UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 7, 2013

Mr. Steven D. Capps
Vice President
McGuire Nuclear Station
Duke Energy Carolinas, LLC
12700 Hagers Ferry Road
Huntersville, NC 28078

SUBJECT: MCGUIRE NUCLEAR STATION, UNITS 1 AND 2 - CORRECTION LETTER TO INTERIM STAFF EVALUATION AND REQUEST FOR ADDITIONAL INFORMATION REGARDING THE OVERALL INTEGRATED PLAN FOR IMPLEMENTATION OF ORDER EA-12-051, RELIABLE SPENT FUEL POOL INSTRUMENTATION (TAC NOS. MF1062 AND MF1063)

Dear Mr. Capps:

By letter dated October 28, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13281A791), the U.S. Nuclear Regulatory Commission issued an interim staff evaluation and requests for additional information regarding the overall integrated plan for implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation.

Due to an inadvertent error, pages 15, 16, and 30 were omitted from the October 28, 2013, document.

Enclose please find pages 15, 16, and 30.

Sincerely,

Jason C. Paige, Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-369 and 50-370

Enclosure:
As stated

cc w/encl: Distribution via Listserv

ENCLOSURE

MCGUIRE NUCLEAR STATION, UNITS 1 AND 2

INTERIM STAFF EVALUATION AND REQUEST FOR ADDITIONAL INFORMATION

REGARDING THE OVERALL INTEGRATED PLAN FOR IMPLEMENTATION OF ORDER

EA-12-051, RELIABLE SPENT FUEL POOL INSTRUMENTATION

(TAC NOS. MF1062 AND MF1063)

Pages 15, 16, and 30

RAI #12

Please provide information indicating the maximum expected relative humidity in the room in which the associated sensor electronics will be located under BDB conditions, in which there is no ac power available to run HVAC systems, and whether the sensor electronics is capable of continuously performing its required functions under this expected humidity condition.

Related to the impact of post-event radiological conditions on the primary SFP level instrumentation channel, in its letter dated July 11, 2013, the licensee stated, in part, that

> The area above and around the pool will be subject to large amounts of radiation in the event water level decreases near the top of the fuel racks. The only parts of the measurement channel in the pool radiation environment are the metallic waveguide and horn, which are not susceptible to the expected levels of radiation. The sensor electronics will be located in an area that does not exceed their $1x10^3$ rad design limit for the required operating time, or the design will provide shielding as required.

The NRC staff has concerns with the licensee's lack of information regarding its analysis of the maximum expected radiological conditions for the location of the sensor electronics that might be considered credible under BDB conditions. The staff is also concerned with the lack of documentation indicating how it was determined that the electronics can withstand a total integrated dose of $1X10^3$ Rads. The staff has identified this request as:

RAI #13

Please provide analysis of the maximum expected radiological conditions (dose rate and total integrated dose) for the location of the sensor electronics that might be considered credible under BDB conditions. Also, please provide documentation indicating how it was determined that the electronics for this equipment is capable of withstanding a total integrated dose of $1X10^3$ Rads. Please discuss the time period over which the analyzed total integrated dose was applied.

3.6.3 *Shock and Vibration*

NEI 12-02 states, in part, that

> Applicable components of the instrument channels are rated by the manufacturer (or otherwise tested) for shock and vibration at levels commensurate with those of postulated design basis event conditions in the area of instrument channel component use using one or more of the following methods:
>
> - instrument channel components use known operating principles, are supplied by manufacturers with commercial quality programs (such as ISO9001) with shock and vibration requirements included in the purchase specification and/or instrument design, and commercial design and testing for operation in

environments where significant shock and vibration loadings are common, such as for portable hand-held devices or transportation applications;

- substantial history of operational reliability in environments with significant shock and vibration loading, such as transportation applications, or

- use of component inherently resistant to shock and vibration loadings or are seismically reliable such as cables.

In its letter dated July 11, 2013, the licensee stated, in part

> The VEGAPuls 62ER Through Air Radar sensor is similar in form, fit and function to the VEGAPuls 66 that was shock and vibration tested in accordance with MILS-901D and MIL-STD-167-1. This shock and vibration testing only applies to the sensor. The waveguide piping is ¾" diameter Schedule 40 piping and is seismically anchored to the floor. Thus the waveguide piping is not considered to be sensitive to shock or vibration.
>
> The power supply panel contains components that are part of the standard VEGA Mobile Remote Display. In addition, the readout portion of the display panel, the PLICSCOM, was installed in the sensor during the shock and vibration testing. The Mobile Remote Display is designed for truck-mounted mobile applications subject to shock and vibration from normal handling, after transportation and setup on the job. Per NEI 12-02, designing instruments for operation in environments where significant shock and vibration loadings are common, such as for portable hand-held devices or transportation applications, is an acceptable measure for verifying that the design is adequate to withstand shock and vibration. This panel is therefore considered to have an acceptable resistance to shock and vibration. There are three components in the AREVA power control panel that are not included with the VEGA Mobile Remote Display but are similar in construction and are tested for shock and vibration and/or mounted on vibration dampeners. This panel also will be subjected to seismic tests.
>
> The main control room display/indicator will be seismically mounted, and is seismically qualified based on similarity to other control board indicators.

The NRC staff notes that the use of MIL-STD-901D appears to be a reasonable method for shock testing. However, the staff has concerns regarding the licensee's lack of information describing the tests, applied forces, and the operability condition of the sensor after the tests were completed. The staff has identified this request as:

RAI #14

Please provide information describing the evaluation of the comparative sensor design, the shock test method, test results, and forces applied to the sensor applicable to its successful tests demonstrating that the referenced previous testing provides an

RAI #24

Please provide the following:

a) **Further information describing the testing and calibration program the licensee will establish and implement to ensure that regular testing and calibration is performed and verified by inspection and audit to demonstrate conformance with design and system readiness requirements. Please include a description of the plans for ensuring that necessary channel checks, functional tests, periodic calibration, and maintenance will be conducted for the level measurement system and its supporting equipment.**

b) **Information describing compensatory actions when both channels are out-of-order.**

c) **Additional information describing expedited and compensatory actions in the maintenance procedure to address when one of the instrument channels cannot be restored to functional status within 90 days.**

The NRC staff has concerns regarding the feasibility of the licensee's process for in-situ calibration to ensure that the design accuracy will be maintained. The staff has identified the following requests as:

RAI #25

Please provide a description of the in-situ calibration process at the SFP location that will result in the channel calibration being maintained at its design accuracy.

3.15 Instrument Reliability

NEI 12-02 states, in part, that

> A spent fuel pool level instrument channel is considered reliable when the instrument channel satisfies the design elements listed in Section 3 [Instrument Design Features] of this guidance and the plant operator has fully implemented the programmatic features listed in Section 4 [Program Features].

In its OIP, the licensee stated, in part

> Reliability of the level instrumentation will be assured by conformance with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02, as described below.

Upon acceptable resolution of the RAIs noted above, the NRC staff will be able to make a conclusion regarding the reliability of the SFP instrumentation.

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Correction Letter No.: ML13309A782 *via e-mail

OFFICE	NRR/LPL2-1/PM	NRR/LPL2-1/LA	NRR/LPL2-1/BC	NRR/LPL2-1/PM
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DATE	11/6/13	11/6/13	11/7/13	11/7/13

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