ATTACHMENT F

NIAGARA MOHAWK NUCLEAR ENGINEERING

CALCULATION COVER SHEET

Page 1 (Next 2)
Total 9
Last B2

NINE MILE POINT NUCLEAR STATION Unit (1, 2 or 0=Both) : 1 Discipline : STRUCTURAL

Title	Calculation No.			
SCREENING EVALUATION WORK SHEETS FOR TANK 96-04	S0.0SEWS9604			
	(Sub)system(s)	Building	Floor Elev.	Index No.
	96	TB	261	S0.0

Originator(s)
CARMEN R. AGOSTA

Checker(s) / Approver(s)
MOHAMMED ALVI

Rev	Description	Design Change No.	By	Date	Chk	Date	App	Date
00	INITIAL ISSUE	NA	A	6-30-97	M.A	7-29-97	M.A	7-29-97

Computer Output/Microfilm Filed Separately (Yes / No / NA): NA Safety Class (SR / NSR / Qxx) : SR

Superseded Document(s) : NONE

Document Cross Reference(s) - For additional references see page(s) : NA

Ref No	Document No.	Doc Type	Index	Sheet	Rev
1	NER-1S-012	NER	---	---	00
2	S0.0SQUGANCHOR	CALC	S0.0	---	00

General Reference(s) :
3. GENERIC IMPLIMENTATION PROCEDURE (GIP)
4. NMPC Letter to NRC, File Code NMP1L 1044, dated March 11, 1996

Remarks :
NONE

Confirmation Required (Yes / No) : No See Page(s) :	Final Issue Status (APP / FIO / VOI) : APP	File Location (Calc / Hold) : Calc	Operations Acceptance Required (Yes / No) : No

Evaluation Number(s) / Revision : NR
Copy of Applicability Review Attached (Yes / N/R)?N/R

Key Words : NMP-1, STRUCTURAL, SQUG, SEWS, SEISMIC VERIFICATION

Component ID(s) / EPN(s) / Line Number(s) :
TANK-96-04, TANK-96-35
TANK-96-05
TANK-96-06
TANK-96-07
TANK-96-08
TANK-96-31
TANK-96-32
TANK-96-33
TANK-96-34

FORMAT # NEP-DES-08-F01-00

Nine Mile Point Nuclear Station Unit: 1 Disposition: ---

Originator/Date	Checker/Date	Calculation No.	Revision
A 6-30-97	M.A 7-29-97	S0.0SEWS96-04	00

Ref.

PURPOSE: Document the Screening Evaluation Work Sheets (SEWS) for the DSA/DG#102 START AIR TANK #4, equipment number 96-04. The emergency diesel air start tanks, ID numbers TANK-96-04 to 08 and TANK-96-31 to 35, are the same tank having the same anchorage. This calculation evaluates the anchorage for all these similar tanks.

This SEWS has been prepared as part of the commitment to use the SQUG (GIP) methodology to document the seismic adequacy of SSEL components.

CONCLUSION: The TANK-96-04 anchor analysis concluded the anchorage can withstand 4.207 times greater the seismic demand. The allowable loads for these cinch anchors are referenced in calculation S0.0SQUGANCHOR. The cinch anchors passed the tightness check for tank 96-04.
Therefore, the SQUG outlier for 96-04 is resolved.

2

ATTACHMENTS

A. SEWS for Equipment ID Number 96-04
B. The Outlier Seismic Verification Sheet (OSVS) for Equipment ID Number 96-04

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : 96-04 (Rev. 1)	Class : 21 - Tanks and Heat Exchangers	
Description : DSA/DG #102 START AIR TANK #1		
Building : TB	Floor El. : 261.00	Room, Row/Col : DG 102 RM
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	Yes
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	Yes
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? **Yes**

COMMENTS

SRT are W. Djordjevic and C. Agosta - Outlier Evaluation

In Revision 0, these air start tanks were declared outliers because they use Cinch type leaded anchors which are not covered by the GIP.

External analysis 95C2873-C-003 evaluates the anchorage using data developed by Westinghouse Savannah River (referenced in calculation) and shows a HCLPF PGA equal to 0.55g.

Subsequently, bolt tightness checking was conducted on ~~111~~ 180 accessible Cinch anchor installations with only ~~one~~ two failure to hold tightness. Since this failure rate is ~~less than~~ 1% and the HCLPF is equivalent to about a 1% failure rate, no reduction factor is applied to Cinch anchors. 00 6/30/97

Therefore, this equipment is found acceptable for A-46 design basis purposes and the outlier is resolved. The HCLPF remains at 0.55g PGA.

Evaluated by: Date:

11/17/95

12/6/95

ATTACHMENT A
CALC NO 30.05EQ-S46-04
REVISION 00
PAGE NO A1

Earthquake :
Response Spectrum : User
Frequency : User - 0.00
Percent Damping : User - 0.00

Spectral Values :

Direction	Acceleration (g's)
North - South	0.412
East - West	0.396
Vertical	0.129

Angle (N-S Direction makes with the X Axis) : 0.00
Combination Criteria : SRSS

Weights :
Number of Weights : 1

No	Weight	X	Y	Z
1	900.00	0.000	15.500	0.000

Forces :
Number of External Forces : 0

Moments :
Number of External Moments : 0

Allowables :
Anchor :
Number of Anchor types : 1

						Tension	Shear	
				Ultimate	Ultimate	Inter	Inter	Saf
No.	Dia	Manufact	Product	Tension	Shear	Coeff	Coeff	Fact
1	3/4	Other	Unknown Expansion Anchor	1280.00	2000.00	1.00	0.30	1.00

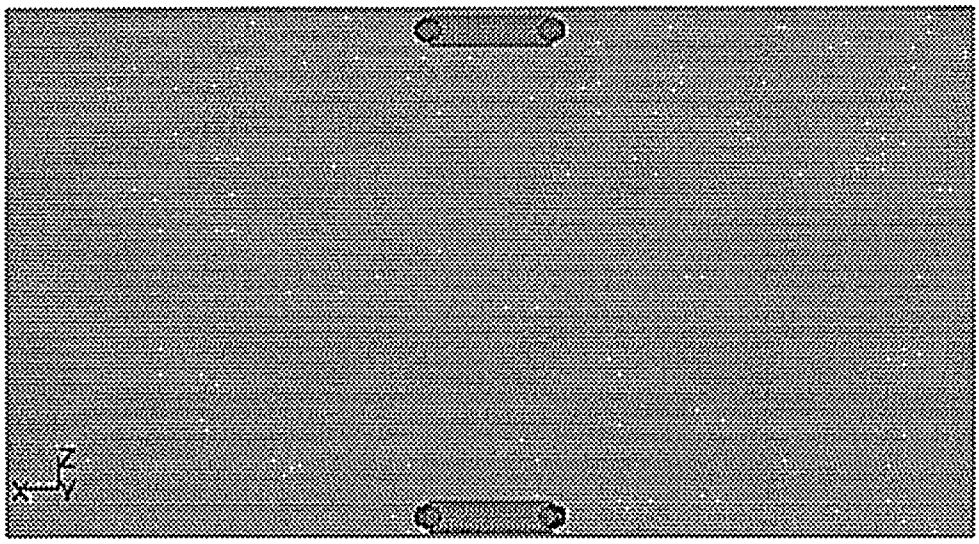
Concrete :
Ultimate Stress : 3500.00 psi.
Reduction Factor : 0.85

Weld :
Allowable Stress : 30600 psi.

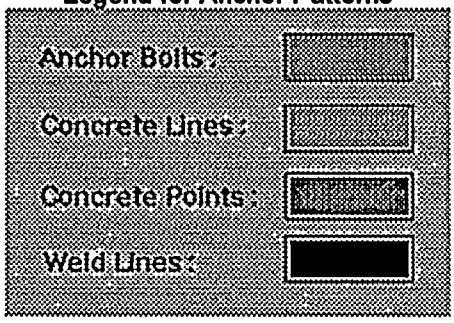
Surfaces :
Number of Surfaces : 1
Surface Orientation

	Direction	Direction	Direction
	Comp	Comp	Comp
No	Nx	Ny	Nz
1	0.000	1.000	0.000

Anchor Pattern for Surface # 1



Legend for Anchor Patterns



Geometry :

Anchor :

Number of Anchors : 4

No.	Anch Id	X Coord	Y Coord	Z Coord	Surf Id
1	1	-6.000	0.000	-24.000	1
2	1	-6.000	0.000	24.000	1
3	1	6.000	0.000	-24.000	1
4	1	6.000	0.000	24.000	1

Concrete Lines :

# of elements per line : 4

Number of Concrete Lines : 2

No	Start X-Coord	Start Y-Coord	Start Z-Coord	End X-Coord	End Y-Coord	End Z-Coord	Sf Id	Line Width
1	-6.000	0.000	-24.000	6.000	0.000	-24.000	1	3.000
2	-6.000	0.000	24.000	6.000	0.000	24.000	1	3.000

Concrete Points :
Number of Concrete Points : 0

Weld Lines :
# of elements per line : 4
Number of Weld Lines : 0

Determination of Reduction Factors :
Reduction Factor Input for Anchor # 1

No Input - Reduction factors needing user input are not used.

Reduction Factor Input for Anchor # 2

No Input - Reduction factors needing user input are not used.

Reduction Factor Input for Anchor # 3

No Input - Reduction factors needing user input are not used.

Reduction Factor Input for Anchor # 4

No Input - Reduction factors needing user input are not used.

Reduction Factors Data Current : Yes

No	Anc Id	Pall/ Vall	Pallr/ Vallr	RT	RN	RL	RG	RS	RE	RF	RC	RR	RP	RB	RM
1	1	1280.00	N/A	X	X	X	X	X	X	X	X	X	X	X	X
		2000.00	N/A	X	X	X	X	X	X	X	X	X	X	X	X
2	1	1280.00	N/A	X	X	X	X	X	X	X	X	X	X	X	X
		2000.00	N/A	X	X	X	X	X	X	X	X	X	X	X	X
3	1	1280.00	N/A	X	X	X	X	X	X	X	X	X	X	X	X
		2000.00	N/A	X	X	X	X	X	X	X	X	X	X	X	X
4	1	1280.00	N/A	X	X	X	X	X	X	X	X	X	X	X	X
		2000.00	N/A	X	X	X	X	X	X	X	X	X	X	X	X

Legend :

N/A	= Not Applicable
Pall	= Allowable Pull without Reduced Inspection
Vall	= Allowable Shear without Reduced Inspection
Pallr	= Allowable Pull with Reduced Inspection
Vallr	= Allowable Shear with Reduced Inspection
*	= Outlier
X	= Reduction Factor Not Used
RT	= Reduction Factor for Type of Anchorage
RN	= Reduction Factor for Installation Adequacy
RL	= Reduction Factor for Embedment
RG	= Reduction Factor for Gap at Anchors
RS	= Reduction Factor for Spacing
RE	= Reduction Factor for Edge Distance
RF	= Reduction Factor for Concrete Strength
RC	= Reduction Factor for Concrete Cracks
RR	= Reduction Factor for Essential Relays
RP	= Reduction Factor for Base Stiffness and Prying Action

RB	= Reduction Factor for Base Strength and Load Path
RM	= Reduction Factor for Embed. Steel and Pads

Analysis Results :
Analysis Performed : Yes

Type of Analysis : Regular

	Spectral Accelerations (G's)			
No	N-S	E-W	Vertical	Safety Factor
1	0.412	0.158	0.052	4.207
2	-0.412	-0.158	-0.052	5.265
3	-0.412	0.158	0.052	4.207
4	0.412	-0.158	-0.052	5.265
5	0.412	-0.158	0.052	5.265
6	-0.412	0.158	-0.052	4.207
7	0.412	0.158	-0.052	4.207
8	-0.412	-0.158	0.052	5.265
9	0.165	0.396	0.052	6.839
10	-0.165	-0.396	-0.052	31.784
11	0.165	-0.396	0.052	34.891
12	-0.165	0.396	-0.052	6.765
13	-0.165	0.396	0.052	6.839
14	0.165	-0.396	-0.052	31.784
15	0.165	0.396	-0.052	6.765
16	-0.165	-0.396	0.052	34.891
17	0.165	0.158	0.129	9.141
18	-0.165	-0.158	-0.129	16.218
19	0.165	0.158	-0.129	9.139
20	-0.165	-0.158	0.129	16.218
21	-0.165	0.158	0.129	9.141
22	0.165	-0.158	-0.129	16.218
23	0.165	-0.158	0.129	16.218
24	-0.165	0.158	-0.129	9.139

Minimum Safety Factor : 4.207

The anchorage can withstand 4.207 times greater seismic demand

Niagara Mohawk Power Corporation - Nine Mile Point 1 OUTLIER SEISMIC VERIFICATION SHEET (OSVS)	GIP Rev 2, Corrected 2/14/92 Sheet 1 of 2

ID : 96-04 (Rev. 0)	Class : 21. Tanks and Heat Exchangers
Description : DSA/DG #102 START AIR TANK #1	

Building : TB	Floor El. : 261.00	Room, Row/Col : DG 102 RM

1. OUTLIER ISSUE DEFINITION - Tanks and Heat Exchangers

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Shell Buckling	
Anchor Bolts and Embedment	X
Anchorage Connections	
Flexibility of Attached Piping	
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

> Air start tanks are anchored to reinforced concrete wall by Cinch (leaded) type anchors. Cinch type anchors are not covered by the GIP.

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

> Determine realistic bolt load allowables for Cinch type anchors and compare them to the seismic demand loads, or retrofit anchorage.

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

3. COMMENTS

4. CERTIFICATION:

The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy:

Approved by: [signature] Date: 2/11/94

[signature] 6/13/95

Niagara Mohawk Power Corporation - Nine Mile Point 1 OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 2 of 2
ID : 96-04 (Rev. 0)	Class : 21. Tanks and Heat Exchangers	
Description : DSA/DG #102 START AIR TANK #1		
Building : TB	Floor El. : 261.00	Room, Row/Col : DG 102 RM