AEC DISTRIBUTION FOR PART 50 DOCKET MATERIAL
(TEMPORARY FORM)

CONTROL NO: 2992

FROM:	DATE OF DOC:	DATE REC'D	LTR	MEMO	RPT	OTHER
Carolina Power & Light Co. Raleigh, N.C. 27602 E. E. Utley	5-8-72	6-1-72	x			
TO:	ORIG	CC	OTHER	SENT AEC PDR X SENT LOCAL PDR X		
Mr. Bloch	1					
CLASS: (U) PROP INFO	INPUT	NO CYS REC'D		DOCKET NO:		
	X	1		50-261		

DESCRIPTION:
Ltr trans the following:

ENCLOSURES:
"Results of Controlled & Uncontrolled Axial Xenon Oscillation Test" & Change to Tech Specs for H.B. Robinson Unit No. 2

PLANT NAMES: H.B. Robinson Unit No. 2

(1 cy ea encl rec'd)

DO NOT REMOVE
ACKNOWLEDGED

FOR ACTION/INFORMATION 6-1-72 AB

BUTLER(L) W/ Copies	KNIEL(L) W/ Copies	VASSALLO(L) W/ Copies	ZIEMANN(L) W/ Copies	KNIGHTON(ENV W/ Copies
CLARK(L) W/ Copies	SCHWENCER (L) W/ Copies	H. DENTON W/ Copies	CHITWOOD(FM) W/ Copies	W/ Copies
GOLLER(L) W/ Copies	STOLZ(L) W/ Copies	✔SCHEMEL(L) W/6 Copies	DICKER(ENVIRO) W/ Copies	W/ Copies

INTERNAL DISTRIBUTION

✔REG FILES	STELLO-L	VOLLMER-L	KARAS-L- L/A PWR
~~AEC PDR~~	MOORE-L	DENTON-L	MASON-L- L/A BWR
✔REG OPER (2)(3)XX	LANGE-L	GRIMES-L	BROWN-L- L/A PWR
✔OGC-RM P-506	PAWLICKI-L	GAMMILL-L	WILSON-L- L/A PWR
✔MUNTZING & STAFF	✔THOMPSON-L	KNIGHTON-ENVIRO	KARI-L- L/A BWR
GIAMBUSSO-L	TEDESCO-L	DICKER-ENVIRO	SMITH-L- L/A BWR
BOYD-L-BWR	LONG-L	PROJ LDR ENVIRO:	GEARIN-L- L/A BWR
✔DEYOUNG-L-PWR	LAINAS-L		DIGGS-L- L/A
MULLER-L-ENVIRO	SHAO-L	~~SALTZMAN-IND.~~	TEETS-L- L/A
✔SKOVHOLT-L-OPER	BENAROYA-L	McDONALD-PLANS	WADE-L- L/A ENVIRO
KNUTH-L	MORRIS-RO	NUSSBAUMER-FM	BRAITMAN-A/T
MACCARY-L	✔DUBE-L	SMILEY-FM	
Schroeder	E.CASE	P. Collins	

EXTERNAL DISTRIBUTION

✔1-LOCAL PDR Hartville, S.C.

1-SAN/LA/NY--PDR

✔1-DTIE-(LAUGHLIN)
✔1-NSIC-(BUCHANAN)
1-ASLB-YORE/SARYE
WOODWARD/H. ST
1-C. MILES-C-459, GT
✔16 CYS ACRS-HOLDING

9-NATIONAL LAB'S
ANL/ORNL/BNWL
1-R. CARROLL-OC, GT
1-R. CATLIN, A-170, GT
1- CONSULTANT'S
NEWMARK/BLUME/AGBABIAN
1- Dr. Levine
Brookhaven National Lab.

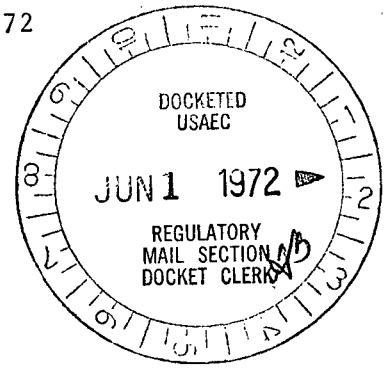
1-CHIEF WATER REACTORS
1-RD.... E. Hall, F-309 GT

Regulatory File Cy.

Carolina Power & Light Company

Raleigh, North Carolina 27602

May 8, 1972



Mr. Edward J. Bloch
Directorate of Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

TECHNICAL SPECIFICATION CHANGE REQUEST - PART LENGTH RODS
FACILITY LICENSE NO. DPR-23
DOCKET NO. 50-261

Dear Mr. Bloch:

It is requested that the Technical Specifications for H. B. Robinson Unit No. 2 be changed to authorize operations of the unit with either a 4 or 8 part-length control rod bank.

Our letter of March 31, 1971 discussed certain non-safety related operational difficulties encountered with the use of a bank of eight part-length control rods during low power physics testing of the H. B. Robinson Unit No. 2. Additional special tests were conducted and results also presented in the referenced letter demonstrating the adequacy of using a bank of four part-length rods at low power to control the axial power distribution and avoid the operational difficulties encountered with the use of eight part-length rods.

At that time, the remaining concern was the adequacy of a bank of four part-length rods to cope with severe maldistributions of xenon and the resulting oscillatory behavior of the axial power distribution which could occur at high power levels.

A special test procedure was written to demonstrate the operational adequacy of a bank of four part-length rods to suppress such oscillatory power behavior. This test was conducted under the temporary Technical Specification change No. 3 to DPR-23 issued by you on May 27, 1971 and extended to September 15, 1971 by your telegram of September 4, 1971.

Satisfactory power distribution control was achieved during this test following a carefully controlled introduction of a severe maldistribution of xenon. Discussion of this test and results are presented in Enclosure A, "Results of Controlled and Uncontrolled Axial Xenon Oscillation Test."

2992

LB

The positioning of the eight part-length control rod bank within the core is unrestricted; however, their position is subject to the requirements of maintaining axial power shape within specified limits or accept the automatic consequencies of either the overpower or overtemperature ΔT protection system operation in the event these set points are exceeded. The use of any symmetrical subdivision of the eight part-length rods offers great flexibility in positioning of these rods, less opportunity for inducing undesirable axial power shapes which could result in exceeding the mentioned set points, without expanding the existing envelope of reactor protection. In Enclosure B, a change to our Technical Specifications is proposed permitting the subdivision of the current eight part-length control rod bank into two symmetrically distributed four rod bank configurations.

Yours very truly,

E. E. Utley
Manager
Bulk Power Supply

RAW/kf

cc: Mr. C. D. Barham
Mr. G. P. Beatty
Mr. N. B. Bessac
Mr. L. E. Smith

ENCLOSURE A

RESULTS OF CONTROLLED AND UNCONTROLLED
AXIAL XENON OSCILLATION TEST

A. GENERAL TEST DESCRIPTION

Xenon induced oscillations were produced by maneuvering the part-length (P/L) rods and the controlling bank. The first oscillation was to demonstrate the ability to arrest an axial oscillation and maintain the axial offset within $\pm$ 10% using four P/L rods. The second oscillation test was a non-controlled test to measure the stability index of the axial oscillation. The approximate burnup at the time of the tests was 1680 MWD/MTU. The power level was maintained at a constant 90% level.

B. CONTROLLED OSCILLATION TEST DESCRIPTION

This test was initiated from an equilibrium condition (ΔI for this condition as indicated by N44 - ΔI meter was -8%) with control group "D" at 200 steps and the P/L rods fully withdrawn. The test was started by inserting the P/L rods to 62 steps (about 1 foot below the midplane of the core). Right after the P/L rods were positioned at 62 steps, control group "D" was inserted to 175 steps.

C. RESULTS OF CONTROLLED OSCILLATION TEST

The history of rod positioning and changes in I during this test is presented by Figures 1 and 2. Based on the response of N44 - ΔI meter indication this test demonstrated the ability of the P/L rods to control axial xenon oscillation by maintaining ΔI within the specified band of $\pm$ 9%.

D. UNCONTROLLED OSCILLATION TEST

This test was initiated immediately following the controlled xenon oscillation test. The P/L rods were at 12 steps and bank "D" at 200 steps. The perturbation for the xenon oscillation was initiated by maneuvering the P/L rods from 12 to 62 steps, and group "D" from 200 to 175 steps. After 40 minutes group "D" was repositioned to 200 steps. With this configuration oscillation was observed for 49 hours.

E. RESULTS OF UNCONTROLLED OSCILLATION TEST

The history of rod positioning and changes in ΔI is presented by Figure 3. Based on the response of N44 - ΔI meter indication the oscillation was found to be dampened with a stability index of -0.017/hr.

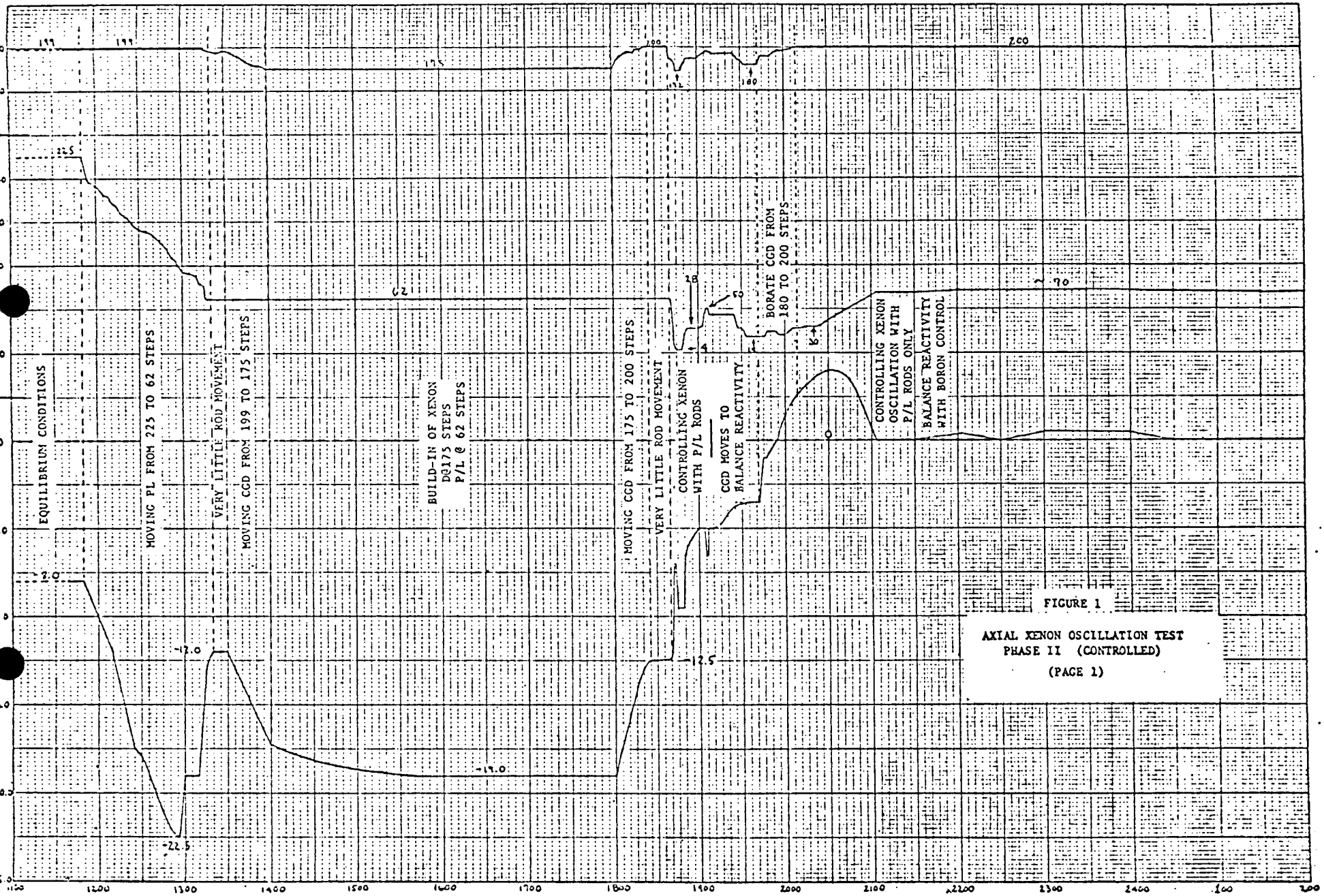


FIGURE 1

AXIAL XENON OSCILLATION TEST
PHASE II (CONTROLLED)
(PAGE 1)

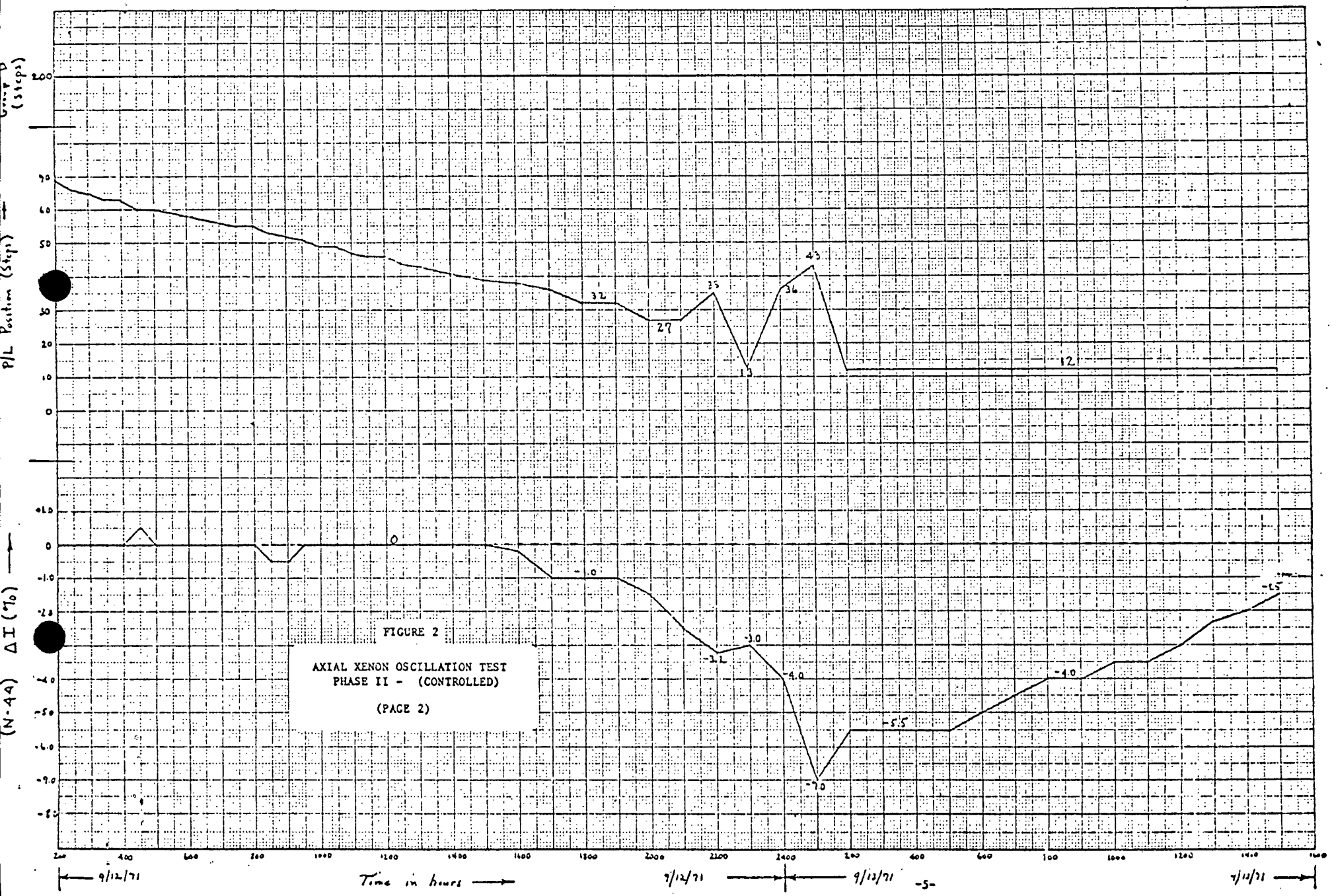


FIGURE 2

AXIAL XENON OSCILLATION TEST
PHASE II - (CONTROLLED)

(PAGE 2)

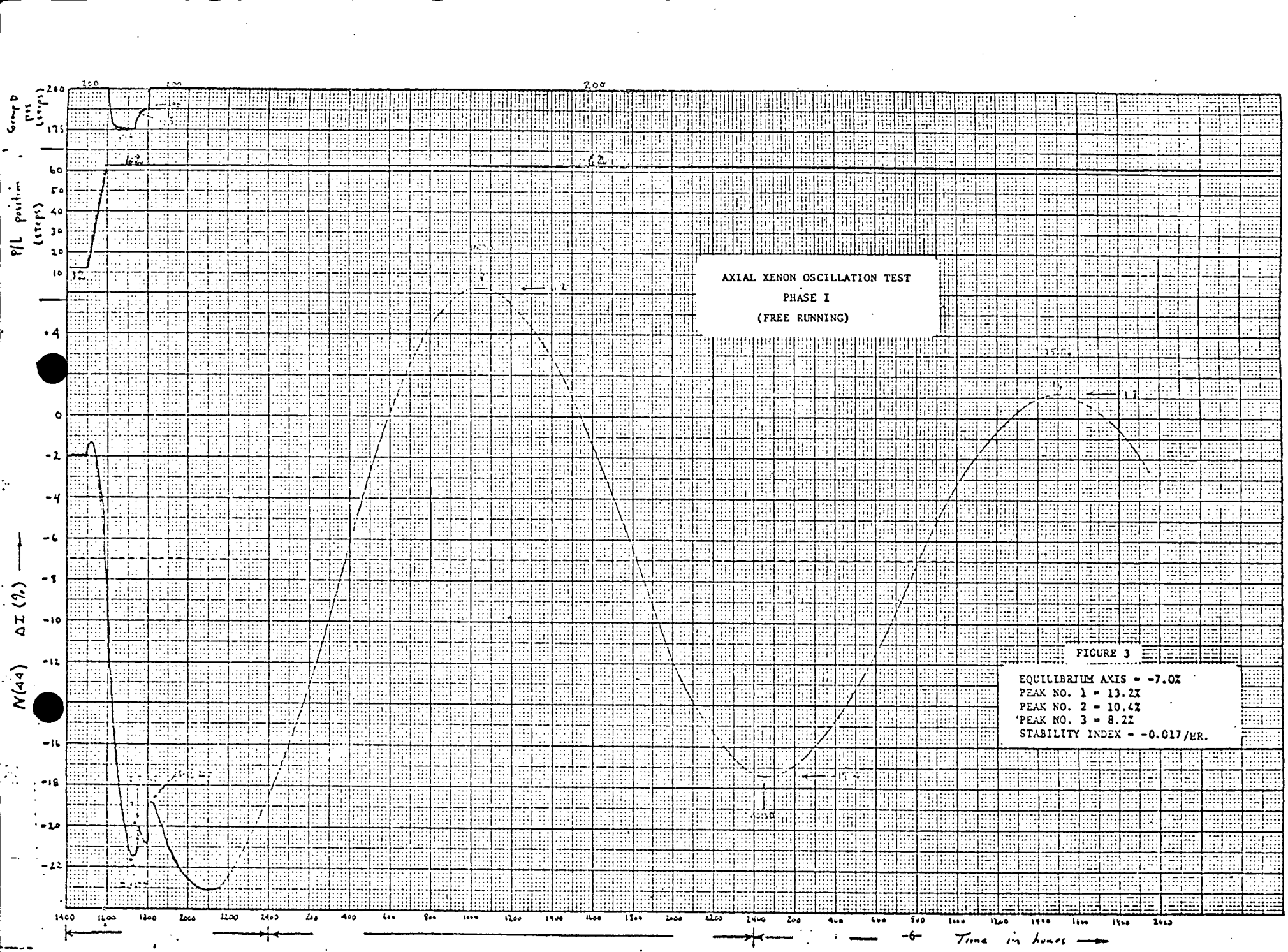


FIGURE 3

EQUILIBRIUM AXIS = -7.0%
PEAK NO. 1 = 13.2%
PEAK NO. 2 = 10.4%
PEAK NO. 3 = 8.2%
STABILITY INDEX = -0.017/HR.

ENCLOSURE B

CAROLINA POWER & LIGHT COMPANY
H. B. ROBINSON UNIT 2
DOCKET NO. 50-261

Change _____ To Technical Specifications

(Appendix A to DPR-23)

Add the following Specifications 3.10.5 on page 3.10-3.

"3.10.5 Part Length Control Rod Banks.

3.10.5.1 The eight (8) Part length control rods shall be configured under administrative control into one of the following part-length rod configurations.

a. Four part length rods occupying core positions K-6, K-10, F-6 & F-10 shall constitute a part length control rod bank, hereafter designated bank P-1.

b. Four part length rods occupying core positions P-8, H-2, H-14, & B-8 shall constitute a part length control bank, hereafter designated part-length bank P-2.

c. Eight part length rod configuration consisting of banks P-1 and P-2.

3.10.5.2 The part length control rod banks may be moved over the entire travel range, full-out to full in without restriction. Individual rods in the part length rod banks may be moved without restriction during periods of special physics testing.