

CALCULATION COVER SHEET

NINE MILE POINT NUCLEAR STATION

Unit (1, 2 or 0=Both): 1

Discipline: STRUCTURAL

Title
SCREENING EVALUATION WORK SHEETS FOR PANEL CP162

Calculation No.
S0.0SEWSCP162

(Sub)system(s)
NA

Building
TB

Floor Elev.
277

Index No.
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	CA	6-23-97	M.A	7-7-97	M.A	7-7-97

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Superseded Document(s) : NONE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. NMP1C Letter to NRC, File Code NMP1L 1044, dated March 11, 1986

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

Component ID(s) / EPN(s) / Line Number(s) :
PNL-PRC-162
PNL-PRC-167
PNL-PRC-172

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

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Nine Mile Point Nuclear Station

Unit: 1

Disposition:

Originator/Date

A / 6-23-97

Checker/Date

M.A 7-7-97

Calculation No.

S0.0SEWS CP162

Revision

00

Ref.

PURPOSE: Document the Screening Evaluation Work Sheets (SEWS) for the AP/REACTOR PROTECTION SYSTEM #162 CONTROL CABINET, equipment number CP162. Cabinets CP167 and CP172 are similar and are evaluated using the analysis for CP162 here-in.

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 CP162 cinch anchor analysis concluded the anchorage is adequate based on the analysis in Attachment A, the cinch anchor capacities given in Calculation S0.0SQUGANCHOR (Ref. 2) and the bolt tightness check results confirming these type of anchors are tight. Therefore, the SQUG outlier for CP162 is resolved.

ATTACHMENTS

- A. SEWS for Equipment ID Number 167A
- B. The Outlier Seismic Verification Sheet (OSVS) for Equipment ID Number 167A

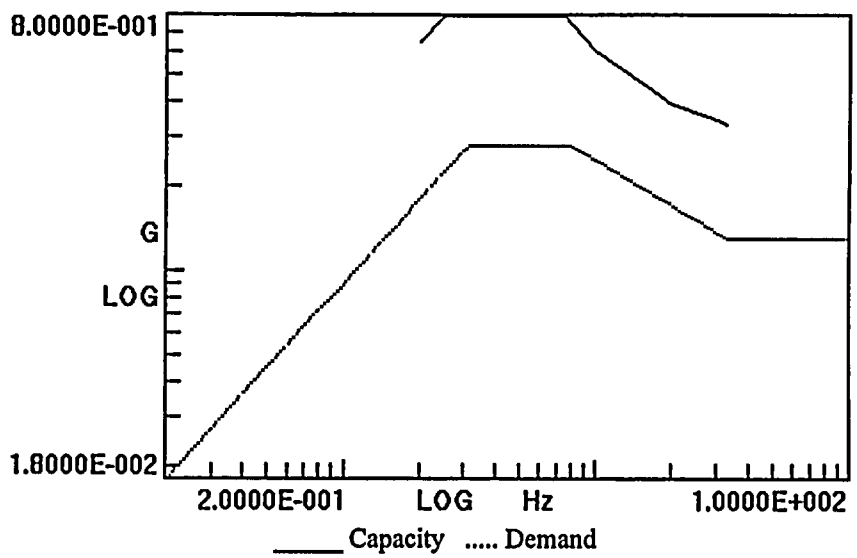


Niagara Mohawk Power Corporation - Nine Mile Point 1 SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: No Sheet 1 of 3
ID : CP162# (Rev. 0)	Class : 20. Instrumentation and Control Panels and Cabinets	
Description : AP/REACTOR PROTECTION SYS MG SET #162 CONTROL CABINET		
Building : TB	Floor El. : 277.00	Room, Row/Col : A7,8
Manufacturer, Model, Etc. :		

A
6-23-97

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input	277.00
2.	Elevation of seismic input below about 40' from grade (grade = 243.00)	Yes
3.	Equipment has fundamental frequency above about 8 Hz (est. frequency =)	SRT
4.	Capacity based on:	1.00 * Bounding Spectrum
5.	Demand based on:	1.00 * Design Basis Ground Response Spectrum



	File	Record
Capacity	F:\GIP\GIP\spectra.des	Label Bounding Spectrum
Demand 1	F:\GIP\PROJ003F\spectra.des	UNIT: PLANT BLDG: BUILDING E/Q: SSE ELEV: ELEVATION ROW/ COL: ALL DIR: DIR NODE: 1
Demand 2	F:\GIP\PROJ003F\spectra.des	UNIT: PLANT BLDG: BUILDING E/Q: SSE ELEV: ELEVATION ROW/ COL: ALL DIR: DIR NODE: 1

Does capacity exceed demand? Yes

ATTACHMENT : A
 CALC NO : SD.05EMSCB162
 REVISION : 00
 PAGE NO : 11

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SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 2 of 3
ID : CP162# (Rev. 1)	Class : 20. Instrumentation and Control Panels and Cabinets	
Description : AP/REACTOR PROTECTION SYS MG SET #162 CONTROL CABINET		
Building : TB	Floor El. : 277.00	Room, Row/Col : A7,8
Manufacturer, Model, Etc. :		

CAVEATS - BOUNDING SPECTRUM

I&C/BS Caveat 1 - Earthquake Experience Equipment Class.	Yes
I&C/BS Caveat 2 - Computers and Programmable Controllers Evaluated Separately.	Yes
I&C/BS Caveat 3 - Strip Chart Recorders Evaluated.	Yes
I&C/BS Caveat 4 - Structural Adequate.	Yes
I&C/BS Caveat 5 - Adjacent Cabinets or Panels Bolted Together.	Yes
I&C/BS Caveat 6 - Drawers or Equipment on Slides Restrained.	Yes
I&C/BS Caveat 7 - Doors Secured.	Yes
I&C/BS Caveat 8 - Sufficient Slack and Flexibility of Attached Lines.	Yes
I&C/BS Caveat 9 - Adequate Anchorage.	Yes
I&C/BS Caveat 10 - Potential Chatter of Essential Relays Evaluated.	Yes
I&C/BS Caveat 11 - No Other Concerns.	Yes

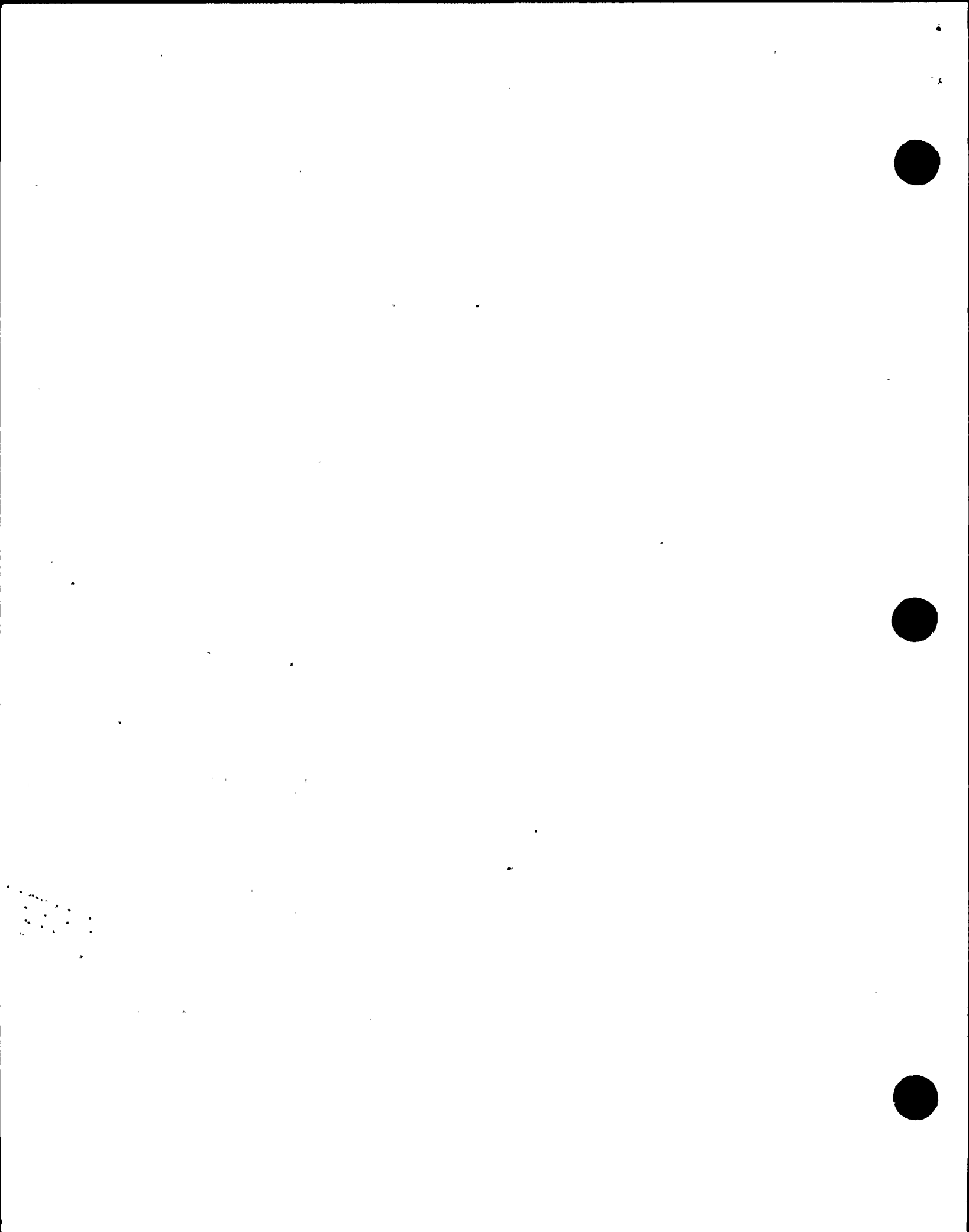
Is the intent of all the caveats met for Bounding Spectrum? Yes

ANCHORAGE

1. The sizes and locations of anchors have been determined.	Yes
2. Appropriate equipment characteristics have been determined (mass, CG, natural freq., damping, center of rotation).	Yes
3. The type of anchorage is covered by the GIP.	Yes*
4. The adequacy of the anchorage installation has been evaluated (weld quality and length, nuts and washers, expansion anchor tightness, etc.)	Yes
5. Factors affecting anchorage capacity or margin of safety have been considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition, and concrete cracking.	Yes
6. For bolted anchorages, any gaps under the base are less than 1/4 .	Yes
7. Factors affecting essential relays have been considered: gaps under the base, capacity reduction for expansion anchors.	Yes
8. The base has adequate stiffness and the effect of prying action on anchors has been considered.	Yes
9. The strength of the equipment base and the load path to the CG is adequate.	Yes
10. The adequacy of embedded steel, grout pads or large concrete pads have been evaluated.	Yes
11. The anchorage capacity exceeds the demand.	Yes

Are anchorage requirements met? Yes

ATTACHMENT A
CALC NO SD.PSEWS/CP162
REVISION 00
PAGE NO A2



SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 3 of 3
ID : CP162# (Rev. 1)	Class : 20. Instrumentation and Control Panels and Cabinets	
Description : AP/REACTOR PROTECTION SYS MG SET #162 CONTROL CABINET		
Building : TB	Floor El. : 277.00	Room, Row/Col : A7,8
Manufacturer, Model, Etc. :		

INTERACTION EFFECTS

1. Soft targets are free from impact by nearby equipment or structures.	Yes
2. If the equipment contains sensitive relays, it is free from all impact by nearby equipment or structures.	N/A
3. Attached lines have adequate flexibility.	Yes
4. Overhead equipment or distribution systems are not likely to collapse.	Yes
5. No other adverse concerns were found.	Yes

Is equipment free of interaction effects? Yes

IS EQUIPMENT SEISMICALLY ADEQUATE? Yes

COMMENTS

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

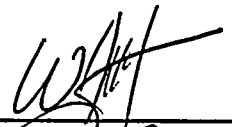
* In Revision 0, these panels were declared outliers because they use Cinch type leaded anchors which are not covered by the GIP.

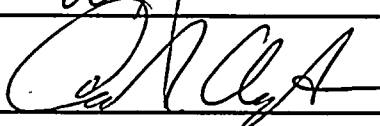
External analysis 95C2873-C-003 evaluates the anchorage using data developed by Westinghouse Savannah River (referenced in calculation) and shows a HCLPF PGA equal to 0.37g. (CALC # 50.01PEEE HCLPF 01) | CA 6/2/97

Subsequently, bolt tightness checking was conducted on ¹⁸⁰ 111 accessible Cinch anchor installations with ^{NB TWO} only one 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. | CA 7/31/97

Therefore, this equipment is found acceptable for A-46 design basis purposes and the outlier is resolved. The HCLPF remains at 0.37g PGA.

Evaluated by:





Date:

11/17/95
12/6/95

ATTACHMENT A
CALC NO 50.01PEEE
REVISION 00
PAGE NO A 3

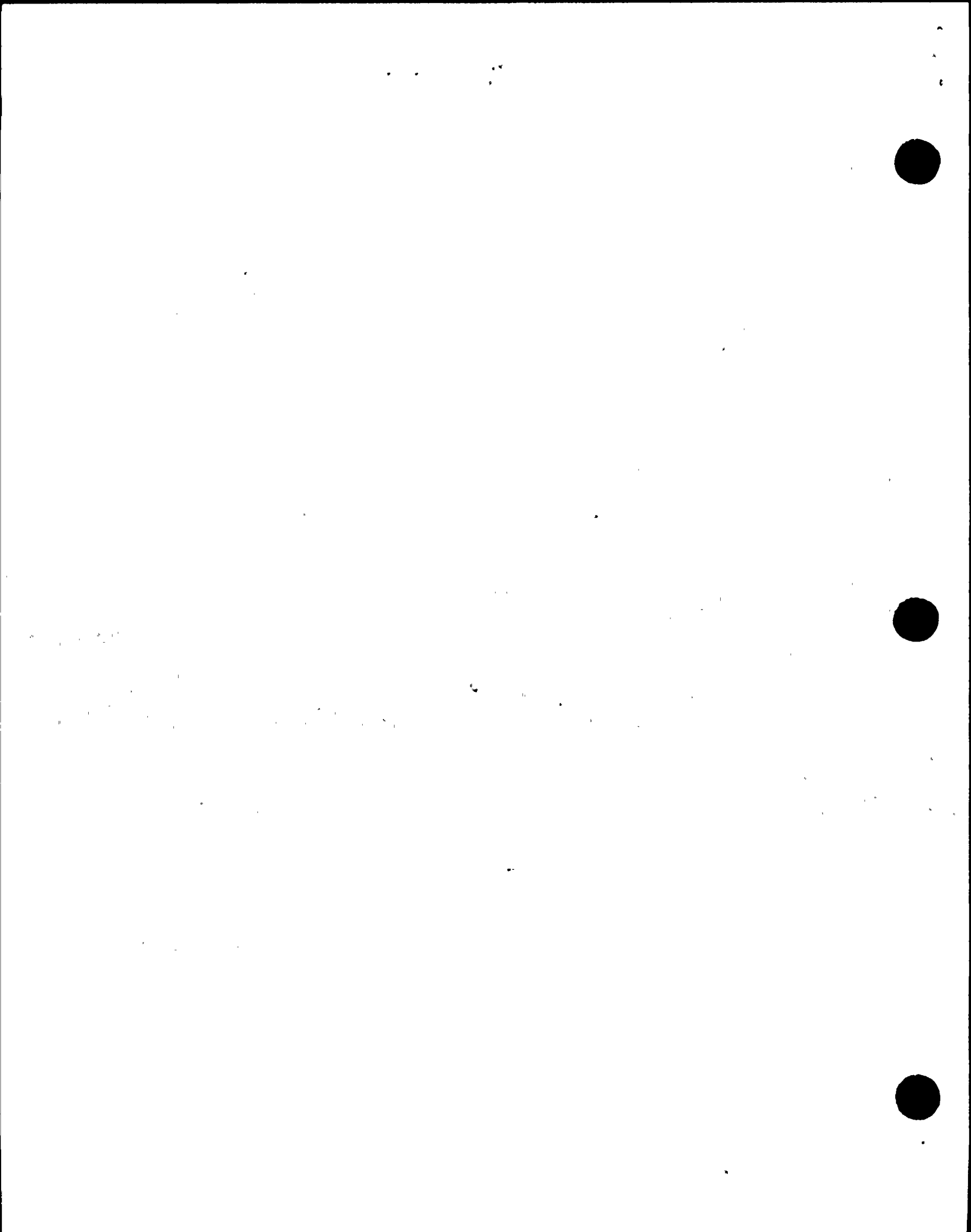


Exhibit 5-1

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)

1. OUTLIER IDENTIFICATION, DESCRIPTION, AND LOCATION

Equipment ID Number EPRC162 Equipment Class 20
 Equipment Location: Building TB Floor Elevation 277'
 Room or Row/Column Base Elevation 277'
 Equipment Description UPS 162A AND 162B PROTECTIVE RELAY
CABINET

2. OUTLIER ISSUE DEFINITION

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

<u>Mechanical and Electrical Equipment</u>		<u>Tanks and Heat Exchangers</u>	
Capacity vs. Demand	<u> </u>	Shell Buckling ¹	<u> </u>
Caveats	<u>✓</u>	Anchor Bolts and Embedment	<u> </u>
Anchorage	<u>✓</u>	Anchorage Connections	<u> </u>
Seismic Interaction	<u> </u>	Flexibility of Attached Piping ¹	<u> </u>
Other	<u> </u>	Other	<u> </u>
		<u>Cable and Conduit Raceways</u>	
<u>Essential Relays</u>		Inclusion Rules	<u> </u>
Capacity vs. Demand	<u> </u>	Other Seismic Performance Concerns	<u> </u>
Mounting, Type, Location	<u> </u>	Limited Analytical Review	<u> </u>
Other	<u> </u>	Other	<u> </u>

¹ Shell buckling and flexibility of attached piping only apply to large, flat-bottom, vertical tanks.

- 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):

CABINET IS WELDED TO EMBEDDED CHANNELS, WHICH ARE ANCHORED WITH CINCH ANCHORS. CINCH ANCHORS ARE NOT COVERED BY THE GIP.



ATTACHMENT
CALC NO
REVISION
PAGE NO

B
SR. D SEVS CP162
02
B2

Revision 2
Corrected, 6/28/91

Sheet 2 of 2

Exhibit 5-1 (Cont'd)

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)

Equipment ID Number CP
PRC 162 A 6/20/95

3. PROPOSED METHOD OF OUTLIER RESOLUTION (OPTIONAL)

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

DETERMINE CINCH ANCHOR TENSILE AND SHEAR
CAPACITIES USING SAVANNAH RIVER TEST PROGRAM
REPORT, AND SHOW THAT MARGIN IS SUCH THAT
TIGHTNESS CHECK (WHICH CAN'T BE DONE) IS UNNECESSARY.
OTHERWISE, MODIFY ANCHORAGE.

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

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 requirements for this item of equipment to be verified for seismic adequacy:

Approved by: (For Equipment Classes #0 - #22, all the Seismic Capability Engineers on the Seismic Review Team (SRT) should sign; there should be at least two on the SRT. One signatory should be a licensed professional engineer. For Relays, the Lead Relay Reviewer should sign.)

CAROLINE S. SCHLASEMAN
Print or Type Name

Caroline S. Schlaseman PE
Signature

6-1-95
Date

CARMEN R. AGOSTA
Print or Type Name

C. R. Agosta
Signature

6/20/95
Date

Print or Type Name

Signature

Date

