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

Duke Energy Carolinas, LLC (Duke Energy)
Oconee Nuclear Station (ONS), Unit No. 2
Docket Nos. 50-270
Renewed License No DPR-47

Subject: Special Report in accordance with Selected Licensee Commitment (SLC) 16.7.4,
"Hydrogen Analyzers"

Pursuant to Oconee Nuclear Station's Selected Licensee Commitment (SLC) 16.7.4, Condition C, this letter constitutes a special report regarding the inoperability of both channels of Hydrogen Analyzers on Unit 2. The SLC commitment requires that if one Hydrogen Analyzer channel is inoperable for greater than 30 days or if both channels are inoperable for greater than 72 hours, a Special Report shall be prepared and submitted within 14 days of the entering the condition. The report is to outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the channel(s).

This Special Report is being submitted due to both Unit 2 Hydrogen analyzer channels being non-functional for greater than 72 hours. The information required by this Special Report is included as an attachment.

This letter contains no new regulatory commitments.

If you have any questions regarding this submittal, please contact David Haile, Oconee Regulatory Affairs at 864-873-4742.

Sincerely,

Scott L. Batson, Vice President,
Oconee Nuclear Station

Attachment: Oconee Nuclear Station Unit 2 Special Report per SLC 16.7.4, Condition C

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NRR

United States Nuclear Regulatory Commission
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ONS Master File (ON02DM, File OS 801.01)
ELL (EC2ZF)

Attachment
Oconee Nuclear Station, Unit 2
Special Report per SLC 16.7.4, (Condition C)

Reporting Requirement:

The ONS Selected Licensee Commitment (SLC) 16.7.4, "Hydrogen Analyzers," is applicable in Modes 1,2, and 3. Condition C of the SLC addresses the circumstance of having one Hydrogen Analyzer channel inoperable for greater than 30 days or two channels inoperable for greater than 72 hours. When either of these scenarios occur, a Special Report is required to be prepared and submitted within 14 days. The report is to outline a preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the channel(s).

Background

The Hydrogen Analyzers are provided to detect high hydrogen concentration conditions that represent a potential for containment breach from a hydrogen explosion during accident conditions. The elimination of the design basis LOCA hydrogen release, eliminated the need for Hydrogen Analyzers to mitigate design basis accidents. The Hydrogen Analyzers serve as Regulatory Guide 1.97, Category 3 instrumentation and are used to assess the degree of core damage following a severe accident and can confirm when an ignition of hydrogen has occurred (random or deliberate).

The Hydrogen Analyzers are used to detect high hydrogen concentration conditions and to provide information to monitor and assess unit status and behavior following an accident. Two OPERABLE channels ensure that no single failure prevents having the information necessary to determine if high hydrogen concentrations are present.

The Hydrogen Analyzers consist of two independent channels with readout from each channel and a recorder on one channel.

Description of Condition:

Unit 2 initiated refueling outage (RF26) activities in early October 2013. During the outage maintenance was performed on both trains of Hydrogen Analyzers, involving replacement and refurbishment of associated solenoid valves inside and outside the reactor building. When post maintenance testing was performed on 11/21 and 11/30 (for Train A and B respectively), acceptable results could not be achieved for either channel. Troubleshooting and repair efforts were initiated. However, due to the long durations required for iterations of troubleshooting and testing (approximately 12-16 hours for a complete cycle), repairs could not be completed prior to mode escalations coming out of the outage. Mode 3 was entered on December 3, 2013 and neither of the channels were returned to service within the following 72 hour completion time. This required entry into Condition C of the SLC, which in turn requires this special report to be written.

Attachment
Oconee Nuclear Station, Unit 2
Special Report per SLC 16.7.4, (Condition C)

Cause of the Non-functional Monitors

The Hydrogen Analyzers were declared non-functional due to the unacceptable calibration results obtained following maintenance on both channels. Maintenance and replacement of system valves in the sample flow path made it difficult to determine if the problem was related to the analyzer or the affected valves, especially since Operating Experience on analyzer regulator failures existed.

The Train B channel was restored to functional status on December 12, 2013 after replacing a flow diverter valve (2PR-89, "Train B Bypass To Post Accident Sample Panel").

Efforts to identify which component is affecting the A train analyzer remains under troubleshooting and investigation.

Preplanned Alternate Method of Monitoring

The pre-planned alternate method for monitoring Reactor Building hydrogen concentrations is to obtain discrete samples for manual analysis.

During times when information regarding Reactor Building Hydrogen concentration would be needed, the Technical Support Center (TSC) will initiate a request (via the Operational Support Center) for Radiation Protection (RP) to obtain a grab sample from the applicable Reactor Building process radiation monitor sample line. The sample is given to Chemistry for analysis and the results (% of H₂) are provided back to the TSC.

This method has been reviewed and determined to provide adequate information for the decision making processes that would use hydrogen concentration as an input.

Plans and Schedule for Restoring Functionality

The Train B channel was restored to functional status on December 12, 2013. Troubleshooting and repair of the A train channel is ongoing. The A train will be returned to service as opportunity allows and no later than the next Unit 2 refueling outage.