OCT 20 1981

Docket No.: 50-389

APPLICANT: Florida Power and Light Company, (FP&L)

FACILITY: St. Lucie Plant, Unit 2

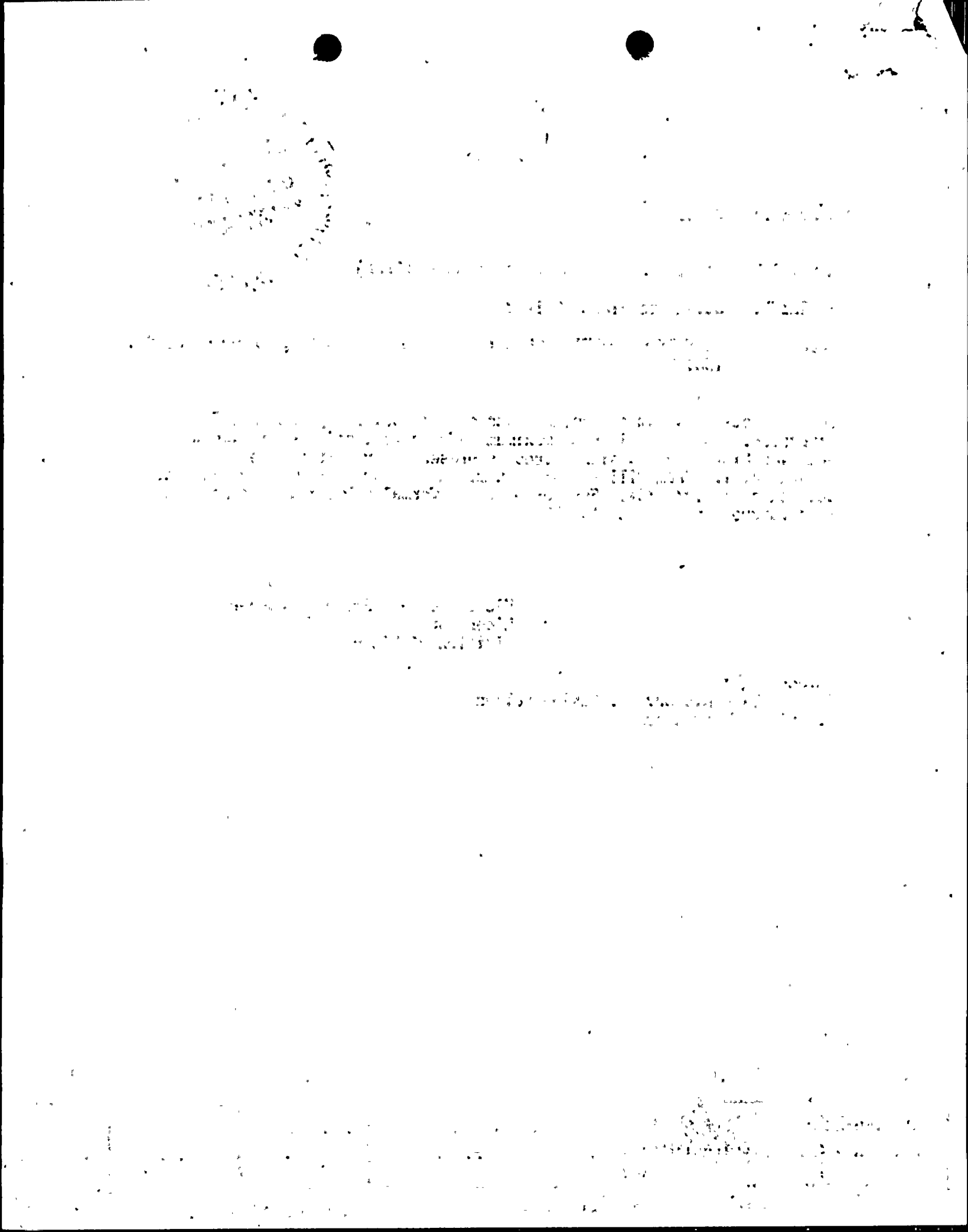
SUBJECT: SUMMARY OF MEETING HELD IN BETHESDA, MD. WITH FP&L ON OCTOBER 15, 1981

In the meeting, seismic displacements of Category I supports was fully discussed. The comparison of maximum differential seismic displacements, DBE time history vs. design values as presented by FP&L is provided in Attachment 1. FP&L will formally submit the attached for our review and acceptance by 10/30/81. Furthermore, the formal submittal will be placed in a future amendment to the FSAR.

Victor Nerses, Project Manager
Licensing Branch No. 3
Division of Licensing

Attachments:
1. DBE Time History Vs. Design Values
2. List of Attendees

OFFICE	DL:LB#3	DL:LB#3					
SURNAME	VNerses:jb	FJMiraglia					
DATE	10/20/81	10/22/81					



MEETING SUMMARY DISTRIBUTION

Docket File
NRC PDR
Local PDR
NSIC
TERA
LB#3 Reading
H. Denton
E. Case
D. Eisenhut
R. Purple
B. J. Youngblood
A. Schwencer
F. Miraglia
J. Miller
G. Lainas
R. Vollmer
J. P. Knight
R. Bosnak
F. Schauer
R. E. Jackson
Project Manager V. Nerses
Attorney, OELD
J. Lee
OIE (3)
ACRS (16)
R. Tedesco

G. Lear

S. Pawlicki
V. Benaroya
Z. Rosztoczy
W. Haass
D. Muller
R. Ballard
W. Regan
R. Mattson
P. Check
M. Srinivasan
O. Parr
F. Rosa
W. Butler
W. Kreger
R. Houston
T. Murphy
L. Rubenstein
T. Speis
W. Johnston

S. Hanauer
W. Gammill
T. Murley
F. Schroeder
D. Skovholt
M. Ernst

NRC Participants:

H. Brammer
J. Rajan
R. Bosnak
V. Nerses
H. Polk

K. Kniel
G. Knighton
A. Thadani
D. Tondi
J. Kramer
D. Vassallo
P. Collins
D. Ziemann
E. Adensam

bcc: Applicant & Service List

Dr. Robert E. Uhrig, Vice President
Advanced Systems and Technology
Florida Power & Light Company
P. O. Box 529100
Miami, Florida 33152

Harold F. Reis, Esq.
Lowenstein, Newman, Reis, Axelrad & Toll
1025 Connecticut Avenue, N.W.
Washington, D.C. 20036

Norman A. Coll, Esq.
Steel Hector & Davis
1400 Southeast First National
Bank Building
Miami, Florida 33131

Mr. Martin H. Hodder
1131 N. E. 86th Street
Miami, Florida 33138

Resident Inspector
St. Lucie Nuclear Power Station
c/o U. S. Nuclear Regulatory Commission
7900 South A1A
Jensen Beach, Florida 33457

ATTACHMENT 1

COMPARISON OF MAXIMUM DIFFERENTIAL SEISMIC DISPLACEMENTS, DBE TIME HISTORY VS. DESIGN VALUES, ST. LUCIE UNIT 2

On St Lucie Unit 2, the design values for displacement of structures not on a common mat were computed by a SRSS summation of maximum response spectra displacements. The maximum response spectra values are based on enveloping maximum response spectra displacements of each building considering a range of various soil properties. In response to the NRC's request for justification of these design values, various scoping studies have been performed to determine appropriate values for maximum expected displacements at St Lucie Unit 2. These values are compared to those actually used in the pipe stress analysis calculations.

Scoping Studies Summary

1). The most realistic indication of the true differential seismic displacements can be seen by comparing the time history values between two points on different structures and calculating the maximum difference. Inherent in this comparison are two assumptions for adjacent structures:

   1. Motion of the two structures begin in-phase.

   2. Differential ground motion between the two structures are negligible.

   Table 1 indicates these maximum diffference values for two cases: for a piping system going from elevation 28'-0" in the reactor building (RB) to elevation 18'-6" in the reactor aux building (RAB) and for a system from elevation 48'-0" in the RB to 42'-6" in the RAB. These two cases are typical for piping between these two buildings. Note that the time history values are in all cases substantially less than the St Lucie Unit 2 design values.

2). In order to account for any additional displacements resulting from inaccuracy due to the two assumptions stated above, the time history values have also been combined by maximum summations of the values as a function of time. As would be expected, these absolute sum displacements are greater than those calculated previously. However, as shown in Table 1, these values are in all cases less than the St Lucie Unit 2 design values.

3). An additional parameter that could be considered is variation in time interval. The time history earthquakes were generated using a time interval of .005 sec. This could be "spread" by 20% analagous to the peak spreading employed for repsonse spectra. Thus time histories with intervals from .004 to .006 sec would be considered. This spreading would account for uncertainties in design assumptions.

Table 2 indicates that even assuming a 20% time interval spread, the maximum differential displacements are in all cases less than the St Lucie Unit 2 design values.

4). Finally, the displacment values from the "spread" time history have been combined by the maximum sum method.

As shown in Table 2, the design values are in all cases within 15% of the values determined by this technique. The maximum difference is less than 1/8".

Discussion

Seismic displacement is a secondary stress when applied to piping systems and is combined with other stresses to determine the total effect. For supports and penetrations, seismic displacement is a primary load. However, this is combined with several other primary loads. Variations in the magnitude discussed above would have negligible impact on the total system and would therefore not require any further evaluation.

It should also be noted that the deviation in displacement values exists only for the .006 sec time interval. The .006 sec time interval reflects a 20% increase above the base case of .005 sec to correspond to the spectra broadening that was used on St Lucie Unit 2. However, this interval could be reduced to 15% and be in compliance with the Standard Review Plan. The effect would be to reduce or eliminate the deviation between the time history value and the design value.

Conclusion

Based on the comparisons presented in Tables 1 and 2 and the discussions above, the specific seismic displacement design values developed for St Lucie Unit 2 are acceptable. This conclusion would apply to all the penetrations listed in Table 3.

TABLE I

COMPARISON OF TIME HISTORY DISPLACEMENTS TO DESIGN VALUES

DIRECTION	MAX. ABS SUM	MAX. DIFF	DESIGN VALUE
	DISPLACEMENTS BETWEEN RB EL 28'-0" & RAB EL 18'-6"		
N-S	0.0484'	0.0462'	0.0515'
E-W	0.0462'	0.0426'	0.0522'
VERT	0.0371'	-0.0286'	0.0372'
	DISPLACEMENT BETWEEN RB EL 48'-0" & RAB EL 42'-6"		
N-S	0.0615'	0.0593'	0.0649'
E-W	0.0591'	0.0531'	0.0625'

NOTE: MAX. ABSOLUTE SUMMATION IS THE MAXIMUM VALUE FOUND BY ADDING OF THE ABSOLUTE VALUE OF THE DISPLACEMENT OF ONE BUILDING TO THE ABSOLUTE VALUE OF THE DISPLACEMENT OF THE OTHER BUILDING BOTH TAKEN AT THE SAME TIME OVER THE DURATION OF THE SEISMIC EVENT.

MAX. DIFFERENCE IS THE MAXIMUM VALUE FOUND BY ALGEBRAIC SUMMATION OF THE DISPLACEMENTS OF ONE BUILDING TO THE DISPLACEMENT OF THE OTHER BUILDING BOTH TAKEN AT THE SAME TIME OVER THE DURATION OF THE SEISMIC EVENT.

TABLE 2
ST. LUCIE #2

~~MAXIMUM SEISMIC DISPLACEMENT COMPARISON~~
EFFECT OF ΔT VARIATION
ON COMPARISON OF TIME HISTORY DISPLACEMENTS TO DESIGN VALUES

DESIGN VALUES

~~DBE TIME HISTORY~~				~~DBE RESPONSE SPECTRA~~		
	ΔT	ABS SUM (FT)	MAX. DIFF. (FT)	RB EL28'-0"	RAB EL.18'-0"	~~SRSS~~
N-S	.004	.0457@T=4.748	.0391@T=5.816			
DISP. BETWEEN RB EL28'-0" & RAB EL18'-6"	.005	.0484@T=6.680	.0462@T=7.090			
	.006	.0567@T=8.418	.0414@T=8.406	.0405'	.0318'	.0515
VERT	.004	.0357@T=5.564	.0309@T=5.632			
DISP. BETWEEN RB EL28'-0" & RAB EL18'-6"	.005	.0371@T=6.535	.0286@T=5.915	.0304'	.0214	.0372
	.006	.0431@T=8.478	.0364@T=8.772			
E-W	.004	.0410@T=3.892	.0392@T=5.788			
DISP. BETWEEN RB EL28'-0" & RAB EL18'-6"	.005	.0462@T=7.11	.0426@T=6.80	.0408'	.0325'	.0522
	.006	.0590@T=8.418	.0394@T=7.302			
N-S	.004	.0551@T=4.752	.0496@T=5.816	RB EL48'-0"	RAB EL42'-6"	
DISP. BETWEEN RB EL48'-0" & RAB EL42'-6"	.005	.0615@T=6.685	.0593@T=7.095	.0508'	.0402'	.0649
	.006	.0713@T=8.430	.0528@T=8.40	.....	.....	.....
E-W	.004	.04806@T=5.792	.04806@T=5.792			
DISP. BETWEEN RB EL48'-0" & RAB EL 42'-6"	.005	.0591@T=7.115	.0531@T=6.795	.0512'	.0358'	.0625
	.006	.0728 @T=8.418	.0502@T=8.418	.....	.....	....

TABLE 3

ATTACHMENT 2

MEETING NRC/EBASCO/FP&L

OCTOBER 15, 1981

ST. LUCIE 2 SRSS

NAME	ORGANIZATION
Patrick Carier	FPL/EPP/Licensing
Paul Grossman	Ebasco - Ass't Proj. Eng.
William F. Brannen	FPL/EPP/Civil
H. L. Brammer	NRC/DE/MEB
J. Rajan	NRC/DE/MEB
R. J. Bosnak	NRC/DE/MEB
V. Nerses	NRC/DL/LB#3
Harold Polk	NRC/DE/SEB
J. Burket	Ebasco/Civil
Bill Fan	Ebasco/S.A.
N. S. Huang	Ebasco/C.E.
Erroll W. Dotson	FPL/EPP/Project
Remo W. Gritz	FPL/PP/Project
Alvin Boehm	Ebasco/Stress Analysis