

October 28, 2010

MEMORANDUM TO: Robert G. Schaaf, Chief
Environmental Projects Branch 3
Division of Site and Environmental Reviews
Office of New Reactors

FROM: Donald E. Palmrose, Senior Project Manager /RA/
Environmental Projects Branch 3
Division of Site and Environmental Reviews
Office of New Reactors

SUBJECT: SUMMARY OF OCTOBER 1, 2010, PUBLIC
TELECONFERENCE WITH PROGRESS ENERGY CAROLINAS,
INC., TO DISCUSS A SUPPLEMENTAL REQUEST FOR
ADDITIONAL INFORMATION RESPONSE FOR THE SHEARON
HARRIS NUCLEAR POWER PLANT UNITS 2 AND 3 COMBINED
LICENSE APPLICATION ENVIRONMENTAL REVIEW

On October 1, 2010, the U.S. Nuclear Regulatory Commission (NRC) and representatives from its contractor, Pacific Northwest National Laboratory, conducted a Category 1 public teleconference with Progress Energy Carolinas, Inc. (PEC), to discuss the hydrologic modeling of Harris Reservoir for the expected tritium concentrations if two new AP1000 reactors are built at the Shearon Harris Site in addition to the existing plant. PEC has provided the native files of their CE-QUAL-W2 water quality model and the NRC staff has several follow-on questions for PEC's technical staff (Agencywide Documents Access and Management System [ADAMS] Accession Number ML102660626).

A list of attendees is included in Enclosure 1. Enclosure 2 contains the NRC's meeting notice. Enclosure 3 contains a summary of the NRC's questions and PEC's responses. The actions discussed in Enclosure 3 were separately sent to PEC to allow the applicant to respond in a timely manner (ADAMS Accession Number ML102800246).

Enclosure:
As stated

cc: See next page

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DATE	10/13/2010	10/13/2010	10/22/2010	10/28/2010

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**LIST OF ATTENDEES IN THE OCTOBER 1, 2010, PROGRESS ENERGY CAROLINAS, INC.,
PUBLIC TELECONFERENCE**

The U.S. Nuclear Regulatory Commission (NRC), its contractor representatives with Pacific Northwest National Laboratory (PNNL), Progress Energy Carolinas, Inc. (PEC), U.S. Army Corps of Engineers (USACE), and members of the public participated in the teleconference.

NRC

Donald Palmrose
Daniel Barnhurst
Richard Emch
Sarah Lopas
Michael Masnik
Sarah Price
Robert Schaaf

PNNL

Stephen Breithaupt
Tara O'Neil
Lance Vail

USACE

Monte Matthews

PEC

Paul Snead
Linda Hickok
Tony Pilo
Klaus Albertin, CH2M-Hill
Eric Woods, CH2M-Hill
A.K. Singh, Sargent-Lundy

Members of the Public

Kathy Stecker, NCDENR DWQ*
Pam Behm, NCDENR DWQ*
Connie Brower, NCDENR DWQ*
Reed Huegerich, Town of Apex, NC

* North Carolina Department of Environment
and Natural Resources, Division of Water
Quality

**Summary of the Public Teleconference with Progress Energy Carolinas, Inc.,
October 1, 2010, Review of the Environmental Report Submitted for the Shearon Harris
Units 2 and 3 Sections 5.2.2 and 5.4, Water Quality and Tritium**

Background

Progress Energy Carolinas, Inc. (PEC) has submitted calculation packages supporting the combined license (COL) application for the proposed Shearon Harris Units 2 and 3, including an Environmental Report (ER), which is in its second revision. The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the ER and calculation packages, and it was determined that additional information is needed to complete the independent environmental review. Consequently, three supplemental requests for additional information (RAIs) were issued to PEC requesting the native files for the water balance calculations, the CE-QUAL-W2 water quality model of Harris Reservoir, and the CEQUAL-W2 tritium model of Harris Reservoir (Agencywide Documents Access and Management System [ADAMS] Accession Number ML102210136). It was anticipated that review of the information in these native files could answer some of the staff's questions, but other questions would be addressed in a public meeting.

As indicated by the supplemental RAIs, the review includes, but is not limited to, an examination of (1) water supply and lake level, (2) water quality analysis, and (3) tritium analysis. Item (1) is necessary because the lake volume affects the dilution of constituent concentrations from the blowdown discharge and Cape Fear River makeup water. Items (2) and (3) are necessary to assess environmental impacts from the proposed modifications to Harris Reservoir, such as raising the reservoir's water level, discharge of makeup water from the Cape Fear River, and blowdown water discharge.

PEC has provided a response to the RAIs, which consisted of a letter response to each of the RAIs and a compact disc of native files (ADAMS Accession Number ML102660626). This additional information is under review by the NRC staff and is the basis of the teleconference.

Meeting Summary

PEC introductory comments included the following background information:

- *For the ER, the Bathtub model was used as a scoping tool to evaluate the suitability of the Cape Fear River as makeup water for Harris Reservoir. That analysis concluded the impacts were SMALL.*
- *The tritium analysis used the previously calibrated CE-QUAL-W2 model to evaluate the water quality impacts of a proposed discharge from the Western Wake Regional Water Reclamation Facility.*
- *The Cape Fear River Basin Hydrologic Model (CFRBHM) is used for the water balance purposes.*
- *PEC has not yet applied for a Section 401 water quality certificate.*
- *The Instream Flow Studies (ISFS) of the Buckhorn Creek and a section of the Cape Fear River are currently underway to evaluate fisheries requirements.*

1. **Pertaining to RAI 5.2.2-4, related to Harris Lake water level calculations and in the response to this RAI**, PEC stated that the spreadsheet calculation was a tool used for analysis of the water supply and the Harris Lake level, but that it was not used for the water quality and tritium modeling analyses with the model CE-QUAL-W2. Instead, PEC relied on the CFRBHM.

PEC Response: PEC noted that the spreadsheet was an early tool to evaluate the lake level needed to support two new reactors at the Shearon Harris site. It has been superseded by the use of the CFRBHM.

- a) Was the water supply calculation in the spreadsheet and CFRBHM compared with measured Harris Lake levels? This provides an idea of what additional inputs and considerations were needed to achieve a good match between calculated and measured lake levels.

PEC Response: PEC noted that a recently submitted revision of the Section 404(b)(1) alternatives analysis package discusses the analysis of the several lake level alternatives.

Concerning the water balance, there is no direct way to compare elevations in the tritium CE-QUAL-W2 model as it was based on the 240 ft. normal pool elevation. PEC relied on the existing model's water balance and calibration. This is discussed in the tech memo supporting the Western Wake Regional Wastewater Management Facilities study. PEC used the water balance utility in W2 to check the water balance, but PEC did not adjust the inflows to match the lake level. The water balance was found to be off by 1.4 cubic feet per second (cfs) using the W2 utility that is a part of the CE-QUAL-W2 model.

- b) What information was used from CFRBHM as input to the CE-QUAL-W2 models? From examination of the http://www.ncwater.org/Data_and_Modeling/CF/ website, it appears that the reservoir elevations analyzed are for 220 ft. water levels. Is there a version of CFRBHM with the updated reservoir data?

PEC Response: PEC indicated that the CFRBHM includes the current stage-volume curve for Harris Reservoir; however, the North Carolina Department of Water Resources web site does not include the current curve. It will be included after completion of the ISFS, which is anticipated by the first quarter of calendar year 2011.

The source of Cape Fear River flow data for makeup water was not from the CFRBHM but from measured United States Geological Survey gage flows for 2000-2008.

- c) The CFRBHM and PEC spreadsheet analyses produce very low elevations for an extended period in the 1980s; how were these apparent drought events incorporated into the CE-QUAL-W2 modeling analyses?

PEC Response: PEC stated the tritium analysis was intended to demonstrate that under normal operating conditions the concentrations were less than 20,000 pCi/yr. The analysis includes a drought period in the 2000s which PEC considers as sufficiently severe.

- d) Have the operational rules for withdrawal from the Cape Fear River been finalized? The calculation package indicated that a threshold of 750 cfs in Cape Fear River is used. A threshold of 600 cfs is used in the tritium model as reported in Table 1 of the response to RAI No. 5.2.2-5.

PEC Response: PEC stated operational rules for the withdrawal of Cape Fear River water have not yet been finalized. A flow of 600 cfs is the target at Lillington but PEC did include a margin of safety of 150 cfs in their analysis.

INFORMATION REQUESTS: The NRC staff requested PEC keep the NRC informed of the status of the ISFS and specifically when the model of Buckhorn Creek and Cape Fear River may be available. The NRC staff also requested to be notified when PEC becomes aware that the North Carolina Department of Water Resources has updated its website for the Cape Fear River Basin Hydrologic Model with the current stage-storage curve for Harris Reservoir.

2. **Pertaining to RAI 5.2.2-5 and related to water quality analysis of Harris Reservoir,** a water quality model has been developed by PEC using CE-QUAL-W2 computer code. The period of analysis was 2001-2007. However, as reported in the ER Section 5.2.3, the Bathtub model was reportedly used for assessing water quality impacts.

PEC Response: PEC stated the Bathtub model was developed as a scoping level tool of the supplemental water source (Cape Fear River) to evaluate the potential impacts (SMALL to LARGE). The CE-QUAL-W2 model had not been developed at that time, however, because this model was now available, it was used for the tritium analysis.

- a) Because the model used for the tritium analysis was CE-QUAL-W2, is this model also to be used for water quality evaluations to support the ER?

PEC Response: PEC has no plans to update the analysis in the ER with results from the current CE-QUAL-W2 model. If more detail is needed to satisfy the State of North Carolinas Department of the Environment and Natural Resources Division of Water Quality (NCDWQ), PEC may incorporate it into the ER at a later date.

- b) What was the statistical accuracy (via error analysis between model results and measurements) for model calibration of the water quality model using CE QUAL W2?

PEC Response: PEC stated Figure 2 in the calibration report shows comparisons where monthly data was plotted. PEC indicated they would provide summary statistics from the calibration. PEC also contends that the model overestimated tritium concentrations.

- c) Provide calibration data or plots comparing model results and measured data.

PEC Response: PEC agreed to include this with the summary of the statistical data.

ACTION: PEC will provide a summary of the statistical data used which illustrates the calibration results for the CE-QUAL-W2 model of Harris Reservoir.

- d) Explain the process in conducting the water balance for Harris Reservoir, in particular how were balance flows input? How were the data from the CFRBHM used in the model, as indicated in the response to RAI 5.2.2

PEC Response: PEC did not add a balance flow, rather the W2 utility was used to check the error in the flow, which was found to be a positive difference of 1.4 cfs.

- e) How much reduction in NPS loading was needed for water quality model calibration?

PEC Response: The Western Wake Partners did not reduce nonpoint source nitrogen loading as it was already underestimated by the model. This was not considered to be an issue since phosphorous was the limiting nutrient for algal growth. Nutrient loadings in the White Oak Arm, including the Holly Springs Wastewater Treatment Plant, were reduced due to losses in Thomas Millpond.

- f) Where is the location used for ascertaining compliance with water quality standards?

PEC Response: CE-QUAL-W2 was not used in the ER. Rather the Bathtub model was used. This model provided seasonal chlorophyll a, and monthly phosphorous, nitrogen concentrations and is a segmented model.

- g) Has the North Carolina Department of Environment and Natural Resources Division of Water Quality (NCDENR DWQ) been consulted with regard to water quality analyses?

PEC Response: This was covered in PEC's introductory comments. PEC will be working with NCDENR DWQ for certification.

- h) What planned analyses are there for examining water quality at lower pool elevations, that is, with lower spillway elevations?

PEC Response: The discussion on this question was deferred until later in the teleconference when specific items about the tritium analysis are raised.

- i) What planned scenarios are there for examining water quality under drought conditions similar to the 1980s, in which the monthly water balance provided in response to RAI 5.2.2-4 dropped below 220 ft.?

PEC Response: The discussion on this question was deferred until later in the teleconference when specific items about the tritium analysis are raised.

- j) Note on electronic files provided in response to RAI 5.2.2-5: the native files provided for CE-QUAL-W2 did not include the native output files.

PEC Response: PEC indicated the native output files would be provided to the NRC staff.

ACTION: PEC will provide electronic copies of the output files for the CE-QUAL-W2 model runs of tritium concentration in Harris Reservoir.

3. **Pertaining to RAI 5.4-1 and related to evaluation of tritium concentrations using the water quality model CE-QUAL-W2.** Modifications to the water quality model were noted in the response to RAI 5.2.2-5. The tritium-evaluation model was run for the same period as the water quality model, 2001 through 2008.

- a) Explain why a 30% reduction loading was necessary to calibrate modeled tritium results with measured tritium concentrations in Harris Lake.

PEC Response: PEC stated this was necessary to calibrate the model. It was requested that PEC provide a response as to why this was required. PEC also stated that the trend matched the data but was overestimated.

ACTION: PEC will provide an explanation of why a 30 percent reduction loading of tritium was necessary to calibrate the CE-QUAL-W2 modeled tritium results with measured tritium concentration in Harris Reservoir.

- b) What was the statistical accuracy (via error analysis between model results and measurements) for model calibration for the tritium model using CE QUAL W2? Provide calibration data or plots comparing model results and measured data.

PEC Response: As noted previously, PEC would provide the summary statistics from the calibration.

ACTION: PEC will provide a summary of the statistical data used which illustrates the calibration results for the CE-QUAL-W2 model of Harris Reservoir.

- c) What planned analyses are there for examining tritium at lower pool elevations, that is, with lower spillway elevations?

PEC Response: From the Section 404(b)(1) alternatives analysis, PEC determined that 240 ft is the pool elevation needed to properly support two new reactors at the Shearon Harris site. Thus, according to PEC, no further analysis is necessary.

- d) What planned scenarios are there for examining tritium under drought conditions similar to the 1980s, in which the monthly water balance provided in response to RAI 5.2.2-4 dropped below 220 ft.?

PEC Response: PEC does not have any plans to analyze the historical drought period that occurred in the 1980's. PEC believes that the period analyzed (2000-2008) was sufficiently severe for the purposes of an environmental analysis, rather than applying what PEC considers to be an extreme drought conditions typical of a safety analysis.

The NRC staff will consider this information as the review proceeds.

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