenio	Quality Assurance Director	ASCO	X	X		X
Edward Fox	Director of Operations	ASCO	X	X	X*	
Nick Ingles	Sr. Product Engineer	ASCO	X	X	X*	X
Kevin Falcon	Sr. Quality Engineer	ASCO	X	X	X*	X
Frank Hanna	Sr. Quality Engineer	ASCO	X	X	X*	X
Steve Casadevall	Engineering Manager	ASCO	X		X*	X
Paul Cetrulo	Technical Specialist	ASCO			X*	

Name	Title	Affiliation	Entrance	Exit February 8, 2016	Exit March 17, 2016	Interviewed
Richard McIntyre	Senior Reactor Inspector	NRC		X*		
Paul Prescott	Senior Reactor Inspector	NRC		X*		
Jonathan Ortega	Reactor Inspector	NRC		X*		

*Participated by teleconference

2. INSPECTION PROCEDURES USED

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

IP 43002, "Routine Inspections of Nuclear Vendors," dated July 15, 2013

IP 43004, "Inspection of Commercial-Grade Dedication Programs," dated November 29, 2013

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Status	Type	Description
99901054/2016-201-01	Opened	NON	Criterion III and VII

4. DOCUMENTS REVIEWED

Procedures:

ASCO Quality Assurance (QA) Manual Revision J, dated August 31, 2015

New Product Development Process NDP2.5-001, "New Product Development Process for Platform Products," Revision B, dated February 26, 2013

Engineering Department Procedure (EDP)-001, "Engineering Change Notice," Revision AH, dated October 10, 2012

EDP-20, "Engineering Evaluation of Materials and Rework Authorization," Revision V, dated February 16, 2007

EDP-111, "Qualification of Products For Safety-Related Nuclear Power Plant Applications," Revision M, dated January 26, 2016

EDP-129, “Reviewing Documents for Impact on the Performance of Nuclear Products,” Revision N, dated January 26, 2016

EDP-177, “Determination of Critical Characteristics for Dedication Inspection (Nuclear Valves),” Revision B, dated November 20, 2015

Quality Control (QC) Procedure-ER-024, Receiving Inspection, Revision U, dated September 22, 2015

QC-ER-8, “Material Verification,” Revision AA, dated September 10, 2014

QC-ER-079, Procedure for Reporting and Executing internal Corrective & Preventive Actions for Non-Conformances (ICARs), Revision M, dated October 10, 2013

QC-ER-084, Conducting Internal Quality Audit, Revision BK, dated February 17, 2014

QC-ER-96, Commercial Grade Dedication of Nuclear Valves, Actuators and Pressure/Temperature Switches and Calibration Services, Revision AB, dated December 21, 2012

QC-ER-121, Conducting Outside Quality Audits or Surveys, Revision Z, dated July 17, 2015

QC-ER-142, Lead Auditor Qualification, Revision E, dated May 16, 2013

QC-ER-003, “Responsibilities of Gage Calibration Technician/Specialist- (Management of Gage Calibration Program),” Revision AC, dated November 6, 2015

QC-ER-024, “Receiving Inspection,” Revision U, dated September 22, 2015

QC-ER-41, “Responsibilities for Performing In-Process and Final Inspection of Solenoid Valves, Pressure/Temperature Switches, and Valve Monitoring Systems (VMS),” Revision L, dated November 30, 1967

QC-ER-57, “Procedure for Operation Sheets,” Revision H, dated May 13, 1971

QC-ER-079, Procedure for Reporting and Executing Internal Corrective/Preventive Actions for Nonconformances (ICAR), Revision M, dated October 13, 2014

QC-ER-80, “Training and Qualification of QA Personnel,” Revision E, dated April 14, 1989

QC-ER-96, “Commercial Grade Dedication of Nuclear Valves, Actuators, And Pressure/Temperature Switches, and Calibration Services,” Revision AB, dated December 21, 2012

QC-ER-168, “Calibration and Maintenance of Instrumentation,” Revision Q, dated April 29, 2014

QC-Calibration Procedure (CP)-13, “Calibration of Outside micrometers, Revision C, dated May 3, 1993

QC-CP-19, “Calibration of Indicators,” Revision C, dated May 3, 1993

QC-CP-24, “Calibration of Torque Instruments,” Revision D, dated June 10, 2015

QC-CP-26, “Calibration of Pressure Gages,” Revision B, dated May 3, 1993

QC-CP-68, “Calibration of JT-206972-8300 Test bench,” Revision 0, dated July 24, 2012

Manufacturing Procedure (MP)-I-011, “Rework and Scrap Control,” Revision Q, dated May 8, 2015

MP-I-026, “Sampling Plan for Product Acceptance,” Revision U, dated December 17, 2014

MP-I-046, “Manufacturing Procedure,” Revision M, dated September 5, 1996

MP-I-081, Nuclear Product for Reporting Defects, Deviations, Noncompliance or Failure to Comply (Safety-Related 10CFR – Part 21), Revision R, dated January 25, 2016

MP-I-114, “Nuclear Material Flow Procedure for Sub-Assemblies & Valves,” Revision C,

MP-I-115, “Inspection of all ASCO Hydramotor Products (Nuclear),” Revision M, dated December 3, 2015

MP-I-116, “Inspection of all Products (Nuclear),” Revision D, dated January 1, 2015 dated February 22, 1999

ASCO test procedure (TP)-9999-32852, “Acceptance Test Procedure AH/NH90 Series Pump Assemblies,” Revision F, dated February 25, 2014

TP-9999-40052, “Adjustment & Test Procedure 108681 + Variable Controller,” Revision E, dated April 19, 2013

TP-NP8320, “Test procedure for 3-Way Nuclear Power Plant-NP8320,” Revision AF, dated January 4, 2016

ASCO assembly procedure (AP)-NP-8320-2, “3-Way Nuclear Power Plant - 8320,” Revision P, dated June 10, 2010

AP-NH90-016, “Assembly Procedure for AH/NH92/94 Controller Assembly,” Revision J, dated July 21, 2015

AP-NH90-007, “Assembly Procedure for AH/NH95/96 Pumps,” Revision K, dated July 22, 2013

AP-1-024, General Instruction for Cleaning Valves (or Components), Revision K, dated October 8, 1993

AP-1-026, General Instructions for Assembly and Testing of Products Using Ethylene Propylene Elastomer parts in Contact with Medium, Revision AB, dated January 1998

AP-NP-228974, “NP & NS 8300 (P37) Catalog Valves per 228974, 278887 & 283346,” Revision B, dated September 2005

AP-NP-8344B1, “Assembly Procedure for NP-8344 Catalog Valves Per 206390 & 208267,” Sheet 1, 2, & 3 Revision T, dated March 2006

Purchase Orders (POs)

Flowserve PO 237543 to ASCO for Solenoid Valves model SNL831674, dated August 31, 2015

Flowserve PO 239907 to ASCO for Solenoid Valves Model NU8344G072V, dated November 11, 2015

Areva PO 1015058872 to ASCO for Solenoid Valves model NPL8320A182V and NPEF8300142ERF, dated December 29, 2015

Areva PO 1016002778 to ASCO for solenoid valves model NP8344B62E and NPEFL8300141EU, dated January 15, 2016

Areva PO 1016004104 to ASCO for Solenoid Valves model NP832066E, NP8320A194E, NP8316A54E, NPL8316A56V, dated January 21, 2016

ASCO PO 604361 to [----------] for valve irradiation of 15 valves;

PO 523232 to [--------] for seismic testing of ASCO valve per ASCO ATS-35118-2;

PO 407432 to [----------] Nyogel Lubricant 775B dated May 15, 2013

PO 602507 to [----------] Nyogel Lubricant 775D, dated September 30, 2015

PO 618125 to [---------] Inc., dated November 13, 2015, for calibration of test benches at site

PO 623696 to [--------] dated December 9, 2015, for calibration of spring testers at site

PO 635834 to [---------]., dated February 4, 2016, for calibration of GFM 17-0-10

PO 1015054413, Purchase Order from Areva, Inc. to ASCO for 3-way 120/60VAC solenoid valve NPEF8300141RVF and 3-way 125VDC solenoid valve NP 8316A55E, dated October 8, 2015

PO 1015045876, Purchase Order from Areva to ASCO for SB11AKR pressure switch and TN10B42R pressure transducer, dated August 27, 2015

PO 1015038212, Purchase Order from Areva to ASCO for coil kit MXX EP AC N, dated July 14, 2015

PO 1015030180, Purchase Order from Areva to ASCO for NP 8320 3-way solenoid valve, dated June 3, 2015

PO 156637-00, Purchase Order from ASCO to [----------], Inc. for Buna O-rings (quantity 10000), dated June 5, 2014

PO 56456, Purchase Order from [----------] to [----------] for 100,000 NBR 70 O-rings, dated November 4, 2013

PO SNA10091333, Purchase Order from Southern Nuclear to ASCO for NPEF L8300 382E 3-way solenoid valves, dated March 30, 2015

PO 4123422515, Purchase Order from Fisher Controls to ASCO for NTQ8316G009 250/DC solenoid valve and 426154-002-Z connector assembly, dated January 26, 2015

PO 4500834520, Purchase Order from PSEG Nuclear to ASCO for NPX8223G131 solenoid valve, 120V, directional control, dated October 31, 2014

Drawings and Specifications

ASCO drawing No. 066671, “Spring, Conical,” Change V, dated March 12, 2015, ASCO drawing No. 206945, “Housing Assembly for Conduit Connection for M12 & MXX Submersible Solenoid,” Revision AJ, dated January 1997

ASCO drawing No. 172759, “Gasket Cover M6, MXX & M12 Submersible Solenoid,” Revision AE, dated January 21, 2013

ASCO drawing No. 108681+VAR, “Control Assembly,” Revision K, dated February 2015

Drawing No. A-659728, “ASCO Solenoid Valves Model No. NSL831674,” Revision A, dated February 23, 1995

ASCO Engineering Change Notice (ECN) 214484 dated December 10, 2010, to add static torque testing of pump assembly to test procedure for AP-NH90-006 valves;

ECN 242199, Update the Baseline Test Table in Appendix D per Radiation Test Change, Revision C, dated January 13, 2014

ECN 224053, dated February 7, 2012, “change to stronger tensile strength bolt, from Grade 2, to higher Grade 5”

ECN 246975, dated July 4, 2014, “Changes to Make upgrade bearing pump as drop in replacement in the Hydramotors,”

ECN 244560 dated April 4, 2014, for deleting heat shrink tubing to two pieces and changes to Bill of Material of pump assembly

ECN 245600, Vibration Aging is Changed, Revision D, dated May 20, 2014

ECN 249790, Update the HELB & LOCA Testing Spec Based on Testing Lab Test Procedure Revision E, dated October 17, 2014

ECN 248606 dated September 8, 2014, to change P/N 50727-001 to 61029B justified on engineering report R3-EQ-78

Engineering Report R3-EQ-78, "Report on Change to the Clevis/Lever 276656-001 used in NH91/94, Model B & B1 Hydramotor Actuators," Revision 0, dated August 28, 2014

ECN 253038 dated February 18, 2015, to revise sleeve and loop assembly justified on engineering report R3-EQ-81

ASCO Engineering Report R3-EQ-81, "Report on Change of Sleeve and Loop Assembly 5108194A with thumb screw 510297-001 used on NH90 series Hydramotor Actuators," Revision 0, dated February 9, 2015

ASCO Qualification Specification (AQS)-10115, "Qualification Specification for Alternate Construction of ASCO NT Series Coils," Revision F, dated July 23, 2015

Design Review and Design Reports

Qualification Program Project No. 35115 - AP1000 (NT 8316 ZM)

Qualification Program Project No. 35115-3/100115 - NT8320 & NT8316

Qualification Program Project No. 35119 - RSPV

Qualification Program Project No. 90111 - Hydramotor - PO No. 394770

ASCO Qualification Report (AQR)-100115, "Equipment Qualification Report for Alternate Constructions of ASCO Coils and Connectors," Revision 0, dated July 24, 2015

Calibration, Inspection and Test Reports

Inspection Report No. INT-RD-251784-16, dated February 11, 2016, for final inspection of two housing assembly P/N G2069-45-001 on w/o 488203

Incoming Inspection Report No. INS-IC-512671-01, dated February 9, 2016, of 7 pieces from a lot of 105 gasket cover P/N 172759-001, accepted on work order No. 828113-16

In-process pre-assembly inspection report No. INT-RD-251790-16, of two 3-way solenoid valve catalog No. NPL8320A195V on work order No. 495357, performed on February 8, 2016

In-process pre-assembly inspection report No. INT-RD-251770-16, of three 3-way solenoid valve catalog No. NPL8316A04E125 on work order No. 488203, accepted on February 10, 2016

In-process pre-assembly inspection report No. INT-RD-251587-16, of six 3-way solenoid valve catalog No. NPX8316E35V18839 on work order No. 477226/OB614707, accepted on February 9, 2016

Final inspection report No. INT-FN429163-01, of 86 disc P/N 198959 on work order No. 519139-16, performed on February 10, 2016

Final inspection report No. INT-RD-251794-16, of three 3-way solenoid valve P/N NPL83A054E125 on work order No. 488203, accepted on February 10, 2016

ASCO Operational Test Certification Sheet for Control Unit Assembly Model No. 108681L, serial No. A501627-001 for work order No. 501627, tested on February 9, 2016

ASCO certificate of calibration for gage ID CTP-1, GC control plate tester, calibrated on January 20, 2016, due on July 18, 2016

ASCO certificate of calibration for gage ID GM-31657- Gauss meter, calibrated on May 15, 2015, due on May 15, 2016

ASCO certificate of calibration for gage ID M-9089041 digital outside micrometer, calibrated on January 15, 2016, due on February 14, 2016

ASCO certificate of calibration for gage ID PG-471 calibrated on December 17, 2015, due on June 14, 2016

[--------] certification of calibration for gage ID TQ-06, calibrated on September 30, 2015, due March 28, 2016, to ASCO PO 599084

[---------] certification of calibration for gage ID PC-2, calibrated on November 12, 2015, due November 11, 2016, to ASCO PO 614093

[---------] certification of calibration for gage ID VTAT-GC, Pump Tester, calibrated on November 16, 2015, due June 18, 2016, to ASCO PO 618125

[---------] certification of calibration for gage ID GC Final Test Bench, calibrated on November 16, 2015, due June 18, 2016, to ASCO PO 618125

[----------] certification of calibration for gage ID SCM-6 – Digital phosphor oscilloscope, calibrated on June 15, 2015, due June 15, 2016, to ASCO PO 583841

[----------] certification of calibration for gage ID BLK-121189-6 - Gage block set, calibrated on July 31, 2015, due July 31, 2016, to ASCO PO 593221

[----------] certification of calibration for gage ID MMS-36, calibrated on August 31, 2015, due August 31, 2016, to ASCO PO 600629

[----------] certificate of verification for gage ID HT-05, model No. UHT-10, calibrated on December 3, 2015, due December 3, 2016, to ASCO PO 6322870

[----------]., certificate of calibration for gage ID UT-11, spring tester, calibrated on January 6, 2016, due January 6, 2017, to ASCO PO 623696

[----------] certificate of calibration for gage ID OC-17 optical comparator, calibrated on July 5, 2015, due July 5, 2016, to ASCO PO 580949

Audit/Surveys Reports

ASCO Appendix B audit of Clark laboratory performed on February 21, 2013

ASCO Appendix B audit of Steris Isomedix Services performed on February 22, 2013

ASCO Appendix B audit of Kinetrics performed on June 4, 2014

ASCO commercial grade calibration survey of Larson Systems Inc., dated August 26, 2015

ASCO commercial grade calibration survey of Aalborg Instruments, dated June 2, 2015

ASCO commercial grade calibration survey of Teledyne Hastings, dated October 16, 2013

ASCO commercial grade calibration survey of Analytical Reference Material International, dated October 19, 2013

ASCO commercial grade calibration survey of Arizona Instrument LLC., dated March 20, 2013

ASCO On-site calibration survey of Vision Engineering, dated May 29, 2014

ASCO Supplier Survey – Larson Systems Inc., dated August 26, 2015

ASCO commercial grade survey of Downwell Company Supplier Survey, dated May 29, 2015

ASCO commercial grade survey of Lot/Batch survey Minnesota Ruber, Reynosa, dated February 14, 2014

ASCO commercial grade survey of Seals Eastern lot/batch survey, dated February 24, 2014

ASCO commercial grade survey of Classic Coil Company Inc., Bristol, CT/Lot & Batch Control Survey

Internal Audit – ASCO General Control Nuclear, dated March 17-25, 2014

Audit Plan – Audit of ASCO Nuclear Valve, Kit & Pressure/Temperature Switch, dated April 3, 2014

Internal Corrective/Preventive Action Report (ICAR) Generated During the NRC Inspection

I-021516-01, M&TE Calibration inadequacies, dated February 15, 2016

I-021516-02, CGD M&TE inadequacies, dated February 15, 2016

I-021516-03, CGD Critical Characteristic and Technical Evaluations, dated February 15, 2016

I-021516-04, Lack of qualification plan and training for testing and inspection personnel, dated February 15, 2016

I-022216-05, Condition adverse to quality and significant condition adverse to quality definitions not in ASCO corrective action procedure, dated February 22, 2016

I-022216-06, Part 21 procedure inadequacies, dated February 22, 2016

I-022216-07, CGD method 1 inadequacies, dated February 22, 2016

I-022216-08, CGD Receipt inspections and certificate of Compliance issue, dated February 22, 2016

I-022916-09, Internal audits correlation, dated February 29, 2016

I-022916-10, Design control issues, dated February 29, 2016

I-022916-11, CGD method 2 issues, dated February 29, 2016

I-022916-12, OP Sheets not adequately reviewed, dated February 29, 2016

ICARs

I-041911-01, NH90 Hydramotor returned from Diablo Canyon Power Plant, dated April 19, 2011

I-051811-01, NP8344E returned from Dresden and Salem, dated May 18, 2011

I-032515-01, Quality M&TE not in calibration program, dated March 25, 2015

I-032515-02, Procedures not referenced in calibration records, March 25, 2015

I-041315-01, Scrap material controls, dated April 13, 2015

Nonconforming Material Reports (NCMRs)/ Nonconforming External (NC-EXT)

NCMR 5576, Hydramotor pump issue, March 29, 2010

NCMR 5676, NP832094E returned due to external leakage, dated September 15, 2010

NCMR 6092, Fermi returned SSPVs, dated October 30, 2012

NCMR 6148, Valve returned due to not venting when de-energized, dated February, 25, 2013

NC-EXT0088-15, length, dated January 22, 2015

NC-EXT0634-15, General Workmanship, dated April 24, 2015

NC-EXT0674-15, Diameter #3, May 1, 2015

NC-EXT0695-15, Surface finish, dated May 6, 2015

NC-EXT0702-15, General workmanship, dated May 7, 2015

NC-EXT0712-15, Thread size, dated May 11, 2015

NC-EXT0883-15, Thickness, dated June 8, 2015

NC-EXT0943-15, General workmanship, dated June 16, 2015

NC-EXT1010-15, Perpendicularity #5, dated June 26, 2015

NC-EXT1095-15, General workmanship, dated July 11, 2016

NC-EXT1189-15, Paint finish, dated July 30, 2015

NC-EXT1232-15, Diameter, dated August 7, 2015

NC-EXT1424-15, General workmanship, dated September 18, 2015

NC-EXT1763-15, Thread size, dated October 8, 2015

NC-EXT1790-15, Depth, dated December 10, 2015

Return Material Authorization (RMA)

RMA 55567, Susquehanna scram solenoid pilot valves returned due to leakage, dated May 3, 2013

RMA 59124, Areva 5 cylinder kit returned, dated May 6, 2014

RMA 60009, Columbia scram solenoid pilot valve returned due to failure, dated July 30 2014

RMA 61450, Areva Hydramotor returned, dated January 5, 2015

RMA 62069, Nine Mile solenoid valves returned due to loud buzzing, dated March 2, 2015

RMA 62811, Areva Hydramotor returned kit, dated May 12, 2015

RMA 64088, Perry Hydramotors returned due to bearing issues, September 24, 2015

RMA 64585, Monticello Hydramotor pump kit returned, November 12, 2015

Qualification and Certification Records

ASCO training records for Brian Howell to Bruker IR/Raman, dated September 2012

Inspector & Technician Certification record for Nancy Allen-QC Inspector, dated August 7, 2015

Inspector & Technician Certification record for Donna Herron-QC Inspector, dated August 7, 2015

Inspector & Technician Certification record for Brian Howell- QA Technician, dated August 7, 2015

Inspector & Technician Certification record for Malinda Perea-QC Inspector, dated August 7, 2015

Inspector & Technician Certification record for Susan Phillips-QC Inspector, dated August 7, 2015

Calibration Specialist Certification record for Jean Anderson, dated August 7, 2015

Calibration Specialist Certification record for Terry Nettles, dated August 7, 2015

Lead Auditor Qualification for Kevin Falcon, dated July 24, 2015

Lead Auditor Qualification for Frank Hanna, dated July 24, 2015

Lead Auditor Qualification for Brian Howell, dated July 24, 2015

Lead Auditor Qualification for Bobby Hays, dated July 24, 2015

Lead Auditor Qualification for Kevin Everhart, dated July 24, 2015

Lead Auditor Qualification for Bill Abercrombie, dated October 2015

Lead Auditor Qualification for Eugene Muzyka, dated October 2015

Miscellaneous

ASCO Assembly Work Order No. 488203, for three 3-way 8316 series solenoid valves Catalog No. NPL8316A054

Manufacturing Work Order No. 501627 for one Control Unit Assembly Model No. 108681L

Manufacturing Work Order No. 498013, for one pump assembly Model No. 440251-502 Certificate of Conformance for 65 commercial housing assembly P/N 206945-001 from [---------]., to ASCO on PO No. 631677

[--------] Certificate of Conformance for 6 x 2 oz. jars of Nyogel 775D, P/N 07071-544, traceable to batch No. SM15060, dated June 2, 2015, to ASCO PO No. 602507

[--------] Certificate of Conformance for 6 x 2 oz. jars of Nyogel 775B, P/N 07071-525, traceable to batch No. NB130507, dated May 14, 2013, to ASCO PO No. 407432

[---------] certificate of conformance for ASCO P/N 172759-004 gasket cover, lot No. 472902032016, dated February 3, 2016

ASCO assembly work order No. 495357 for nuclear 3-way NP8320A195 solenoid valve dated February 8, 2016

[---------], A2LA certificate No. 1780.01, due September 30, 2017

[---------], A2LA certificate No. 1527-01, valid to December 31, 2016

Engineering Report No. R3-EQ-30, “NH90 Series Hydramotor Actuator Failure Modes & Effects Analysis including listing of Commercial Grade Components,” Revision 2, dated November 7, 2002