

August 29, 2016

Mr. Jim Borst, Quality Assurance Manager
Namco Controls
2100 West Broad Street
Elizabethtown, NC 28337

SUBJECT: NUCLEAR REGULATORY COMMISSION VENDOR INSPECTION OF NAMCO
CONTROLS REPORT NO. 99901470/2016-202, AND NOTICE OF
NONCONFORMANCE

Dear Mr. Borst:

On July 11 to July 15, 2016, the U.S. Nuclear Regulatory Commission (NRC) conducted an inspection at the Namco Controls facility in Elizabethtown, North Carolina. Namco Controls (hereafter referred to as Namco), provides safety-related limit switches to the nuclear industry. The purpose of the limited-scope inspection was to assess Namco compliance with the 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," and 10 CFR Part 21, "Reporting of Defects and Noncompliance."

This technically-focused inspection specifically evaluated Namco's implementation of quality activities associated with the fabrication, testing, design control, qualification, and commercial grade dedication activities associated with safety-related limit switches to U.S. operating nuclear plants and AP1000 plants. The enclosed report presents the results of this inspection. This NRC inspection report does not constitute NRC endorsement of your overall quality assurance (QA) or 10 CFR Part 21 programs.

Based on the results of this inspection, the NRC staff determined that the implementation of your QA program did not meet certain NRC requirements imposed on you by your customer or NRC licensees in the areas of commercial grade dedication; nonconforming material, parts or components; corrective actions; and instructions, procedures and drawings. Specifically, Namco failed to: (1) ensure 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; (2) establish appropriate measures that included provisions for source evaluation of subcontractors and examination of products upon delivery; (3) disposition and provide measures to control nonconforming materials, parts, or components; (4) correct significant conditions adverse to quality; (5) ensure that personnel performed activities affecting quality in accordance with documented work instructions and processing documents; and (6) ensure that assembly and test procedures, included appropriate quantitative acceptance criteria for determining that important activities have been satisfactorily accomplished. In response to the enclosed notice of nonconformance (NON), Namco should document the results of the extent of condition review for these findings and determine if there

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

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response 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/

Terry W. Jackson, Chief
Quality Assurance Vendor Inspection Branch-1
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket No.: 99901470

Enclosures:

1. Notice of Nonconformance
2. Inspection Report 99901470/2016-202
and Attachment

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response 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).

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Terry W. Jackson, Chief
Quality Assurance Vendor Inspection Branch-1
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and Attachment

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DATE	09/16/16	09/26/16	

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NOTICE OF NONCONFORMANCE

Namco Control Corporation
2100 West Broad Street
Elizabethtown, NC 28337

Docket No.: 99901470
Report Number 2016-202

Based on the results of a Nuclear Regulatory Commission (NRC) inspection conducted at Namco Controls (hereafter referred to as Namco) facility in Elizabethtown, NC on July 11, 2016, through July 15, 2016, certain activities were not conducted in accordance with NRC requirements which were contractually imposed on Namco by NRC licensees:

- A. Criterion III, "Design Control," of Appendix B, to 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 "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."

Namco Procedure QCP-002, "Inspection and Dedication," Revision S, dated August 31, 2015, Section 8.0, "Sampling Procedures," Subsection 8.1.1, "Piece Level Parts and Subassemblies," states, in part, "the specific plan chosen depends upon the type of product, method of manufacture and other relevant factors. Inspection of piece level parts and subassemblies shall be performed in accordance with the applicable drawing, specifications, and the Dimensional Inspection Report (DIR)."

Contrary to the above, as of July 15, 2016, Namco failed to ensure 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. Additionally, Namco failed to establish appropriate measures that included provisions for source evaluation of subcontractors and examination of products upon delivery. Specifically:

1. Namco failed to adequately verify the material composition critical characteristic of the contact plates during the examination of products upon delivery for the EA 184-73026 contact plates purchase order (PO) numbers: 1) 70122, dated March 24, 2016; 2) 67998, dated February 22, 2016; and 3) 72248, dated April 29, 2016. The DIR sampling plan required a sample size of 13 out of 2000 contact plates for material inspection per PO but Namco only sent one contact plate for the three POs to be tested at Applied Technical Services.
2. Namco failed to perform an adequate engineering evaluation for the change in sample population identified from ANSI/ASQC Z1.4-1993 and MIL-STD-105E to EPRI TR-017218-RI for the control of the critical characteristics for PO 70608 Part Number EA182-91026, and PO 75580, Part Number EA185-93025, when a commercial-grade survey was not conducted to verify that the supplier had lot and batch control to ensure traceability of material.

This issue has been identified as Nonconformance 99901470/2016-202-01.

- B. Criterion XV, “Nonconforming Materials, Parts, or Components,” of Appendix B to 10 CFR Part 50, states, in part, “Measures shall be established to control materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation. These measures shall include, as appropriate, procedures for identification, documentation, segregation, disposition, and notification to affected organizations. Nonconforming items shall be reviewed and accepted, rejected, repaired or reworked in accordance with documented procedures.”

Namco Quality Manual, Revision N, Section XV, Section 3.0, “Program Control,” states, in part, that nonconforming parts and subassemblies are to be identified, documented and segregated, pending disposition. It also states, in part, that rework or repair instructions shall be documented, and rework or repaired items are re-inspected to the original requirements.

Procedure NSP60-004, “Processing Nonconforming Material, Parts, Components and Services,” Revision N, describes “use as is” dispositions of discrepant items as items that are nonconforming, but the discrepancy does not adversely impact the fit, form, function, or qualification per the appropriate QTR but there must be a technical justification included on the Inspection Report (IR) form. In addition, inspection [staff] issues an IR for the items to be sorted, and for discrepancies identified as rework, inspection [staff] shall issue an IR containing repair/rework instructions.

Contrary to the above, as of July 15, 2016, Namco failed to establish measures to identify, control, document, segregate, and disposition materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation and failed to review, accept, reject, repair or rework nonconforming items in accordance with documented procedures, as illustrated in the following examples.

1. Namco failed to establish measures for the use of nonconformance reports (NCRs) and their differentiation from inspection reports (IRs) in their Quality Assurance Manual and Procedure NSP 60-0004.
2. Namco failed to provide an technical justification for the disposition of “use as is” for IR 30-4702, IR 30-4948, IR 30-4860, IR 30-5314, IR 30-5440, IR 30-4649 and NCR 2539. Specifically, the disposition lacked the basis for why the discrepancy did not impact form, fit, or function.
3. Namco failed to evaluate how the disposition in IRs and NCRs may affect the acceptance of the sample and lot in its entirety when the selected sampling plans stated in the DIRs only allows one piece to be rejected.
4. Namco failed to provide objective evidence for rework instructions, rework inspections, sort results, sort re-inspections, and return to vendor or scrap results as required per Procedure NSP 60-0004 for IRs and NCRs dispositioned as “re-work” or “sort.”

This issue has been identified as Nonconformance 99901470/2016-202-02.

- C. Criterion XVI, “Corrective Action,” of Appendix B, to 10 CFR Part 50, states, in part, that “Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and

non-conformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition.”

Namco Quality Manual, Revision N, dated January 15, 2009, Section XVI, “Corrective Action”, Step 2.1 states, “Conditions adverse to quality, such as supplier product or system nonconformities, and internal product or system non conformities, shall be promptly identified and corrected. Conditions significantly adverse to quality shall be documented on a Corrective Action Request (CAR) and processed in accordance with documented procedures.” Step 2.1.1 states, in part, that steps to prevent recurrence should be identified and there should be verification that the corrective action has been implemented.”

Contrary to the above, NAMCO failed to provide measures to assure significant conditions adverse to quality were promptly corrected in order to preclude repetition. Specifically, the NRC Inspection team identified the following examples where Namco opened and closed CARs but the corrective actions were ineffective to correct the significant condition adverse to quality and did not adequately verify implementation.

1. Namco provided conflicting close out disposition information on inspection reports and nonconformances as the identified in CAR 14-0011, which was closed on December 31, 2014. The NRC inspection team identified that NCR 2681, dated July 1, 2016, and NCR 2539, dated April 23, 2015, provided conflicting close-out information, where both nonconformance reports dispositioned the discrepant material “use as is” but also marked “Part Reject” in the header of NCR form. In IR 30-5139 (EH160-03097), dated January 15, 2015, the Material Review Board circled “Return to Vendor” and “Use-as-Is (with justification)” simultaneously without a technical justification.
2. Namco failed to correct CAPA 15-171, closed November 30, 2015, for Contact Block EA181-60010. CAPA 15-171 corrective actions required a revision to work instructions to include a pressure setting for contact blocks EA181-60010. After discussions regarding the pressure setting with Namco quality inspectors, the NRC inspection team identified that Namco had not updated the work instructions.
3. Namco failed to adequately correct CAPA/NCR Ref. No.: E04450 and Engineering Change Request (ECR) 4547 for incorrect dimensions to Namco contact carrier EA184-43031 drawing. The NRC inspection team identified that from June 7, 2013, to July 23, 2015, Namco opened seven IRs due to the incorrect dimensions in the drawing. The team also found the design change described in E04450 and ECR 4547 had not been entered in to the corrective action program.

This issue has been identified as Nonconformance 99901470/2016-202-03.

- D. 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.”

Section 5, "Instructions, Procedures, and Drawings," of the Namco Quality Assurance Manual (QAM) outlines Namco's system of instruction, procedures, drawings, and other documents controlling activities that affect quality. Section 5, states, in part, that, "Work Order Routing and Assembly Inspection Record (AIR) are the primary documents used to provide instruction and indicate verification and completion of applicable manufacturing operations, inspections, and tests." Namco AIRs QF-24A, Revision K, and QF-24B, Revision H, are the controlling procedures for the assembly and testing of EA170/EA180 and EA740 limit switches, respectively.

Contrary to the above, as of July 15, 2016, NAMCO failed to ensure that personnel performed activities affecting quality in accordance with documented work instructions and processing documents and failed to ensure that assembly and test procedures included appropriate quantitative acceptance criteria for determining that important activities have been satisfactorily accomplished, as illustrated in the following examples.

1. Namco failed to ensure that electrical continuity testing of EA180 limit switches was accomplished in accordance with Procedure QF-24A.
2. Namco failed to verify that the appropriate lubrication of EA180 switches was accomplished in accordance with Procedure QF-24A.
3. Namco failed to ensure that for mandatory hold points specified in its procedures, work did not proceed beyond such hold point until the required inspections were complete.
4. Namco failed to include appropriate quantitative acceptance criteria in Procedure QF-24B to determine if trip travel tests for the EA740 limit switch were satisfactorily accomplished.

This has been identified as Notice of Nonconformance 99901470-2015-202-04.

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 Assurance Vendor Inspection Branch-1, Division of Construction Inspection and Operational Programs, Office of New Reactors, within 30 days of the date of the letter transmitting this Notice of Nonconformance. This reply should be clearly marked as a "Reply to a Notice of Nonconformance" and should include for each noncompliance: (1) the reason for the noncompliance, or if contested, the basis for disputing the noncompliance; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken to avoid noncompliance; and (4) the date when your corrective action will be completed. Where good cause is shown, the NRC will consider extending the response time.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System, which is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material be withheld, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your

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

Dated this the 29th day of August 2016.

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

Docket No.: 99901470

Report No.: 99901470/2016-202

Vendor: Specialty Product Technologies – Namco Controls
2100 West Broad Street
Elizabethtown, NC 28337

Vendor Contact: Jim Borst, Quality Assurance Manager
Jim.borst@spotech.com
910-879-5845

Nuclear Industry Activity: Namco designs, manufactures, tests nuclear qualified solenoids, limit switches, position switches, proximity switches, connectors, cables and electronic and electro mechanical devices to operating nuclear plants and AP1000 plants. Namco is part of a group of core-technology companies, named Specialty Product Technologies, that have combined resources and expertise related to instrumentation and controls and is located in Elizabethtown, NC.

Inspection Dates: July 11, 2016 – July 15, 2016

Inspectors: Aixa Belen-Ojeda NRO/DCIP/QVIB-2 Team Lead
Nicholas Savwoir NRO/DCIP/QVIB-1 Lead Trainee
Jermaine Heath NRO/DCIP/QVIB-3
Shavon Edmonds NRR/DE/EEEEB

Approved by: Terry W. Jackson, Chief
Quality Assurance Vendor Inspection Branch-1
Division of Construction Inspection
and Operational Programs
Office of New Reactors

EXECUTIVE SUMMARY

Specialty Product Technologies - Namco Controls
99901470/2016-202

The U.S. Nuclear Regulatory Commission (NRC) conducted a vendor inspection to verify Namco Controls (hereafter referred to as Namco) 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," and 10 CFR Part 21, "Reporting of Defects and Noncompliance."

The vendor inspection of Namco focused on the quality assurance policies, procedures, and implementation associated with their: Part 21 program; design control and commercial-grade dedication (CGD) processes; manufacturing, inspections, testing controls; measuring and test equipment; nonconforming materials, parts, or components; and corrective actions. The inspection will also focus on in-process safety-related qualification, manufacturing, inspections, and testing at the time of the inspection.

The NRC inspection team observed component configuration, design verification activities, and changes or deviations from the original design for EA170, EA180, and EA120 limit switches. The NRC inspection team observed the CGD program, which included purchase orders, the technical evaluation process including the commercial-grade item evaluations, receipt inspection reports, certificates of compliance, quality control source inspection reports, various design drawings, and piece-part technical information. The NRC inspectors also observed Namco personnel conduct in-process inspections of EA180 limit switch subcomponents, the assembly and functional testing, and acceptance of production testing for EA180 limit switch components. The inspection team observed a contact plates batch with cracks, and reviewed its material analysis, thermal aging, and bend test results.

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

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

During the course of this inspection, the NRC inspection team implemented Inspection Procedure (IP) 43002, "Routine Inspections of Nuclear Vendors"; 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

The NRC inspection team identified NON 99901470/2016-202-01 for Namco's failure to establish adequate measures for the selection and review for suitability of application of materials and processes that are essential to the safety functions of certain structures, systems, and components and failed to establish measures that include provisions for source evaluation of subcontractors and examination of products upon delivery. Specifically, Namco failed to: 1) adequately verify the material composition critical characteristic of the contact plates during the examination or products upon delivery; and 2) document an adequate engineering

evaluation for the change in sample population identified for the control of critical characteristics when a commercial-grade survey was not conducted to verify that the supplier had lot and batch control to ensure traceability of material.

Nonconformance Control

The NRC inspection team identified NON 99901470/2016-202-02 for Namco's failure to establish measures to identify, control, document, segregate, and disposition materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation and failure to review, accepted, rejected, repaired or reworked nonconforming items in accordance with documented procedures. Specifically, Namco failed to: (1) document the use of NCRs and provide differentiation from IRs in the Quality Assurance Manual and Procedure NSP 60-0004; (2) provide a technical justification for the disposition of "use as is" for a sample of IRs and NCRs; (3) evaluate how the IRs and NCRs disposition may affect the acceptance of the sample and lot in its entirety when the selected sampling plans stated in the DIRs only allows one piece being rejected; and (4) provide objective evidence for rework instructions, rework inspections, sort results, sort re-inspections and return to vendor or scrap results as required per the procedure for IRs and NCRs dispositioned as "re-work" or "sort".

Corrective Action Program

The NRC inspection team identified NON 99901470/2016-202-03 for Namco's failure to establish measures to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. Specifically, Namco failed to: (1) adequately correct conflicting close out disposition information in IRs and NCRs as the identified in CAR 14-0011, (2) implement CAPA 15-171 corrective actions to correct work instructions to add a pressure setting for contact block EA181-60010, and (3) implement design changes to a drawing stated in E04450 and ECR 4547 in order to rectify incorrect part dimensions.

Inspections and Test Control

The NRC inspection team identified NON 99901470/2016-202-04 for Namco's failure to ensure that personnel performed activities affecting quality in accordance with documented work instructions, and their failure to ensure assembly and test procedures included appropriate quantitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Specifically, Namco failed to: (1) ensure that testing of EA180 limit switches was accomplished in accordance with procedure, (2) verify the appropriate lubrication of EA180 switches was accomplished in accordance with procedures, (3) ensure that, for mandatory hold points specified in its procedures, work did not proceed beyond such hold point until the required inspections were complete; and (4) include appropriate quantitative acceptance criteria in Procedure QF-24B, "Assembly Inspection Record for EA740 Switch," Revision H, to determine if trip travel tests for the EA740 limit switch were satisfactorily accomplished.

Other Inspections Areas

The NRC inspection team determined that Namco is implementing its programs for control of special processes, control of M&TE, design control and procurement document control in accordance with the applicable regulatory requirements of Appendix B to 10 CFR Part 50. Also, Namco is implementing its Part 21 program in accordance with the regulatory requirements of 10 CFR Part 21. Based on the limited sample of documents reviewed and activities observed, the NRC inspection team also determined that Namco is implementing its policies and procedures associated with these programs and no findings of significance were identified.

REPORT DETAILS

1. Design Control and Quality Assurance Records

a. Inspection Scope

The NRC inspection team reviewed Namco's policies and implementing procedures that govern design control to verify compliance with the requirements of Criterion III, "Design Control," and Criterion XVII, "Quality Assurance Records," of Appendix B to 10 CFR Part 50. The NRC inspection team evaluated Namco's design control process which includes validation of the design's current component configuration, design verification activities, and changes or deviations from the original design. Specifically, the scope of the review was limited to the EA170, EA180, and EA120 limit switches. The NRC inspection team reviewed each type of limit switch's design test plan, qualification report, design change, and subsequent purchase orders (POs) to verify that the design control process was effectively implemented throughout the various stages of the limit switches design.

The attachment to this inspection report lists the individuals interviewed and documents reviewed by the NRC inspection team.

b. Observations and Findings

No findings of significance were identified

c. Conclusions

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

2. Commercial-Grade Dedication and Oversight of Suppliers

a. Inspection Scope

The NRC inspection team reviewed Namco's policies and implementing procedures that govern the dedication of commercial-grade items (CGIs) for use in safety-related applications to verify compliance with the applicable regulatory requirements of 10 CFR Part 21 and Criterion III, "Design Control," and Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50. Specifically, the NRC inspection team reviewed dedication packages of CGIs performed by Namco for supplying basic components to domestic utilities in order to assess the different elements of the CGD program. The scope of review included purchase orders, the technical evaluation process (including the commercial-grade item evaluations), receipt inspection reports, certificates of compliance, quality control source inspection reports, various design drawings, and relevant technical information. The NRC inspection team evaluated the criteria for the identification of an item's functions, credible failure

mechanisms, selection of critical characteristics and acceptance criteria, and the identification of verification methods to verify effective implementation of Namco's dedication process.

The NRC inspection team discussed the conduct of the CGD activities with Namco's management involved in the development of the CGD packages. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

The NRC inspection team found multiple examples where Namco failed to adequately establish and implement sampling plans to determine the suitability of CGIs during the examination of products upon delivery and failed to conduct commercial-grade surveys to verify that the suppliers had adequate lot and batch control to ensure traceability of material in accordance with 10 CFR Part 50, Appendix B, Criteria III and VII.

The NRC inspection team verified procurement and dedication activities related to the POs of contact plates, contact strips, compression springs and O-rings to be used in Namco's limit switches. Namco dedicated these items for the limit switches with a combination of Method 1, "Special Tests and Inspections," and Method 2, "Commercial Grade Survey." Namco followed Procedure NSP60-0015, "Acceptance Sampling Procedure," Revision H, dated March 16, 2009, which explains the sampling methodology used is based on ANSI/ASQC Z1.4-1993 and MIL-STD-105E, "Military Standard Sampling Procedures and Tables for Inspection Attributes."

Namco tested items during receiving inspection following a dimensional inspection record (DIR). The DIR provides the critical characteristics and the selected sampling plan. The NRC inspection team noted Procedure QCP-002, "Inspection and Dedication," Revision S, Section 8.0, "Sampling Procedures," Subsection 8.1.1, "Piece Level Parts and Subassemblies," states the specific plan chosen depends upon the type of product, method of manufacture and other relevant factors. The NRC inspection team requested the engineering basis for the selection of specific sampling plans for the EA184-73026 contact plates, EA742-12600 contact strip, EH160-03146 compression springs, and EH080-0004 O-rings.

The NRC inspection team reviewed three DIRs for EA184-73026 contact plates for the following PO numbers: 1) 70122, dated March 24, 2016; 2) 67998, dated February 22, 2016; and 3) 72248, dated April 29, 2016. Namco procured the contact plates from an approved commercial supplier. Namco had a DIR specifically for Part Number EA184-73026, and it was approved on November 28, 2012 by Engineering. The DIR had dimensions and material composition as critical characteristics for the contact plates. The DIR required the use of Special Inspection Level 1 (S-1) with acceptable quality levels (AQL) of 1.0 and 15.0 per MIL-STD-105E. The NRC inspection team noted the DIR required an S-1 AQL 1.0 for material testing, which had a sample size of 13 out of 2000 contact plates per PO. However, Namco only sent one contact plate from the three POs for material testing Criterion III, "Design Control," of Appendix B to 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 of Appendix B to 10 CFR Part 50 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, Namco failed to follow the sampling plan selected for the review of material composition as a critical characteristic during examination of products upon delivery. The NRC inspection team identified this issue as an example of NON 99901470/2016-202-01 for the failure to establish adequate measures for the selection and review for suitability of application of materials during examination of products upon delivery.

The NRC inspection noted that Namco opened CAPA 16-093 in July 2016 to verify the suppliers in the qualified supplier list as some of them maintained a conditional or approved status without been surveyed/audited or without proper documentation. While working on qualifying some suppliers, Namco wrote the Memo, “Adjusted Sampling Plans for suppliers that have not been surveyed within 36 months Method 1: Commercial Grade Dedication,” dated June 9, 2016, where it states the change from ANSI/ASQC Z1.4-1993 and MIL-STD-105E in sampling methodology described in their procedure to the EPRI TR-017218-RI sampling methodology for suppliers with an expired survey. The memo provided three different sampling plan options. The NRC inspection team noted that Namco received parts from unqualified suppliers and used the EPRI sampling methodology to verify the critical characteristics after receipt. Namco received 650 pieces of Part Number EA182-91026 (cover, bottom with countersink) of PO 70608 when its last survey was performed on May 10, 2011; and 250 pieces of Part Number EA185-93025 (internal shaft) of PO 75580 since the last survey was performed in August 28, 2007. The NRC inspection team noted that Namco did not perform and document an adequate engineering evaluation for the change in sample population identified for the control of critical characteristics when a commercial-grade survey was not conducted to verify the supplier had adequate lot and batch control to ensure traceability of material. Contrary to Criteria III and VII of Appendix B to 10 CFR Part 50, the NRC inspection team identified this issue as an example of NON 99901470/2016-202-01 for the failure to establish adequate measures for the selection and review for suitability of application of materials when objective evidence of quality furnished by the contractor or subcontractor was not provided.

c. Conclusion

The NRC inspection team identified NON 99901470/2016-202-01 for Namco’s failure to establish adequate measures for the selection and review for suitability of application of materials and processes that are essential to the safety functions of certain structures, systems, and components and failed to establish measures that include provisions for source evaluation of subcontractors and examination of products upon delivery. Specifically, Namco failed to: 1) adequately verify the material composition critical characteristic of the contact plates during the examination or products upon delivery; and 2) document an adequate engineering evaluation for the change in sample population identified for the control of critical characteristics when a commercial-grade survey was not conducted to verify that the supplier had lot and batch control to ensure traceability of material.

3. Nonconformance

a. Inspection scope

The NRC inspection team reviewed Namco's policies and implementing procedures for the nonconformance program to verify compliance with the requirements of Criterion XV, "Nonconforming Material, Parts and Components," of Appendix B to 10 CFR Part 50. The NRC inspection team discussed the nonconformance program with Namco management and technical staff and reviewed a sample nonconformance for appropriate disposition. In addition, the inspectors reviewed nonconformance reports justifications to verify appropriate disposition items.

The attachment to this inspection report lists the individuals interviewed and documents reviewed by the NRC inspection team.

b. Observations and Findings

The NRC inspection team reviewed Namco Procedure NSP 60-0004 "Processing Non-conforming Material, Parts, Components and Services," Revision N, which defines the measures to identify, document, control, and disposition nonconforming items and services. NSP 60-0004, Section 7.0, "Inspection Report Procedure" stated, in part, the inspector initiates an IR for nonconforming items. The NRC inspection team noted that Namco employees interchangeably used IRs and NCRs. Also, the NRC inspection team identified that Namco input their NCRs via "Defective Material Disposition Record" electronic form under the nuclear cell 0057 in its parent company Specialty Product Technologies nonconformance program. However, the NRC inspection team observed that NCRs are not mentioned in Namco's Quality Manual, and they are not described in procedures such as Procedure NSP 60-0004. Criterion XV, "Nonconforming Materials, Parts, or Components," of Appendix B to 10 CFR Part 50, states, in part, that nonconforming items shall be reviewed and accepted, rejected, repaired or reworked in accordance with documented procedures. The NRC inspection team identified this issue as an example of NON 99901470/2016-202-02 for the failure to review, accept, reject, repair or rework nonconforming items in accordance with a documented procedure.

The NRC inspection team reviewed the following IRs for EA184-73026 contact plates dispositioned "use as is:" IR 30-4702, IR 30-4948, IR 30-4860, IR 30-5314, and IR 30-4649. The NRC inspection team also reviewed NCR 2539 regarding EA742-12600 contact strip dispositioned "use as is." Procedure NSP60-004, Revision N, Section 6.0, "Material Review Board," Subsection 6.3 stated that For all "Use-as-is" dispositions, there must be a technical justification included in the IR form. Procedure NSP60-004, Revision N, Section 8.0, "Disposition of Discrepant Items," Subsection 8.1, "Use As-Is," states in part, for items that are nonconforming, but the discrepancy does not adversely impact the fit, form, function, or qualification per the appropriate QTR, they can be disposition as use as is." The NRC inspection team identified that Namco used this same statement as the technical justification for the disposition instead of providing a technical justification for why it does not affect the fit, form, function or qualification per the appropriate QTR. Criterion XV, "Nonconforming Materials, Parts, or Components," of Appendix B to 10 CFR Part 50, states, in part, measures shall include, as appropriate, procedures for identification, documentation, segregation, disposition, and notification to affected organizations. In this case, Namco

provided a disposition for the discrepant items, but the technical justification provided for the disposition was insufficient to provide information to affected organizations, such as quality assurance or engineering, who may need to take action even if the discrepancy was accepted for use. The NRC inspection team identified this issue as an example of NON 99901470/2016-202-02 for the failure to adequately document the disposition of nonconforming items.

In addition, the NRC inspection team noted that Namco initiates an IR when an item is found to be outside the acceptance criteria or have a nonconformance during the execution of the DIRs. Namco evaluated the following IRs for EA184-73026 contact plates: IR 30-5440, IR 30-4649, IR 30-4702, IR 30-4860, IR 30-4948. These IRs also provided a technical justification for the dispositions. The DIRs had dimensions and material composition as critical characteristics for the contact plates and a sampling plans of S-1 AQL 1.0 and 15.0 per MIL-STD-105E. The S-1 AQL 1.0 sampling plan required to sample 13 and allowed for 1 rejection. The S-1 AQL 15.0 sampling plan required to sample 5 and allowed for 3 rejections. The NRC inspection team noted that NAMCO failed to evaluate how the disposition may affect the acceptance of the sample and lot in its entirety when the selected sampling plans in their DIRs had restrictions in the pieces being rejected. Criterion XV, "Nonconforming Materials, Parts, or Components," of Appendix B to 10 CFR Part 50, states, in part, "measures shall include, as appropriate, procedures for identification, documentation, segregation, disposition, and notification to affected organizations." The NRC inspection team identified this issue as an example of NON 99901470/2016-202-02 for the failure to establish measures for the disposition of nonconforming materials, parts, or components when those items are part of a sampling plan.

The NRC inspection team reviewed the following IRs and NCRs for rework and sort:

- IR 30-4932 contact plate EA184-73027, disposition rework
- IR 30-4970 contact plate EA184-73027, disposition sort
- IR 30-5140 internal springs EH160-03097, disposition sort
- NCR 2126 housing assembly EA173-93008, disposition sort
- NCR 2127 housing assembly EA173-73004, disposition sort

Procedure NSP60-004, Revision N, Section 8.4, "Rework or Repair," states, in part, that "Inspection shall issue an Inspection Report (IR) containing repair/rework instructions and reworked or repaired items are re-inspected." Section 8.2, "Sort," states, in part, that "conforming material is separated from discrepant material; sorted material is re-inspected and nonconforming items which cannot be returned to specification are scrapped or returned to the vendor." IR 30-4932 reviewed a non-conformance for contact plate EA184-73027. Namco dispositioned IR 30-4932 to rework, if possible, and if they cannot, to scrap. IR 30-4932 did not reference rework instructions, provide objective evidence rework was performed, or ensure rework was re-inspected per Namco's documented procedures. The NRC inspection team determined that the IRs and NCRs did not include objective evidence for rework instructions, rework inspections, sort results, sort re-inspections and return to vendor or scrap results as required per the procedure. Criterion XV, "Nonconforming Materials, Parts, or Components," of Appendix B to 10 CFR Part 50, states, in part, nonconforming items shall be reviewed and accepted, rejected, repaired or reworked in accordance with documented procedures. The NRC inspection team identified this issue as an example of

NON 99901470/2016-202-02 for the failure to review, accept, reject, repair or rework nonconforming items in accordance with a documented procedure.

c. Conclusion

The NRC inspection team identified NON 99901470/2016-202-02 for Namco's failure to establish measures to identify, control, document, segregate, and disposition materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation and failure to review, accepted, rejected, repaired or reworked nonconforming items in accordance with documented procedures. Specifically, Namco failed to: (1) document the use of NCRs and provide differentiation from IRs in the Quality Assurance Manual and Procedure NSP 60-0004; (2) provide a technical justification for the disposition of "use as is" for a sample of IRs and NCRs;(3) evaluate how the IRs and NCRs disposition may affect the acceptance of the sample and lot in its entirety when the selected sampling plans stated in the DIRs only allows one piece being rejected; and (4) provide objective evidence for rework instructions, rework inspections, sort results, sort re-inspections and return to vendor or scrap results as required per the procedure for IRs and NCRs dispositioned as "re-work" or "sort".

4. Corrective Action Program (CAP)

a. Inspection Scope

The NRC inspection team reviewed Namco's policies and implementing procedures for the CAP to verify compliance with the requirements of Criterion XVI, "Corrective Action," in Appendix B to 10 CFR Part 50. The NRC inspection team verified that the corrective action process screened for Part 21 reporting. The NRC inspection team reviewed in detail Corrective Action Reports (CARs) from 2014 and 2016 to verify Namco had implemented their corrective action process by evaluating that conditions adverse to quality were promptly identified, corrected and screened for Part 21 reporting, and that the dispositions appeared appropriate. The NRC inspection team discussed the CAP with Namco's management and technical staff.

The attachment to this inspection report lists the individuals interviewed and documents reviewed by the NRC inspection team.

b. Observations and Findings

The NRC inspection team reviewed CAR 14-0011 which was closed on December 31, 2014. CAR 14-0011 stated, in part, the disposition in NCR 1880 contained conflicting closeout information. Namco's engineering staff accepted a reading, while the associated IR-30-4565 stated to "reject" and "return to the vendor." CAR 14-0011 noted that Namco failed to provide measures to distinguish whether the identified dispositions were effectively implemented in order to close out non-conformances and inspection reports. The NRC inspection team identified that CAR 14-0011 did not include effective corrective actions to address the inadvertent use

of conflicting dispositions in IRs and NCRs. Subsequently, the NRC inspection team found the following three examples of NCRs containing conflicting disposition information.

- NCR 2681 was opened July 1, 2015, to address a discrepancy regarding compression springs (EH160-03297) dimensional specifications. Namco dispositioned the discrepancy to “use as is” and “sort.” However, the header of NCR form indicated “Part Rejected.”
- NCR 2539 was opened April 23, 2015, for stationary contact strips (EA742-12600) not meeting specification dimension. Namco dispositioned the dimensional discrepancy of the stationary contact strips to “use as is.” However, the NCR form also directed to reject a quantity of 1000 to the designated supplier.
- IR 30-5139 was initiated January 15, 2015, for two spring rates of internal spring (EH160-03097) out of specification. IR 30-5139 gives a description that, “if correct, use as is.” The Material Review Board dispositioned the discrepancy as “Return to Vendor” and “Use as Is (with justification)” simultaneously.

Namco Quality Assurance Manual, Section XVI, Subsection 2.1, stated, in part, the resolution of a CAR shall include determining the cause of the condition, the corrective action taken, steps to prevent recurrence, and verification that the corrective action has been implemented. It also stated that implementation of corrective action shall be followed-up as necessary to determine the effectiveness of the actions in eliminating the identified cause. The NRC inspection team identified NCR 2681, NCR 2539 and IR 30-5139 as examples of repetitive actions providing conflicting disposition close out information on IRs and NCRs, and determined that Namco failed to take adequate corrective action to eliminate the identified cause of CAR 14-0011. Criterion XVI, “Corrective Action,” of Appendix B to 10 CFR Part 50, states, in part, that “Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. The NRC inspection team identified this issue as an example of NON 99901470/2016-202-03 for the failure to promptly identify and correct conditions adverse to quality.

The NRC inspection team reviewed CAPA 15-171 which was closed on November 30, 2015. The CAPA 15-171 problem solving failure analysis stated, “Work instructions need to call out pressure setting for the installation of contacts into the block.” The corrective action was to correct work instructions to add a pressure setting for contact block (EA181-60010). After discussions regarding the pressure setting with Namco quality inspectors, the NRC inspection team identified that Namco had not updated the work instructions as required by CAPA 15-171 corrective actions. The NRC inspection team found the work order instructions at the fabrication floor were dated August 19, 1994 on product work order Routing Number 423664 for contact block (EA 181-60010). Namco had updated the work instruction, per CAPA 15-171, on July 14, 2016, but failed to verify the effectiveness of the action taken by quality engineering. Namco Quality Assurance Manual, Section XVI, Subsection 2.1 stated, in part, that resolution of CAR shall include verification that the corrective action has been implemented. Criterion XVI, “Corrective Action,” of Appendix B, 10 CFR Part 50, states, in part, that “Measures shall be established to assure that conditions adverse to quality,

such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. The NRC inspection team identified this issue as an example of NON 99901470/2016-202-03 for the failure to promptly identify and correct conditions adverse to quality.

The NRC inspection team identified several examples of inspection reports (e.g.; IR 30-4821, IR 30-4916, IR30-4990, IR 30-5024, IR 30-5177, IR 30-5297,30-5298) indicating contact carriers (EA184-43031) are not meeting the dimensional criteria. Namco dispositioned them to “use as is.” Based on the nonconforming discrepancies, Namco identified the drawing needed to be revised to reflect the accurate dimensions in each inspection report listed above. The contact carrier, if not manufactured at the proper dimensions, would not meet the limit switch’s intended safety function. Namco issued changes per E04450, January 22, 2015, and Engineering Change Request (ECR) 4547, March 4, 2015. The NRC inspection team requested a copy of the drawing for contact carriers and the drawing still included the incorrect dimensions. Namco Quality Assurance Manual, Section XVI, Subsection 2.1, stated, in part, conditions adverse to quality, such as supplier products or system nonconformities, shall be promptly identified and corrected. The resolution of CAR shall include determining the cause of the condition, the corrective action taken, steps to prevent recurrence, and verification that the corrective action has been implemented. The implementation of corrective action shall be followed-up as necessary to determine the effectiveness of the actions in eliminating the identified cause.” The NRC inspection team determined that Namco failed to implement design changes stated in E04450 and ECR 4547. Criterion XVI, “Corrective Action,” of Appendix B, 10 CFR Part 50, states, in part, that “Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. The NRC inspection team identified this issue as an example of NON 99901470/2016-202-03 for the failure to promptly identify and correct conditions adverse to quality.

c. Conclusions

The NRC inspection team identified NON 99901470/2016-202-04 for Namco’s failure to establish measures to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. Specifically, Namco failed to (1) provide non-conflicting closeout disposition information on IRs and NCRs as the identified in CAR 14-0011, (2) implement CAPA 15-171 corrective actions to correct work instructions to add a pressure setting for a desired level of pressure to seat contacts on contact block (EA181-60010), and (3) implement design changes to a drawing stated in E04450 and ECR 4547.

5. Inspection and Test Control

a. Inspection Scope

The NRC inspection team reviewed Namco’s Inspections and Test Control policies and procedures to verify compliance with Criterion X, “Inspections,” and Criterion XI, “Test Control,” of Appendix B to 10 CFR Part 50. The inspectors observed a sample of Namco’s production specific to the manufacturing, assembly, inspection, and testing for safety-related limit switches. Specifically, the NRC inspection team observed the

conduct of in-process inspections of EA180 limit switch subcomponents, the assembly and functional testing, and acceptance of production testing for EA180 limit switch components.

The NRC inspection team discussed the conduct of the inspection and test control activities with Namco's management. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

On July 19 and July 20, 2016, the NRC inspection team observed Namco's assembly and testing of a batch of EA180-32309 snap-lock limit switches manufactured under POs #KT-16N0527041 and #KT-16N0527041.

The NRC inspection team reviewed Procedure QF-24A, "Assembly Inspection Record for EA170-180 Switch," Revision K, which is the Assembly Inspection Record (AIR) and controlling procedure for the assembly and testing of EA170/EA180 limit switch. Procedure QF-24A required a 100 percent verification of electrical continuity for each limit switch. The continuity test requires measurement and recording of the limit switch travel (angle). During observation of the EA180 limit switch assembly, the NRC inspection team observed a nuclear assembler and quality inspector sign off on the electrical continuity test and record the test data for an EA180 limit switch prior to the test being performed. Criterion V, "Instructions, Procedures, and Drawings," of Appendix B to 10 CFR Part 50, states, in part, that "activities affecting quality shall be accomplished in accordance with these instructions, procedures, or drawings." The NRC inspection team identified this issue as an example of NON 99901470/2016-202-04 for Namco's failure to ensure that testing of the limit switch was accomplished in accordance with the QF-24A procedure.

Procedure QF-24A included the implementing instructions for the lubrication of important limit switch components. The procedure specified the type of grease, oil, and thread locker with associated lot numbers to ensure traceability. During observation of the limit switch assembly, the NRC inspection team observed a quality inspector signed off for Synthetic Oil EH310-00008 where the lot number used during assembly did not match the lot number of the oil documented and signed for in the procedure. Namco later determined that the oil used during the switch assembly was acceptable for use. Criterion V, "Instructions, Procedures, and Drawings," of Appendix B to 10 CFR Part 50, states, in part, that "activities affecting quality shall be accomplished in accordance with these instructions, procedures, or drawings." The NRC inspection team identified this as an example of NON 99901470/2016-202-04 for Namco's failure to ensure that lubrication of EA180 switches were accomplished in accordance with Procedure QF-24A. Procedure QF-24A included several hold points where it required the completion of proper mechanical operation by the assembler and verification of the work by a quality inspector prior to assembly. During observation of the limit switch assembly, the NRC inspection team observed that Namco nuclear assembler and quality inspector proceeded to conduct the electrical contact assembly section of the AIR, bypassing a hold point, prior to completing and verifying completion of the mechanical operation test section. The NRC inspection team determined that Namco failed to ensure that work did not proceed beyond the hold point specified in the procedure until the inspection or witness activity was complete. Criterion V, "Instructions, Procedures, and Drawings," of Appendix B to 10 CFR Part 50, states, in part, that "activities affecting quality shall be

accomplished in accordance with these instructions, procedures, or drawings.” The NRC inspection team identified this as an example of NON 99901470/2016-202-05 for Namco’s failure to ensure that, for mandatory hold points specified in its procedures, work does not proceed beyond such hold points until the required inspections are complete.

The NRC inspection team reviewed Procedure QF-24B, “Assembly Inspection Record for EA740 Switch,” Revision H, which is the AIR and controlling procedure for the assembly and testing of EA740 limit switch. The NRC inspection team noted the procedure did not include appropriate quantitative acceptance criteria to determine if travel tests for the EA740 limit switch were satisfactorily accomplished. For an EA740 limit switch test (PO 4500249182) the travel angle was recorded and accepted by the Namco quality inspector. However, the EA740 design Drawing EA740 20000, “SL Nuclear SW,” Revision U, specified an angle without a tolerance. When the NRC inspection team questioned the quality inspector on how he/she knew that the angle was acceptable, the inspector responded that he/she was unaware of the technical acceptance criteria, but instead, had been trained that the indicated angle value was the expectation. Based on the NRC inspector questions, the engineering staff demonstrated the minimum travel angle for the EA740 and tolerance, which constitutes the allowable total travel angle. This information was located in QTR 180, Revision 0, for the EA740 limit switch. The NRC inspection team determined that the EA740 AIR did not include acceptance criteria appropriate to determine the travel angle accepted by the quality inspector was satisfactory. Criterion V, “Instructions, Procedures, and Drawings,” of Appendix B to 10 CFR Part 50, states, in part, that “instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.” The NRC inspection team identified this as an example of NON 99901470/2016-202-04 for Namco’s failure to ensure that assembly and test procedures included appropriate quantitative acceptance criteria to determine if trip travel tests for the EA740 limit switch were satisfactorily accomplished.

c. Conclusions

The NRC inspection team issued NON 99901470/2016-202-04 in association with Namco’s failure to implement the regulatory requirements of Criterion V, “Instructions, Procedures, and Drawings,” of Appendix B to 10 CFR 50 for Namco’s failure to ensure that personnel performed activities affecting quality in accordance with documented work instructions and failure to ensure that assembly and test, procedures, included appropriate quantitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Specifically, Namco failed to: (1) ensure that testing of EA180 limit switches was accomplished in accordance with procedure, (2) verify that the appropriate lubrication of EA180 switches was accomplished in accordance with procedure, (3) ensure that, for mandatory hold points specified in its procedures, work does not proceed beyond such hold point until the required inspections were complete; and (4) include appropriate quantitative acceptance criteria in QF-24B procedure to determine if travel angle for the EA740 limit switch were satisfactorily accomplished.

6. Control of Special Processes

a. Inspection Scope

The NRC inspection team reviewed Namco's policies and implementing procedures that govern the control of special processes to verify compliance with the regulatory requirements of Criterion IX, "Control of Special Processes," of Appendix B to 10 CFR Part 50. Specifically, the NRC inspection team reviewed policies and procedures associated with a selection of manufacturing control and special processes for Namco safety-related limit switches to ensure proper implementation of requirements. The selection included a review of processes for painting, heat curing, and annealing. The NRC inspection team discussed the control of special processes program with Namco's management and technical 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 concluded that Namco is implementing its special processes consistent with the regulatory requirements of Criterion IX, "Special Processes," of Appendix B to 10 CFR Part 50. Based on the limited sample of activities observed and documents reviewed, the inspectors also determined that Namco is effectively implementing its policies and procedures associated with special processes program. No findings of significance were identified.

7. Control of Measuring and Test Equipment

a. Inspection Scope

The NRC inspection team reviewed Namco's policies and implementing procedures that govern the measurement and test equipment (M&TE) program to verify compliance with the requirements of Criterion XII, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50. The 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 sampling of records to ensure documentation matched the observed use of M&TE, and that M&TE was calibrated to a nationally recognized standard, and the calibration was current. The inspectors verified that Namco 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 M&TE located in assembly and test areas and M&TE storage locations 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 NRC inspection team interviewed Namco management and gauge calibration technician to assess their understanding of the requirements for M&TE. The attachment to this inspection report lists the documents reviewed by the inspectors.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The NRC inspection team determined that Namco 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 NRC inspection team determined that Namco is effectively implementing its policies and procedures associated with M&TE. No findings of significance were identified.

8. Procurement Document Control

a. Inspection Scope

The NRC inspection team reviewed Namco's policies and procedures governing the procurement document control program to verify compliance with Criterion IV, "Procurement Document Control," of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed a sample of safety-related POs initiated to its approved suppliers for the procurement of safety-related items, equipment and services supplied to the operating fleet of nuclear utilities, to verify that specific procurement requirements were met and documented correctly. The NRC inspection team verified that the POs included, as appropriate: scope of work; right of access to facilities; extension of contractual requirements to subcontractors; reporting and approving disposition of nonconformances; supplier restrictions; and reference to specific drawings, codes, and specifications. In addition, the NRC inspection team confirmed that all reviewed safety-related POs invoked the requirements of 10 CFR Part 21 and required the supplier to conduct safety-related work under its approved quality assurance program.

The NRC inspection team reviewed Namco's process for selecting and approving suppliers and service providers of safety-related components. The NRC inspection reviewed Namco's approved vendor list and selected a sample of audits for suppliers of safety-related parts and services. For the sample selected the NRC inspection verified that scheduled audits were performed using checklists and/or procedures and that the checklists and/or procedures included an audit plan, audit results, documented objective evidence, and a review by responsible management. The NRC inspection verified that the audits were performed at the frequency in accordance with Namco's procedures and quality assurance Manual. The team reviewed the disposition of audit findings for adequacy and timeliness. The NRC inspection team discussed the procurement activities with Namco's management. The attachment to this inspection report lists the individuals interviewed and documents reviewed by the NRC inspection team.

b. Observation and Findings

No findings of significance were identified.

c. Conclusions

The NRC inspection team determined that Namco is implementing its procurement document control program in accordance with the regulatory requirements of Criterion IV, "Procurement Document Control," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that Namco is effectively implementing its policies and procedures associated with procurement document control program. No findings of significance were identified.

9. 10 CFR Part 21 Program Implementation

a. Inspection Scope

The NRC inspection team reviewed Namco's policies and implementing procedures that govern Namco's 10 CFR Part 21, "Reporting of Defects and Noncompliance," program to verify compliance with the regulatory requirements. The NRC inspection team evaluated Namco's 10 CFR Part 21 procedure regarding evaluation and reporting timeframes, and 10 CFR Part 21 records retention policy. In addition, the NRC inspection team evaluated the 10 CFR Part 21 postings and a sample of Namco's PO 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 NRC inspection team also verified that Namco's nonconformance and corrective action procedures provide a link to the 10 CFR Part 21 program.

The attachment to this inspection report lists the individuals interviewed and documents reviewed by the NRC inspection team.

b. Observations and Findings

The NRC inspection team observed Namco performing a Part 21 investigation. The inspection team observed Namco detected the batch with non-conforming contact plates. The batch was put on QA hold and not used in any products. The inspection team reviewed Namco's inspections results of previous batches which did not detect non-conforming contact plates. The NRC inspection team reviewed Namco's material analysis of the non-conforming contact plates and found the material was in specification and consistent with other contact plates. The NRC inspection team reviewed Namco's results of thermal aging of the non-conforming contact plates to the end of the position switch life to see if the non-conformance would cause a failure. From Namco's results they did not see a change in the contact plates. The NRC inspection team reviewed results from Namco's bend test on the non-conforming contact plates to see if they would break at the non-conformance or the thinnest area of the plates (expected to break at the thinnest area for fully qualified contact plates). The non-conforming contact plates broke at the expected thinnest area of the plates and not at the area of non-conformance. Based on the information above, Namco determined that a Part 21 notice on switches shipped prior to the batch with the non-conforming contact plates was not necessary. Namco is finalizing their Part 21 evaluation package.

No findings of significance were identified.

c. Conclusions

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

10. Entrance and Exit Meetings

On July 11, 2016, the NRC inspection team discussed the scope of the inspection during an entrance meeting with Mr. Jim Borst, Quality Manager, and other members of Namco management and technical staff. On July 15, 2016, the NRC inspection team presented the inspection results and observations during an on-site exit meeting with Cathy Clausen, Vice President of Marketing, and other members of Namco management and technical staff.

ATTACHMENT

1. ENTRANCE/EXIT MEETING ATTENDEES

Name	Title	Affiliation	Entrance	Exit	Interviewed
Jamie W. Kean	Director of Engineering	Namco	X		X
Mike Mabee	Strategic Sourcing Manager	Namco	X		
Troy Carson	Manufacturing Engineering Tech	Namco	X	X	
Marta Rosa	Senior Quality Engineer	Namco	X	X	X
Jim Borst	Quality Assurance Manager	Namco	X	X	X
Samuel Vanderslice	Senior Quality Engineer	Namco	X	X	X
John Petty	Operations Manager	Namco	X	X	X
Troy Kloss	Senior Development Engineer	Namco	X	X	X
Cathy Clausen	Vice President of Marketing	Namco		X	
Terry Jackson	Branch Chief	NRC		X	
Aixa Belen	Reactor Operations Engineer	NRC	X	X	
Nicholas Savwoir	Reactor Operations Engineer	NRC	X	X	
Shavon Edmonds	Reactor Operations Engineer	NRC	X	X	
Jermaine Heath	Reactor Operations Engineer	NRC	X	X	

2. INSPECTION PROCEDURES USED

IP 43002, "Routine Inspections of Nuclear Vendors"

IP 43004, "Inspection of Commercial-Grade Dedication Programs"

IP 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance"

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Item Number</u>	<u>STATUS</u>	<u>TYPE</u>	<u>ITAAC</u>	<u>DESCRIPTION</u>
99901470/2016-202-01	Open	NON	N/A	App. B, Crit. III, VII
99901470/2016-202-02	Open	NON	N/A	App. B, Crit. XV
99901470/2016-202-03	Open	NON	N/A	App. B, Crit. XVI
99901470/2016-202-04	Open	NON	N/A	App. B, Crit. V

4. LIST OF ACRONYMS USED

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ADAMS	Agencywide Documents Access and Management System
AQL	acceptable quality level
CAP	corrective action program
CAR	corrective action request
CFR	Code of Federal Regulation
COC	Certificate of Conformance
CGD	commercial-grade dedication
CGI	commercial-grade item
DIR	dimensional inspection record
ECR	Engineering Change Request
IP	inspection procedure
MRB	Material Review Board
M&TE	measuring and test equipment
NCR	nonconformance report
NON	Notice of Nonconformance
NRC	Nuclear Regulatory Commission
PO	purchase order
QA	quality assurance
SPT	Specialty Product Technologies

DOCUMENTS REVIEWED

Procedures and Work Instructions

CPM-000, "Calibration Procedure," Revision AB, dated June 6, 2014

CPM-029, "Calibration Procedure Nuclear Continuity Fixtures," Revision B, dated June 13, 2014

CPM-039, "Paint Line Oven," Rev. A dated July 30, 2009

QCP-002, "Inspection and Dedication," Revision S, dated August 31, 2015

NSP10-0001, "Customer Purchase Order Entry," Revision G, dated June 2009

NSP01-0003, "Identifying and Controlling Important Features for Nuclear Products," Revision F, dated March 16, 2009

NSP20-0002, "Design Review Procedures," Revision K NSP20-0003, "Engineering Changes," Revision G

NSP20-0008, "Test lab procedure for the testing of components for use in nuclear power plants," Revision J, dated March 18, 2011

NSP 60-0004 "Processing Non-conforming Material, Parts, Components and Services," Revision N

NSP60-0005, "Qualification of Suppliers," Revision P, dated October 2014

NSP60-0006, "Guidelines for Auditing Quality Systems," Revision O, dated October 6, 2015

NSP60-0015, "Acceptance Sampling Procedure," Revision H, dated March 16, 2009

NSP60-0016, "Processing Customer Orders for Qualified Products," Revision G, dated July 2009

QCP-002, "Inspection and Dedication," Revision S, dated August 31, 2015

QCP-003, "Procedure for Independent Testing of Material, Parts, and Components," Revision K

QF-38B, "Assembly Inspection Record for EA740 limit switch (pre-wired)," Revision G

QF-38A, "Assembly Inspection EA170/EA180 limit switches (pre-wired)," Revision H

QF-24A, "Assembly Inspection Record for EA170-180 Switch," Revision K

QF-24B, "Assembly Inspection Record for EA740 Switch," Revision H

WO 423253 for Contact Carrier-Heat Cure-

WO 420427 for Contact Plate-Stress Relieved, dated June 2, 2014

WO 423244 for Contact Plate-Stress Relieved, dated March 4, 2016

WO 423649, "In-process inspection of lever shaft assembly (P/N: EA176-10119) for EA 180 limit switches," dated July, 12, 2016

WO 423666, "Contact Block Assembly NSP 60-0010" (P/N: EA181-60010) updated August 19, 1994

WO 423666, "Contact Block Assembly NSP 60-0010" (P/N: EA181-60010) updated July 14, 2016

EH400-00204, "Paint Process, Gray Epoxy", Revision C, Namco Part #: EA184-7030

EA709-80020 Heat Cure Specification, Revision A, dated November 12, 1986.

EA189-8004, Stress Relief Procedure for Copper Alloy Parts, Revision A, dated November 15, 1991

Commercial Grade Dedication Packages

PO 72248 Purchase Order dated April 26, 2016

Certificate of Conformance 179286, dated April 29, 2016 Qty 2000

NAMCO Controls Dimensional Inspection Record, dated May 11, 2016

IR 30-5440, thickness of the plates were bigger than the acceptance criteria, date opened May 17, 2016, date dispositioned as "use as is" June 10, 2016

Failure Modes and Effects Analysis Report for EA 184-73026, contact plate, dated August 8, 1984

Chemical Test Report C253602N, dated May 9, 2016

PO 67998 Purchase Order, dated February 17, 2016

Certificate of Conformance 179286, dated February 18, 2016, Qty 2000

NAMCO Controls Dimensional Inspection Record, dated April 4, 2016

Chemical Test Report C253602N, dated May 9, 2016

PO 70122 Purchase Order, dated March 22, 2016

Certificate of Conformance 179286, dated March 24, 2016, Qty 2000

NAMCO Controls Dimensional Inspection Record, dated February 23, 2016

Chemical Test Report C253602N, dated May 9, 2016

Failure Modes and Effects Analysis Report for EA742-12600, contact strip, dated August 8, 1984

PO 71095 Purchase Order, dated April 8, 2016

Certificate of Conformance 21439, dated April 27, 2016 Qty 1000

NAMCO Controls Dimensional Inspection Record, dated May 11, 2016

Chemical Test Report C25351N, dated May 9, 2016

PO 58547 Purchase Order, dated August 31, 2015

Certificate of Conformance D131KB-B, dated May 2, 2015 Qty 360

NAMCO Controls Dimensional Inspection Record, dated October 12, 2015

Chemical Test Report C225861-2N, dated December 4, 2014

PO 62315 Purchase Order dated November 2, 2015

Certificate of Conformance 1002669, dated November 13, 2015

NAMCO Controls Dimensional Inspection Record dated November 17, 2015

Failure Modes and Effects Analysis Report for EH080-0004, O-ring, dated August 8, 1984

Chemical Test Report CD254801N, dated June 1, 2016

PO 40560 Purchase Order dated October 30, 2014

Certificate of Conformance 2073021-1, dated December 8, 2014

NAMCO Controls Dimensional Inspection Record dated February 13, 2015

Chemical Test Report CD234294N, dated May 8, 2015

PO 10267 Purchase Order, dated December 3, 2013

Failure Modes and Effects Analysis Report for EH160-03146 compression spring, dated August 8, 1984

PO 13019 Purchase Order, dated January 7, 2014

NAMCO Controls Dimensional Inspection Record, dated January 20, 2014

Chemical Test Report C178766-1N, dated February 23, 2012

NAMCO Controls Dimensional Inspection Record dated, December 15, 2014

Chemical Test Report C226672N, dated December 5, 2014

Calibration Services

PO 73197 Purchase Order, calibration for switch membrane, laser micrometer, dated May 17, 2016; Certificate of Calibration 99-100756, dated May 2016

Accreditation No. 67316 Cert L16-191, expiration date May 31, 2018

PO 73470 Purchase Order for calibration of gauge, megohmmeter, chamfer, torque dial, dated May 20, 2016

Calibration Certificate 649-1603434, dated May 25, 2016

Calibration Certificate LT627-16518 for torque analyzer, dated May 25, 2016

Accreditation Certification Number 1877.01, expiration dated March 31, 2017

PO 66828 Purchase Order for calibration of gage bloke set, dated February 22, 2016

Calibration Certificate 3409710004, dated February 22, 2016

PO 62412 Purchase Order, calibration for crimper, dated November 3, 2015

PO 64572 Purchase Order, calibration for crimper, dated December 15, 2015

Accreditation Certificate 2357.20, expiration date July 31, 2016

S/N NUC-001, "Continuity fixture," dated June 13, 2016

S/N SVW3023914, "OGP Optical Comparator," dated November 5, 2015

S/N 13247421, "Digital caliper," dated October 1, 2015

S/N 427101, oven, dated June 28, 2016 (WO 1602202), May 24, 2016 (WO 1601592)

S/N 1301026, "Torque Driver," dated November 3, 2015

S/N Z40248, "Torque Driver," dated March 3, 2016

S/N 11279-1, Torque transducer, dated November 18, 2015

S/N 25030467, "Mitutoyo Digimatic microcrometer," dated November 2, 2015

Purchase Orders and Drawings

PO 03014461 from Duke Energy, for EA180 limit switches dated January 28, 2016

PO 4500249182 from Dominion Energy for EA740 limit switches dated September 16, 2015

PO 4700824992 from DTE Energy for EA740 limit switches dated December 19, 2014

PO 589711 from Flowserve Valtek for EA170 limit switches dated July 16, 2015

PO #KT-16N0527041 for EA180-32309 and EA180-31309 limit switches

PO 65622 Purchase Order for material testing services, January 6, 2016

PO 22894 Purchase Order for material testing services, April 25, 2014

PO 42870 Purchase Order for cables, December 2, 2014

PO 51708 Purchase Order for seismic testing services, May 1, 2015

PO 74178 Purchase Order for EC 298-19001, pins, June 3, 2016

PO 72353 Purchase Order for EC 298-19001, pins, April 28, 2016

PO 70782 Purchase Order for EC 298-19001, pins, April 4, 2016

PO 10378473 Purchase Order from Entergy (Waterford Unit 3) to Namco for EA 180-32302 Limit Switch, Revision 1, July 12, 2016

PO 247125 Purchase Order from Flowserve to Namco for EA 180-12309 Limit Switch, July 7, 2016

Dwg. EC299-20000, "Inspection and Assembly Specification," dated August 8, 2002

Dwg. EH080-00004, "O-Ring," dated November 8, 1994

Dwg. EH310-00010, "O-Ring Lubricant Kit," dated March 25, 1993

Dwg. EH299-20002, "Maintenance Instructions," dated September 13, 2002

Dwg. EH299-20001, "Installations Instructions of EC290 Series Receptacle and Connector Assembly," dated September 12, 2002

Dwg. EH709-40001, "Installations Instructions Pipe Fitting Adapters EH700 Series," dated September 13, 2002

Dwg. EA742-12600, "Stationary Contact Strip", dated June 6, 1992

Dwg. EA122-00009, "Spring Stop," dated April 13, 2015

Dwg. EH160-03096, "Spring Leaf," dated January 30, 2015

Dwg. EH459-20000, "Thread Sealant Kit," Revision D

Dwg. EA189-10005, "Lubrication procedure for EA 180 Series Nuclear Switches," Revision D, dated July 20, 1994

Dwg. EA189-20079, "Assembly and Test Procedure for EA180 Nuclear Switch-Westinghouse," Revision B, dated January 31, 1994

Dwg. EA749-20076, "Assembly and Test Procedure for EA740 Series Nuclear Switch," Revision A, dated August 7, 1992

Dwg. EA749-10013, "Lubrication procedure for EA 740 and EA 750 Nuclear Switches," Revision D, dated November 9, 1993

Dwg. EA740 20000, "SL Nuclear SW," Revision U, dated May 6, 1985

Dwg. EA184-43030, "Contact Carrier," Revision C, dated April 21, 2000

Dwg. EA184-73027, "Contact Plate," Revision V, dated December 15, 1991

Dwg. EA181-53030, "Contact Block & Insert," Revision D, dated November 1, 2011

Dwg. EA181-60010, "Contact Block Assembly," Revision A, dated January 13, 2000

Dwg. EA182-70039, "Contact Strip Assembly," Revision M, dated December 18, 1991

Dwg. EA186-83015, "Contact Strip-L," Revision J, dated December 17, 1991

Dwg. EA186-83025, "Contact Strip-R," Revision J, dated December 17, 1991

Dwg. EH160-03297, "Compression Spring," Revision H, dated December 30, 2015

Audit and Surveys Reports

NIAC Audit Report #14-01/NIAC 19045 for ATS, dated February 14, 2014

Qualtech NP a Curtiss Wright Flow Control Company Audit Report, dated January 23, 2015

Kinectrics Audit Report 526-5, dated February 6, 2014

Nuclear Logistic Audit Report, dated April 9, 2016

Namco Commercial Grade Survey Report of Laystrom Manufacturing Company, dated August 21, 2015

Namco Commercial Grade Survey Report # 2012-CGS-07/12 of Laystrom Manufacturing Company, dated July 20, 2012

Namco Commercial Grade Survey Report of Wyatt Seal, dated October 17, 2014

Namco Nuclear Supplier Audit Schedule - 2014 (CAR 14-008)

Inspection Reports

IR: 30-5598, 30-4948, 30-5011, 30-4970, 30-5440, 30-4649, 30-4702, 30-4860

Inspection Reports, Nonconformance Reports, Corrective Actions, and Corrective and Action Preventative Actions

IR #30-4645 Contact Plate P/N: EA184-73027, April 24, 2013

IR #30-4649 Contact Plate PN/: EA184-73026, May 1, 2013

IR #30-4664 Contact Carrier P/N: EA184-43031, May 7, 2013

IR #30-4702 Contact plate P/N: EA184-73026, September 3, 2013

IR #30-4841 Compression Spring P/N: EH160-03297, March 11, 2014

IR #30-4860 Contact plate P/N: EA184-73026, March 28, 2014

IR #30-4932 Contact plate P/N: EA184-73027, July 10, 2014

IR #30-4948 Contact plate P/N: EA184-73026, August 14, 2014

IR #30-4970 Contact plate P/N: EA184-73027, September 11, 2014

IR #30-5011 Contact Plate P/N: EA184-73027, November 3, 2014

IR #30-5027 Contact Plate P/N: EA184-73026, December 3, 2014

IR #30-5052 Compression Spring P/N: EH160-03297, December 18, 2014

IR #30-5053 Contact Plate P/N: EA184-73027, December 18, 2014
IR #30-5139 Internal Spring P/N: EH160-03097, January 15, 2015
IR #30-5140 Internal Spring P/N: EH160-03097, January 15, 2015
IR #30-5314 Contact Plate P/N: EA184-73026, August 28, 2015
IR #30-5218 Contact Strip P/N: EA742-12600, April 23, 2015
IR #30-5269 Shaft P/N: EA185-93025, June 23, 2015
IR #30-5434 Contact Plate P/N: EA184-73030, April 27, 2016
IR #30-5440 Contact plate P/N: EA184-73026, May 17, 2016
IR #30-5580 Contact Plate P/N: 184-73027, June 16, 2016
NCR #1880 Contact Plate P/N: EA742-12805, January 22, 2013
NCR #2126 House Assy P/N: EA173-93008, January 30, 2014
NCR #2127 House Finish P/N: EA173-73004, January 30, 2014
NCR #2128 House Finish P/N: EA173-73004, January 30, 2014
NCR #2539 Stationary Contact Strip P/N: EA742-12600, April 23, 2015
NCR #2656 Shaft P/N: EA185-93025, June 23, 2015
NCR #2681 Compression Spring P/N: EH160-03297, July 1, 2015
CAR 14-008 December 10, 2014
CAR 14-011 December 10, 2014
CAR 14-013 December 10, 2014
CAR 14-012 December 10, 2014
CAR14-009 December 31, 2014
CAR 14-010 December 10, 2014
CAPA 14-008
Root Cause Analysis: Thread Gage Serial#THP-5A, May 8, 2012
Root Cause Analysis: Ring Gages THR-5C and THR-26A, February 10, 2012
Root Cause Analysis: CAR 1-031 Torque Wrench, October 25, 2011

CAPA 15-171 P/N: 181-60010; Contact Block Assembly; October 30, 2015

CAPA 15-177 P/N: N/A; Description: Pin Press Operation; November 16, 2016

CAPA 16-087 P/N: Various; Description: Various June 22, 2016

CAPA 16-092

CAPA 16-093

CAPA 16-094

CAPA 16-095

Engineering Reports and Change Notices

Dimensional Inspection Report (DIR) EH080-00004 – “O-Ring”, dated July 7, 2009

DIR EA745-21630 – “Contact Block,” dated September 9, 2015

DIR EA742-12600 – “Stationary Contact Strip,” dated April 21, 2015

ECR E05251 – “Updates to FMEA for both EA180 and 170 LP11039-1,” dated July 14, 2016

ECR E04703 – “Tooling is worn for part number EA742-12600/EA742-12600C,” dated May 20, 2015

ECR E05166 – “Update drawing to match changes that were implemented during qualification build,” dated April 18, 2016

ECR E05037 – “EA122-00009,” dated December 17, 2015

ECR E04978 – “Deviation Form,” dated October 30, 2015

ECR E04838 – “Update the BOM for wired switches to call for the correct amount of DOW 734 RTV sealant,” dated August 6, 2015

ECR E05108 – “Deviation Form,” dated February 29, 2016

PEI-TR-880701-04, “Test Report for Nuclear Environmental Qualification of Patel ½-inch Electrical Connector,” dated March 24, 1989

EA189-90100, “Baseline Control Procedures EA180 Series Nuclear Switches”, dated August 4, 1987

EA129-90100, “Baseline Control Procedures EA120 Series Nuclear Switches”, dated July 6, 2016

QTR155, “Generic Qualification of EA180-Series limit switches for use in Nuclear power plant class IE applications in compliance with IEEE Standards 323-1974, 382-1972, and 344-1975,” dated 1984

QTR155, "Requalification to support the change of contact block, contact carrier, and internal lever material and an alternate lubricant," Revision 2, dated October 1999

QTP215, "Test Plan for the Generic Qualification of Series EA180 and EA170 switches for use in nuclear power plant class 1E applications in compliance with IEEE standards 323-1974, 382-1972, and 344-1975," dated 1984

QTR 300, "Qualification of NAMCO EA120-series with flying leads and EA120-series limit switches with EC390-series connector/cable assemblies for use in nuclear power plants in compliance with IEEE standards," Revision 1, dated April 2015

QTR159, "Generic Qualification of EA170-XX302 Series limit switches for use in Nuclear power plant class 1E applications in compliance with IEEE Standards 323-1974, 382-1972, and 344-1975; for outside containment, non-harsh environment, only," Revision 2, dated December 1999

Miscellaneous Documents

"Adjusted Sampling Plans for Suppliers that Have not been surveyed within 36 months: Method 1: Commercial Grade Dedication," dated June 9, 2016

IEEE 323, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Systems," dated 1974

IEEE 344, "IEEE Recommended Practices for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations," dated 1975

IEEE 382, "IEEE Standard for Qualification of Safety-Related Valve Actuators," dated 1980

Regulatory Guide 1.89, "Environmental Qualification of Certain Electrical Equipment Important to Safety for Nuclear Power Plants," dated June 1984