Duke Energy®

T. PRESTON GILLESPIE, Jr.
Vice President
Oconee Nuclear Station

Duke Energy
ON01VP / 7800 Rochester Hwy.
Seneca, SC 29672

864-873-4478
864-873-4208 fax
T.Gillespie@duke-energy.com

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

10 CFR 21.21

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287
NRC Event Number 46375
10 CFR 21 Notifications - Identification of Defect
Mackson Inc. - Defective Tube Steel

Pursuant to 10CFR21.21(d)(3)(ii), Duke Energy Carolinas, LLC (Duke Energy) is providing a written notification of the identification of a defect in a basic component. This information was initially reported to the Nuclear Regulatory Commission (NRC) Operations Center on October 29, 2010 (Event Number 46375, ADAMS Accession Number ML 103060087). Investigations to determine the cause and extent of the problem are ongoing. Within thirty (30) days of the completion of that evaluation, Duke Energy will furnish an amended version of this letter addressing the results of the evaluation and the corrective action which has or will be taken.

The information required by 10CFR21.21(d)(4) is included as an attachment to this letter.

Please direct any questions you may have in this matter to Sandy N. Severance at (864) 873-3466.

Very truly yours,

T Gillespie

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

Attachment

IE19

cc: L. A. Reyes
Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
Marquis One Tower
Atlanta, GA 30303-1257

J. F. Stang, Jr., Project Manager (addressee only)
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Stop 8 G9A
Washington, DC 20555-0001

A. T. Sabisch
NRC Senior Resident Inspector
Oconee Nuclear Station

Mr. Tom Sharp, Director of Quality
Mackson Inc.
PO Box 12067
2346 Southway Drive
Rock Hill, SC 29730

Attachment
Oconee Nuclear Station
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.

T. Preston Gillespie
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7800 Rochester Highway
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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.

Basic component which fails to comply or contains a defect:

Tube Steel, four inch by four inch by one half inch wall thickness (4 inch x 4 inch x 1/2 inch) supplied Mackson, Inc., under Duke Energy Purchase Order number: 124917, Heat No. A010493

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

Supplied by (dedicating entity):

Mackson Incorporated
P.O. Box 12067
2346 Southway Drive
Rock Hill, SC 29731

Manufactured by:

Hanna Steel Corporation
Tuscaloosa Division
1701 Boone Blvd
PO Box 428
Northport, AL 35476

(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 affected material is 4 inch x 4 inch x 1/2 inch tube steel. The material was manufactured by Hanna Steel under ASTM A500 as commercial grade. It was then dedicated as defined by Part 21 by the supplier (Mackson, Inc.). Duke Energy procured the tube steel as safety-related from Mackson, Inc.

During construction of the Protected Service Water (PSW) ductbank elevated cable raceway, craft reported a longitudinal crack in the tube steel, approximately four feet in length, adjacent to a raceway fabrication weld. The crack was located in the manufacturer's longitudinal seam weld in the tube steel. Follow-up investigation and laboratory evaluation revealed that the structural steel tubing in question contains surface breaking flaws located along the centerline of the seam weld which are attributable to lack of fusion that occurred during tubing manufacture. Additional testing of samples from the same heat of material indicated that the seam weld flaw depth varied with some localized areas reaching depths of at least 40 percent through the wall thickness prior to raceway fabrication welding.

According to documents received from the supplier, during dedication, the supplier performed chemical, physical and 100 percent visual exam in accordance with their accepted dedication procedures for ASTM A500 for Grade B material. However, the supplied product did not conform to the requirements of ASTM A500 in that the longitudinal butt joint was not welded across its thickness (Reference ASTM A500, Section 6.2).

Samples of the 4 inch x 4 inch x 1/2 inch A500 tube steel were sent to Duke Energy's metallurgical laboratory (Metlab). The Metlab report concluded that "the structural steel tubing in question contains OD surface breaking flaws located along the centerline of the seam weld which are attributed to lack of fusion that occurred during tubing manufacture. ... weld flaw depth [varied but reached] depths of at least 40% throughwall."

The defective longitudinal seam weld of the hollow structural section (HSS) 4 inch x 4 inch x 1/2 inch structural members significantly impaired the structural properties of the HSS section of the tube steel. The generic implications associated with the potential use of these structural members in various nuclear safety-related applications at Oconee and other stations could result in a substantial safety hazard.

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

Duke Energy concluded its evaluation of the deviation under 10CFR21.21(a)(1) on October 28, 2010.

(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.

Mackson, Inc. states that Duke Energy is the only known nuclear utility which has purchased this type of tube steel from them. Four (4) additional samples of seam welded tube steel procured from Mackson, Inc., representing different sizes, manufacturers and heat numbers, were submitted for metallurgical analysis. Those results indicated the problem to be isolated to 4 inch x 4 inch x 1/2 inch tube steel, heat A010493. On October 29, 2010, Duke Energy reported an initial conclusion that the subject defect was confined to this heat of tubing in use at Oconee.

(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.*

The defective tube steel utilized in the PSW structure was not placed into service. Tube steel sections of the same heat of material not used in pre-fabrication efforts were scrapped. Those installed were cut out or evaluated for acceptability by Engineering. All tube steel of this heat has either been disposed of, removed or verified to be acceptable.

Additional required testing for safety-related tube steel has been developed. Duke Energy is working with Mackson, Inc. to determine the cause and extent of the problem. Within 30 days of the completion of that evaluation, Duke Energy will furnish an amended version of this letter addressing the results of the evaluation and the corrective action which has or will be taken.

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

None at this time. Duke Energy is working with Mackson, Inc. to determine the cause and extent of the problem.