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TALEN ENERGY

AUG 17 2017

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

10 CFR 21

SUSQUEHANNA STEAM ELECTRIC STATION
10 CFR 21 NOTIFICATION
UNIT 1 LICENSE NO. NPF-14
UNIT 2 LICENSE NO. NPF-22
PLA-7629

Docket No. 50-387
50-388

Reference: *Talen Letter (PLA-7613), Susquehanna Steam Electric Station, Interim Report of Deviation, dated June 9, 2017.*

In the reference cited above, Susquehanna Nuclear, LLC (Susquehanna) submitted an interim report pursuant to 10 CFR 21.21(a)(2) that provided information regarding an evaluation of a deviation associated with an Eaton/Cutler Hammer A200 series starter manufactured in 2014. The condition was subsequently determined to create the possibility of a substantial safety hazard and was reported on July 21, 2017 via EN 52867. In accordance with 10 CFR 21.21(d)(3)(ii) and 10 CFR 21.21(d)(4), Susquehanna is providing the final report which is provided in the attachment to this letter.

This letter contains no new regulatory commitments.

If you have any questions or require additional information, please contact Mr. Jason Jennings, Manager of Nuclear Regulatory Affairs, at (570) 542-3155.

Sincerely,

B. Berryman

Attachment: 10 CFR 21 Report

Copy: NRC Region I
Ms. T. E. Hood, NRC Project Manager
Ms. L. H. Micewski, NRC Sr. Resident Inspector
Mr. M. Shields, PA DEP/BRP

Attachment to PLA-7629
10 CFR 21 Report

10 CFR Part 21 Notification

The following provides the information required by 10 CFR 21.21(d)(4):

i) Name and address of the individual or individuals informing the Commission.

Brad Berryman
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ii) Identification of the facility, the activity, or the basic component supplied for such facility or such activity within the United States which fails to comply or contains a defect.

Facility:
Susquehanna Steam Electric Station
769 Salem Boulevard
Berwick, PA 18603

Component: Eaton/Cutler Hammer A200 series contactor (motor starter) - Size 1

iii) Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains a defect.

Supplier:
AZZ Nuclear / NLI
7410 Pebble Drive
Fort Worth, TX 76118

iv) Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.

The condition is a defect in an Eaton/Cutler Hammer A200 series starter that failed while in service at Susquehanna Steam Electric Station. The failed starter was manufactured by Eaton Corporation in 2014 and purchased by Susquehanna from AZZ/NLI as part of an MCC bucket assembly. The starter failed with its contacts stuck in the energized state when it was de-energized. A failure analysis, performed by Exelon PowerLabs, identified the contactor sticking to be due to the pole faces of the coil laminations and those of the armature laminations adhering to one another at normal operating temperatures. There was residue/material on the pole faces which closely matched Polydimethylsiloxane (PDMS) and silicone grease. Exelon PowerLabs stated, "One of the characteristics of PDMS is that at cooler temperatures it is more of a solid consistency, and at higher temperatures it becomes more viscous and tacky." The Exelon PowerLabs report concluded that the presence of the PDMS on the pole face surfaces was not due to contamination, but rather either over-application or migration of the material from the inner areas of the laminations.

A previous Part 21 report submitted by Curtiss-Wright QualTech NP (Event Notification Number 51611) in December 2015 provided notification of Eaton/Cutler Hammer A200 series starters failures due to silicon based mold release that remained on the molded parts and would come between the moving (magnet) and fixed armatures. The Part 21 stated that when heated for extended period of time, the material would become sticky causing anywhere from a minor delay in opening to a frozen closed condition. Eaton/Cutler Hammer determined that the silicone mold release was first introduced into the manufacturing facility in May 2008 and used periodically until October 2012. According to Eaton/Cutler Hammer, any starters manufactured after January 1, 2013 should be silicon mold release free.

Following the failure of the 2014 starter at Susquehanna, Eaton Corporation performed an investigation and reconfirmed that silicon mold release was banned from molding production in October 2012 and has not been used since that time. Eaton concluded that the contamination does not appear to be systemic, but rather random and intermittent and that the contamination was most likely introduced either by operators and assemblers on the manufacturing lines, or by others who disassemble and inspect the product after shipment from their plant. Susquehanna does not take the components apart during receipt for testing or visual inspection. Eaton concluded that there is no evidence that the issue is systemic and considers it a random event. Eaton performed testing of eight starters (seven with a 2012 date code and one with a 2014 date code). The starters were energized for one week at ambient temperature. At the end of that period, one unit (with a 2012 date code) stuck. Laboratory analysis of the failed unit confirmed the presence of silicone on the magnet surface.

The Susquehanna failed starter was associated with one of the Drywell Cooling fans. The Drywell Cooling fans are designed to run in high speed (normal operation) or low speed (post Loss of Coolant Accident (LOCA) mixing). The Drywell Cooling fans operating in low speed ensure a uniformly mixed post-accident primary containment atmosphere, thereby minimizing the potential for local hydrogen burns due to a pocket of hydrogen above the flammable concentration. With one fan failing to start and assuming failure of redundant components, the safety function could be lost. As a result, the condition could create a substantial safety hazard, and the conclusion is that the deviation is a defect reportable in accordance with 10 CFR Part 21.

v) The date on which the information of such defect or failure to comply was obtained.

Susquehanna submitted an interim Part 21 report on June 9, 2017

The assessment for Part 21 was completed on June 14, 2017, and determined that the reported deviation constituted a defect in accordance with regulatory definitions. The initial Part 21 report was made on June 21, 2017 in EN 52867.

vi) In the case of a basic component which contains a defect or fails to comply, the number and location of these components in use at, supplied for, being supplied for, or may be supplied for, manufactured, or being manufactured for one or more facilities or activities subject to the regulations in this part.

There are fifty Size 1 A200 series starters manufactured outside of the date range of the original Curtiss-Wright Part 21 that are in use at Susquehanna in various locations and

applications. None of these starters have the exact date code of the 2014 starter that failed at Susquehanna.

vii) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.

Susquehanna is addressing the original Curtiss-Wright Part 21 associated with starters manufactured from May 2008 to January 1, 2013 through scheduled replacement of the suspect components with new, more robust starters. This action is expected to be completed by May 2018.

As indicated above, the manufacturer, Eaton, has concluded that the failure of the starter from 2014 is a random event with no evidence that the issue is systematic. Outside of the January 2017 failure, no other Susquehanna starters have failed due to residue/material on the pole faces. In addition, no other starters supplied to Susquehanna had the exact date code as the failed starter. Based on this information, Susquehanna does not currently plan to replace these components on an expedited schedule as with the starters manufactured between May 2008 and January 1, 2013. If additional failures were to occur, additional corrective action would be determined at that time.

Susquehanna continues to discuss the failure with the AZZ/NLI and Eaton to resolve differences between the Eaton conclusions and the Exelon PowerLabs conclusions. If these discussions were to result in characterization of the issue that is different than the basis for the corrective action plan provided above, the corrective action plan would be re-evaluated.

viii) Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.

Not Applicable

ix) In the case of an early site permit, the entities to whom an early site permit was transferred.

Not Applicable