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CNS-17-031

May 24, 2017

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

Subject: Duke Energy Carolinas, LLC (Duke Energy)
Catawba Nuclear Station (CNS), Unit 2
Facility Operating License Number NPF-52, Docket Number 50-414
End of Cycle 21 Refueling Outage Inservice Inspection Report and Steam
Generator Inservice Inspection Summary Report
Response to NRC Requests for Additional Information (RAIs)

- References:
1. Letter from Duke Energy to the NRC dated January 6, 2017, ADAMS Accession No. ML17010A282
 2. Letter from the NRC to Duke Energy dated April 25, 2017, ADAMS Accession No. ML17115A142

The Reference 1 Letter was submitted for the Catawba Nuclear Station (CNS), Unit 2 Facility Operating License Number NPF-52, End of Cycle 21 Refueling Outage Inservice Inspection Report and Steam Generator Inservice Inspection Summary Report. The Reference 2 Letter transmitted Requests for Additional Information (RAIs) from the NRC associated with the inservice inspection reports.

The purpose of this letter is to formally respond to the RAI questions contained in the April 25, 2017, Reference 2 Letter. The enclosure to this letter constitutes Duke Energy's response to the RAIs. The format of the attachment is to re-state each RAI question, followed by its associated response.

There are no regulatory commitments contained in this letter or enclosure.

Please direct questions on this matter to Carrie L. Wilson, Sr. Engineer, at (803) 701-3014.

Sincerely,

Tom Simril
Vice President, Catawba Nuclear Station

Enclosure: Response to NRC Requests for Additional Information (RAIs)

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U.S. Nuclear Regulatory Commission
CNS-17-031
Enclosure Page | 2
May 24, 2017

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U.S. Nuclear Regulatory Commission
CNS-17-031
Enclosure Page | 3
May 24, 2017

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Enclosure

Response to NRC Requests for Additional Information (RAIs)

REQUESTS FOR ADDITIONAL INFORMATION
END OF CYCLE 21, REFUELING OUTAGE INSERVICE INSPECTION REPORT AND
STEAM GENERATOR INSERVICE INSPECTION SUMMARY REPORT
DUKE ENERGY CAROLINAS, LLC
CATAWBA NUCLEAR STATION, UNIT 2
DOCKET NUMBER 50-414
FACILITY OPERATING LICENSE NUMBER NPF-52

By letter dated January 6, 2017, (Agencywide Documents Access Management System (ADAMS) Accession No. ML17010A282), Duke Energy, (the licensee), submitted the results of their fall 2016 steam generator inspections performed during refueling outage 21 at the Catawba Nuclear Station, Unit 2.

In order to complete its review, the U.S. Nuclear Regulatory Commission staff requests the following additional information.

RAI-1

Results from the steam generator bowl visual inspection discussed on page 8 of 19 in the outage report show an area of missing stainless steel cladding was detected in the "D" SG hot leg channel head. The report states that no repair of the irregularly shaped area was performed since analysis supports operation until the next planned inspection during Refueling Outage 23. Please discuss the root cause for the area of thin/missing cladding. In addition, confirm that the operational assessment considers potential tube degradation resulting from pieces of stainless steel cladding becoming dislodged from the channel head and being transported into the steam generator tubes.

Duke Energy Response:

The Original Equipment Manufacturer performed an evaluation of the area and concluded that fabrication grinding activities contributed to the area of thin/missing cladding. The grinding activities in this region during fabrication resulted in very thinned cladding and/or exposed low alloy steel.

With regard to potential tube degradation from dislodged pieces of cladding, a Prompt Determination of Operability for the degraded cladding determined that there was no evidence of loose cladding material being present in the tubes and therefore any pieces of cladding were evaluated to have passed through the steam generators. There were no visible indications of impact damage to the tubesheet cladding or tube ends from a loose part or cladding fragment. In addition, there were no indications of inside diameter degradation. The potential for a large fragment of cladding to break away and enter the reactor coolant system was evaluated and not considered credible. Lack of significant delamination coupled with minimal undercutting of the clad edges made grinding repairs to remove potentially loose material unnecessary. As a result, the Steam Generator tube integrity Condition Monitoring Operational Assessment (CMOA) did not consider

potential tube degradation resulting from pieces of stainless steel cladding becoming dislodged from the channel head and being transported into and remaining in the steam generator tubes. As a conservative measure, an examination of the cladding anomaly will be performed during the next Steam Generator inspection.

RAI-2

Most of the steam generator tubes plugged during Refueling Outage 21 were identified as high stress (2-sigma) tubes. All tubes screened as 2-sigma tubes were also inspected with an array probe during the 2015 outage and only one was plugged due to a presumed crack-like indication identified at a tube support plate. Please discuss the plugging criteria for the 2-sigma tubes during Refueling Outage 21 and whether it changed from previous outages.

Duke Energy Response:

The plugging criterion changed for Refueling Outage 21. Duke plans to skip an inspection at Refueling Outage 22. Plugging of the high stress tubes would remove from service the tubes most susceptible to crack-like indications at Refueling Outage 23. All of the high stress tubes were not plugged during Refueling Outage 21, twelve remain in service and were evaluated in an operational assessment. No crack-like indications were identified during Refueling Outage 21.

RAI-3

The steam generator identification is not apparent for the list of steam generator tube service induced indications (pages 11 through 19). Please confirm that the indication lists are presented in the following order: Steam Generators 2A, 2B, 2C and 2D.

Duke Energy Response:

Yes, the indication list is presented in order, Steam Generators 2A, 2B, 2C, and 2D.

RAI-4

Please confirm that pages 7 and 8 should read 13 tubes plugged for Steam Generator 2C.

Duke Energy Response:

The number of tubes plugged in Steam Generator 2C is twelve. Listing Tube Row 36-Column 48 was an administrative error.