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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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PLANT VOGTLE - UNITS 1, 2
NRC DOCKETS 50-424, 50-425
OPERATING LICENSES NPF-68, NPF-81
SETTLEMENT MONITORING PROGRAM

References:

1. Letter GN-1368, dated May 22, 1987
2. Letter SL-3002, dated August 3, 1987
3. Letter GN-1398, dated September 22, 1987
4. NRC letter, dated October 20, 1987, M. A. Miller to J. P. O'Reilly

Gentlemen:

The settlement of safety-related structures at the Vogtle Electric Generating Plant is monitored through an established program as defined in FSAR Section 2.3.4.13.2. This program includes specific provisions for the reading of settlement markers and for the engineering evaluation of settlement data.

In October 1987, approval was obtained from the NRC staff to reduce the reading frequency from 60 days to six months for 58 plant settlement markers, most of which are located in Unit 1 structures. The remaining markers continue to be read at 60-day intervals. However, we have reviewed our settlement program and determined that further modifications can be made which will continue to provide ample data for settlement evaluation while reducing the amount and difficulty of the work involved.

The proposed modifications to the settlement monitoring program are as follows:

- Change the reading frequency on 56 of the most stable markers on the Unit 2 side (west of the plant centerline) and nine additional markers on the Unit 1 side, from 60-day intervals to six-month intervals. Affected markers are located in completed areas where neither concrete placement nor backfilling have recently occurred.

- Discontinue the readings of 5 markers associated with the radwaste solidification building.

- Discontinue the engineering review of basemat deformation and structural tilt.

Drawings To: Reg File 1
LPDR 1
NRC PDR 1
Pm (J. Hopkins) 2

A001
1/5

The justification for the proposed reading frequency modification is as follows:

1. Readings of the affected markers (see attached Table 1) have been essentially stable for at least 12 months. This can be verified by reviewing the settlement drawings provided with the attached Appendix A. These drawings, which show the graphical plot of settlement as a function of time, demonstrate that the settlement of these markers has essentially leveled off. A comparison of the actual measured total settlements of the major seismic Category I structures to the predicted maximum values is included for information in the attached Figure 1.

2. The attached sketch, SK-2-C-330, provides a plan view of the major power block structures and shows those markers whose reading frequency is proposed to be changed from 60-day intervals to 6-month intervals by this request, as well as those whose reading frequency has already been changed by our previous request. Most of the Unit 1 markers and a few of the Unit 2 markers which are shown were approved by the NRC staff in October 1987 (References 1, 2, 3 and 4). The placement of all backfill, concrete and equipment loads is complete with the exception of the high density fuel racks and water loads in the west pool of the fuel handling building which are forecast for August 1989.

3. Where the affected markers have been used to calculate differential settlement between structures, the gross differential settlement is low. These low differential values are shown in Table 2 (also attached). These differential values are typically calculated from the date both markers were first monitored, not merely subsequent to the installation of piping.

4. The differentials which have been measured are substantially less than the predicted differentials for which the piping has been analyzed. It can be seen from Table 2 that in the unlikely event that relatively substantial differentials were to develop in the future at these interfaces, enough margin remains so that piping would not be overstressed.

The above data demonstrate that no changes are likely to occur within a six month period which would affect our evaluation of the settlement data.

The radwaste solidification building is not used, nor is it planned to be used in the near future. All pipes which pass from the building to the tunnel are not utilized and have been abandoned in place. Therefore, we propose to discontinue the readings for all markers associated with the radwaste solidification building, i.e., markers 158, 159, 160 and 161 in the radwaste solidification building and marker 155 in the radwaste tunnel.

These 5 markers have never shown any unusual settlement and their settlement has stabilized, as can be seen from the drawings of Appendix A. Although we plan to discontinue their readings, the markers will be retained so that they will be available if readings are required at some future date.

Basemat deformation due to differential settlement within a structure is addressed by developing contours of equal measured settlement for the large power block structures and estimating the amount of basemat deformation relative to the tilt of the structure as a whole. This is done by determining the maximum net slope of the deflection curve (δ/L) relative to the structure tilt for key sections through the basemat and comparing this value to published criteria. Deformations represented by a maximum net slope of less than 1/670 are so small that no further review is required (reference FSAR Question 241.18).

An example of the calculation of the maximum δ/L ratio for a structure, in this case the auxiliary building, is shown in Figure 2. This is an update of FSAR Figure 241.18-3.

The maximum δ/L values determined for applicable VEGP structures as of January, 1989 are as follows:

Auxiliary Building	1/3917
Fuel Handling Building	1/2773
Control Building	1/3720

The largest δ/L ratio is 1/2773 for the fuel handling building. This is well below the value of 1/670 previously discussed. Therefore, the effects of differential settlement on the VEGP structures are negligible and further review of basemat deformation and structural tilt is not required.

It should be noted that only those structures whose size resulted in the installation of a large number of markers were suitable for the development of contours. However, since the effects of differential settlement on large structures is negligible and the data typically indicate that the remaining structures are settling uniformly, the effects of differential settlement on the remaining structures is also negligible.

We would appreciate your timely review and concurrence of these changes to our settlement monitoring program.

Sincerely,

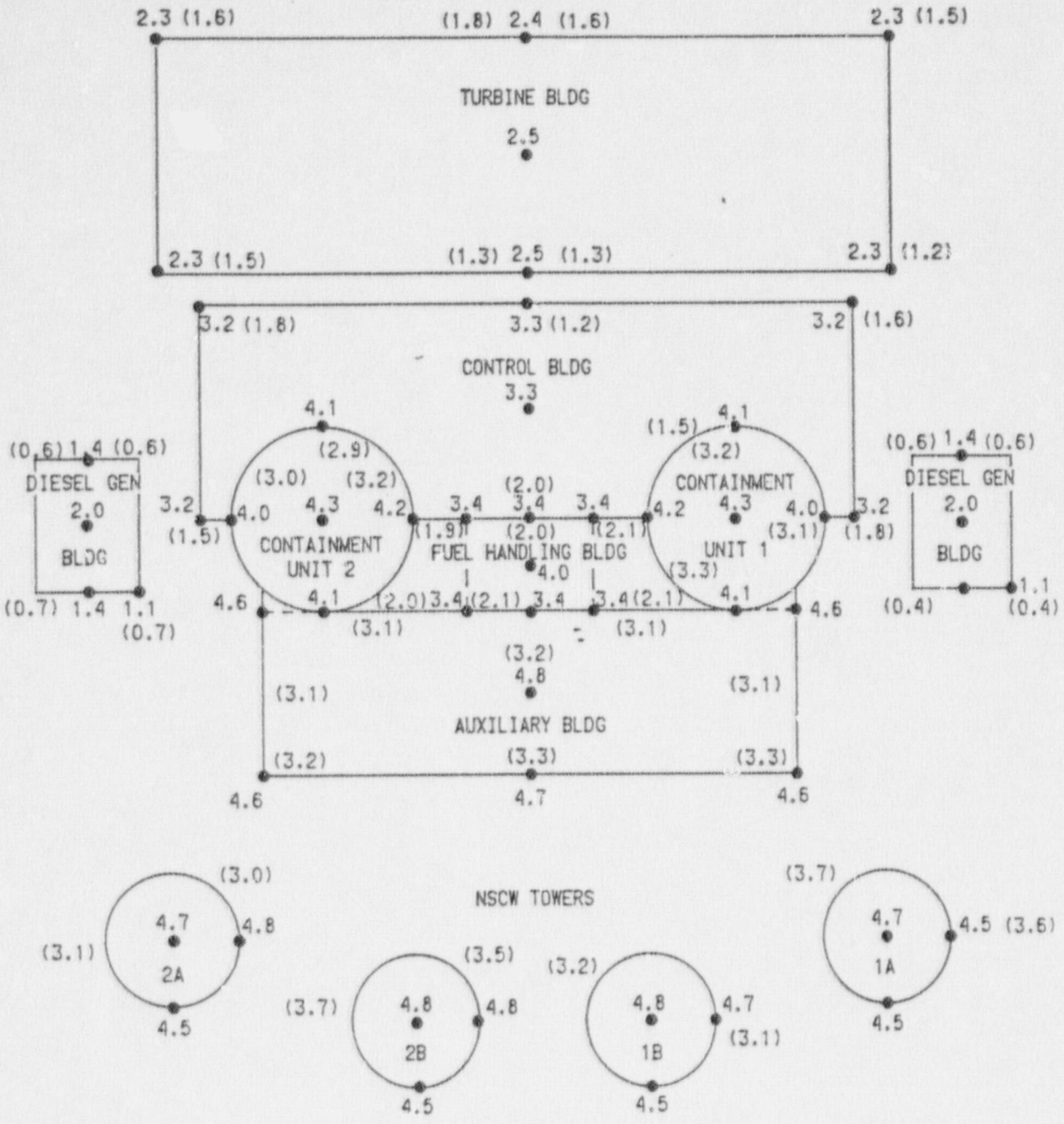
W. G. Hairston, III

Georgia Power

WGH, III/JAB/gm

Attachment
xc: Georgia Power Company
Mr. C. K. McCoy
Mr. G. Bockhold, Jr.
Mr. R. M. Odom
Mr. J. P. Kane
NORMS

U. S. Nuclear Regulatory Commission
Mr. S. D. Ebneter, Regional Administrator
Mr. J. B. Hopkins, Licensing Project Manager, NRR
Mr. J. F. Rogge, Senior Resident Inspector, Vogtle



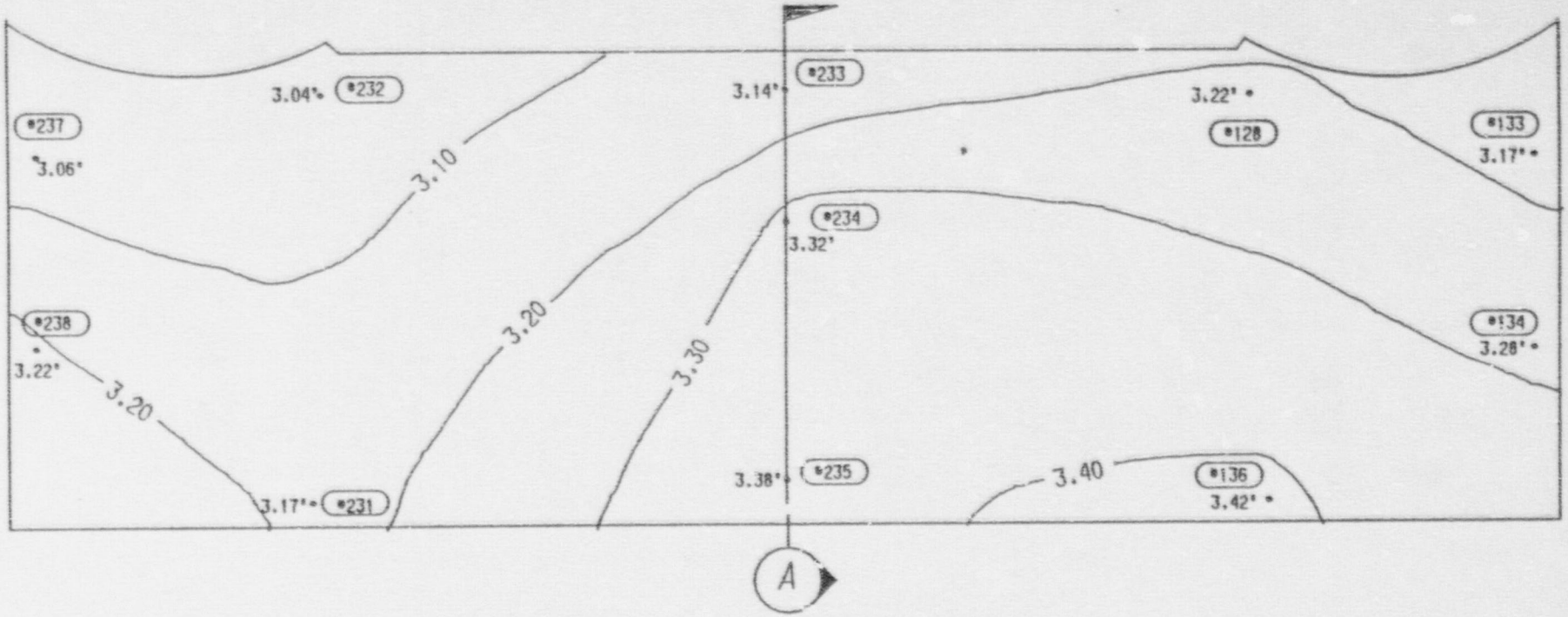
● 4.2 -TOTAL SETTLEMENT IN INCHES - PREDICTED MAXIMUM

(3.1) - TOTAL SETTLEMENT IN INCHES - ACTUAL JANUARY, 1989

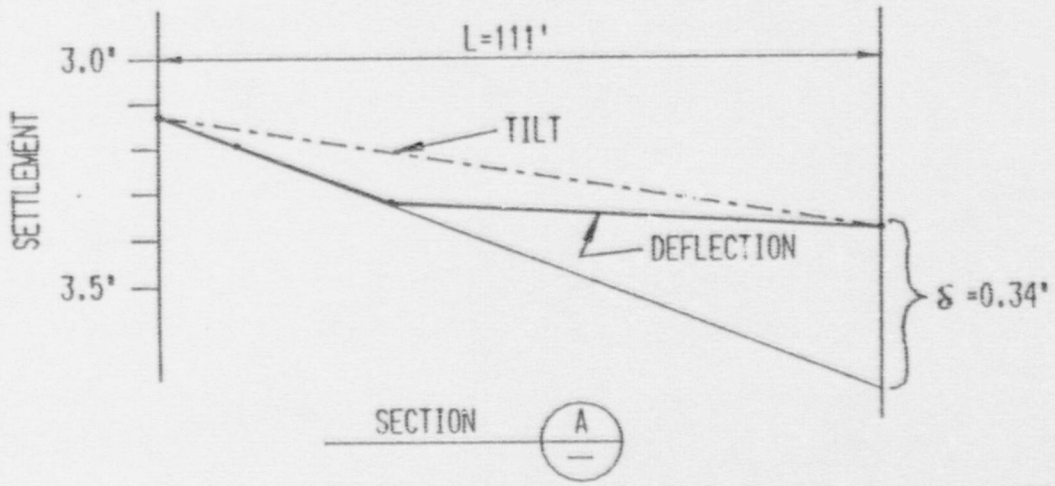
FIGURE 1

SETTLEMENT OF UNITS 1 AND 2

POWER BLOCK STRUCTURES



AUXILIARY BUILDING BASEMAT - PLAN VIEW



$$\left(\frac{\delta}{L}\right)_{MAX} = \frac{0.34}{111(12)} = \frac{1}{3917} << \frac{1}{670}$$

$$\text{TILT} = \frac{3.38 - 3.14}{111(12)} = .00018 \text{ RADIANS}$$

FIGURE 2
AUXILIARY BUILDING SETTLEMENT
AND SLOPE DEFLECTION

TABLE 1

LIST OF MARKERS WHOSE READING FREQUENCY WILL BE REDUCED FROM ONCE EVERY 60 DAYS TO ONCE EVERY 6 MONTHS

Marker No.	Location - Unit 1
140	NSCW Tower and Valvehouse
142	"
1003	"
1005	"
193	Category I Tunnels
194	"
192	Category I Tanks
133	Auxiliary Building
136	"

Marker No.	Location - Unit 2
200	Turbine Bldg. (Non Cat. I)
20[illegible]	"
203	"
204	"
205	"
262	"
263	"
264	Mainsteam Tunnel (Non Cat. I)
265	"
267	"
219	Control Building
221	"
222	"
224	"
266	"
269	"
241	Category I Tunnels
268	"
270	"
271	"
272	"
273	"
274	"
279	"
280	"
288	"

TABLE 1 (Continued)

LIST OF MARKERS WHOSE READING FREQUENCY WILL BE REDUCED FROM ONCE EVERY 60 DAYS TO ONCE EVERY 6 MONTHS

Marker No.	Location - Unit 1
289	Category I Tunnels
291	"
292	"
294	"
234	Auxiliary Building
225	Containment Building
226	"
427	"
247	Auxiliary Feedwater Pumphouse
248	"
249	Diesel Generator Building
250	"
251	"
252	"
253	Diesel Fuel Oil Storage Tank Pumphouse
254	"
295	"
296	"
239	Category I Tanks
240	"
255	"
256	"
290	"
242	NSCW Tower and Valvehouse
246	"
259	"
297	"
298	"
299	"
2001	"

TABLE 2

INTERFACES TO BE READ AT REDUCED (6-MONTH) FREQUENCY

(Based On Readings Taken In January, 1989)

Marker Interface	Structure Interface	Actual Differential[1] (inch)	Minimum Differential Used In Piping Design (inch)
192/193	Reactor Makeup Water Storage Tank/Tunnel 1T2B	0.03	0.5
194/140	Tunnel 1T2B, 5B/NSCW Valvehouse	0.04	0.5
194/1003	"	0.01	0.5
222/226	Control/Containment	0.02	0.6
222/427	"	0.19	0.6
224/225	"	0.11[2]	0.4
289/299	Tunnel 2T2B,5B/NSCW Valvehouse	0.07	0.5
289/244	"	0.06	0.5
290/291	Reactor Makeup Water Storage Tank/Tunnel 2T2B	0.09	0.5
288/292	Tunnel 2T2B/Tunnel 2T2B	0.02	0.3
241/297	Tunnel 2T2A,5A/NSCW Valvehouse	0.10	0.5
241/2[illegible]	"	0.07	0.5
293/294	Tunnel 2T2A,5A/Tunnel 2T2A,5A	0.01	0.3
279/280	Tunnel 2T3A/Tunnel 2T2A,5A	0.05	0.3
273/2[illegible]4	Tunnel 2T3B/Tunnel 2T3B	0.01	0.3
252/271	Diesel Gen. Bldg/Tunnel 2T3A	0.07	0.5
249/272	Diesel Gen. Bldg/Tunnel 2T3B	0.10	0.5
252/296	Diesel Gen. Bldg/Diesel Fuel Oil Storage Tank Pumphouse	0.06	0.5
251/254	Diesel Gen. Bldg/Diesel Fuel Oil Storage Tank Pumphouse	0.12	0.5
251/270	Diesel Gen. Bldg/Tunnel 2T4A,4B	0.16	0.5
250/270	"	0.14	0.5
248/255	Aux. Feedwater Pumphouse/Condensate Storage Tank	0.12	0.5
247/256	Aux. Feedwater Pumphouse/Condensate Storage Tank	0.00	0.5
268/269	Tunnel 2T4A,4B/Control	0.17	0.6
266/267	Control/Mainsteam Tunnel	0.25	0.6
265/204	Mainsteam Tunnel/Turbine	0.13	0.5
264/263	"	0.23	0.5
264/262	"	0.02	0.5

(1) Calculated from the first date that both markers were monitored except for marker interface 224/225.

(2) Calculated from pipe installation date.

APPENDIX A

LIST OF SETTLEMENT DRAWINGS

Drawing No.	Revision No.
AX2D55V001	17
" V006	15
" V007	18
" V008	18
" V009	14
" V010	18
" V011	18
" V012	13
" V013	14
" V017	10
" V018	11
" V019	11
" V020	9
" V024	7
" V025	5
" V026	7
" V027	7
" V028	8
" V029	7
" V030	7
" V031	3
" V032	3
" V033	2
" V034	1
" V035	1
" V050	7
" V051	7
" V052	8
" V053	7
" V054	7
" V055	7
" V056	8
" V057	7
" V058	7
" V059	6
" V060	6
" V061	7
" V062	6
" V063	6
" V064	1
" V065	1
" V066	1
" V067	1
" V068	1
SK-2-C-330	B

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