

**Public Meeting 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. NRC staff have 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 CE-QUAL-W2 tritium model of Harris Reservoir. 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. Item (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 CD of native files. This additional information is being reviewed by NRC staff.

## **Additional Questions**

**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, they relied on the Cape Fear River Basin Hydrologic Model (CFRBHM).

- 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.
- 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/](http://www.ncwater.org/Data_and_Modeling/CF/) website, it appears that the reservoir elevations analyzed are for 220 ft water levels. Is there are version of CFRBHM with the updated reservoir data?
- 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?

- 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 #: 5.2.2-5.

**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.

- 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?
- 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? Provide calibration data or plots comparing model results and measured data.
- 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 5.2.2-4?
- How much reduction in NPS loading was needed for water quality model calibration?
- Where is the location used for ascertaining compliance with water quality standards?
- Has the North Carolina Department of Water Quality been consulted with regard to water quality analyses?
- What planned analyses are there for examining water quality at lower pool elevations, that is, with lower spillway elevations?
- 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?
- *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*

**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 2007.

- Explain why a 30% reduction loading was necessary to calibrate modeled tritium results with measured tritium concentrations in Harris Lake.
- 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.
- What planned analyses are there for examining tritium at lower pool elevations, that is, with lower spillway elevations?
- 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?