**Progress Energy**

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Attn: Document Control Desk
United States Nuclear Regulatory Commission
Washington, DC 20555-0001

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/RENEWED LICENSE NO. DPR-23

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION
RELATED TO RELIEF REQUEST-2 FOR THE FIFTH 10-YEAR
INTERVAL INSERVICE TESTING PROGRAM PLAN

Ladies and Gentlemen:

Carolina Power and Light (CP&L) Company, now doing business as Progress Energy, by letter dated March 16, 2012 (Agencywide Documents Access and Management System Accession (ADAMS) No. ML12086A067) submitted Relief Requests (RR)-1, RR-2, and RR-3 for the Inservice Testing (IST) Program Plan for the Fifth 10-Year Interval for H. B. Robinson Steam Electric Plant (HBRSEP) Unit No. 2.

By letter dated August 21, 2012, additional information was requested by the NRC's staff. The requested information is related to the Basis for Requesting Relief for Relief Request 2 in Appendix 10.2 of the Fifth 10-Year Interval Inservice Testing Program Plan (ADAMS No. ML12086A067) and the CP&L response, by letter dated May 10, 2012 (ADAMS No. ML12138A041) to a request for additional information which was sent on May 4, 2012 (ADAMS No. ML12102A174).

Progress Energy is providing the additional information requested in the attachment to this letter.

This letter contains no new Regulatory Commitments.

If you have any questions concerning this matter, please contact Mr. Richard Hightower, Supervisor – Regulatory Affairs at (843) 857-1329.

Sincerely,

Wilds R. Hightower for

Sharon A. Wheeler
Manager – Support Services – Nuclear

**Progress Energy Carolinas, Inc.**
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NRR

SAW/sjg

Attachment: Response to Request for Additional Information Related to Relief Request-2 for the Fifth 10-Year Interval Inservice Testing Program Plan

c: Mr. V. M. McCree, NRC Region II
Ms. A. T. Billoch-Colon, NRC Project Manager, NRR
NRC Resident Inspector, HBRSEP Unit No. 2

# RESPONSE TO REQUEST FOR ADDITIONAL

# INFORMATION RELATED TO RELIEF REQUEST-2 FOR THE

# FIFTH 10-YEAR INTERVAL INSERVICE TESTING PROGRAM PLAN

REQUEST FOR ADDITIONAL INFORMATION

REGARDING H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT 2

INSERVICE TESTING PROGRAM PLAN FOR THE FIFTH 10-YEAR INTERVAL

DOCKET NO. 50-261

By letter to the U.S. Nuclear Regulatory Commission (NRC) dated March 16, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML110310012 *[the correct Accession No. is ML12086A067]*), Carolina Power & Light Company, now doing business as Progress Energy, submitted Relief Requests (RR)-1, RR-2, and RR-3 for the Inservice Testing Program (IST) Plan for the Fifth 10-Year Interval for the H. B. Robinson Steam Electric Plant, Unit No. 2 (HBRSEP).

By letter dated May 10, 2012 (ADAMS Accession No. ML12138A041), the licensee submitted its response to the NRC's staff request for additional information (RAI), which was sent on May 4, 2012. Subsequently, by letter dated June 4, 2012, (ADAMS Accession No. ML12165A261), the licensee submitted its response to RAI-2, which was sent on May 24, 2012. The NRC staff is reviewing your responses to RAI-2 and has determined that additional information is required to complete its review of IST RR-2.

IST-RR-2: "Required Instrumentation Accuracy"

In the basis for requesting relief, the licensee stated:

> *Generally, spare instruments are maintained and certified, but may not be available, or rendered inoperable. When calibrated instruments are not available, back-up instruments can be installed and verified in accordance with a detailed procedure in order to provide a high level of assurance relative to the proper operation of the flow rate device.*

1) Explain why the back-up flow measurement instruments are not calibrated.

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**CP&L Response**

Pump flow rate measurement instrumentation for the Safety Injection (SI) pumps, the Component Cooling Water (CCW) pumps and Service Water (SW) Pumps A and B are located along a common flow path in each of the respective systems. Each system has a permanently installed flow instrument based on the V-cone technology. The performance of the permanently installed V-cone flow instrumentation on the SI and SW systems has been problematic and unreliable. The performance of the V-cone technology in the CCW system has been accurate and repeatable. The difference in performance is attributed to the incorporation of lessons learned from the design and installation of components on the SI and SW systems to the design and installation of the CCW instrumentation.

Supplemental ultrasonic flow instrumentation has been procured consisting of four Model 1010 computer/meters and a number of transducers. Transducers have been installed on

the common flow paths of the SW and SI systems. Specific combinations of computer/meter and transducer components can be calibrated with each of the components of the transducer set matched or "paired" with the computer/meter component through off-site calibration. Information included on the calibration certificate is incorporated into site instructions and applicable procedures.

After offsite calibration, the paired components (computer/meter and transducers) are installed and tested for acceptable operation. The calibration certification is only valid for the "paired" components. After being tested, the computer/meter and associated wiring is removed and the transducers may be left in place. The computer/meter that is 'paired' to the transducers is labeled and stored in a controlled environment or radiation control area (RCA) locker. Use of a computer/meter paired to one set of transducers with another set of transducers results in a non-calibrated flow measurement.

For the SW system application, two calibrated ultrasonic flow measurement instruments, each composed of a computer/meter and its paired set of transducers have been installed and tested. These two flow instruments provide redundant calibrated flow measurement capability for the SW system. The SW system is included in this relief request primarily as a contingency in the event problems with the computer/meter components of these two calibrated instruments are encountered, such as a common software programming issue or other technical challenge that is beyond the capability of station personnel to immediately correct. In the event both of these instruments are rendered inoperable or are otherwise unavailable, the remaining Model 1010 computer/meter and transducer components, including older model 990 transducers could be used to configure a non-calibrated back-up flow rate instrument.

Applicability of the relief request to SI pump flow rate measurements are limited to the Comprehensive Pump Test and does not include flow rate measurements for the quarterly Group B test. A single calibrated ultrasonic flow instrument set (paired computer/meter and transducers) has been installed and tested on the common SI system flow path. The computer/meter that is 'paired' to the transducers has been labeled and stored in a test equipment locker inside the RCA. In the event this instrument is rendered inoperable or is otherwise unavailable, the remaining computer/meter and transducer components could be configured to provide flow measurements with a non-calibrated back-up instrument.

Flow rate tests of CCW system pumps use a permanently installed common V-Cone flow element. This flow instrument has been in place since June 2010 and while it utilizes the same V-Cone flow technology that has resulted in erroneous results for the SW and SI applications, the CCW application has proven to be extremely accurate and repeatable. A calibrated spare instrument has not been procured. For this reason, HBRSEP has included the CCW pumps in the relief request to provide for the installation of a Model 1010 computer/meter with available transducers as a contingency for an unforeseen

condition that impacts the reliability of the existing CCW V-cone flow instrument. Under these circumstances, an ultrasonic flow rate instrument (Model 1010 computer/meter and either Model 1010 or 990 transducers) would be used as a non-calibrated back-up instrument.

For each of the three applications included in the relief request a primary calibrated means of flow measurement is available. In the case of SW Pumps A and B, two redundant calibrated ultrasonic flow instruments are available. Non-calibrated back-up flow measurement instruments are available for each of the three applications using available Model 1010 computer/meter and either Model 1010 or 990 transducer components.

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2) Clarify if the back-up instruments are property of the plant and where the instruments are stored when not in use.

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**CP&L Response**

All components that would be used in the event of a need for a back-up ultrasonic instrument have been purchased by HBRSEP. Transducers that are part of a calibrated ultrasonic instrument are installed along the respective common flow paths of the SI and SW systems. All other components are stored and maintained on-site in a controlled environment, or inside the test equipment locker.

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3) Explain if the procedure that addresses the installation and verification of the back-up instruments addresses calibration procedures.

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**CP&L Response**

Calibration is performed off-site. Plant procedure PPP-006 'Model 1010 Ultrasonic Flow Measurement' is written to ensure that ultrasonic flow rate instruments are properly installed, diagnostically tested and verified to be operating acceptably. This procedure; however, does not calibrate the instrument, or address calibration for non-calibrated instrument configurations. The procedure merely provides instructions and criteria to ensure that the instrument is properly installed, operated and that these activities are documented.

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4) Clarify if there is a plant procedure that addresses instrument calibration and if the back-up instruments are included in that procedure.

**CP&L Response**

Calibration is performed off-site. Procedure MNT-NGGC-0050 'Measuring & Test Equipment Calibration Program' section 9.6.5 is applicable to off-site calibration and provides for the specification of acceptance criteria by either the Measuring & Test Equipment staff or Procurement Engineering Group. Computer/meter and transducer components are calibrated as an instrument and the individual components are described as being paired with the other components. The use of a component from a calibrated instrument with components not paired with it produces a non-calibrated instrument. As described in the response to Item 1 above, back-up instruments are assembled from components which are not paired and therefore back-up instruments are not calibrated.

5) State how many of these noncalibrated flow measurement instruments the plant has installed.

**CP&L Response**

Neither calibrated nor non-calibrated ultrasonic flow rate instruments are permanently installed on the SW pumps A and B common flow path, the SI system common flow path or the CCW common flow path. When not in use, the computer/meter components are placed in protected storage. Currently there are no operable ultrasonic flow instruments installed.

However, there are six transducer components currently installed; four of these form a transducer set installed on the SW pumps A and B common flow path and the other two form a transducer set installed on the SI system common flow path. If a non-paired computer/meter is used with either of these installed transducer sets the resulting ultrasonic flow rate instrument would not be calibrated.

Following usage as either a calibrated instrument or a non-calibrated back-up flow rate instrument, the computer/meter components and wiring are removed for storage in a controlled environment until subsequent use as a part of a calibrated instrument when installed with its paired transducer set or as a non-calibrated instrument when installed with non-paired transducer components.

In letter dated May 10, 2012 (ML12138A041), the licensee submitted the following response to RAI-3:

*The ultrasonic flow meters are dependent of pipe size, wall thickness and spacing parameters. HBRSEP has used non-calibrated meters in the past and found the degree of error to be within the normally expected test variations. Vendor literature indicates that an intrinsic accuracy of 3% of flow rate can be expected when set up properly. The degree of error is based on percent of reading; which provides a higher accuracy than percent of scale where the actual allowable error is 6% of reading. However, the vendor rating is not replicated on a certificate of compliance. HBRSEP documents the proper installation and set up of these meters prior to use.*

*This relief was utilized during the fourth program interval and a table showing the results of use during the previous interval, is included below. The table may not be inclusive of each instance that this provision was utilized due to the large volume of tests; however, is intended to reflect the known instances and is indicative of expected instrument performance.*

| Pump (PMP) | Non-Calibrated Flow Rate | Calibrated Flow Rate | Deviation |
|---|---|---|---|
| [Service Water] SW -PMP-A | 7327 [gallons per minute] gpm on 10/22/09 | 7316 gpm on 1/14/10 | 0.15% of actual |
| SW -PMP-B | 7062 gpm on 11/17/09 | 6910 gpm on 1/14/10<br>7024 gpm on 2/19/10 | 2.2% of actual<br>0.54% of actual |
| [Safety Injection] SI-PMP-C | 1186.59 psid @ set flow of 322 gpm on 1/7/09<br><br>1186.8 psid @ set flow of 325.1 gpm on 3/23/10 | 1176.79 psid @ set flow of 323 gpm on 8/18/10 | 0.87% of actual |

*SW-PMP-A & SW-PMP-B utilize a common flow rate device. The SI-PMP-C test involved the biennial comprehensive pump test. A subsequent test was completed approximately five months later, instead of two years.*

The data contained in the table provided is very limited and the dates of measurement are too far apart. In the case of SW-PMP-A, the time between the calibrated and the non-calibrated flow rate tests is of about 3 months.

1) Clarify if there is a larger data sample that compares the measurements of calibrated and non-calibrated instruments within a shorter time frame.

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**CP&L Response**

The reference to the large amount of data from the fourth interval was with respect to the use of earlier models of ultrasonic instrumentation over a wider range of plant systems. The data points presented in the table are limited to those readily identifiable instances when more recent models of ultrasonic instruments were used on the SW and SI systems

in a non-calibrated configuration following failure of the permanently installed V-cone technology instruments consistent with Relief Requests approved for the fourth ten-year interval.

The non-calibrated flow rates reported for SW pumps A and B in the table were measured using back-up ultrasonic flow instrumentation comprised of Model 990 transducer and Model 1010 computer/meter components. The calibrated flow rate values were obtained using a calibrated ultrasonic instrument configuration consisting of a Model 1010 computer/meter and Model 1010 transducers that were installed on the SW pump A and B common flow path subsequent to the use of the non-calibrated instrument configuration.

The non-calibrated flow rates reported in the table for SI pump C were obtained using an ultrasonic flow instrument consisting of a Model 990 computer/meter and Model 990 transducers. The calibrated flow rate values listed in the table for SI pump C were obtained using an ultrasonic flow instrument consisting of a Model 1010 computer/meter and Model 1010 transducers calibrated to the SI system common flow path configuration.

The time intervals between the data points for SW pumps A and B, and the longer time intervals for SI Pump C are consistent with applicable surveillance test intervals. It should be noted that the interval of approximately six months is not significant with respect to pump degradation since SI Pump C is a Group B pump which is only operated for testing and for limited periods during refueling conditions.

HBRSEP is not aware of any additional data points that may be available to increase the statistical assessments made in the table.

| **Pump (PMP)** | **Non-Calibrated Flow Rate** | **Calibrated Flow Rate** | **Deviation** |
|---|---|---|---|
| [Service Water] SW -PMP-A | 7327 [gallons per minute] gpm on 10/22/09 1010 meter, 990 transducers | 7316 gpm on 1/14/10 1010 meter, 1010 transducers | 0.15% of actual |
| SW -PMP-B | 7062 gpm on 11/17/09 1010 meter, 990 transducers | 6910 gpm on 1/14/10 7024 gpm on 2/19/10 1010 meter, 1010 transducers | 2.2% of actual 0.54% of actual |
| [Safety Injection] SI-PMP-C | 1186.59 psid @ set flow of 322 gpm on 1/7/09 990 meter and transducers<br><br>1186.8 psid @ set flow of 325.1 gpm on 3/23/10 990 meter and transducers | 1176.79 psid @ set flow of 323 gpm on 8/18/10 1010 meter, 1010 transducers | 0.87% of actual |