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POWER & LIGHT

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February 12, 1985

W3P85-0387
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A4.05

Director of Nuclear Reactor Regulation
Attention: Mr. D. M. Crutchfield,
Assistant Director for Safety Assessment
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: Waterford 3 SES
Docket No. 50-382
Review Material for Basemat Monitoring Program

REFERENCE: Letter W3P84-3414, K. W. Cook to G. W. Knighton, dated
December 7, 1984

Dear Mr. Crutchfield:

Two areas have been identified by the NRC Staff as requiring LP&L action with regards to the issue of cracks in the Nuclear Plant Island Structure Common Foundation Basemat. This letter provides draft material to be reviewed and discussed with the NRC Staff prior to finalization of a program to monitor the Waterford 3 basemat.

The NRC Staff filings with the Atomic Safety and Licensing Appeal Board have indicated the need for a monitoring and surveillance program. LP&L has committed (reference letter) to provide to the NRC Staff, prior to exceeding 5% power, a monitoring and surveillance program for the basemat. LP&L has also committed that, following NRC Staff review and approval, LP&L will not modify the program without prior approval of the NRC Staff. A draft program is attached which addresses the following elements:

1. Settlement of the basemat
2. Ground water chemistry
3. Seasonal variation of ground water levels
4. Crack Surveillance

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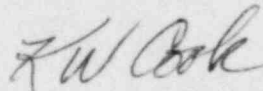
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A meeting has been scheduled for February 13, 1985 to discuss the draft program and resolve any differences prior to submittal of the program plan to the NRC Staff.

If you need further information regarding the proposed program, please contact me.

Very truly yours,



K.W. Cook
Nuclear Support & Licensing Manager

KWC:sms

cc: R.D. Martin, NRC-Region IV
G.W. Knighton, NRC-NRR
J.H. Wilson, NRC-NRR
NRC Resident Inspectors Office
INPO Records Center (D.L. Gillispie)
E.L. Blake
W.M. Stevenson

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bcc: R. S. Leddick, F. J. Drummond, R. P. Barkhurst, T. F. Gerrets,
D. E. Dobson, R. F. Burski, S. A. Alleman, L. R. Storz, J. N. Woods,
R. M. Nelson, W. A. Cross, R. A. Savoie, G. E. Wuller

Project Files, Administrative Support (2), Licensing Library, Onsite
Licensing Files

Ebasco - M. K. Yates, A. M. Cutrona, J. Hart, G. G. Hofer

CE - J. W. Veirs

NUCLEAR PLANT ISLANDS STRUCTURE

COMMON FOUNDATION BASEMAT MONITORING PROGRAM

GENERAL

The monitoring program for the Nuclear Plant Island Structure (NPIS) Common Foundation Basemat has been established to provide continuing assurance of basemat integrity. The program provides for data collection and trending such that information will be available to conduct a detailed evaluation and correlation of data should this become necessary or desirable. The elements monitored were chosen to reflect relationships among the parameters. For example, cracking could result from induced stress caused by differential settlement of the foundation. Should an unexpected indication be observed, the data can be used to identify potential causes, and allow an accurate assessment of the structural integrity of the basemat.

PROGRAM OVERVIEW

The Basemat Monitoring Program established to demonstrate continued integrity is divided into four major areas. The criteria will provide overall assurance that changes in observable and measurable phenomena will be detected and that sufficient data is available to evaluate the causes and effects with respect to the basemat integrity. The program elements are:

- A. Basemat Settlement
- B. Ground Water Chemistry
- C. Seasonal Variation of Groundwater Level
- D. Crack Surveillance

The program is implemented using approved Plant Operating Manual procedures to conduct the necessary surveillances.

SURVEILLANCE METHODOLOGY

- A. Basemat Settlement. This portion of the program is essentially an extension of the data taken during the past several years. Elevation data is taken on selected monitoring points and differential settlement is checked between key monitoring points. FSAR Figure 2.5-117 shows the previously used monitoring points and the associated settlement. Prior to fuel load, some monitoring point locations were revised and additional points added. Several sets of concurrent data on the old and new monitoring points were taken to provide correlation data between the points. The monitoring points were revised to facilitate measurements during plant operation considering accessibility from an ALARA and Security standpoint. Enclosure (1) provides an overview of the selected monitoring points and the calculations made to determine differential settlement. As shown in the enclosure a one inch criteria is used as a threshold beyond which additional evaluation is required. This criteria is relative to the baseline data taken prior to fuel load.

Presently the elevation data is taken through surveys conducted on a quarterly basis. Similar to other equipment monitoring programs such as Steam Generator Tube Inspection (Technical Specification 3.4.4) and Snubbers (Technical Specification 3.7.8) the monitoring interval will be lengthened provided no significant changes are observed and no adverse or unexplained data has been observed. Three consecutive, satisfactory surveillances are required to extend the interval to the next interval stated below. The intervals are: (as used within Technical Specifications)

Q At least once per 92 days

SA At least once per 184 days

A 12 months

R At least once per 18 months

- B. Groundwater Chemistry. Actual corrosion in the groundwater surrounding the basemat is highly unlikely given the normal groundwater chemistry found in the vicinity of Waterford 3, and the minimal contact between the water and rebar. Nonetheless, water samples are taken and analyzed for chloride content from wells provided for this specific purpose. Enclosure (2) shows the locations of the wells with respect to the basemat. A conservative threshold of 250 ppm chloride has been established beyond which more extensive water analyses and/or evaluation is required to determine the potential impact on rebar corrosion.

Samples are presently being taken and analyzed each quarter. Several samples have shown that chloride content is well below the 250 ppm threshold and stable around 30 ppm. It is intended to extend the interval of chemical samples in the same manner as the basemat settlement provided the chloride content is below the threshold and shows no significant change from the previous sample. This provides assurance that long term natural changes are detected as well as groundwater contamination from an external source.

- C. Seasonal Variation of Groundwater Level. Groundwater level measurements will be taken and maintained to provide data in the event that evaluation of other observed basemat phenomena becomes necessary. These measurements will be taken on a quarterly basis. The wells established for groundwater sampling provide a means to determine the groundwater level.
- D. Significant Cracking. All currently observable cracks in the basemat have been mapped, although due to inaccessibility and floor finish some existing cracks may still be undetected. State-of-the-art NDT inspections, calculations, and evaluations have determined that existing cracking does not imply any degradation of the designed structural integrity. To provide further assurance that basemat integrity is not degraded from some unanticipated mechanism or postulated event from this time on, a program associated with basemat cracks has been established. The program includes obtaining quantitative data on changes in crack width.

The quantitative program will consist of taking precision measurements on representative cracks that are chosen based on visual appearance, crack depth and accessibility. These cracks will be "the most significant cracks" for comparison purposes. These cracks will be instrumented similar to that shown in Enclosure (3) which allows detection of any changes in crack width. A change in crack width, should any occur, will be used in two ways.

The crack monitoring activities also include a visual inspection of the previously mapped cracks and inspection of accessible areas of the basemat for additional cracks. Additional cracks and changes to existing cracks are updated on the crack maps.

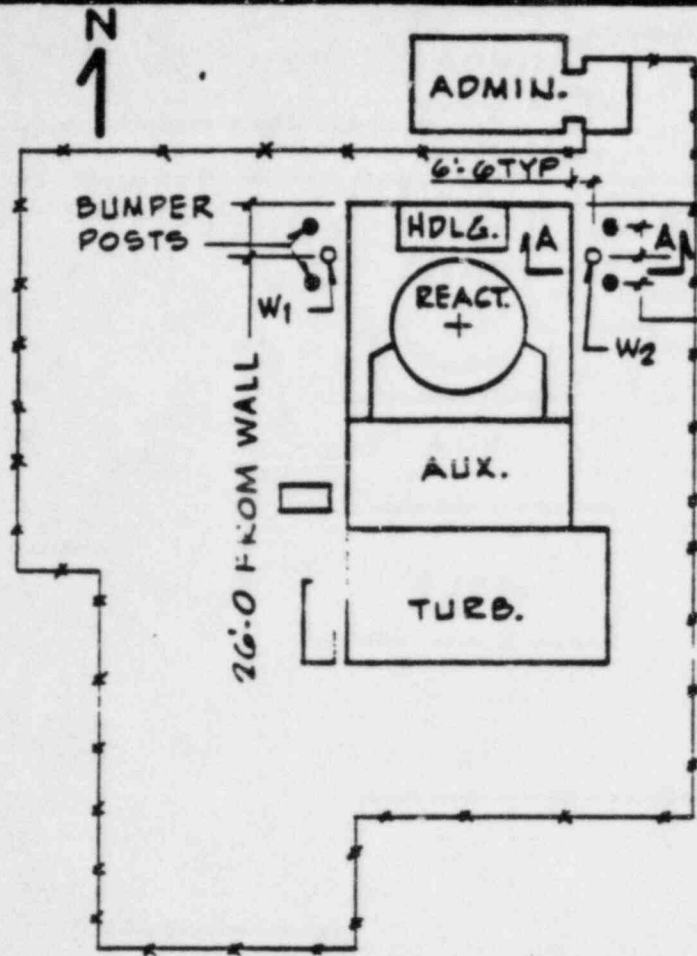
The cracks in the vertical walls were investigated by the Non-Destructive Examination (NDE) program using ultra sound. These cracks were identified as being shallow and probably resulting from shrinkage. They are not related to the cracks in the basemat. Brookhaven National Laboratory (BNL) agrees that "...cracks in the vertical walls are no longer considered a problem." Therefore, LP&L does not propose to either map the cracks in vertical walls or to monitor their length, width, or other characteristics.

FOUNDATION BASEMAT DIFFERENTIAL SETTLEMENT MONITORING

	Monitoring* Points	Differential Calculation** Basemat Edge Relative to Shield Building
Shield Building	A (East Side)	
Monitoring Points	B (West Side)	
Basemat	NE (Northeast)	[A-NE]
Corner	SE (Southeast)	[A-SE]
Monitoring	SW (Southwest)	[B-SW]
Points	NW (Northwest)	[B-NW]
Basemat	E1 (East)	[A-E1]
Edge	E2 (East)	[A-E2]
Monitoring	W1 (West)	[B-W1]
Points	W2 (West)	[B-W2]

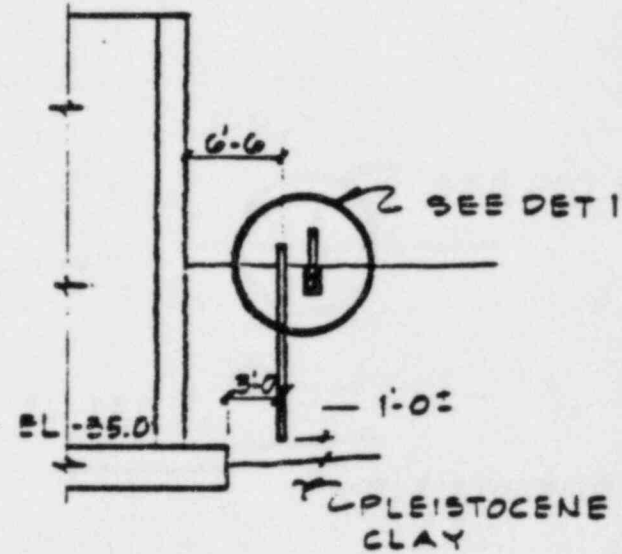
*Monitoring points may be located on the Basemat or on the walls above the Basemat to facilitate measurements. Monitoring points may be relocated after original baseline measurements provided the correlation of the new and old monitoring points is measured and recorded to enable comparison to the baseline data.

**Baseline Calculations shall be taken prior to initial unit operation. Subsequent calculations shall be compared to the baseline calculation data. Changes from the baseline calculation of less than or equal to one inch are acceptable.



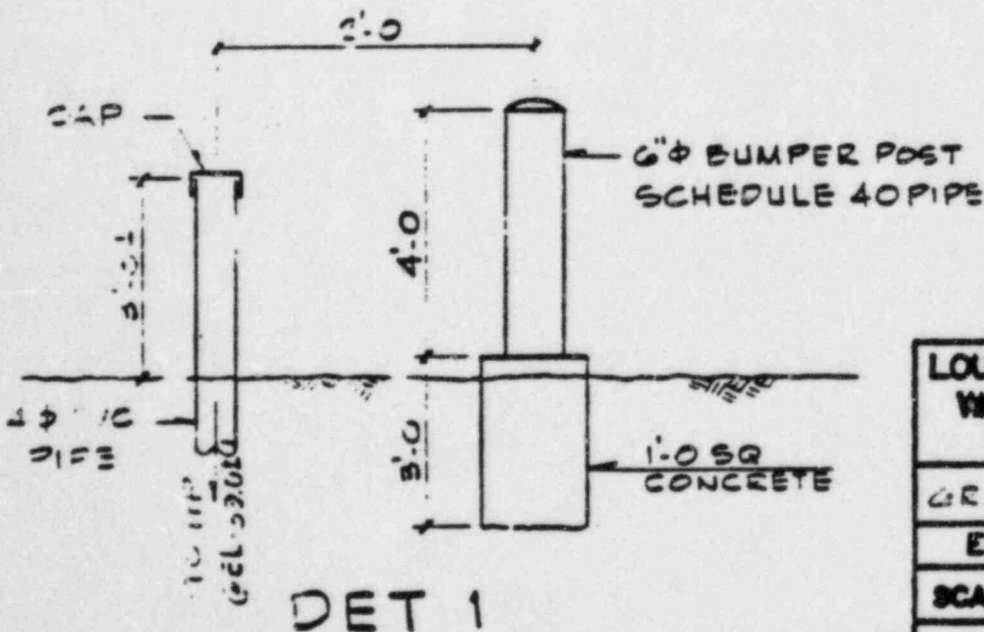
PLAN

21'-0 FROM WALL



SECT A

NOTE
 6" ± MAXIMUM HORIZONTAL
 DEVIATION OF GROUNDWATER
 SAMPLING WELL BETWEEN:
 POINT OF ENTRY AT GRADE LEVEL
 AND BOTTOM OF WELL.



DET 1

LOUISIANA POWER & LIGHT COMPANY		
WATERFORD S.E.S UNIT NO. 3		
1983-1165 MW INSTALLATION		
GROUNDWATER SAMPLING WELLS		
EBASCO SERVICES INC.-FIELD		
SCALE	RELEASED	DATE 5-20-
DIV. <u> </u>	<u> </u>	FIELD SKETCH
DR. <u> </u>	5/22/84	SK 1564
CH. <u> </u>		3.1.1-A-14

NO.	DATE	REVISION	BY	CH.	RELEASED
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ASSEMBLY FOR MONITORING THE PROPAGATION OF
THE CRACK WIDTH

