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FROM: Carolina Power & Light Co. Raleigh, N.C. 27602 N.B. Bessac	DATE OF DOC: 12-15-72	DATE REC'D 12-20-72	LTR X	MEMO	RPT	OTHER
TO: Mr. D.J. Skovholt	ORIG 1 signed	CC	OTHER	SENT AEC PDR <input checked="" type="checkbox"/> SENT LOCAL PDR <input checked="" type="checkbox"/>		
CLASS: <u>U</u> PROP INFO	INPUT X	NO CYS REC'D 1	DOCKET NO: 50-261			

DESCRIPTION: Ltr re our 7-28-72 ltr.....
Ltr pursuant to Sec. 50.59 of 10 CFR req for
change in Sec. 3.10 of Tech Specs for H.B.
Robinson Plant Unit 2....

ENCLOSURES:

DO NOT REMOVE

PLANT NAMES: H.B. Robinson Plant Unit 2

ACKNOWLEDGED

FOR ACTION/INFORMATION

DL 12-21-72

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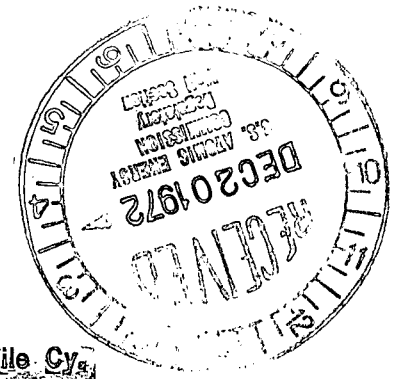
Carolina Power & Light Company

December 15, 1972

Mr. D. J. Skovholt
Asst. Director for Operating Reactors
Directorate of Licensing
United States Atomic Energy Commission
Washington, D. C. 20545

Regulatory

File Cy.



50-261

H. B. ROBINSON UNIT NO. 2
LICENSE DPR-23
REQUEST FOR REVISION OF TECHNICAL SPECIFICATIONS
CHANGE OF QUADRANT POWER TILT LIMITS

Dear Mr. Skovholt:

In response to your letter of July 28, 1972, the quadrant power tilt limits in the Technical Specifications have been reviewed. The information contained herein supersedes previous correspondence on this matter.

This review, along with operational tests on the performance of the radial flux deviation alarm, indicated that a reduction is both prudent and operationally practical. The quadrant power tilt at which remedial action is required has been revised to be 1.05. This is based upon the 1.10 design uncertainty factor incorporated in $F_{\Delta H}^N$ and F_q^N . A conservative 2 to 1 ratio of increase in $F_{\Delta H}^N$ to increase in quadrant power tilt has been employed although the results of dropped and static ejected rod testing performed during the initial startup programs indicate that a 1.5 to 1 ratio would be more appropriate.

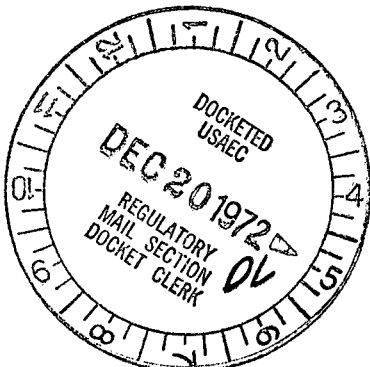
A reduction in reactor power to 75% of rated power will maintain core safety margins for a quadrant power tilt of 1.12, using the 2 to 1 ratio. A tilt ratio of 1.12 or more is indicative of a serious performance anomaly and a plant shutdown is prudent.

Pursuant to Section 50.59 of 10CFR, the following changes are requested in Section 3.10, Control Rod and Power Distribution Limits, of the currently effective Technical Specifications of License DPR-23:

1. Delete paragraphs 3.10.2.1, 3.10.2.2, and 3.10.2.3. Replace these paragraphs with:

- 3.10.2.1 Power distribution limits are expressed as hot channel factors. Limiting values at rated power are:

$$F_{\Delta H}^N = 1.75$$
$$F_q^N = 2.75$$



6360
fw

If measured peaking factors exceed these values, with due allowance for measurement error, the maximum allowable reactor power level and the Nuclear Overpower Trip set point shall be reduced by one percent for each percent which F_{AH} or F_{qN} exceed the limiting values, whichever is more restrictive. If the hot channel factors cannot be reduced below the limiting values within two days, the overpower ΔT and overtemperature ΔT trip set points shall be similarly reduced.

3.10.2.2 Except for physics tests, if the quadrant to average power tilt ratio, exceeds 1.05 but is less than 1.12 or if a part-length or full-length control rod is more than 15 inches out of alignment with its bank, then within four hours:

- a. Correct the situation, or
- b. Determine by measurement the hot channel factors, and apply Specification 3.10.2.1, or
- c. Limit power to 75% of rated power for 3-loop operation or 45% of rated power for 2-loop operation.

3.10.2.3 If the quadrant to average power tilt ratio, exceeds 1.05 but is less than 1.12 for a sustained period of more than 24 hours without known cause, or if such a tilt recurs intermittently without known cause, the reactor power level shall be restricted so as not to exceed 50% of rated power. If the cause of the tilt is determined, continued operation at a power level determined by 3.10.2.1 above, shall be permitted.

3.10.2.4 Except for physics test, if the quadrant to average power tilt ratio is 1.12 or greater, the reactor shall be put in the hot shutdown condition utilizing normal operating procedures. Subsequent operation for the purpose of measuring and correcting the tilt is permitted provided the power level does not exceed 50% of rated power and the Nuclear Overpower Trip set point is reduced by 50%.

2. Delete the sentences in the basis dealing with quadrant tilt and rod out of bank beginning on page 3.10-5 with the sentence that reads, "The eight hours in 3.10.2.1 is acceptable since complete rod misalignment (part-length or full-length control rod 12 feet out of alignment with its bank) does not result in exceeding core limits in steady state operation at rated power." and ending with the sentence which reads, "A tilt ratio of 1.25 or more of undetermined cause is indicative of a serious performance anomaly and a plant shutdown is prudent." Replace

these sentences with:

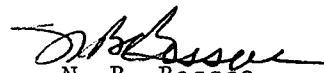
"The four hours in 3.10.2.2 are acceptable since complete rod misalignment (Part-length or full-length control rod 12 feet out of alignment with its bank) does not result in exceeding core safety limits in steady-state operation at rated power and is short with respect to probability of an independent accident. If the condition cannot be readily corrected, the specified reduction in power to 75% will ensure that design margins to core limits will be maintained under both steady state and anticipated transient conditions.

"The quadrant power tilt of 1.05 at which remedial action is required has been set so as to provide DNB and linear heat generation rate, (kilowatts/foot) protection in radial power tilts. Analyses have shown that the ratio of increase in $F_{\Delta H}^N$ to increase in quadrant power tilt is less than or equal to 2 to 1. In addition, comprehensive dropped and static ejected rod testing performed during the initial startup program demonstrated that this ratio was less than 1.5 to 1. For conservatism, the 2 to 1 ratio is used.

"The uncertainty factor included during the initial core nuclear design is 1.10 for both F_q^N and $F_{\Delta H}^N$. Therefore, the limiting tilt has been set as 1.05. To avoid unnecessary power changes, the operator is allowed four hours in which to verify the tilt reading and/or to determine and correct the cause of the tilt. Should this action verify a tilt in excess of 1.05 which remains uncorrected, the margin for uncertainty in F_q^N and $F_{\Delta H}^N$ is reinstated by reducing the power by 2% for each percent of tilt above 1.0, in accordance with the 2 to 1 ratio above, or as required by the restriction on peaking factors.

"If instead of determining the hot channel factors, the operator decides to reduce power, the specified 75% power maintains the design margin to core safety limits for up to a 1.12 power tilt, using the 2 to 1 ratio. Reducing the overpower trip set point ensures that the protection system basis is maintained for sustained plant operation. A tilt ratio of 1.12 or more is indicative of a serious performance anomaly and a plant shutdown is prudent."

Very truly yours,


N. B. Bessac
Manager
Nuclear Generation

DBW/za

cc: Mr. C. D. Barham
Mr. B. J. Furr
Mr. S. Grant