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 AUTH. NAME: AUTHOR AFFILIATION
 MANGAN, C.V. Niagara Mohawk Power Corp.
 RECIP. NAME: RECIPIENT AFFILIATION
 SCHWENCER, A. Licensing Branch 2

SUBJECT: Forwards info re primary containment hatch boundary conditions to close out open items of NRC structural audit of 831212-16. Equipment hatch uses STRUDL code capability.

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March 30, 1984
(NMP2L 0018)

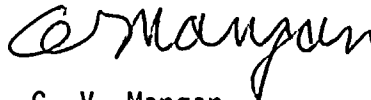
A. Schwencer, Chief
Licensing Branch No. 2
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Schwencer:

SUBJECT: Nine Mile Point Unit 2
Docket No. 50-410

Enclosed for your review are eight copies of information to close out certain open issues of the Nuclear Regulatory Commission Structural Audit. During the Structural Audit of December 12 through 16, 1983, we committed to provide this information.

Sincerely,



C. V. Mangan
Vice President
Nuclear Licensing and Engineering

CVM/TRL:lf

cc: W. Morrison
A. F. Zallnick, Jr.
M. Haughey
R. Pinney
Project File (W/Attachment)

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A PDR

Boo!
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10/10/10

Dear Sir,
I have the pleasure to inform you that your application for the position of [Job Title] has been received and is currently under consideration. We are impressed with your qualifications and would like to invite you for an interview. The interview will take place on [Date] at [Time] at [Location]. Please bring with you your CV, a recent passport-sized photograph, and any relevant certificates or references. We look forward to meeting you and discussing the details of the position further.

Yours faithfully,
[Name]
[Title]
[Company Name]
[Address]
[City]
[Country]

NINE MILE POINT UNIT 2

NRC REQUEST NO. 11

Provide a discussion on the primary containment hatch boundary conditions and the correlation of forces/displacements between the two models.

RESPONSE

The equipment hatch of the primary containment uses the finite element capability of the STRUDL computer code and is modeled with three dimensional solid finite elements (as shown in Figure 11-1).

To demonstrate the proper correlation of forces/displacements between the two models, a study was performed using as an example a load case of 45 psi internal pressure loading on the containment. The boundary conditions for this model, under axisymmetric loadings, are shown in Figure 11-2.

The forces and displacements at the edges A & B of the finite element model (FEM) (see Figure 11-2) are compared with those obtained from the axisymmetric shell analysis (Figure 11-3). The results of this study are illustrated in Figure 11-4. Additionally, the forces and displacements in the hoop direction at Edge C of the FEM are also compared for both models (as shown in Figures 11-5 and 11-6).

The results indicate that the boundary conditions for the FEM are appropriately specified.



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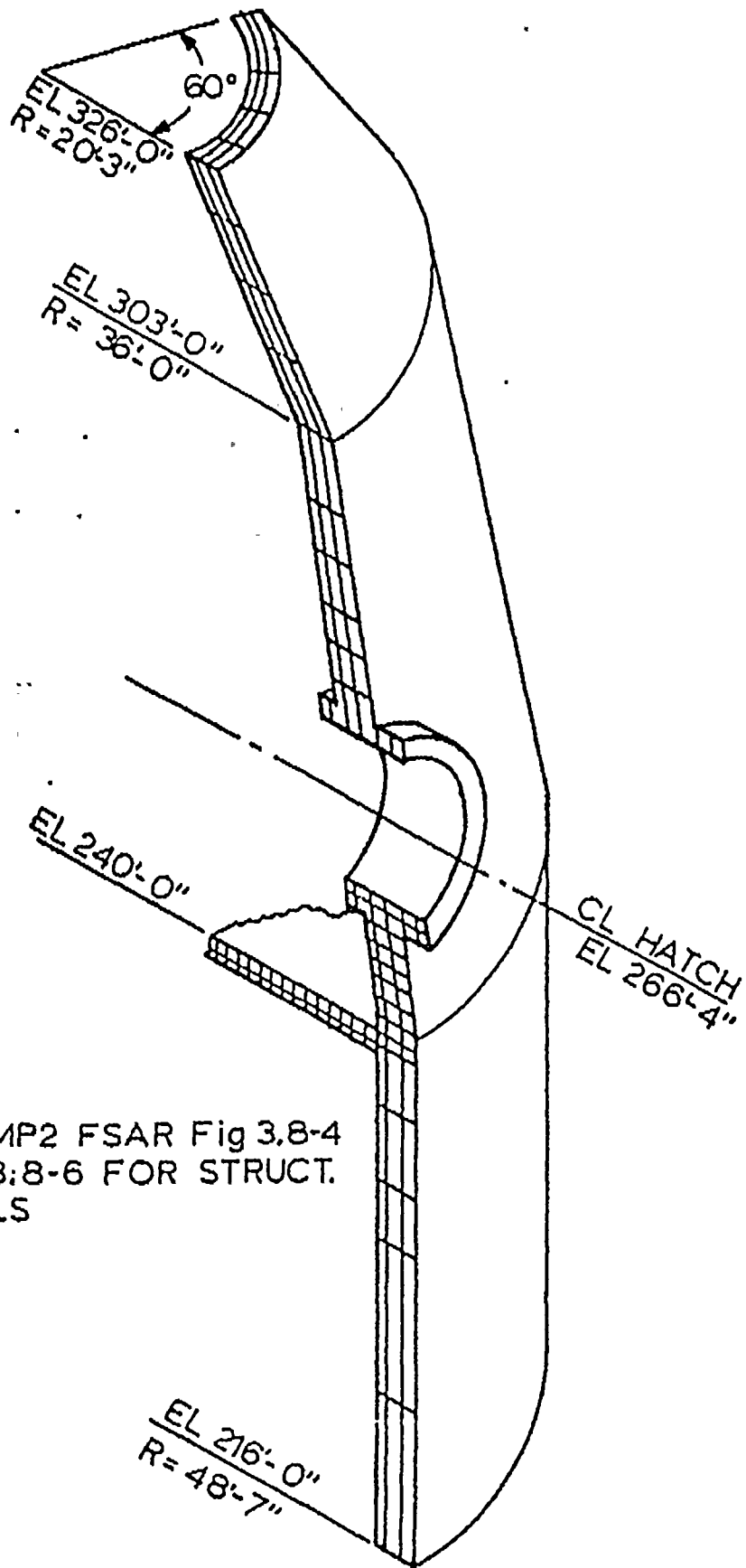
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SEE NMP2 FSAR Fig 3.8-4
& Fig 3:8-6 FOR STRUCT.
DETAILS

FINITE ELEMENT MODEL OF HATCH AREA

Figure 11-1



NINE MILE POINT - UNIT 2

APPLIED FORCES
FROM DRYWELL
HEAD

FREE (EDGE B)

EL 326'-0"

EL 303'-0"

AXIS OF SYMMETRY

FREE TO MOVE
RADIALLY AND
VERTICALLY

FREE TO MOVE
RADIALLY AND
VERTICALLY
(EDGE C)

CL HATCH

FIXED

EL 240'-0"

CL HATCH
EL 266'-4"

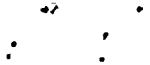
FREE TO MOVE
RADIALLY AND
VERTICALLY

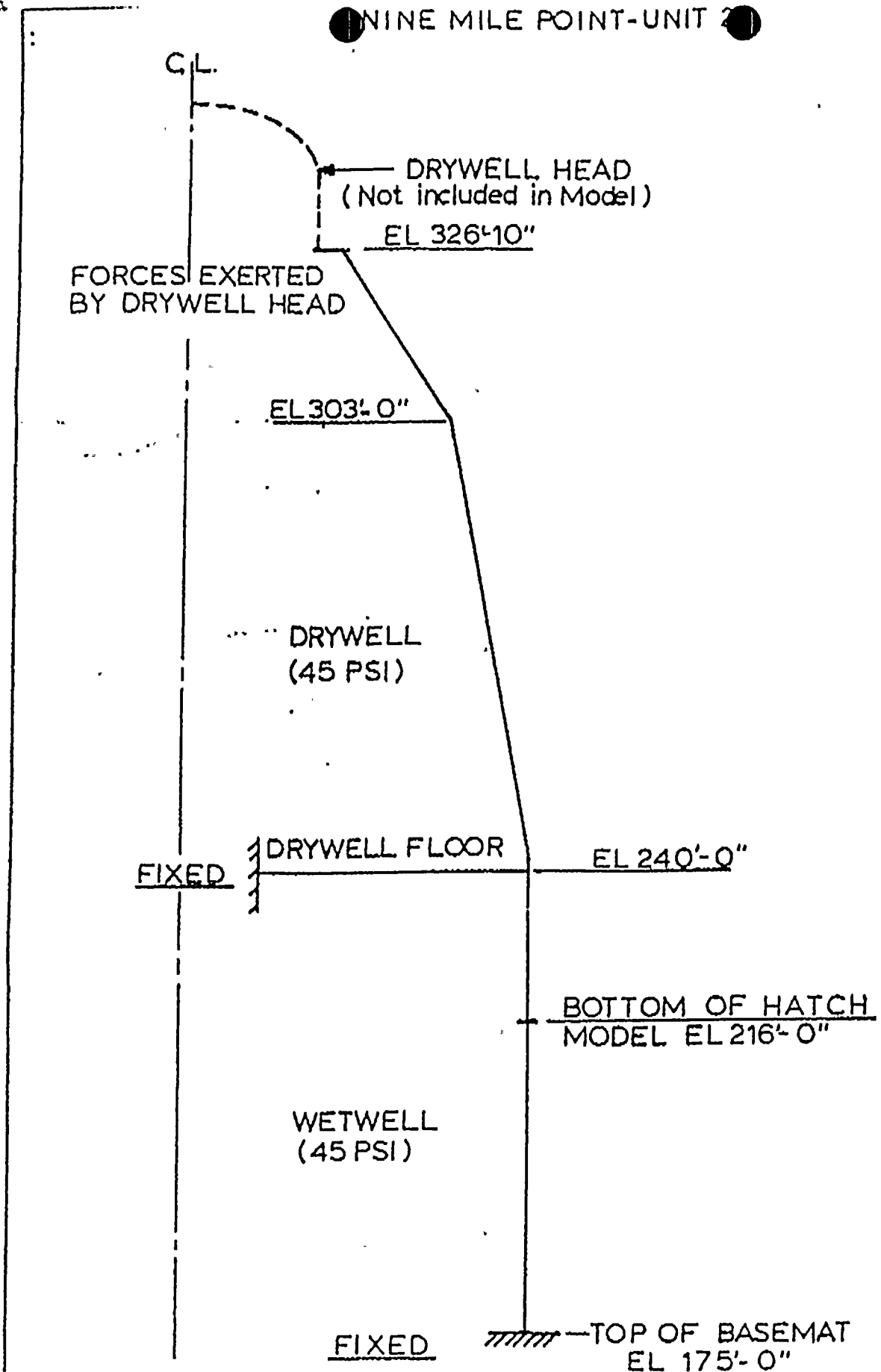
FIXED, BUT WITH
SPECIFIED RADIAL
AND VERTICAL
DISPLACEMENTS,
OBTAINED FROM
SHELL ANALYSIS.
(EDGE A)

EL 216'-0"

BOUNDARY CONDITIONS FOR
HATCH FINITE ELEMENT MODEL

Figure 11-2



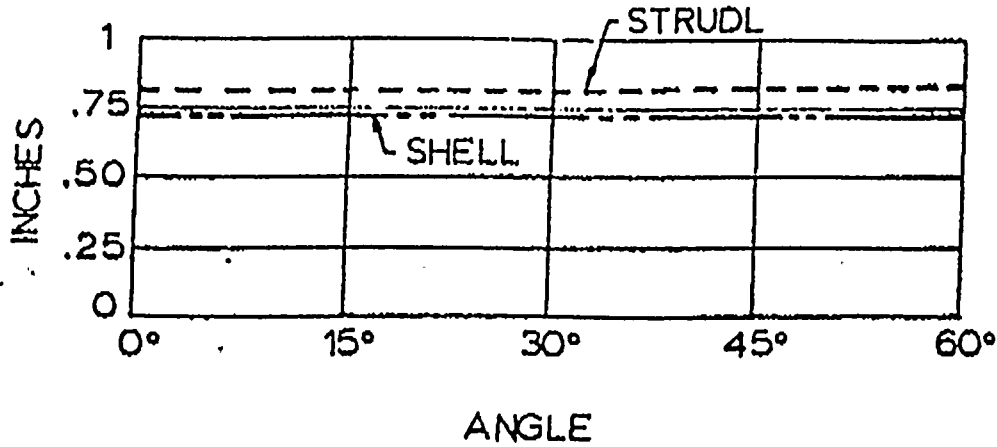


AXISYMMETRIC SHELL MODEL OF
PRIMARY CONTAINMENT

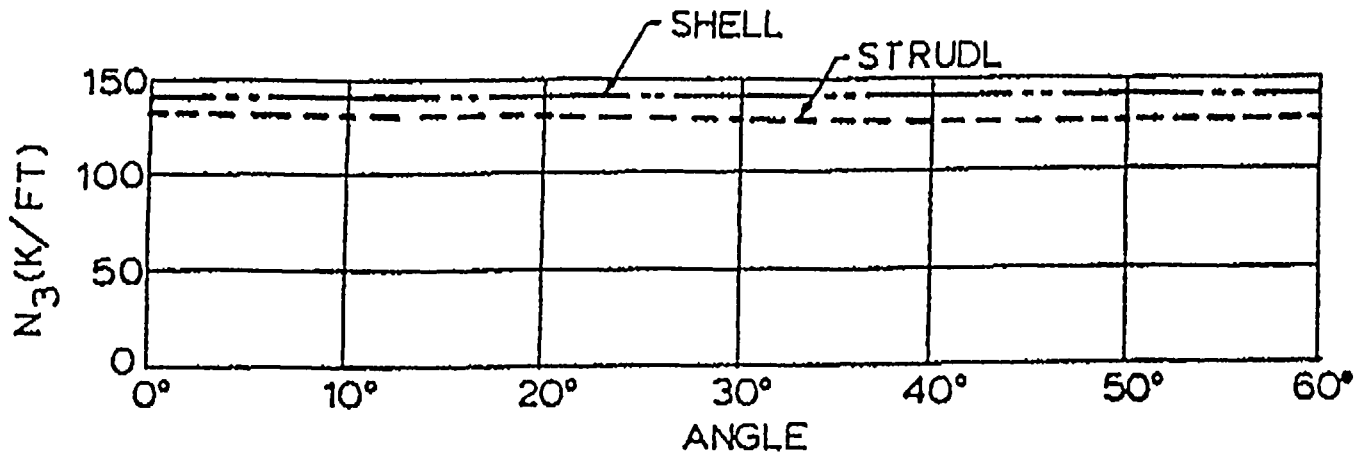
Figure 11-3



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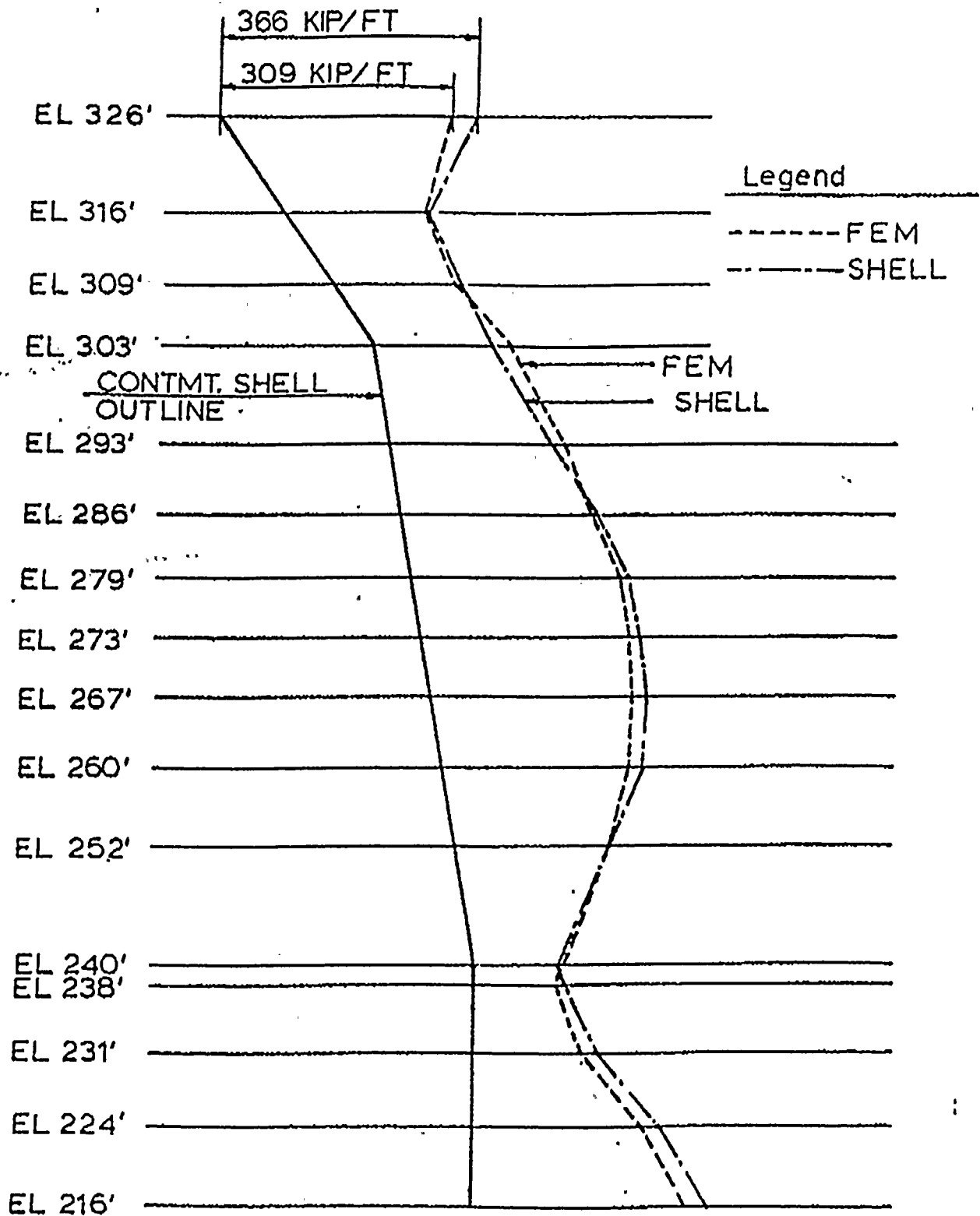
VERTICAL DISPLACEMENT AT EDGE "B"
(Fig 11-2)



VERTICAL FORCES N_3 AT EDGE "A" (Fig 11-2)



NINE MILE POINT-UNIT 2

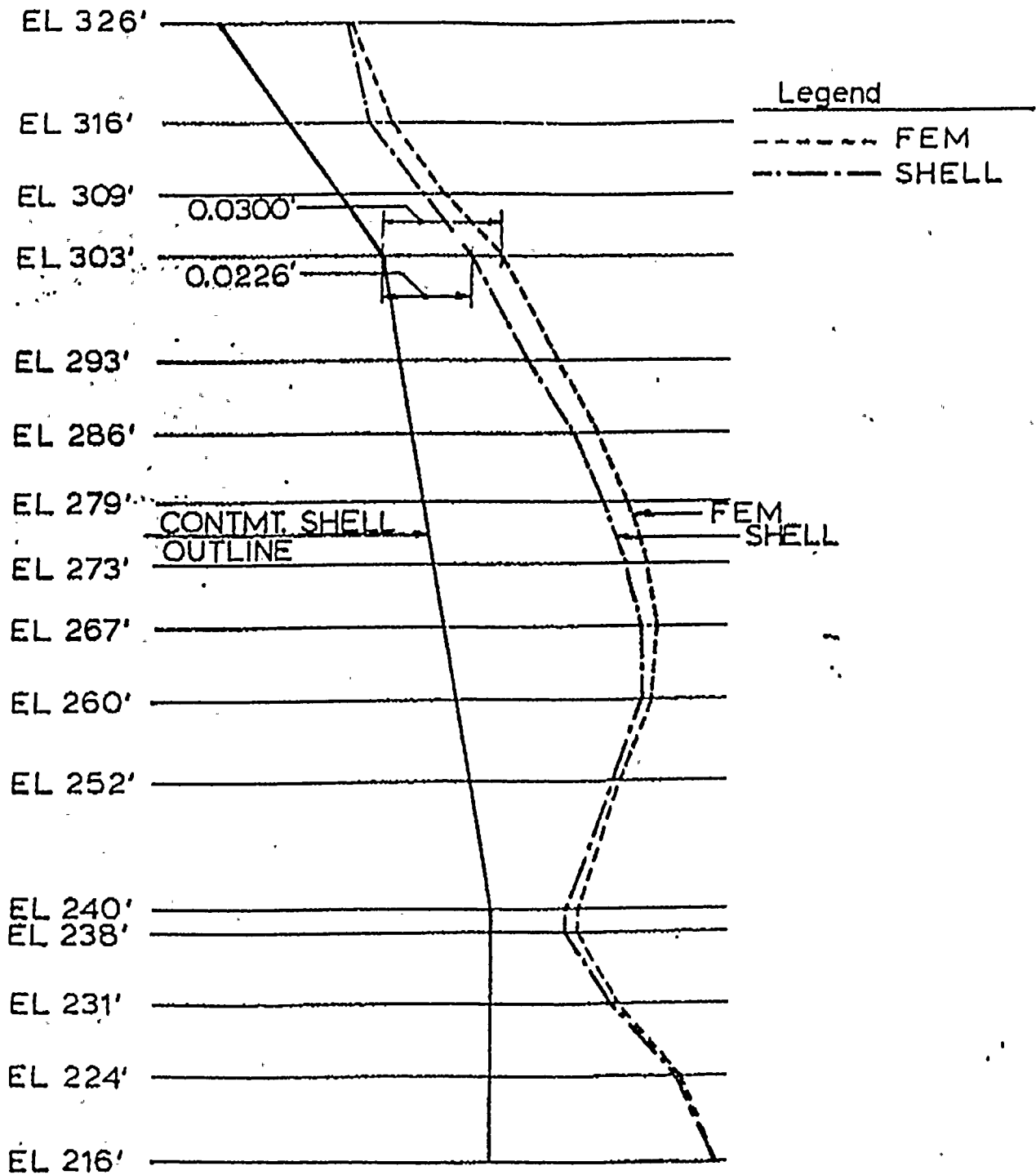


HOOP FORCES ALONG EDGE "C" (Fig 11-2)

Figure 11-5



NINE MILE POINT-UNIT



COMPARISON OF RADIAL DISPLACEMENTS
(EDGE "C" Fig 11-2)

Figure 11-6



NINE MILE POINT UNIT 2

NRC REQUEST NO. 14

Verify all Category I foundations for stability considering upward seismic forces.

RESPONSE

A review of all Category I stability analyses showed that except for the screenwell building calculations, all other calculations considered the effects of upward seismic forces. The stability calculations for the screenwell building are now revised to include the upward seismic forces. The factors of safety against sliding and overturning are listed in revised Table 3.8-14 (attached). This table will be amended in the FSAR.



1944

1944

The following information was obtained from the records of the
 Bureau of the Census, Department of Commerce, Washington, D. C.
 for the year 1944. The information is presented in the form of
 a table showing the number of persons in the United States
 who were employed in the various occupations listed below.
 The total number of persons employed in the United States
 in 1944 was 67,000,000. The number of persons employed
 in the various occupations is shown in the following table.
 The occupations are listed in the order in which they appear
 in the table. The number of persons employed in each
 occupation is shown in the right-hand column of the table.
 The total number of persons employed in the United States
 in 1944 is shown in the bottom row of the table.

NINE MILE POINT UNIT 2 FSAR

TABLE 3.8-14

FACTORS OF SAFETY FOR OVERTURNING, SLIDING AND
FLOATATION OF MAJOR CATEGORY I STRUCTURES

STRUCTURE	OVERTURNING				SLIDING				FLOATATION
	LOADING CONDITIONS				LOADING CONDITIONS				LOADING CONDITION
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Control and Diesel-Generator Buildings	2.9	2.4	1.7	2.3	1.5	1.5	1.1	2.3	1.1
North and South Electrical Tunnels	3.7	3.7 ⁽¹⁾	3.7 ⁽¹⁾	3.7 ⁽¹⁾	2.4	2.4 ⁽¹⁾	2.4 ⁽¹⁾	2.4 ⁽¹⁾	2.1
Main Stack	4.2 ⁽¹⁾	4.2	4.2 ⁽¹⁾	4.2 ⁽¹⁾	19.8 ⁽¹⁾	19.8	19.8 ⁽¹⁾	19.8 ⁽¹⁾	11.6
Reactor Building	1.6 ⁽¹⁾	7.4	1.1	2.4	2.6	5.8	1.6	2.3	1.7
Screenwell Building	1.8 ⁽¹⁾	1.8 ⁽¹⁾	1.8 ⁽¹⁾	1.8 ⁽¹⁾	1.5	1.5 ⁽¹⁾	1.5 ⁽¹⁾	1.5 ⁽¹⁾	1.3
Standby Gas Treatment	3.6 ⁽¹⁾	3.6 ⁽¹⁾	1.7	1.7 ⁽¹⁾	1.5	1.5 ⁽¹⁾	1.2	1.2 ⁽¹⁾	2.1

LEGEND:

- 1 D+H+E
- 2 D+H+W
- 3 D+H+E'
- 4 D+H+W_t
- 5 D+F'

(1) Indication and/or evaluation of the structure for these loading conditions indicates that the actual factors of safety would meet or exceed the values listed herein.



11
1
2
3

NINE MILE POINT UNIT 2

NRC REQUEST NO. 16

For all Category I buildings, verify vermiculite concrete-bearing capacity against sliding resistance.

RESPONSE

No Category I structure utilizes vermiculite concret to resist sliding in its stability analysis.

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