FPL Energy
Seabrook Station

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Docket No. 50-443
SBK-L-06173

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Seabrook Station
Licensee Qualification for Performing
Dynamic Rod Worth Measurement Analysis

FPL Energy Seabrook, LLC (FPL Energy Seabrook) intends to use Westinghouse supplied methods to perform physics calculations in support of Dynamic Rod Worth Measurement (DRWM) for low power physics testing of Seabrook Station. This testing will take place on or about October 31, 2006. The Safety Evaluation Report issued by the Nuclear Regulatory Commission (NRC) for WCAP-13360-P-A, "Westinghouse Dynamic Rod Worth Measurement Technique," contains the requirement to provide to the NRC confirmation that the competencies to perform DRWM design calculations will be demonstrated. Attachments 1 and 2 demonstrate that these criteria have been met for Seabrook Station. Documentation of training, qualification and benchmark calculations is available for review at the Florida Power and Light, Juno Beach Headquarters, Nuclear Fuel Department.

Should you have any questions, please contact Michael Ossing, Engineering Support Manager, at (603) 773-7512.

Very truly yours,

FPL Energy Seabrook, LLC

Gene St. Pierre
Site Vice President

cc: S. J. Collins, NRC Region I Administrator
G. E. Miller, NRC Project Manager
G. T. Dentel, NRC Senior Resident Inspector

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ATTACHMENT 1
DEMONSTRATION OF THE ABILITY TO PERFORM COMPUTATIONS TO SUPPORT DYNAMIC ROD WORTH MEASUREMENTS (DRWM)

1.0 INTRODUCTION

Westinghouse performed the initial application of Dynamic Rod Worth Measurements (DRWM) at Seabrook Station on January 27, 2001. Florida Power and Light intends to perform the analytical computations necessary to support the DRWM.

ATTACHMENT 2 contains approved NRC criteria needed to be met in order to perform computations to support DRWM. Successfully meeting these criteria constitutes inherent NRC approval to use DRWM in Low Power Physics Testing (LPPT). This report demonstrates that these criteria have been met.

FPL personnel that will perform computations to support DRWM were trained by Westinghouse in these computations on January 24 through 26, 2006 and received procedures on how to perform these computations at that time. This training included the ability to set up input, understand and interpret output results, understand applications and limitations, and to perform analyses in compliance with the procedures provided by Westinghouse.

Cross sections to support DRWM computations are obtained from the PHOENIX-P lattice physics code (see Reference 1). The flux solutions for these computations are obtained from the ANC code (see Reference 2). NRC review and approval of these codes and the procedures by which FPL uses these codes is contained in Reference 3. Application of these codes and procedures, and the Westinghouse DRWM procedure, is controlled by the FPL quality assurance program defined in Reference 4. This quality assurance program meets the requirements of 10 CFR 50, Appendix B.

2.0 COMPARISON OF RESULTS

TABLE 1 provides the DRWM measured and predicted rod worths based on Westinghouse predictions for Seabrook Cycle 11 LPPT. TABLE 2 provides the DRWM measured and predicted rod worths based on FPL predictions for Seabrook Cycle 11 LPPT.

TABLE 3 compares the predicted rod worths based on Westinghouse and FPL data. TABLE 4 compares the rod worths measured by the DRWM technique using Westinghouse analytical data to support the measured data and FPL analytical data to support the measured data.

3.0 DISCUSSION OF RESULTS

Comparing Westinghouse and FPL predicted results, it can be seen from TABLE 3 that the maximum percent difference in the predicted worth of any bank is 0.1 % occurring in Bank SA, and the maximum pcm difference in the predicted worth of any bank is 0.3 pcm occurring in Bank CA. The difference in the total predicted rod worth is 0.0 % or 1.3 pcm.

Comparing measured results based on Westinghouse and FPL supporting analytical data, it can be seen from TABLE 4 that the maximum percent difference in the measured worth of any bank is 0.3 % occurring in Bank CA, and the maximum pcm difference in the measured worth of any bank is 2.0 pcm occurring in Bank CA. The difference in the total measured rod worth is 0.0 % or 0.4 pcm.

(Note that if the comparisons exceed the review criteria given in Item 4 of the document in ATTACHMENT 2, then a discussion of the differences that exceed the review criteria and the reason, or reasons, for these differences being acceptable must be addressed in this section)

4.0 CONCLUSIONS

Based on the results in Section 2.0 and the discussions of results in Section 3.0, it is concluded that the review criteria in the document in ATTACHMENT 2 have been met; therefore, FPL has demonstrated the qualification to perform their own analytical computations to support DRWM tests for future LPPT. The first application of FPL analytical computations to support DRWM in LPPT will occur with the start up of Seabrook Cycle 12 which will occur on or about October 31, 2006.

5.0 REFERENCES

1. Nguyen, T. Q., et al., Qualification of the PHOENIX-P/ANC Nuclear Design System for Pressurized Water Reactor Cores, WCAP-11596-P-A, June 1988. (Westinghouse Propriety)
2. Liu, Y. S., Meliksetian, A., Rathkopf, J. A., Little, D. C., Nakano, F., Poploski, M. J., ANC – A Westinghouse Advanced Nodal Code, WCAP-10965-P-A, September 1986. (Westinghouse Propriety)
3. Bordelon, F. M., et al., Westinghouse Reload Safety Evaluation Methodology, WCAP-9272-P-A, July 1985. (Westinghouse Propriety)
4. FPL Procedure, FPLTQAR, "Topical Quality Assurance Report".

ATTACHMENT 1
DEMONSTRATION OF THE ABILITY
TO PERFORM COMPUTATIONS TO SUPPORT
DYNAMIC ROD WORTH MEASUREMENTS (DRWM)

TABLE 1

MEASURED AND PREDICTED ROD WORTHS
BASED ON
WESTINGHOUSE PREDICTIONS

BANK	WORTH (pcm)		DIFFERENCE	
	Measured	Predicted	% (M-P/P)	pcm
CA	773.8	758.8	2.0	15
CB	670.3	626.8	6.9	43.5
CC	788.7	751.0	5.0	37.7
CD	611	574.6	6.3	36.4
SA	281.7	270.5	4.1	11.2
SB	895.7	863.1	3.8	32.6
SC	428.9	412.4	4.0	16.5
SD	430.4	411.0	4.7	19.4
SE	469.5	458.0	2.5	11.5
TOTAL	5350.0	5126.2	4.4	223.8

TABLE 2

MEASURED AND PREDICTED ROD WORTHS
BASED ON
FPL PREDICTIONS

BANK	WORTH (pcm)		DIFFERENCE	
	Measured	Predicted	% (M-P/P)	pcm
CA	775.8	758.7	2.3	17.1
CB	669.9	626.5	6.9	43.4
CC	788.4	750.9	5.0	37.5
CD	610.7	574.4	6.3	36.3
SA	281.2	270.3	4.0	10.9
SB	895.6	862.9	3.8	32.7
SC	428.9	412.3	4.0	16.6
SD	430.3	411	4.7	19.3
SE	468.8	457.9	2.4	10.9
TOTAL	5349.6	5124.9	4.4	224.7

TABLE 3

COMPARISON OF PREDICTED ROD WORTHS
BASED ON
WESTINGHOUSE AND FPL DATA

BANK	PREDICTED ROD WORTH (pcm)		DIFFERENCE	
	Westinghouse	FPL	% (U - W)/W	pcm
CA	758.8	758.7	0.0	-0.1
CB	626.8	626.5	0.0	-0.3
CC	751.0	750.9	0.0	-0.1
CD	574.6	574.4	0.0	-0.2
SA	270.5	270.3	-0.1	-0.2
SB	863.1	862.9	0.0	-0.2
SC	412.4	412.3	0.0	-0.1
SD	411.0	411	0.0	0
SE	458.0	457.9	0.0	-0.1
TOTAL	5126.2	5124.9	0.0	-1.3

TABLE 4

COMPARISON OF MEASURED ROD WORTHS
BASED ON
WESTINGHOUSE AND FPL SUPPORTING ANALYTICAL DATA

BANK	MEASURED ROD WORTH (pcm)		DIFFERENCE	
	Westinghouse	FPL	% (U - W)/W	pcm
CA	773.8	775.8	0.3	2
CB	670.3	669.9	-0.1	-0.4
CC	788.7	788.4	0.0	-0.3
CD	611	610.7	0.0	-0.3
SA	281.7	281.2	-0.2	-0.5
SB	895.7	895.6	0.0	-0.1
SC	428.9	428.9	0.0	0
SD	430.4	430.3	0.0	-0.1
SE	469.5	468.8	-0.1	-0.7
TOTAL	5350.0	5349.6	0.0	-0.4

ATTACHMENT 2
CRITERIA FOR A UTILITY PERFORMING DYNAMIC ROD WORTH MEASUREMENT (DRWM) COMPUTATIONS

In order for a utility to perform their own physics calculations to support the use of the Dynamic Rod Worth Measurement (DRWM) technique during the Low Power Physics Testing (LPPT), the following five criteria must be met. Compliance with the following five criteria demonstrates a utility's qualification and constitutes inherent NRC approval to use DRWM in their LPPT. To document its qualification, the utility must send the NRC a notification of compliance with the criteria and the date of the intended first application of the codes to determine the DRWM physics constants for LPPT. Any voluntary limitations or restrictions of the utility's use of the DRWM methodology must also be addressed in the notification. The NRC would then, at their option, audit the application of the utility's DRWM program to ensure compliance.

1) Criterion 1: Eligibility of Codes for DRWM Computations

Only lattice physics codes and methods which have received prior NRC review and approval are eligible to be used in determining the physics constants to be used in DRWM. The NRC review ensures that the codes being used for the DRWM computations were developed under a qualified QA program and were properly benchmarked and verified.

2) Criterion 2: Application of Procedures to DRWM Computations

In a manner consistent with the procedures obtained from Westinghouse, the utility analyses shall be performed in conformance with in-house application procedures which ensure that the use of the methods is consistent with the Westinghouse approved application of the DRWM methodology.

3) Criterion 3: Training and Qualification of Utility Personnel

The first application of DRWM for LPPT will be performed by Westinghouse. This will ensure that DRWM is applicable to the specific plant, provide utility personnel with training in the DRWM technique and be used to meet Criterion 4 - Comparison Calculations for the DRWM Technique. The first application of DRWM for LPPT by Westinghouse will be applicable for all of the same plant type at the plant site of application. If the fuel vendor should change subsequent to the first application, a second application by Westinghouse is not required.

Utilities shall establish and implement a training program to ensure that each qualified user of the DRWM methodology has a good working knowledge of the codes and methods used for DRWM. This training shall include the ability to set up input decks, understand and interpret output results, understand applications and limitations, and to perform analyses in compliance with the procedures provided by Westinghouse.

ATTACHMENT 2
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DYNAMIC ROD WORTH MEASUREMENT (DRWM) COMPUTATIONS

4) Criterion 4: Comparison Calculations for the DRWM Technique

Prior to the first application by a utility using their own methods to perform physics calculations in support of DRWM for LPPT, the utility will demonstrate its ability to use the methods supplied by Westinghouse by comparing its calculated results with the analyses and results obtained by Westinghouse during the first, or subsequent, application(s) of DRWM at the utility's plant. These comparisons must be documented in a report which is part of the utility's QA records. Any significant differences between the calculations and the comparison data must be discussed in the report. As a minimum, the following parameters should be compared to the supplier of the DRWM methodology calculations, and should agree within the given acceptable deviation:

Parameter	Acceptable Deviation
Calculated Bank Worth	±2% or ±25 pcm
Calculated Total Worth of All Banks	±2%
Measured Bank Worth Obtained for First Application	±2% or ±25 pcm
Measured Total Worth Obtained for First Application	±2%

5) Criterion 5: Quality Assurance and Change Control

All calculations for DRWM by a utility using the Westinghouse methodology which has been approved by the NRC shall be conducted under the control of a quality assurance program which meets the requirements of 10 CFR 50, Appendix. The utility QA program will also include the following:

a) A provision for implementing changes in the methods and procedures being used for DRWM.

b) A provision for informing Westinghouse of any problems or errors discovered while using the DRWM[1] methods or procedures.

[1] Westinghouse has a requirement to inform utilities performing DRWM calculations of changes to the DRWM process.