U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

June 10, 2024

REPLY TO A NOTICE OF NONCONFORMANCE

Please see the attached Reply to a Notice of Nonconformance for the following:

Nonconformance 99902123/2024-201-01
Nonconformance 99902123/2024-201-02

Sincerely,

Megan Strong

Megan Strong
Quality Manager

IE09
NRR

Reply to a Notice of Nonconformance 99902123/2024-201-01

Reason for Nonconformance (see reasons in each detailed section):

The commercial grade dedication process requires that we at TE perform both non-destructive measurements/tests as well as destructive measurements/tests. The number of samples chosen for each of these tests is defined in TE procedure EP/02 which is based on sampling plan guidelines from EPRI TR-017218-R1 document.

The Internal TE procedure that instructs the use of the sampling plan, EP-02, justifies the use of the EPRI document by citing in the notes that the

> For all lot sizes: Accept on 0 (zero) defects and reject on 1 (or more) defects.
>
> 1. The sampling plans are based on TR-017218-R1
> 2. Sampling criteria are as follows: "Sampling size - Accept/reject" quantities. "0/1 – Accept/ Reject" quantities.
> 3. 'Normal Plan' shall be selected for sample size of parts and kits (inspection and dedication) based on control of compound formulation, intercompany manufacturing (shares same quality manual) and satisfactory results of the supplier audits and survey.
> 4. If an item has failed two out of the last three inspections, use Tightened Plan.

While it is true that EP/02 states that the Normal plan shall be selected "...based on control of compound formulation, intercompany manufacturing (shares same quality manual) and satisfactory results of the supplier audits and survey.", Note 3 in our procedure EP/02 above, omits the usual considerations as suggested in section 2.4.2 *Sampling Plan Selection Factors* from the EPRI TR-017218-R1 even though Note 1 of EP/02 states that "the sampling plans are based on TR-017218-R1" ; this same document. Additionally, when the revision of the EP/02 sampling plan was made and "note 3" was added, the creator of the revision did not consider all of the items that were subject to the sampling plan especially those items where the supplier was not intended nor required to be surveyed. This revised "note 3" replaced the allowance of the "reduced sampling plan" and a prior revision actually used a MIL spec standard that also required a reduced number of samples compared to the current "Normal Plan".

The NRC inspection nonconformance specifically states that TEC has not performed a commercial grade survey of the supplier of spring clamps, ground braid, grease and insulation covers (BCIC) to establish adequate homogeneity and traceability controls to support the selected sampling plan.

The items identified above have been offered as "commercial grade" non-safety related for many years in non-nuclear applications. The spring clamps, ground braid, and grease items are generally considered commodity "off-the-shelf" items that have not been formulated or designed specifically for the application but were simply selected to perform the function that was needed. For some

Commercial grade items, there was never an intention or perceived need to survey the supplier because reasonable assurance that the commercial grade item being used as a basic component would perform its intended safety function was provided through the acceptance criteria with the identified critical characteristics.

The non-conformance also applies to items (not listed above) that do require, by TE procedure, a commercial grade survey. The overall corrective action to address this non-conformance will also include a review and an update/improvement of the dedication procedure documents; including the product requirements, the dedication plan, the nuclear suppliers list, the audit schedules and the technical evaluation documents as needed to clarify any requirement for appropriate source evaluations.

EPPA-100 roll spring:

Originally used in non-nuclear applications, when the spring was selected for the purpose, it was selected to be used over a range or diameters and with an "application margin" that would provide more than reasonable assurance or confidence that it could successfully perform the function needed. The function of the spring clamp is to secure the ground braid to the shield of a MV cable termination. Testing confirmed the performance of the selection. These same configurations and springs have been used in nuclear applications since 1980. These springs have been purchased from suppliers based on readily available, standard, off-the-shelf selections of springs. The critical characteristics that are verified include dimensional checks for length, diameter (as relaxed/delivered), width, as well as material composition. Spring manufacturers that make this type of spring have limited materials from which to choose and standard catalog selections for dimensions. When the decision of material selection was made, it was documented that essentially, any "spring material" could be used, but 301 Stainless Steel was selected due to cost and availability along with corrosion resistance. Although the failure mode of corrosion is identified in the technical evaluation, the likelihood of corrosion is minimized because these springs are sealed from a moisture environment in the application. since the original selection of the springs, there have been two manufacturers. Neither manufacturer or supplier of these springs has ever been surveyed due to nature of the item and the homogeneity of the manufacturing process, there is no record that any dedication or inspection has ever identified one spring "different" than the others selected, and the fact that TE has no record of receiving, or shipping, incorrect or defective springs, supports the use of the normal sampling plan.

The cause of this non-conformance is: When the revision of the EP/02 sampling plan was made, "note 3" was added. The creator of the revision did not consider all of the items that were subject to the sampling plan, such as those items where the supplier was not intended to be surveyed. It was not the intention of note 3, that ALL suppliers would be surveyed, in order to apply the normal sampling plan. This is not in conflict with the guidance within the EPRI TR-017218-R1 particularly considering the complexity (or simplicity) of the item, the correlation of the destructive and non-destructive tests, the historical evidence of homogeneity, and the acceptance method chosen for

each critical characteristic. (Supplier is not supplying any objective evidence or data used for dedication acceptance.)

The corrective action is: To revise the procedure(s) to reflect and justify the sampling plan selected for each Commercial Dedicated Item.

GCA-Grounding braid:

The ground braid is sourced from a small supplier that has a long, 40-year relationship with TE, although they have only been the supplier of the braids for about ten years. The process and equipment used for supplying the solder blocked braids was originally set-up by TE at another supplier but was transferred to the current supplier. The actual braided material is supplied by international wire, (or by Vicksburg Inc, now owned by International Wire) and has been since the mid 1980's. The braided material is purchased from a standard product offering of tin-plated copper braided conductor of an equivalent AWG cross section area. The weave construction is specified and verified as a critical characteristic during dedication (although other weave constructions would function without any issues). The braided material is purchased on large spools and cut to length which provides expectations that the lot would have sufficient homogeneity and therefore a randomly selected sample would represent the whole. The braids selected for commercial grade dedication are checked for weave construction (AWG equivalence), material composition, dimensions of solder block size and placement as well as a PH test to ensure that the braids were washed adequately after soldering.

The cause of this non-conformance is: When the revision of the EP/02 sampling plan was made, "note 3" was added. The creator of the revision did not consider all of the items that were subject to the sampling plan, such as those items where the supplier was not intended to be surveyed. It was not the intention of note 3, that ALL suppliers would be surveyed, in order to apply the normal sampling plan. This supplier nor the manufacturer of the braided conductor is an audited or surveyed supplier. This is not in conflict with the guidance within the EPRI TR-017218-R1 particularly considering, 1) the complexity (or simplicity) of the item, 2) the fact that the method and equipment used for the soldering process was created by TE, 3) the correlation of the destructive and non-destructive tests, 4) the safety significance of this critical characteristics are low, 5) the close and historical relationship between TE and this supplier, and 6) the acceptance method chosen for each critical characteristic. (The supplier is not supplying any objective evidence or data used for dedication acceptance.)

The corrective action is: To revise the procedure(s) to reflect and justify the sampling plan selected for each Commercial Dedicated Item.

EPPA-109 Grease

The grease that is supplied is a silicone-based lubricant whose sole purpose is to fill any air gaps that are created at the end of the semi-conductor layer cutback during cable preparation. The air gap can promote a stress concentration that creates partial discharge issues. This is particularly important at system voltages above 25kV. Electrically, the permittivity of any trapped air is about

1.0 . The relative permittivity of the EPR insulation ranges from 2.5 to 3.0, and therefore the E-field stress is not linear across the region. By adding the silicone grease with a relative permittivity of about 2.7, this creates a more evenly distributed electrical stress field in the area of the cutback, therefore improving the partial discharge. Also, the dielectric strength of the air is improved when the silicone grease is applied in the region. This also adds to the overall reliability of the termination. The installer is instructed to "apply a small bead at the end of the semi-conductor layer cutback..." using the grease that is supplied with the termination kit. A trained installer would understand the placement and the amount of grease that is expected. One of the critical characteristics that are verified during dedication is the amount of grease that is supplied in the ampule or packet. The most important possible "failure" that could occur is that if there were no grease supplied (for example, the packet was empty or grossly underfilled). If this were the case, the installer would know that there was not enough grease to create the bead and the installer would notify as appropriate.

Lot formation for sampling is related to lot homogeneity. Homogeneity is achieved by the way these packets are filled from a large volume container that is purchased from a single manufacturer.

Neither the manufacturer (DOW) nor the packager of the grease has ever been surveyed due to nature of the item and the homogeneity of the manufacturing process. Although in 2022, there was one instance where the incorrect grease was selected for dedication, the FTIR, which validates the LOT or Batch to be the correct grease, provided clear evidence with an incorrect spectrum for the expected result, the sample size was never brought into question because ALL of the packets were made from the same grease.

Also in 2011 it was discovered during the dedication acceptance that there were some packets that were slightly under-filled. This batch was sorted 100 percent by weight. Again, the installer would know whether the installation instructions could be followed based on the amount of grease that is supplied. There have been no issues discovered or reported from the installers about the volume of grease supplied. The safety significance of this critical characteristic is very low.

The cause of this non-conformance is: When the revision of the EP/02 sampling plan was made, "note 3" was added. The creator of the revision did not consider all of the items that were subject to the sampling plan, such as those items where the supplier was not intended to be surveyed. It was not the intention of note 3, that ALL suppliers would be surveyed, in order to apply the normal sampling plan. This is not in conflict with the guidance within the EPRI TR-017218-R1 particularly considering the, safety significance of the critical characteristic and the item, the historical evidence of homogeneity, and the acceptance method chosen for each critical characteristic. (supplier is not supplying any objective evidence or data used for dedication acceptance.)

The corrective action is: To revise the procedure(s) to reflect and justify the sampling plan selected for each Commercial Dedicated Item.

Buss Bar Insulating Covers

The BCIC Covers are designed to cover busbars within switchgear. They provide secondary insulation and protection from incidental contact by covering the non-insulated areas of buss bar connections. The parts are made from a sheet of insulating BCIS material and thermoformed in a vacuum process to a particular designed application shape which is defined by the customer.

It was noticed during the NRC inspection that the manufacturer that formed these covers, Custom Plastics Inc., were not on the approved nuclear suppliers list, and they had never been surveyed or audited.

This particular supplier was chosen due to an urgent need for a nuclear plant to have parts made and delivered with a relatively short lead time. The BCIS material was supplied directly from TE in Fuquay Varina and there is no other material in the supplier facility that could be used to fabricate these parts. The customer was also aware that this was a new vendor and a new design. It was anticipated that these parts would be needed quickly but not again for several years. As such, the vendor was not properly "treated" as though there would be subsequent orders. The design/engineering group worked closely with the customer, and the fabricating supplier as the parts were made. This interaction was instrumental in making some minor design changes in the part. The commercial grade dedication acceptance methods did not include any data or input from the fabricator and both lots/batches were 100 percent visually inspected. The recorded dimensional measurements only included the minimum required for the normal sampling plan although many more measurement s were made.

The cause of this non-conformance is: When the vendor was chosen for thermoforming these parts, the procurement/purchasing function did not properly follow the proper process for vendor selection. Even though there was close cooperative interaction between TE and the fabricator, there should have been a more thoroughly documented justification for this selection, and a vendor survey should have taken place prior to the fabrication of the parts.

The corrective action is: To revise the procedure(s) to reflect and justify the sampling plan selected for each Commercial Dedicated Item. This includes the commercial grade survey of the fabricator or supplier of these parts. It may also be decided to fabricate these parts "in-house" under TE's quality system.

Corrective Action Steps Taken and Results Achieved:

- Full review of EP/02 as it relates to EPRI TR-017218-R1.
    - Indicate disconnects between the procedure and EPRI guidelines.
    - Learned of unintended consequences of a revision of EP/02.

Corrective Action Steps that Will be Taken & Dates Actions Will be Completed:

- Revise the procedure(s) to reflect and justify the sampling plan selected for each Commercial Dedicated Item. Due Date: July 19, 2024
- Revise the procedure(s) to reflect and justify the sampling plan selected for each Commercial Dedicated Item. This includes the commercial grade survey of the fabricator or supplier of these parts. It may also be decided to fabricate these parts "in-house" under TE's quality system. Due Date: July 19, 2024

Reply to a Notice of Nonconformance 99902123/2024-201-02

Reason for Nonconformance:

Current corrective action process and system was developed to be used primarily in an ISO 9001 application and as such has not met the needs for nuclear requirements. This system did not adequately address the identification of Conditions Adverse to Quality, Significant Conditions Adverse to Quality or potential Part 21s and relied on the user to manually insert information to identify this had been done. Additionally, the system does not have any type of tracking system to keep track of all the open corrective actions and the manual review of all of these actions was not properly managed. Additionally, due dates were set at intervals that were thought to be acceptable based on the severity of the finding and the resources available to resolve the findings. Some of these findings had extended dates because they were tied to larger projects.

Corrective Action Steps Taken and Results Achieved:

- Developed corrective action form specifically for nuclear to ensure conditions adverse to quality and significant conditions adverse to quality can be clearly identified. This document will serve as a supplement to the TECHs system which does not adequately address these issues.
    - Removes the task of manually entering the information into the TECHs system which can be forgotten since there is no location on the form to indicate this information.
    - Provides clear evidence that consideration has been given to addressing CAQ vs SCAQ and a determination if the finding is a reportable Part 21.
    - Ensures that there is an effectiveness review of the implemented actions that must be recorded on the form.
- Created tracking sheet for all nuclear audit findings that is tied to the nuclear corrective action form action items.
    - Provides a method for tracking all findings in one spreadsheet instead of having to open each nuclear corrective action form.
    - Provides a method for tracking Action Plan Generation, Action Plan Implementation, and Effectiveness Review of Implemented Actions.
    - Uses conditional formatting to identify when actions are past due so the spreadsheet can be used as an escalation tool.

Corrective Action Steps that Will be Taken & Dates Actions Will be Completed:

- Complete procedure that documents the use of the nuclear corrective action form and the tracking spreadsheet. Due Date: July 19, 2024
- Review all existing action items and assign reasonable due dates for completion. Due Date: July 19, 2024