NEXTera® ENERGY
SEABROOK

November 17, 2016

10 CFR 21

SBK-L-16174
Docket No. 50-443

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

Seabrook Station

10 CFR Part 21 Notification

Westinghouse Life Line D Type LAC Induction Motor Model HSDP 4000V, 700hp

Pursuant to 10 CFR 21.21(d)(3)(ii), NextEra Energy Seabrook LLC, is providing written notification of the identification of a defect. This information was initially reported to the NRC Operations Center on October 20, 2016 (Event Number 52310).

The attachment to this letter provides the information required by 10 CFR 21.21(d)(4). In addition, the attachment discusses the relevance of this issue to Seabrook Station.

No commitments to the NRC are contained in this submittal.

If you have any questions regarding this submittal, please contact Mr. Kenneth Browne, Licensing Manager, at (603) 773-7932.

Sincerely,

NextEra Energy Seabrook, LLC

Eric McCartney
Site Vice President

IE19
NRR

cc: D. Dorman, NRC Region I Administrator
J. Poole, NRC Project Manager
P. Cataldo, NRC Resident Inspector

Attachment

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This notification follows the format of and addresses the considerations contained in 10 CFR 21.21(d)(4)(i)-(viii).

(i) Name and address of the individual or individuals informing the Commission:
Eric McCartney
Site Vice President
NextEra Energy Seabrook, LLC
P. O. Box 300
626 Lafayette Road
Seabrook, NH 03874

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

Facility:

Seabrook Station
626 Lafayette Road
Seabrook, NH 03874

Basic component which fails to comply or contains a defect:

Westinghouse Life Line D Type LAC Induction Motor Model HSDP 4000V, 700hp

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

The motor was manufactured and supplied by Westinghouse Electric Corporation, Buffalo, NY.

(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 basic component which is the subject of this notification is a motor for Primary Component Cooling Water (PCCW) Pumps CC-P-11-A, B, C & D. These are Westinghouse Life Line D Type LAC Induction Motor Model HSDP 4000V, 700hp, motors that are original to the plant construction.

On 7/23/2008 and 11/21/2008 the CC-P-11-D and CC-P-11-C motors failed both due to shorted windings. These motors failed in service after approximately 87,000 hours of operation. On 6/13/2015, CC-P-11-B failed due to shorted windings. This motor failed following approximately 32,000 hours of operation.

A failure analysis performed by Schultz Electric on failed CC-P-11-C and CC-P-11-D motors determined that the failure of the motor windings was

due to a short caused by localized heating. The heating was most likely caused by a turn-to-turn short circuit which led directly to the eventual failure of the entire coil to ground. Since the coil insulation was not tightly wrapped, the subsequent vacuum pressure impregnation (VPI) process was not able to fully compensate for the looseness of the coil insulation wrappings and required additional resin flow and penetration (beyond the capabilities of the VPI process at the time) resulting in less than 100% resin penetration throughout the stator insulation system (i.e., voids). The looseness of taping and lack of penetration of epoxy lead to poor thermal conductivity which resulted in localized hot spots that accelerated the degrading of insulation properties over time. Both Westinghouse motors were manufactured at the same time. The failure analysis did not contain definitive language whether the failure was a result of a manufacturing process defect or whether it was simply an artifact of the manufacturing capabilities available in the 1970s. Based on failure analysis it can be concluded that the undesirable coil quality is most likely attributable to workmanship, not motor design. Since all 4 Unit 1 motors were manufactured in the same year it is possible that they could all have been subjected to the same workmanship issues. The failure of motor insulation could cause phase-to-phase and phase-to-ground faults which ultimately would prevent motor and PCCW pump from performing their intended safety function.

A subsequent failure analysis of the 2015 CC-P-11-B motor failure performed by Westinghouse reached the conclusion that inadequate VPI resin penetration resulted in sections of the coil exhibiting ground-wall insulation voids and mica de-lamination. The presence of voids and thus air pockets thermally blocked the required heat transfer and resulted in significant increases in localized temperature. This ultimately led to the breakdown of the coil ground-wall insulation resulting in the stator fault indication.

Consequently, the identified condition appears to be a deviation from expected quality of construction and the two failures in 2008, and the additional failure in 2015 indicate that the condition is possibly applicable to all the motors manufactured in 1977 and 1978.

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

On October 13, 2016 evaluation of the failed motors was completed and the initial report was made to the NRC Operations Center on October 20, 2016 (Event Number 52310).

(vi) In the case of the a basic component which contains a defect or fails to comply, the number and location of these components in use at, 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:

Eight motors were originally procured; four motors for Unit 1 and four motors for Unit 2. All four of the original Unit 1 motors were manufactured in July 1978 and were installed at the time of the 2008 failures. Three of the four Unit 2 motors were manufactured in March 1977 with one of the four manufactured in August 1977. Currently only one of the original motors is in use.

(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:

NextEra Energy Seabrook, LLC intends to replace the remaining motors with rewound motors.

(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:

None