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December 1, 1978

Georgia Power
the southern electric system

Director of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

NRC DOCKET 50-366
OPERATING LICENSE NPF-5
EDWIN I. HATCH NUCLEAR PLANT UNIT 2
TECHNICAL SPECIFICATIONS - BUILDING SETTLEMENT

Gentlemen:

The Plant Hatch Unit 2 Technical Specifications, as issued June 13, 1978, contained a requirement on Table 3.7.8-1 to establish and report to the Commission by November 1, 1978, allowable differential settlements for the Class 1 structures listed in the table. Our letter of October 20, 1978, requested an extension of the deadline to December 1, 1978, in order to more accurately specify the allowable values.

The attached proposed revision to Specification 3/4.7.8 is an outgrowth of the requirement to establish and report differential settlement values on Table 3.7.8-1. The proposed changes to the Technical Specifications being submitted to comply with the above requirement have been reviewed and approved by the Plant Review Board and the corporate Safety Review Board and has been determined not to involve an unreviewed safety question.

Therefore, as required by Technical Specification 3/4.7.8 and 10 CFR 50.59 (c)(1), pursuant to 10 CFR 50.90, Georgia Power Company hereby proposes an amendment to the Technical Specifications (Appendix A to the Operating License).

Yours very truly,

Chas. F. Whitmer

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Attachments

Sworn to and subscribed before me this 1st day of December, 1978.

Notary Public

My Commission Expires Sept. 29, 1982

xc: Mr. Ruble A. Thomas
George F. Trowbridge, Esquire

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SUPPORTING INFORMATION FOR
PROPOSED TECHNICAL SPECIFICATIONS
SETTLEMENT OF CLASS I STRUCTURES

1.0 Scope

The proposed Technical Specifications for allowable settlement are presented in four tables: a) the total settlement of each structure is measured and compared with the predicted settlement to assess the accuracy of the settlement predictions and to obtain an indication of settlement trends; b) differential settlement across each building is measured to assess the tilt of the building and to compare this value with the allowable tilt derived from static and seismic considerations; c) the differential settlement of penetration - structure to soil; and d) the differential settlement of penetrations between adjacent structures. The last two categories are concerned with the allowable movements of pipes and pipe anchors and supports in which calculations of stress analysis are compared with settlements measured at nearby benchmarks.

2.0 Settlement Measurement

Measurements of structure movements were obtained by periodically reading the elevations of benchmarks established generally at the beginning of construction. Settlement versus time curves for each structure, except the Intake Structure, have been developed. (Only one benchmark was originally set on the Intake Structure and its date of establishment is presently not known; four new benchmarks were set in July, 1978). In the case of the Powerblock buildings, the curves are drawn from the end of May, 1976, the date of completion of Reactor Unit No. 2. For the Main Stack and Diesel Generator Building, the curves are drawn from a somewhat earlier date. The total measured settlement of each structure was obtained by averaging the settlements at each benchmark. These average measured settlements in most cases represent the total settlements since the beginning of construction, although the settlement records are not always clear on precisely at what stage of foundation construction the monitoring started. In the case of the Radwaste building, settlement records were initiated well after the start of construction.

3.0 Comparison of Predicted vs. Measured Settlement

The ratios of the measured settlements to the predicted and allowable settlements are highest at the Control and Intake Structures; these were constructed earlier than the Unit 2 buildings and have had correspondingly longer to settle. No significant settlement of either of these structures has occurred in the last two years. It can be observed that the settlement curves have flattened out. As predicted, the large majority of settlement appears to have taken place during construction due to the mainly granular nature of the foundation soils. In short, all evidence points to the fact that any settlement of the structures in the future will be small; the actual values are unlikely to reach the predicted values.

Settlement predictions were made by the Soils and Foundations Consultant to Georgia Power Company, Law Engineering Testing Company, for the Unit 2 Reactor, Turbine and Radwaste Buildings, and for the Control Building, Intake Structure

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3.0 Comparison of Predicted vs. Measured Settlement (Cont'd)

and Main Stack. The predictions utilized stress values calculated in accordance with the Westergaard theory and considered stress overlap from all the nearby foundations. For stress calculation purposes, the loads imparted to the foundations were considered to be structural dead loads plus live loads. The soil compressibility characteristics were determined by one-dimensional laboratory consolidation tests. The Reactor, Radwaste and Turbine analyses predicted settlement in terms of immediate settlement, total consolidation settlement, and consolidation after construction settlement.

Comparison of the predicted settlement values with the allowable values specified in the Technical Specification as it presently exists indicates that the allowable settlement values are identical to the predicted settlements in the case of the Reactor and Radwaste Buildings and 0.5 in. greater for the Main Stack, and the Control and Diesel Generator Buildings. There seems to be no reason why allowable settlement values should be the same as or be a function of predicted settlement. In fact, the term "allowable total settlement" is meaningless in the present context, except where total settlement is associated with differential settlement, as discussed later. It is therefore proposed that, in the Technical Specification, the term "allowable" be replaced by "predicted", and the predicted values be used for total settlement.

4.0 DIFFERENTIAL SETTLEMENTS ACROSS STRUCTURES

4.1 Allowable Differential Settlements

To establish allowable differential settlements across the Category I buildings, the foundations are assumed to be completely rigid. As the building settles, the entire structure moves vertically and/or rotates as a plane rigid body. The allowable differential settlement values place a limit on the amount of rotation of each building as settlement occurs. Two criteria were developed to cover the buildings under consideration; the choice of criterion is based primarily on distance to adjacent buildings. The criteria are summarized on Table 1.

The first criterion covers structures which are not in close proximity to other buildings, i.e., the Main Stack, the Intake Structure, and the Diesel Generator Building. The criterion developed limits the tilt of the building to insure the appearance and proper functioning of all operating systems and equipment. In order to satisfy this criterion, a limiting settlement profile slope of 0.002 radians was used to calculate allowable differential settlements between the established benchmarks in the corners of each building. The 0.002 slope value is for structures with rigid foundations and is tabulated in the Navy Design Manual[1].

(1)"Soil Mechanics, Foundations, and Earth Structures", NAVFAC DM-7, Department of the Navy, Naval Facilities Engineering Command, 1971.

4.1 Allowable Differential Settlements (Cont'd)

The second criterion applied to structures concentrated in the Powerblock and separated by a gap of three inches from surrounding structures. Included in this group are the Control Building, Turbine Building Units 1 and 2, Reactor Building Units 1 and 2, and the Radwaste Building Unit 2. The criterion developed for these structures limits the tilt of each building to insure that two adjacent buildings do not touch during a possible Operating Basis Earthquake (OBE).

Based on the allowable slopes derived for the buildings, the allowable differential settlement values were calculated between the established benchmarks in each of the Category I buildings.

4.2 Measured Differential Settlements

To determine the actual differential settlements which have occurred to date, reference elevations must be established for the benchmarks in each building. A reference elevation is defined here as an elevation which can be compared with current survey elevation readings to indicate the existing degree of differential settlement. These reference elevations are based on the survey readings taken at the approximate structure completion date of each building. This date corresponds to the time when the structure is assumed to be properly aligned, both with respect to itself and to any adjacent building. Existing differential settlement will be measured from this reference date and compared with the allowables.

For those cases where a benchmark location has been altered in the field since the completion date of the building, an adjustment must be made to the reference elevation. This adjustment insures that the reference elevation can be compared directly with the current readings to establish differential settlement.

Using the reference elevations and the latest survey values, the settlement of each benchmark from the reference date to the present can be determined. A comparison of settlement values of any two benchmarks within a building will provide the differential settlement between the benchmarks.

4.3 Comparison of Allowable and Measured Settlements

Comparison of the existing and allowable differential settlements of the Category I structures of Unit 2 indicates that there has been little differential settlement to date, and that the existing settlement is well below the allowable differential settlement values for each of the buildings examined.

5.0 PENETRATION DIFFERENTIAL SETTLEMENTS

5.1 Allowable Differential Settlements

The amount of differential movement each penetration can withstand before the pipe or pipe anchor (or support) becomes overstressed was computed for penetrations entering the building directly from the soil and for penetrations passing between adjacent buildings. Either the pipe or the pipe anchor can become overstressed due to penetration settlement.

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5.1 Allowable Differential Settlements (Cont'd)

For pipes, the allowable stress criterion[2] is:

$$\frac{iM_D}{Z} \leq 3.0\ S_c$$

where i = stress intensification factor

Z = pipe section modulus

M_D = moment due to building settlement

S_c = allowable stress in cold condition

For anchors, the allowable stress criterion is:

$$M_D \leq M_{\text{anchor design}}$$

or $$\sigma \leq \sigma_{\text{allowable}}$$

where $M_{\text{anchor design}}$ = moment from pipe stress analysis (seismic, thermal)

$\sigma_{\text{allowable}}$ = particular allowable stress in anchor parts (bearing, bending, bolt shear, etc.)

For penetrations leading from the structure into the soil, the moments in the pipes and anchors produced by building settlement were computed by one of three methods. The first method is more conservative by assuming the pipe anchor to be rigid; with this assumption, small settlements will tend to produce large stresses in the pipe and anchor. The second method assumes a degree of flexibility in the anchor; moments are obtained from a computer calculation using a pipe stress program. The third method assumes changes to have been made in the pipe anchors to allow more flexibility, and also requires computer solution.

For penetrations passing between adjacent structures, the moments in the pipes and anchors produced by the differential movements of the structures were computed by one of the two methods outlined in Table 2. Again, the first method is more conservative by assuming rigid anchors and double-acting hangers. The second method assumes a degree of flexibility in the anchors and considers single-acting hangers, where applicable.

If the first method indicated a high allowable penetration settlement value, no further computations were made. If the first method assumptions produced a small allowable settlement value, then the assumptions of the second method were utilized. In all of the penetrations analyzed except at the Intake Structure, methods 1 or 2 indicated allowable settlements large enough to present no major measurement problems in the future life of the plant. At the Intake Structure, allowable

(2) Criterion defined by ASME Boiler and Pressure Vessel Code, Section 3, Nuclear Power Plant Components, NC-3652.3(b), 1977 Edition.

5.1 Allowable Differential Settlements (Cont'd)

settlements calculated by methods 1 or 2 were unacceptably low. The Intake Structure penetrations were re-analyzed by assuming that anchors and supports were modified to allow more flexibility in the pipe; fixity was assumed to be approximately 10 pipe diameters outside the walls (method 3). This analysis, assuming the modifications, produced acceptably high allowable penetration settlements.

5.2 Measured Differential Settlements

Differential settlements of the penetrations since installation were measured by assuming the settlement of the penetration to be the same as the settlement of the nearest benchmark. For each penetration leading from the structure into the soil, reference was made to the appropriate settlement curve to obtain the maximum settlement which had occurred since the date of penetration completion. It should be noted that the maximum settlement is not necessarily the settlement between the penetration completion date and the present. The settlement pattern of most of the benchmarks is presently nearly level, with dips and peaks; maximum settlement frequently occurs in one of the dips established prior to the present.

For penetrations passing between adjacent structures, the settlement of the benchmarks closest to the penetration on both structures must be considered. The settlement curves of the two benchmarks from date of penetration installation to present are compared. Review of the curves indicates that maximum differential settlement does not necessarily occur on the most recent date.

5.3 Comparison of Allowable and Measured Settlements

The ratios of the maximum measured settlement to the allowable settlement for the penetration pipes and anchors have been calculated. It is evident that, at present, the measured settlements exceed about 30 percent of the allowable in only isolated cases, and the majority are less than 20 percent of the allowable. These low ratios reflect two related factors: first, the majority of the penetrations have been installed within the last two years; and second, settlement values over the last two years have been very small. In general, the small ratios are more a function of small measured settlements than large allowable settlements.

6.0 TECHNICAL SPECIFICATIONS

In the following paragraphs, the proposed format and content of the Technical Specifications for structure settlement are presented and discussed. The approach to the proposed Technical Specifications has been to select a controlling or limiting value of allowable settlement (a) for each structure in the case of total settlement, (b) for each direction across each structure in the case of differential settlement across structures, and (c) for each structure or pair of adjacent structures in the case of pipe penetration. It is felt, given the range of allowable settlements that selection of a single limitng value for each category of settlement would be, by necessity, over-conservative.

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6.1 Total Settlement of Structures

For proposed Technical Specifications for total settlement of each structure, the term "predicted" replaces the term "allowable" used in the existing specification, and the predicted values are used. If the total measured settlement value for a building (obtained by averaging the individual benchmark values for the building) reaches the predicted value, an engineering evaluation of the situation should be conducted to ascertain whether new settlement trends have developed and what effect, if any, further settlement will have on the structure. As noted in Section 3.0, no significant settlement has occurred in the past two years. Thus, a requirement to place the unit in cold shutdown if the existing allowable value is exceeded is unnecessary and overly severe due to the slow pace at which total settlement is occurring and is expected to occur in the future. The proposed engineering evaluation to be performed, should total settlement reach the predicted value, provides a mechanism to assure the continuing integrity of the Class I structure and the systems within.

6.2 Differential Settlement Across Structures

The proposed Technical Specification for differential settlement across structures includes the allowable differential settlement in both the north-south and east-west directions for each building. Included are the reference dates after which the settlements should be measured. If the maximum measured value of differential settlement of any building in any direction reaches 75 percent of the allowable value, it should be determined whether the buildings are in fact leaning towards each other; since the allowable values take no account of the differential slope direction, the buildings could be leaning away from each other or leaning in the same direction. If it is established that the buildings are leaning towards each other, an engineering evaluation of the situation should be conducted to ascertain whether new settlement trends have developed and what action can be taken.

6.3 Penetration Differential Settlements

The proposed Technical Specifications for penetration differential settlements between structure and soil and between structures includes the reference dates after which the settlements should be measured.

The values of allowable penetration differential settlement are based upon the allowable values for the controlling penetrations. The controlling penetrations are those which would approach becoming overstressed first if excessive settlement should occur. In the case of the Reactor Building, values of allowable settlement corresponding to two benchmarks are given, since penetrations leading from the Reactor Building to the soil are nearest to either Bechmark Nos. 1 or 2. A similar situation exist for the Intake Structure with three benchmarks, and for the Reactor-Radwaste penetrations.

If the maximum measured value of penetration differential settlement reaches 75 percent of the allowable settlement value for any limiting penetration, an engineering evaluation of the situation should be conducted to ascertain whether new settlement trends have developed and whether re-analysis of the allowable value using less conservative assumptions is feasible. If re-analysis does not produce greater allowable values, a course of remedial action, such as changing the anchoring system of the penetration in question or adjusting the pipe supports, would be considered.

7.0 CONSERVATISM IMPLICIT IN ANALYSIS

In the case of tilting of the Powerblock structures to produce potential contact between the structures in the event of an OBE, the allowable settlements presented represent the worst case. In order to touch during the earthquake, the buildings must lean towards each other and both must reach or exceed the allowable tilt simultaneously. Thus, the fact that a building has reached the maximum allowable tilt value does not necessarily mean that touching would occur during the OBE.

For penetration differential settlement between structure and soil, the conservative assumptions involve mainly soil behavior. No account is taken of the fact that some movement of the soil adjacent to the building will take place as building movement occurs. Movement of the soil with the building will reduce the amount of differential settlement between building and soil. In addition, time and relaxation effects are not taken into account. Settlement of the building is slow enough to insure that stresses built up in the soil due to penetration movement will be redistributed with time, reducing the level of stress in the pipes and anchors.

In view of the fact that the proposed changes to the Technical Specifications do not change plant systems or plant operations, the proposed Specifications do not create the possibility of new accidents or malfunctions not previously analyzed and do not increase the probability of occurrence or the consequences of accidents or malfunctions previously analyzed. Additionally, the proposed Specification has reestablished, using conservative methodology, conservative values which have increased margins of safety above those assured by the existing Specification.

8.0 POTENTIAL REMEDIAL ACTION

Where measured penetration differential settlement exceeds the allowable settlement and re-analysis of the situation does not result in increased allowable settlement values, remedial action may involve modification of the pipe and anchor set-up. Minor changes, such as removing or adjusting a hanger or increasing bolt size may be all that is required, and the operation of the plant may be basically unaffected during the alterations.

As discussed earlier, actual total settlements in excess of predicted values should not produce adverse effects and no remedial action should be required in these cases. For buildings tilting towards each other with the maximum allowable tilt, a detailed analysis should be performed to predict the effect of contact during an OBE; predictions of the damage level should be made and the potential damage effect assessed.

TABLE 1

CRITERIA FOR DETERMINING ALLOWABLE DIFFERENTIAL SETTLEMENTS ACROSS STRUCTURES

STRUCTURE	CRITERIA
Diesel Generator Building Main Stack Intake Structure	1 a. Apearance b. Equipment and System Operation
Reactor Building Unit No. 2 Control Building Turbine Building Unit No. 2 Radwaste Building Unit No. 2	2 a. Gap between buildings b. Operating Basis Earthquake

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TABLE 2

CALCULATION OF MOMENT M_D DUE TO BUILDING SETTLEMENT

Penetrations between Adjacent Structures

METHOD NO.	ASSUMPTIONS	TYPE OF CALCULATION
1	1. Rigid anchor 2. Double-acting hangers 3. Piping modeled only through 3 or 4 supports	1. Hand calculation using basic beam formulas. 2. Computer calculation
2	1. Some anchor flexibility 2. Single-acting hangers 3. Piping modeled only through 3 or 4 supports	Computer calculation

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EDWIN I. HATCH NUCLEAR PLANT UNIT 2
PROPOSED CHANGE TO TECHNICAL SPECIFICATIONS

The attached proposed change to the Technical Specifications (Appendix A to the Operating License) would be incorporated as follows:

Remove Page	Insert Page
3/4.7-31	3/4.7-31 thru
3/4.7-32	3/4.7-38

PLANT SYSTEMS

3/4.7.8 SETTLEMENT OF CLASS 1 STRUCTURES

3/4.7.8.1 TOTAL SETTLEMENT

LIMITING CONDITION FOR OPERATION

3.7.8.1 The total settlement of each Class 1 structure shall not exceed the predicted values of Table 3.7.8.1-1.

APPLICABILITY: All CONDITIONS.

ACTION:

With the total settlement of any structure reaching the predicted settlement value, conduct an engineering review of field conditions and evaluate the consequences of additional settlement. Submit a special report to the Commission pursuant to Specification 6.9.2 within 60 days, containing the results of the investigation, the evaluation of existing and possible continued settlement and the remedial action to be taken, if any, including the date of the next survey.

SURVEILLANCE REQUIREMENTS

4.7.8.1 The total settlment of each Clas I structure listed in Table 3.7.8.1-1 shall be determined to the nearest 0.01 foot by measurement and calculation:

a. At least once per 31 days;

   1. Until observed settlement has stabilized,* and

   2. Whenever previously stabilized* settlement exceeds 0.10 inch since the previous reading.

b. At least once per 6 months.

*≤ 0.10 inch from previous reading.

TABLE 3.7.8-1

PREDICTED TOTAL SETTLEMENT FOR CLASS 1 STRUCTURES

Structure	Predicted Total Settlement (Inches)
Reactor Building	4.5
Control Building	2.0
Diesel Generator Building	2.0
Main Stack	2.0
Intake Structure	2.0

3/4.7.8 SETTLEMENT OF CLASS 1 STRUCTURES

3/4.7.8.2 DIFFERENTIAL SETTLEMENT ACROSS STRUCTURES

LIMITING CONDITION FOR OPERATION

3.7.8.2 The differential settlement across structures shall not exceed the allowable values of Table 3.7.8.2-1.

APPLICABILITY: All CONDITIONS.

ACTION:

With the differential settlement across any structure exceeding 75% of the allowable settlement value, conduct an engineering review of field conditions and evaluate the consequences of additional settlement. Submit a special report to the Commission pursuant to Specification 6.9.2 within 60 days, containing the results of the investigation, the evaluation of existing and possible continued settlement and the remedial action to be taken, if any, including the date of the next survey.

SURVEILLANCE REQUIREMENTS

4.7.8.2 The differential settlement across structures listed in Table 3.7.8.2-1 shall be determined to the nearest 0.01 foot by measurement and calculation:

a. At least once per 31 days;

   1. Until observed settlement has stabilized,* and

   2. Whenever previously stabilized* settlement exceeds 0.10 inch since the previous reading.

b. At least once per 6 months.

*$\leq$ 0.10 inch from previous reading.

TABLE 3.7.8.2-1

DIFFERENTIAL SETTLEMENT ACROSS STRUCTURES

Structure	Settlement between Benchmark Nos.	Reference Date	Allowable Differential Settlement, Ft.	75% Allowable Differential Settlement, Ft.
Reactor Building Unit No. 2	1 and 2	5-76	0.033	0.025
	3 and 4	5-76	0.034	0.026
	1 and 3	5-76	0.139	0.104
	2 and 4	5-76	0.134	0.101
Radwaste Building Unit No. 2	5 and 6	10-75	0.154	0.116
	7 and 8	10-75	0.160	0.120
	5 and 7	10-75	0.132	0.099
	6 and 8	10-75	0.080	0.060
Control Building	9 and 10	1-75	0.083	0.062
	11 and 12	1-75	0.079	0.059
	9 and 11	1-75	0.251	0.188
	10 and 12	1-75	0.288	0.216
Turbine Building Unit No. 2	13 and 14	5-76	0.224	0.168
	15 and 16	5-76	0.205	0.154
	13 and 15	5-76	0.247	0.185
	14 and 16	5-76	0.281	0.211
Diesel Generator Building	17 and 18	1-75	0.424	0.318
	19 and 20	1-75	0.394	0.296
	17 and 19	1-75	0.206	0.155
	18 and 20	1-75	0.206	0.155
Main Stack	21 and 22	10-74	0.037	0.028
	21 and 23	10-74	0.046	0.035
	22 and 23	10-74	0.042	0.032
Intake Structure	24 and 25	10-74	0.208	0.156
	26 and 27	10-74	0.208	0.156
	24 and 26	10-74	0.054	0.041
	25 and 27	10-74	0.104	0.078

PLANT SYSTEMS

3/4.7.8 SETTLEMENT OF CLASS 1 STRUCTURES

3/4.7.8.3 PENETRATION DIFFERENTIAL SETTLEMENT - STRUCTURE TO SOIL

LIMITING CONDITION FOR OPERATION

3.7.8.3 The penetration differential settlement - structure to soil shall not exceed the allowable values of Table 3.7.8.3-1.

APPLICABILITY: All CONDITIONS.

ACTION:

With the penetration differential settlement - structure to soil exceeding 75% of the allowable settlement value, conduct an engineering review of field conditions and evaluate the consequences of additional settlement. Submit a special report to the Commission pursuant to Specification 6.9.2 within 60 days, containing the results of the investigation, the evaluation of existing and possible continued settlement and the remedial action to be taken, if any, including the date of the next survey.

SURVEILLANCE REQUIREMENTS

4.7.8.3 The penetration differential settlement - structure to soil listed in Table 3.7.8.3-1 shall be determined to the nearest 0.01 foot by measurement and calculation.

a. At least once per 31 days;

1. Until observed settlement has stabilized,* and

2. Whenever previously stabilized* settlement exceeds 0.10 inch since the previous reading.

b. At least once per 6 months.

*$\leq$ 0.10 inch from previous reading.

TABLE 3.7.8.3-1

PENETRATION DIFFERENTIAL SETTLEMENT STRUCTURE TO SOIL

Structure	Reference Date	Nearest Benchmark No.	Allowable Differential Settlement, Ft.	75% Allowable Differential Settlement, Ft.
Reactor Building	1-78	1	0.060	0.045
	1-78	2	0.047	0.035
Diesel Generator Building	1-78	17	0.048	0.036
Main Stack	5-74	23	0.038	0.029
Intake Structure	1-78	25	0.055	0.041
	4-76	26	0.078	0.059
	2-78	27	0.106	0.079

3/4.7.8 SETTLEMENT OF CLASS 1 STRUCTURES

3/4.7.8.4 PENETRATION DIFFERENTIAL SETTLEMENT BETWEEN ADJACENT STRUCTURES

LIMITING CONDITION FOR OPERATION

3.7.8.4 The penetration differential settlement between adjacent structures shall not exceed the allowable values of Table 3.7.8.4-1.

APPLICABILITY: All CONDITIONS.

ACTION:

With the penetration differential settlement between adjacent structures exceeding 75% of the allowable settlement value, conduct an engineering review of field conditions and evaluate the consequences of additional settlement. Submit a special report to the Commission pursuant to Specification 6.9.2 within 60 days, containing the results of the investigation, the evaluation of existing and possible continued settlement and the remedial action to be taken, if any, including the date of the next survey.

SURVEILLANCE REQUIREMENTS

4.7.8.4 The penetration differential settlement between adjacent structures listed in Table 3.7.8.4-1 shall be determined to the nearest 0.01 foot by measurement and calculation:

a. At least once per 31 days;

   1. Until observed settlement has stabilized,* and

   2. Whenever previously stabilized* settlement exceeds 0.10 inch since the previous reading.

b. At least once per 6 months.

*$\leq$ 0.10 inch from previous reading.

TABLE 3.7.8.4-1

PENETRATION DIFFERENTIAL SETTLEMENT BETWEEN ADJACENT STRUCTURES

Structure	Reference Date	Nearest Benchmark Nos.	Allowable Differential Settlement, Ft.	75% Allowable Differential Settlement, Ft.
Reactor 2 to Turbine 2	2-77	4 and 13	0.084	0.063
Reactor 2 to Control	1-78	3 and 10	0.052	0.039
Reactor 2 to Radwaste 2	11-77	2 and 5	0.089	0.067
	2-77	4 and 5	0.073	0.055
Reactor 2 to Reactor 1	1-78	1 and 29	0.044	0.033