

CALCULATION COVER SHEET

NINE MILE POINT NUCLEAR STATION

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

Discipline: STRUCTURAL

Title SCREENING EVALUATION WORK SHEETS FOR FAN210-01		Calculation No. S0.0SEWS210-01		
(Sub)system(s) 210	Building TB	Floor Elev. 300	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	09	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Superseded Document(s) : NONE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. 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)?NR		Component ID(s) / EPN(s) / Line Number(s) : FN-210-01	
Key Words : NMP-1, STRUCTURAL, SQUG, SEWS, SEISMIC VERIFICATION			



Nine Mile Point Nuclear Station

Unit: 1

Disposition:

Originator/Date

CA / 6-23-97

Checker/Date

M.A 7-7-97

Calculation No.

S0.0SEWS210-01

Revision

00

Ref.

PURPOSE: Document the Screening Evaluation Work Sheets (SEWS) for the CRAC/EMER VENT FAN #11, equipment number 210-01.

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 300 pound fan anchored with six ½" diameter cinch anchors is adequate based on engineering judgment, the cinch anchor capacities given in Calculation S0.0SQUGANCHOR (Ref. 2) and the bolt tightness check results confirming these type of anchors are tight. The existing structure constructed of scaffold components is adequate for seismic loads per Calculation S0.0TBSCAF01
Therefore, the SQUG outlier for 210-01 is resolved.

ATTACHMENTS

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



SSEL Line No. 7303
 AI

Status Y (N) U

SCREENING EVALUATION WORK SHEET (SEWS)

Sheet 1 of 2

Equip. ID No. 210-01 Equip. Class 09 - Fans

Equipment Description CRAC/EMER VENT FAN #11

Location: Bldg. TB Floor El. 300 Room, Row/Col A15

Manufacturer, Model, Etc. (optional but recommended) AMERICAN STANDARD (DETROIT, MI)
5HP RELIANCE MOTOR INDUSTRIAL FAN, SIZE 11, TYPE E2
SERIAL 11-265, ORDER # 3-7874701

SEISMIC CAPACITY VS DEMAND

- | | |
|--|--------------------|
| 1. Elevation where equipment receives seismic input | <u>300'</u> |
| 2. Elevation of seismic input below about 40' from grade | Y <u>(N)</u> U |
| 3. Equipment has fundamental frequency above about 8 Hz | <u>(Y)</u> N U N/A |
| 4. Capacity based on: Existing Documentation | DOC |
| Bounding Spectrum | BS |
| 1.5 x Bounding Spectrum | <u>(ABS)</u> |
| GERS | GERS |
| 5. Demand based on: Ground Response Spectrum | GRS |
| 1.5 x Ground Response Spectrum | AGS |
| Conserv. Des. In-Str. Resp. Spec. | CRS |
| Realistic M-Ctr. In-Str. Resp. Spec. | <u>(RRS)</u> |

Does capacity exceed demand? (Indicate at right (*) and in COMMENTS if a special exception to enveloping of seismic demand spectrum is invoked per Section 4.2 of the GIP.)

Y (N) U *
 NOTE(1)

CAVEATS - BOUNDING SPECTRUM (Identify with an asterisk (*) those caveats which are met by intent without meeting the specific wording of the caveat rule and explain the reason for this conclusion in the COMMENTS section below)

- | | |
|---|--|
| 1. Equipment is included in earthquake experience equipment class | <u>(Y)</u> N U N/A |
| 2. Drive motor and fan mounted on common base | <u>(Y)</u> N U N/A |
| 3. For axial fan with long shaft between fan and motor, shaft supported at fan as well as motor | Y N U <u>(N/A)</u> <u>SHORT SHAFT</u> |
| 4. No possibility of excessive duct distortion causing binding or misalignment of fan | <u>(Y)</u> N U N/A |
| 5. Base vibration isolators adequate for seismic loads | Y N U <u>(N/A)</u> <u>NO ISOLATORS</u> |
| 6. Attached lines (electrical) have adequate flexibility | <u>(Y)</u> N U N/A |
| 7. Anchorage adequate (See checklist below for details) | Y <u>(N)</u> U N/A NOTE(2) |
| 8. Have you looked for and found no other adverse concerns? | <u>(Y)</u> N U N/A |

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

Y (N) U N/A
 SEE OSVS

ANCHORAGE

EST. TO BE ±300# FROM TOP OF PAD

- | | |
|---|----------------------------|
| 1. Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation) | <u>(Y)</u> N U N/A |
| 2. Type of anchorage covered by GIP | Y <u>(N)</u> U N/A NOTE(2) |
| 3. Sizes and locations of anchors determined | <u>(Y)</u> N U N/A |
| 4. Anchorage installation adequate, e.g., weld quality and length, nuts and washers, expansion anchor tightness | Y N <u>(U)</u> N/A NOTE(2) |

ATTACHMENT
OF 01A7
MOBILE
OF 30A7



SSEL Line No. 7303

SCREENING EVALUATION WORK SHEET (SEWS)

Sheet 2 of 2

Equip. ID No. 210-01 Equip. Class 09 - Fans

Equipment Description CRAC/EMER VENT FAN #11

ANCHORAGE (Cont'd)

- | | | | | |
|--|------------------------------------|-------------------------|-------------------------|---------------------------|
| 5. Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition, and concrete cracking | <input checked="" type="radio"/> Y | <input type="radio"/> N | <input type="radio"/> U | <input type="radio"/> N/A |
| 6. For bolted anchorages, gap under base less than 1/4-inch | <input checked="" type="radio"/> Y | <input type="radio"/> N | <input type="radio"/> U | <input type="radio"/> N/A |
| 7. Base has adequate stiffness and effect of prying action on anchors considered | <input checked="" type="radio"/> Y | <input type="radio"/> N | <input type="radio"/> U | <input type="radio"/> N/A |
| 8. Strength of equipment base and load path to CG adequate | <input checked="" type="radio"/> Y | <input type="radio"/> N | <input type="radio"/> U | <input type="radio"/> N/A |
| 9. Embedded steel, grout pad or large concrete pad adequacy evaluated | <input checked="" type="radio"/> Y | <input type="radio"/> N | <input type="radio"/> U | <input type="radio"/> N/A |

Are anchorage requirements met?

NOTE (3)
 Y N U
 NOTE (2)
 SEE OSVS

INTERACTION EFFECTS

- | | | | | |
|--|------------------------------------|-------------------------|-------------------------|---------------------------|
| 1. Soft targets free from impact by nearby equipment or structures | <input checked="" type="radio"/> Y | <input type="radio"/> N | <input type="radio"/> U | <input type="radio"/> N/A |
| 2. Distribution lines have adequate flexibility | <input checked="" type="radio"/> Y | <input type="radio"/> N | <input type="radio"/> U | <input type="radio"/> N/A |
| 3. Overhead equipment or distribution systems are not likely to collapse | <input checked="" type="radio"/> Y | <input type="radio"/> N | <input type="radio"/> U | <input type="radio"/> N/A |
| 4. Have you looked for and found no other adverse concerns? | <input checked="" type="radio"/> Y | <input type="radio"/> N | <input type="radio"/> U | <input type="radio"/> N/A |

Is equipment free of interaction effects?

Y N U

IS EQUIPMENT SEISMICALLY ADEQUATE?

Y N U

COMMENTS

- (1) RIGID, CENTRIFUGAL-TYPE FAN; FREQ. EST. > 20 Hz. TURBINE BLDG 300' IRS EXCEED 1.5* BS BETWEEN 9-18 Hz ∴ ~~SEWS~~^{FIR} FREQ IS OUTSIDE EXCEEDANCE RANGE, AND CAP. > DEMAND.
- (2) PER NMPC DWG # C-18952-C, FAN-IS ANCHORED w/6, 1/2" φ 2-UNIT CINCH (LEADED) ANCHORS. LEADED ANCHORS ARE NOT COVERED BY THE GIP → OUTLIER. SEE OSVS. ALSO, INSTALLATION ADEQUACY IS UNKNOWN.
- (3) PER DWG C-18952-C, ANCHORS ARE THROUGH 1 1/2" GROUT PAD & ARE SECURED IN CONCRETE FLOOR.

A) SCAFFOLDING WAS ADDED AFTER THIS WALKDOWN.

1 01
8/10/95

Evaluated by: [Signature] FE

Date: 1-10-95

[Signature]

6/3/95

THRODATA
C 210
W 1000
01 3021



ATTACHMENT B
 CALC NO SO. 2 SEIS 210-01
 REVISION 00
 PAGE NO 01

Revision 2
 Corrected, 6/28/91

Sheet 1 of 2

Exhibit 5-1

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)

1. OUTLIER IDENTIFICATION, DESCRIPTION, AND LOCATION

Equipment ID Number 210-01 Equipment Class 09-FANS
 Equipment Location: Building TB Floor Elevation 300'
 Room or Row/Column Base Elevation 300'
 Equipment Description CRAC/EMER. VENT FAN #11

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	<input checked="" type="checkbox"/>	Shell Buckling ¹	_____
Caveats	<input type="checkbox"/>	Anchor Bolts and Embedment	_____
Anchorage	<input checked="" type="checkbox"/>	Anchorage Connections	_____
Seismic Interaction	<input checked="" type="checkbox"/>	Flexibility of Attached Piping ¹	_____
Other	_____	Other	_____
		<u>Cable and Conduit Raceways</u>	
<u>Essential Relays</u>		Inclusion Rules	_____
Capacity vs. Demand	_____	Other Seismic Performance Concerns	_____
Mounting, Type, Location	_____	Limited Analytical Review	_____
Other	_____	Other	_____

RI
 M.A
 8/15/95

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):

- (1) EQUIPMENT IS ANCHORED BY LEADED CINCH ANCHORS. LEADED ANCHORS ARE NOT COVERED BY GIP.
- (2) TIGHTNESS/INSTALLATION QUALITY OF CINCH ANCHORS IS UNKNOWN.
- (3) SCAFFOLD MAY IMPACT FAN

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 8/15/95



Exhibit 5-1 (Cont'd)

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)

Equipment ID Number 210-01

3. PROPOSED METHOD OF OUTLIER RESOLUTION (OPTIONAL)

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

DETERMINE CATCH ANCHOR TENSILE AND SHEAR CAPACITIES USING SAVANNAH RIVER TEST PROGRAM REPORT, AND CONFIRM TIGHTNESS OF EXISTING ANCHORS. OTHERWISE, MODIFY ANCHORAGE. ANALYZE SCAFFOLD OR REPLACE W/ A PERMANENT PLATFORM

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

R1
1/8/95
M.A
8/15/95

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.)

C.S. SCHLASEMAN, PE
Print or Type Name

[Signature]
Signature

1-10-95
Date

CARMEN R. AGOSTA
Print or Type Name

[Signature]
Signature

6/3/95
Date

Print or Type Name

Signature

Date

