



Commercial HVAC
North American Parts
Carrier Parkway, TR5
Syracuse, NY 13221

March, 9, 2020

U.S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Subject: Final Report/Notification of Defect Pursuant to 10 CFR Part 21

Reference (A): Duke Energy Carolinas, LLC (Duke Energy)
McGuire Nuclear Station (MNS), Units 1 and 2
Request for Determination of 10 CFR 21 Reportability
Nuclear Condition Report (NCR) 2300622

Reference (B): Carrier 17FA999-1200-107 Oil Pump
Duke Catalog Identification Number: 157183
Duke Energy UTC Numbers: 30110654, 30078287

This Final Report supplements the Interim Report/Notification of Defect Pursuant to 10 CFR Part 21 submitted by Carrier Corporation on January 10, 2020.

Duke Energy Notice

Duke Energy via Mr. James M. Smith issued a letter to Carrier Corporation's Customer Service Organization on November 21, 2019 reporting that on November 4, 2019, a Carrier 17FA999-1200-107 Oil Pump (Duke Energy UTC Number 30110654) failed, rendering one train of the Control Room Area Chilled Water System inoperable.

A failure investigation by Duke Energy representatives determined that the oil pump, which had been in service for less than two months, had a broken shaft and failed due to improperly assembled oil pump motor assembly.

The failed oil pump and a replacement (spare) oil pump in the warehouse (Duke Energy UTC Number 30078287) both had loose fasteners and unstaked alignment pins.

Final Corrective Actions:

Carrier issued a corrective action to our supplier on April 28, 2017 to address failures with a different non-safety related oil pump (Carrier Model 17FA512-968) at a non-nuclear facility. The corrective action was applied to all 17FA oil pump assemblies supplied to Carrier after April 28, 2017, including both safety and non-safety related oil pumps. The corrective action consisted of cleaning of threaded holes and

application of red Loctite, ensuring specified torque requirements are met using a calibrated digital torque wrench, and verifying the staking operation.

Additional design modifications are being implemented, which consist of: adding an additional set screw with Nylok Patch into the motor housing to secure the stator, installing pressed in dowel pins to hold the pump cover and pump housing together, and the addition of lock tab washers with TorQ-Patch cover bolts to keep the bolts more secure.

Carrier's records indicate that four affected pumps were supplied to three nuclear facilities: the two pumps that were the subject of Duke Energy's notice; one pump supplied to Dominion Energy, Inc.; and one pump supplied to Susquehanna Nuclear, LLC. Carrier mailed letters to the three nuclear facilities on March 5, 2020, to coordinate replacement of the affected pumps. It is not known whether the pumps supplied to Dominion Energy, Inc., or Susquehanna Nuclear, LLC were improperly assembled.

10 CFR Part 21 Final Report Details

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

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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.

Duke Energy — McGuire Nuclear Station
12700 Hagers Ferry Road
Huntersville, NC 28078

Supplied Component — Carrier 17FA999-1200-107 Oil Pumps (Duke Energy UTC Numbers 30110654, 30078287)

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

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- (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

As Guide Pin peening operations were not performed correctly and Cover Bolts were not torqued down enough, the two Guide Pins and two Cover Bolts vibrated loose on the Oil Pump Assembly, resulting in failure of the pumps.

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

Carrier Customer Service was informed in writing by Duke Energy on November 21, 2019.

- (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.

Two Carrier 17FA999-1200-107 Oil Pumps (Duke Energy UTC Numbers 30110654, 30078287) were supplied to the McGuire Nuclear Station.

One pump was supplied to Dominion Energy, Inc. and one pump was supplied to Susquehanna Nuclear, LLC. It is not known whether these pumps were improperly assembled.

- (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.

Carrier mailed letters to Duke Energy, Dominion Energy, Inc., and Susquehanna Nuclear, LLC, on March 5, 2020, offering to replace the four affected oil pumps at Carrier's expense. Corrective action and process improvements are in place with Carrier's supplier.

- (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.

Carrier has determined that no additional affected oil pumps, beyond the four identified herein, were supplied to other nuclear facilities.

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

N/A

Carrier considers this to be its final report to the U.S. Nuclear Regulatory Commission. If you should have any questions regarding this matter, please contact the undersigned.



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