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February 9, 2011

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287
10 CFR 21 Notification - Identification of Defect
Problem Investigation Process No.: O-10-08030

Gentlemen:


Pursuant to 10 CFR 21.21(d)(3)(ii), Duke Energy Carolinas, LLC (Duke Energy) is providing the required written notification of the identification of a defect. This information was initially reported to the NRC Operation Center on January 19, 2011. The NRC assigned event number 46554 to this notification.

The attachment to this letter provides the information requested by 10CFR 21.21(d)(4). In addition, the attachment discusses the relevance of this issue to Duke Energy's Oconee Nuclear Station (ONS). There are no commitments contained in this letter or its attachment.

Should you have any questions or require additional information, please contact Kent Alter, ONS Regulatory Compliance, at (864) 873-3255.

This issue is considered to be of no significance with respect to the health and safety of the public.

Sincerely,


T. Preston Gillespie, Jr., Vice President
Oconee Nuclear Station

Attachment

JE19
MRR

Document Control Desk

Date: February 9, 2011

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cc: Mr. Victor McCree
Administrator, Region II
U.S. Nuclear Regulatory Commission
Marquis One Tower
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, GA 30303-1257

Mr. John Stang
Project Manager
U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

Mr. Andrew Sabisch
NRC Senior Resident Inspector
Oconee Nuclear Station

Robert Paton, VP of Quality Assurance
Energy Steel & Supply Company
3123 John Conley Drive
Lapeer, Michigan 48446-2987

Attachment

Notification per 10 CFR 21.21 (d)(3)(ii)

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.

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Vice President
Oconee Nuclear Station
7800 Rochester Highway
Seneca, Sc, 29672

(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:

Duke Energy Carolinas, LLC (Duke Energy)
Oconee Nuclear Station (ONS)
7800 Rochester Highway
Seneca, Sc, 29672

Basic component which fails to comply or contains a defect:

Heat exchanger intended for use as a RCS Letdown Cooler
supplied by Energy Steel Supply Company (ESSC)
Catalog ID 350952,
S/N N32389-1
Purchase Order No.: DP 19279 - (NAS - PO #51554) - ordered in 2006.

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

Manufactured and Supplied by (dedicating entity):

Energy Steel Supply Company (ESSC)
3123 John Conley Drive
Lapeer, Michigan 48446-2987

(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.

Nature of the defect:

On October 05, 2010, visual inspections were being performed prior to expected installation of two spare heat exchangers during the upcoming refueling outage

designated 3EOC-25. When performing these inspections, Maintenance was unable to remove the bonnet from the lower (inlet) pressure seal on one of the two coolers (cooler S/N N32389-1). An e-mail with details of the issue was sent by ONS Engineering to the cooler manufacturer, ESSC, on October 15, 2010.

On October 19, 2010, a fiberscope inspection was performed of the "back side" of the pressure seal bonnet by inserting a fiberscope thru the High Pressure Injection (HPI) inlet nozzle access. A foreign object that appeared as a u-shaped piece of thin wire, very similar to a cable staple, was seen just behind the pressure seal bonnet, laying in the bottom of the body.

The procurement specification does specifically state in Section 5.3 that "All internal wetted surfaces shall be free of metal chips, weld splatter, slag, oil, grease, dirt, scale and other foreign material. Demineralized water meeting requirements of ANSI N45.2.1-1973 shall be used for final cleaning or rinsing of cooler internals." Per discussions with the cooler manufacturer, ESSC, concerted efforts were made to clean/flush the cooler following fabrication. This u-shaped foreign material (FM) was apparently missed. It could not have been introduced by Duke Energy following receipt at the site.

Safety hazard which could be created by such defect:

The FM could have potentially created a substantial safety hazard had the spare Letdown Cooler been installed in the system. The FM was retrieved from the spare cooler on December 27, 2010, and its size and material type confirmed. The "U-shaped" material is type 304 stainless steel and appears to be a metal shaving. It is about 1-1/2" in length if the "U" was stretched out, 3/32" wide and less than 1/64" thick. Assuming that this material was not discovered during any Letdown Cooler installation activity (i.e. not seen during the pressure seal connector disassembled) and remained in the cooler, upon filling the HPI system the material would be immediately washed out of the cooler via the outlet nozzle and into the 2-1/2" diameter HPI piping (reference Oconee Flow Diagram 101A-x.1, where x = Unit 1, 2 or 3).

Once out of the cooler the material would flow into/through the HPI discharge isolation globe valve, either xHP-3 or xHP-4 (x = Unit 1, 2 or 3), depending on the cooler of origin. These valves are containment isolation valves.

The most likely scenario is that the metal shaving, fairly small and lightweight, would easily be transported in the flowstream through xHP-3 or xHP-4, which are normally open, and would continue in the HPI piping. Downstream of xHP-3 and xHP-4 is xHP-5, a ball-type control valve, also a containment isolation valve. The FM would easily pass thru the ball valve. Downstream of xHP-5 the FM would likely get trapped in either the block orifice (Letdown orifice) or in xHP-7. It is unlikely that this small amount of material would create any operational issues with either of these components. If the material did make it through the block orifice it would eventually travel to the purification demineralizers where it would be captured.

However, in the highly unlikely scenario that the xHP-3 or xHP-4 valve disc were to be cycled closed (this valve is normally in the open position all fuel cycle) with the metal shaving caught in the disc area, the valve would close but would not seat or seal tightly. The metal shaving could damage the seat ring area with a scar or mark on the seating surface area, resulting in a leakage path.

It is possible but not probable that the resultant leakage would not be acceptable with respect to containment integrity, assuming a single failure of xHP-5. Thus this FM has an extremely low potential to challenge containment integrity

Also, valves xHP-3 and xHP-4 have a design function to close to preserve Reactor Coolant System (RCS) inventory during an event which challenges the Oconee Standby Shutdown Facility (SSF). These include station blackout, fire, flood, and certain security events. The design differential pressure across these valves during such an event is ~ 2800 psid. With xHP-3 and xHP-4 closed, the positive displacement SSF RCS makeup pump (~28 gpm capacity) is able to ensure that sufficient RCS inventory is maintained. However, design margin for the SSF RCS makeup system is limited. A leakage rate greater than 1 gpm past xHP-3 or xHP-4 could reduce available margin to the point that operability is challenged.

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

October 05, 2010 - ONS Maintenance personnel were unable to remove the bonnet from the lower (inlet) pressure seal on one of the two coolers (cooler S/N N32389-1).

October 15, 2010 - ONS Engineering notified the cooler manufacturer, ESSC, of that issue.

October 19, 2010 - A fiberscope inspection of the "back side" of the pressure seal bonnet observed a foreign object (a u-shaped piece of thin wire) just behind the pressure seal bonnet.

December 27, 2010 - The FM was retrieved from the spare cooler and transferred to the Duke Energy Materials Laboratory (MatLab) for analysis.

MatLab confirmed the material to be type 304 stainless steel and appears to be a metal shaving.

January 6, 2011 - ONS Engineering concluded that in some low probability scenarios this FM could potentially damage the seating surface of the cooler outlet valve sufficiently to constitute a significant safety hazard.

January 17, 2011 - Site VP notified that issue is reportable. (Note: ONS has a four day normal work week. This was the fifth working day after the determination by Engineering.)

January 19, 2011 - Initial NRC notification by Fax/ENS. Assigned NRC Event Number 46554.

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

ONS received three HXs per the same Purchase Order. HX SN N32389-2 was placed into service on Unit 3 during Spring 2006, and no operating issues have been identified as being associated with FM similar to that seen during this event.

Another was the affected HX S/N N32389-1, which has had the FM removed, but was not installed due to the binding of the pressure seal bonnet.

HX SN N32389-3 was inspected with no FM found, was installed in lieu of S/N N32389-1, and was placed into service.

Duke Energy has no direct knowledge of any other HXs from this vendor with potential for the same problem.

(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.

Corrective actions taken or planned:

1. The observed piece of FM was removed, as described above.
2. The other spare heat exchanger at ONS was inspected and no similar FM found.
3. The supplier, ESSC, was initially notified of the issue, and was subsequently notified that this issue is being reported under Part 21 as a defect.
4. Duke Energy has the understanding that ESSC is conducting its own investigation into this issue, but Duke Energy has no direct knowledge of any details of the scope or schedule for that investigation or any additional corrective actions planned by ESSC.

Individual or organization responsible for the action:

Duke Energy has no additional planned corrective actions associated with the issue of the FM observed in this HX.

Length of time to complete the action:

All Duke Energy corrective actions associated with the issue of the FM observed in this HX are complete.

(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