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SUBJECT:
RESPONSE TO NRC'S LTR DTD 01/16/78... FURNISHING LIST AND INFO RELATING THE
STARTUP PHYSICS TESTS WITH ASSOCIATED ACCEPTANCE CRITERIA WHICH WILL BE USED
IN THE STARTUP OF UNIT 2 SUBSEQUENT TO THE REFUELING OUTAGE NOW IN PROGRESS.

PLANT NAME: H B ROBINSON - UNIT 2

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Carolina Power & Light Company

March 17, 1978

FILE: NG-3514 (R)

SERIAL GD-78-654
REGULATORY DOCKET FILE COPY

Mr. A. Schwencer, Chief
Operating Reactors Branch No. 1
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555



H. B. ROBINSON STEAM ELECTRIC PLANT UNIT NO. 2
DOCKET NO. 50-261
LICENSE NO. DPR-23
STARTUP PHYSICS TESTS/ACCEPTANCE CRITERIA

Dear Mr. Schwencer:

In accordance with your request of January 16, 1978, a list follows relating the startup physics tests with associated acceptance criteria which will be used in the startup of H. B. Robinson Unit No. 2 subsequent to the refueling outage now in progress. As you will note, this response provides information regarding startup physics testing related to the pending 2300 MWt uprating of Robinson No. 2. This information was requested during a conference call between the staff and CP&L. Although not specifically requested in your letter, it was suggested by the staff that the information be included with this response.

<u>TEST/MEASUREMENT</u>	<u>ACCEPTANCE CRITERIA</u>
1. INITIAL CRITICALITY	
a. All rods out (ARO) Boron Endpoint	PREDICTED \pm 50 PPM
b. Moderator Temperature Coefficient	NON-POSITIVE (Note 1)
2. HOT ZERO POWER (HZP) INCORE POWER DISTRIBUTION MAP -	
a. FAH	$\leq 0.08 \times \text{FAH PREDICTED}$ (for PREDICTED FAH ≥ 1.0) $\leq 0.15 \times \text{FAH PREDICTED}$ (for PREDICTED FAH < 1.0)
b. QUADRANT POWER TILT RATIO	< 1.02
3. CONTROL BANKS ROD WORTH MEASUREMENTS -	
a. Control Bank D	PREDICTED \pm 15%
b. Control Bank C	PREDICTED \pm 15%

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<u>TEST/MEASUREMENT</u>	<u>ACCEPTANCE CRITERIA</u>
c. Control Bank B	PREDICTED \pm 15%
d. Control Bank A	PREDICTED \pm 15%
e. SUM OF ABOVE (a+b+c+d)	PREDICTED \pm 10%
4. CONTROL BANK D INSERTED -	
a. Moderator Temperature Coefficient	NON-POSITIVE (Note 1)
5. SHUTDOWN BANKS ROD WORTH MEASUREMENTS -	
a. Shutdown Bank B (Note 2)	NONE
b. Sum of Control Bank Worths (Item 3.e above plus 5.a above)	PREDICTED \pm 10%
c. Most Reactive Stuck Rod (Note 3)	NONE
d. Shutdown Bank A (Note 3)	NONE
e. N-1 (Most Reactive Stuck Rod withdrawn, Note 3)	$>0.95 \times$ PREDICTED
6. POWER ESCALATION INCORE POWER DISTRIBUTION MAPS -	
a. 30 Percent	(Note 4)
b. 70 Percent	(Note 4)
c. 90 Percent	(Note 4)
d. 100 Percent	(Note 4)

- Notes:
- (1) Should a positive value be measured during physics testing, procedures are provided for determinations of limitations in terms of maximum boron concentration and maximum control bank height which ensure that no power operation occurs with a positive moderator temperature coefficient.
 - (2) Performed only if any acceptance criteria at 3. not satisfied.
 - (3) Performed only if acceptance criteria of 5.b not satisfied.
 - (4) Acceptance criteria is based on Technical Specification limits for FQ (Z), FAH, QUADRANT POWER TILT. Additionally, measured values are evaluated to determine if the succeeding power plateau can be obtained without exceeding this criteria.

If not, the maximum power level which can be achieved is calculated using Technical Specification limits (FQ(Z), FΔH) and the measured values.

- (5) If any acceptance criteria other than that discussed in notes (1) through (4) cannot be satisfied, power escalation is permitted only after review and approval by the Plant Nuclear Safety Committee.

STARTUP PHYSICS TESTING - 2300 MWt (Uprating)

In the event that power escalation includes ascension from 2200 MWt to 2300 MWt, the program above would be identical with the exception of Power Escalation Incore Power Distribution Maps. For this segment of the testing program, an additional step in the escalation would provide for comparison data for incore parameters at 2200 MWt and 2300 MWt. During the escalation through the final 100 MWt, NSSS parameters would be closely monitored to ensure temperatures and pressures follow the expected trends. Due to the anticipated minimum changes in power distribution during the 100 MWt escalation, incore measurements will be made only at the beginning and end of the increase.

Should the Robinson No. 2 uprating be implemented during an operating cycle, the measurements discussed above for escalation from 2200 MWt to 2300 MWt would be performed. This would include an incore power distribution map at the beginning and end of the escalation and NSSS monitoring during power increase.

Acceptance criteria for the measurements made during uprating power escalation will be based strictly on Technical Specification limits as they apply to incore power distribution and NSSS parameters.

In addition to the above tests and measurements, a number of additional parameters are monitored from the cold shutdown condition to full power operation to verify alignment of various control and instrumentation functions including the Nuclear Instrumentation System (NIS). The latter system monitoring includes the F(ΔI) calibration at 70% power and determination of Target Values for Constant Axial Offset Control (CAOC). Power calorimetrics are performed at various power levels in order to calibrate the NIS.

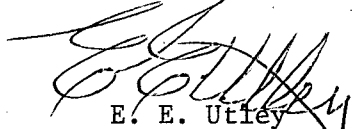
Mr. A. Schwencer, Chief

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March 17, 1978

The program described above relates the test and measurements, with acceptance criteria, for the startup procedures as currently approved. As a result of a commitment to the Commission, the procedures are currently being revised in format to reflect additional requirements for documentation review. It is unlikely that this or other revisions to the procedures will affect the scope of measurements or associated acceptance criteria as presented. However, this option must be retained in order to maintain needed flexibility in program improvements. As with other documentation within the Plant Operating Manual, any revision to the Startup Program would be available for review upon request.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'E. E. Utley', is written over the typed name.

E. E. Utley

Senior Vice President
Power Supply Group

JMC:DCS:as*