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 Sheet 2 of 37

 Job No.: 52233 Job: Duquesne Beaver Valley Power Station By: RC Date: 11-30-95

 Calc No.: 019

 Chk: One Date: 11-30-95

 Subjects Appleared Evolution for Values lasts

Subject: Anchorage Evaluation for Various Instruments

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### ATTACHMENTS

A

SEWS SHEETS FOR VARIOUS INSTRUMENTS A-1

B-1

(152 PAGES IN ATTACHMENT A)

B

DUQUESNE LIGHT COMPANY MASONRY BLOCK WALL ANCHORAGE INFORMATION

6 PAGES IN ATTACHMENT B)

Sheet 4 of 37 Job No.: 52233 Job: Duquesne Beaver Valley Power Station By: <u>RC</u> Date: <u>Interf</u> Calc No.: 019. Chk: <u>Mr</u> Date: <u>II-33-45</u> Subject: Anchorage Evaluation for Various Instruments

1.0 PURPOSE

THE PURPOSE OF THIS CALCULATION IS TO DEMONSTRATE SEISMIC ANCHORAGE ADEQUACY FOR THE FOLLOWING INSTRUMENTS AT THE DUQUESNE LIGHT COMPANY BEAVER VALLEY POWER STATION:

TAG No.	BUILDING	FLOOR ELEVATION
FT-CH-122	AXLB	722
FT-CH-124	SFGB	722
FT-CH-127	SFGB	722
FT-CH-130	SFGB	722
FT-CH-150	AXLB	722
FT-FW-100A	SFGB	735
FT-FW-1CJB	SFGB	735
FT-FW-100C	SFGB	735
LT-FW-474	RCBX	718
LT-FW-475	RCBX	718
LT-FW-476	RCBX	718
LT-FW-477	RCBX	718
LT-FW-484	RCBX	738
LT-FW-485	RCBX	738
LT-FW-486	ACBX	718
LT-FW-495	RCBX	718
LT-FW-496	RCBX	718
LT-WT-104A1	YARD	735
LT-WT-104A2	YARD	735
PT-RC-403	RCBX	701
QS-RACK-4	YARD/RWS	Г 735

A REVIEW OF THE SEWS SHEETS FOR THE ABOVE INSTRUMENTS INDICATES THAT THE CONCERN IS THE ANCHORAGE.

FOR INSTRUMENTS LT-QS-100A, -100B, -100C, and -100D THE SEWS INDICATES THAT THEY ARE LINE MOUNTED AND AS SUCH THE ANCHORAGE IS MARKED AS "N/A". THEREFORE THESE FOUR INSTRUMENTS ARE NOTED HERE FOR COMPLETENESS ONLY.

Job No.: <u>522</u> Calc No.: <u>01</u> Subject: <u>Anct</u>	9	Sheet <u>5</u> of <u>37</u> <u>quesne Beaver Valley Power Station</u> By: <u><u>R</u> Date: <u>11-30-95</u> <u>Chk: Crem</u> Date: <u>11-30-95</u> <u>ion for Various Instruments</u></u>
IAG No. OS-RACK-3	BUILDIN YARD/RWS	
	DICATES THA	T THE ABOVE ITEM HAS AN INTERACTION CONCERN.
TAG No.	BUILDING	FLOOR ELEVATION
FIS-FW-151A	SFGB	722
FIS-FW-151B	SFGB	722
PS-MS-101A	SFGB	768
PS-MS-101B	SFGB	768
PS-MS-101C	SFGB	768
PS-VS-106A	AXLB	768
PS-VS-106B	AXLB	768
TS-HV-55A	SRVB	713
TS-HV-55B	SRVB	713

 TS-HV-55B
 SRVB
 713

 PNL-MS-101A
 SFGB
 751

 PNL-MS-101B
 SFGB
 751

 PNL-MS-101C
 SFGB
 751

QS-RACK-3 YARO/RWST 735 ZA

THE SEWS INDICATES THAT THE ABOVE ITEMS ARE SEISMICALLY ADEQUATE.

Sheet 6 of 37 Job No.: 52233 Job: Duquesne Beaver Valley Power Station By: <u>n</u> Calc No.: 019 Calc No.: 019 Subject: Anchorage Evaluation for Various Instruments

#### 2.0 REFERENCES

1. SEISMIC QUALIFICATION UTILITY GROUP (SQUG), "GENERIC IMPLEMENTATION PROCEDURE (GIP)", REVISION 2, JUNE 28, 1991.

2. SEWS SHEETS FOR EACH INSTRUMENT SHOWN IN SECTION 1.0 ABOVE.

3. TELECOPY FROM G.S. RITZ TO R.W. CUSHING dated JULY 13, 1995, EQE INCOMING LOG NUMBER 52233-I-003.

4. DUQUESNE LIGHT COMPANY NUCLEAR DIVISION DRAWING 8700-07.072-0431, "TECHNICAL MANUAL, MODEL 764 DIFFERENTIAL PRESSURE ELECTRONIC TRANSMITTER".

5. DUQUESNE LIGHT COMPANY NUCLEAR DIVISION DRAWING 8700-RK-1F-3, "INSTRUMENT PIPING - SHEET 4".

 DUQUESNE LIGHT COMPANY NUCLEAR DIVISION DRAWING 8700-6.24-4016-SHEET 1-1, "DEMINERALIZED WATER STORAGE TANK WT-TK-10, TRANSMITTER LT-WT-104A1".

 DUQUESNE LIGHT COMPANY NUCLEAR DIVISION DRAWING 8700-6.24-4017-SHEET 1-1, "DEMINERALIZED WATER STORAGE TANK WT-TK-10, TRANSMITTER LT-WT-104A2".

8. O. W. BLODGETT, "DESIGN OF WELDED STRUCTURES", 1966.

9. DUQUESNE LIGHT COMPANY NUCLEAR DIVISION CALCULATION 8700-DSC-0075, "SFISMIC BLOCK WALLS".

10. FAX'ed MASONRY BLOCK WALL INFORMATION, FROM TOM WESTBROOK (DUQUESNE LIGHT COMPANY) TO RON CUSHING (EQE). COPIES ARE IN BOTH THE EQE IRVINE OFFICE QA FILES, AND A COPY IS FOUND IN ATTACHMENT B OF THIS CALCULATION.

11. TELECON NOTES, CARL NELMAN (EQE) AND TOM WESTBROOK (DUQUESNE LIGHT COMPANY), NOVEMBER 28, 1995; FOUND IN EQE IRVINE OFFICE QA FILES.

Sheet 7 of 37 Job No.: 52233 Job: Duquesne Beaver Valley Power Station By: Orn Date: 9-24-95 Calc No.: 019 Chk: 04 Date: 10/18/95 Subject: Anchorage Evaluation for Various Instruments

3.0 ANCHORAGE CALCULATION FOR:

FT-CH-124, -127, -130, -150; LT-FW-474, -475, -476, -477, 484, -485, -486, -495, -496; and PT-RC-403

----- REFER TO FIGURES 1 THROUGH 8 FOR THIS SECTION.

----- THESE INSTRUMENTS ARE GROUPED TOGETHER BASED ON SIMILAR ANCHORAGE CONFIGURATIONS. THE INSTRUMENT IS MOUNTED ONTO A 2" DIAMETER PIPE. THE PIPE IS WELDED TO A BASEPLATE. THE BASEPLATE IS FASTENED TO THE CONCRETE STRUCTURE WITH EXPANSION ANCHORS.

-- THE MINIMUM ANCHOR BOLT SIZE IS 3/8" DIAMETER "RED HEAD" WHICH IS A PHILLIPS SHELL-TYPE ANCHOR.

-- THE SMALLEST ANCHOR BOLT PATTERN IS 4" SQUARE.

-- THE GREATEST INSTRUMENT WEIGHT IS THE FISHER PORTER FLOW TRANSMITTER, CONSERVATIVELY ESTIMATED AT 50 LB.

-- THE SMALLEST PIPE-TO-BASEPLATE WELD = 3/16".

#### CONSERVATIVE

-- THE LONGEST CANTILEVER LENGTH FROM BASEPLATE-TO-INSTRUMENT IS 18.25" (Jee Figure 8).

-- THE LONGEST VERTICAL OFFSET IS ESTIMATED TO BE 12".

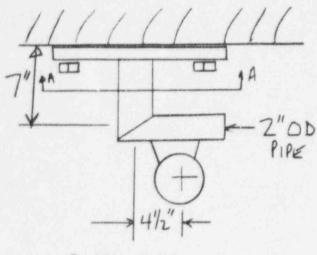
-- BASED ON A REVIEW OF FIGURES 1 THROUGH 7, A BOUNDING CONFIGURATION IS SHOWN IN FIGURE 8.

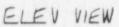


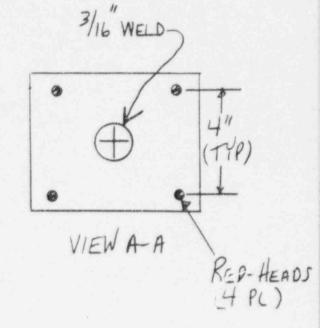
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1.78x1.17636.4L	0 1 1 2	~	SHEE	TNO O
JOB NO 52233	JOB DUDUETE BEAVER IDLEY POU	ET JAMON	BY CRM	DATE 9-29-95
CALC NO. 017	SUBJECT_JAZ		CHKD PA	DATE 10/18/95

FT- CH- 150 FUHER & PORTER MODEL 10B 2496 P13







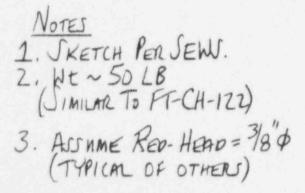
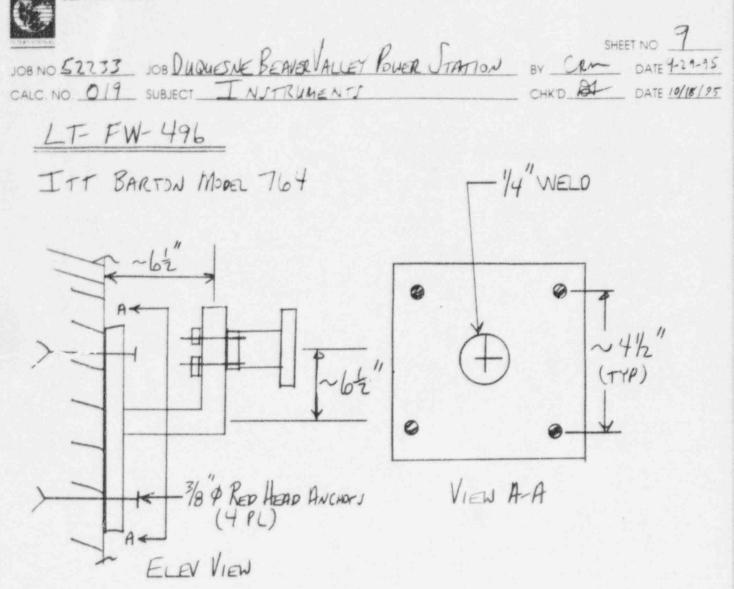


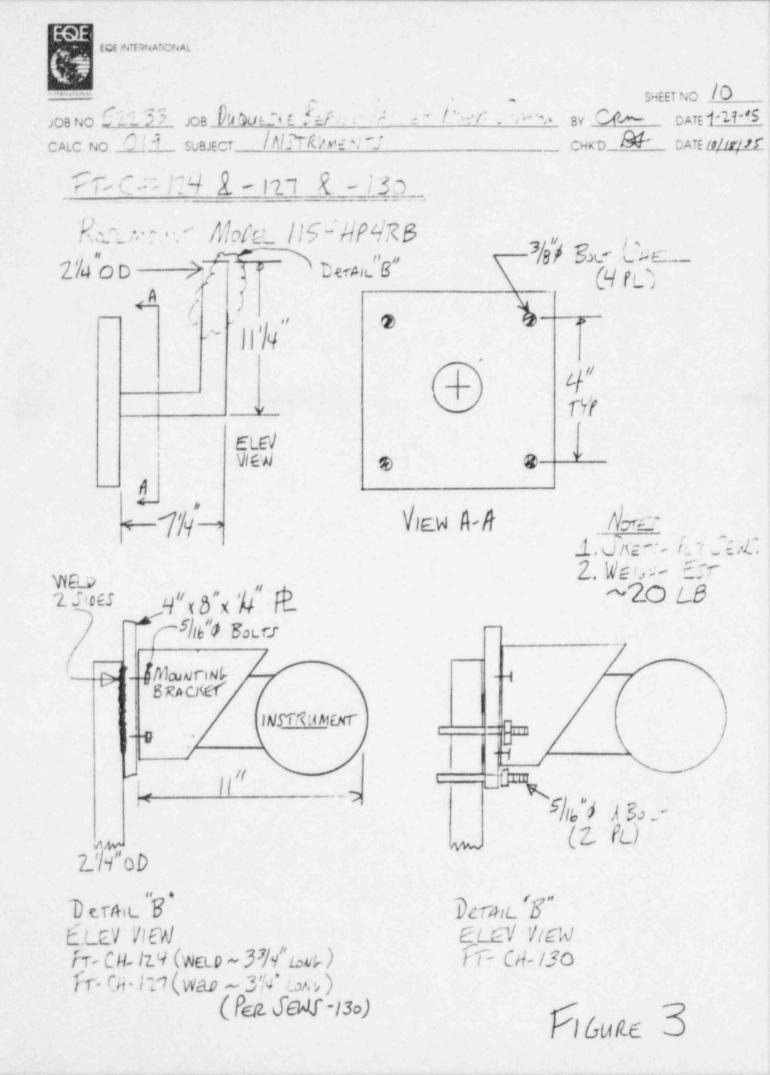
FIGURE 1

EQE INTERNATIONAL



NoTES 1. SKETCH VER BEAVER VALLET SKETCH 3016-4 2. WE~21 LB Per Ref 4.

FIGURE 2





EQE INTERNATIONAL

JOB NO 52233 JOB DUQUESNE BEAVER VALLET BUER STATION BY CAM DATE 4-29-45 CALC NO 019 SUBJECT INSTRUMENTS CHKD AT DATE 10/10795

PT-RC-403 Rasemount 11546P9RB 3/8" HILTI (4 PL) 4 62 VIEN A-A ELEV VIEW A.

NOTES 1. SKETCH PER SEWS. 2. INSTRUMENT AT ELEV ~701. 3. INSTRUMENT ~ 20 LB (ESTIMATED)

FIGURE 4



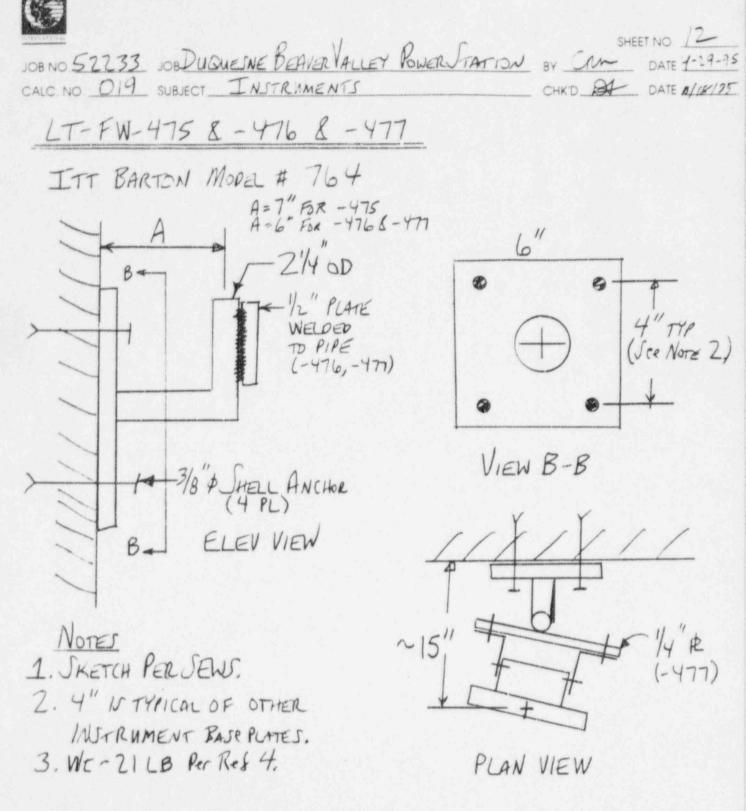
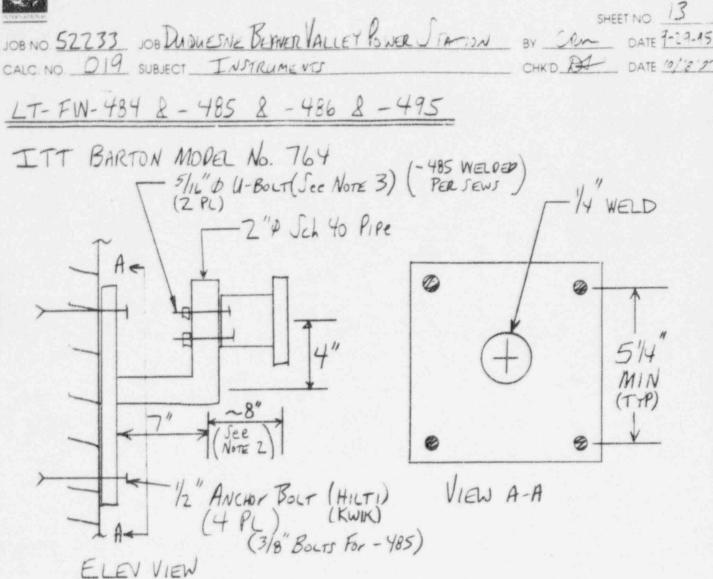


FIGURE 5



EQE INTERNATIONAL



Notes 1. Sketch Per Ref 5. 2. 8" TYPICAL PER OTHERS (See Skerch For LT-FW-475). 3. TYPICAL OF OTHER INSTALLATIONS (See FT-CH-130 SKETCH). 4. Wt~21 LB Per Ref 4.

FIGURE 6

EGE INTERNATIONAL

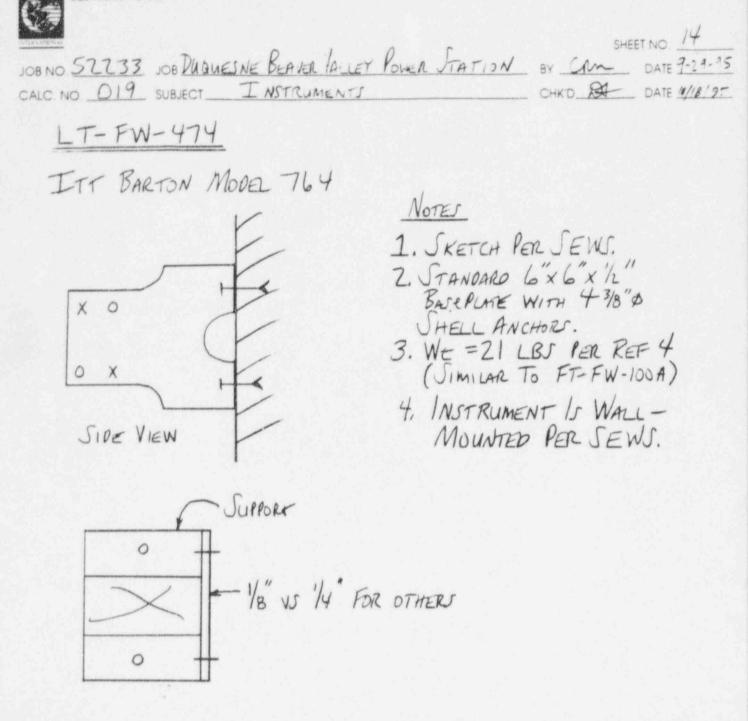


FIGURE 7

EQE INTERNATIONAL

	JOB DUDNESNE BOAKEN VALLET BUG FATIS	SHEET NO 15
JOB NO. 52233	JOB VUDNESNE BEAKEN VALLET BUS TATION	1 BY CAM DATE 9-29-7
CALC NO 019	SUBJECT_INSTRUMENTS	CHK'D DATE 10/10/19

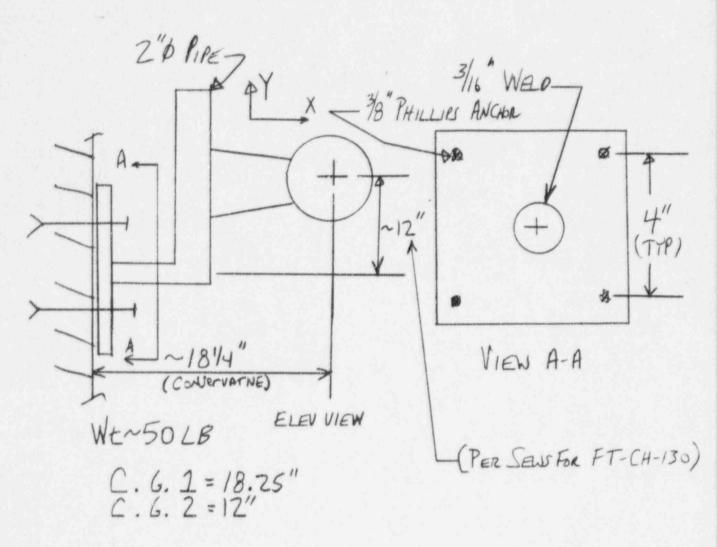


FIGURE 8 BOUNDING CONFIGURATION for FIGURES 1 THEN 7

Sheet 16 of 37 Job No.: 52233 Job: Duquesne Beaver Valley Power Station By: DA Date: 9/29/95 Calc No.: 019 Chk: OM De J: //-22-35 Subject: Anchorage Evaluation for Various Instruments

WT = 50

----- FOR BOUNDING PURPOSES DETERMINE THE LARGEST VALUE OF THE PEAK HORIZONTAL ACCELERATION FOR THESE INSTRUMENTS USING THE SPECTRA PROVIDED IN REFERENCE 3. USE THE 3% DAMPING PLOT.

BLDG.	FLOOR ELEV	PEAK SPECTRAL ACCEL	
SFGB	722	0.63g	
AXLB	722	0.69g	
RCBX	701	0.79g (use value for Floor Elev = $738$ )	
RCBX	718	0.79g (use value for Floor Elev = 738)	
RCBX	738	0.79g	

USE: ah = 0.79

L:  $av = \frac{2}{3} \cdot ah$  av = 0.53

----- C.G.'s AS SHOWN IN FIGURE 8:

CG1 = 18.25 CG2 = 12

----- DETERMINE STRESSES ON THE 3/16" WELD FOR X-DIRECTION, Y-DIRECTION, Z-DIRECTION, AND DEAD LOAD. USE REFERENCE 8 SECTION 7.4 AS A GUIDE:

Aw =  $\pi \cdot (2)$  Aw = 6.28 Sv: =  $\frac{\pi \cdot (2)^2}{4}$  Sw = 3.14 Jw =  $\frac{\pi \cdot (2)^3}{4}$  Jw = 6.28

-- X-DIRECTION:

Xaxial =	WT ah	Xaxial = 6	
Aaxiai	Aw	Aaxiai - 0	
DEND V	WT·CG2·ah	DENID Y - 161	
BEND_X	Sw	$BEND_X = 151$	
SHR_X	= 0	$SHR_X = 0$	

-- Y-DIRECTION:

Yaxial 0 Yaxial = 0

 $BEND_Y = \frac{WT \cdot CG1 \cdot av}{Sw} \qquad BEND_Y = 153$ 

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 Date: 9/29/95

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 Chk: 100
 Date: 1/-22-95

Subject: Anchorage Evaluation for Various Instruments

CUP V	WT-av	SHR $Y = 4$
SHR_Y	Aw	SUR_1-4

-- Z-DIRECTION:

Zaxial = 0

Zaxial = 0

BEND Z = 229 (about Y axis)

 $BEND_Z = \frac{WT \cdot CG1 \cdot ah}{Sw}$ 

TORSION\_Z  $\frac{\left[(WT \cdot CG2 \cdot ah) \cdot \left[(2) \cdot \frac{1}{2}\right]\right]}{J_W}$  TORSION\_Z = 75 (about X axis)

 $SHR_Z = \frac{WT \cdot ah}{Aw}$ 

 $SHR_Z = 6$ 

- DEAD LOAD:

BENDd	I = WT-CG1 Sw	BENDdI = 290
SHRdl	WT	SHRdl = 8

----- COMBINE WELD STRESSES:

-- X-DIRECTION:

WELDx = Xaxial + BEND\_X + BEND\_Y + BENDdl WELDx = 601

(Note that BEND\_Z is not included with WELDx. The bending stresses due to X-dir and Y-dir loads act at the "top" of the weld. The bending stress due to the Z-dir load acts at the "side" of weld, i.e., 90 degrees away. The Z-dir bending stress = 0.0 at the "top" of the weld, which is neutral axis for the Z-dir bending stress).

f = 606

WELDy = 12

WELDz = 82

-- Y-DIRECTION:

WELDy SHR\_Y + SHRdl

- Z-DIRECTION

WELDZ TORSTON\_Z + SHR\_Z

- COMBINED STRESS ON THE WELD:

 $f = \sqrt{WELDx^2 + WELDy^2 + WELDz^2}$ 

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Subject: Anchorage Evaluation for Various Instruments

-- DETERMINE MINIMUM WELD SIZE REQUIRED. USE TABLE 6 OF REFERENCE 8, FOR A FILLET WELD, ASSUME E60 ELECTRODE:

SIZEmin =  $\frac{f}{9600}$  SIZEmin = 0.063 SAFETY\_FACTOR =  $\frac{\frac{3}{16}}{\frac{16}{\text{SIZEmin}}}$  SAFETY\_FACTOR = 3 or  $\frac{1}{\text{SAFETY}_FACTOR}$  = 0.34

THEREFORE IT CAN BE SEEN THAT THE 3/16" PIPE-TO-BASEPLATE WELD HAS HIGH CAPACITY FOR THE BOUNDING CONFIGURATION. THE ANALYSIS IS ALSO CONSIDERED TO BE CONSERVATIVE SINCE THE SEISMIC COMPONE'4TS WERE ADDED TOGETHER ABSOLUTELY (i.e. NOT SRSS'd); ALSO THE DEAD LOAD COMPONENTS WERE SIMILARLY ADDED DIRECTLY TO THE SEISMIC COMPONENTS.

----- EVALUATE THE CONCRETE ANCHOR BOLTS:

-- X-DIRECTION LOADS:

 $TENx = \left(\frac{WT \cdot CG2 \cdot ah}{2 \cdot 4} + \frac{WT \cdot ah}{4}\right) \cdot lb \qquad TENx = 69 \cdot lb$ SHRx = 0 · lb SHRx = 0 · lb

-- Y-DIRECTION LOADS:

TENy	$:= \frac{WT \cdot CG1 \cdot av}{(2 \cdot 4)} \cdot lb$	TENy = 60°1b
SHRy	$= \frac{WT \cdot av}{4}$ lb	SHRy = 7*lb

-- Z-DIRECTION LOADS:

 $TENz := \frac{WT \cdot CG1 \cdot ah}{(2 \cdot 4)} \cdot lb \qquad TENz = 90 \cdot lb$ 

SHRz = 
$$\left[\frac{WT \cdot CG2 \cdot ah}{4 \cdot \sqrt{4^2 + 4^2}} + \frac{WT \cdot ah}{4}\right]$$
 · lb SHRz = 31 · lb (Torsional and average shear)

-- DEAD LOADS:

$$TENdI := \frac{WT \cdot CG1}{(2\cdot4)} \cdot lb \qquad TENdI = 114 \cdot lb$$

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SHRdI = 
$$\frac{WT}{4}$$
 lb SHRdI = 13·lb

-- COMBINE ANCHOR BOLT LOADS:

 $P = \sqrt{TENx^{2} + TENy^{2} + TENz^{2} + TENdl}$   $P = 243 \cdot lb$   $V = \sqrt{SHRx^{2} + SHRy^{2} + SHRz^{2} + SHRdl}$   $V = 44 \cdot lb$ 

-- DETERMINE ANCHOR BOLT CAPACITY:

USING REFERENCE 1 APPENDIX C PARAGRAPH C.2 FOR 3/8" EXPANSION ANCHORS, DETERMINE THE ANCHOR BOLT ALLOWABLE VALUES FOR TENSION AND SHEAR:

Pnom := 1460-lb Vnom := 1420-lb

-- ANCHOR TYPE, EMBEDMENT, BOLT SPACING, EDGE DISTANCE, CONCRETE STRENGTH, CONCRETE CRACKS, ESSENTIAL RELAYS: NO CAPACITY REDUCTION FACTORS ARE REQUIRED AS THESE ATTRIBUTES ARE NOT MENTIONED AS A CONCERN IN THE SEWS.

-- THEREFORE THE ANCHOR BOLT ALLOWABLES ARE:

Pallow := Pnom	Pallow = $1460 \cdot 1b$
Vallow = Vnom	Vallow = 1420°lb

---- USING THE CONSERVATIVE LINEAR SHEAR-TENSION INTERACTION:

 $\frac{1}{Pallow} + \frac{1}{Vallow} = 0.2 < 1.0 \text{ OK} (3/8" DIA ANCHOR BOLTS)$ 

PER THE SEWS FOR FT-CH-130, INSTRUMENTS FT-CH-124, -127, & -130 ARE MOUNTED ON A BLOCK WALL. REFERENCE 9 DEMONSTRATES SEISMIC ADEQUACY FOR THIS BLOCK WALL.

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Job No.: 52233 Job: Duquesne Beaver Valley Power Station By: <u>RC</u> Date: <u>11-38-95</u> Calc No.: 019 Chk: <u>Opn</u> Date: <u>11-30-95</u>

Subject: Anchorage Evaluation for Various Instruments

-- CHECK THE ADEQUACY OF THE ANCHORAGE IN THE MASONRY BLOCK WALL ITSELF. FIGURE 4 OF REFERENCE 10 PROVIDES ALLOWABLES FOR MASONRY WALLS.

PER TOM WESTBROOK OF DLCo., THE INSTRUMENTS ARE MOUNTED ON C-145 SOLID BLOCK WALLS (REFERENCE 11).

THE C-145 TABLE SPECIFIES A MINIMUM SPACING OF 4.375", AND FIGURE 3 SHOWS THE ACTUAL BOLT SPACING TO BE 4.0". STRAIGHT-LINE INTERPOLATION WILL BE TAKEN PER NOTE 2 OF FIGURE 4.

THEREFORE, FROM FIGURE 4 OF REFERENCE 10, FOR THE C-145 SOLID BLOCK, FOR THE 3/8" DIAMETER ANCHOR, FOR DBE, AND APPLYING THE REDUCTION:

Pallow =  $1170 \cdot \left(\frac{4}{4.375}\right) \cdot 1b$  Pallow =  $1070 \cdot 1b$ Vallow =  $1175 \cdot \left(\frac{4}{4.375}\right) \cdot 1b$  Vallow =  $1074 \cdot 1b$ 

-- BECAUSE THE ANCHOR BOLT SPACING IS 4", IT IS POSSIBLE THAT ALL 4 ANCHOR BOLTS ARE IN ONE BLOCK. PER NOTE 3 OF FIGURE 4, THE LOADS WILL BE COMBINED. USING THE PREVIOUSLY CALCULATED ANCHOR BOLT LOADS:

 $P = 4 \cdot P \qquad P = 860 \cdot 1b$  $V = 149 \cdot 1b$ 

-- FROM FIGURE 1A OF REFERENCE 10, FOR SINGLE WYTHE, CHECK THE BLOCK USING THE ABOVE ALLOWABLES:

$$\left(\frac{P}{Pallow}\right)^{\frac{2}{3}} + \left(\frac{V}{Vallow}\right)^{\frac{2}{3}} = 0.73 < 1.0 \text{ OK} \text{ (MASONRY BLOCK WALL)}$$

THE MASONRY BLOCK WALL HAS BEEN SHOWN TO HAVE ADEQUATE CAPACITY TO ANCHOR THE BOUNDING CONFIGURATION INSTRUMENT INSTALLATION. Sheet 2 of 37 Job No.: 52233 Job: Duquesne Beaver Valley Power Station By: An Date: 9-29-15 Calc No.: 012 Subject: Anchorage Evaluation for Various Instruments

3.1 ANCHORAGE CALCULATION FOR: FT-CH-122; FT-FW-100A, -100B, -100C; LT-WT-104A1, -104A2

-- REFER TO FIGURES 9 THROUGH 12 FOR THIS SECTION.

-- THESE INSTRUMENTS ARE GROUPED TOGETHER BASED ON SIMILAR ANCHORAGE CONFIGURATIONS. THE INSTRUMENT IS MOUNTED ONTO A VERTICAL CANTILEVER. THE CANTILEVER IS WELDED TO A BASEPLATE. THE BASEPLATE IS FASTENED TO THE CONCRETE FLOOR WITH EXPANSION ANCHORS.

-- THE MINIMUM ANCHOR BOLT SIZE IS 3/8" DIA.

-- THE SMALLEST ANCHOR BOLT PATTERN IS 4" SQUARE.

-- THE GREATEST INSTRUMENT WEIGHT IS THE FISHER & PORTER FLOW TRANSMITTER, CONSERVATIVELY ESTIMATED AT 50 LB.

-- THE SMALLEST PIPE-TO-BASEPLATE WELD IS 1/8".

-- THE LONGEST CANTILEVER LENGTH FROM BASEPLATE-TO-INSTRUMENT IS ABOUT 50".

-- THE GREATEST HORIZONTAL DISTANCE FROM PIPE CENTERLINE TO INSTRUMENT IS ESTIMATED TO BE 13".

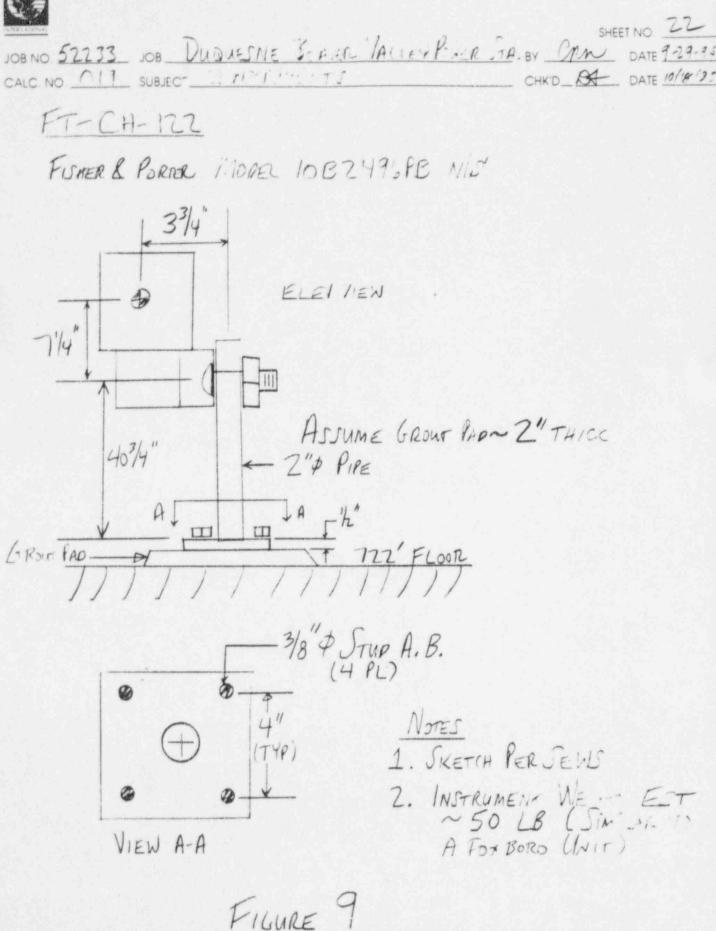
-- GROUT PAD MAXIMUM THICKNESS ASSUMED TO BE 2".

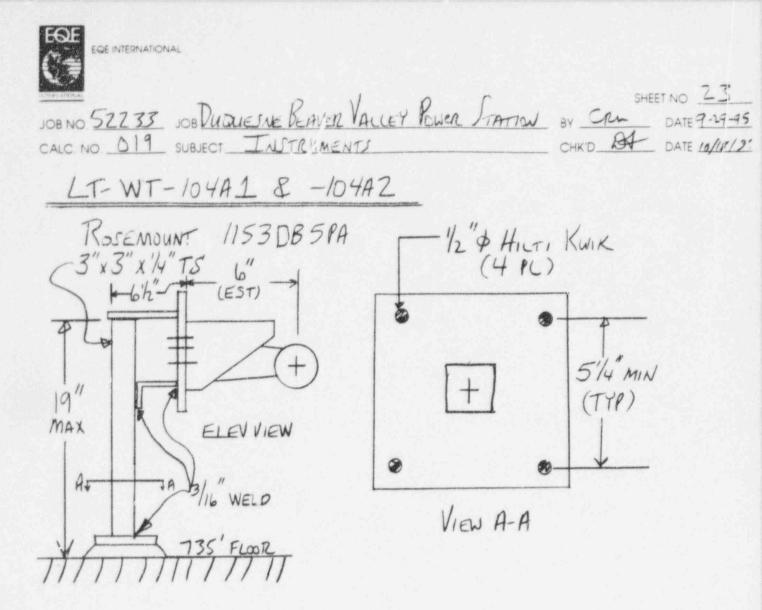
-- THE SMALLEST DIAMETER CANTILEVER IS 2" DIA PIPE.

-- BASED ON A REVIEW OF FIGURES 9 THROUGH 11, A BOUNDING CONFIGURATION IS SHOWN IN FIGURE 12.



EGE INTERNATIONAL

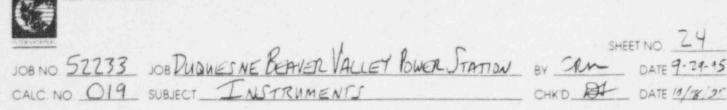




<u>Notes</u> 1. Skerch Per REF 6 (-104A1) & Ref 7(-104A2). 2. Wt ~ 20 LB(ESTIMATED)

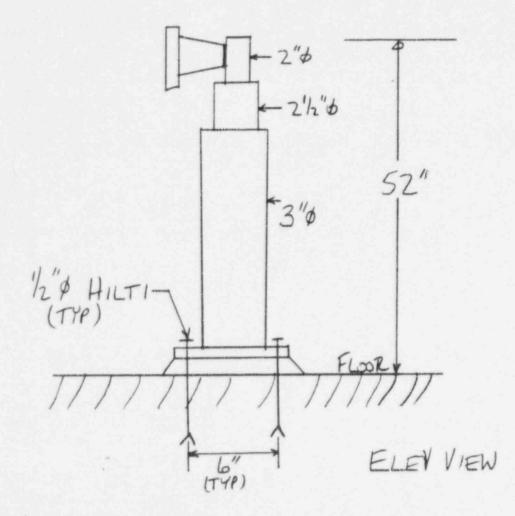
FIGURE 10

EGE INTERNATIONAL



FT-FW-100A & -100B & -100C

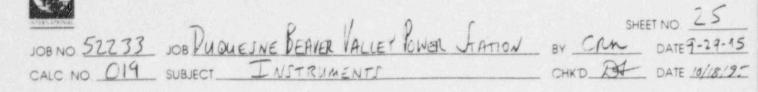
ITT- BARTON MODEL 764

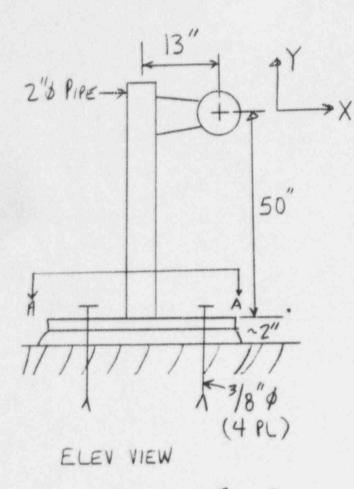


NOTES 1. SKETCH PER SEWS 2. WEIGHT ~ ZI LB PERREF 4. More # 764 PERREF 4.

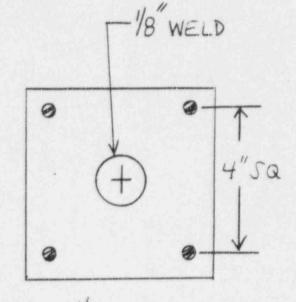
FIGURE 11

EQE INTERNATIONAL





INST WE = 50 LB C.G.1 = 50" C.G.2 = 13"



VIEW A-A

FIGURE 12 BOUNDING CONFIGURATION FOR FIGURES 9 THRU 11 Sheet <u>26</u> of <u>37</u> Job No.: <u>52233</u> Job: <u>Duquesne Beaver Valley Power Station</u> By: <u>A</u> Date: <u>9/29/95</u> Calc No.: <u>019</u> Subject: Anchorage Evaluation for Various Instruments

FOR BOUNDING PURPOSES DETERMINE THE LARGEST VALUE OF THE PEAK HORIZONTAL ACCELERATION FOR THESE INSTRUMENTS USING THE SPECTRA PROVIDED IN REFERENCE 3. USE THE 3% DAMPING PLOT.

 BLDG.
 FLOOR ELEV
 PEAK SPECTRAL ACCEL.

 SFGB
 735
 0.64g

 AXLB
 722
 0.69g

 YARD
 735
 0.43g (ratioed from 5% damping plot)

 USE:
 ah := 0.69

VERTICAL:  $av := \frac{2}{3} \cdot ah$  av = 0.46

----- C.G.'s AS SHOWN IN FIGURE 12:

CG1 := 50 CG2 := 13

---- DETERMINE STRESSES ON THE 1/8" WELD FOR X-DIRECTION, Y-DIRECTION, Z-DIRECTION, AND DEAD LOAD. USE REFERENCE 8 SECTION 7.4 AS A GUIDE:

Aw :=  $\pi \cdot (2)$  Aw = 6.28 Sw :=  $\frac{\pi \cdot (2)^2}{4}$  Sw = 3.14 Jw :=  $\frac{\pi \cdot (2)^3}{4}$  Jw = 6.28

-- X-DIRECTION:

SHR\_X :=  $\frac{WT \cdot ah}{Aw}$  SHR\_X = 5 BEND\_X :=  $\frac{WT \cdot CG1 \cdot ah}{Sw}$  BEND\_X = 549

Xaxial := 0 Xaxial = 0

-- Y-DIRECTION:

SHR\_Y = 0 SHR\_Y = 0

 $BEND_Y := \frac{WT \cdot CG2 \cdot av}{Sw} \qquad BEND_Y = 95$ 

Yaxial :=  $\frac{WT \cdot av}{Aw}$  Yaxial = 4

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-- Z-DIRECTION:

Zaxial = 0	Zaxial = 0
$BEND_Z := \frac{WT \cdot CG1 \cdot ah}{Sw}$	BEND_Z = 549 (about X axis)

TORSION_Z =	(WT·CG2·ah)·	$(2)\cdot\frac{1}{2}$
	Jw	the second se

 $SHR_Z := \frac{WT \cdot ah}{Aw}$ 

SHR Z = 5

AXIALdI = 8

TORSION Z = 71 (about Y axis)

-- DEAD LOAD:

BENDdl := WT-CG2 BENDdI = 207AXIALdI :=  $\frac{WT}{AW}$ 

SHRdl := 0 SHRdl = 0

----- COMBINE WELD STRESSES:

-- X-DIRECTION:

```
WELDX = SHR X + TORSION Z
```

WELDx = 77

-- Y-DIRECTION:

WELDy := Yaxial + BEND\_Y + BEND\_X + BENDdl - AXIALdl WELDy = 847

(Note that BEND Z is not included with WELDy. The bending stresses due to X-dir and Y-dir loads act at the "top" of the weld. The bending stress due to the Z-dir load acts at the "side" of weld, i.e., 90 degrees away. The Z-dir bending stress = 0.0 at the "top" of the weld, which is neutral axis for the Z-dir bending stress).

-- Z-DIRECTION:

WELDz = 77WELDz := SHR\_Z + TORSION\_Z

-- COMBINED STRESS ON THE WELD:

 $f := \sqrt{(WELDx^2 + WELDy^2 + WELDz^2)}$  f = 854

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Subject: Anchorage Evaluation for Various Instruments

-- DETERMINE MINIMUM WELD SIZE REQUIRED. USE TABLE 6 OF REFERENCE 8, FOR A FILLET WELD, ASSUME E60 ELECTRODE:

SIZEmin :=  $\frac{f}{9600}$  SIZEmin = 0.089 SAFETY\_FACTOR :=  $\frac{1}{8}$  SAFETY\_FACTOR = 1.41 Or  $\frac{1}{SAFETY_FACTOR} = 0.71$ 

THEREFORE IT CAN BE SEEN THAT THE 1/8" PIPE-TO-BASEPLATE WELD HAS ADEQUATE CAPACITY FOR THE BOUNDING CONFIGURATION. THE ANALYSIS IS ALSO CONSIDERED TO BE CONSERVATIVE SINCE THE SEISMIC COMPONENTS WERE ADDED TOGETHER ABSOLUTELY (i.e. NOT SRSS'd)...

----- EVALUATE THE CONCRETE ANCHOR BOLTS:

-- X-DIRECTION LOADS:

$$TENx := \left(\frac{WT \cdot CG1 \cdot ah}{2 \cdot 4}\right) \cdot lb \qquad TENx = 216 \cdot lb$$
  
SHRx :=  $\frac{WT \cdot ah}{4} \cdot lb$  SHRx = 9 \cdot lb

-- Y-DIRECTION LOADS:

$$TENy := \left[ \frac{WT \cdot CG2 \cdot av}{(2 \cdot 4)} + \frac{WT \cdot av}{4} \right] \cdot lb \qquad TENy = 43 \cdot lb$$

$$SHRy := 0 \cdot lb \qquad SHRy = 0 \cdot lb$$

-- Z-DIRECTION LOADS:

$$TENz := \frac{WT \cdot CG1 \cdot ah}{(2 \cdot 4)} \cdot lb \qquad TENz = 216 \cdot lb$$

SHRz = 
$$\left[\frac{WT \cdot CG2 \cdot ah}{4 \cdot \sqrt{4^2 + 4^2}} + \frac{WT \cdot ah}{4}\right] \cdot lb$$

SHRz = 28-1b (Torsional and average shear)

-- DEAD LOADS:

ENdl := 
$$\left(\frac{WT \cdot CG2}{2 \cdot 4} - \frac{WT}{4}\right) \cdot lb$$

SHRdl = 0-lb

SHRdl = 0.1b

TENdI = 69+1b

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Subject: Anchorage Evaluation for Various Instruments

-- COMBINE ANCHOR BOLT LOADS:

 $P := \sqrt{TENx^{2} + TENy^{2} + TENz^{2} + TENdl}$   $P = 377 \cdot lb$   $V := \sqrt{SHRx^{2} + SHRy^{2} + SHRz^{2} + SHRdl}$   $V = 30 \cdot lb$ 

-- DETERMINE ANCHOR BOLT CAPACITY:

USING REFERENCE 1 APPENDIX C PARAGRAPH C.2 FOR 3/8" EXPANSION ANCHORS, DETERMINE THE ANCHOR BOLT ALLOWABLE VALUES FOR TENSION AND SHEAR:

Pnom = 1460-lb Vnom = 1420-lb

- EMBEDMENT, BOLT SPACING, EDGE DISTANCE, CONCRETE STRENGTH, CONCRETE CRACKS, ESSENTIAL RELAYS: NO CAPACITY REDUCTION FACTORS ARE REQUIRED AS THESE ATTRIBUTES ARE NOT MENTIONED AS A CONCERN IN THE SEWS.

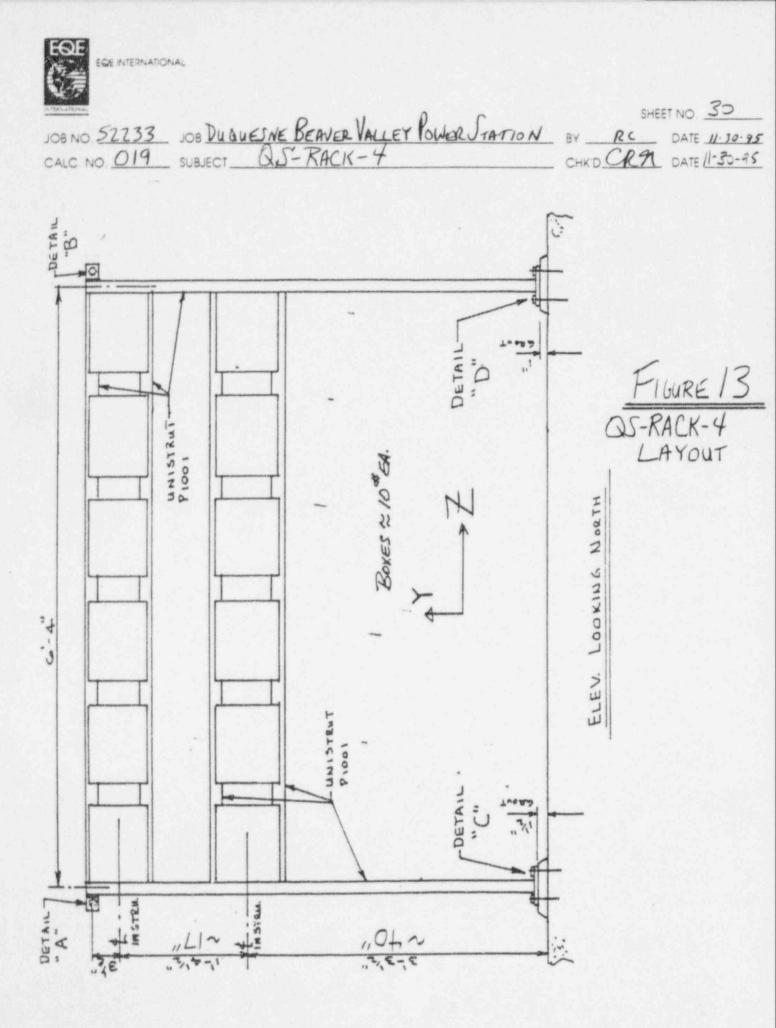
-- SINCE THE ANCHOR BOLT TYPE IS UNKNOWN, USE THE 0.6 REDUCTION FACTOR:

-- THEREFORE THE ANCHOR BOLT ALLOWABLES ARE:

Pallow := Pnom-0.6	Pallow = 876°lb	
Vallow := Vnom-0.6	Vallow = 852°lb	

---- USING THE CONSERVATIVE LINEAR SHEAR-TENSION INTERACTION:

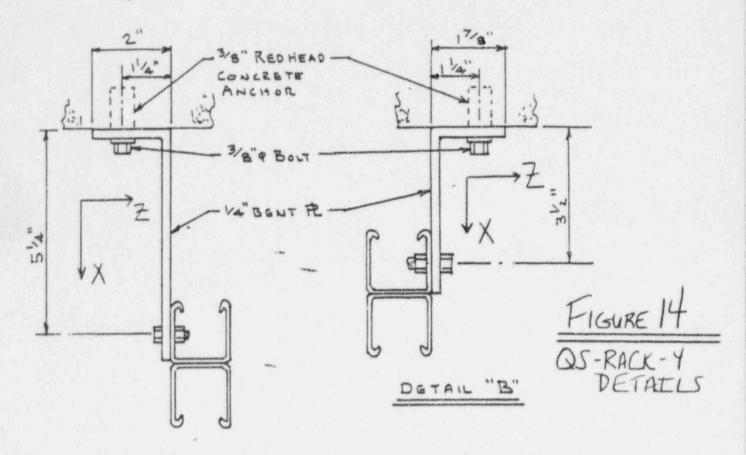
 $\frac{1}{\text{Pallow}} + \frac{1}{\text{Vallow}} = 0.46 < 1.0 \text{ OK} (3/8" DIA ANCHOR BOLTS)$ 

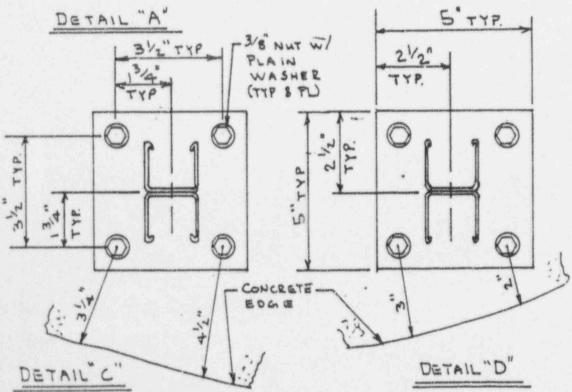


EQE INTERNATIONAL

FQF

IN TERMAL	0	0 11	7 0	SHEE	TNO.31
			POWER STATION	BYRC	DATE 11- 30- 45
CALC. NO. DI9	SUBJECT Q.S-	RACK-4		CHK'D CR9	DATE 11-32-75





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3.2 ANCHORAGE CALCULATION FOR QS-RACK-4

-- GENERAL CONFIGURATION AND DIMENSIONS FOR THIS INSTRUMENT RACK ARE FOUND ON FIGURES 13 and 14.

--- A REVIEW OF THE SEWS INDICATES THAT THE RACK IS VERY STIFF AND WELL-ANCHORED. SINCE THE RACK IS ANCHORED AT THE TOP ALSO, IT IS JUDGED THAT THE WEAK LINK IN THE ANCHORAGE ARE THE TWO 3/8" CONCRETE WALL ANCHORS AT THE TOP. THE 8-3/8" CONCRETE ANCHORS FOR THE TWO FLOOR BASEPLATES ARE JUDGED ADEQUATE BASED ON PERSONAL EXPERIENCE.

-- EACH BOX WEIGHS 10 LB PER THE SEWS. THEREFORE EACH ROW OF BOXES WEIGHS:

 UPPERROW := 6·10·lb
 UPPERROW = 60°lb

 LOWERROW := 6·10·lb
 LOWERROW = 60°lb

-- THE C.G. HEIGHTS ARE: UPcg := 57 LOWcg := 40

-- THIS RACK IS LOCATED IN THE YARD. USE GROUND SPECTRUM PEAK SPECTRAL ACCELERATION, 5% DAMPING (REFERENCE 3):

HORIZONTAL: ah = 0.33

-- DETERMINE LOADS ON THE WALL ANCHOR BOLTS:

X-DIR:

 $TENx := \frac{(UPPERROW \cdot ah \cdot UPcg) + (LOWERROW \cdot ah \cdot LOWcg)}{(2 \cdot (40 + 17 + 3.5))}$   $TENx = 16 \cdot lb$ 

SHRx := 0.1b

 $SHRx = 0 \cdot lb$ 

-- Y-DIR:

SINCE THE RACK IS BOLTED TO THE FLOOR, IT IS JUDGED THAT ALL VERTICAL LOADS ARE REACTED BY THE FLOOR ANCHORS, AND NO VERTICAL LOADS ARE REACTED BY THE WALL ANCHORS.

TENy = 0 lb SHRy = 0 lb

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 $SHRz = 20 \cdot Ib$ 

#### -- Z-DIR:

SINCE THE RACK IS STIFF, IT IS JUDGED THAT ONLY SHEAR LOADS WILL BE EXPERIENCED BY THE WALL ANCHORS. TENSION LOADINGS CAUSED BY ROTATION ABOUT THE VERTICAL AXIS ARE JUDGED TO BE INSIGNIFICANT.

TENz := 0-16

SHRz := UPPERROW ah + LOWERROW ah

-- DEAD LOAD:

DEAD LOADS ON THE WALL ANCHORS ARE CONSIDERED TO BE = 0.

TENdl = 0.1b SHRdl = 0.1b

-- COMBINE ANCHOR BOLT LOADS:

 $P := \sqrt{TENx^2 + TENy^2 + TENz^2 + TENdl}$   $P = 16 \cdot lb$  $V = \sqrt{SHRx^2 + SHRy^2 + SHRz^2 + SHRdl}$  $V = 20 \cdot 1b$ 

-- DETERMINE ANCHOR BOLT CAPACITY:

USING REFERENCE 1 APPENDIX C PARAGRAPH C.2 FOR 3/8" EXPANSION ANCHORS, DETERMINE THE ANCHOR BOLT ALLOWABLE VALUES FOR TENSION AND SHEAR:

Pnom := 1460-lb Vnom := 1420-lb

-- ANCHOR TYPE, EMBEDMENT, BOLT SPACING, EDGE DISTANCE, CONCRETE STRENGTH, CONCRETE CRACKS, ESSENTIAL RELAYS: NO CAPACITY REDUCTION FACTORS ARE REQUIRED AS THESE ATTRIBUTES ARE NOT MENTIONED AS A CONCERN IN THE SEWS.

Pallow := Pnom	18-	$Pallow = 1460 \cdot 1b$
Vallow := Vnom		Vallow = 1420-16

---- USING THE CONSERVATIVE LINEAR SHEAR-TENSION INTERACTION:

 $\frac{P}{Pallow} + \frac{V}{Vallow} = 0.02 < 1.0 OK (3/8" DIA WALL ANCHOR BOLTS)$ 

THE ANCHORAGE FOR QS-RACK-4 HAS BEEN SHOWN TO BE SEISMICALLY ADEQUATE.

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Subject: Anchorage Evaluation for Various Instruments

ANCHORAGE 40 3.3 INTERACTION EVALUATION FOR US-RACK-3

A REVIEW OF THE SEWS FOR THIS ITEM SHOWS THAT THE ANCHORAGE WAS CONSIDERED TO BE ADEQUATE BY THE SEISMIC REVIEW TEAM.

THE NOTED CONCERN WAS AN INTERACTION WITH AN ENCLOSURE. THE WOODEN ROOF OF THIS STRUCTURE WAS NOTED AS BEING A FALLING HAZARD, AND COULD AFFECT SENSING LINES ON THE EQUIPMENT RACK.

THE STRUCTURE PROVIDES WEATHER ROTECTION, AND IS A WOODEN FRAMEWORK COVERED WITH VISQUEEN. AS SUCH, IT IS NOT CONSIDERED TO BE A RUGGED STOUCTURE NOR SEISMICALLY ADEQUATE.

THIS FTEM IS CONSIDERED TO BE AN OUTLIER.

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## 3.4 DISCUSSION OF ITEMS NOTED ON THE SEWS AS BEING SEISMICALLY ADEQUATE

THE FOLLOWING ITEMS WERE NOTED ON THE SEWS AS BEING SEISMICALLY ADEQUATE:

TAG No.	BUILDING	FLOOR ELEVATION
FIS-FW-151A	SFGB	722
FIS-FW-151B	SFGB	722
PS-MS-101A	SFGB	768
PS-MS-101B	SFGB	768
PS-MS-101C	SFGB	768
PS-VS-106A	AXLB	768
PS-VS-106B	AXLB	768
TS-HV-55A	SRVB	713
TS-HV-55B	SRVB	713
PNL-MS-101A	SFGB	751
PNL-MS-101B	SFGB	751
PNL-MS-101C	SFGB	751

THESE ITEMS HAVE BEEN INCLUDED IN THIS CALCULATION FOR COMPLETENESS.

Sheet <u>36</u> of <u>37</u> Job No.: <u>52233</u> Job: <u>Duquescie Beaver Valley Power Station</u> By: <u>nc</u> Date: <u>11-30-95</u> Calc No.: <u>019</u> Subject: <u>Anchorage Evaluation for Various Instruments</u>

4.0 SUMMARY

a. THE ANCHORAGE FOR THE FOLLOWING INSTRUMENTS AT THE DUQUESNE LIGHT COMPANY BEAVER VALLEY POWER STATION HAS BEEN SHOWN TO BE ADEQUATE TO WITHSTAND THE SEISMIC LOADINGS FROM AN SSE EVENT:

TAG No.	BUILDING	FLOOR ELEVATION
FT-CH-122	AXLB	722
FT-CH-124	SFGB	722
FT-CH-127	SFGB	722
FT-CH-130	SFGB	722
FT-CH-150	AXLB	722
FT-FW-100A	SFGB	735
FT-FW-100B	SFGB	735
FT-FW-100C	SFGB	735
LT-FW-474	RCBX	718
LT-FW-475	RCBX	718
LT-FW-476	RCBX	718
LT-FW-477	RCBX	718
LT-FW-484	RCBX	738
LT-FW-485	RCBX	738
LT-FW-486	RCBX	718
LT-FW-495	RCBX	718
LT-FW-496	RCBX	718
LT-WT-104A1	YARD	735
LT-WT-104A2	YARD	735
PT-RC-403	RCBX	701
QS-RACK-4	a second s	

FOR INSTRUMENTS LT-QS-100A, -100B, -100C, and -100D THE SEWS INDICATES THAT THEY ARE LINE MOUNTED AND AS SUCH THE ANCHORAGE IS MARKED AS "N/A". THEREFORE THESE FOUR INSTRUMENTS ARE NOTED HERE FOR COMPLETENESS ONLY.

b. INSTRUMENT BACK OS-RACK-3 WAS SHOWN TO BE AN OUTLIER BASED ON

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THE FOLLOWING INSTRUMENTS WERE NOTED ON THE SEWS AS BEING

TAG No.	BUILDING	FLOOR ELEVATION
FIS-FW-151A	SFGB	722
FIS-FW-151B	SFGB	722
PS-MS-101A	SFGB	768
PS-MS-101B	SFGB	768
PS-MS-101C	SFGB	768
PS-VS-106A	AXLB	768
PS-VS-106B	AXLB	768
TS-HV-55A	SRVB	713
TS-HV-55B	SRVB	713
PNL-MS-101A	SFGB	751
PNL-MS-101B	SFGB	751
PNL-MS-101C	SFGB	751
QJ-RACK-3	YARDIRWY	735 1

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Attachment A

## SEWS SHEETS FOR INSTRUMENTS

(152 pages in Attachment A)

Ezzai Statu	5- C.T.	A Y t		2
SCREENING EVALUATION WORK SHEET (SEWS) Sheet	1 of	3		
Equip DNO. FT-CH-122 Equip. Class 18 - Instruments	on Rac	ks		
Equip No. <u>FT-CH-122</u> Equip. Class <u>18 - Instruments</u> Equipment Description <u>CH/CHARGING HEADER FLOW TRANSMITTER</u>				
Location: Bldg. AXLB Floor El. 722 Room, Row/C	01 <u>2</u> 2	END, L 10	ee )-1/4	& J
Manufacturer, Model, Etc. (optional) FISCHER PORTER MODEL	IDBZY	96P	BN	3
SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input 2. Elevation of seismic input below about 40' from grade 3. Equipment has fundamental frequency above about 8 Hz 4. Capacity based on: Existing Documentation Bounding Spectrum GERS	Y N DOC BS GERS			
5. Demand based on: I.5 x Bounding Spectrum Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec.	GREERS	)	_	
Does capacity exceed demand?			Y	NU
<u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) those are met by intent without meeting the specific wording of the cave explain the reason for this conclusion in the COMMENTS section be	eat ru	s wh le a	ich nd	
<ol> <li>Equipment is included in earthquake experience equipment class</li> </ol>	Ø N	U	N/A	
<ol> <li>No computers or programmable controllers</li> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together</li> </ol>	Å N	UU	N/A	
<pre>if they contain essential relays 5. Natural frequency relative to 8 Hz limit considered 6. Attached lines have adequate flexibility 7. Anchorage adequate (See checklist below for details) 8. Relays mounted on equipment evaluated 9. Have you locked for and found no other adverse concerns? Is the intent of all the caveats met for Bounding Spectrum?</pre>	N × Q × Y	ccOccc	N/A	N DN/A
<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveats which met by intent without meeting the specific wording of the caveat mand explain the reason for this conclusion in the COMMENTS section	rule	()		
<ol> <li>Equipment is included in the generic seismic testing equipment class</li> </ol>	Y N	U	N/A	
<ol><li>Neets all Bounding Spectrum caveats</li></ol>	Y N	Ŭ	N/A	
<ol> <li>Component is a pressure, temperature, level or flow transmitter</li> </ol>	Y N	U	N/A	

SCREENING EVALUATION WORK SHEET (SEWS)

52233- 6-614 + + + 3 Sheet 2 of 3

N/A

NU

U

ON.

Equip. ID No. FT-CH-122 Equip. Class 18 - Instruments on Racks Equipment Description CH/CHARGING HEADER FLOW TRANSMITTER CAVEATS - GERS (Cont'd) 4. Component is one of the specific makes and models tested, as listed in Appendix B Y N U N/A Necessary function of component not sensitive to 5. seismically induced system perturbations (e.g., sloshing) U N/A N 6. No vacuum tubes N U N/A 7. All external mounting bolts in place Y N U N/A Demand based on amplified portion of 3% damped 8. floor response spectrum if estimated natural frequency of rack less than 33 Hz N U N/A Rack capable of structurally transferring GERS 5. Y N U N/A level seismic loads to anchorage Is the intent of all the caveats met for GERS? YNUN/A ANCHORAGE Appropriate equipment characteristics determined 1. Y N W N/A \*\*\* (mass, CG, natural freq., damping, center of rotation) 2. Type of anchorage covered by GIP N U N/A Sizes and locations of anchors determined 3. N U N/A 4. Adequacy of anchorage installation evaluated (weld quality and length, nuts and washers, expansion anchor tightness, etc.) Y N (U) N/A XXX 5. Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition, and concrete cracking N U N/A 6. For bolted anchorages, gap under base less than 1/4-inch N Y U N/A Factors affecting essential relays considered: gap 7. under base, capacity reduction for expansion anchors N U (N/A) Base has adequate stiffness and effect of prying 8. action on anchors considered (Y) N U N/A Strength of equipment base and load path 9. to CG adequate N N U N/A 10. Embedded steel, grout pad or large concrete  $\bigcirc$ pad adequacy evaluated U N/A N Are anchorage requirements met? YND INTERACTION EFFECTS 1. Soft targets free from impact by nearby equipment or structures (Y) N U N/A \* If equipment contains sensitive relays, equipment 2.

- free from all impact by nearby equipment or structures
- 3. Attached lines have adequate flexibility

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Steet 3 of 3

Equip. ID No. FT-CH-122 Equip. Class 18 - Instruments on Racks Equipment Description CH/CHARGING HEADER FLOW TRANSMITTER INTERACTION EFFECTS (Cont'd) 4. Overhead equipment or distribution systems are not likely to collapse N U N/A S Have you looked for and found no other adverse concerns? 5. U N/A Is equipment free of interaction effects? DN U IS EQUIPMENT SEISMICALLY ADEQUATE? YND COMMENTS

\* - LIGHT FIXTURE OVERHEAD (O.K. BY ENGL JUDGEMENT) \*\* - NEED WT OF TEANS.

\* \* + - TIGHTNESS CHK. REQ.

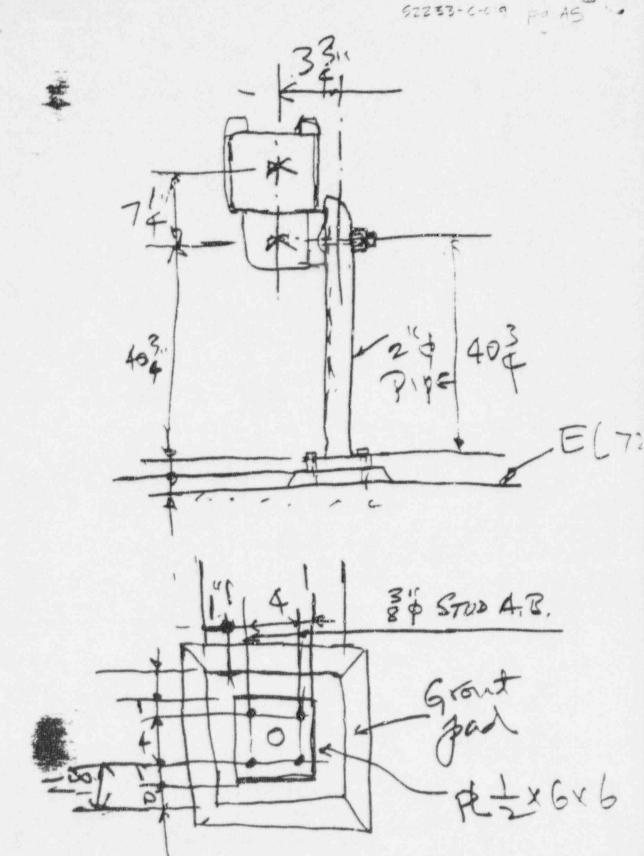
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Evaluated by:

ai an

Date:

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SCREENING EVALUATION WORK SHEET (SEWS) Shee	t 1 o	f 3		
Equip. IP No. FT-CH-124 Equip. Class 18 - Instruments	on R	acks		
Equipment Description _ CH/RCP-IC SEAL INJECTION FLOW TRANSMITTER			and in terms for any	
Location: Bldg. SFGB Floor El. 722 Room, Row/C	Co1 _	PENT	A	
Manufacture, Model, Etc. (optional) ROSEMOUNT MODEL 1154HP4RB				
SEISMIC CAPACITY VS DEMAND         1. Elevation where equipment receives seismic input         2. Elevation of seismic input below about 40' from grade         3. Equipment has fundamental frequency above about 8 Hz         4. Capacity based on: Existing Documentation Bounding Spectrum GERS         5. Demand based on: Ground Response Spectrum 1.5 x Bounding Spectrum Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec.         Does capacity exceed demand?	DOC BS EFS GRS GRS CRS CRS	S	Z N/A	NU
<ul> <li><u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) those are met by intent without meeting the specific wording of the cave explain the reason for this conclusion in the COMMENTS section be</li> <li>Equipment is included in earthquake experience equipment class</li> <li>No computers or programmable controllers</li> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together</li> </ul>	eat r	N U N U N U N U	N/A N/A N/A	
if they contain essential relays 5. Natural frequency relative to 8 Hz limit considered 6. Attached lines have adequate flexibility 7. Anchorage adequate (See checklist below for details) 8. Relays mounted on equipment evaluated 9. Have you looked for and found no other adverse concerns? Is the intent of all the caveats met for Bounding Spectrum?	Pro	N U N U	N/A N/A N/A N/A Y	N U N/A
<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveats which met by intent without meeting the specific wording of the caveat and explain the reason for this conclusion in the COMMENTS section 1. Equipment is included in the generic seismic testing	rule	ow)		
equipment class 2. Meets all Bounding Spectrum caveats 3. Component is a pressure, temperature, level or flow	Y	N U	N/A N/A	
transmitter	Y	U N	N/A	

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equipm	ent Description _CH/RCP-1C SEAL INJECTION FLOW TRANSMITTE	R			
		<u>N</u>			
Capital and a literative statement of the	S - GERS (Cont'd)				
4.	Component is one of the specific makes and models	11.00	1.1	÷	
1.00	tested, as listed in Appendix B	Y	N	U	:4/A
5.	Necessary function of component not sensitive to				
	seismically induced system perturbations (e.g.,				
c	sloshing)	Y	N	0	N/A
6. 7.	No vacuum tubes	Ţ	N	Ŭ	N/A
8.	All external mounting bolts in place Demand based on amplified portion of 3% damped	10.0	N	0	N/A
ω.	floor response spectrum if estimated natural				
	frequency of rack less than 33 Hz	V	N	IJ	N/A
9.	Rack czyable of structurally transferring GERS	1. A.	14	12	11/ A
	level seismic loads to anchorage	Y	N	u.	N/A
Is the	intent of all the caveats met for GERS?			0	YNUN/
					1 4 9 47
ANCHOR	AGE				
1.	Appropriate equipment characteristics determined	-			
	(mass, CG, natural freq., damping, center of rotation)	GY)	N	U	N/A
2.	Type of anchorage covered by GIP	(J+B	N	Ď	N/A
3.	Sizes and locations of anchors determined	Q	N	U	N/A
4.	Adequacy of anchorage installation evaluated				
	(weld quality and length, nuts and washers, expansion				
	anchor tightness, etc.)	(Y)	N	U	N/A
5.	Factors affecting anchorage capacity or margin of				
	safety considered: embedment length, anchor spacing,				
	free-edge distance, concrete strength/condition, and	1			
6	concrete cracking	(1)	N	U	N/A
6.	For bolted anchorages, gap under base less than	10-		1.1	
7.	1/4-inch	(I)	N	U	N/A
1.	Factors affecting essential relays considered: gap	10	ыř.		NI / A
8.	under base, capacity reduction for expansion anchors Base has adequate stiffness and effect of prying	0	N	U	N/A
Ο.	action on anchors considered	$(\overline{Y})$	N	11	NI / A
9.	Strength of equipment base and load path	U	n	0	N/A
	to CG adequate	12	Ν	11	N/A
10.	Embedded steel, grout pad or large concrete	C	in.	0	N/ M
	pad adequacy evaluated	¥	N	11.3	N/A/
Are and	chorage requirements met?		19	Ŭ	YNU
INTERAC	CTION EFFECTS				
1.	Soft targets free from impact by nearby				
	equipment or structures	D	N	U	N/A
2.	If equipment contains sensitive relays, equipment				1 C C C C C C C C C C C C C C C C C C C
	free from all impact by nearby equipment or structures	R	N	U	N/A
3.	Attached lines have adequate flexibility	D	N	UU	N/A

SCREENING EVALUATION WORK SHEET (SEWS)

52233-0 019 Pg 4%

YNU

Equip. ID No. <u>FT-CH-124</u> Equip. Class <u>18 - Instruments on Racks</u> Equipment Description <u>CH/RCP-1C SEAL INJECTION FLOW TRANSMITTER</u> <u>INTERACTION EFFECTS (Cont'd)</u> 4. Overhead equipment or distribution systems are not likely to collapse 5. Have you looked for and found no other adverse concerns? N U N/A Is equipment free of interaction effects?

IS EQUIPMENT SEISMICALLY ADEQUATE?

COMMENTS

Evaluated by: GSR

Date: 5/27/93 5/27/93

	52233-0-019 FA AS Status Y N U-
SCREENING EVALUATION WORK SHEET (SEWS)	Sheet 1 of 3
(Equip) = D No. FT-CH-127 Equip. Class 18 - Instru	
Equipment Description CH/RCP-18 SEAL INJECTION FLOW TRANSM	AITTER
Location: Bldg. SFGB Floor El. 722 Room,	Row/Col PENT A
Manufacturer, Model, Etc. (optional) ROSEMOUNT MODEL 1154	HP4RB
SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input	727
<ol><li>Elevation of seismic input below about 40' from grad</li></ol>	e ONU
<ol> <li>Equipment has fundamental frequency above about 8 Hz</li> <li>Capacity based on: Existing Documentation</li> </ol>	
Bounding Spectrum	DOC BS
GERS	GERS 71
5. Demand based on: Ground Response Spectrum 1.5 x Bounding Spectrum	GRS
Conserv. Des. In-Str. Resp. Spec	CRS
Realistic M-Ctr. In-Str. Resp. S Does capacity exceed demand?	pec. RRS
CAVEATS - BOUNDING SPECTRUM (Identify with an asterisk (*)	those caugate which
are met by intent without meeting the specific wording of t	he caveat rule and
explain the reason for this conclusion in the COMMENTS sect 1. Equipment is included in earthquake experience	ion below)
equipment class	ON U N/A
2. No computers or programmable controllers	ON U N/A
<ol> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or</li> </ol>	ON U N/A
sections of multi-bay racks are bolted together	
if they contain essential relays	Y N U (NA)
<ol> <li>Natural frequency relative to 8 Hz limit considered</li> <li>Attached lines have adequate flexibility</li> </ol>	Y N U N/A Y N U N/A Y N U N/A
<ol><li>Anchorage adequate (See checklist below for details)</li></ol>	Y N U N/A
<ol><li>Relays mounted on equipment evaluated</li></ol>	Y N U ATTAD
9. Have you looked for and found no other adverse concer Is the intent of all the caveats met for Bounding Spectrum?	rns? ON UN/A YNUN/A
CAVEATS - GERS (Identify with an asterisk (*) those caveats	which are
met by intent without meeting the specific wording of the ca	aveat rule
and explain the reason for this conclusion in the COMMENTS	section below)
<ol> <li>Equipment is included in the generic seismic testing equipment class</li> </ol>	Y N U N/A
<ol><li>Meets all Bounding Spectrum caveats</li></ol>	Y N U NA
<ol> <li>Component is a pressure, temperature, level or flow transmitter</li> </ol>	V M H M/A
	Y N U N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3 + 0

Equip. ID No. FT-CH-127 Equip. Class 18 - Instrument	ts on A	Raci	ks			
Equipment Description _CH/RCP-18 SEAL INJECTION FLOW TRANSMITTE	R					
<ul> <li><u>CAVEATS - GERS (Cont'd)</u></li> <li>4. Component i: ne of the specific makes and models tested, as liked in Appendix B</li> <li>5. Necessary function of component not sensitive to seismically induced system perturbations (e.g.,</li> </ul>	Y	N	U	N/A		
sloshing)	Y	N	U	N/A		
<ol><li>No vacuum tubes</li></ol>	Y	N	Ű	N/A		
<ol> <li>All external mounting bolts in place</li> <li>Demand based on amplified portion of 3% damped floor response spectrum if estimated natural</li> </ol>	Ŷ	N	Ŭ	N/A N/A N/A		
frequency of rack less than 33 Hz 9. Rack capable of structurally transferring GERS	Y	N	U	N/A		
level seismic loads to anchorage Is the intent of all the caveats met for GERS?	Y	Ν	U	N/A Y	NU	N/A
ANCHORAGE 1. Appropriate equipment characteristics determined						14/14
(mass, CG, natural freq., damping, center of rotation)	$\bigcirc$	N		NI / A		
2. Type of anchorage covered by GIP	390	N	U	N/A N/A N/A		
3. Sizes and locations of anchors determined	X	N	0	N/A		
<ol> <li>Adequacy of anchorage installation evaluated (weld quality and length, nuts and washers, expansion</li> </ol>	-					
anchor tightness, etc.) 5. Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition, and	Ð	N	U	N/A		
6. For bolted anchorages, gap under base less than	$\odot$	Ν	U	N/A		
<ol> <li>1/4-inch</li> <li>Factors affecting essential relays considered: gap</li> </ol>	$\odot$	Ν	U	N/A		
under base, capacity reduction for expansion anchors 8. Base has adequate stiffness and effect of prying	Ø	N	U	N/A		
action on anchors considered 9. Strength of equipment base and load path	$(\mathfrak{T})$	Ν	U	N/A		
to CG adequate 10. Embedded steel, grout pad or large concrete	$\odot$	N	U	N/A		
Are anchorage requirements met?	Y	N	U	IN/A	N	0
INTERACTION EFFECTS						
equipment or structures	$\Theta$	N	U	N/A		
<ol> <li>If equipment contains sensitive relays, equipment free from all impact by nearby equipment or structures</li> </ol>	(1)	N	11	N/A		
3. Attached lines have adequate flexibility	0	N	UUU	N/A N/A		

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

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U N/A

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YNU

Equip. ID No. FT-CH-127 Equip. Class 18 - Instruments on Racks

Equipment Description CH/RCP-18 SEAL INJECTION FLOW TRANSMITTER

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are

not likely to collapse

Se Have you looked for and found no other adverse concerns? 5. U N/A N Is equipment free of interaction effects?

IS EQUIPMENT SEISMICALLY ADEQUATE?

COMMENTS

Evaluated by: GSR Date: 5/27/93 GTW

27/93

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Stat	us		r I	U V	-	
SCREENING EVALUATION WORK SHEET (SEWS) Shee	t 1 c	of 3	3			
Equip. ID No. FT-CH-130 Equip. Class 18 - Instruments	on F	lack	s			
Equipment Description _ CH/RCP-1A SEAL INJECTION FLOW TRANSMITTER						- 1 -
Locathon: Bldg. SFGB Floor El. 722 Room, Row/	Col _	PEN	IT /	1		
Manufacturer, Model, Etc. (optional) <u>ROSEMOUNT MODEL 1154HP4RB</u>						
SEISMIC CAPACITY VS DEMAND			-7			
<ol> <li>Elevation where equipment receives seismic input</li> <li>Elevation of seismic input below about 40' from grade</li> </ol>	0	N	4			
3. Equipment has fundamental frequency above about 8 Hz	Y	N	U U	NIA	>	
4. Capacity based on: Existing Documentation	DO	C	~	er a		
Sounding Spectrum GERS	8S GE	RS	_	NA	ł,	
5. Demand based on: Ground Response Spectrum	GR		_	2		
1.5 x Bounding Spectrum	AB	5	-			
Conserv. Des. In-Str. Resp. Spec.	CR	S				
Realistic M-Ctr. In-Str. Resp. Spec.	RR	S		R	IN L	19
Does capacity exceed demand?				U	IN L	,
CAVEATS - BOUNDING SPECTRUM (Identify with an asterisk (*) those	cave	ats	wh	ich		
are met by intent without meeting the specific wording of the car	/eat	rul	e a	nd		
explain the reason for this conclusion in the COMMENTS section be	elow)					
<ol> <li>Equipment is included in earthquake experience</li> </ol>	0	n.	i.	1. A. A. A.		
equipment class	Q	N	U	N/A N/A N/A		
2. No computers or programmable controllers	Canal Canal	N	U	N/A		
<ol> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or</li> </ol>	O	N	0	N/A		
sections of multi-bay racks are bolted together						
if they contain essential relays	¥	N	U	ATA		
5. Natural frequency relative to 8 Hz limit considered	R	N		N/A		
<ol><li>Attached lines have adequate flexibility</li></ol>	€()××	N		N/A		
<ol> <li>Attached lines have adequate flexibility</li> <li>Anchorage adequate (See checklist below for details)</li> </ol>	Y	N N	U	N/A		
8. Relays mounted on equipment evaluated	Y	N		NA		
9. Have you looked for and found no other adverse concerns?	S	N	U	N/A		
Is the intent of all the caveats met for Bounding Spectrum?				Ŷ	NU	N/A
CAVEATS - GERS (Identify with an asterisk (*) those caveats which						
met by intent without meeting the specific wording of the caveat	rule					
and explain the reason for this conclusion in the COMMENTS section	n be	IOW	)			
<ol> <li>Equipment is included in the generic seismic testing</li> </ol>	v		11	NI/A		
equipment class 2. Meets all Bounding Spectrum caveats	Y	N	U	N/A N/A		
3. Component is a pressure, temperature, level or flow		14	0	IT/ A		
transmitter	Y	N	U	N/A		

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3 - 4 3

Equip.	ID No. FT-CH-130 Equip. Class 18 - Instruments	oni	Raci	ks		
Equipm	ent Description _CH/RCP-1A SEAL INJECTION FLOW TRANSMITTER					
CAVEAT	S - GERS (Cont'd)					
4.	Component is one of the specific makes and models					
	tested, as listed in Appendix B	Y	N	U	N/A	
5.	Necessary function of component not sensitive to					
	seismically induced system perturbations (e.g.,					
6	sloshing)	Y	N	U	N/A N/A	
6. 7.	No vacuum tubes	Y	N	U	N/A	
8.	All external mounting bolts in place Demand based on amplified portion of 3% damped	Ŷ	N	0	N/A	
<b>.</b> .	floor response spectrum if estimated natural					
	frequency of rack less than 33 Hz	v	N	U	N/A	
9.	Rack capable of structurally transferring GERS		14	0	M/ A	
	level seismic loads to anchorage	Y	N	U	N/A	
Is the	intent of all the caveats met for GERS?				Y	N U N/A
ANCHOR	AGE					
1.	Appropriate equipment characteristics determined					
	(mass, CG, natural freq., damping, center of rotation)	Ø	N	U	N/A N/A N/A	
2.	Type of anchorage covered by GIP	D	N	U	N/A	
3.	Sizes and locations of anchors determined	Ø	N	U	N/A	
4	Adequacy of anchorage installation evaluated					
	(weld quality and length, nuts and washers, expansion	0			1.11	
5.	anchor tightness, etc.)	Ø	N	U	N/A	
2.	Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing,					
	free-edge distance, concrete strength/condition, and					
	concrete cracking	Í	N	U	N/A	
6.	For bolted anchorages, gap under base less than	U	14	0	IN/ A	
	1/4-inch	N	Ν	U	N/A	
7.	Factors affecting essential relays considered: gap	0				
1919	under base, capacity reduction for expansion anchors	(Y)	Ν	U	N/A	
8.	Base has adequate stiffness and effect of prying	-				
0	action on anchors considered	$(\mathbf{Y})$	Ν	U	N/A	
9.	Strength of equipment base and load path	~				
10.	to CG adequate	Y	N	U	N/A	
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated		1		-	
Are and	chorage requirements met?	Ŷ	Ν	U	N/A	N U
					-	
	TION EFFECTS					
1.	Soft targets free from impact by nearby equipment or structures	0				
2.	If equipment contains sensitive relays, equipment	Q	N	U	N/A	
	free from all impact by nearby equipment or structures	R	N	11	NZA	
3.	Attached lines have adequate flexibility	X	14	1	N/A N/A	
	and and and the truth the		14	0	11/14	

Equip. ID No. FT-CH-130 Equip. Class 18 - Instruments of	on R	ack	s	-
Equipment Description _CH/RCP-1A SEAL INJECTION FLOW TRANSMITTER				
INTERACTION EFFECTS (Cont'd) 4. Overhead equipment or distribution systems are not likely to collapse 5. Have you looked for and found no other adverse concerns? Is equipment free of interaction effects?	8	NN	UU	N/A N/A YN U
IS EQUIPMENT SEISMICALLY ADEQUATE?				YNU

COMMENTS

Evaluated by: GSR Date: 5/27/93 5/27/93 Giw 1150

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62233-1-CIA 5/27/93 - 3/5 301+/ shell A-A2400 6 k 4" 1/2 1/2 viità on islock Will € 7:4 4 14"1 + ×8 THE Bolts - CH - 124 127 130 weld 3.4 Ly Both Sides 2:00 124 - 34 4 130 - LI- Bolts 124 127 130. Facing Wall 5/16 \$ 4-3. it # 130

SSEL Line No.	3209A 3208A	SZZ33-C-DIA DA ALLA Status Y N U
	SCREENING EVALUATION WORK SHEET (SEWS)	Sheet 1 of 3
EQUATO NO.	FT-CH-150 Equip. Class 18 - Instr	ruments on Racks
Equipment Desci	ription CH/LETDOWN FLOW TRANSMITTER	
Location: Bldg	AXLB Floor El. 722 Room	n, Row/Col COL 11-1/2 & G
Manufacturer, 1	Model, Etc. (optional but recommended) F12	OFISHER & PORTER CO
<ol> <li>Elevatic</li> <li>Equipmer</li> <li>Capacity</li> <li>Demand b</li> <li>Does capacity e <u>COMMENTS</u> if</li> </ol>	IY VS DEMANDon where equipment receives seismic inputon of seismic input below about 40' from grainon of seismic input below about 50' from grainon of seismic input b	z Y N U NA DOC BS GERS GRS AGS c. CE Spec. RRS n ic
<u>CAVEATS - BOUND</u> are met by inte explain the rea 1. Equipmen equipmen 2. No compu	ING SPECTRUM (Identify with an asterisk (*) nt without meeting the specific wording of son for this conclusion in the COMMENTS sec t is included in earthquake experience t class ters or programmable controllers	those caveats which the caveat rule and tion below) N U N/A N U N/A
<ol> <li>Adjacent sections if they</li> <li>Natural</li> <li>Attached</li> <li>Anchorage</li> <li>Relays me</li> <li>Have you</li> </ol>	ame and sheet metal structurally adequate racks which are close enough to impact or of multi-bay racks are bolted together contain essential relays frequency relative to 8 Hz limit considered lines have adequate flexibility e adequate (See checklist below for details) bunted on equipment evaluated looked for and found no other adverse conce f all the caveats met for Bounding Spectrum?	Prns? YN U NA
and explain the l. Equipment equipment 2. Meets all	Bounding Spectrum caveats is a pressure, temperature, level or flow)	aveat rule section below)

SSEL Line No. 3208A

SCREENING EVALUATION WORK SHEET (SEWS)

52233-1-04 pr A 7

Sheet 2 of 3

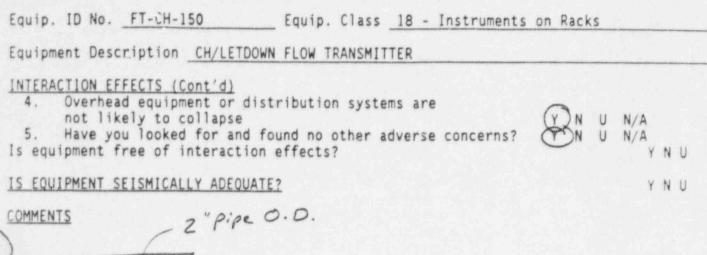
Equip. ID No. FT-CH-150 Equip. Class 18 - Instruments on Racks Equipment Description CH/LETDOWN FLOW TRANSMITTER CAVEATS - GERS (Cont'd) 4. Component is one of the specific makes and models tested, as listed in Appendix B N/A U 5. Necessary function of component not sensitive to seismically induced system perturbations, e.g., sloshing (cover this as part of Section 6 evaluation) U N/A No vacuum tubes 6. U N/A 7. All external mounting bolts in place N/A N U Demand based on realistic amplification of floor 8. response through rack to transmitter to-rack interface (document basis) N/A Rack capable of structurally transferring 9. seismic demand loads to anchorage Y N/A 10. All adjacent cabinets or sections of multi-bay assemblies bolted together N/A Y N U Is the intent of all the caveats met for GERS? YCHTU N/A P:0 ANCHORAGE Appropriate equipment characteristics determined 1. (mass, CG, natural freq., damping, center of rotation) (U) N/A N 2. Type of anchorage covered by GIP RED-HEADS N/A 3. Sizes and locations of anchors determined U N/A 4. Anchorage installation adequate, e.g., weld quality and length, nuts and washers, expansion anchor tightness DN U N/A Y 5. Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition, and concrete cracking No concrete cracking N/A N U For bolted anchorages, gap under base less than 6. 1/4-inch U N/A 7. Factors affecting essential relays considered: gap under base, capacity reduction for expansion anchors U N/A) N 8. Base has adequate stiffness and effect of prying action on anchors considered Y U N/A 9. Strength of equipment base and load path to CG adequate U N/A 10. Embedded steel, grout pad or large concrete pad adequacy evaluated N U( N/A Are anchorage requirements met? N U INTERACTION EFFECTS Soft targets free from impact by nearby 1. equipment or structures U N/A 1-If equipment contains sensitive relays, equipment 2. free from all impact by nearby equipment or structures Attached lines have adequate flexibility 3.

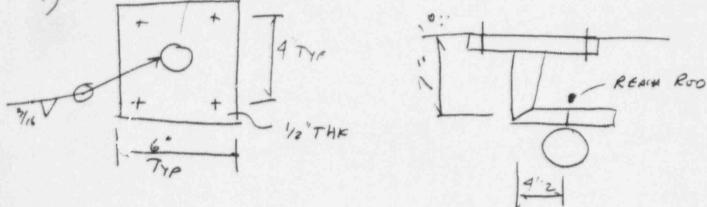
SSEL Line No. 3208A

SCREENING EVALUATION WORK SHEET (SEWS)

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Sheet 3 of 3





2) REATH ROD = 14" CLES - No interaction Repected.

Date: 5-29-94 Evaluated by: aim

SSEL Line No. 4103A	52233- 5-019	
A SCREENING EVALUATION WORK SHEET (SEWS)	Sheet 1 of 3	
Equip. DNg. FT-FW-100A Equip. Class 18 - Instru	ments on Racks	
Equipment Description _ FW/AUX FEED TO SGA TRANSMITTER		
Location: Bldg. SFGB Floor El. 735 Room,	Row/Col AUX FEED PUMP	
Manufacturer, Model, Etc. (optional but recommended) 1204	ITT-BARTON	
SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input 2. Elevation of seismic input below about 40' from grade 3. Equipment has fundamental frequency above about 8 Hz 4. Capacity based on: Existing Documentation Bounding Spectrum 1.5 x Bounding Spectrum GERS 5. Demand based on: Ground Response Spectrum 1.5 x Ground Response Spectrum Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. COMMENTS if a special exception to enveloping of seismic demand spectrum is invoked per Section 4.2 of the GIP.)	DUC BS GERS GRS AGS Pec. RRS	
<u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) t are met by intent without meeting the specific wording of th explain the reason for this conclusion in the COMMENTS secti	he caveat rule and	
<ol> <li>Equipment is included in earthquake experience equipment class</li> <li>No computers or programmable controllers</li> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or</li> </ol>	Y N U N/A N U N/A Y N U N/A	
sections of multi-bay racks are bolted together if they contain essential relays 5. Natural frequency relative to 8 Hz limit considered 6. Attached lines have adequate flexibility 7. Anchorage adequate (See checklist below for details) 8. Relays mounted on equipment evaluated 9. Have you looked for and found no other adverse concer Is the intent of all the caveats met for Bounding Spectrum?		1/A
<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveats met by intent without meeting the specific wording of the ca and explain the reason for this conclusion in the COMMENTS s 1. Equipment is included in the generic seismic testing	aveat rule section below)	
equipment class 2. Meets all Bounding Spectrum caveats	Y N U N/A Y N U N/A	
<ol> <li>Component is a pressure, temperature, level or flow transmitter</li> </ol>	Y N U N/A	

SSEL Line No. 4103A

SCREENING EVALUATION WORK SHEET (SEWS)

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Sheet 2 of 3

Equip. ID No. FT-FW-100A Equip. Class 18 - Instruments on Racks Equipment Description FW/AUX FEED TO SGA TRANSMITTER CAVEATS - GERS (Cont'd) 4. Component is one of the specific makes and models tested, as listed in Appendix B Y N U N/A 5. Necessary function of component not sensitive to seismically induced system perturbations, e.g., sloshing (cover this as part of Section 6 evaluation) YN U N/A No vacuum tubes 6. Y N U N/A All external mounting bolts in place 7. Y N U N/A 8. Demand based on realistic amplification of floor response through rack to transmitter-to-rack interface (document basis) N U N/A Rack capable of structurally transferring 9. seismic demand loads to anchorage N U N/A All adjacent cabinets or sections of multi-bay 10. assemblies bolted together N U N/A ¥ Is the intent of all the caveats met for GERS? YNUNTA ANCHORAGE Appropriate equipment characteristics determined 1. (mass, CG, natural freq., damping, center of rotation) X N N/A U Type of anchorage covered by GIP 2. N U N/A 3. Sizes and locations of anchors determined N U N/A 4. Anchorage installation adequate, e.g., weld quality and length, nuts and washers, expansion anchor tightness YN U N/A 5. Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition, and concrete cracking Y N U N/A For bolted anchorages, gap under base less than 6. 1/4-inch N U N/A 7. Factors affecting essential relays considered: gap under base, capacity reduction for expansion anchors N U N/A Base has adequate stiffness and effect of prying 8. action on anchors considered Y N U N/A Strength of equipment base and load path 9. to CG adequate Y N U N/A 10. Embedded steel, grout pad or large concrete pad adequacy evaluated N U (N/A Are anchorage requirements met? NU INTERACTION EFFECTS Soft targets free from impact by nearby 1. equipment or structures (Y) N U : I/A If equipment contains sensitive relays, equipment 2. free from all impact by nearby equipment or structures U N/A 3. Attached lines have adequate flexibility U N/A

SSEL Line No. 4103A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

52233- (-04 Pg AZI Sheet 3 of 3

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Equip. ID No. <u>FT-FW-100A</u> Equip. Class <u>18 - Instruments on Racks</u> Equipment Description <u>FW/AUX FEED TO SGA TRANSMITTER</u> <u>INTERACTION EFFECTS (Cont'd)</u> 4. Overhead equipment or distribution systems are not likely to collapse 5. Have you looked for and found no other adverse concerns? <u>Y</u> N U N/A

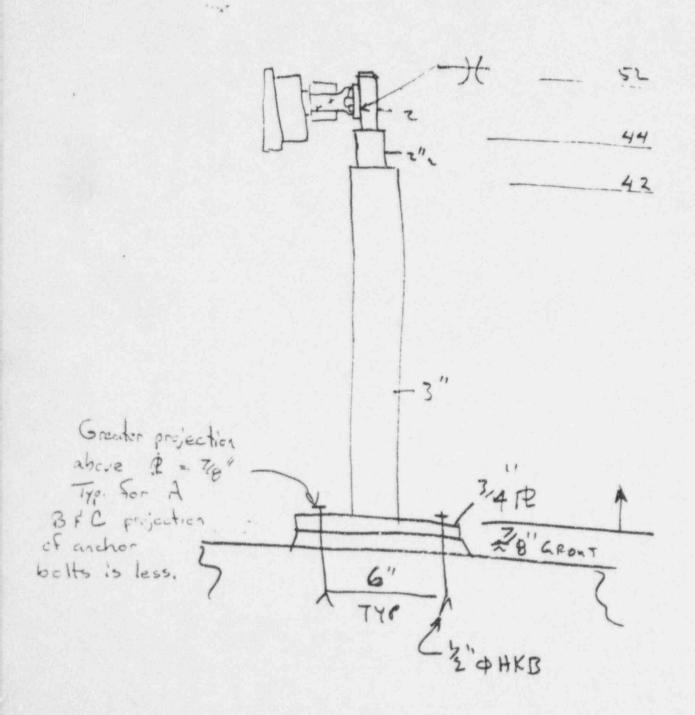
IS EQUIPMENT SEISMICALLY ADEQUATE?

Is equipment free of interaction effects?

COMMENTS

Evaluated by:

Date: 2/21/15 Firs 2122 1005



FT-FW-100A/B/C

SSEL Line No 4104A	Szzos-Cola Pr Azz Status Y N U
A SCREENING EVALUATION WORK SHEET (SEWS)	Sheet 1 of 3
Equip DIT No. FT-FW-1008 Equip. Class 18 - Inst	ruments on Racks
Equipment Description _ FW/AUX FEED TO SGB TRANSMITTER	
Location: Bldg. SFGB Floor El. 735 Room	n, Row/Col AUX FEED PUMP
Manufacturer, Model, Etc. (optional but recommended)	D4 ITT-BARTON
SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input 2. Elevation of seismic input below about 40' from gra 3. Equipment has fundamental frequency above about 8 H 5. Capacity based on: Existing Documentation Bounding Spectrum 1.5 x Bounding Spectrum GERS	Ade 735 N U N/A DOC BS GERS
5. Demand ised on: Ground Response Spectrum 1.5 x Ground Response Spectrum Conserv. Des. In-Str. Resp. Spe Realistic M-Ctr. In-Str. Resp. Does capacity esceed demand? (Indicate at right (*) and i <u>COMMEN</u> is special exception to enveloping of seism demand special is invoked per Section 4.2 of the GIP.	GRS AGS Spec. RRS n QNU
<u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) are met by intent without meeting the specific wording of explain the reason for this conclusion in the COMMENTS sec 1. Equipment is included in earthquake experience	the caveat rule and
<ol> <li>equipment class</li> <li>No computers or programmable controllers</li> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together</li> </ol>	N U N/A N U N/A N U N/A
<ul> <li>if they contain essential relays</li> <li>5. Natural frequency relative to 8 Hz limit considered</li> <li>6. Attached lines have adequate flexibility</li> <li>7. Anchorage adequate (See checklist below for details</li> <li>8. Relays mounted on equipment evaluated</li> <li>9. Have you looked for and found no other adverse conclist the intent of all the caveats met for Bounding Spectrum</li> </ul>	) $(Y = N = U = N/A)$ Y N U N/A Y N U N/A erns? $(Y = N = U = N/A)$
<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveat met by intent without meeting the specific wording of the and explain the reason for this conclusion in the COMMENTS 1. Equipment is included in the generic seismic testing	caveat rule section below)
equipment class 2. Meets all Bounding Spectrum caveats	Y N U N/A Y N U N/A
<ol> <li>Component is a pressure, temperature, level or flow transmitter</li> </ol>	Y N U N/A

SSEL Line No. 4104A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

62233-1 - -

Equip. ID No. FT-FW-100B Equip. Class 18 - Instruments on Racks Equipment Description FW/AUX FEED TO SGB TRANSMITTER CAVEATS - GERS (Cont'd) Component is one of the specific makes and models 4. Y N U N/A tested, as listed in Appendix B 5. Necessary function of component not sensitive to seismically induced system perturbations, e.g., sloshing (cover this as part of Section 6 evaluation) YNU N/A Y N U N/A No vacuum tubes 6. All external mounting bolts in place Y N U N/A 7. 8. Demand based on realistic amplification of floor response through rack to transmitter-to-rack interface (document basis) N U N/A Rack capable of structurally transferring 9. seismic demand loads to anchorage U N/A All adjacent cabinets or sections of multi-bay 10. N U N/A assemblies bolted together YNUNA Is the intent of all the caveats met for GERS? ANCHORAGE 1. Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation) U N/A 2. Type of anchorage covered by GIP N/A U Sizes and locations of anchors determined 3. U N/A 4. Anchorage installation adequate, e.g., weld quality and length, nuts and washers, expansion anchor tightness N U N/A Factors affecting anchorage capacity or margin of 5. safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition, and concrete cracking NU N/A Y 6. For bolted anchorages, gap under base less than 1/4-inch U N/A Factors affecting essential relays considered: gap 7. under base, capacity reduction for expansion anchors U (N/A 8. Base has adequate stiffness and effect of prying action on anchors considered U N/A 9. Strength of equipment base and load path to CG adequate N U N/A Embedded steel, grout pad or large concrete pad adequacy evaluated Y N U (N/A Are anchorage requirements met? NU INTERACTION EFFECTS 1. Soft targets free from impact by nearby equipment or structures (Y) N U N/A 2. If equipment contains sensitive relays, equipment free from all impact by nearby equipment or structures U N/A 3. Attached lines have adequate flexibility N U N/A

= A21

SSEL Line No. 4104A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. FT-FW-100B Equip. Class 18 - Instruments on Racks

Equipment Description FW/AUX FEED TO SGB TRANSMITTER

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are

not likely to collapse

Have you looked for and found no other adverse concerns? 5. Is equipment free of interaction effects?

## IS EQUIPMENT SEISMICALLY ADEQUATE?

COMMENTS

Evaluated by:

Date: 2/21 Fun 21 1. 1945

13 - Commin

N U

YN U N/A

N/A

NU

02233- C-019 pa A 210 52 44 42 Gaster projection ah. 12 . R = 714" Tr: Ser A BrC , i je tion 3.412 38' GRONT of wither the lits is less. 6" TYP *HKB* FT-FW-ILCA/B/C

\* \* \* \*.

A       SCREENING EVALUATION WORK SHEET (SEWS)       Sheet 1 of 3         A       A       SCREENING EVALUATION WORK SHEET (SEWS)       Sheet 1 of 3         A       A       Gauge Diversion FU/AUX FEED TO SGC TRANSMITTER         Location: Bldg. SFGB       Floor E1. 735       Room, Row/Col AUX FEED PUMP         Anufacturer, Model, Etc. (optional but recommended)       1204 ITT-BARTOM         SEISMIC CAPACITY VS DEMAND       I.S. Koround Response Spectrum Bounding Spectrum Capacity based on: Existing Documentation Bounding Spectrum Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Resp. Spection to enveloping of seismic Comment by intent without meeting the specific wording of the caveat rule and explain the reason for 1 is conclusion in the COMMENTS section below)         1. S zele frame and shet metal structurally adequate       W. U. N/A         2. No computers or programmable controllers       W. U. N/A         3. Steel frame and shet metal structurally adequate       W. U. N/A         4. Adjacentry relative to 8 Hz limit considered       W. U. N/A         5. Nu unvial frequency relative to 8 Hz limit considered       W. U. N/A         6. Attached lines have adequiste flexibility       W. U. N/A         7. Adjacen	SSEL Line No. 4105A	52233-C-019 Pg 427 Status Y N U
Equip. DINo. FT-FM-100C       Equip. Class 18 - Instruments on Racks         Equipment Description FW/AUX FEED TO SGC TRANSMITTER         Location: Bidg. SFGB       Floor El. 735       Room, Row/Col AUX FEED PUMP         Manufacturer, Model, Etc. (optional but recommended) 1204 ITT-BARTON       Second Recomposition       72-7         Second Recomposition of seismic input below about 40' from grade       72-7       72-7         2. Elevation of seismic input below about 40' from grade       72-7       72-7         3. Equipment has fundamental frequency above about 8 Hz       000       N U N/A         4. Capacity based on: Existing Documentation       000       85         5. Demand based on: Ground Response Spectrum Conserv. Des. In-Str. Resp. Spect.       RRS         6. Second Response Spectrum Conserv. Des. In-Str. Resp. Spect.       RRS         7.5 x Ground Response Spectrum Conserv. Des. In-Str. Resp. Spect.       RRS         7.6 Command Spectrum is invoked per Section 4.2 of the GIP.)       0N U         Command Spectrum is invoked per Section 4.2 of the GIP.)       0N U         Command Spectrum is invoked per Section 4.2 of the GIP.)       0N U         Command Spectrum is invoked per Section 4.2 of the GIP.)       0N U         Command Spectrum is invoked per Section 4.2 of the GIP.)       0N U         1. Equipment is included in aearthquake experience equipment class       N U		Sheet 1 of 3
Eggipment Description       FW/AUX FEED TO SGC TRANSMITTER         Location: Bidg.       SFGB       Floor El. 735       Room, Row/Col AUX FEED PUMP         Manufacturer, Model, Etc. (optional but recommended)       1204 ITT-BARTON         SEISMIC CAPACITY VS DEMAND       1.       Elevation of seismic input below about 40° from grade         3.       Equipment has fundamental frequency above about 8 Hz       0.0       U.N/A         4.       Capacity based on:       Existing Documentation       0.0       0.0         8.       Equipment has fundamental frequency above about 8 Hz       0.0       0.0       0.0         6.       Capacity based on:       Existing Documentation       0.0       0.0       0.0         8.       S.       Demand based on:       Ground Response Spectrum       GRS       0.0       0.0       0.0       0.0         ComMENTS if a special exception to enveloping of seismic       Instruct is included in earthquake experience       0.0 <t< td=""><td>0.00</td><td></td></t<>	0.00	
Eggipment Description       FW/AUX FEED TO SGC TRANSMITTER         Location: Bidg.       SFGB       Floor El. 735       Room, Row/Col AUX FEED PUMP         Manufacturer, Model, Etc. (optional but recommended)       1204 ITT-BARTON         SEISMIC CAPACITY VS DEMAND       1.       Elevation of seismic input below about 40° from grade         3.       Equipment has fundamental frequency above about 8 Hz       0.0       U.N/A         4.       Capacity based on:       Existing Documentation       0.0       0.0         8.       Equipment has fundamental frequency above about 8 Hz       0.0       0.0       0.0         6.       Capacity based on:       Existing Documentation       0.0       0.0       0.0         8.       S.       Demand based on:       Ground Response Spectrum       GRS       0.0       0.0       0.0       0.0         ComMENTS if a special exception to enveloping of seismic       Instruct is included in earthquake experience       0.0 <t< td=""><td>Equip TD'No. FT-FW-100C Equip. Class 18 - Instrum</td><td>nents on Racks</td></t<>	Equip TD'No. FT-FW-100C Equip. Class 18 - Instrum	nents on Racks
<pre>Manufacturer, Model, Etc. (optional but recommended)</pre>	1-1	
SEISMIC CAPACITY VS DEMAND         1.       Elevation where equipment receives seismic input         2.       Elevation of seismic input below about 40' from grade         3.       Equipment has fundamental frequency above about 8 Hz       N.U.N/A         4.       Capacity based on: Existing Documentation       DOC         Bunding Spectrum       BS         .1.5 x Bounding Spectrum       CRS         5.       Demand based on: Ground Response Spectrum       ACS         .1.5 x Ground Response Spectrum       ACS         .1.6 x Ground Response Spectrum       ACS         .1.6 x Ground Response Spectrum       ACS         .1.6 x Ground Response Spectrum       ACS	Location: Bldg. SFGB Floor El. 735 Room,	Row/Col AUX FEED PUMP
<ol> <li>Elevation where equipment receives seismic input</li> <li>Elevation of seismic input below about 40' from grade</li> <li>Equipment has fundamental frequency about 8 Hz</li> <li>Capacity based on: Existing Documentation</li> <li>Bounding Spectrum</li> <li>Stabunding Spectrum is invoked per Section 4.2 of the GIP.)</li> <li>CAVEATS - BOUNDING SPECTR!<sup>M</sup> (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 t.is conclusion in the COMMENTS section below)</li> <li>Steel frame and sheet metal structurally adequate</li> <li>N U N/A</li> <li>Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays</li> <li>Natural frequency relative to 8 Hz limit considered</li> <li>Relays mounted on equipment evaluated</li> <li>Have you looked for and found no other adverse concerns?</li> <li>N U N/A</li> <li>Relays mounted on equipment evaluated</li> <li>Have you looked for and found no other adverse concerns?</li> <li>N U N/A</li> <li>Relays mounted on equipment evaluated</li> <li>Have you looked for an</li></ol>	Manufacturer, Model, Etc. (optional but recommended) 1204	ITT-BARTON
Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. TRS Does capacity exceed demand? (Indicate at right (*) and in <u>COMMENTS</u> if a special exception to enveloping of seismic domand spectrum is invoked per Section 4.2 of the GIP.) <u>CAVEATS - BOUNDING SPECTB</u> 'M (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 t.is conclusion in the COMMENTS section below) 1. Equipment is included in earthquake experience equipment class 2. No computers or programmable controllers 3. Steel frame and sheet metal structurally adequate if they contain essential relays 5. Natural frequency relative to 8 Hz limit considered 6. Attached lines have adequate flexibility 7. Anchorage adequate (See checklist below for details) 8. Relays mounted on equipment evaluated 9. Have you looked for and found no other adverse concerns? 1. Equipment is included in the generic seismic testing equipment class 2. No U N/A 3. Component is a pressure, temperature, level or flow 2. Mets all Bounding Spectrum caveats 3. Component is a pressure, temperature, level or flow	<ol> <li>Elevation where equipment receives seismic input</li> <li>Elevation of seismic input below about 40' from grade</li> <li>Equipment has fundamental frequency above about 8 Hz</li> <li>Capacity based on: Existing Documentation Bounding Spectrum</li> <li>1.5 x Bounding Spectrum GERS</li> </ol>	DOC BS GERS
<pre>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 2. No computers or programmable controllers 3. Steel frame and sheet metal structurally adequate 4. Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays 5. Natural frequency relative to 8 Hz limit considered 6. Attached lines have adequate flexibility 7. Anchorage adequate (See checklist below for details) 8. Relays mounted on equipment evaluated 9. Have you looked for and found no other adverse concerns? 1. Equipment is included in the generic seismic testing equipment class 2. Y N U N/A 2. Meets all Bounding Spectrum caveats 3. Component is a pressure, temperature, level or flow Y N U N/A 3. Component is a pressure, temperature, level or flow Y N U N/A Y N U</pre>	Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Sp Does capacity exceed demand? (Indicate at right (*) and in <u>COMMENTS</u> if a special exception to enveloping of seismic	ec. RRS
<pre>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 the generic seismic testing equipment class 2. Meets all Bounding Spectrum caveats 3. Component is a pressure, temperature, level or flow</pre>	<ul> <li>are met by intent without meeting the specific wording of th explain the reason for this conclusion in the COMMENTS section.</li> <li>1. Equipment is included in earthquake experience equipment class</li> <li>2. No computers or programmable controllers</li> <li>3. Steel frame and sheet metal structurally adequate</li> <li>4. Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays</li> <li>5. Natural frequency relative to 8 Hz limit considered</li> <li>6. Attached lines have adequate flexibility</li> <li>7. Anchorage adequate (See checklist below for details)</li> <li>8. Relays mounted on equipment evaluated</li> <li>9. Have you looked for and found no other adverse concerning the intent of all the caveats met for Bounding Spectrum?</li> </ul>	e caveat rule and on below)
3. Component is a pressure, temperature, level or flow	<pre>met by intent without meeting the specific wording of the car and explain the reason for this conclusion in the COMMENTS so 1. Equipment is included in the generic seismic testing equipment class 2. Meets all Bounding Spectrum caveats</pre>	veat rule ection below) Y N U N/A
	<ol><li>Component is a pressure, temperature, level or flow</li></ol>	â

SSEL Line No. 4105A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equip	ent Description FW/AUX FEED TO SGC TRANSMITTER					
CAVEAT	S - GERS (Cont'd)					
	Component is one of the specific makes and models					
	tested, as listed in Appendix B	Y	N	U	N/A	
5.	Necessary function of component not sensitive to					
	seismically induced system perturbations, e.g.,					
	sloshing (cover this as part of Section 6 evaluation)	Y	N	U	N/A N/A N/A	
6.	No vacuum tubes	Y	N	U	N/A	
7. 8.	All external mounting bolts in place	Ŷ	N	U	N/A	
0.	Demand based on realistic amplification of floor response through rack to transmitter-to-rack					
	interface (document basis)	v	N	11	N/A	
9.	Rack capable of structurally transferring	<b>.</b> .		0	in/ n	
1	seismic demand loads to anchorage	Y	N	U	N/A	
10.	All adjacent cabinets or sections of multi-bay					
	assemblies bolted together	Y	N	U	(N/A)	
Is the	intent of all the caveats met for GERS?				Y	N U N/A
ANCUOS						
ANCHOR						
1.	Appropriate equipment characteristics determined	0			11/0	
2.	(mass, CG, natural freq., damping, center of rotation) Type of anchorage covered by GIP	()	N	0	N/A N/A N/A	
3.	Sizes and locations of anchors determined	X	N	0	N/A	
4	Anchorage installation adequate, e.g.,	U	14	0	M/M	
	weld quality and length, nuts and washers, expansion					
	anchor tightness	(Y)	N	U	N/A	
5.	Factors affecting anchorage capacity or margin of	0		0		
	safety considered: embedment length, anchor spacing,					
	free-edge distance, concrete strength/condition, and					
	concrete cracking	P	N	U	N/A	
6.	For bolted anchorages, gap under base less than	-				
-	1/4-inch		N	U	N/A	
7.	Factors affecting essential relays considered: gap				-	
0	under base, capacity reduction for expansion anchors	Y	N	U	N/A	
8.	Base has adequate stiffness and effect of prying	(5)				
9.	action on anchors considered	Ð	N	0	N/A	
2.	Strength of equipment base and load path to CG adequate	R	N	11	N/A	
10.	Embedded steel, grout pad or large concrete	O	IN .	U	N/A	
	pad adequacy evaluated	Y	N	11	N/A.	
re and	horage requirements met?	- <b>*</b>		~	C/ TY	NU
					-	
NTERAC	TION EFFECTS					
1.	Soft targets free from impact by nearby	00				
-	equipment or structures	X	N	U	N/A	
2.	If equipment contains sensitive relays, equipment	(7)				
3.	free from all impact by nearby equipment or structures Attached lines have adequate flexibility	X	N	U	N/A	
4.	ALLALIEU TIMES HAVE ACECUATE TIEXIDITIEV	IY/	N	U	N/A	

SSEL Line No. 4105A

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(X N U

N/A

NU

NU

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. FT-FW-100C Equip. Class 18 - Instruments on Racks

Equipment Description \_FW/AUX FEED TO SGC TRANSMITTER

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are

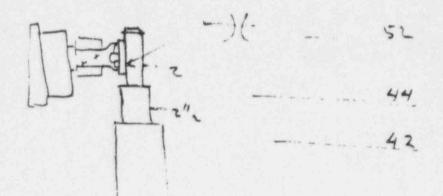
not likely to collapse

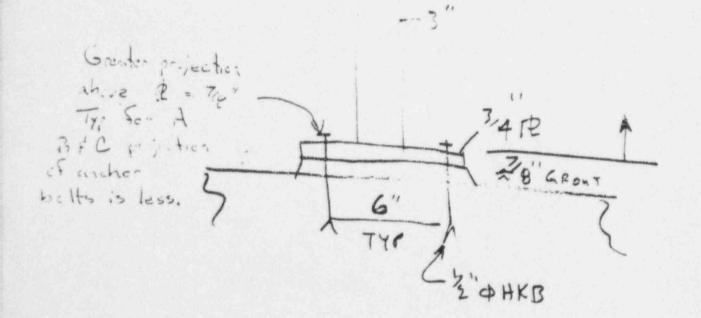
5. Have you looked for and found no other adverse concerns? (V N U N/A Is equipment free of interaction effects?

IS EQUIPMENT SEISMICALLY ADEQUATE?

COMMENTS

Evaluated by: Date: 2/21/95 FISD 21 5 1993 and





FT-FW-ILCA, B/C

	522 #3- C- 019 = 431 Status Y N U
SCREENING EVALUATION WORK SHEET (SEWS)	
~ ^ /	
Equipy 10 No. LT-FW-474 Equip. Class 18 - Ins	truments on Racks
Equipment Description FW/RC-E-1A NARROW RANGE LEVEL TRA	NSMITTER
Location: Bldg. RCBX Floor El. 718 Ro	om, Row/Col ANNULUS COL 16
Manufacturer, Model, Etc. (optional) IT Barton	Mod 7-4 5/11.515
SEISMIC CAPACITY VS DEMAND	- 22
<ol> <li>Elevation where equipment receives seismic input</li> <li>Elevation of seismic input below about 40' from groups</li> </ol>	A N N II
<ol> <li>Equipment has fundamental frequency above about 8</li> </ol>	HZ N U N/A
<ol> <li>Capacity based on: Existing Documentation</li> </ol>	DOC
Bounding Spectrum GERS	BS GERS
5. Demand based on: Ground Response Spectrum	GRS
1.5 x Bounding Spectrum	ABS
Conserv. Des. In-Str. Resp. Sp. Realistic M-Ctr. In-Str. Resp.	pec. CRS . Spec. RRS
Does capacity exceed demand?	YNU
CAVEATS - BOUNDING SPECTRUM (Identify with an asterisk (*	) those caveats which
are met by intent without meeting the specific wording of explain the reason for this conclusion in the COMMENTS se	r the caveat rule and ection below)
<ol> <li>Equipment is included in earthquake experience</li> </ol>	
equipment class 2. No computers or programmable controllers	N U N/A
<ol><li>Steel frame and sheet metal structurally adequate</li></ol>	N U N/A N U N/A
<ol> <li>Adjacent racks which are close enough to impact or</li> </ol>	
sections of multi-bay racks are bolted together	No adj. Racks
if they contain essential relays 5. Natural frequency relative to 8 Hz limit considere	Y N U N/A
<ol><li>Attached lines have adequate flexibility</li></ol>	N U N/A
	s) Y N O N/A
<ol> <li>Relays mounted on equipment evaluated</li> <li>Have you looked for and found no other adverse con</li> </ol>	
Is the intent of all the caveats met for Bounding Spectru	im? NUN/A YNUN/A
CAVEATS - GERS (Identify with an asterisk (*) those cavea	ts which are
met by intent without meeting the specific wording of the	caveat rule
and explain the reason for this conclusion in the COMMENT	S section below)
<ol> <li>Equipment is included in the generic seismic testi equipment class</li> </ol>	NG YNUN/A
2. Meets all Bounding Spectrum caveats	Y N U N/A
<ol> <li>Component is a pressure, temperature, level or flo transmitter</li> </ol>	W
	Y N U N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

52233 - C-015 == 432

Equip. ID No. LT-FW-474 Equip. Class 18 - Instrumen	ts on R	aci	(5	
Equipment Description _ FW/RC-E-1A NARROW RANGE LEVEL TRANSMITT	ER	_		
CAVEATS - GERS (Cont'd)				
4. Component is one of the specific makes and models				
tested, as listed in Appendix B	Y	N	U	N/A
5. Necessary function of component not sensitive to				
seismically induced system perturbations (e.g.,				
sloshing)	Y	N	U	N/A
6. No vacuum tubes	Y	N	U	N/A N/A
7. All external mounting bolts in place	Y	N	U	N/A
8. Demand based on amplified portion of 3% damped				
floor response spectrum if estimated natural				
frequency of rack less than 33 Hz	Y	N	U	N/A
9. Rack capable of structurally transferring GERS				
level seismic loads to anchorage	Y	N	U	N/A
Is the intent of all the caveats met for GERS?				YNUN/A
ANCHORAGE				
<ol> <li>Appropriate equipment characteristics determined</li> </ol>	a.			
(mass, CG, natural freq., damping, center of rotation)	R	N	U	N/A
<ol><li>Type of anchorage covered by GIP</li></ol>	X	NNN	U	N/A N/A
<ol><li>Sizes and locations of anchors determined</li></ol>	CP	N	U	N/A
<ol> <li>Adequacy of anchorage installation evaluated</li> </ol>				
(weld quality and length, nuts and washers, expansion	G			
anchor tightness, etc.)	Y	N	U	N/A
5. Factors affecting anchorage capacity or margin of				
safety considered: embedment length, anchor spacing,				
free-edge distance, concrete strength/condition, and	-			
concrete cracking	$\odot$	N	U	N/A
6. For bolted anchorages, gap under base less than	-			
1/4-inch	Y	N	U	N/A
<ol><li>Factors affecting essential relays considered: gap</li></ol>	-	Ŀ.	11	
under base, capacity reduction for expansion anchors	V	N	Ų	N/A
8. Base has adequate stiffness and effect of prying	-			
action on anchors considered	V	N	U	N/A
9. Strength of equipment base and load path	-		1.1	
to CG adequate	Y	N	U	N/A
10. Embedded steel, grout pad or large concrete				- Wall
pad adequacy evaluated	Y	N	Ų	N/A Antra
Are anchorage requirements met?				YNU
INTERACTION FEFFETE				
INTERACTION EFFECTS				
1. Soft targets free from impact by nearby				11/1
equipment or structures	0	N	0	N/A
2. If equipment contains sensitive relays, equipment	0			
free from all impact by nearby equipment or structures	×	N	0	N/A N/A
<ol> <li>Attached lines have adequate flexibility</li> </ol>	C	N	0	N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. LT-FW-474 Equip. Class 18 -	Instruments on Racks
Equipment Description _ FW/RC-E-1A NARROW RANGE LEVEL	TRANSMITTER
INTERACTION EFFECTS (Cont'd) 4. Overhead equipment or distribution systems are not likely to collapse 5. Have you looked for and found no other adverse Is equipment free of interaction effects?	WNUN/A
IS EQUIPMENT SEISMICALLY ADEQUATE?	YNU
COMMENTS Sugerst interst in	Std 6" × 6" × 12" onseplate with 4 - 3%" shell archers All tight
side View	
Evaluated by:	Date: $5/15/93$ 5-15-4:3

	52233 0. 20 A3. Status Y N 0
Equip. LD Np. LT-FW-476 Equip. Class 18 - Instr	
Equippent Description _ FW/RC-E-1A NARROW RANGE LEVEL TRANS	MITTER
Location: Bldg. RCBX Floor El. 718 Room	, Row/Col ANNULUS COL 15
Manufacturer, Model, Etc. (optional) ITT BARTON MODEL 764	5/N 1968
SEISMIC CAPACITY VS DEMAND1. Elevation where equipment receives seismic input2. Elevation of seismic input below about 40' from gra3. Equipment has fundamental frequency above about & H4. Capacity based on: Existing Documentation Bounding Spectrum GERS5. Demand based on: Ground Response Spectrum 1.5 x Bounding Spectrum 	de N U N/A DOC BS GERS GRS ABS CRS
<ul> <li><u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) are met by intent without meeting the specific wording of explain the reason for this conclusion in the COMMENTS sectors.</li> <li>1. Equipment is included in earthquake experience equipment class</li> <li>2. No computers or programmable controllers</li> <li>3. Steel frame and sheet metal structurally adequate</li> <li>4. Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays</li> <li>5. Natural frequency relative to 8 Hz limit considered</li> <li>6. Attached lines have adequate ilexibility</li> <li>7. Anchorage adequate (See checklist below for details)</li> <li>8. Relays mounted on equipment is other adverse concerts</li> <li>15. the intent of all the caveats met for Bounding Spectrum?</li> </ul>	the caveat rule and tion below) $ \begin{array}{c}                                     $
<u>CAVEATS - GERS</u> (Identify with an esterisk (*) those caveats met by intent without meeting the specific wording of the or and explain the reason for this conclusion in the COMMENTS 1. Equipment is included in the generic seismic testing equipment class 2. Meets all Bounding Spectrum caveats 3. Component is a pressure, temperature, level or flow transmitter	which are aveat rule section below)

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

N U N/A N U N/A

quipm	ent Description _FW/RC-E-1A NARROW RANGE LEVEL TRANSMITTER	R			
and the second sec	<u>S - GERS (Cont'd)</u>				
4.	Component is one of the specific makes and models tested, as listed in Appendix B	v	N	11	N/A
5.	Necessary function of component not sensitive to	1.1	14	U	M/ M
	seismically induced system perturbations (e.g.,				
	sloshing)	Y	N	U	N/A N/A N/A
6.	No vacuum tubes	Y	N	U	N/A
7.	All external mounting bolts in place	Y	N	U	N/A
8.	Demand based on amplified portion of 3% damped floor response spectrum if estimated natural				
	frequency of rack less than 33 Hz	Y	N	U	N/A
9.	Rack capable of structurally transferring GERS				
	level seismic loads to anchorage	Y	Ν	U	N/A
s the	intent of all the caveats met for GERS?				YNUN/A
NCHOR	AGE				
1.	Appropriate equipment characteristics determined	1.1			
	(mass, CG, natural freq., damping, center of rotation)	Ð	N	U	N/A
2.3.	Type of anchorage covered by GIP	× ×	N	U	N/A _ Locatic
3.	Sizes and locations of anchors determined	Q	N	U	N/A N/A _ Lecatic N/A within d
4.	Adequacy of anchorage installation evaluated (weld quality and length, nuts and washers, expansion				tileman
	anchor tightness, etc.)	R	N	U	N/A
5.	Factors affecting anchorage capacity or margin of	9			1.1.1.1
	safety considered: embedment length, anchor spacing,				
	free-edge distance, concrete strength/condition, and	-	1		
	concrete cracking	Ø	N	U	N/A
6.	For bolted anchorages, gap under base less than 1/4-inch	$(\overline{\mathbf{v}})$	N	U	NI / A
7.	Factors affecting essential relays considered: gap	G	14	0	N/A
	under base, capacity reduction for expansion anchors	D	N	U	N/A
8.	Base has adequate stiffness and effect of prying	-			
	action on anchors considered	Y	N	U	N/A
9.	Strength of equipment base and load path	12		1.1	
10	to CG adequate				N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	~	N	11	ALA Weint
re and	chorage requirements met?	1	N	0	YNU
	TION EFFECTS				
**	Soft targets free from impact by nearby equipment or structures	5	N	11	N/A
2.	If equipment contains sensitive relays, equipment	U	14	0	N/A

- If equipment contains sensitive relays, equipment free from all impact by nearby equipment or structures
   Attached lines have adequate flexibility

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

29 A310

52233-C-014 Status Y N II

Equip AID No. LT-FW-475 Equip. Class 18 - Instruments on Racks Equipment Description FW/RC-E-1A NARROW RANGE LEVEL TRANSMITTER Location: Bidg. RCBX Floor El. 718 Room, Row/Col ANNULUS COL 16 Manufacturer, Model, Etc. (optional) \_IT Broten 1161 764 5/10 1 SEISMIC CAPACITY VS DEMAND Elevation where equipment receives seismic input 1. 2. Elevation of seismic input below about 40' from grade N U N/A Equipment has fundamental frequency above about 8 Hz 3. 4. Capacity based on: Existing Documentation DOC Bounding Spectrum BS GERS GERS 5. Demand based on: Ground Response Spectrum GRS 1.5 x Bounding Spectrum 28A Conserv. Des. In-Str. Resp. Spec. CRS Realistic M-Ctr. In-Str. Resp. Spec. RRS Does capacity exceed demand? YNU 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) Equipment is included in earthquake experience 1. equipment class OON U N/A N U N/A 2. No computers or programmable controllers 3. Steel frame and sheet metal structurally adequate Adjacent racks which are close enough to impact or 4. No relays/No adj. racks sections of multi-bay racks are bolted together Y N U ONTA if they contain essential relays BN U N/A 5. Natural frequency relative to 8 Hz limit considered Attached lines have adequate flexibility 6. Anchorage adequate (See checklist below for details) Y N U N/A 8. N U NA Relays mounted on equipment evaluated Have you looked for and found no other adverse concerns? 9. Is the intent of all the caveats met for Bounding Spectrum? Y N U N/A CAVEATS - GERS (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) Equipment is included in the generic seismic testing 1. equipment class N U N/A 2. Meets all Bounding Spectrum caveats U N/A N 3. Component is a pressure, temperature, level or flow transmitter Y N U N/A Support Detuils same as 476,477 Anchors All taht

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3 P1 437

Equip	pment Description _FW/RC-E-1A NARROW RANGE LEVEL TRANSMITTE	ER			
CAVE	ATS - GERS (Cont'd)				
4.					
	tested, as listed in Appendix B	V	N	11	N/A
5.	Necessary function of component not sensitive to			0	II/A
	seismically induced system perturbations (e.g.,				
	sloshing)	Y	N	11	N/A
6.		¥	N	ii.	N/A
7.		Ý	N	U	N/A N/A
8.	Demand based on amplified portion of 3% damped		14	0	N/A
	floor response spectrum if estimated natural				
	frequency of rack less than 33 Hz	V	N		11/0
9.	Rack capable of structurally transferring GERS	1	14	0	N/A
	level seismic loads to anchorage	v	M	11	N/A
is th	intent of all the caveats met for GERS?		14	0	N/A
	e meene of all ene careaco mee for dans.				Y N U N/A
NCHO	RAGE				
1.					
	(mass, CG, natural freq., damping, center of rotation)	D	M	11	11/6
2.	Type of anchorage covered by GIP	X	NI.	0	N/A
3	Sizes and locations of anchors determined	to	NNN	UUUU	N/A N/A
4.	Adequacy of anchorage installation evaluated	U	N	0	N/A
	(weld quality and length, nuts and washers, expansion				
	anchor tightness, etc.)	D			
5.	Factors affecting anchorage capacity or margin of	()	N	0	N/A
	safety considered: embedment length, anchor spacing,				
	free-edge distance, concrete strength/condition, and				
	concrete cracking	1			
6.	for holted anchorages, gan under base less than	U	N	U	N/A
0.	For bolted anchorages, gap under base less than 1/4-inch	6			
7.		V	N	U	N/A
1.	Factors affecting essential relays considered: gap	-			
0	under base, capacity reduction for expansion anchors	$\odot$	N	U	N/A
0.	Base has adequate stiffness and effect of prying	-			
	action on anchors considered	Y	N	U	N/A
9.	and here and here and here	-			
	to CG adequate	X	N	U	N/A
10.	Embedded steel, grout pad or large concrete	0			Wall .
	pad adequacy evaluated	Y	N	U	Mante Mente
re ar	nchorage requirements met?				YNU
HTCO	ACTION FFFFFF				
	ACTION EFFECTS				
1.	and an and the treat impace by nearby				
1.0	equipment or structures	D	N	U	N/A
2.	If equipment contains sensitive relays, equipment	$\sim$			
	free from all impact by nearby equipment or structures	( )	64	10.0	

free from all impact by nearby equipment or structures 3. Attached lines have adequate flexibility

N U N/A N U N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equipment Description <u>FW/RC-E-1A NARROW RANGE LEVEL TRANSMITTER</u> <u>INTERACTION EFFECTS (Cont'd)</u> 4. Overhead equipment or distribution systems are not likely to collapse	Equip. ID No. L	T-FW-475	Equip. Class	18 -	Instruments	on R	lack	S		
INTERACTION EFFECTS (Cont'd) 4. Overhead equipment or distribution systems are not likely to collapse	Equipment Descri	ption <u>FW/RC-E-1A</u>	NARROW RANGE	LEVEL	TRANSMITTER					
<ul> <li>4. Overhead equipment or distribution systems are not likely to collapse</li> <li>5. Have you looked for and found no other adverse concerns?</li> <li>N U N/A</li> <li>Is equipment free of interaction effects?</li> </ul>	INTERACTION EFFE 4. Overhead not likel 5. Have you Is equipment free	CTS (Cont'd) equipment or distr y to collapse looked for and fou e of interaction e	ribution syste und no other a effects?	ems are adverse	e concerns?	BB	NN	UU	N/A N/A () N U	
IS EQUIPMENT SEISMICALLY ADEQUATE? YN U	IS EQUIPMENT SEL	SMICALLY ADEQUATE?	2						YNU	

COMMENTS

Date: <u>5/15/93</u> <u>5-15-93</u> Evaluated by:

No FILES Status	33-6-014 FA +39
SCREENING EVALUATION WORK SHEET (SEWS) Sheet	1 of 3
Faip, No. LT-FW-477 Equip. Class 18 - Instruments of	on Racks
Equipment Description _ FW/RC-E-1A WIDE RANGE LEVEL TRANSMITTER	
Location: Bldg. RCBX Floor El. 718 Room, Row/Co	
Manufacturer, Model, Etc. (optional) III Barton Model	764 5/N 3423
SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input 2. Elevation of seismic input below about 40' from grade 3. Equipment has fundamental frequency above about 8 Hz 4. Capacity based on: Existing Documentation Bounding Spectrum GERS 5. Demand based on: Ground Response Spectrum 1.5 x Bounding Spectrum Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Does capacity exceed demand?	722 N U N/A DOC BS GRS ABS 3% RRS WN U
CAVEATS - BOUNDING SF CTRUM (Identify with an asterisk (*) those of are met by intent without meeting the specific wording of the cave explain the reason for this conclusion in the COMMENTS section be 1. Equipment is included in earthquake experience equipment clas 2. No computers of programmable controllers 3. Steel frame and sheet metal structurally adequate 4. Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together Ne if they contain essential relays 5. Natural frequency relative to 8 Hz limit considered 6. Attached lines have adequate flexibility 7. Anchorage adequate (See checklist below for details) 8. Relays mounted on equipment evaluated 9. Have you looked for and found no other adverse concerns? Is the intent of all the caveats met for Bounding Spectrum?	eat rule and
<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveats which met by intent without meeting the specific wording of the caveat and explain the reason for this conclusion in the COMMENTS section 1. Equipment is included in the generic seismic testing equipment class 2. Meets all Bounding Spectrum caveats 3. Component is a pressure, temperature, level or flow transmitter	rule

52233-6-019 Pg AUD Sheet 2 of 3 Pg

	ID No. LT-FW-477 Equip. Class 18 struments					
quipme	ent Description _ FW/RC-E-1A WIDE RANGE LEVEL TRANSMITTER					
AVEATS	GERS (Cont'd)					
4	Component is one of the specific makes and moders	Y	N	U	N/A	
	tested, as listed in Appendix B Necessary function of component not sensitive to					
5.	seismically induced system perturbations (e.g.,				11.1.2.1	
	seismically induced system percurbations (0.5.				N/A	
	sloshing) No vacuum tubes	Y	Ν			
	All avtornal mounting holts in place	Y	Ν		N/A	
7.	Domand based on amplified portion of 5% damped					
8.	floor response spectrum if estimated natural					
	Frequency of rack less than 33 MZ	Y	N	0	N/A	
9.	Rack capable of structurally transferring GERS	- 1				
	lovel spismic loads to anchorage	Ŷ	N	0	N/A Y N	UNTA
e the	intent of all the caveats met for GERS?				1 1	
5 01.5						
NCHORA	AGE determined					
1.	and an anished on an and the second states of the second states tates of the second states of the second states of	Q	N	U	N/A	
	(mace (G. natural freq., damping, center of focación)	996	NNN	U	N/A	
2.	Tune of anchorage covered by GIP	Ø	N	Ŭ	N/A	
3.	cizes and locations of anchors determined	~	1		11	
4.	Adapusey of anchorade installation evaluated	1.1.1				
	(weld quality and length, nuts and washers, expansion	Ŷ	N	U	N/A	
	anchor tightness, etc.)	$\cup$				
5.	Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing,					
	safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition, and	-				
	free-edge distance, concrete strongen, sand	$\bigcirc$	) N	U	N/A	
1	concrete cracking For bolted anchorages, gap under base less than					
	1/A inch	S	Ν	U	N/A	
	1/4-inch Factors affecting essential relays considered: gap	~				
7.	La have appareity reduction for expansion ducing	Y	) N	U	N/A	
0		-				
8.	action on anchors considered	C	N	U	N/A	
0	a contract back and load back	0				
9.	to CG adequate				N/A	
10	Embedded steel, grout pad or large concrete			1.11	N/A	Wall 1
10.	pad adequacy evaluated	Ŷ	N	U	CNIA	MELLAT
Are at	nchorage requirements met?				9	NU
AIC C.	renor age : equities and a second s					
INTER/	ACTION EFFECTS					
1.	Soft targets free from impact by nearby	T	S N	14	J N/A	
	aguinment or structures	U	14	U	in/ in	
2.	te oquinment contains sensitive relays, equipment	T	2 N	V	N/A	
	free from all impact by nearby equipment or structures	X	2N	i V	J N/A J N/A	
2	Attached lines have adequate flexibility	4	1.10		and are	

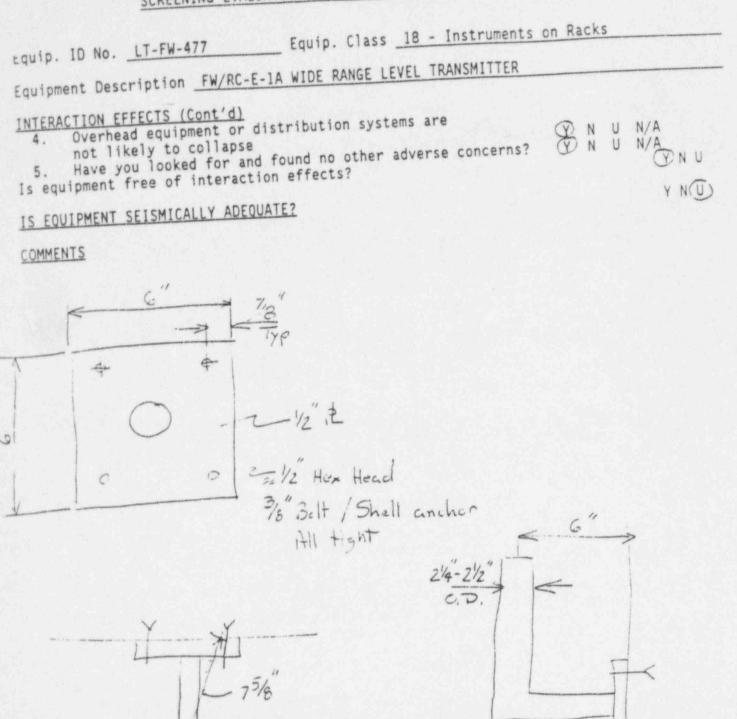
free from all impact by nearby equipment or structures 3. Attached lines have adequate flexibility

52233-6-019 Pg 4-11 Sheet 3 of 3 Pg 4-11

SCREENING EVALUATION WORK SHEET (SEWS)

15 Tetal

Evaluated by:



Date: <u>5/15/93</u> 5-15-93

52233-6-019 20 ALI Status YNU SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3 Equip. ID No! LT-FW-484 Equip. Class 18 - Instruments on Racks Equipment Description FW/RC-E-18 NARROW RANGE LEVEL TRANSMITTER Location Eldg. RCBX Floor El. 738 Room, Row/Col ANNULUS COL 9 Manufacturer, Model, Etc. (optional) ITT BARTON MODEL 764 SEISMIC CAPACITY VS DEMAND Elevation where equipment receives seismic input 1. Elevation of seismic input below about 40' from grade 2. (N) U 3. Equipment has fundamental frequency above about 8 Hz (Y)N U N/A 4. Capacity based on: Existing Documentation DOC Bounding Spectrum BS GERS GERS 5. Ground Response Spectrum GRS Demand based on: 1.5 x Bounding Spectrum ABS Conserv. Des. In-Str. Resp. Spec. CRS Realistic M-Ctr. In-Str. Resp. Spec. RRS YNU, Does capacity exceed demand? 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 VNU N/A 2. No computers or programmable controllers N U N/A Steel frame and sheet metal structurally adequate 3. N U N/A 4. Adjacent racks which are close enough to impact or relays/ No adj. Rack No sections of multi-bay racks are bolted together if they contain essential relays N U CN/A 5. Natural frequency relative to 8 Hz limit considered B N U N/A N U N/A 6. Attached lines have adequate flexibility 0 Anchorage adequate (See checklist below for details) Y N 7. N/A 8. Relays mounted on equipment evaluated Y N U (N/A) 9. ON U N/A Have you looked for and found no other adverse concerns? Is the intent of all the caveats met for Bounding Spectrum? YN U N/A CAVEATS - GERS (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 the generic seismic testing equipment class Y N U N/A 2. Meets all Bounding Spectrum caveats YN U N/A 3. Component is a pressure, temperature, level or flow transmitter YN U N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3 Pg. AUS

Equipa	ent Description _FW/RC-E-18 NARROW RANGE LEVEL TRANSMITT	FD				
		LK				
	<u>S - GERS (Cont'd)</u>					
4.					1.01	
5.	tested, as listed in Appendix B	Y	N	U	N/A	
э.	Necessary function of component not sensitive to					
	seismically induced system perturbations (e.g., sloshing)	v				
6.	No vacuum tubes	Y	N	U	N/A N/A N/A	
7.	All external mounting bolts in place	T V	IN N	0	N/A	
8.	Demand based on amplified portion of 3% damped	1	N	0	N/A	
	floor response spectrum if estimated natural					
	frequency of rack less than 33 Hz	Y	N	11	N/A	
9.	Rack capable of structurally transferring GERS			0	N/A	
	level seismic loads to anchorage	Y	N	U	N/A	
s the	intent of all the caveats met for GERS?	100		-	Y	N UN/A
NCHOR	and set a					
1.	Appropriate equipment characteristics determined	-				
	(mass, CG, natural freq., damping, center of rotation)	R	N	U	N/A	
2.	Type of anchorage covered by GIP	æ	N	U	N/A N/A N/A	
	Sizes and locations of anchors determined	C)	N	U	N/A	
4.	Adequacy of anchorage installation evaluated	A	1.1.	sla.	-	
	(weld quality and length, nuts and washers, expansion anchor tightness, etc.)	AN	174	XTTR		
5.	Factors affecting anchorage capacity or margin of	O	N	Z	N/A	1981 A.
	safety considered: embedment length, anchor spacing,				NX	relays
	free-edge distance, concrete strength/condition, and				No a	dj ic
	concrete cracking	$\bigcirc$	N	U	N/A	
6.	For bolted anchorages, gap under base less than	Y	14	0	N/A	
	1/4-inch	N	N	U	N/A	
7.	Factors affecting essential relays considered: gap	U		0	in/ A	
	under base, capacity reduction for expansion anchors	3	N	U	N/A	
8.	Base has adequate stiffness and effect of prying	0		-	N/ N	
	action on anchors considered	D	N	U	N/A	
9.	Strength of equipment base and load path	9				
1.1	to CG adequate	D	N	U	N/A	
10.	Embedded steel, grout pad or large concrete		-	1		Juli Mike
	pad adequacy evaluated	Y	N	U	N/A)	
e anc	horage requirements met?				T	Jali Mik )n u
TEDAO	TION SECRETE					
	TION EFFECTS					
1.	Soft targets free from impact by nearby	0				
2.	equipment or structures	(V)	N	U	N/A	
S. 1	If equipment contains sensitive relays, equipment	6				
3.	free from all impact by nearby equipment or structures	A	N	0	N/A N/A	
. ·	Attached lines have adequate flexibility	Q	N	U	N/A	

52233-6-019 Sheet 3 of 3 PAUL

Equip. ID No. <u>LT-FW-484</u> Equip. Class <u>18 - Instruments on Racks</u> Equipment Description <u>FW/RC-E-1B NARROW RANGE LEVEL TRANSMITTER</u> <u>INTEFACTION EFFECTS (Cont'd)</u> 4. Overhead equipment or distribution systems are not likely to collapse 5. Have you looked for and found no other adverse concerns? NUN/A Is equipment free of interaction effects? NUN/A <u>IS EQUIPMENT SEISMICALLY ADEQUATE?</u> YNU

COMMENTS

Hilt: Kulk-Bit, Checkert - All tight

Date: 5/15/93 Evaluated by: -15-43

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

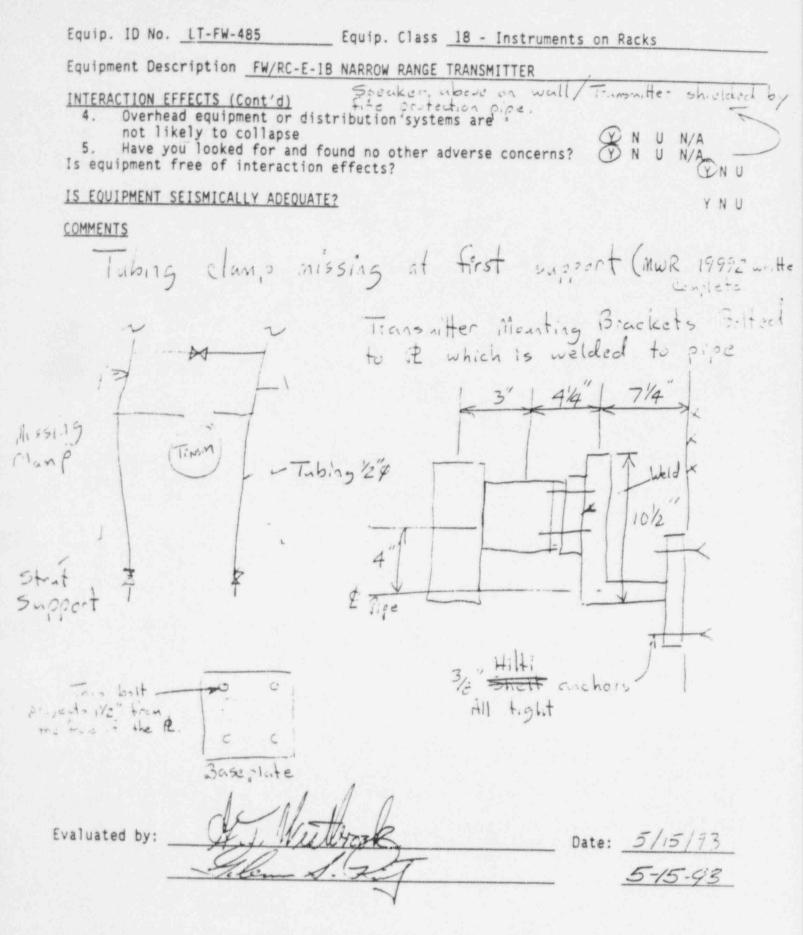
SZZ 33-C-019 pg AUS Status Y N U

Equip	. ID No.	LT-FW-48	85		E	quip.	Cla	ss j	18 -	Insti	umer	nts	on	Rac	ks				
		ription _																	
		. RCBX										w/c	01	AN	NUL	US C	OL	9	
Manuf	acturer,	Model, Et	tc.	(optic	onal)	I	11	3	$c_1 - t_2$		M	od	le		76.	4	3/1	N 1	969
SEISM	IC CAPACI	TY VS DEM	IAND																
1.	Elevati	on where	equ	ipment	rec	eive	s se	ismic	inn	ut				72	2		ML I		uall
2.	Llevati	on of sei	Smic	: inpu	t be	low	about	40'	from	m ara	de		Ý	N	50		ina	e. 0	man
э.	Equipme	nt has tu	Indan	nental	fre	quen	cv at	avoc	about	t 8 H	z		T	) N	Ŭ	N/	Α		
4.	Capacit	y based o	n:	Exist Bound	ing	Docu	menta	ation					DC BS	00		,			
5.	Demand	hared on.		GERS										ERS					
3.	Demanu	based on:		1.5 x	d Ke	spon	se Sp	ectr	um				GF						
				Conse	rv.	Des	y spe	tr	Pern	See			AE						
				Reali	stic	M-C	tr. I	n-St	r. R	, spe	Sner		CF						
Does o	capacity	exceed de	mand	?						o apri	spec	· · · ·	N.	12			V	N Û)	
14 1 Tap 111 Ta	in the real Equipment	DING SPEC ent witho ason for nt is inc	this	conc	lusi	e spe on ir	eciri h the	COM	MENTS	1 14 1	PAG	A 14.1.1		- mar + 1	s wh le a	ind			
2	equipmen	it class											T	N	U	N/	A		
2.3.	Steel fr	iters or p	prog	rammat	ble	contr	rolle	rs					0	N	U	N// N//	A		
4.	Adjacent	rame and stracks wh	snee	t meta		truct	ural	ly ac	lequa	ite			C	N	U	N/	A		
	sections	of mult	i-ha	v rack	1050	e enc	ltod	to in	npact	or						1.	1	suij.	
	if they	contain e	esse	ntial	rel	eve	niced	Loge	erner				NO 1	elc	173	1	20	sury.	. in i
5.	Natural	frequency	v re	lative	e to	8 Hz	lim	it co	nsid	ered			a	N	0	CTV/	A		
0.	Attached	l lines ha	ave	adequa	ite f	lexi	bili	tv					to	N	11	N/I	4		
1.	Anchorad	le adequat	te (	See ch	peck	ist	helou	w for	· det	ails)	í		Y	N	Ď	N/IN/I	Δ.		
8.	Relays n	iounted or	n eq	ulomen	it ev	alua	ted						Y	N	U	ATT	D		
9.	Have you	looked f	for	and fo	ound	no o	ther	adve	rse	conce	rns?	>	0	N	U	N/A	A		
s the	incent c	f all the	e ca	veats	met	for	Bound	ding	Spec	trum?							2N	UI	N/A
AVEAT	S - GERS	(Identify	wit	th an	aste	risk	(*)	thos	e ca	veats	whi	ch	are						
nd ex	nlain the	ithout me	for	ng the	spe	C111	C WOI	rding	of	the c	avea	it r	ule	2	20				
1.	Equipmen	reason f t is incl	uder	in t	he	US10	ic se	the	CUMM	ENIS	sect	100	be	IOW	)				
	equipmen	t class						= 1 2 m 1	c te	sting			v	N	11		10		
2.	Meets al	1 Boundin	g St	ectru	m ca	veat	s						Y	N	U	N/A			
3.	componen	t is a pr	essi	ire, t	empe	ratu	re, 1	evel	or	flow			1	14	0	IN/A	·		
	transmit	ter											Y	N	U	N/A			
														11		14 6			

	ID No. LT-FW-485 Equip. Class 18 - Instrument	ts on i	Kac	KS		
Equipm	ment Description _FW/RC-E-1B NARROW RANGE TRANSMITTER					
CAVEAT	S - GERS (Cont'd)					
4.	Component is one of the specific makes and models					
	tested, as listed in Appendix B	Y	N	U	N/A	
5.	Necessary function of component not sensitive to					
	seismically induced system perturbations (e.g., sloshing)					
6	No vacuum tubes	Y	N	U	N/A	
6. 7.	All external mounting bolts in place	Y	N	0	N/A N/A	
8.	Demand based on amplified portion of 3% damped	r	M	U	N/A	
	floor response spectrum if estimated natural					
	frequency of rack less than 33 Hz	¥	N	11	N/A	
9.	Rack capable of structurally transferring GERS					
	level seismic loads to anchorage	Y	N	U	N/A	
Is the	intent of all the caveats met for GERS?				N/A Y N	UN/A
ANCHOR						-
1.	Appropriate equipment characteristics determined	1.546				
	(mass, CG, natural freq., damping, center of rotation)	Ø	Ν	U	N/A	
2.	Type of anchorage covered by GIP	B	N	UU	N/A N/A	
2. 3. 4.	Sizes and locations of anchors determined	a	N	U	N/A	
4.	Adequacy of anchorage installation evaluated		T	1/1	145/25	
	(weld quality and length, nuts and washers, expansion	A	41	N.	511-	
5.	anchor tightness, etc.)	C	N	00	N/A	
5.	Factors affecting anchorage capacity or margin of					
	safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition, and					
	concrete cracking	N	N		AL / A	
6.	For bolted anchorages, gap under base less than	U	14	0	N/A	
	1/4-inch	Q	N	11	N/A	
7.	Factors affecting essential relays considered: gap	L.		0	IN/M	s reing
	under base, capacity reduction for expansion anchors	Y	N	11	(N/A)	(s
8.	Base has adequate stiffness and effect of prying	- N		~	N/A N	C Dab
	action on anchors considered	T	N	U	N/A	
9.	Strength of equipment base and load path	and the second s				
	to CG adequate	Ø	N	U	N/A	
10.	Embedded steel, grout pad or large concrete	-			wa	11
	pad adequacy evaluated	Y	N	U,	N/A) A	ninte
re anc	horage requirements met?				N/A N/A	NU
	TION EFFECTS					
1.	Soft targets free from impact by nearby	1. 1.1.				
	equipment or structures	Ø	N	U	N/A	
2.	If equipment contains sensitive relays, equipment	-				
	free from all impact by nearby equipment or structures	Ø	N	11	N/A	

3. Attached lines have adequate flexibility N U N/A

52233-C-01 19 AU7 Sheet 3 of 3



	52233-C-019 Pg 4-18 Status Y N U
SCREENING EVALUATION WORK SHEET (SEWS)	Sheet 1 of 3
Equip. A M. LT-FW-486 Equip. Class 18 - Inst Equipment Description FW/RC-E-18 NARROW RANGE LEVEL TRAN	ruments on Racks
Equipment Description _FW/RC-E-1B NARROW RANGE LEVEL TRAN	ISMITTER
Location: Bldg. RCBX Floor El. 718 Roc	m, Row/Col ANNULUS COL 9
Manufacturer, Model, Etc. (optional) IT Barton	Model 764
<ul> <li>SEISMIC CAPACITY VS DEMAND         <ol> <li>Elevation where equipment receives seismic input</li> <li>Elevation of seismic input below about 40' from gr</li> <li>Equipment has fundamental frequency above about 8</li> <li>Capacity based on: Existing Documentation</li></ol></li></ul>	ade Hz ON UN/A DOC BS GERS GRS ABS
Conserv. Des. In-Str. Resp. Sp Realistic M-Ctr. In-Str. Resp.	ec. CRS Spec. RRS
Does capacity exceed demand?	YND
<ul> <li><u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (* are met by intent without meeting the specific wording of explain the reason for this conclusion in the COMMENTS see 1. Equipment is included in earthquake experience equipment class</li> <li>2. No computers or programmable controllers</li> <li>3. Steel frame and sheet metal structurally adequate</li> <li>4. Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays</li> <li>5. Natural frequency relative to 8 Hz limit considered</li> <li>6. Attached lines have adequate flexibility</li> <li>7. Anchorage adequate (See checklist below for details</li> <li>8. Relays mounted on equipment evaluated</li> <li>9. Have you looked for and found no other adverse conditions</li> </ul>	the caveat rule and ction below) N U N/A NO relays /No adj. racks Y N U N/A No relays /No adj. racks Y N U N/A N U N/A S) Y N U N/A S) Y N U N/A Y N U N/A
<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveat met by intent without meeting the specific wording of the and explain the reason for this conclusion in the COMMENTS	caveat rule 5 section below)
<ol> <li>Equipment is included in the generic seismic testin equipment class</li> </ol>	YNUN/A
<ol> <li>Meets all Bounding Spectrum caveats</li> <li>Component is a pressure, temperature, level or flow</li> </ol>	Y N U N/A
transmitter	Y N U N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

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Equip	ment Description _FW/RC-E-1B NARROW RANGE LEVEL TRANSMITTE	P			
	TS - GERS (Cont'd)				
4.	Component is one of the specific makes and models				
5.	tested, as listed in Appendix B	Y	N	U	N/A
2.	Necessary function of component not sensitive to				
	seismically induced system perturbations (e.g., sloshing)			1.	
6.	No vacuum tubes	Ť	N	0	N/A N/A N/A
6. 7. 8.	All external mounting bolts in place	Ť	N	0	N/A
8.	Demand based on amplified portion of 3% damped	T	N	U	N/A
1	floor response spectrum if estimated natural				
	frequency of rack less than 33 Hz	V	N	U	N/A
9.	Rack capable of structurally transferring GERS			0	N/ M
	level seismic loads to anchorage	Y	N	U	N/A
s the	intent of all the caveats met for GERS?				YNUN/A
					1 4 4 22
NCHOR					
1.	Appropriate equipment characteristics determined	1.1			
	(mass, CG, natural freq., damping, center of rotation)	T	N	U	N/A
2.3.	Type of anchorage covered by GIP	BB	N	U	N/A N/A N/A
	Sizes and locations of anchors determined	S	N	U	N/A
4.	Adequacy of anchorage installation evaluated				
	(weld quality and length, nuts and washers, expansion	0			
5.	anchor tightness, etc.)	O	Ν	U	N/A
2.	Factors affecting anchorage capacity or margin of				
	safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition, and				
	concrete cracking	0			
6.	For bolted anchorages, gap under base less than	()	N	U	N/A
	1/4-inch	$\odot$		-	AL / A
7.	Factors affecting essential relays considered: gap	P	N	U	N/A
	under base, capacity reduction for expansion anchors	V			No -aling
8.	Base has adequate stiffness and effect of prying	1	N	U	NA No -elay
	action on anchors considered	A	A.I		
9.	Strength of equipment base and load path	O	IN	U	N/A
	to CG adequate	a	M	11	NIZA
10.	Embedded steel, grout pad or large concrete				N/A
	pad adequacy evaluated	V	N	11	N/A Wall
e an	chorage requirements met?		14	0	V Mantec
					J a v
	CTION EFFECTS				
1.	Soft targets free from impact by nearby				
	equipment or structures	Ø	N	U	N/A
2.	If equipment contains sensitive relays, equipment				
	free from all impact by nearby equipment or structures	Ø	N	U	N/A N/A
3.	Attached lines have adequate flexibility	R	N	11	N/A

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YNU

Equip. ID No. LT-FW-486 Equip. Class 18 - Instruments on Racks Equipment Description FW/RC-E-1B NARROW RANGE LEVEL TRANSMITTER

INTERACTION EFFECTS (Cont'd)

Overhead equipment or distribution systems are 4. not likely to collapse N U N/A Have you looked for and found no other adverse concerns? 5. Is equipment free of interaction effects?

IS EQUIPMENT SEISMICALLY ADEQUATE?

COMMENTS

" Hi Brocelate Detail 1/2% Kwile Belts / All toght 8"x 5" P Barealate within tolerand of Detail D, RK-LF

Evaluated by:

Date: 5/15/93 -15-43

	52233- C-019 P' ASI Status Y N U
SCREENING EVALUATION WORK SHEET (SEWS)	Sheet 1 of 3
Equip De No. <u>LT-FW-495</u> Equip. Class <u>18 - Instr</u> Equipment Description <u>FW/RC-E-IC NARROW RANGE LEVEL TRANS</u>	
Equipment Description FW/RC-E-1C NARROW RANGE LEVEL TRANS	MITTER
Location: Bldg. RCBX Floor El. 718 Room	, Row/Col ANNULUS COL 5
Manufacturer, Model, Etc. (optional) ITT BARTON MODEL 764	5/N 38.56
SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input 2. Elevation of seismic input below about 40' from grad 3. Equipment has fundamental frequency above about 8 Hi 4. Capacity based on: Existing Documentation Bounding Spectrum GERS	DOC BS
<ol> <li>Demand based on: Ground Response Spectrum</li> <li>1.5 x Bounding Spectrum</li> <li>Conserv. Des. In-Str. Resp. Spec</li> <li>Realistic M-Ctr. In-Str. Resp. 5</li> </ol>	Spec. RRS
Does capacity exceed demand?	YNU
<u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) are met by intent without meeting the specific wording of t explain the reason for this conclusion in the COMMENTS sect 1. Equipment is included in earthquake experience	the caveat rule and
<ul> <li>equipment class</li> <li>No computers or programmable controllers</li> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays</li> <li>Natural frequency relative to 8 Hz limit considered</li> <li>Attached lines have adequate flexibility</li> <li>Anchorage adequate (See checklist below for details)</li> <li>Relays mounted on equipment evaluated</li> <li>Have you looked for and found no other adverse conce</li> <li>Is the intent of all the caveats met for Bounding Spectrum?</li> </ul>	rns? Y N U NZA Y N U NZA Y N U N/A
<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveats met by intent without meeting the specific wording of the c and explain the reason for this conclusion in the COMMENTS 1. Equipment is included in the generic seismic testing	aveat rule section below)
equipment class 2. Meets all Bounding Spectrum caveats 3. Component is a pressure, temperature, level or flow	Y N U N/A Y N U N/A
transmitter	Y N U N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equip. ID No. LT-FW-495 Equip. Class 18 - Instrument	s on R	ack	s	
Equipment Description _ FW/RC-E-1C NARROW RANGE LEVEL TRANSMITTE	R	_		
CAVEATS - GERS (Cont'd)				
<ol> <li>Component is one of the specific makes and models</li> </ol>				
tested, as listed in Appendix B	Y	N	U	N/A
5. Necessary function of component not sensitive to				
caismically induced system perturbations (e.g., sloshing)	v	N	11	N/A
	Y	N	ŭ	N/A
<ol> <li>No vacuum tubes</li> <li>All external mounting bolts in place</li> <li>Demand based on amplified portion of 3% damped</li> </ol>	Ý	N	Ŭ	N/A
8. Demand based on amplified portion of 3% damped			1	
floor response spectrum if estimated natural				
frequency of rack less than 33 Hz				N/A
9. Rack capable of structurally transferring GERS		1		N/A Y N U N/A
level seismic loads to anchorage	Ŷ	N	U	N/A
Is the intent of all the caveats met for GERS?				TNUNA
ANCHORAGE				
<ol> <li>Appropriate equipment characteristics determined</li> </ol>	3			
(mass, CG, natural freq., damping, center of rotation)	Q	N	U	N/A - N/A N/A
2. Type of anchorage covered by GIP	R	N	U	N/A
<ol> <li>Sizes and locations of anchors determined</li> </ol>	C	N	U	N/A
4. Adequacy of anchorage installation evaluated				
(weld quality and length, nuts and washers, expansion anchor tightness, etc.)	T	N	11	N/A
5. Factors affecting anchorage capacity or margin of	U		V	N/ C
safety considered: embedment length, anchor spacing,				
free-edge distance, concrete strength/condition, and				
concrete cracking	D	Ν	U	N/A
<ol><li>For bolted anchorages, gap under base less than</li></ol>	0			
1/4-inch	(Y)	N	U	N/A
<ol><li>Factors affecting essential relays considered: gap</li></ol>	0	N		NI / A
under base, capacity reduction for expansion anchors 8. Base has adequate stiffness and effect of prying	O	N	U	N/A
<ol> <li>Base has adequate stiffness and effect of prying action on anchors considered</li> </ol>	$\odot$	N	11	N/A
9. Strength of equipment base and load path	4	2	~	N/ D
to CG adequate	0	N	U	N/A
10. Embedded steel, grout pad or large concrete	0			Wall 1
pad adequacy evaluated	Y	N	U	(N/B_Menter)
Are anchorage requirements met?				Y N U
INTERACTION EFFECTS				
1. Soft targets free from impact by nearby				
equipment or structures	8	N	J	N/A
2. If equipment contains sensitive relays, equipment	9	1		
free from all impact by nearby equipment or structures	R	N	U	N/A N/A
<ol><li>Attached lines have adequate flexibility</li></ol>	Q	N	U	N/A

Equip. ID No. <u>LT-FW-495</u> Equip. Class <u>18 - Instruments on Racks</u> Equipment Description <u>FW/RC-E-1C NARROW RANGE LEVEL TRANSMITTER</u> <u>INTERACTION EFFECTS (Cont'd)</u> 4. Overhead equipment or distribution systems are not likely to collapse 5. Have you looked for and found no other adverse concerns? N U N/A Is equipment free of interaction effects? N U N/A IS EQUIPMENT SEISMICALLY ADEQUATE? Y N U <u>COMMENTS</u>

Hilt: Bolt base late detail / All anchers tight.

Evaluated by:

Date: 5/15/93 5-15-43

52255 C-014 D* 454
Status Y N U
SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3
Equip. TO No. LT-FW-496 Equip. Class 18 - Instruments on Racks
Equipment Description _FW/RC-E-IC NARROW RANGE LEVEL TRANSMITTER
Location: Bldg. RCBX Floor El. 718 Room, Row/Col ANNULUS COL 4
Manufacturer, Model, Etc. (optional) ITT BARTON MODEL 764 5/N 3857
SEISMIC CAPACITY VS DEMAND         1. Elevation where equipment receives seismic input         2. Elevation of seismic input below about 40' from grade         3. Equipment has fundamental frequency above about 8 Hz         4. Capacity based on:         Existing Documentation         Bounding Spectrum         BS         GERS
5. Demand based on: 1.5 x Bounding Spectrum Conserv. Des. In-Str. Resp. Spec. Pealistic M-Ctr. In-Str. Resp. Spec. RES
Does capacity exceed demand? Y N Ū
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) <ol> <li>Equipment is included in earthquake experience equipment class</li> <li>No computers or programmable controllers</li> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or No relays</li> <li>Adjacent racks which are close enough to impact or No relays</li> <li>No u N/A</li> <li>Attached lines have adequate flexibility</li> <li>Anchorage adequate (See checklist below for details)</li> <li>Have you looked for and found no other adverse concerns?</li> <li>N U N/A</li> <li>N U N/A</li> </ol>
<u>CAVEATS - GERS</u> (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 the generic seismic testing equipment class 2. Meets all Bounding Spectrum caveats Y N U N/A
<ol> <li>Component is a pressure, temperature, level or flow transmitter</li> <li>Y N U N/A</li> </ol>

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Faultar	ent Description EW/DC E 10 Happour Davids LEVEL TRANSPORT	- 0			
Equipm	ent Description _FW/RC-E-1C NARROW RANGE LEVEL TRANSMITTE	R	-		
CAVEAT	S - GERS (Cont'd)				
4.	Component is one of the specific makes and models				
1.2	tested, as listed in Appendix B	Y	N	U	N/A
5.	Necessary function of component not sensitive to				
	seismically induced system perturbations (e.g., sloshing)				
6.	No vacuum tubes	Y			N/A
7.	All external mounting bolts in place	Y	N	U	N/A
8.	Demand based on amplified portion of 3% damped		IN	0	N/A
	floor response spectrum if estimated natural				
	frequency of rack less than 33 Hz	Y	N	11	N/A
9.	Rack capable of structurally transferring GERS			~	17.0
	level seismic loads to anchorage	Y	Ν	U	N/A
Is the	intent of all the caveats met for GERS?				YNUN
ANCHOR					
ANCHOR					
1.	Appropriate equipment characteristics determined	0	1	1.	
2.	(mass, CG, natural freq., damping, center of rotation) Type of anchorage covered by GIP	×	N		N/A
3.	Sizes and locations of anchors determined	R	N N	0	N/A
4.	Adequacy of anchorage installation evaluated	0	N		N/A
	(weld quality and length, nuts and washers, expansion		H	1	
	anchor tightness, etc.)	T	R	AN	N/A
5.	Factors affecting anchorage capacity or margin of	C		RY.	11/ 6
	safety considered: embedment length, anchor spacing,				
	free-edge distance, concrete strength/condition, and				
	concrete cracking	Ø	N	U	N/A
6.	For bolted anchorages, gap under base less than	-			
-	1/4-inch	(Y)	N	U	N/A
7.	Factors affecting essential relays considered: gap	-			
8.	under base, capacity reduction for expansion anchors	T	N	U	N/A
0.	Base has adequate stiffness and effect of prying action on anchors considered	0			
9.	Strength of equipment base and load path	UV	N	U	N/A
	to CG adequate	D		12	11/0
	Embedded steel, grout pad or large concrete	O	N	0	N/A
	pad adequacy evaluated	V	N	ii .	NID
Are and	horage requirements met?	1	IN	U	N/A Wail N/A meast Y N U
					U N U
INTERAC	TION EFFECTS				
1.	Soft targets free from impact by nearby				
	equipment or structures	Ø	N	U	N/A
2.	If equipment contains sensitive relays, equipment				1000
	free from all impact by nearby equipment or structures	R	N	U	N/A N/A
3.	Attached lines have adequate flexibility	X	N	11	N/A

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Equip. ID No. <u>LT-FW-496</u> Equip. Class <u>18 - Instruments on Racks</u> Equipment Description <u>FW/RC-E-1C NARROW RANGE LEVEL TRANSMITTER</u> <u>INTERACTION EFFECTS (Cont'd)</u> 4. Overhead equipment or distribution systems are not likely to collapse 5. Have you looked for and found no other adverse concerns? N U N/A Is equipment free of interaction effects? N U N/A IS EQUIPMENT SEISMICALLY ADEQUATE? Y N U <u>COMMENTS</u> Stel pize samet meaning detail.

G" (" 1/2" Broeplate with 4 - 72 & Shell anchors. All tight

Evaluated by: Date: 5/15/93 -15-93

	52233	. C.O	a po 457
	tatus		
Eduppio No. LT-WT-104A1 Equip. Class 18 - Instrume			
LEquipment Description WT/WT-TK-10 LEVEL TRANSMITTER			
Location: Bldg. YARD Floor El. 735 Room, Re	w/Co1 _	YARD	
Manufacturer, Model, Etc. (optional but recommended)	SEMOUNT		
SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input 2. Elevation of seismic input below about 40' from grade 3. Equipment has fundamental frequency above about 8 Hz 4. Capacity based on: Existing Documentation Bounding Spectrum 1.5 x Bounding Spectrum GERS 5. Demand based on: Ground Response Spectrum 1.5 x Ground Response Spectrum Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Does capacity exceed demand? (Indicate at right (*) and in <u>COMMENTS</u> if a special exception to enveloping of seismic demand spectrum is invoked per Section 4.2 of the GIP.)		Down	5 ' N/A
<u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) tho are met by intent without meeting the specific wording of the explain the reason for this conclusion in the COMMENTS section 1. Equipment is included in earthquake experience	caveat 1	ats wi rule	hich and
<ol> <li>equipment is included in earthquake experience equipment class</li> <li>No computers or programmable controllers</li> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together</li> </ol>	000	N U U U U U	N/A N/A N/A
if they contain essential relays 5. Natural frequency relative to 8 Hz limit considered 6. Attached lines have adequate flexibility 7. Anchorage adequate (See checklist below for details) 8. Relays mounted on equipment evaluated 9. Have you looked for and found no other adverse concerns Is the intent of all the caveats met for Bounding Spectrum?	Y_	NO	N/A N/A N/A N/A Y NON/A
<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveats wh met by intent without meeting the specific wording of the cave and explain the reason for this conclusion in the COMMENTS sec	at rule	ow)	
<ol> <li>Equipment is included in the generic seismic testing equipment class</li> </ol>		N U	N/A
<ol> <li>Meets all Bounding Spectrum caveats</li> <li>Component is a pressure, temperature, level or flow</li> </ol>	Y	NU	N/A
transmitter	Y	NU	N/A

SSEL Line No. 4101A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

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Equip. ID No. LT-WT-104A1 Equip. Class 18 - Instruments on Racks Equipment Description WT/WT-TK-10 LEVEL TRANSMITTER CAVEATS - GERS (Cont'd) 4. Component is one of the specific makes and models tested, as listed in Appendix B Y N U N/A 5 Necessary function of component not sensitive to seismically induced system perturbations, e.g., sloshing (cover this as part of Section 6 evaluation) Y N U N/A No vacuum tubes Y N U N/A 6. N U N/A 7. All external mounting bolts in place 8. Demand based on realistic amplification of floor response through rack to transmitter-to-rack interface (document basis) NU N/A Rack capable of structurally transferring 9. seismic demand loads to anchorage N U N/A 10. All adjacent cabinets or sections of multi-bay assemblies bolted together N U N/A Y N U(N/A Is the intent of all the caveats met for GERS? ANCHORAGE 1. Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation) N (U N/A N Type of anchorage covered by GIP U N/A 2. 3. Sizes and locations of anchors determined within design N U N/A 4. Anchorage installation adequate, e.g., drawing televances weld quality and length, nuts and washers, expansion VNU N/A anchor tightness 5. Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition, and concrete cracking N(U) N/A 6. For bolted anchorages, gap under base less than 1/4-inch brouted N U N/A 7. Factors affecting essential relays considered: gap under base, capacity reduction for expansion anchors U(N/A) N Base has adequate stiffness and effect of prying 8. action on anchors considered U N/A 9. Strength of equipment base and load path to CG adequate (Y) N U N/A 10. Embedded steel, grout pad or large concrete N/A NU pad adequacy evaluated N (0 Are anchorage requirements met? INTERACTION EFFECTS 1. Soft targets free from impact by nearby equipment or structures U N/A 2. If equipment contains sensitive relays, equipment free from all impact by nearby equipment or structures N/A U 3. Attached lines have adequate flexibility U N/A

SSEL Line No. 4101A

SCREENING EVALUATION WORK SHEET (SEWS)

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N U N/A N U N/A

Sheet 3 of 3

X

Equip. ID No. LT-WT-104A1 Equip. Class 18 - Instruments on Racks Equipment Description WT/WT-TK-10 LEVEL TRANSMITTER

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are

not likely to collapse

5. Have you looked for and found no other adverse concerns? Is equipment free of interaction effects?

IS EQUIPMENT SEISMICALLY ADEQUATE?

COMMENTS

Level gauge and conduit support nearby are not credible interaction concerns,

Evaluated by: GTW

Date:

N/A

NU

NU

	52233- C-019 Pg AUD tatus Y N U
A A A SCREENING EVALUATION WORK SHEET (SEWS) S	heet 1 of 3
Equil ID No. LT-WT-104A2 Equip. Class 18 - Instrume	nts on Racks
Equipment Description WT/WT-TK-10 LEVEL TRANSMITTER	
Location: Bldg. YARD Floor El. 735 Room, R	ow/Col YARD
Manufacturer, Model, Etc. (optional but recommended)	OSEMOUNT
SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input 2. Elevation of seismic input below about 40' from grade 3. Equipment has fundamental frequency above about 8 Hz 4. Capacity based on: Existing Documentation Bounding Spectrum 1.5 x Bounding Spectrum GERS	735.5 NUN/A DOC BS ABS GERS
5. Demand based on: Ground Response Spectrum 1.5 x Ground Response Spectrum Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec Does capacity exceed demand? (Indicate at right (*) and in <u>COMMENTS</u> if a special exception to enveloping of seismic demand spectrum is invoked per Section 4.2 of the GIP.)	GRS AGS CRS CRS RRS QN U
<u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) the are met by intent without meeting the specific wording of the explain the reason for this conclusion in the COMMENTS section 1. Equipment is included in earthquake experience	caveat rule and
equipment class 2. No computers or programmable controllers 3. Steel frame and sheet metal structurally adequate 4. Adjacent racks which are close enough to impact or	
sections of multi-bay racks are bolted together if they contain essential relays 5. Natural frequency relative to 8 Hz limit considered 6. Attached lines have adequate flexibility 7. Anchorage adequate (See checklist below for details) 8. Relays mounted on equipment evaluated 9. Have you looked for and found no other adverse concerns 1s the intent of all the caveats met for Bounding Spectrum?	$\begin{array}{c} Y & N & U \\ 0 & N & U \\ Y & N & U \\ Y & N \\ Y & N \\ Y & N \\ 0 \\ Y & N \\ 0 \\ N \\ Y \\ N \\ 0 \\ N \\ 1 \\ N \\ N \\ A \\ Y \\ N \\ 0 \\ N \\ N \\ A \\ Y \\ N \\ 0 \\ N \\ N \\ A \\ Y \\ N \\ 0 \\ N \\ A \\ Y \\ N \\ N \\ N \\ A \\ Y \\ N \\ N \\ N \\ A \\ Y \\ N \\ N \\ A \\ X \\ X \\ Y \\ N \\ X \\ X \\ X \\ X \\ Y \\ N \\ X \\ X$
<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveats wh met by intent without meeting the specific wording of the cave and explain the reason for this conclusion in the COMMENTS sec 1. Equipment is included in the generic seismic testing	at rule tion below)
equipment class 2. Meets all Bounding Spectrum caveats	Y N U N/A Y N U N/A
<ol> <li>Component is a pressure, temperature, level or flow transmitter</li> </ol>	Y N U N/A

SSEL Line No. 4102A

# 52233-C-019 pg A 101

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equip. ID No. LT-WT-104A2 Equip. Class 18 - Instruments on Racks Equipment Description WT/WT-TK-10 LEVEL TRANSMITTER CAVEATS - GERS (Cont'd) Component is one of the specific makes and models 4. tested, as listed in Appendix B Y N U N/A Necessary function of component not sensitive to 5. seismically induced system perturbations, e.g., sloshing (cover this as part of Section 6 evaluation) YNU N/A 6. No vacuum tubes Y N U N/A 7. All external mounting bolts in place Y N U N/A 8. Demand based on realistic amolification of floor response through rack to transmitter-to-rack interface (document basis) NU N/A 9. Rack capable of structurally transferring seismic demand loads to anchorage N U N/A All adjacent cabinets or sections of multi-bay 10. assemblies bolted together N U N/A YN UNA Is the intent of all the caveats met for GERS? ANCHORAGE Appropriate equipment characteristics determined 1. (mass, CG, natural freq., damping, center of rotation) Y N (U) N/A Type of anchorage covered by GIP 2. N N/A U 3. Sizes and locations of anchors determined N U N/A 4. Anchorage installation adequate, e.g., weld quality and length, nuts and washers, expansion anchor tightness ON U N/A 5. Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition, and concrete cracking Y N (D) N/A 6. For bolted anchorages, gap under base less than 1/4-inch U N N/A 7. Factors affecting essential relays considered: gap under base, capacity reduction for expansion anchors U (N/A) N 8. Base has adequate stiffness and effect of prying action on anchors considered (Y) N U N/A Strength of equipment base and load path 9. to CG adequate (P) N U N/A 10. Embedded steel, grout pad or large concrete Y N O N/A Y N O pad adequacy evaluated Are anchorage requirements met? INTERACTION EFFECTS 1. Soft targets free from impact by nearby equipment or structures (DN U N/A 2. If equipment contains sensitive relays, equipment free from all impact by nearby equipment or structures U N/A 3. Attached lines have adequate flexibility U N/A

SSEL Line No. 4102A

SCREENING EVALUATION WORK SHEET (SEWS)

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U N/A

Y.NU

YNU

Sheet 3 of 3

Equip. ID No. LT-WT-104A2 Equip. Class 18 - Instruments on Racks Equipment Description WT/WT-TK-10 LEVEL TRANSMITTER

### INTERACTION EFFECTS (Cont'd)

Overhead equipment or distribution systems are 4.

not likely to collapse

N U N/A 5. Have you looked for and found no other adverse concerns? Is equipment free of interaction effects?

#### **IS EQUIPMENT SEISMICALLY ADEOUATE?**

COMMENTS

Permanent ladder for tank and conduit support nearby are not credible interaction concerns. Distance between components is sufficient. Component support is judged to be adequate.

Evaluated by: GTU Date: 12/14/94

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SCREENING EVALUATION WORK SHEET (SEWS) Shee	tlo	of :	3		
Equip. ID Non- PT-RC-403 Equip. Class 18 - Instruments	on R	aci	ks		
Equipment Description RCS/WIDE RANGE RCS PRESSURE TRANS					
Location: Bldg. RCBX Floor El. 701 Room, Row/	Col	A	UBI	CLE	
Manufacturer, Model, Etc. (optional) VTI 7.31-0053 ROSEMOUNT	-				
SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input 2. Elevation of seismic input below about 40' from grade 3. Equipment has fundamental frequency above about 8 Hz 4. Capacity based on: Existing Documentation Bounding Spectrum GERS 5. Demand based on: Ground Response Spectrum 1.5 x Bounding Spectrum Conserv. Des. In-Str. Resp. Spec.	Ŷ	NN CK RS	U	" N/A	
Realistic M-Ctr. In-Str. Resp. Spec. Does capacity exceed demand?	RR	S		Y	NŪ
<u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) those are met by intent without meeting the specific wording of the cav explain the reason for this conclusion in the COMMENTS section be 1. Equipment is included in earthquake experience equipment class	Pat I	rul N	e a	nd N/A	
<ol> <li>No computers or programmable controllers</li> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together</li> </ol>	e e	NN	0	N/A N/A	
if they contain essential relays 5. Natural frequency relative to 8 Hz limit considered 6. Attached lines have adequate flexibility 7. Anchorage adequate (See checklist below for details) 8. Relays mounted on equipment evaluated 9. Have you looked for and found no other adverse concerns? Is the intent of all the caveats met for Bounding Spectrum?	××⊖××⊖	NNNNN	celece	A A A A A A A A A A A A A A A A A A A	N (DN/A
AVEATS - GERS (Identify with an asterisk (*) those caveats which net by intent without meeting the specific wording of the caveat and explain the reason for this conclusion in the COMMENTS section 1. Equipment is included in the generic seismic testing	rule	ow	)		
2. Meets all Bounding Spectrum caveats	Y Y	NN	U U	N/A N/A	
<ol> <li>Component is a pressure, temperature, level or flow transmitter</li> </ol>	Y	N	U	N/A	

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3 Pg Aug

Equip. ID No. PT-RC-403 Equip. Class 18 - Instrument	s on A	lac	ks		
Equipment Description _RCS/WIDE RANGE RCS PRESSURE TRANS		_			
CAVEATS - GERS (Cont'd)					
<ol> <li>Component is one of the specific makes and models tested, as listed in Appendix B</li> <li>Necessary function of component not sensitive to</li> </ol>	Y	N	U	N/A	
seismically induced system perturbations (e.g.,					
sloshing)	Ŷ	N	U	N/A	
6. No vacuum tubes	Y	N	U	N/A	
<ol> <li>All external mounting bolts in place</li> <li>Demand based on amplified portion of 3% damped floor response spectrum if estimated natural</li> </ol>	Ŷ	N	U	N/A	
frequency of rack less than 33 Hz 9. Rack capable of structurally transferring GERS	Y	N	U	N/A	
9. Rack capable of structurally transferring GERS support level seismic loads to anchorage	Y	N	U	N/A	
Is the intent of all the caveats met for GERS?				Y	N U N/A
ANCHORAGE					
1. Appropriate equipment characteristics determined			1.2		
(mass, CG, natural freq., damping, center of rotation)	Y	N	0	N/A N/A N/A	
<ol><li>Type of anchorage covered by GIP</li></ol>	Ø	N	U	N/A	
3 Sizes and locations of anchors determined	$\odot$	N	U	N/A	
4. Adequacy of anchorage installation evaluated					
(weld quality and length, nuts and washers, expansion			-		
anchor tightness, etc.)	Y	N	0	· N/A	
<ol> <li>Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing,</li> </ol>					
free-edge distance, concrete strength/condition, and					
concrete cracking	0	N	U	N/A	
6. For bolted anchorages, gap under base less than	L.	1	~	14/14	
1/4-inch	$\odot$	N	U	N/A	
7. Factors affecting essential relays considered: gap		1		13/14	
under base, capacity reduction for expansion anchors	¥	N	U	N/A	
8. Base has adequate stiffness and effect of prying			151	- contraction of the second se	
action on anchors considered	Ø	N	U	N/A	
9. Strength of equipment base and load path					
to CG adequate	P	N	U	N/A	
10. Embedded steel, grout pad or large concrete				100	
pad adequacy evaluated	Y	N	U	NA	
Are anchorage requirements met?				Y	NU
INTERACTION EFFECTS					
1. Soft targets free from impact by nearby					
equipment or structures	Ø	N	U	N/A	*
2. If equipment contains sensitive relays, equipment	-				
free from all impact by nearby equipment or structures	Y	N	U	NA	
<ol> <li>Attached lines have adequate flexibility</li> </ol>	Ø	N	U	N/A	

U

N/A

VN U

YND

Equip. ID No. PT-RC-403 Equip. Class 18 - Instruments on Racks Equipment Description RCS/WIDE RANGE RCS PRESSURE TRANS

#### INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are

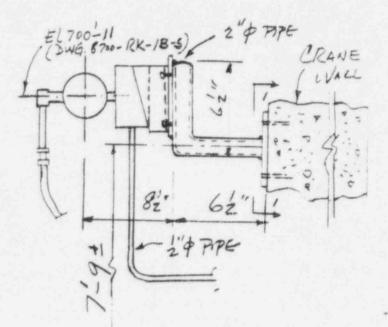
not likely to collapse

8 N N 5. Have you looked for and found no other adverse concerns? U N/A Is equipment free of interaction effects?

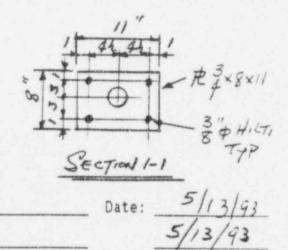
### IS EQUIPMENT SEISMICALLY ADEQUATE?

#### COMMENTS

\* - LIGHT FIXTURE ABOVE



EL. 692-11 (SEE MEL)



Evaluated by:

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52233-C-D19	P	. A	66	,
SSEL Line Ng. 4107D Sta	tus		YI	NU
MARY SCREENING EVALUATION WORK SHEET (SEWS) She	et l	of	3	
Bourp. ID No. FIS-FW-151A Equip. Class 18 - Instrument	s on	Rac	×s	-
Equipment Description AUX FW PUMP FW-P-3A SUCTION LINE FROM WT	-TK-1	0 F.	IS	
Location: Bldg. SFGB Floor El. 722 Room, Row,	/Co1	AF	R	MOC
Manufacturer, Model, Etc. (optional but recommended) 1204/BAR	I NOT	NSTR	NUM	ENT/7.23-20
SEISMIC CAPACITY VS DEMAND <ol> <li>Elevation where equipment receives seismic input</li> <li>Elevation of seismic input below about 40' from grade</li> <li>Equipment has fundamental frequency above about 8 Hz</li> <li>Capacity based on: Existing Documentation Bounding Spectrum         <ol> <li>Statistic M-Ctrunt</li> <li>Statistic M-Ctrunt</li> <li>Statistic M-Ctrunt</li> <li>Statistic M-Ctrunt</li> <li>Commentiation</li> <li>Statistic M-Ctrunt</li> <li></li></ol></li></ol>	D m d g g g a d	ERS SS SS		7" WA
<ul> <li><u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) those are met by intent without meeting the specific wording of the care explain the reason for this conclusion in the COMMENTS section be 1. Equipment is included in earthquake experience equipment class</li> <li>No computers or programmable controllers</li> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together</li> </ul>	veat elow)	rul		
if they contain essential relays 5. Natural frequency relative to 8 Hz limit considered 6. Attached lines have adequate flexibility 7. Anchorage adequate (See checklist below for details) 8. Relays mounted on equipment evaluated 9. Have you looked for and found no other adverse concerns? Is the intent of all the caveats met for Bounding Spectrum?	8-869-		CCCCCC	N/A N/A N/A N/A N/A N/A
<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveats whic met by intent without meeting the specific wording of the caveat and explain the reason for this conclusion in the COMMENTS section 1. Equipment is included in the generic seismic testing	rule		)	
equipment class	Y Y	N N	U U	N/A N/A
<ol> <li>Meets all Bounding Spectrum caveats</li> <li>Component is a pressure, temperature, level or flow transmitter</li> </ol>	Y	N	U	N/A

SSEL Line No. 4107D

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SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equipn	nent Description _AUX FW PUMP FW-P-3A SUCTION LINE FROM	WT-TK-10	F	IS		
CAVEAT	S - GERS (Cont'd)					
4.	Component is one of the specific makes and models					
	tested, as listed in Appendix B	Y	N	U	N/A	
5.	Necessary function of component not sensitive to				14/14	
	seismically induced system perturbations, e.g.,					
	sloshing (cover this as part of Section 6 evaluation)	Y	N	U	N/A	
6.	No vacuum tubes	Y	N	U	N/A N/A	
7.	All external mounting bolts in place	Y	N	U	N/A	
8.	Demand based on realistic amplification of floor					
	response through rack to transmitter-to-rack interface (document basis)					
9.	Rack capable of structurally transferring	ŕ	N	0	N/A	
	seismic demand loads to anchorage	V	N	U	N/A	
10.	All adjacent cabinets or sections of multi-bay					
	assemblies polted together	Y	N	U.	N/A	
Is the	intent of all the caveats met for GERS?	1997 - A.		Ű,	N/A Y N U	ND
					일을 가지 않는	Securit
ANCHOR						
1.	Appropriate equipment characteristics determined	. And				
2	(mass, CG, natural freq., damping, center of rotation)	0	N	U	N/A N/A	
2.	Type of anchorage covered by GIP	8	N	U	N/A	
2. 3. 4.	Sizes and locations of anchors determined Anchorage installation adequate, e.g.,	X	N	Ų	N/A	
**	weld quality and length, nuts and washers, expansion				*	
	anchor tightness	R	N		N/A	
5.	Factors affecting anchorage capacity or margin of	4	N	0	N/A	
	safety considered: embedment length, anchor spacing,					
	free-edge distance, concrete strength/condition, and					
	concrete cracking	Ø	N	U	N/A	
6.	For bolted anchorages, gap under base less than			3		
	1/4-inch	Q	N	U	N/A	
7.	Factors affecting essential relays considered: gap					
0	under base, capacity reduction for expansion anchors	Y	N	UC	NA	
8.	Base has adequate stiffness and effect of prying action on anchors considered	-		11		
9.		0	N	U	N/A	
	Strength of equipment base and load path to CG adequate	0		14		
10.	Embedded steel, grout pad or large concrete	$\Theta$	N	U	N/A	
	pad adequacy evaluated	Y	N	U	NTR	
Are and	chorage requirements met?	1.1.1	14	0	D N	15
						~
	TION EFFECTS					
1.	Soft targets free from impact by nearby					
	equipment or structures	0	N	U	N/A	
2.	If equipment contains sensitive relays, equipment				_	
3.	free from all impact by nearby equipment or structures Attached lines have adequate flexibility		N		N/A	
	ave avequate flexibility		N	U	N/A	

SSEL Line No 4107D

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

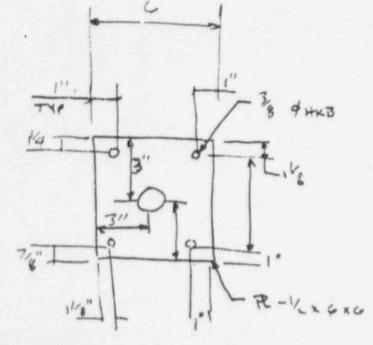
Equip. ID No. <u>FIS-FW-151A</u> Equip. Class <u>18 - Instruments on Racks</u> Equipment Description <u>AUX FW PUMP FW-P-3A SUCTION LINE FROM WT-TK-10 FIS</u> <u>INTERACTION EFFECTS (Cont'd)</u> 4. Overhead equipment or distribution systems are not likely to collapse 5. Have you looked for and found no other adverse concerns? ON U N/A Is equipment free of interaction effects?

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## IS EQUIPMENT SEISMICALLY ADEQUATE?

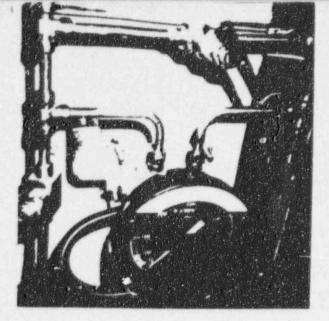
COMMENTS

NOTE: DRAFTING REQUEST SUBMITTED NOV. 6,1945 TO CORRECT DRAWING WIRDER ON \$700-6.24-3833 SH. 2 DETAIL OF THIS SUPPORT.

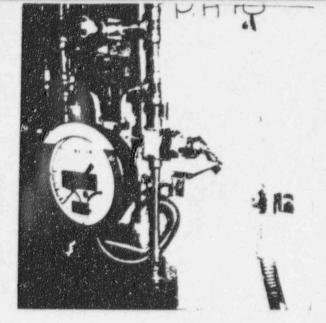


Evaluated by: Date: Nov. 6 1995 11/6/95

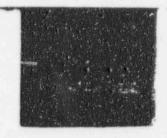
esign Anely	sis M	Alternate C	alculation	Unit <u>/</u>	PAGE 1 (	P 14-13	2135	
Design Analysis Alternate Calculation Unit CA "LATION TITLE (Indicative of the Objective): FIS-FW - 15175 - EVALUATION OF Seismie QUALIFICATION & RELOCITION OF TEAMINA - BOX FON FIS-FU-151A, 64152					QA CATEGORY			
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FIS-FW-151A



F15-FW-151B





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SSEL Line Nd. 4108D Stat	us	Y	NU
SCREENING EVALUATION WORK SHEET (SEWS) Shee	t 1 of	3	
Equip. D No. FIS-FW-151B Equip. Class 18 - Instruments	on Rac	ks	
Equipment Description AUX FW PUMP FW-P-38 SUCTION LINE FROM WT-	TK-10 F	IS	
Location: Bidg. SFGB Floor El. 722 Room, Row/	Col AF	WR	MOOM
Manufacturer, Model, Etc. (optional but recommended)I204/BART	ON INST	RUM	ENT/7.23-20
SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input 2. Elevation of seismic input below about 40' from grade 3. Equipment has fundamental frequency above about 8 Hz 4. Capacity based on: Existing Documentation Bounding Spectrum 1.5 x Bounding Spectrum GERS 5. Demand based on: Ground Response Spectrum 1.5 x Ground Response Spectrum Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Does capacity exceed demand? (Indicate at right (*) and in <u>COMMENTS</u> if a special exception to enveloping of seismic demand spectrum is invoked per Section 4.2 of the GIP.)	70 NN DOS BABERS GRASS ACRASS		MA DN U
<u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) those are met by intent without meeting the specific wording of the cav explain the reason for this conclusion in the COMMENTS section be 1. Equipment is included in earthquake experience	veat rul	swł le a	nich and
<ul> <li>equipment class</li> <li>No computers or programmable controllers</li> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together</li> </ul>	000 zzz	U U U U	N/A N/A N/A
if they contain essential relays 5. Natural frequency relative to 8 Hz limit considered 6. Attached lines have adequate flexibility 7. Anchorage adequate (See checklist below for details) 8. Relays mounted on equipment evaluated 9. Have you looked for and found no other adverse concerns? Is the intent of all the caveats met for Bounding Spectrum?	0-000- zzzzz	000000	N/A N/A N/A N/A N/A
<u>CAVEATS - GERS</u> (Iden'tify with an asterisk (*) those caveats which met by intent without meeting the specific wording of the caveat and explain the reason for this conclusion in the COMMENTS sectio 1. Equipment is included in the generic seismic testing	rule	)	
equipment class	Y N	U	N/A
3. Component is a pressure, temperature, level or flow	Y N	U	N/A
transmitter	YN	U	N/A

SSEL Line No. 4108D

# SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

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Equip	ment Description _AUX FW PUMP FW-P-3B SUCTION LINE FROM W	T-TK-10	F	IS		
	TS - GERS (Cont'd)					
4.			۰.,			
	tested, as listed in Appendix B	Y	N	U	N/A	
5.	Necessary function of component not sensitive to					
	seismically induced system perturbations, e.g., sloshing (cover this as part of Section 6 evaluation)	V				
6.	No vacuum tubes	, i	N	0	N/A	
7.	All external mounting bolts in place	Ŷ	N	000	N/A N/A	
8.	Demand based on realistic amplification of floor	1.1		0	n/A	
	response through rack to transmitter-to-rack					
	interface (document basis)	Y	N	U	N/A	
9.	Rack capable of structurally transferring			~	11/1	
	seismic demand loads to anchorage	Y	N	U	N/A	
10.		1912				
	assemblies bolted together	Y	N	U	N/A	
Is the	e intent of all the caveats met for GERS?				Y	NUM
ANCHOR						
1.	Appropriate equipment characteristics determined	- 7.5				
	(mass, CG, natural freq., damping, center of rotation)	999	N	U	N/A	
2.3.	Type of anchorage covered by GIP	0	N	UU	N/A	
4.	Sizes and locations of anchors determined	0	N	U	N/A	
4.	Anchorage installation adequate, e.g.,					
	weld quality and length, nuts and washers, expansion anchor tightness	0				
5.		Q	N	U	N/A	
5.	Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing,					
	free-edge distance, concrete strength/condition, and					
	concrete cracking	0			NI / A	
6.	For bolted anchorages, gap under base less than	0	N	U	N/A	
0.	1/4-inch	1	N	11	N/A	
7.	Factors affecting essential relays considered: gap	0	N	U	N/A	
. 119	under base, capacity reduction for expansion anchors	v	N	U	NIA	
8.	Base has adequate stiffness and effect of prying		14	0	00	
	action on anchors considered	0	N	11	N/A	
9.	Strength of equipment base and load path	- telest		×.	11/1	
	to CG adequate	Ø	N	U	N/A	
10.	Embedded steel, grout pad or large concrete	-		Ξ.		
	pad adequacy evaluated	Y	N	U	NA	
Are an	chorage requirements met?				C	N U
INTERA	CTION EFFECTS					
1.	Soft targets free from impact by nearby	1.1				
	equipment or structures	0	N	U	N/A	
2.	If equipment contains sensitive relays, equipment	-				
1.00	free from all impact by nearby equipment or structures	Y	N	U	ATD.	
3.	Attached lines have adequate flexibility	02		U	N/A	

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SSEL Line No. 4108D

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

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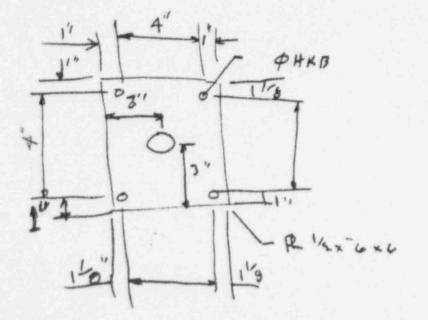
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Equip. ID No. FIS-FW-1518 Equip. Class <u>18 - Instruments on Racks</u> Equipment Description <u>AUX FW PUMP FW-P-38 SUCTION LINE FROM WT-TK-10 FIS</u> <u>INTERACTION EFFECTS (Cont'd)</u> 4. Overhead equipment or distribution systems are not likely to collapse 5. Have you looked for and found no other adverse concerns? N U N/A Is equipment free of interaction effects? N U N/A

IS EQUIPMENT SEISMICALLY ADEQUATE?

COMMENTS



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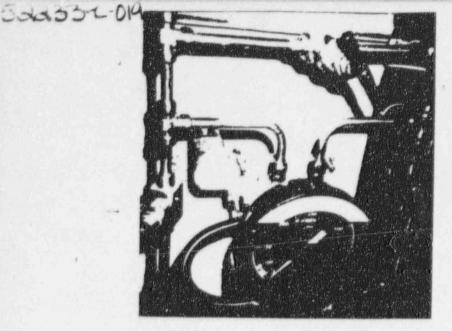
Evaluated by:

Date: Nov. 6,1995 11/6/95

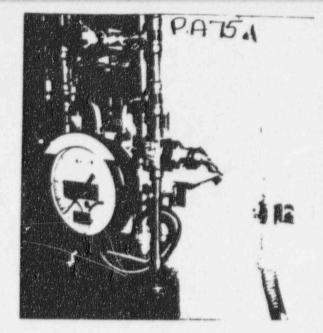
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and an Anel	veis M	Alternate C	alculation	Unit /	PAGE 1 0	F 14-73.	1.125
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FIS-FW-151A



FIS-FW-1513





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A DY SCREENING EVALUATION WORK SHEET (SEWS) S	heet l	of 3	3	
Equip ID No. PS-MS-101A Equip. Class 18 - Instrume	nts on	Rack	s	······································
Equipment Description ATMOSPHERE STEAM DUMP S.G. 1A				
Location: Bldg. SFGB Floor El. 768 Room, Ro	ow/Col	MSV	H	
Manufacturer, Model, Etc. (optional but recommended) <u>B70/BAN</u>	RKSDALE	CON	ITRO	DL DIV/B2T-M12S
SEISMIC CAPACITY VS DEMAND         1. Elevation where equipment receives seismic input         2. Elevation of seismic input below about 40' from grade         3. Equipment has fundamental frequency above about 8 Hz         4. Capacity based on: Existing Documentation Bounding Spectrum         1.5 x Bounding Spectrum         1.5 x Bounding Spectrum         1.5 x Ground Response Spectrum         Conserv. Des. In-Str. Resp. Spec.         Realistic M-Ctr. In-Str. Resp. Spec.         Realistic M-Ctr. In-Str. Resp. Spec.         COMMENTS if a special exception to enveloping of seismic         demand spectrum is invoked per Section 4.2 of the GIP.)	90000000000000000000000000000000000000	ON CARSOND	U	N/A
<u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) the are met by intent without meeting the specific wording of the explain the reason for this conclusion in the COMMENTS section 1. Equipment is included in earthquake experience equipment class	caveat below)	rul	e a	nd
<ol> <li>No computers or programmable controllers</li> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together</li> </ol>	8	NN	UUU	N/A N/A N/A
<pre>if they contain essential relays 5. Natural frequency relative to 8 Hz limit considered 6. Attached lines have adequate flexibility 7. Anchorage adequate (See checklist below for details) 8. Relays mounted on equipment evaluated contacted contacted 9. Have you looked for and found no other adverse concerns Is the intent of all the caveats met for Bounding Spectrum?</pre>	-00000 ?Hum	N N N	U	N/A
<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveats wh met by intent without meeting the specific wording of the cave and explain the reason for this conclusion in the COMMENTS sec 1. Equipment is included in the generic seismic testing	at rule		)	
equipment class 2. Meets all Bounding Spectrum caveats	Y Y	N N	UU	N/A N/A
<ol> <li>Component is a pressure, temperature, level or flow transmitter</li> </ol>	Y	N	U	N/A

522:3 -014

PHIL

SSEL Line No. 4205E

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equip. ID No. PS-MS-101A Equip. Class 18 - Instruments on Racks Equipment Description ATMOSPHERE STEAM DUMP S.G. 1A CAVEATS - GERS (Cont'd) Component is one of the specific makes and models 4. tested, as listed in Appendix B Y N U N/A 5. Necessary function of component not sensitive to seismically induced system perturbations, e.g., sloshing (cover this as part of Section 6 evaluation) N U N/A 6. No vacuum tubes NU N/A 7. All external mounting bolts in place YNU N/A 8. Demand based on realistic amplification of floor response through rack to transmitter-to-rack interface (document basis) N U N/A Rack capable of structurally transferring 9. seismic demand loads to anchorage Y N U N/A All adjacent cabinets or sections of multi-bay 10. assemblies bolted together Y N U N/A YNUNTAD Is the intent of all the caveats met.for GERS? ANCHORAGE Appropriate equipment characteristics determined 1. (mass, CG, natural freq., damping, center of rotation) N U N/A Type of anchorage covered by GIP 2. N U N/A WELDED 3. Sizes and locations of anchors determined N U (MA) RO 4. Anchorage installation adequate, e.g., 11/1/95 weld quality and length, nuts and washers, expansion anchor tightness (DN U N/A Factors affecting anchorage capacity or margin of 5. safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition, and concrete cracking Y N U (N/A) 6. For bolted anchorages, gap under base less than 1/4-inch N U N/A) 7. Factors affecting essential relays considered: gap under base, capacity reduction for expansion anchors Y N U ONDAD Base has adequate stiffness and effect of prying 8. action on anchors considered D N U N/A 9. Strength of equipment base and load path to CG adequate 0 N U N/A Embedded steel, grout pad or large concrete pad adequacy evaluated YN U NTA Are anchorage requirements met? NU INTERACTION EFFECTS 1. Soft targets free from impact by nearby equipment or structures U N N/A 2. If equipment contains sensitive relays, equipment free from all impact by nearby equipment or structures U N/A N 3. Attached lines have adequate flexibility N U N/A

Jaas - C-019 PHI

SSEL Line No. 4205E

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. PS-MS-101A Equip. Class 18 - Instruments on Racks

Equipment Description ATMOSPHERE STEAM DUMP S.G. 1A

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are

not likely to collapse

ON U N/A Have you looked for and found no other adverse concerns? 5. Is equipment free of interaction effects? ON U

# IS EQUIPMENT SEISMICALLY ADEQUATE?

COMMENTS

Evaluated by: 1

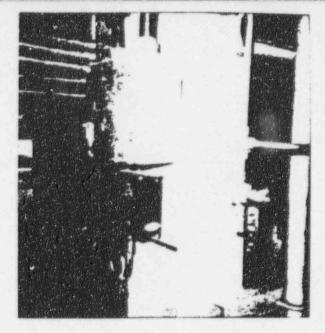
Date: Nov.7#, 995

ON U

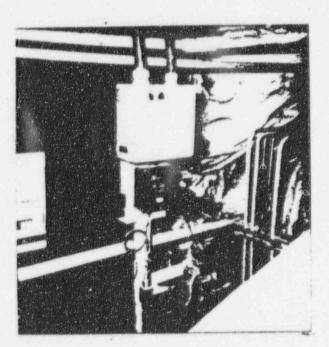


30-1-0H

P.H H



PS-M5-101A

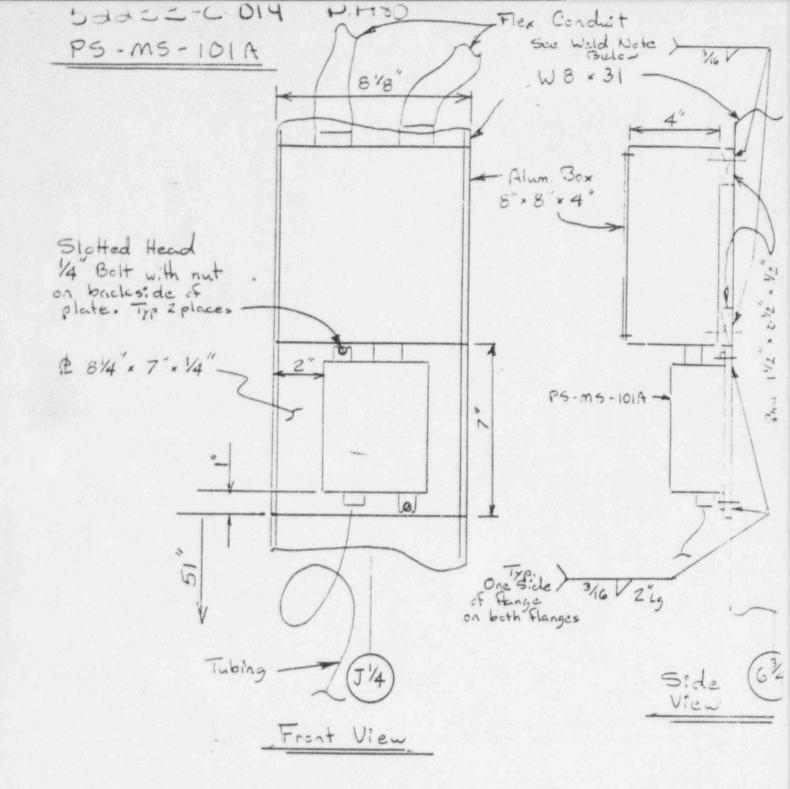


P5-M5-101B

7--



Stand for PS-MS-101B



Building Steel Dug 8700 - 125 - 193

50023-6-019

Housed Bourdon Tube Models Water Tight Housing (NEMA 6) and Terminal Strip Tamper proof External Adjustment



BIT SINGLE SETTING

B2T DUAL CONTROL

# OPERATING CHARACTERISTICS . ORDERING DATA

PRESSURE SWITCHES - All values given in P.S.I. (Gauge)

	Adjustat	ble Rai	nge	Approx	No. of Concession, Name	Card of Logic Property and the design of the	Statements reading and second	-
Decr	easing	Inc	reasing	Actuation	here's a	BIT	B2T	
Min.	Max.	Min	Max.		Wetted Material*			
50 50 160 240 325 600 600		77 190 199 325 440 1150	1200 1200 3200 3200 4800 6500 12000 18000	and the second statement of the se	Bronze 316 Bronze 316 316 316 316 316	B1T-H12 B1T-A12SS B1T-H32 B1T-H32SS B1T-H32SS B1T-A48SS B1T-A65SS	B2T-H12 B2T-A12SS B2T-H32 B2T-H32SS B2T-A48SS B2T-A65SS B2T-A120SS	IN STOCK
	Decr Min. 50 50 160 160 240 325 600	Decreasing           Min.         Max.           50         1180           50         1173           160         3170           160         3161           240         4715           325         6385           600         11450	Decreasing         Inc.           Min.         Max.         Min           50         1180         70           50         1173         77           160         3170         190           160         3161         199           240         4715         325           325         6385         440           600         11450         1150	Min.         Max.         Min.         Max.           50         1180         70         1200           50         1173         77         1200           160         3170         190         3200           160         3161         199         3200           240         4715         325         4800           325         6385         440         6500           600         11450         1150         12000	Decreasing         Increasing         Actuation Value           Min.         Max.         Min.         Max.         (Differential)           50         1180         70         1200         10 to 20           50         1173         77         1200         11 to 27           160         3170         190         3200         15 to 30           160         3161         199         3200         16 to 39           240         4715         325         4800         40 to 85           325         6385         440         6500         54 to 115           600         11450         1150         12000         275 to 550	Decreasing         Increasing         Actuation Value         Wetted           Min.         Max.         Min.         Max.         (Differential)         Wetted           50         1180         70         1200         10 to 20         Bronze           50         1173         77         1200         11 to 27         316           160         3170         190         3200         15 to 30         Bronze           160         3161         199         3200         16 to 39         316           240         4715         325         4800         40 to 85         316           325         6385         440         6500         54 to 115         316           600         11450         1150         12000         275 to 550         316	Decreasing         Increasing         Actuation Value         Wetted Material         BIT Catalog Material           Min.         Max.         Min.         Max.         (Differential)         Wetted Material         Catalog Material           50         1180         70         1200         10 to 20         Bronze         BIT-H12           50         1173         77         1200         11 to 27         316         BIT-H12           160         3170         190         3200         15 to 30         Bronze         B1T-H32           160         3161         199         3200         16 to 39         316         B1T-H32           240         4715         325         4800         40 to 85         316         B1T-A48SS           325         6385         440         6500         54 to 115         316         B1T-A65SS           600         11450         1150         12000         275 to 550         316         B1T-A120SS	Decreasing         Increasing         Actuation Value         Wetted Waterial*         BIT Catalog Number         B2T Catalog Number           Min.         Max.         Min.         Max.         (Differential)         Material*         Catalog Number         Catalog Number           50         1180         70         1200         10 to 20         Bronze         BIT-H12         B2T-H12           50         1173         77         1200         11 to 27         316         BIT-A12SS         B2T-H12           160         3170         190         3200         15 to 30         Bronze         B1T-H32         B2T-H32           160         3161         199         3200         16 to 39         316         B1T-H32SS         B2T-H32           240         4715         325         4800         40 to 85         316         B1T-A48SS         B2T-A48SS           325         6385         440         6500         54 to 115         316         B1T-A65SS         B2T-A48SS           600         11450         1150         12000         275 to 550         316         B1T-A120SS         B2T-A43SS

BARKSDALE CONTROLS DIVISION-3211 FURIAND AVE PO BOX 58843+LOS ANDERS CA 90058+12131 589-6181

\*"Bronze" represents Phosphor Bronze Tube with SAE 88 Brass Socket

"316" represents 316 Stainless Steel Tube & Socket

""SUPERPRESSURE" (formerly AMINCO) female opening for '4" OD tube connection To change A65SS and A120SS switches to '4" npt, add -P4 suffix to model number. Price

### DETAIL DATA

ELECTRICAL CHARACTERISTICS: All models incorporate Underwriters' Laboratories, Inc. isted single pole double throw snap-action switching elements. Electrical rating (con-tinuous inductive) 10 amps 125 or 250 volts AC, 3 amps 480 volts AC. Automatically reset by snap-action of switch. For more details and other switch classes, see pages 37-38.

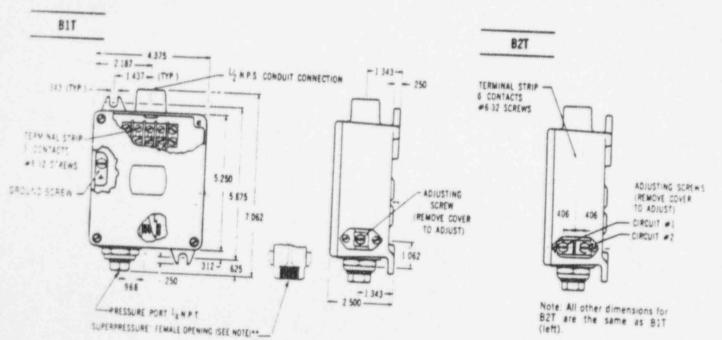
ELECTRICAL CONNECTION: To screw terminals on covered terminal strip through 1/2" nps

PRESSURE CORRECTION: 6" N.P.T. internal thread, except as noted", models with Proof Pressures above 8,000 P.S.I. have "SUPERPRESSURE" female opening for '4" 0.D. tube

# ADJUSTMENT INSTRUCTIONS

Turn adjustment screw clockwise to lower actuation point (switch setting).

WIRE CODING - PRESSURE Circuit #1: Common - Purc . Normally Closed - 8 .-Normally Open -Der Circuit #2: Common - Brown Normally Closed --- Orange Normally Open - Yellow



Barksdale Bulletin No. 870420 - A

Conventional electromechanical pressure switches use vanous technologies depending upon the application. These include diaphragm, bourdon tube, sealed piston and a combination of

a diaphragm and piston. The following chart compares the advantages and disadvantages of each technology so you may choose pressure switch most ideal for your application.

2, M Q OMMADUMLE LUNTROLS DIVISION+3211 Fruitiand Ave PO Box S6843+Los Angeles. CA 90058+(213) 589-6181

# Comparison Table

0

EDC

1			Switching Technolog	la contractor and the second	the second s
Characteristic	Solid-State	Diaphragm	Bourston Tube		
Life (Typical)	10.000.000 cycles	1.000.000 cycles	No	Pisten	Dis-Seal Piston
Operating Range	1.5 to 10,000 psi	and the second se	1.000.000 cycles	2.500.000 cycles	1.000.000 cycles
Accuracy	± 0.5% adjustable range	Vacuum to 150 psi	50 to 18 000 psi	15 to 20.000 psi	Vacuum to 1.000 psi
Resistance to	and the second data and the se	±0.5% adjustable range	± 0 5% adjustable range	± 2 0% adjustable range	±2.0% adjustable rang
Vibration	Excellent	Good	Good	Good	and the second s
Switch Differential Range	2 to 100% adjustable range	2 to 7% adjustable range	2 to 7% adjustable range		Good
Operating Ambient			aniosimole ralige	2 to 7% adjustable range	2 to 7% adjustable rang
Temperature Range	0°F 10 160°F	-65°F 10 + 165°F	- 65°F to + 165°F -	-20°F to +165°F	2005
Proof Pressure	15.000 psi	300 ps:			-20°F to +165°F
perating indicators	A CONTRACTOR OF A CONTRACTOR O	The second s	24 000 psi	20.000 psi	2.000 psi
a moncetors	2 LED's indicate over/ under set point status	N/A	N/A	N/A	N/A

# Solid-State Pressure Switch Component Description

# Mounting

External Mounting. Mounts in any position.

# Sensor

Transducer type: Semiconductor strain gauges bonded to a 17-4PH stainless steel diaphragm. Electrical output of the sensor is proportional to the pressure applied.

# Switching

Solid-state triacs. Leakage current 1.7 Ma max. Voltage drop 2V max Switching voltage from 30 to 130 VAC.

### Status Indicators

Two LED's switch simultaneously with control circuits. Red LED illuminates when pressure is greater than increasing set point. Green LED illuminates when pressure is lower than decreasing set point.

3

# Enclosure

Meets requirements of NEMA 4, 12 and 13. Four captive screws each hold chained tamper-resistant adjustment cover and terminal block cover in place. Covers include captivated extrusion-proof gaskets.

# Set Point Adjustment

Large dial calibrated in bar and psi provides setting accuracy to 3% adjustable range.

# ALI UN INN VALUE (UTHEFERINAL, UCAU DANU, MYSIEFESIS) BY LLASS UF ELECTINICAL SWITCH USED

Actualion value tolesances on diaphragin and bourdon tube switches are due \_\_\_\_\_ anufacturing toler ances on hmit switches and sensing elements. The actuation value of each pressure switch resoants fired within the tolerances showe.

BOHRDON TUBE PRESSURE SWITCHES -- Values given in P.S.I. (Gauge)

ž.č.	Prestare				Approximate Actuation Value (Di	ate Actu	tion Val		entral Dead B	and Hysi	eserve) by	Clasvel E	Dead Band Hystereus) by Classed Electoral Smith	(h										
tar Strupperd Housed Models Models	and the	*			3			3	*		=	-	*		-	:	11		F	3		W		
-	1800	17 10 36					102 9	86 to 308	8 140 to	265 10	10 10 20+	\$ to 28	2810 118	8 17 46	36 135	35 to 285	108 te	734 267	Mar 10 to	W a	17 64 28	24 14	-	
-	18081	11 50 27.	1. 2010	65	Si la 10	100 53 10	in 104	58 to 702	2 101 te	185	2 40 14	6 to 70	Z0 to 8	0 11 te				2002						9 10 90 9 10 90
-	1800	26 to 59	42 10	547 .	111 te 23	NZZ		133 15 682	212 40	405 15	15 ta 30+	13 10 44	\$2 50 182	2 26 10	26 201	10 200			1		1	+	1	1
	68080	26 10 29	42 30	187	111 10 21	224 396 10	312	11316 482	212 10	405 15	15 te 30+	13 le 44	\$2 to 182	-		10 420	111 10	170 870 Max	Man 1540	(a) 3G	1 1	31	6 101	21 to 1/6
-	4800	19 10 79	51 29	121	132 10 26	266		154 16 54/	1 261 10	474 26	16 40 39-	16 to 52	51 40 212	2 19 60	EN. 101	10 X08		4	÷		a	L	L	1
_	4806	1910 79	9 51 10	111	137 40 25	260 131 10	598 0	154 10 541	761 te	474 36	16 to 39+	16 40 52	51 10 21	2 1940		2	1.74 10	413 574 Max	Max 16.10	10 39		-	222 2	28 to 142
	17060		91 65 -9	226.	161 10 34	341		204 to 787	295 te	591 2	22 to 40	1810 65	182 01 65	11 40 10	85 200				÷		1.0	+	1	
	1206	40 16 85-	5- 59 to	328	163 to 34	341 136 to	499 8	204 to 781	1 79530	12 165	22 to 40	18 te 65	182 01 65			2	231 te	566 7521	Max 27 to	10 40		58 10	794	3d to 151
-	95/6	54 to 115 -	5= 76 to	100	21516 45	454 17310	0 618	212 to 1064	1 383 to	181 79	79 the 52	23 to 86	15 to 374	SA to	115 396	to 930		1010	-		1.00	-	1	41 10 207
-	18000	275 10 550+	3+ 366 to 1	520	061 to 2289	58		1375 10 5532	18.14 10	181 5685	144 to 246	121 10 427 3	366 to 1897	27546	550 1998	ta #750			÷.			L	1	
	1 80,000	275 to 550*	0* 366 to 1520	-	1061 to 2289	-	786 to 3085 1375	51375 to 5532	1634 10	181 5681	164 10 246	111 10 427	366 to 189	11 275 to 550	1		1454 40 21	1 1/2 1/2 1 1/2 1 1/2 1 1/2 1/2 1/2 1/2	Nan 144	10. 78L	775 In 550	204 In	1076 10	08 to 900
-	24000	275 to 550+		1 9251	366 to 1529 1061 to 2289		C 3085	786 to 3085 1375 to 5532	1834 10	141 5585	4 to 745	111 10 421	1981 at 901	and	50	64/130	2	-	144	10 / 46	775 to 550	395 to	-	065 of 85

\*\*\* Available on B1S, B2S, & B11 Models only Plann numbers represent Phasphor Bronce tube. 35 represents Stantess Steel ""Not available on dual or U.L. listed switches

HI-P (DIA-SEAL PISTON) PRESSURE SWITCHES

	Approx Actuation Value	Ac Lough	HON VARAT (LINE	Treast Lands to the one the star is a start a start and the start and the start of Tenets I	An JEUSALDAR LAS must	LOUDING . 1 101 100 100	11 11 11 11 11 11 11 11 11 11 11 11 11		
lement				B/GH			8	44	MM
10	1 41.8	.0	1 0 10 4 0	1 10 1 01	1 10 151	* 50 2 8 +	1 1	1	
RUSS	1 10 2	20.	1010 4.0	1 10 10	1 10 15s	4 10 24+	1 15	-	1
82	8 40 7	*0	3 10 10 11 0	75 the 25	75 to 35=		10 50	1210 91	1410 7
8555	8 40 2	* 8	3015110	7548 25	25 to 35 a	8 to 84 -	10 50	-	
346	28 40 22	*0	9 6 10 4 5 8	10 10 50			2.0 101	5 10 28 6	4 4 10 32 1
34055	201022	-072	5019450	10 10 60	10 10 85+	2010 265 -	20 101		
1009	5.0 to 30.0		15.016 /00	78 te 1/8+		\$ 8 1a 35 c	36 23	18.0350	5 0 to 10
60055	6010 30.0		15910/066	20 10110+	2.0 to 19.0 x +	69 to 150			1
1600.	25 14 18	8	60 to 275	20 10 10		25 10 125	56 R	1	1
- HAURDSS	25 in 100		60 to 215	20 40 70	20 10 80	21812		1	-

ECON-O-TROL (DIA-SEAL PISTON) PRESSURE SWITCHES

0 . 0 0

.... Not available on Stripped. Dual or UL Issed switches

Ebenest			*					3
S & 2 & 3	1062 106 151	210 23 1910105 2010270 6010270	1 te 8 • 5 te 80 • 1 0 te 208 • 4 0 te 280 •	1 to 10 5 te 90 10 te 230 40 te 350	2 to 2 5 1 9 to 1 2 0 2 0 to 30 0 2 0 to 30 0	210 12 1510 196 2619 21 6 2619 21 6	SEE CHARTS PG 37	1 te 8 5 te 8 0 1 0 te 20 0 1 0 te 20 0

Represents polysuitone filling

20

CC

14

K. HINS

"Plain numbers represent Anodized Aluminum Fitting. 55 represents Stainless Steel Fitting

"+ Fixed at any pressure, varies as shown from lowest to highest setting

X Standard' for Explosion Proof (check your Barksdela Controls representative for prices and delivery).

·Standard' for Regular Housed and Stripped (check your Barksdale Controls representative for prices and delivery) All others are 'Special' (check with factory for prices and delivery)

Class AA. HH swetches are hermetically sealed

Class GH switches are SPDT with gold contacts. Class J, K & X switches are SPDT with fine silver contacts and an Elastomer Bool around pin actuators to prevent moisture and foreign matter from affecting contacts. - Class R & S switches are SPDT with fine silver contacts and adjustable differentials.

silver contacts. Class W switch is SPDT with fine silver contacts and internal permanent magnet for DC service. All other switch classes are SPDT with fine silver contacts and fixed differentials. Class A, H & M switches meet humidity requirements of MiL 5-6743.



52233-C DI9 P.A	641		
SSEL Line No. 4206E Stat	us	Y	NU
A A SCREENING EVALUATION WORK SHEET (SEWS) Shee	t 1 of	3	
Egup ID No. PS-MS-101B Equip. Class 18 - Instruments	on Ra	cks	
Equipment Description _ATMOSPHERE STEAM DUMP S.G. 18			NAME OF STREET AND ADDRESS OF STREET, S
Location: Bldg. SFGB Floor El. 768 Room, Row/	Co1 <u>M</u>	SVH	anne ar ann an
Manufacturer, Model, Etc. (optional but recommended)B70/BARKS	DALE C	ONTR	OL DIV/B2T-M12SS
SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input 2. Elevation of seismic input below about 40' from grade 72% 3. Equipment has fundamental frequency above about 8 Hz 4. Capacity based on: Existing Documentation Bounding Spectrum 1.5 x Bounding Spectrum GERS	Y OCC BS ABS GER		GRIE PLIF. N/A
5. Demand based on: Ground Response Spectrum 1.5 x Ground Response Spectrum Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Does capacity exceed demand? (Indicate at right (*) and in <u>COMMENTS</u> if a special exception to enveloping of seismic demand spectrum is invoked per Section 4.2 of the GIP.)	GRS AGS CRS RRS	,	ØNU
<u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) those are met by intent without meeting the specific wording of the ca explain the reason for this conclusion in the COMMENTS section be 1. Equipment is included in earthquake experience	veat ru		
equipment class	0!		N/A
<ol> <li>No computers or programmable controllers</li> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or sections of multi-bay racks are boited together</li> </ol>	000		N/A N/A
	YN	U	NA
<ol> <li>Natural frequency relative to 8 Hz limit considered</li> <li>Attached lines have adequate flexibility</li> </ol>	8		N/A N/A
7. Anchorage adequate (See checklist below for details)	Ø	U	N/A
8. Relays mounted on equipment evaluated CONTACTORS	Ø	U	N/A
9. Have you looked for and found no other adverse concerns? Is the intent of all the caveats met for Bounding Spectrum?	NT Q N	U	N/A ON U N/A
5. Natural frequency relative to 8 Hz limit considered 6. Attached lines have adequate flexibility 7. Anchorage adequate (See checklist below for details) 8. Relays mounted on equipment evaluated Contractors 9. Have you looked for and found no other adverse concerns? Is the intent of all the caveats met for Bounding Spectrum? CAVEATS - GERS (Identify with an asterisk (*) those caveats which met by intent without meeting the specific wording of the caveat and explain the reason for this conclusion in the COMMENTS section 1. Equipment is included in the generic seismic testing	n are rule on belo	w)	
equipment class	YN	U	N/A
2. Meets all Bounding Spectrum caveats	YN		N/A
<ol> <li>Component is a pressure, temperature, level or flow transmitter</li> </ol>	Y N	U	N/A

52233-C-019 P.A85

SSEL Line No. 4206E

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equip	. ID No. PS-MS-101B Equip. Class 18 - Instrumen	ts on F	lack	(5	
Equip	ment Description _ATMOSPHERE STEAM DUMP S.G. 1B				
CAVEA	TS - GERS (Cont'd)				
4.					
	tested, as listed in Appendix B	Y	N	U	N/A
5.	Necessary function of component not sensitive to				
	seismically induced system perturbations, e.g.,				
	sloshing (cover this as part of Section 6 evaluation)	Y	N	U	N/A
0.	No vacuum tubes	Y	N	U	N/A N/A N/A
6. 7. 8.	All external mounting bolts in place	Ŷ	N	U	N/A
0.	Demand based on realistic amplification of floor response through rack to transmitter-to-rack				
	interface (document basis)	Y	N	11	N/A
9.	Rack capable of structurally transferring		14	0	N/A
	seismic demand loads to anchorage	Y	N	u	N/A
10.					
	assemblies bolted together	Y	N	U	N/A
Is the	e intent of all the caveats met for GERS?				YNUND
ANCHOR					
1.	Appropriate equipment characteristics determined	_			
~	(mass, CG, natural freq., damping, center of rotation)	a	N	U	N/A
2.3.	Type of anchorage covered by GIP	00	N	U	N/A WELDED
4.	Sizes and locations of anchors determined	0	N	U	N/A was pro
	Anchorage installation adequate, e.g., weld quality and length, nuts and washers, expansion				
	anchor tightness	D	N	U	N/A
5.	Factors affecting anchorage capacity or margin of	E	IN .	0	N/ M
	safety considered: embedment length, anchor spacing,				
	free-edge distance, concrete strength/condition, and				
	concrete cracking	Y	N	U	(N/D)
6.	For bolted anchorages, gap under base less than				- dealer
	1/4-inch	Y	N	U	(N/A)
7.	Factors affecting essential relays considered: gap				
0	under base, capacity reduction for expansion anchors	Y	N	U	(AZA)
8.	Base has adequate stiffness and effect of prying	0			
9.	action on anchors considered	3	N	U	De no
2.	Strength of equipment base and load path to CG adequate	0			N /A
10.	Embedded steel, grout pad or large concrete	Ø	n	U	N/A
	pad adequacy evaluated	V	N	U	NTA-
Are an	chorage requirements met?			Ŭ	ON U
INTERA	CTION EFFECTS				
1.	Soft targets free from impact by nearby				
6.5.5	equipment or structures	0	N	U	N/A
2.	If equipment contains sensitive relays, equipment				
	free from all impact by nearby equipment or structures	0	N	U	N/A
3.	Attached lines have adequate flexibility	0	N	U	N/A

52233-6-019 P.A 86

SSEL Line No. 4206E

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. PS-MS-101B Equip. Class 18 - Instruments on Racks

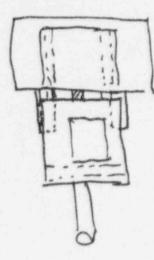
Equipment Description ATMOSPHERE STEAM DUMP S.G. 1B

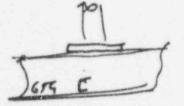
INTERACTION EFFECTS (Cont'd)

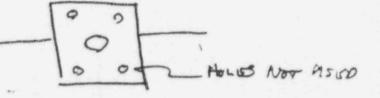
Overhead equipment or distribution systems are 4. DN U N/A not likely to collapse Have you looked for and found no other adverse concerns? OR N U N/A 5. ODN U Is equipment free of interaction effects? HEAT -OK ONU

# IS EQUIPMENT SEISMICALLY ADEQUATE?

COMMENTS

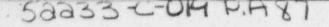




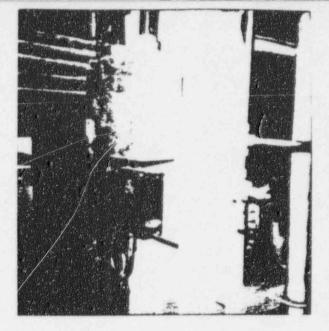


Date: Nov. 7 4, 1995 Evaluated by: Ta 11/7/95

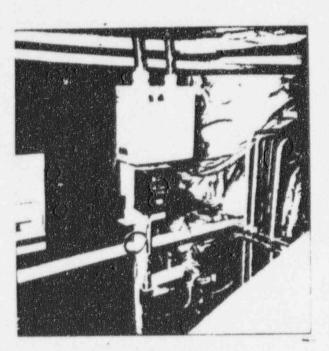
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P5-M5-101A

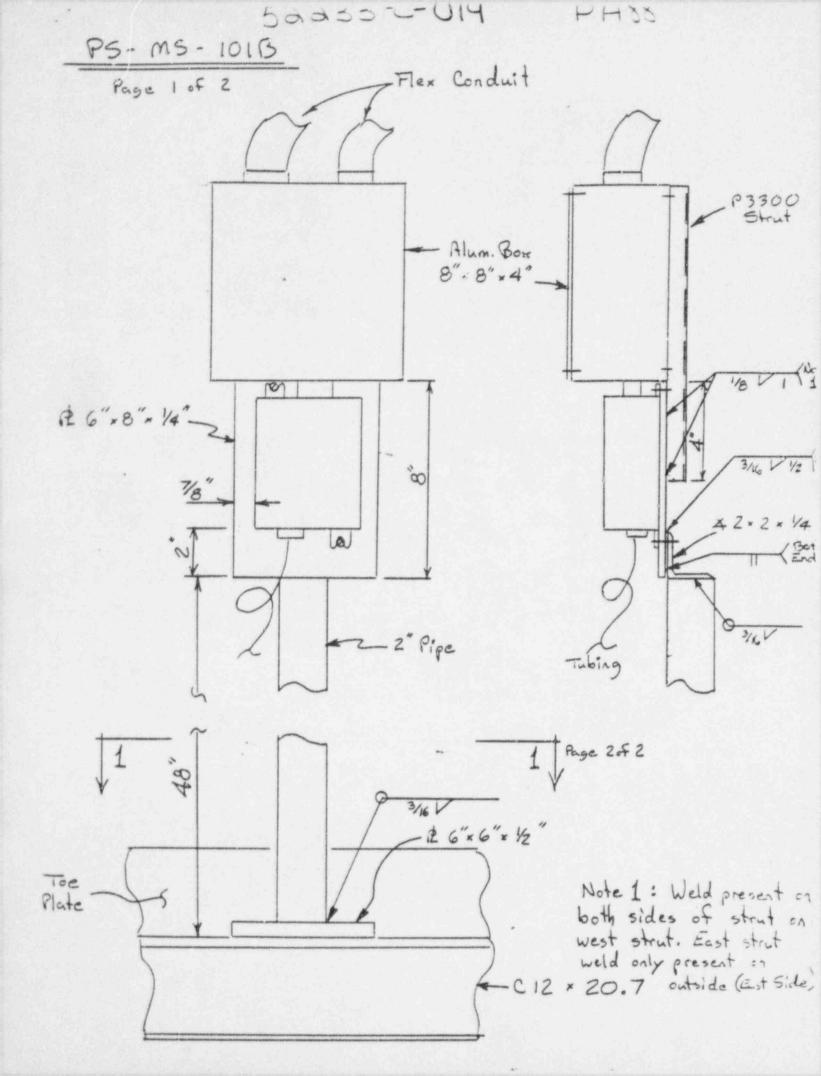


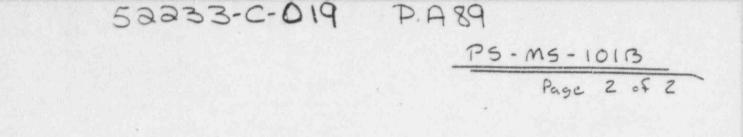
P5-M5-101B

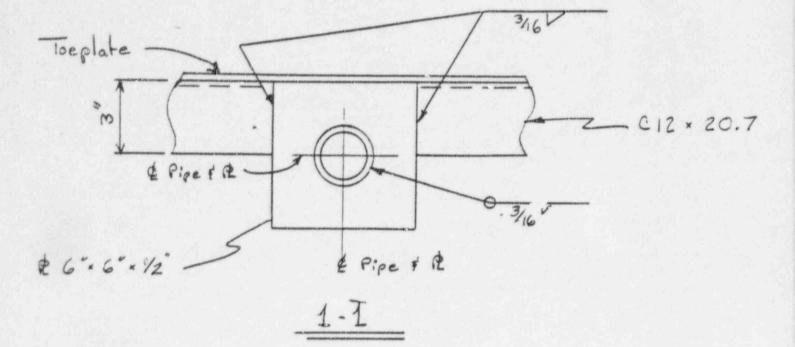
Y ....



Stand for PS-MS-101B







5335-0-019

Housed Bourdon Tube Models Water Tight Housing (NEMA 4) and Terminal Strip Tamper proof External Adjustment



BIT SINGLE SETTING

B2T DUAL CONTROL

# BARKSDALE CONTROLS DIVISION+3211 Fruitiand Ave P.D. Box 56843+Los Angeles. CA 90056+(213) 589-6181

# OPERATING CHARACTERISTICS . ORDERING DATA

PRESSURE SWITCHES -- All values given in P.S.I. (Gauge)

2. 6

Proof		Adjustat	ie Rar	120	Approx.		Commence and some statement of		-
(Test)	Decr	easing	Inci	essing	Actuation	i de la composición d	BIT	B2T	
Pressure	Min.	Max.	Min	· Staglards Sectional Control of	(Differential)	Wetted Material*	Number	Catalog	
1800	50	1180	70	1200	10 to 20	Bronze	BIT UID		ш
1800	50	1173	77	1200	11 to 27	316	B1T-H12	82T-H12	N
4800	160	3170	190		15 to 30	Bronze	81T-A1255	82T-A1255	S
4800	160	3161	199	3200	16 to 39	316	B1T-H32	BZT-H32	S T
7200	240	4715	325	4800	40 to 85	316	BIT-H32SS	B2T-H32SS	
**9750	325	6385	440	6500	54 to 115	316	BIT-A4855	B2T A4855	2
**18000	600	11450		12000	275 to 550	316	817 A6555	B2T-A65SS	0
**24000	600	17450		18000	275 to 550	316	B1T-A120SS B1T-A180SS	827-A12055 827-A18055	K
Approxie	nate s	hipping	weight	lbs.			2.5	2.5	

"Bronze" represents Phosphor Bronze Tube with SAE 88 Brass Socket "316" represents 316 Stainless Steel Tube & Socket

SUPERPRESSURE" (formerly AMINCO) female opening for 14" OD tube connection To change -A65SS and -A120SS switches to 14" npt, add -P4 suffix to model number. Price

### DETAIL DATA

ELECTRICAL CHARACTERISTICS: All models incorporate Underwriters' Laboratories, Inc. listed single pole double throw snap-action switching elements. Electrical rating (con-tinuous inductive) 10 amps 125 or 250 volts AC, 3 amps 480 volts AC. Automatically reset by snap-action of switch. For more details and other switch classes, see pages 37-38.

ELECTRICAL CONNECTION: To screw terminals on covered terminal strip through 1/2" nps

PRESSURE CONNECTION: 44" N.P.T. internal thread, except as noted\*\*, models with Proof Pressures above 8,000 P.S.I. have "SUPERPRESSURE" female opening for 14" 0.D. tube connection

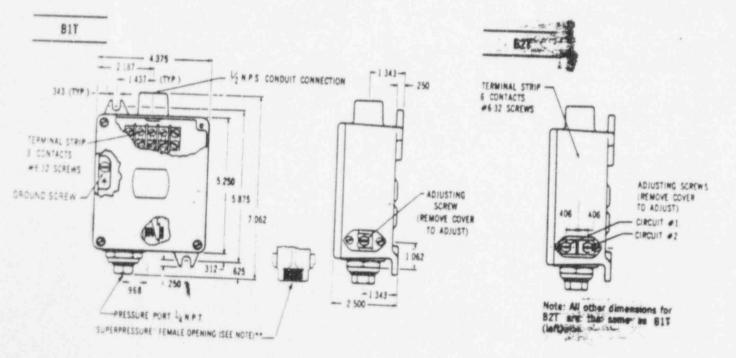
# ADJUSTMENT INSTRUCTIONS

£

Turn adjustment screw clockwise to lower actuation point (switch setting).

# WIRE CODING - PRESSURE

Circuit #1: Common - Purple Normally Closed -- Blue Normally Open ----Red Circuit #2: Common - Brown Normally Closed - Orange Normally Open - Yellow



Barksdale Bulletin No. 870420-A

Conventional electromechanical pressure switches use various technologies depending upon the application. These include diaphragm, bourdon tube, sealed piston and a combination of

100000

Comparison Table

a diaphragm and piston. The following chart compares the advantages and disadvantages of each technology so you may choose the pressure switch most ideal for your application.

1

Ave P.O. Box 58843=Los Angeles. CA 90058+(213) 589-6181

			Switching Tachnelog	·	
Characteristic	Sellis-State	Disphragm	Bourden Yebe		A CONTRACT OF A
Life (Typical)	10.000.000 cycles	1.000.000 cycles		Piston	Dis-Seel Plates
Operating Range	1.5 to 10.000 psi	The second s	1.000.000 cycles	2.500.000 cycles	1.000.000 cycles
Accuracy	±0.5% adjustable range	Vacuum to 150 psi	50 to 18.000 ps/	15 to 20.000 psi	Vacuum to 1.000 psi
Resistance to	Section 2	±0.5% adjustable range	± 0.5% adjustable range	± 2.0% adjustable range	The control of the second s
Vibration	Excellent	Good	Good	Good	±2.0% adjustable range
Switch Differential	2 to 100% adjustable range	2 10 70			Good
Range	any any	2 10 / 90 adjustable range	2 to 7% adjustable range	2 to 7% adjustable range	2 to 7% adjustable range
Poenstall, Silverson	6 0°F to 160°F	-65°F to + 165°F	1600	Non-statement of the second	
No. of Concession, Name of			1 -00"F B13 189946	-20°5 10 + 165°5	- 20°F to + 165°F
root Pressure	15.000 psi	300 psi	24.000 psi	20.000	
perating indicators	2 LED's molicate over/	N/A	N/A	20.000 psi	2.000 psi
	under set point status		10.00	N/A	NA

# Solid-State Pressure Switch Component Description

# Mounting

External Mounting. Mounts in any position.

### Sensor

Transducer type: Semiconductor strain gauges bonded to a 17.4PH stainless steel diaphragm. Electrical output of the sensor is proportional to the pressure applied.

# Switching

Solid-state triacs. Leakage current 1.7 Ma max. Voltage drop 2V max Switching voltage from 30 to 130 VAC.

# Status Indicators

Two LED's switch simultaneously with control circuits. Red LED illuminates when pressure is greater than increasing set point. Green LED illuminates when pressure is lower than decreasing set point.

3

# Enclosure

Meets requirements of NEMA 4, 12 and 13. Four captive screws each hold chained tamper-resistant adjustment cover and terminal block cover in place. Covers include captivated extrusion-proof gaskets.

# Set Point Adjustment

Large dial calibrated in bar and psi provides setting accuracy to 3% adjustable range.



V

SSEL Line No. 4207E Statu	IS	V	N	11			
A				0			
SCREENING EVALUATION WORK SHEET (SEWS) Sheet							
Eq. To No. PS-MS-101C Equip. Class 18 - Instruments	on R	ack	s				
quipment Description ATMOSPHERE STEAM DUMP S.G. 10					_		-
ocation: Bldg. SFGB Floor El. 768 Room, Row/C	01	SVI	Н				
Manufacturer, Model, Etc. (optional but recommended)B70/BARKSD	ALE	CON	TROL	L DIV	/B21	T-M	1
SEISMIC CAPACITY VS DEMAND							
1. Elevation where equipment receives seismic input	= 7	71-	6				
<ol> <li>Elevation of seismic input below about 40' from grade</li> <li>Equipment has fundamental frequency above about 8 Hz</li> </ol>	P	en a	Ŭ	N/A			
<ol><li>Capacity based on: Existing Documentation</li></ol>	DO	С					
Bounding Spectrum 1.5 x Bounding Spectrum	BS						
GERS 1.5 x Bounding Spectrum	GE						
5. Demand based on: Ground Response Spectrum	GR						
1.5 x Ground Response Spectrum	AG	S					
Conserv. Des. In-Str. Resp. Spec.	CCR						
Realistic M-Ctr. In-Str. Resp. Spec. oes capacity exceed demand? (Indicate at right (*) and in	RR	S		A	DN U		
nes capacità exceed demandi illudicare ar Light () and in							
<u>COMMENTS</u> if a special exception to enveloping of seismic demand spectrum is invoked per Section 4.2 of the GIP.)				9			
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SSEL Line No. 4207E

# SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

SOADS-L'UN F.MIS

	ID No. <u>PS-MS-101C</u> Equip. Class <u>18 - Instrument</u>	s on R	lack	(5	
Equip	nent Description _ATMOSPHERE STEAM DUMP S.G. 1C				
CAVEAT	S - GERS (Cont'd)				
4.	Component is one of the specific makes and models				
	tested, as listed in Appendix B	Y	N	U	N/A
5.	Necessary function of component not sensitive to				
	seismically induced system perturbations, e.g.,				
	sloshing (cover this as part of Section 6 evaluation)	Y	N	U	N/A
6.	No vacuum tubes	Y	N	U	N/A N/A N/A
7. 8.	All external mounting bolts in place	Y	N	U	N/A
8.	Demand based on realistic amplification of floor				
	response through rack to transmitter-to-rack				
1.1	interface (document basis)	Y	N	U	N/A
9.	Rack capable of structurally transferring				
	seismic demand loads to anchorage	Y			N/A
10.	All adjacent cabinets or sections of multi-bay				11/4
	assemblies bolted together	Ŷ	N	0	N/A
is the	intent of all the caveats met for GERS?				N/A YNUNA
ANCHOR					
1.	Appropriate equipment characteristics determined				a de la companya de l
	(mass, CG, natural freq., damping, center of rotation)	Q	N	U	N/A
2.	Type of anchorage covered by GIP	989	N	U	N/A N/A welogo N/A
3.	Sizes and locations of anchors determined	8	Ν	U	N/A
4.	Anchorage installation adequate, e.g.,				
	weld quality and length, nuts and washers, expansion	~			
	anchor tightness	0	N	U	N/A
5.	Factors affecting anchorage capacity or margin of				
	safety considered: embedment length, anchor spacing,				
	free-edge distance, concrete strength/condition, and	V		14	())
6	concrete cracking	Y	N	U	(N/A)
6.	For bolted anchorages, gap under base less than	V	8.1		ATTA
7	1/4-inch	1	N	U	CKB
7.	Factors affecting essential relays considered: gap	V	N	U	1070
0	under base, capacity reduction for expansion anchors	1	IN	0	CV B
8.	Base has adequate stiffness and effect of prying action on anchors considered	0	N	U	N/A
9.		A.	a	U	M/ A
3.	Strength of equipment base and load path to CG adequate	Ø	N	U	N/A
10.	Embedded steel, grout pad or large concrete	4	14	0	19/ 0
10.	pad adequacy evaluated	Y	N	U	NTA
Are an	chorage requirements met?			, in the second	ON U
INTERA	CTION EFFECTS				
1.	Soft targets free from impact by nearby				
**	equipment or structures	A	N	U	N/A
2.	If equipment contains sensitive relays, equipment	G	a	0	110
	free from all impact by nearby equipment or structures	m	N	11	N/A
	in a right and and a solution of a service o	6	1.4		

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52233-C-019 P.A94

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SSEL Line No. 4207E

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. PS-MS-101C Equip. Class 18 - Instruments on Racks

Equipment Description ATMOSPHERE STEAM DUMP S.G. 1C

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are

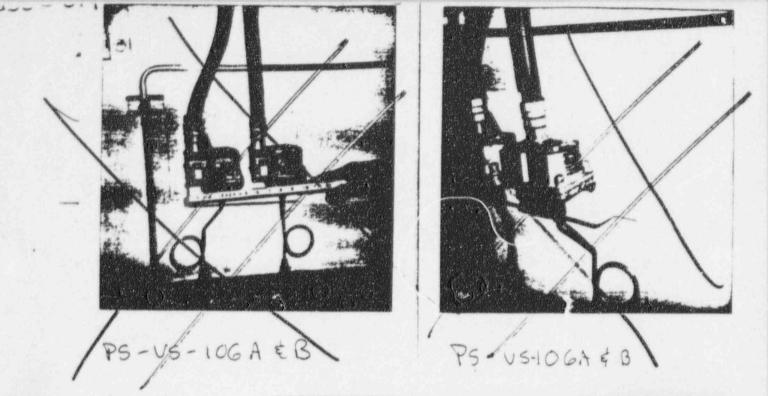
Have you looked for and found no other adverse concerns? ON U N/A 5. Is equipment free of interaction effects?

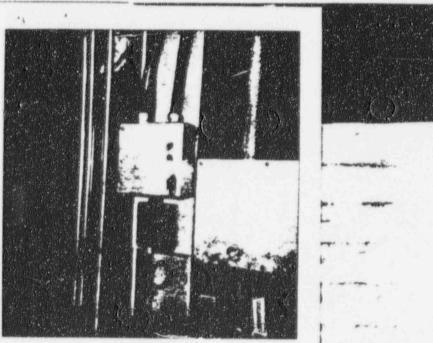
IS EQUIPMENT SEISMICALLY ADEQUATE?

COMMENTS

Evaluated by: Taul

Date: Nov 7 1995 7 195

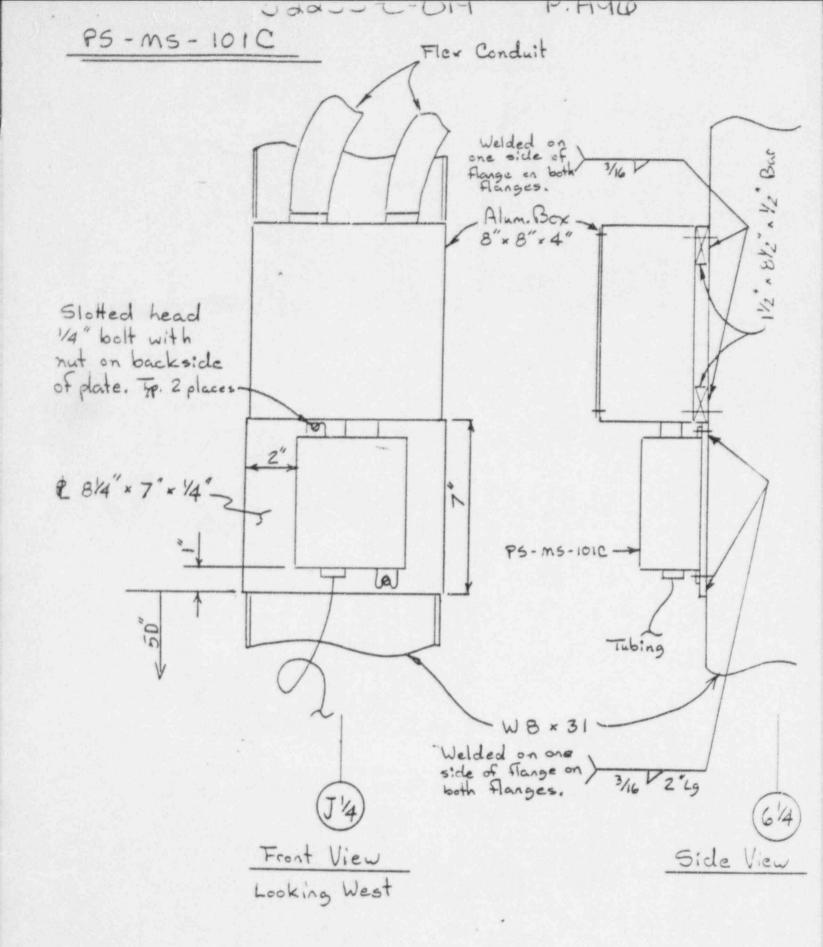






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PS-MS-101C



Building Steel Dug 8700-RS-193

BARKSDALE CONTROLS DIVISION+3211 Fruitiand Ave PO Box 58843+Los Angeles CA 90058+(213) 589-5181 101-1-

Housed Bourdon Tube Models Water-Tight Housing (NEMA 4) and Terminal Strip Tamper-proof External Adjustment



BIT SINGLE SETTING

B2T DUAL CONTROL

# OPERATING CHARACTERISTICS . ORDERING DATA

# PRESSURE SWITCHES - All values given in P.S.I. (Gauge)

Proof		Adjustal	ble Rar	ige	Approx.	State of Street of Streeto	No. of Concession, Name	States of the local division of the local di	-
(Test)		easing	Long of Content of M	reasing	Actuation	later a second	B17	82T	1.15
Pressure	Min.	Max.	Min	where the second s	Value (. Gerential)	Wetted Material*	Catalog	Catalog Number	
1800 1800 4800 7200 **9750 **18000 **24000	50 50 160 240 325 600 600	1173 3170 3161 4715 6385 11450	77 190 199 325 440 1150	1200 1200 3200 3200 4800 6500 12000 18000	Contractory of the local division of the	Bronze 316 Bronze 316 316 316 316 316	B1T-H12 B1T-A12SS B1T-H32 B1T-H32SS B1T-H32SS B1T-A48SS B1T-A65SS B1T-A120SS B1T-A180SS	827 H12 B2T A12SS B2T H32 B2T H32SS B2T A48SS B2T A48SS B2T A65SS B2T A120SS B2T A180SS	-N STOCK
Approxin	nate s	hipping	weight	ibs.			2.5	25	

\*"Bronze" represents Phosphor Bronze Tube with SAE 88 Brass Socket

"316" represents 316 Stainless Steel Tube & Socket

\*\*"SUPERPRESSURE" (formerly AMINCO) female opening for 14" OD tube connection. To change -A65SS and -A120SS switches to 14" npt, add -P4 suffix to model number. Price

### DETAIL DATA

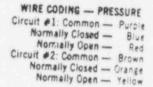
ELECTRICAL CHARACTERISTICS: All models incorporate Underwriters' Laboratories, Inc. listed single pole double throw snap-action switching elements. Electrical rating (con-tinuous inductive) 10 amps 125 or 250 volts AC, 3 amps 480 volts AC. Automatically reset by snap-action of switch. For more details and other switch classes, see pages 37-38.

ELECTRICAL CONNECTION: To screw terminals on covered terminal strip through 1/2" nps

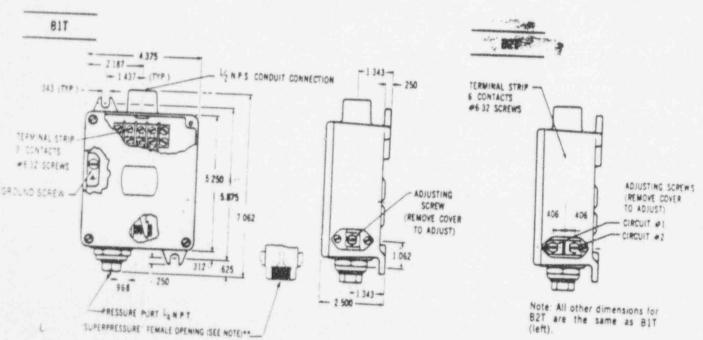
PRESSURE CONNECTION: 14" N.P.T. internal thread, except as noted\*", models with Proof Pressures above 8,000 P.S.I. have "SUPERPRESSURE" female opening for 14" O.D. tube

# ADJUSTMENT INSTRUCTIONS

Turn adjustment screw clockwise to lower actuation point (switch setting).



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Backsdale Bulletin No. 870420-A

110 JUD-Conventional electromechanical pressure switches use vario

technologies depending upon the application. These inc , de

3

diaphragm, bourdon tube, sealed piston and a combination of

a diaphragm and piston. The following chart compares the advantages and disadvantages of each technology so you may choose the pressure switch most ideal for your application.

land wire P 0 Berl 58843+Los Angeles. CA 90058+(213) 589-6181

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# Comparison Table

	All houses a sub-sub-sub-sub-sub-sub-sub-sub-sub-sub-	- 14 · 16 · 1	Switching Technolog	and an and a second	and the state of the	
Characterissie	Solid-State	Diaphragm	Binistian Tutop	-		
Lite (Typical)	10.000.000 cycles	1 000 000 cycles	and in the second s	Pision	Dis-Seel Piston	
Operating Range	1 5 to 10.000 psi	and some one of the second	1.000.000 cycles	2.500.000 cycles	1.000.000 cycles	
Accuracy	± 0.5% adjustable range	Vacuum to 150 psi	50 to 18,000 psi	15 to 20.000 psi	Vacuum to 1.000 psi	
Resistance to	The second	±0.5% adjustable range	± 0.5% adjustable range	± 2 0% adjustable range	±2 0% adjustable range	
Vibration	Excellent	Good	Good	Good	The second statement of the se	
Switch Differential Range	2 to 100% adjustable range	2 to 7% adjustable range	2 to 7% adjustable range		Good	
Doerating Amiliana	and the same and the			2 to 7% adjustable range	2 to 7% adjustable range	
emperature Range	0 -F 10 160 F	-65°F 10 + 165°F		1 220°F to + 165°F	- 20°F to + 165°F	
Proof Pressure	15.000 psi	300 psi	and the second data and the se		20710 +100-7	
perating indicators	2 LED's indicate over/	the second and descent sources the second	24.000 psi	20.000 psi	2.000 psi	
	under set point status	₩/A	N/A	N/A	N/A	

# Solid-State Pressure Switch Component Description

# Mounting

External Mounting, Mounts in any position.

### Sensor

Transducer type: Semiconductor strain gauges bonded to a 17-4PH stainless steel diaphragm. Electrical output of the sensor is proportional to the pressure applied.

### Witching

Solid-state triacs. Leakage current 1.7 Ma max. Voltage drop 2V max Switching voltage from 30 to 130 VAC.

# Status Indicators

Two LED's switch simultaneously with control circuits. Red LED illuminates when pressure is greater than increasing set point. Green LED illuminates when pressure is lower than decreasing

# Enclosure

Meets requirements of NEMA 4, 12 and 13. Four captive screws each hold chained tamper-resistant adjustment cover and terminal block cover in place. Covers include captivated extrusion-proof gaskets.

# Set Point Adjustment

Large dial calibrated in bar and psi provides setting accuracy to 3% adjustable range.

500550-017 1.			
SSEL Line No. 5222C	Status	Y	NU
CINA SCREENING EVALUATION WORK SHEET (SEWS)	Sheet 1	of 3	
Equip. ID No. PS-VS-106A Equip. Class 18 - Instrum	ents on l	Racks	
Equipment Description SLCRS EXH FAN VS-F-4A TRIP UPON VAC C	OND IN CI	MMT P	URGE
Location: Bldg. AXLB Floor El. 768 Room,	Row/Col		
Manufacturer, Model, Etc. (optional but recommended)B070/	BARKSDAL	E CON	TROL DIV/DIT-M3
SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input 2. Elevation of seismic input below about 40' from grade 3. Equipment has fundamental frequency above about 8 Hz 4. Capacity based on: Existing Documentation Bounding Spectrum 1.5 x Bounding Spectrum GERS 5. Demand based on: Ground Response Spectrum 1.5 x Ground Response Spectrum Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Does capacity exceed demand? (Indicate at right (*) and in <u>COMMENIS</u> if a special exception to enveloping of seismic demand spectrum is invoked per Section 4.2 of the GIP.)	Y HOB BUG G A LIR		U N/A
<u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) the are met by intent without meeting the specific wording of the explain the reason for this conclusion in the COMMENTS section 1. Equipment is included in earthquake experience	e caveat	rule	which and
<ol> <li>Equipment is included in earinquake experience equipment class</li> <li>No computers or programmable controllers</li> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together</li> </ol>	999		J N/A J N/A J N/A
if they contain essential relays <ol> <li>Natural frequency relative to 8 Hz limit considered</li> <li>Attached lines have adequate flexibility</li> <li>Anchorage adequate (See checklist below for details)</li> <li>Relays mounted on equipment evaluated Control</li> <li>Have you looked for and found no other adverse concern</li> <li>Is the intent of all the caveats met for Bounding Spectrum?</li> </ol>	90000×		J N/A J N/A J N/A J N/A J N/A J N/A J) N/A J) N/A J) N/A J) N/A J) N/A J)
<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveats we met by intent without meeting the specific wording of the cav and explain the reason for this conclusion in the COMMENTS se 1. Equipment is included in the generic seismic testing	leat rule		
equipment class 2. Meets all Bounding Spectrum caveats	Y Y	NUN	J N/A J N/A
<ol> <li>Component is a pressure, temperature, level or flow transmitter</li> </ol>	Y	NL	I N/A

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SSEL Line No. 5222C

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equipm	ent Description SLCRS EXH FAN VS-F-4A TRIP UPON VAC COND	IN C	NMT	PUR	GE
CAVEAT	S - GERS (Cont'd)				
4.					
	tested, as listed in Appendix B	Y	N	U	N/A
5.	Necessary function of component not sensitive to				
	seismically induced system perturbations, e.g.,				
	sloshing (cover this as part of Section 6 evaluation)	Y	N	U	N/A
6.	No vacuum tubes	Y	N	U	N/A N/A
7.	All external mounting bolts in place	Y	N	U	N/A
8.	Demand based on realistic amplification of floor				
	response through rack to transmitter-to-rack	V			11/4
0	interface (document basis)	Ŷ	N	U	N/A
9.	Rack capable of structurally transferring	V	N	11	NI/A
10.	seismic demand loads to anchorage All adjacent cabinets or sections of multi-bay	1			N/A
10.	assemblies bolted together	~	N		N/A
e the	intent of all the caveats met-for GERS?	- 13	14	0	N/A YNU WA
a the	Theene of all the caveats met. (of diks:				Invita
NCHOR	AGE				
1.	Appropriate equipment characteristics determined			PVD	VGIA5
	(mass, CG, natural freq., damping, center of rotation)	a	N	100 1	
2.	Type of anchorage covered by GIP		N	8	N/A
2. 3. 4.	Sizes and locations of anchors determined	a	>N	U	N/A N/A N/A
4.	Anchorage installation adequate, e.g.,				
	weld quality and length, nuts and washers, expansion				
	anchor tightness TUG TIST, FINGUR TIGHT, PAINT OVE	r a	N	U	N/A
5.	Factors affecting anchorage capacity or margin of				
	safety considered: embedment length, anchor spacing,				
	free-edge distance, concrete strength/condition, and	-			
	concrete cracking	a	) N	U	N/A
6.	For bolted anchorages, gap under base less than				
	1/4-inch	a	N	U	N/A
7.	Factors affecting essential relays considered: gap				
	under base, capacity reduction for expansion anchors .	a	N	U	N/A CONTACT
8.	Base has adequate stiffness and effect of prying			$ \omega $	
	action on anchors considered	C	N	U	N/A
9.	Strength of equipment base and load path	1.1		1.1	
10	to CG adequate	0	N	U	N/A
10.	Embedded steel, grout pad or large concrete	U.			01770
	pad adequacy evaluated	Ŷ	N	U	SALA2
re an	chorage requirements met?				QNU
NTERA	CTION EFFECTS				
1.	Soft targets free from impact by nearby				
· · ·	equipment or structures	m	N	11	N/A 1)
2.	If equipment contains sensitive relays, equipment	9	- 14	0	
	a sea priette settentila settate telaja, cualpinette				
	free from all impact by nearby equipment or structures	T	N	11	N/A CONTRET

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SSEL Line No. 5222C

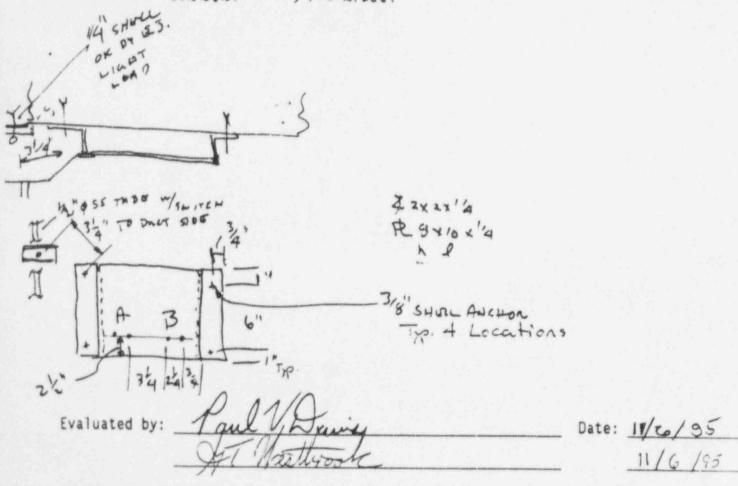
SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

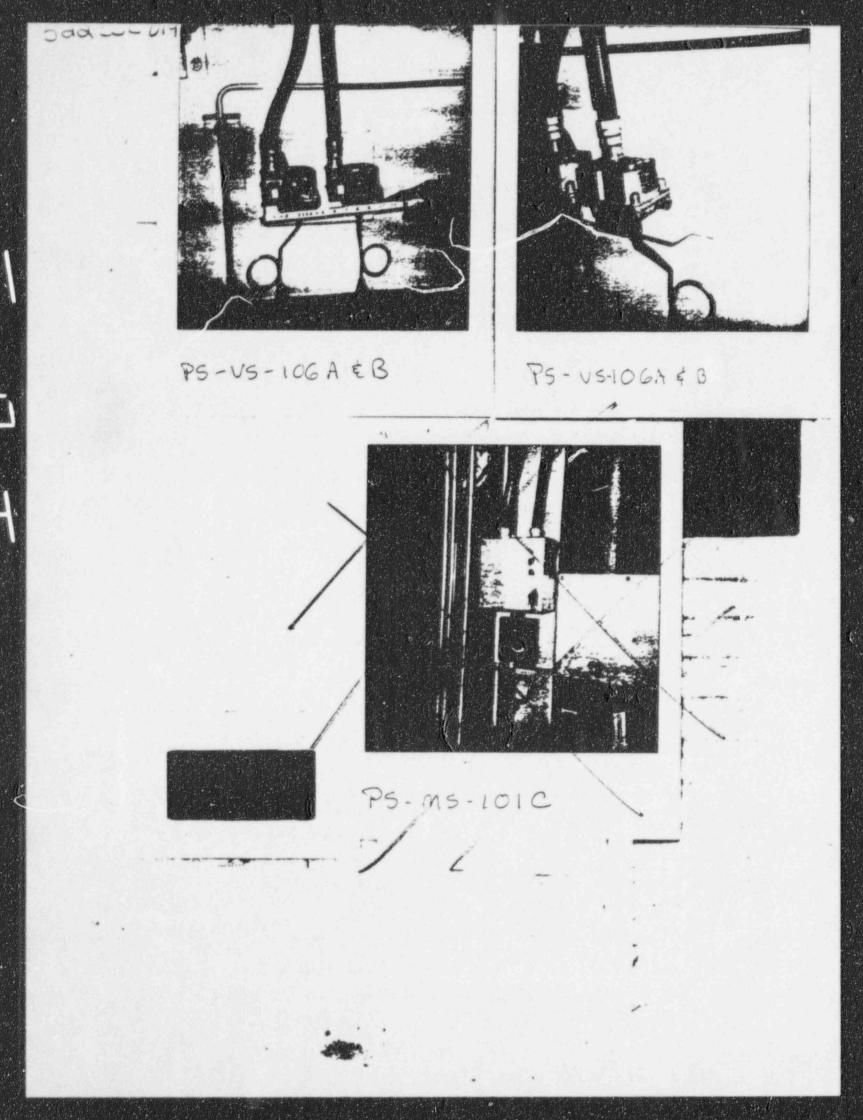
12255-C-DI4 H.H.IUI

Equip. ID No. PS-VS-106A Equip. Class 18 - Instruments on Racks Equipment Description SLCRS EXH FAN VS-F-4A TRIP UPON VAC COND IN CNMT PURGE INTERACTION EFFECTS (Cont'd) Overhead equipment or distribution systems are 4. not likely to collapse 00 NNN U N/A U N/A 5. Have you looked for and found no other adverse concerns? Is equipment free of interaction effects? ONU IS EQUIPMENT SEISMICALLY ADEQUATE? ON U

COMMENTS

- 1) OVERHEAD PIPING, TUBING & DUCT WORK SUPPORTED NON-SETISMIC. HOWEVER, IT APPEARS ADEQUATE TO RESIST FALLING DURING A SETISMIC EVENT. OVERHEAD CIGHT FIXTHEE WILL CASE NO DAMAGE IF IT FAILS.
- 1) LINES & CONDANT & INSTRUMENTS ALL SUPPORTOD OF CONTRETE WALL-WILL MOVE IN UNISON. ALSO, FLOREIBLE.





BARKSDALE CONTROLS DIVISION+3211 Fruitiand Ave PO Box 58843+Los Angeles CA 90058+12131 589-5181

# PRESSURE SWITCHES -- All values given in P S I (Gauge)

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16

# OPERATING CHARACTERISTICS . ORDERING DATA

Housed Diaphragm Models Water Tight Housing (NEMA 4) Covered Terminal Strip Tamper proof External Adjustment



Proof		Adjustabl	s Range		Approx	Contraction of the lot of the lot	The second s	No. of Concession, Name of Street, Str
(Test) Decrea		creasing Increasi			Actuation Value		DIT	D2T
Pressure	Min.	Max.	Min.	Max.	(Differential)	Wetted Material*	Catalog Number	Catalog
3	018	1.654	.54	1.7	018 to .046	8 25	DIT H2	Number
3	018	1.65	.068	1.7	02 to 05	17.7PH	1	D2T H2
10	0.3	2.89	14	3.	05 to 11	B 25	DIT H2SS	D2T H2SS
10	03	2.85	18	3.	07 to 15	17.7PH	DIT A3	D2T-A3
60	4	17.80	60	18.	1 to 20	8 25	DIT ASS	D2T-A3SS
60	.4	17.74	66	18.	12 to 26	17.7PH	DIT HIS	D2T H18
160	.5	77.2	3.3	80.	1.4 to 2.8	8 25	DIT HI8SS	D2T H18SS
160	5	76.6	3.9	80.	16 to 3.4	17-7PH	01T-A80	C2T ABO
300	1.5	144.8	6.7	150.	2.2 to 5.2	B 25	DITABOSS	D2T-A80SS
300	1.5	144.	7.5	150.	2.3 to 6.0	17-7PH	D1T-A150 D1T-A150SS	027-A150 027-A15055
Approxim	nate ship	oping weigh	t ibs.				2.0	2.0

### VACUUI M SWITCHES - All values given in inches of mercury (Gauge)

### Proof Proof Adjustable Range Approx. (Test) (Test) Actuation Dec. Vacuum Incr. Vacuum DIT D2T Vacuum Pressure Value Wetted Catalog Catalog Min Max Min Max (Differential) Material\* Number Number 6 10 PSI 06 58 26 6 09 to .20 8 25 DIT A3 DZT A3 6 10 PSI 06 5 72 34 6. 14 to 28 17.7PH DIT A3SS 30 027 A354 60 PSI 8 29.34 1.46 30. 4 10 .66 D1T-H18 8 25 30 D2T HIS 50 PSI 8 29.2 16 30. 4 to 8 17.7PH D17-H1855 D2T H13 Approximate shipping weight lbs. 20 20

(left).

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### DETAIL DATA

DIT SINGLE SETTING

DET DUAL CONTROL

ELECTRICAL CHARACTERISTICS: All models incorporate Underwriters' Laboratories, Inc. listed single pole double throw snap-action switching elements. Electrical rating (continuous inductive) 10 amps 125 or 250 volts AC, 3 amps 480 volts AC. Automatically reset by snap-action of switch. For more details and other switch classes, see pages 36-38

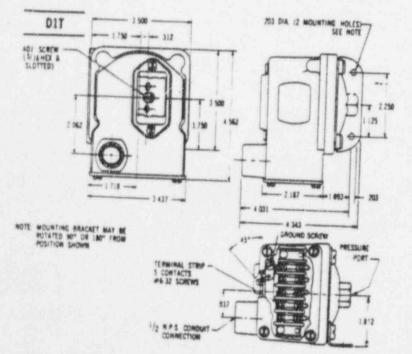
E'ECTRICAL CONNECTION: To screw terminals on covered terminal strip through 1/2" nps conduit connector

PRESSURE (VACUUM) CONNECTION: 14" npt internal thread. 1/2" npt available stainless steel only add ---P2 to catalog number when ordering.

### ADJUSTMENT INSTRUCTIONS

Positive Pressure: Turn adjustment screw clockwise to lower actuation point

Vacuum, Turn adjustment screw counterclockwise to approach atmospheric pressure



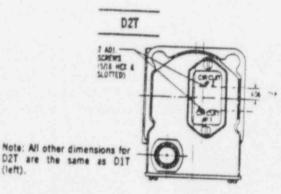
\*B 25 Beryllium Copper, 17.7PH Stainless

### WIRE CODING - PRESSURE

Circuit #1: Commor, -- Purple Normally Cir sed - Blue Normally Open --- Red Circuit #2: Common - Brown Normally Closed - Orange Normally Open --- Yellow

WIRE CODING --- VACUUM Circuit #1: Common - P. : -Normally Closed - --Normally Open - 8 . Circuit #2: Common - Bran Normally Closed - " . Normally Open - Orania

Switches Underwriters Laboratories and Factory Mutual listed for Protection service request bulletin 690627



Barksdale Bulletin No. 870420 -1

52233-C-019 P.H	10	H		
SSEL Line No. 5223C Statu	IS	Y	N	U
SCREENING EVALUATION WORK SHEET (SEWS) Sheet				
Equip. 10 No No -VS-106B Equip. Class 18 - Instruments	on R	ack	s	
Equipment percrition SLCRS EXH FAN VS-F-48 TRIP UPON VAC COND I	N CN	MT	PUR	GE
Equip. 10 No <u>PS-VS-106B</u> Equip. Class <u>18 - Instruments</u> Equipment percrition <u>SLCRS EXH FAN VS-F-48 TRIP UPON VAC COND I</u> Location: Brdg. <u>AXLB</u> Floor El. <u>768</u> Room, Row/C	01			
Manufacturer, Model, Etc. (optional but recommended)B070/BARKS				
SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input 2. Elevation of seismic input below about 40' from grade 3. Equipment has fundamental frequency above about 8 Hz 4. Capacity based on: Existing Documentation Bounding Spectrum 1.5 x Bounding Spectrum GERS 5. Demand based on: Ground Response Spectrum 1.5 x Ground Response Spectrum 1.5 x Ground Response Spectrum Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Does capacity exceed demand? (Indicate at right (*) and in <u>COMMENIS</u> if a special exception to enveloping of seismic demand spectrum is invoked per Section 4.2 of the GIP.)	Y Y DOBSER	DRSSSA		T N/A
<ul> <li><u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) those are met by intent without meeting the specific wording of the cave explain the reason for this conclusion in the COMMENTS section be <ol> <li>Equipment is included in earthquake experience equipment class</li> <li>No computers or programmable controllers</li> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays</li> <li>Natural frequency relative to 8 Hz limit considered</li> <li>Attached lines have adequate flexibility</li> <li>Anchorage adequate (See checklist below for details)</li> <li>Relays mounted on equipment evaluated CONTAcTOR</li> <li>Have you looked for and found no other adverse concerns?</li> </ol> </li> </ul>	eat 1	N N N	wha e u u u u u u u u u u u u u u u u u	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveats which met by intent without meeting the specific wording of the caveat and explain the reason for this conclusion in the COMMENTS section 1. Equipment is included in the generic seismic testing equipment class 2. Meets all Bounding Spectrum caveats 3. Component is a pressure, temperature, level or flow transmitter	rule		000	N/A N/A N/A

SSEL Line No. 5223C

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

500--- UN F.HIU-

Equipm	ent Description SLCRS EXH FAN VS-F-48 TRIP UPON VAC COND IN	I CN	MT	PUR	GE
And the second s	S - GERS (Cont'd)				
4.	Component is one of the specific makes and models	v			N/A
5.	tested, as listed in Appendix B Necessary function of component not sensitive to	4	N	0	N/A
э.	seismically induced system perturbations, e.g.,				
	sloshing (cover this as part of Section 6 evaluation)	Y	N	U	N/A
6.	No vacuum tubes	Y	N	U	N/A N/A
7.	All external mounting bolts in place	Y	N	U	N/A
8.	Demand based on realistic amplification of floor				
	response through rack to transmitter-to-rack				
9.	interface (document basis)	T	N	U	N/A
9.	Rack capable of structurally transferring seismic demand loads to anchorage	¥	N	U	N/A
10.	All adjacent cabinets or sections of multi-bay	2.1		~	14/14
	assemblies bolted together	Y	N	U	N/A
Is the	intent of all the caveats met for GERS?				YNU
ANCHOR					
1.	Appropriate equipment characteristics determined	0			
2	(mass, CG, natural freq., damping, center of rotation) Type of anchorage covered by GIP	36	N	0	N/A
2.3.	Sizes and locations of anchors determined	000	N	11	N/A N/A N/A
4.	Anchorage installation adequate, e.g.,	ve	14	0	17 A
	weld quality and length nuts and washers expansion				
	anchor tightness TUG TOST F. SLOT TIGHT, PA, JT Won Frank Factors affecting anchorage capacity or margin of	0	N	U	N/A
5.	Factors affecting anchorage capacity or margin of				
	safety considered: embedment length, anchor spacing,				
	free-edge distance, concrete strength/condition, and	0		11	11/4
6	concrete cracking	0	N	U	N/A
6.	For bolted anchorages, gap under base less than 1/4-inch	0	N	U	N/A
7.	Factors affecting essential relays considered: gap	42		U	11/ A
· · ·	under base, capacity reduction for expansion anchors	Ø	N	U	N/A CONTACTOR
8.	Base has adequate stiffness and effect of prying	-	<u>.</u>	П.	
	action on anchors considered	0	N	U	N/A
9.	Strength of equipment base and load path	- 31			
1.0	to CG adequate	0	N	U	N/A
10.	Embedded steel, grout pad or large concrete	V			Th
Are and	pad adequacy evaluated chorage requirements met?	Y	N	U	CLAD N II
ni e un					Q . 0
INTERAC	TION EFFECTS				
1.	Soft targets free from impact by nearby	~	2		
	equipment or structures	0	N	U	N/A 1)
2.	If equipment contains sensitive relays, equipment	0			NI/A
3.	free from all impact by nearby equipment or structures	X	N	UU	N/A CONTACTOR
2.	Attached lines have adequate flexibility	0	IN	U	M/A 2)

SSEL Line No. 5223C SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

 Equip. ID No.
 PS-VS-106B
 Equip. Class
 18 - Instruments on Racks

 Equipment Description
 SLCRS EXH FAN VS-F-4B TRIP UPON VAC COND IN CNMT PURGE

 INTERACTION EFFECTS (Cont'd)
 4.
 Overhead equipment or distribution systems are not likely to collapse

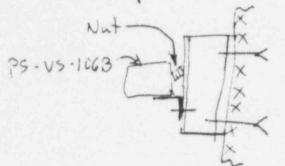
 5.
 Have you looked for and found no other adverse concerns?
 Interaction Note: No

5. Have you looked for and found no other adverse concerns? N U N/A Is equipment free of interaction effects? N U N/A

# IS EQUIPMENT SEISMICALLY ADEQUATE?

1) & 2) Refer to notes for PS-US-106A.

3) A nut is wedged between the suitch housing und the plate. The nut should be removed,

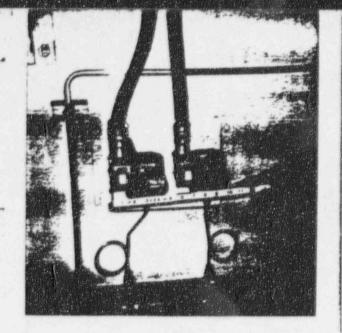


TO REMOVE WEDGED NUT

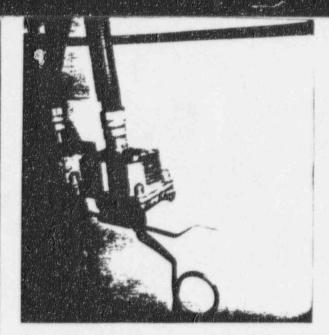
QNU

For support and anchorage details refer to FS-VS-106A.

Evaluated Ly: AMaria Date: 11/2/95 Paul Varia Nov, 6<sup>TH</sup>, 1995

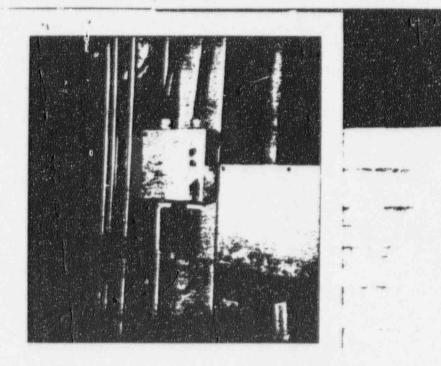


P5-V5-106A €B



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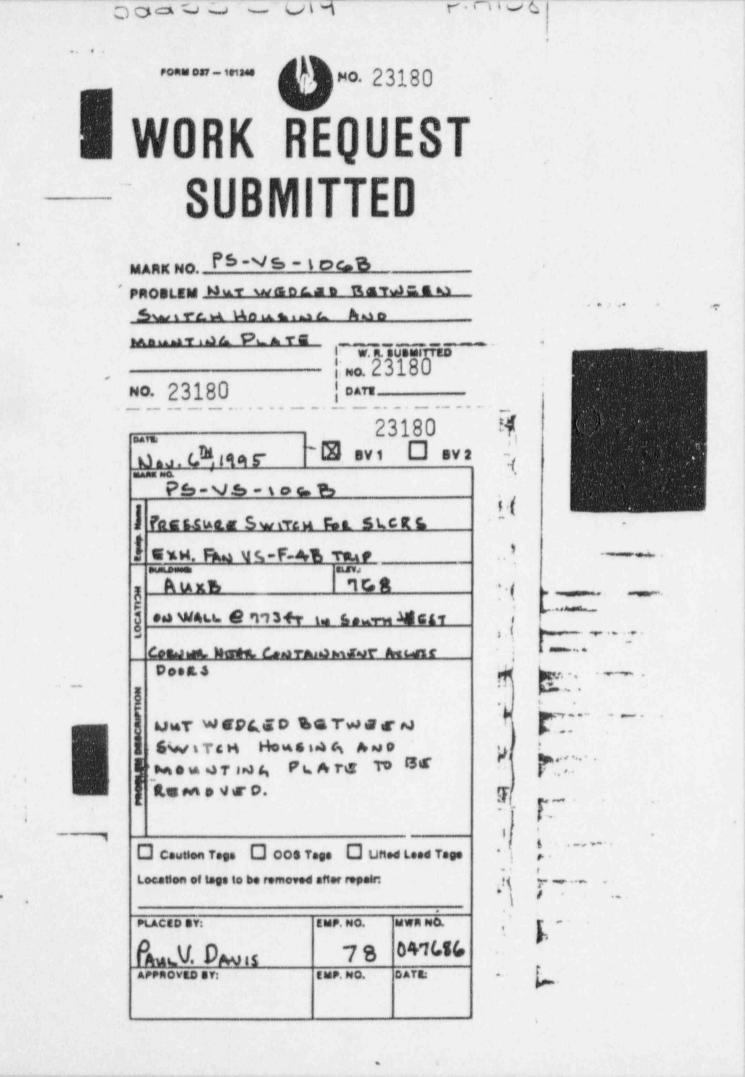
P5- US-1067 & B





PS-MS-101C

17



 EVPOWR19
 EERVER VALLEY POWER STATION WORK REQUEST
 EVPMN19

 SECTION 1: ORIGINATOR
 ORANGE OOS CAUTION

 NUMBER PRIORITY: 4 REPAIR MODE: 7 EQ ITEM.: N IST PUMP/ TAG NO LOG NO TAG NO

 7686 QA CAT.: 1 TEST MODE: 7 TYPE C: N VALVE: N 023180 N/A
 N/A

 71T SYSTEM NO EQUIPMENT MARK NO
 NPRD CODE
 TASK NO

 01
 16
 PS-VS-106B
 INETRU
 N/A

 ELDG AUXILIARY
 ELEV 768 ELDG AREA SOUTE-WEST WALL
 SEO: N

 PRA: N
 R.G.1.97: N
 G.L. 89-10: N
 SEISMIC CLASS:
 SEO: N

 UPMN19
 VAC COND IN CNMT PURGE SIE DUCT

 MANUFACTURER BO70
 BARKSDALE CONTROL DIV / DELAVAL

 MODEL NO DIT-M3
 SERIAL NO N/A

 REQUEST
 TIME NUMBER
 NO. Y/N: N

 DATE TIME NUMBER
 NO. Y/N: N
 EMP.# NAME

 951106 N/A
 N/A
 N/A - N/A
 O078
 P V DAVIS

10000-L'UN PIMIM

INITIAL PROBLEM/FAILURE DESCRIPTION: A NUT IS WEDGED BETWEEN THE SWITCH HOUSING AND THE MOUNTING PLATE. IT NEEDS TO BE REMOVED.

RECORD WAS WRITTEN YOU ARE IN CHANGE MODE "PF1" - HELP "PF5" - CONTINUE PROCESSING "PF3" - RETURN SysAvl Appl O

# MILL

BARKSDALE CONTROLS DIVISION-3211 Fruitiand Ave P D Box 58843+Los Angeles CA 90058+12131 589-6181

# OPERATING CHARACTERISTICS . ORDERING DATA PRESSURE SWITCHES - All values given in P S.I. (Gauge)

**Housed Disphragm Models** Water Tight Housing (NEMA 4) Covered Terminal Strip Tamper proof External Adjustment

00-



Proof		Adjustabl	e Range		Approz.		THE OWNER AND ADDRESS OF ADDRESS OF ADDRESS OF	Statements of the local diversion lines
(Test)	Decr	easing	Incre	asing	Actuation	Wanted	DIT	027
Pressure	Min.	MEL	Min.	Max	(Differential)	Wetted Materiai*	Catalog Number	Catalog
3	018	1.654	064	1.7	018 to 046	8 25	DIT H2	Number D2T H2
3	018	1 65	068	1.7	02 to 05	17.7PM	DIT-H2SS	
10	03	2.89	.14	3.	05 to 11	B 25	DIT A3	DZT H2SS
10	03	2.85	18	3.	07 to 15	17-7PH	DIT A3SS	D2T-A3
60	4	17.80	60	18.	1 to 20	8 25	D17-H18	DZT-A3SS
60	4	17.74	66	18.	12 to 26	17.7PH		D2T H18
150	5	77 2	3.3	80.	1.4 to 2.8	8 25	DIT-H18SS	D2T-H18SS
160	5	76.6	3.9	80.	1.6 1934	17.7PM	D1T-A80	C27 480
300	1.5	144.8	6.7	150.	2.2 10 5.2	B 25	DIT ABOSS	DZT ABOSS
300	15	144.	7.5	150.	2.3 10 6.0	17.7PH	DIT A150	D2T A150
Approxin	nate ship	ping weigh	et libro			11.114	01T-A15055	DET ALSOSS
No. of Concession, name	and arrit	burf weißu	105.				2.0	2.0

# VACUUM SWITCHES -- All values given in inches of mercury (Gauge)

#### Proof Proof Adjustable Range Approx (Test) (Test) Dec. Vacuum Actuation Incr. Vacuum DIT D2T Vacuum Pressure Value Wetted Catalog Min Catalog Max Min Max (Differential) Material\* Number Number 10 PS! 6 06 58 26 6 09 to .20 8 25 DITAS 6 DOT AT 10 PSI 05 5.72 34 14 to .28 6. 17.7PH DIT-A3SS 30 D27 4355 60 PSI 8 29.34 1.46 30. 4 to 66 01T-H18 8 25 30 60 PSI 02T H13 8 29.2 16 30. 4 to 8 17.7PH DIT-HIBSS DET HIS Approximate shipping weight lbs. 2.0 20

#### DETAIL DATA

1

DIT SINGLE SETTIME

DET DUAL CONTROL

ELECTRICAL CHARACTERISTICS: All models incorporate Underwriters' Laboratories, Inc. listed single pole double throw snap-action switching elements. Electrical rating (continuous inductive) 10 amps 125 or 250 volts AC. 3 amps 480 volts AC. Automatically reset by snap-action of switch. For more details and other switch classes, see pages 36-38.

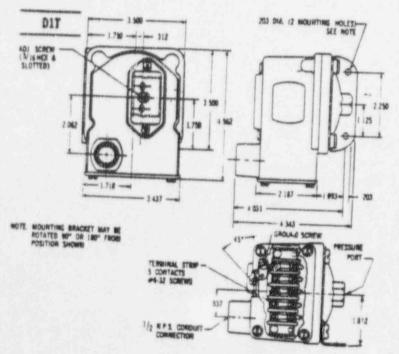
ELECTRICAL CONNECTION: To screw terminals on covered terminal strip "hrough 1/2" nps conduit connector.

PRESSURE (VACUUM) CONNECTION: 1/6" npt internal thread. 1/2" npt available stainless steel only add ---P2 to catalog number when ordering

#### ADJUSTMENT INSTRUCTIONS

Positive Pressure: Turn adjustment screw clockwise to lower actuation point

Vacuum: Turn adjustment screw counterclockwise to approach atmospheric pressure.



\*8 25 Beryllium Copper, 17-7PH Stainless

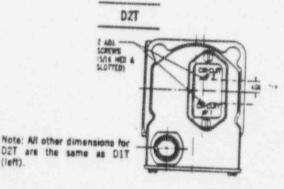
WIRE CODING --- PRESSURE Circuit #1: Common -- Purple Normally Closed - Blue Normally Open --- Red Circuit #2: Common --- Brown Normally Closed --- Orange Normally Open --- Yellow

(left).

8

WIRE CODING - VACUUM Circuit #1: Common - P. : + Normally Closed - ---Normally Open - 3 .. Circuit #2: Common - B .: --Normality Closed --- Ye -Normally Open - Oranie

Switches Underwriters Laboratories and Factory Mutual listed for F . Protection service request bulletin 690627.



Barksdale Bulletin No. 870420 -1

20000 - 019	PHI	11	
SSEL Line No. 5201C Sta	tus	Y	N U
C. NOT SCREENING EVALUATION WORK SHEET (SEWS) She	et 1 of	3	
Equip. ID No. TS-HV-55A Equip. Class 18 - Instrument	s on Rad	ks	
Equipment Description			
Location: Bldg. SRVB Floor El. 713 Room, Row	/[0] 54	EM	FPC SUCP
Manufacturer, Model, Etc. (optional but recommended)	/ 001	LI	LIG SHOL
(operonal bat recommended)			
SEISMIC CAPACITY VS DEMAND			
<ol> <li>Elevation where equipment receives seismic input</li> <li>Elevation of seismic input below about 40' from grade</li> </ol>	72	5.	5
<ol> <li>Equipment has fundamental frequency above about 8 Hz</li> </ol>	Y N	U	NA
<ol> <li>Capacity based on: Existing Documentation</li> </ol>	DOC		and the second s
Bounding Spectrum 1.5 x Bounding Spectrum	BS		
GERS	ABS		
5. Demand based on: Ground Response Spectrum	GRS		
1.5 x Ground Response Spectrum Conserv. Des. In-Str. Resp. Spec.	AGS		
Realistic M-Ctr. In-Str. Resp. Spec	RRS		
Does capacity exceed demand? (Indicate at right (*) and in			(TN U
<u>COMMENTS</u> if a special exception to enveloping of seismic demand spectrum is invoked per Section 4.2 of the GIP.)			
CAVEATS - BOUNDING SPECTRUM (Identify with an asterisk (*) those	a caveat	s wł	nich
are met by intent without meeting the specific wording of the care explain the reason for this conclusion in the COMMENTS section to	un teque	lea	and
1. Equipment is included in earthquake experience	below)		
equipment class	( N	U	N/A
2. No computers or programmable controllers	D N	U	N/A
<ol> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or</li> </ol>	(Y) N	U	N/A
sections of multi-bay racks are bolted together			
if they contain essential relays	Y N	U	N/A
5. Natural frequency relative to 8 Hz limit considered	00000	U	N/A N/A N/A N/A
<ol> <li>Attached lines have adequate flexibility</li> <li>Anchorage adequate (See checklist below for details)</li> </ol>	2ZZ	U	N/A
8. Relays mounted on equipment evaluated	N N	0	N/A
<ol><li>Have you looked for and found no other adverse concerns?</li></ol>	YN	Ŭ	N/A
Is the intent of all the caveats met for Bounding Spectrum?		Ŭ	YN UN/A
CAVEATS - GERS (Identify with an asterisk (*) those caveats which	h are		
met by intent without meeting the specific wording of the caveat	rule		
and explain the reason for this conclusion in the COMMENTS secti	on below	1)	
<ol> <li>Equipment is included in the generic seismic testing equipment class</li> </ol>	V N	11	N/A
2. Meets all Bounding Spectrum caveats	Y N	U	N/A N/A
<ol> <li>Component is a pressure, temperature, level or flow</li> </ol>		-	
transmitter	Y N	U	N/A

52233-C-014 4.HII2

SSEL Line No. 5201C

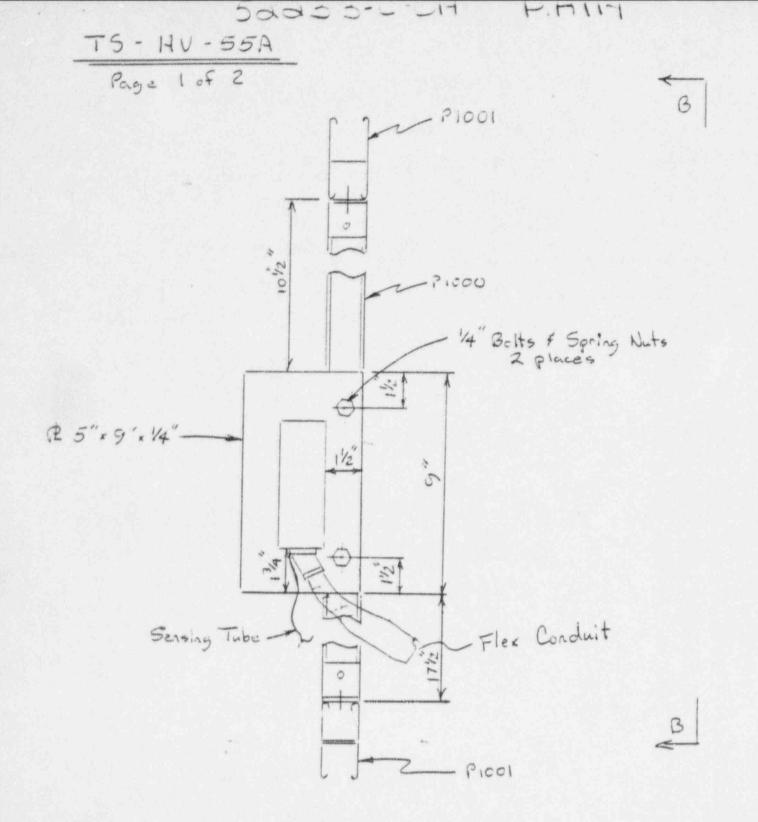
SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equip. ID No. TS-HV-55A Equip. Class 18 - Instruments on Racks Equipment Description TEMP SWITCH FOR VS-F-55A CAVEATS - GERS (Cont'd) 4. Component is one of the specific makes and models Y N U N/A tested, as listed in Appendix B 5. Necessary function of component not sensitive to seismically induced system perturbations, e.g., sloshing (cover this as part of Section 6 evaluation) N U N/A No vacuum tubes N 6. U N/A 7. All external mounting bolts in place Y N U N/A 8. Demand based on realistic amplification of floor response through rack to transmitter-to-rack interface (document basis) U N/A 9. Rack capable of structurally transferring seismic demand loads to anchorage N U N/A All adjacent cabinets or sections of multi-bay 10. assemblies bolted together N U N/A YNUNA Is the intent of all the caveats met for GERS? ANCHORAGE 1. Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation) N U N/A N/A Surveted 2. Type of anchorage covered by GIP N U 3. N Sizes and locations of anchors determined U N/A by mistru 4. Anchorage installation adequate, e.g., weld quality and length, nuts and washers, expansion anchor tightness (Y) N U N/A 5. Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition, and concrete cracking is a start that is For bolted anchorages, gap under base less than U (N/A 6. 1/4-inch U N/A 7. Factors affecting essential relays considered: gap under base, capacity reduction for expansion anchors U N/A N 8. Base has adequate stiffness and effect of prying action on anchors considered U N/A 9. Strength of equipment base and load path to CG adequate (1) U N N/A Embedded steel, grout pad or large concrete 10. pad adequacy evaluated Y N U CN/A Are anchorage requirements met? N U INTERACTION EFFECTS 1. Soft targets free from impact by nearby equipment or structures U N/A If equipment contains sensitive relays, equipment 2. free from all impact by nearby equipment or structures U N/A N 3. Attached lines have adequate flexibility U N/A

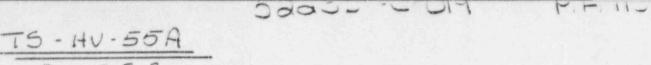
	52232-	C-014	PHILD
SSEL Line No. 5201C			
SCREE	NING EVALUATION WORK S	HEET (SEWS) She	et 3 of 3
Equip. ID No. TS-HV-	55A Equip. Cli	ass <u>18 - Instrument</u>	s on Racks
Equipment Description	TEMP SWITCH FOR VS-F	- 55A	
INTERACTION EFFECTS ( 4. Overhead equip not likely to 5. Have you looke Is equipment free of	ment or distribution sy collapse d for and found no othe	vstems are er adverse concerns?	N U N/A N U N/A V U
15 EQUIPMENT SEISMICA	LLY ADEQUATE?		(YN U

COMMENTS

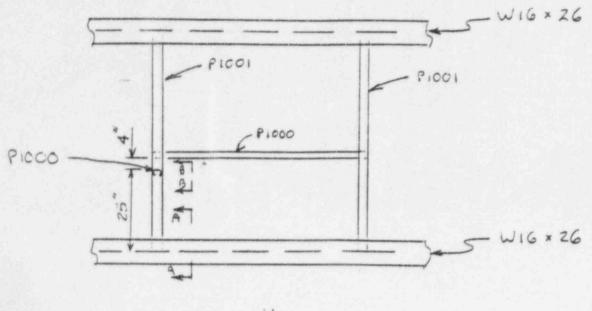
Evaluated by: A thomas Muthrate Date: 11/2/95 Nov. 2 20, 1995

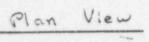


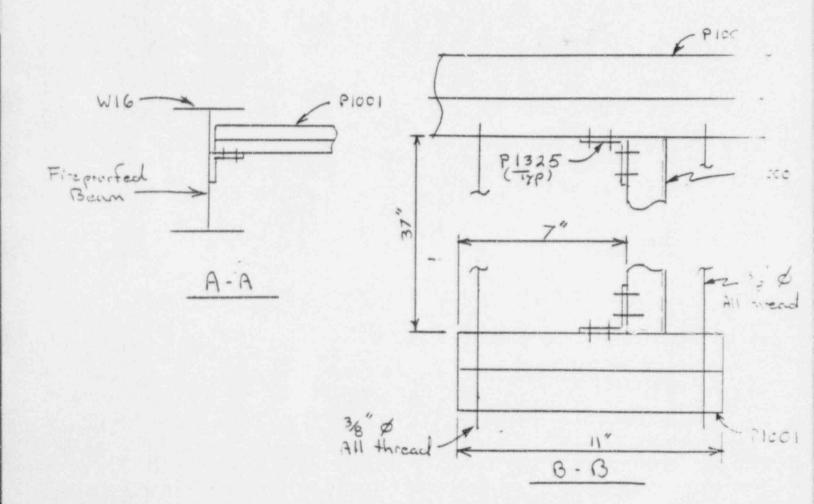
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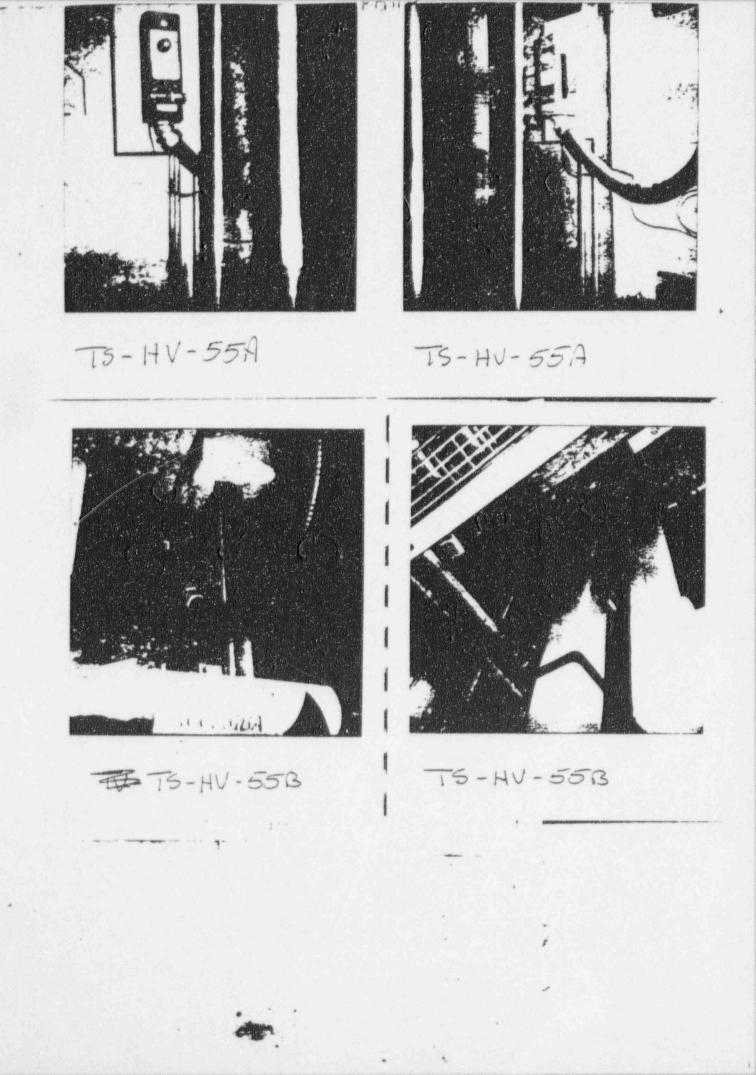


Page 2 of 2









22222224	PAIL	
SSEL Line No. 5202C	Status	YNU
COPY SCREENING EVALUATION WORK SHEET (SEWS)	Sheet 1 of	f 3
Cequip ID No. TS-HV-55B Equip. Class 18 - In	nstruments on Ra	icks
Equipment Description		
Location: Bldg. SRVB Floor El. 713	Room, Row/Col _s	W EMERG SWGR
Manufacturer, Model, Etc. (optional but recommended)		
<ul> <li>SEISMIC CAPACITY VS DEMAND         <ol> <li>Elevation where equipment receives seismic input</li> <li>Elevation of seismic input below about 40' from</li> <li>Equipment has fundamental frequency above about</li> <li>Capacity based on: Existing Documentation Bounding Spectrum</li></ol></li></ul>	grade 8 Hz V DOC BS GER GRS GER GRS Spec. CRS Spec. CRS in ismic iIP.) (*) those caveat	2 (VNU
<ul> <li>explain the reason for this conclusion in the COMMENTS <ol> <li>Equipment is included in earthquake experience equipment class</li> <li>No computers or programmable controllers</li> <li>Steel frame and sheet metal structurally adequat</li> <li>Adjacent racks which are close enough to impact sections of multi-bay racks are bolted together if they contain essential relays Single fast, on</li> <li>Natural frequency relative to 8 Hz limit consider</li> <li>Attached lines have adequate flexibility</li> <li>Anchorage adequate (See checklist below for deta</li> <li>Relays mounted on equipment evaluated</li> <li>Have you looked for and found no other adverse consistent of all the caveats met for Bounding Spectrum</li> </ol> </li> </ul>	e or Strut red ils)	$\begin{array}{cccc} V & U & N/A \\ V & N/A \end{array}$
CAVEATS - GERS (Identify with an asterisk (*) those cave met by intent without meeting the specific wording of the and explain the reason for this conclusion in the COMMEN 1. Equipment is included in the generic seismic test equipment class 2. Meets all Bounding Spectrum caveats 3. Component is a pressure, temperature, level or fl transmitter	he caveat rule NTS section belo ting Y N Y N	U N/A U N/A

SSEL Line No. 5202C

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

PHIL

Equip. Class 18 - Instruments on Racks Equip. ID No. TS-HV-55B Equipment Description TEMP SWITCH FOR VS-F-55B CAVEATS - GERS (Cont'd) 4. Component is one of the specific makes and models tested, as listed in Appendix B Y N U N/A 5. Necessary function of component not sensitive to seismically induced system perturbations, e.g., sloshing (cover this as part of Section 6 evaluation) N U N/A No vacuum tubes NU 6. N/A N U All external mounting bolts in place 7. N/A Demand based on realistic amplification of floor 8. response through rack to transmitter-to-rack interface (document basis) U N/A Rack capable of structurally transferring 9. seismic demand loads to anchorage N U N/A All adjacent cabinets or sections of multi-bay 10. assemblies bolted together NU N/A YNUN/A Is the intent of all the caveats met for GERS? ANCHORAGE Appropriate equipment characteristics determined 1. (mass, CG, natural freq., damping, center of rotation) N U N/A 2. Type of anchorage covered by GIP U N/A N 3. U Sizes and locations of anchors determined N/A 4. Anchorage installation adequate, e.g., weld quality and length, nuts and washers, expansion anchor tightness Y) N U N/A Factors affecting anchorage capacity or margin of 5. safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition, and concrete cracking TS is attached to struct that is attached Y N U N/A For bolted anchorages, gap under base less than to bldg Steel. 6. 1/4-inch (Y) NU N/A 7. Factors affecting essential relays considered: gap under base, capacity reduction for expansion anchors UGN/A. 8. Base has adequate stiffness and effect of prying action on anchors considered O N/A U N Strength of equipment base and load path 9. (Y) to CG adequate N U N/A Embedded steel, grout pad or large concrete 10. pad adequacy evaluated N U GN/ Are anchorage requirements met? NU INTERACTION EFFECTS 1. Soft targets free from impact by nearby equipment or structures (Y) N U N/A 2. If equipment contains sensitive relays, equipment free from all impact by nearby equipment or structures N/A U 3. Attached lines have adequate flexibility U N/A

5000	5-1-44 P.A119
SSEL Line No. 5202C	
SCREENING EVALUATION WORK	SHEET (SEWS) Sheet 3 of 3
Equip. ID No. <u>TS-HV-55B</u> Equip.	Class <u>18 - Instruments on Racks</u>
Equipment Description	-F-55B
INTERACTION EFFECTS (Cont'd) 4. Overhead equipment or distribution not likely to collapse 5. Have you looked for and found no o Is equipment free of interaction effects?	(Y) N U N/A
IS EQUIPMENT SEISMICALLY ADEQUATE?	(YNU

COMMENTS

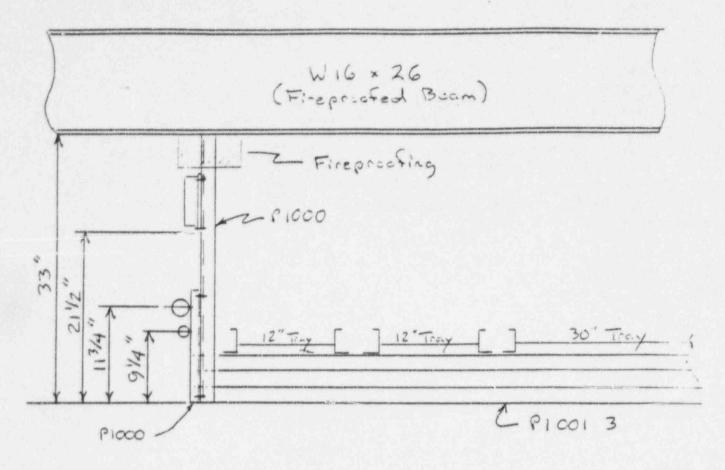
Evaluated by: Aliconge Miettrook Date: 11/6/95 Nov. 6th, 1995

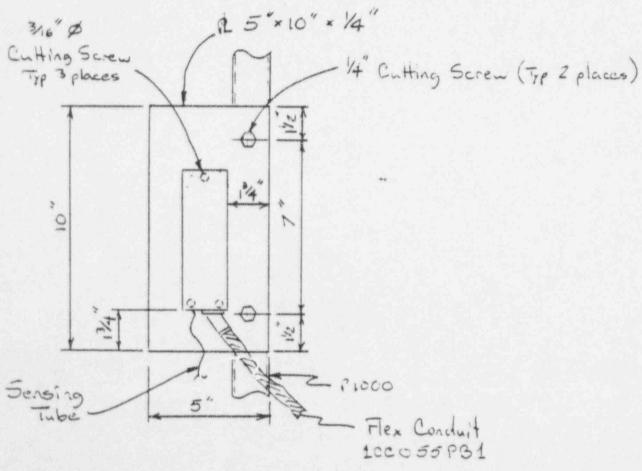
а.

Dadju - L'CARC

P.H.D

TS - HV - 55B





.



T3-HV-55A

TS-HV-55A



TS-HV-55B



TS-HV-55B

*	52233-C-019	PA	1	99	
	SSEL Line No. 4205E	Status	Y	N U	
1	Equip. Class 18 - Instrum				
	Equipment Description INSTRUMENT RACK FOR SOV-MS-101A AND S				
)	Location: Bldg. SFGB Floor El. 751 Room,				
	Manufacturer, Model, Etc. (optional but recommended) DCP 7.	21			
	SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input 2. Elevation of seismic input below about 40' from grade 3. Equipment has fundamental frequency above about 8 Hz 4. Capacity based on: Existing Documentation Bounding Spectrum 1.5 x Bounding Spectrum GERS 5. Demand based on: Ground Response Spectrum 1.5 x Ground Response Spectrum Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Does capacity exceed demand? (Indicate at right (*) and in <u>COMMENTS</u> if a special exception to enveloping of seismic demand spectrum is invoked per Section 4.2 of the GIP.)	O DOC BB GERS GRS GRS AGS	U	N/A	·)
	<u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) th are met by intent without meeting the specific wording of the explain the reason for this conclusion in the COMMENTS section 1. Equipment is included in earthquake experience	e caveat rul	s wh le a	iich nd	
	<ul> <li>equipment class</li> <li>No computers or programmable controllers</li> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together</li> </ul>	000 zzz	U U U	N/A N/A N/A	
	if they contain essential relays 5. Natural frequency relative to 8 Hz limit considered 6. Attached lines have adequate flexibility 7. Anchorage adequate (See checklist below for details) 8. Relays mounted on equipment evaluated 9. Have you looked for and found no other adverse concern Is the intent of all the caveats met for Bounding Spectrum?	× 000 × 0 × 2 × 2 × 2 × 2	00000	AAAAAAA N	1) 0 1 A
	<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveats w met by intent without meeting the specific wording of the cav and explain the reason for this conclusion in the COMMENTS se 1. Equipment is included in the generic seismic testing equipment class 2. Meets all Bounding Spectrum caveats 3. Component is a pressure, temperature, level or flow transmitter	eat rule	) U U U	N/A N/A N/A	

52235-C-014 P.A105

SSEL Line No. 4205E

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equipment Description INSTRUMENT RACK FOR SOV-MS-101A AND SOV	-MS-101	A4				
CAVEATS - GERS (Cont'd)						
<ol><li>Component is one of the specific makes and models</li></ol>						
tested, as listed in Appendix B	Y	N	U	N/A		
5. Necessary function of component not sensitive to						
seismically induced system perturbations, e.g., sloshing (cover this as part of Section 6 evaluation)	v			A1 / A		
6. No vacuum tubes	v	N	U	N/A		
7. All external mounting bolts in place	Y	N	ü	N/A N/A		
8. Demand based on realistic amplification of floor		÷.	~	M/A		
response through rack to transmitter-to-rack						
interface (document basis)	Y	Ν	U	N/A		
9. Rack capable of structurally transferring		1				
seismic demand loads to anchorage 10. <u>All</u> adjacent cabinets or sections of multi-bay	Y	N	U	N/A		
assemblies bolted together	V	N	54	N/A		
Is the intent of all the caveats met for GERS?	1	IN	0	N/A	N U	0
				1.1	1.1	-
ANCHORAGE						
<ol> <li>Appropriate equipment characteristics determined</li> </ol>	1.1					
(mass, CG, natural freq., damping, center of rotation)	0	N	U	N/A		
<ol> <li>Type of anchorage covered by GIP</li> <li>Sizes and locations of anchors determined</li> </ol>	<b>900</b>	N	U	N/A		
4. Anchorage installation adequate, e.g.,	0	N	U	N/A		
weld quality and length, nuts and washers, expansion						
anchor tightness	D	N	U	N/A		
5. Factors affecting anchorage capacity or margin of	Real Property lies		~	4/ 4		
safety considered: embedment length, anchor spacing,						
free-edge distance, concrete strength/condition, and						
concrete cracking	0	N	U	N/A		
<ol> <li>For bolted anchorages, gap under base less than 1/4-inch</li> </ol>	0					
7. Factors affecting essential relays considered: gap	8	N	U	N/A		
under base, capacity reduction for expansion anchors	~	N	11	NIA		
8. Base has adequate stiffness and effect of prying	1	14	0	an		
action on anchors considered	0	N	U.	N/A		
9. Strength of equipment base and load path	and the second s	.,	-	14, P4		
to CG adequate	Ø	N	U	N/A		
10. Embedded steel, grout pad or large concrete						
pad adequacy evaluated	Y	N	U	(N/A)		
Are anchorage requirements met?				0	N	1
INTERACTION EFFECTS						
1. Soft targets free from impact by nearby						
equipment or structures	0	N	U	N/A		
2. If equipment contains sensitive relays, equipment	PVI	-	100			
free from all impact by nearby equipment or structures	B	N	0	KAD		
<ol> <li>Attached lines have adequate flexibility</li> </ol>	0	N	U	N/A		

	52235-6-011	PAIDA
SSEL Line No.	4205E	
	SCREENING EVALUATION WORK SHEET (SEWS) She	eet 3 of 3
Equip. ID No.	PNL-MS-101A Equip. Class 18 - Instrument	s on Racks
Equipment Desc	ription INSTRUMENT RACK FOR SOV-MS-101A AND SOV-	MS-101A4
not liki 5. Have you	FECTS (Cont'd) d equipment or distribution systems are ely to collapse u looked for and found no other adverse concerns? ree of interaction effects?	ONUN/A ONUN/A ONU
IS EQUIPMENT S	EISMICALLY ADEQUATE?	ØN U

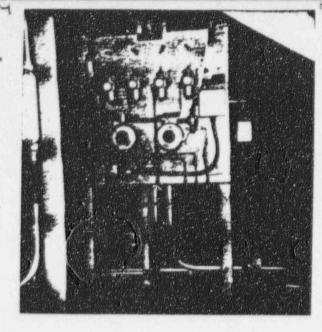
COMMENTS

1) RACK IS RIGIO PER ANALYSES \$700-DMC-2268 \$ \$700-DQC-0004.

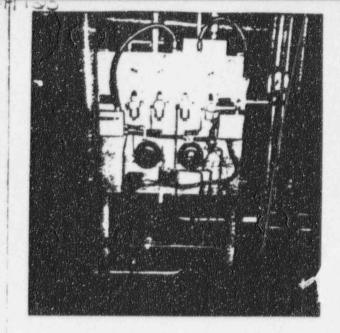
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Evaluated by: Paul Davis

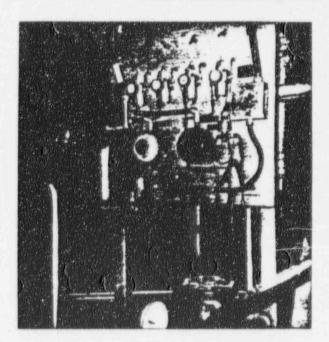
\_\_\_ Date: Oct 107,1995 10-10-4



"B" PNL-MS-101B



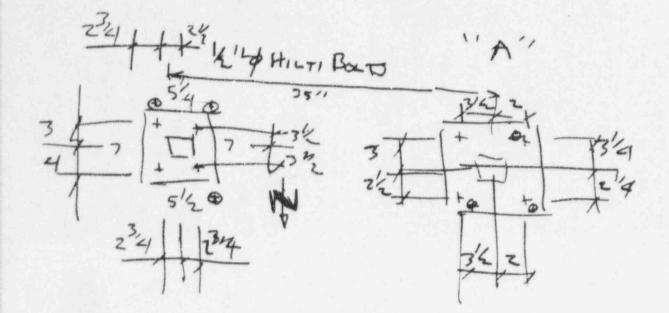
"A" PUL-MS-101A



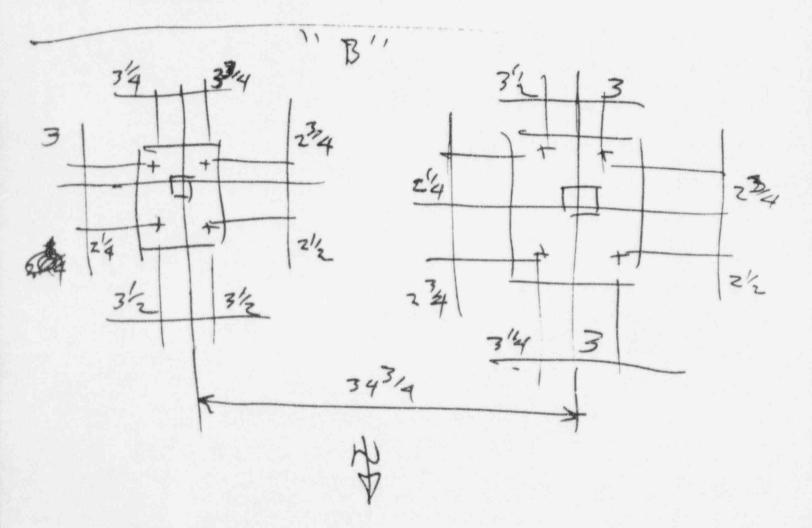
"c" PNL-MS-10/C



500332-UM LIP CONTROL ] WHIDU



& SLIGHTTURN



5

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52255-6-014

PHIOT

Page 1 of \$ 10

DUQUESNE LIGHT COMPANY Nuclear Engineering and Records Unit

#### DESIGN ANALYSIS COVER SHEET

Design Analysis Alternate Calculation Unit No. / DCP No. Safety Related Verification Required Seismic Analysis No. 8700-DC-Yes X No Yes X 721 No Yes No 0004 8700.21.33 Title: ATHOSPHERIC STEAM DUNIP SOLENORD VALVES-SEISHE EN Purpose and Scope: TO DETERMINE WHETHER S.V.'S AVAILABLE C BU-Z ARE SEISMICALLY QUALIFIED FOR USE @ BV-1. THE BY-2 S.V.'s ARE MODEL 206-381-6RF BY ASCO. Design Base Document(s) Affected: System No. 21 CALC. 8700-DSC-2268 BV-2 EQ. RAT. \* EQDP-HE-2/HE-5, REV. 5-1/85 CONTROLLED RMPS TINIT 1 Conclusion: S.V. IS QUALIFIED FOR INTENDED USE CEV-1. Rev. Prepared By/Date Checked By/Date Approved By/Date Alochaci 12/4/89 0 12/5/80 Renterg Johna. Jan 1 2

4.4100 Dm - - 213

Page \_\_\_\_ of 26

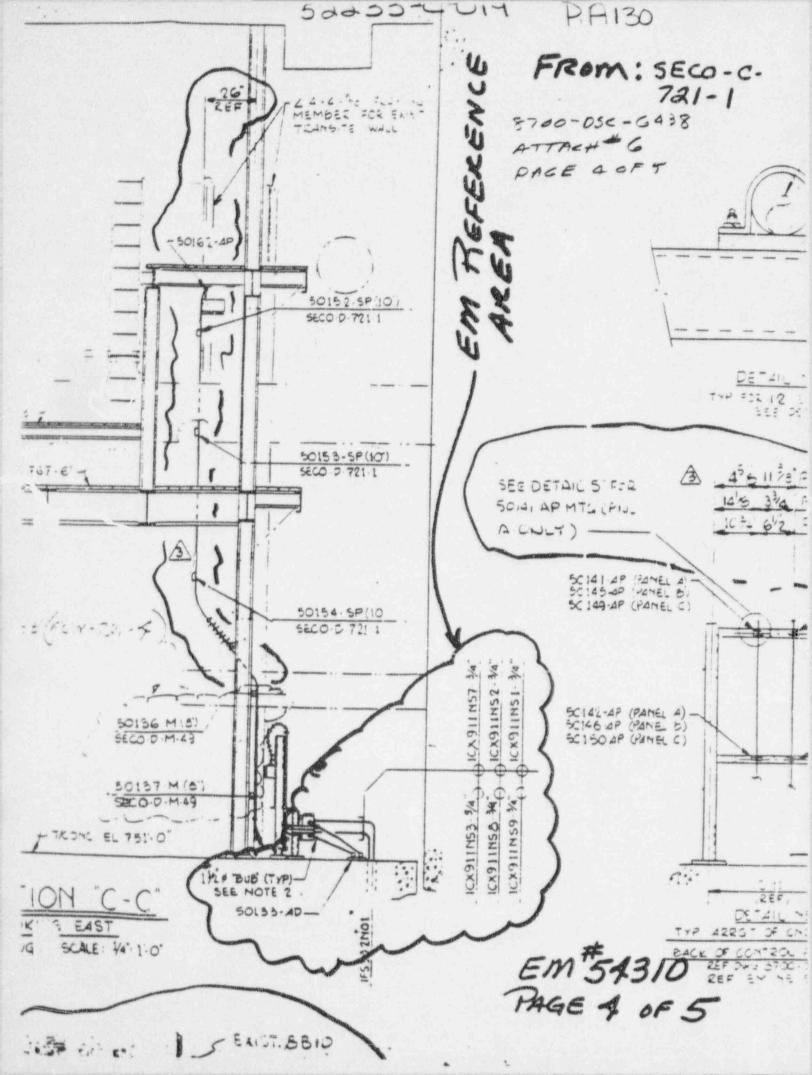
DUQUESNE LIGHT COMPANY Nuclear Engineering and Records Unit

53333-C-019 RC-2 D

DESIGN ANALYSIS COVER SHEET

Design Analysis 🕅 Alternate Calculation Unit No. DCP No. Safety Related Verification Required Seismic Analysis No. 721 Yes No X 8700-DMC-Yes No S Yes No 2268 Title: 8700 AT.13 ATMOSPHERIC STEAM DUNP VALVES CONTROL TIMERUMENT RAIK To DESIEN AN instrument rack for mounting the ATMOSPHERIC STEAM DUMP VALVES CONTROLS. THIS RACE is MOUNTED in The MAIN STEAM VALVE House & is SEISMIRALLY DESIGNED. To AMALVEE Associated TUBING Supports Revi Design Base Document(s) Affected: System No. 21 8700- DMK-215#A 8700- DMK - 221#A 8700- DMK - 223#A R6- 1 GA CATI - 224\* A CAMIC. Reul Conclusion: SEE PASE 11119 for concusion. SEC BOOY OF ALALYSIS CONTROLLED Reul UNIT SUPS Rev. Prepared By/Date Checked By/Date Approved By/Date 0 Ancuso 3/10/81 10/89 CMANCINO 1 2

J-UM Pitian 4026 Duquesne Light Company Analysis Sheet PO-M DIS-1111112-881 PAGE Z OF COMPILED BY CMAN WODATE 2/25/80 CHECKED BY 400- DATE 3/10/89 ANALYSIS NO. 8700-DM C-2269 REV 3/10/27 REV 7/27/89 SCOPE / BACKGANNO 1.0 To design an instrument race the mounting The ATMUSPHERIC STERM Due VALVES CONTINIS THIS Pack will be monthed in The MAINSTRAM VALOE HUSS And requires seismic dosign. . 2.0 REFERENCES 10 11 AISC MAN-AL OF STORE CONSIDER, B' EDITION 2.1 12 "DESIGN OF WEIDED STR-TURO," O. BUDGEIT, 1966 2.2 13 "Formulas for Stains and Stania" 5" toition, Ronar & Young 2.3 2.4 2.4 SD-STOP6, MAY 3, 1979 Stu Design Process 15 2.5 EMTR-612 OFT 1977 16 2.6 UNISTAT PATALOCU: , PELIOR 17 18 27 Willioms and COMPANY CATALOG. 33 28 .8 EMO-79.23 :0 3.0 DESIGN INATS 21 22 MAILSTRAM VALUE HOUSE bottom elevation is 3.1 23 Considered 29 area. 24 32 to be mounted is 51.5# WEIGHT OF INSTANCTS 25 por LE F. GARDING 26 27 8700- OMK-213 #42 3.3 28 3. 5:640 29 1700- DMK-221 #A - 225 # A 30 31 3.6 ALALTIN 8700- DMC-2196 32 3.7 EM 54049 33 34 3.8 EM 54000 35



53232-014	P.F	- 1	21
SSEL Line No. 4206E St	atus	Y	NU
Equip Do lo. PNL-MS-1018 Equip. Class 18 - Instrumen			
Equipment Description INSTRUMENT RACK FOR SOV-MS-1018 AND SOV	-MS-101B	4	
Location: Bldg. SFGB Floor El. 751 Room, Ro	V/Co1 M	SVH	
Manufacturer, Model, Etc. (optional but recommended) DCP 721			
SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input 2. Elevation of seismic input below about 40' from grade 7 3. Equipment has fundamental frequency above about 8 Hz 4. Capacity based on: Existing Documentation Bounding Spectrum 1.5 x Bounding Spectrum GERS 5. Demand based on: Ground Response Spectrum 1.5 x Ground Response Spectrum Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Does capacity exceed demand? (Indicate at right (*) and in <u>COMMENTS</u> if a special exception to enveloping of seismic demand spectrum is invoked per Section 4.2 of the GIP.)	Z Z Q DOC BS GER GRS AGS	2	1 N/A 1) @N U
<u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) thos are met by intent without meeting the specific wording of the c explain the reason for this conclusion in the COMMENTS section 1. Equipment is included in earthquake experience equipment class 2. No computers or programmable controllers 3. Steel frame and sheet metal structurally adequate 4. Adjacent racks which are close enough to impact or	avoat mi	ile i	N/A N/A N/A
sections of multi-bay racks are bolted together if they contain essential relays 5. Natural frequency relative to 8 Hz limit considered 6. Attached lines have adequate flexibility 7. Anchorage adequate (See checklist below for details) 8. Relays mounted on equipment evaluated 9. Have you looked for and found no other adverse concerns? Is the intent of all the caveats met for Bounding Spectrum?	0-000-0 zzzzz	000000	N/A I) N/A N/A N/A N/A N/A
<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveats which met by intent without meeting the specific wording of the cavear and explain the reason for this conclusion in the COMMENTS sect 1. Equipment is included in the generic seismic testing equipment class 2. Meets all Bounding Spectrum caveats 3. Component is a pressure, temperature, level or flow transmitter	rule	*) U U U	N/A N/A N/A

SSEL Line No. 4206E

### SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

52255-6-617

FH100

Equip. ID No. PNL-MS-1018 Equip. Class 18 - Instruments on Racks Equipment Description INSTRUMENT RACK FOR SOV-MS-101B AND SOV-MS-101B4 CAVEATS - GERS (Cont'd) 4. Component is one of the specific makes and models tested, as listed in Appendix B Y N U N/A 5. Necessary function of component not sensitive to seismically induced system perturbations, e.g., sloshing (cover this as part of Section 6 evaluation) YNU N/A 6. No vacuum tubes Y N U N/A All external mounting bolts in place 7. Y N U N/A 8. Demand based on realistic amplification of floor response through rack to transmitter-to-rac: interface (document basis) YNU N/A 9. Rack capable of structurally transferring seismic demand loads to anchorage YNU N/A 10. All adjacent cabinets or sections of multi-bay assemblies bolted together Y N U N/A YNUWA Is the intent of all the caveats met for GERS? ANCHORAGE Appropriate equipment characteristics determined 1. (mass, CG, natural freq., damping, center of rotation) ON U N/A N U N/A 2. Type of anchorage covered by GIP 3. Sizes and locations of anchors determined Anchorage installation adequate, e.g., 4. weld quality and length, nuts and washers, expansion anchor tightness ON U N/A 5. Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing, free-edge distance, concrete strengt /condition, and concrete cracking Q N U N/A 6. For bolted anchorages, gap under bise less than 1/4-inch ON U N/A 7. Factors affaciing essential relays considered: gap under base, capacity reduction for expansion anchors Y N U ON/A Base has adequate stiffness and effect of prying 8. action on anchors considered 0 U N/A Strength of equipment base and load path 9. to CG adequate QNU N/A 10. Embedded steel, grout pad or large concrete pad adequacy evaluated Y N U CN/A Are anchorage requirements met? N U INTERACTION EFFECTS 1. Soft targets free from impact by nearby equipment or structures ON U N/A 2. If equipment contains sensitive relays, equipment free from all impact by nearby equipment or structures YNUNL 3. Attached lines have adequate flexibility ON U

SOUBE-U-UM V.HIE

SSEL Line No. 4206E

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. <u>PNL-MS-1018</u> Equip. Class <u>18 - Instruments on Racks</u> Equipment Description <u>INSTRUMENT RACK FOR SOV-MS-1018 AND SOV-MS-10184</u> <u>INTERACTION EFFECTS (Cont'd)</u> 4. Overhead equipment or distribution systems are not likely to collapse

not likely to collapse 5. Have you looked for and found no other adverse concerns? Is equipment free of interaction effects? NUN/A NUN/A NUN/A

## IS EQUIPMENT SEISMICALLY ADEQUATE?

COMMENTS

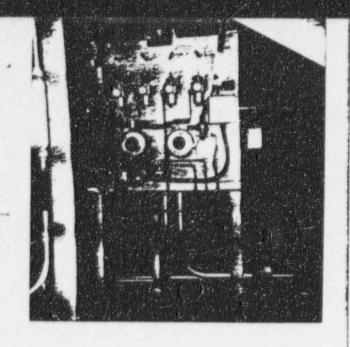
1) RACK IS RIGID PER ANALYSES 8700 - DMC - 2268 4 8700 - DRC - 0004

NOTE: SEE SEWS FOR SOU-MS-101B & SOU-MS-10184

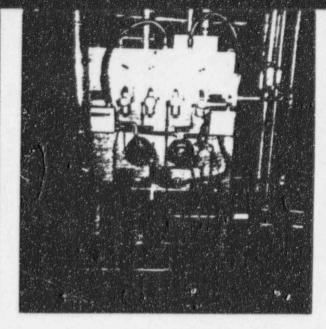
and Evaluated by: 1 Now

Date: Oct 10 1995 10-10-9-5

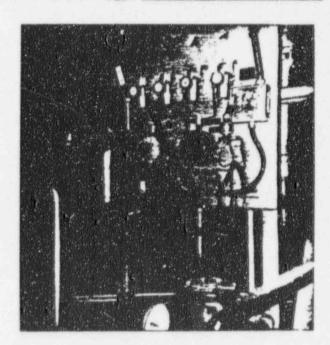
ON U



"B" FUL-MS-101B



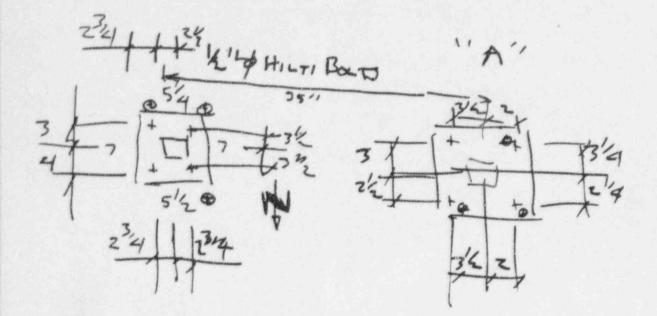
"A" AUK-MS-101A



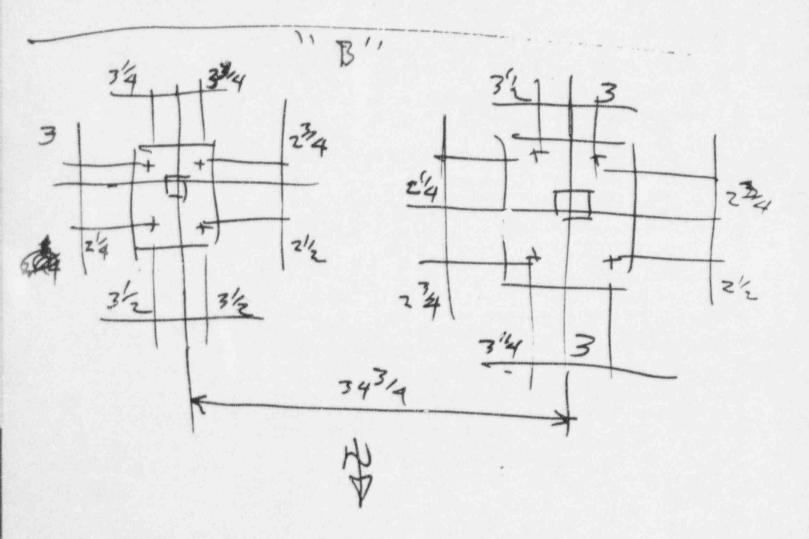
"c" PNL-MS-10/C



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SSEL Line No. 4207E Sta	tus	Y	N U
CED No. PNL-MS-101C Equip. Class 18 - Instrument			
Equipment Description INSTRUMENT RACK FOR SOV-MS-101C AND SOV-			
Location: Bldg. SFGB Floor El. 751 Room, Row	/Co1 M	SVH	
Manufacturer, Model, Etc. (optional but recommended) DCP 721			
SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input 2. Elevation of seismic input below about 40' from grade 72. 3. Equipment has fundamental frequency above about 8 Hz 4. Capacity based on: Existing Documentation Bounding Spectrum 1.5 x Bounding Spectrum GERS 5. Demand based on: Ground Response Spectrum 1.5 x Ground Response Spectrum Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Does capacity exceed demand? (Indicate at right (*) and in <u>COMMENIS</u> if a special exception to enveloping of seismic demand spectrum is invoked per Section 4.2 of the GIP.)	Z OOC BS GERS GRS AGS	IU	
<u>CAVEATS - BO ING SPECTRUM</u> (Identify with an asterisk (*) those are met by incent without meeting the specific wording of the ca explain the reason for this conclusion in the COMMENTS section is 1. Equipment is included in earthquake experience	aveat ru	s wi le a	nich and
equipment class 2. No computers or programmable controllers 3. Steel frame and sheet metal structurally adequate 4. Adjacent racks which are close enough to impact or	000		
sections of multi-bay racks are bolted together if they contain essential relays 5. Natural frequency relative to 8 Hz limit considered 6. Attached lines have adequate flexibility 7. Anchorage adequate (See checklist below for details) 8. Relays mounted on equipment evaluated 9. Have you looked for and found no other adverse concerns? Is the intent of all the caveats met for Bounding Spectrum?	0-000- zzzzz	000000	N/A I) N/A N/A N/A N/A N/A
<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveats whic met by intent without meeting the specific wording of the caveat and explain the reason for this conclusion in the COMMENTS secti 1. Equipment is included in the generic seismic testing	rule	w)	
equipment class 2. Meets all Bounding Spectrum caveats 3. Component is a pressure, temperature, level or flow	Y N Y N	UU	N/A N/A
transmitter	Y N	U	N/A

SSEL Line No. 4207E

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

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ON U N/A

Equip. ID No. PNL-MS-101C Equip. Class 18 - Instruments on Racks Equipment Description INSTRUMENT RACK FOR SOV-MS-101C AND SOV-MS-101C4 CAVEATS - GERS (Cont'd) Component is one of the specific makes and models Y N U N/A tested, as listed in Appendix B Necessary function of component not sensitive to 5. seismically induced system perturbations, e.g., N/A sloshing (cover this as part of Section 6 evaluation) Y N U Y N U N/A No vacuum tubes 6. Y N U N/A All external mounting bolts in place 7. Demand based on realistic amplification of floor 8. response through rack to transmitter-to-rack N U N/A interface (document basis) Rack capable of structurally transferring 9. ¥ N U N/A seismic demand loads to anchorage All adjacent cabinets or sections of multi-bay 10. N/A NU assemblies bolted together Y N U(N/A Is the intent of all the caveats met for GERS? ANCHORAGE Appropriate equipment characteristics determined 1, . N/A (mass, CG, natural freq., damping, center of rotation) N U N U N/A Type of anchorage covered by GIP 2. U N/A Sizes and locations of anchors determined 3. 4. Anchorage installation adequate, e.g., weld quality and length, nuts and washers, expansion ON U N/A anchor tightness Factors affecting anchorage capacity or margin of 5. safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition, and N U N/A 0 concrete cracking For bolted anchorages, gap under base less than 6. U N/A N 1/4-inch Factors affecting essential relays considered: gap 7. under base, capacity reduction for expansion anchors N U CR!/A Base has adequate stiffness and effect of prying 8. U N/A N action on anchors considered Strength of equipment base and load path 9. N U N/A to CG adequate 10. Embedded steel, grout pad or large concrete U (N/A YN pad adequacy evaluated N U Are anchorage requirements met? INTERACTION EFFECTS 1. Soft targets free from impact by nearby O N U N/A equipment or structures D N U NA If equipment contains sensitive relays, equipment

free from all impact by nearby equipment or structures 3. Attached lines have adequate flexibility 

 SSEL Line No. 4207E

 SCREENING EVALUATION WORK SHEET (SEWS)
 Sheet 3 of 3

 Equip. ID No. PNL-MS-101C
 Equip. Class 18 - Instruments on Racks

 Equipment Description INSTRUMENT RACK FOR SOV-MS-101C AND SOV-MS-101C4

 INTERACTION EFFECTS (Cont'd)

 4. Overhead equipment or distribution systems are not likely to collapse

 5. Have you looked for and found no other adverse concerns?

 Source of interaction effects?

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0000-0-014

IS EQUIPMENT SEISMICALLY ADEQUATE?

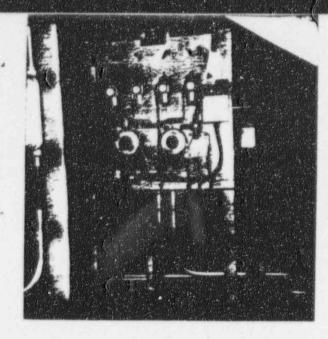
COMMENTS

1) RACK IS RIGIN PER ANALYSES 8700-DMC-2268 & 8700-DRC-0004.

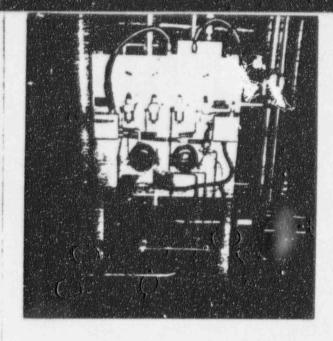
SET SEWS FOR SOV-MS-101C & SOV-MS-101C4

Evaluated by:

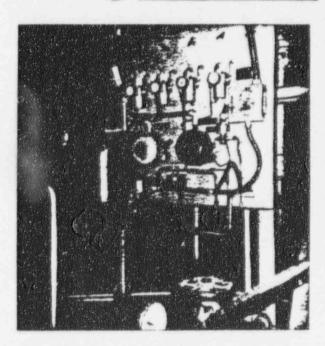
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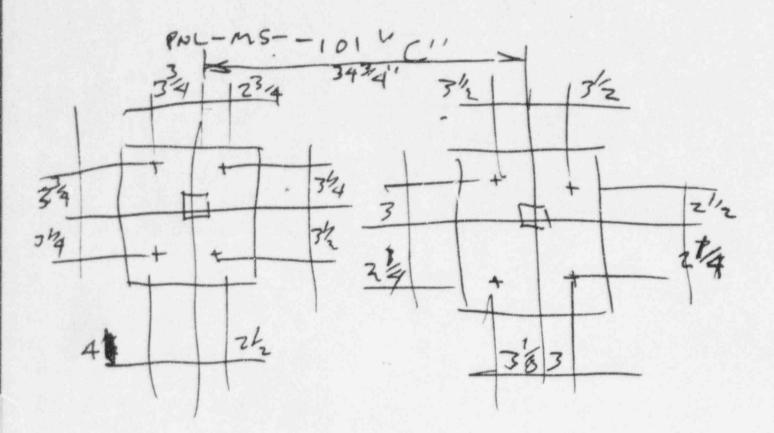
"B" FUL-MS-101B



AUL-MS-101A "A"



"c" PNL-MS-101C



50033-6-01-1			P.H.	[4]
SSEL Line No. 8121	Status	Y	N U	
SCREENING EVALUATION WORK SHEET (SEWS)				
Quipment Description QS/RACK FOR RWST HEAT TRACE (SE SIDE	nents on	Rack	s R	
Location: Bldg. YARD / RWST Floor El. 735 Room,				
Manufacturer, Model, Etc. (optional but recommended)	KON/ CO1	IAN		
SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input 2. Elevation of seismic input below about 40' from grade 3. Equipment has fundamental frequency above about 8 Hz 4. Capacity based on: Existing Documentation Bounding Spectrum 1.5 x Bounding Spectrum GERS 5. Demand based on: Ground Response Spectrum 1.5 x Ground Response Spectrum Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Boes capacity exceed demand? (Indicate at right (*) and in <u>COMMENTS</u> if a special exception to enveloping of seismic demand spectrum is invoked per Section 4.2 of the GIP.)	BODAGUAC	N N DC DES S	39 U N/A	0.4
<u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) t are met by intent without meeting the specific wording of th explain the reason for this conclusion in the COMMENTS section	e caveat	rule	which and	
<ol> <li>Equipment is included in earthquake experience equipment class</li> <li>No computers or programmable controllers</li> <li>Steel frame and sheet metal structurally adequate</li> <li>Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together</li> </ol>	000		U N/A U N/A U N/A	*1
<ul> <li>if they contain essential relays</li> <li>5. Natural frequency relative to 8 Hz limit considered</li> <li>6. Attached lines have adequate flexibility</li> <li>7. Anchorage adequate (See checklist below for details)</li> <li>8. Relays mounted on equipment evaluated</li> <li>9. Have you looked for and found no other adverse concer</li> <li>Is the intent of all the caveats met for Bounding Spectrum?</li> </ul>	rs?	22222		* 2 * 3 BY Nost
<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveats met by intent without meeting the specific wording of the ca and explain the reason for this conclusion in the COMMENTS s 1. Equipment is included in the generic seismic testing	veat rule			
equipment class 2. Meets all Bounding Spectrum caveats	Y	N N	U N/A U N/A	
<ol> <li>Component is a pressure, temperature, level or flow transmitter</li> </ol>	Y	N	U N/A	

LIC-J-CCPPC

SSEL Line No. 3121

4

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

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Equip. ID No. QS-RACK-13 Equip. Class 18 - Instrume	nts on F	and the second s	and the second second		
Equipment Description QS/RACK FOR RWST HEAT TRACE (SE-SIDE O	F RWST)	the second	R		
CAVEATS - GERS (Cont'd)					
4. Component is one of the specific makes and models					
tested, as listed in Appendix B	Y	N	U	N/A	
5. Necessary function of component not sensitive to					
seismically induced system perturbations, e.g.,					
sloshing (cover this as part of Section 6 evaluation)	Y	N	U	N/A	
<ol><li>No vacuum tubes</li></ol>	Y	N	U	N/A	
<ol><li>All external mounting bolts in place</li></ol>	Y	Ν	U	N/A	
<ol><li>Demand based on realistic amplification of floor</li></ol>					
response through rack to transmitter-to-rack					
interface (document basis)	Y	N	U	N/A	
9. Rack capable of structurally transferring					
seismic demand loads to anchorage				N/A	
10. All adjacent cabinets or sections of multi-bay					
assemblies bolted together	Y	N	U	N/A	-
Is the intent of all the caveats met for GERS?				Y	N U NA
ANCHORAGE					
<ol> <li>Appropriate equipment characteristics determined</li> </ol>			Pro	11/7/95	
(mass, CG, natural freq., damping, center of rotation)	Ø	N	Ø	N/A	
2. Type of anchorage covered by GIP	0	N	U	N/A	
<ol><li>Sizes and locations of anchors determined</li></ol>	0	N	U	N/A N/A	
4. Anchorage installation adequate, e.g.,					
weld quality and length, nuts and washers, expansion		6	20	11/3/95	
anchor tightness	$\odot$	N	æ	N/A	
<ol><li>Factors affecting anchorage capacity or margin of</li></ol>					
safety considered: embedment length, anchor spacing,			0	a 11 i i i	
free-edge distance, concrete strength/condition, and			M	Pn/7/45	·
concrete cracking	Q	N	0	N/A	
<ol><li>For bolted anchorages, gap under base less than</li></ol>	1				
1/4-inch	$\odot$	N	U	N/A	
<ol><li>Factors affecting essential relays considered: gap</li></ol>				_	
under base, capacity reduction for expansion anchors	Y	N	U	(D)	
<ol> <li>Base has adequate stiffness and effect of prying</li> </ol>					
action on anchors considered	Ø	N	U	N/A	
<ol><li>Strength of equipment base and load path</li></ol>					
to CG adequate	0	N	U	N/A	
<ol> <li>Embedded steel, grout pad or large concrete</li> </ol>					
pad adequacy evaluated	0	N	U	N/A_	1 00 7/9
Are anchorage requirements met?				0	"D
INTERACTION EFFECTS					
1. Soft targets free from impact by nearby					
equipment or structures	Y	0	U	N/A	*5
2. If equipment contains sensitive relays, equipment					
free from all impact by nearby equipment or structures	Y	N	U	TA	
<ol> <li>Attached lines have adequate flexibility</li> </ol>	0	N	U	N/A	

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SSEL Line No. 8121

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. QS-RACK-13 Equip. Class 18 - Instruments on Racks

Equipment Description QS/RACK FOR RWST HEAT TRACE (SE SIDE OF RWST)

INTERACTION EFFECTS (Cont'd)

 Overhead equipment or distribution systems are not likely to collapse

not likely to collapse 5. Have you looked for and found no other adverse concerns? Is equipment free of interaction effects? YOU N/A \*5 N U N/A YOU

IS EQUIPMENT SEISMICALLY ADEQUATE?

- \* COMMENTS
  - 1) RUSTING OF PLATES, STRUT L'ANCHORS EVIDENT, HOWEVER NO APPARENT STRUCTURAL CAPACITY REDUCTION.

2) NO RELATIVE MOTION POSSIBLE, ALL LINES OK.

- 3) MASS LOW, SUPPORT REDUNDANT, VERY STIFF
- 4) NO RELAYS, THERM CONPLES REVIEWED / RULLED
- 5) WOODEN ROOF COULD FALL AFFECTING SENSING LINES; NO OTHER SOFT TARKETS.

Evaluated by: Paul 7

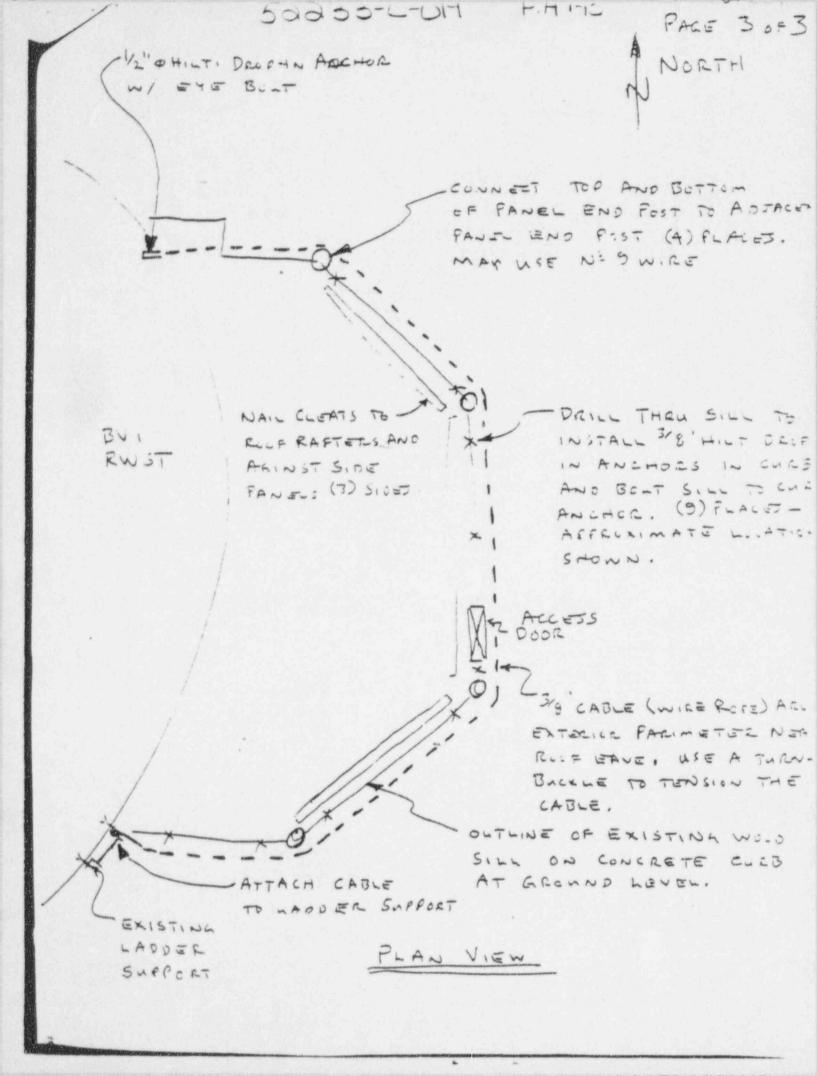
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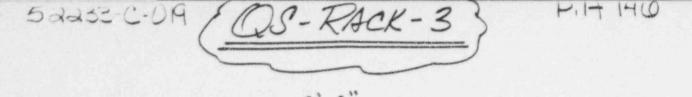
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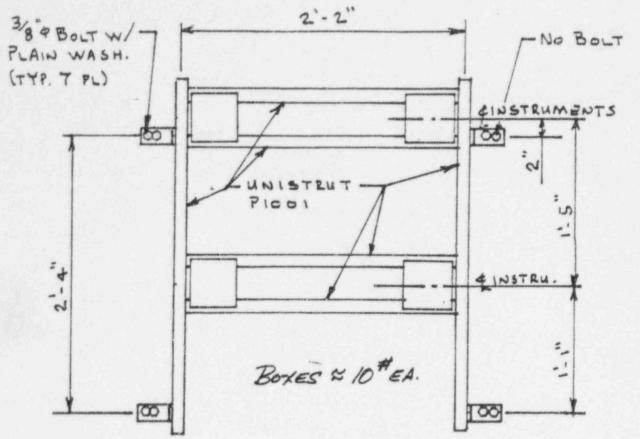
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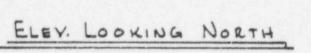
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EM NO. 10730/     UM No.     System No.     DUD 1007 1947 TEN EN No.       Date Prepared     1/21/94     MAR No.     TY ER Date     1/2007 1947 TEN EN No.       Target Due Date     1/21/94     MAR No.     TY ER Date     1/2007 1947 TEN EN No.       Target Due Date     1/21/94     MAR No.     TY ER Date     1/2007 1947 TEN EN No.       Target Due Date     1/28/94     EN demandation     3     Compage Rested Via a     No.       Target Due Date     1/28/94     Prove Date     Due to Expendence     No.       Subject I us oracit     AT UNA 1     Quistr.     AND REDUct The Like Hold     No.       Subject I us oracit     AT UNA 1     Quistr.     Response Required The Like Hold     No.       Subject I us oracit     AT UNA 1     Quistr.     Response Required The Like Hold     No.       Subject I us oracit     AT The Base of the Unit 1     Ruber Response     The Response The Subject The Execution Inc.     No.       Subject I us oracit     AT The Base of the Unit 1     Ruber Response     The Response The Subject The Execution Inc.     No.       Subject I us oracit     At The Execution Inc.     At The Execution Inc.     No.     No.       Subject I us oracit     At The Execution Inc.     At The Execution Inc.     No.     No.       Subject I us oracit     At The		Jay:	Nuclear Facil	neering Manager		
EM NO.     10730/     UM No.     STREM NO.     TO DO SUM/TENEN NO.       Date Progred     1/21/24     MAR NO.     TY EXAMPLE MAR.       Date Progred     1/21/24     MAR NO.     TY EXAMPLE MAR.       Target Due Date     1/21/24     MAR NO.     TY EXAMPLE MAR.       Target Due Date     1/21/24     MAR NO.     TY EXAMPLE MAR.       Subject I.     1/21/24     MAR NO.     TY EXAMPLE MAR.       Subject I.     1/21/24     MAR NO.     The Example Mar.       Subject I.     0/20/24     MAR NO.     MAR NO.       Subject I.     0/20/24     TY UN 1     Ruistro.       Subject I.     0/20/24     The Date Code Nija     Mar.       Mar.     0/20/24     The Date Code Nija     Mar.       Mar.     0/20/24			Duquesr	e Light Company	m	2
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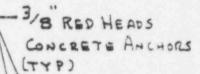


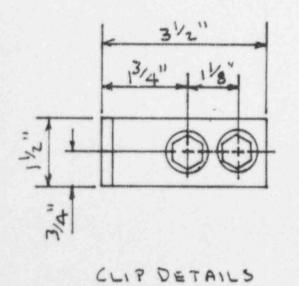


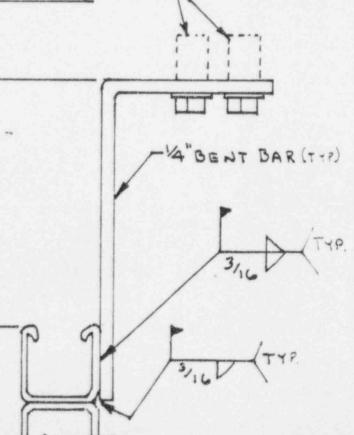


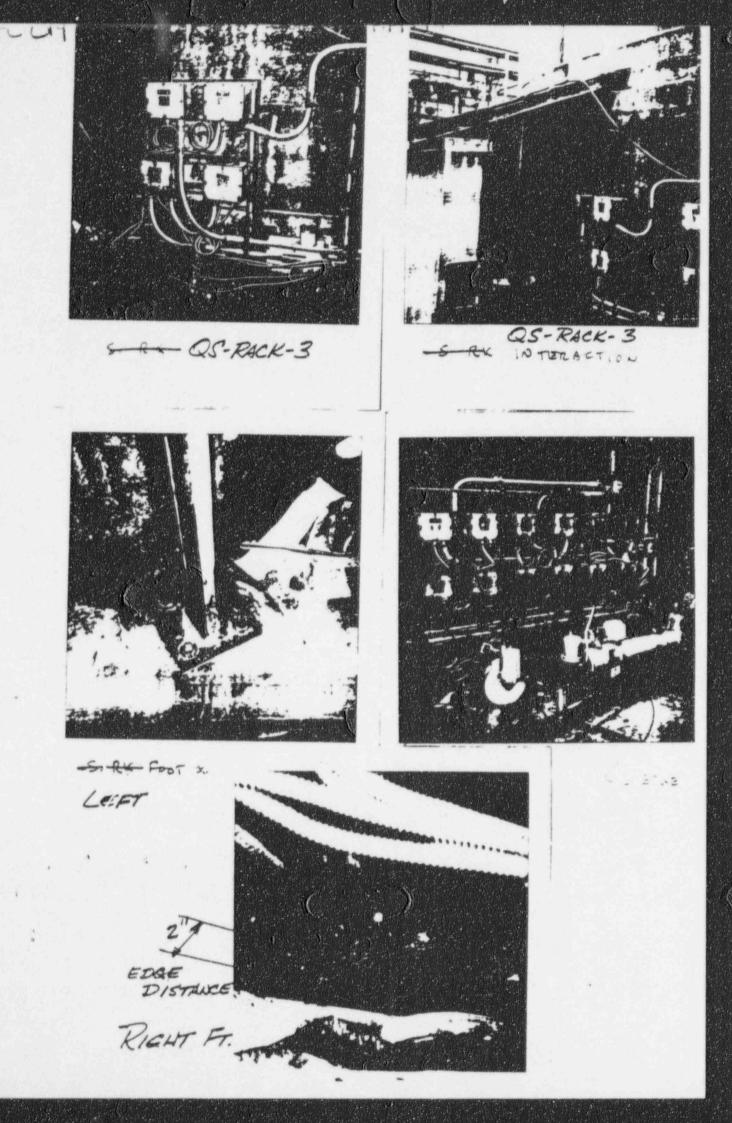


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SSEL Line No. 8124 St	atus		Y	NU
- AN SCREENING EVALUATION WORK SHEET (SEWS) SH	neet l	of	3	
ENIP. ID No. QS-RACK-4 Equip. Class 18 - Instrumer	its on	Rac	ks	
VEquipment Description QS/RACK FOR RWST HEAT TRACE (HOST SE SI				
Location: Bldg. YARD/KWST Floor El. 735 Room, Ro	w/Col	YA	RD	
Manufacturer, Model, Etc. (optional but recommended)				and a second
SEISMIC CAPACITY VS DEMAND 1. Elevation where equipment receives seismic input 2. Elevation of seismic input below about 40' from grade 3. Equipment has fundamental frequency above about 8 Hz 4. Capacity based on: Existing Documentation Bounding Spectrum 1.5 x Bounding Spectrum GERS 5. Demand based on: Ground Response Spectrum 1.5 x Ground Response Spectrum Conserv. Des. In-Str. Resp. Spec. Realistic M-Ctr. In-Str. Resp. Spec. Does capacity exceed demand? (Indicate at right (*) and in <u>COMMENTS</u> if a special exception to enveloping of seismic demand spectrum is invoked per Section 4.2 of the GIP.)	O P B D B D B D B D B D B D B D B D B D B	D NN NOCOBS BS RS RS RS	UUU	
<u>CAVEATS - BOUNDING SPECTRUM</u> (Identify with an asterisk (*) tho are met by intent without meeting the specific wording of the explain the reason for this conclusion in the COMMENTS section 1. Equipment is included in earthquake experience	caveat	rul	s wh le a	nich Ind
equipment class 2. No computers or programmable controllers 3. Steel frame and sheet metal structurally adequate 4. Adjacent racks which are close enough to impact or	ABB	NNN		N/A N/A N/A № 1
sections of multi-bay racks are bolted together if they contain essential relays 5. Natural frequency relative to 8 Hz limit considered 6. Attached lines have adequate flexibility 7. Anchorage adequate (See checklist below for details) 8. Relays mounted on equipment evaluated 9. Have you looked for and found no other adverse concerns? Is the intent of all the caveats met for Bounding Spectrum?	<u>66668</u> ≺	NNNNN	CCCCC	N/A N/A * 2 N/A BY INSPECTION N/A 4 N/A ON U N/A
<u>CAVEATS - GERS</u> (Identify with an asterisk (*) those caveats whi met by intent without meeting the specific wording of the cavea and explain the reason for this conclusion in the COMMENTS sect 1. Equipment is included in the generic seismic testing	t rule		)	
equipment class 2. Meets all Bounding Spectrum caveats 3. Component is a pressure, temperature, level or flow	Ŷ	NN	UU	N/A N/A
transmitter	Y	N	U	N/A

SSEL Line No. 8124

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

P.A 149

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Equip. ID No. QS-RACK-4 Equip. Class 18 - Instruments on Racks glk Equipment Description QS/RACK FOR RWST HEAT TRACE (MOST SE SIDE OF RWST) CAVEATS - GERS (Cont'd) 4. Component is one of the specific makes and models tested, as listed in Appendix B Y N U N/A 5. Necessary function of component not sensitive to seismically induced system perturbations, e.g., sloshing (cover this as part of Section 6 evaluation) Y N U N/A 6. No vacuum tubes N U N/A All external mounting bolts in place Y N U N/A 7. 8. Demand based on realistic amplification of floor response through rack to transmitter-to-rack interface (document basis) Y N U N/A Rack capable of structurally transferring 9. seismic demand loads to anchorage Y N U N/A All adjacent cabinets or sections of multi-bay 10. assemblies bolted together Y N U N/A YNUNA) Is the intent of all the caveats met for GERS? ANCHORAGE 1. Appropriate equipment characteristics determined Y N O N/A N U N/A N U N/A (mass, CG, natural freg., damping, center of rotation) 2. Type of anchorage covered by GIP 3. Sizes and locations of anchors determined 4. Anchorage installation adequate, e.g., weld quality and length, nuts and washers, expansion Provisias anchor tightness Q N P N/A Factors affecting anchorage capacity or margin of 5. safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition, and concrete cracking Y N O N/A 6. For bolted anchorages, gap under base less than 1/4-inch Q N U N/A 7. Factors affecting essential relays considered: gap under base, capacity reduction for expansion anchors Y N U (A/A) Base has adequate stiffness and effect of prying 8. action on anchors considered Q N U N/A Strength of equipment base and load path 9. to CG adequate ON UN/A 10. Embedded steel, grout pad or large concrete ON U N/A pad adequacy evaluated V NO Are anchorage requirements met? INTERACTION EFFECTS Soft targets free from impact by nearby 1. equipment or structures ON U N/A 2. If equipment contains sensitive relays, equipment free from all impact by nearby equipment or structures YN U 3. Attached lines have adequate flexibility ON U

\*

SSEL Line No. 8124

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

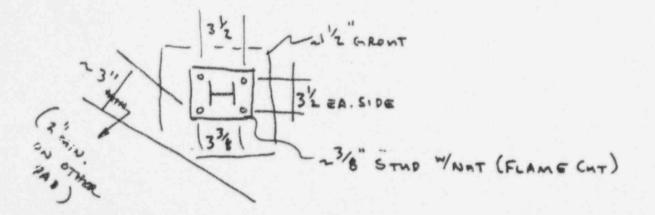
Equip. ID No. <u>QS-RACK-4</u> Equip. Class <u>18 - Instruments on Racks</u> Equipment Description <u>QS/RACK FOR RWST HEAT TRACE (MOST SE SIDE OF RWST)</u> <u>INTERACTION EFFECTS (Cont'd)</u> 4. Overhead equipment or distribution systems are not likely to collapse 5. Have you looked for and found no other adverse concerns? N U N/A Is equipment free of interaction effects?

#### IS EQUIPMENT SEISMICALLY ADEQUATE?

COMMENTS

- 1) RUSTING OF PLATES, STRUT ANCHORS EVIDENT, HOWEVER NO APPARENT STRUCTURAL CAPACITY REDUCTION .
- 2) NO RELATIVE MOTION POSSIBLE, ALL LINES OK.
- 3) MASS LOW, SUPPORT REDANDANT, VILY STIFF

4) NO RELAYS, THERMOLOUPLES REVIEWED / RUGGED

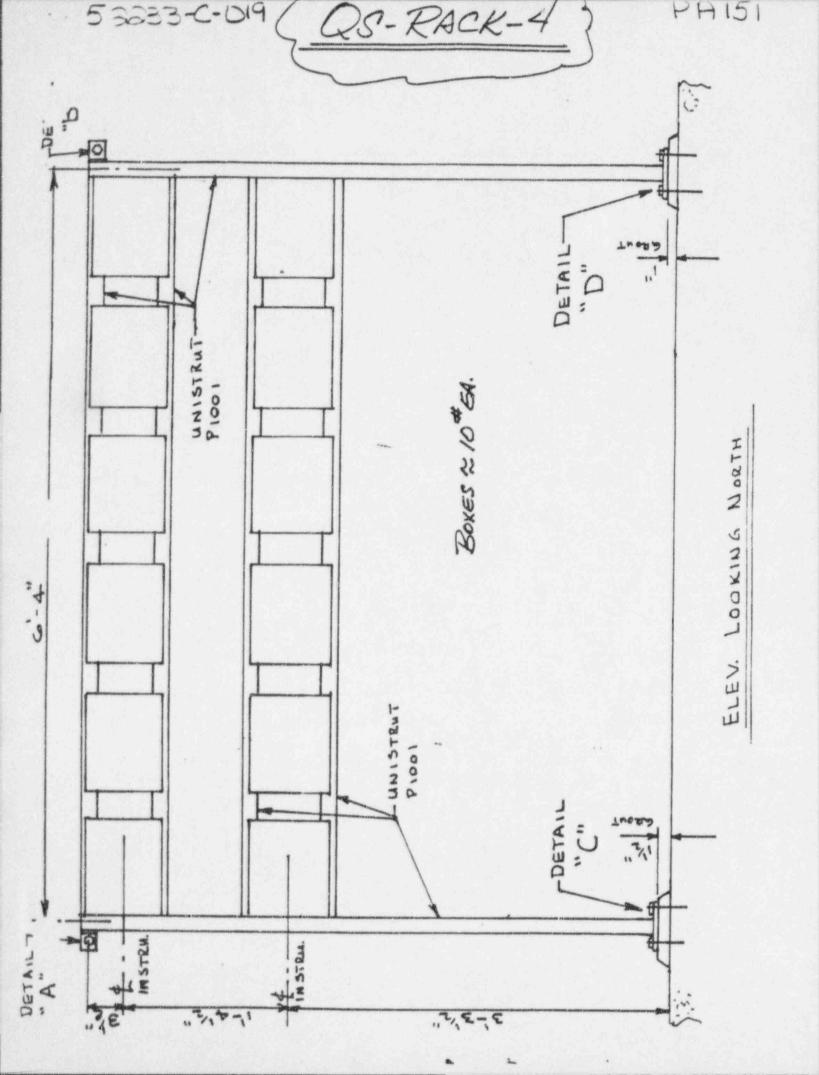


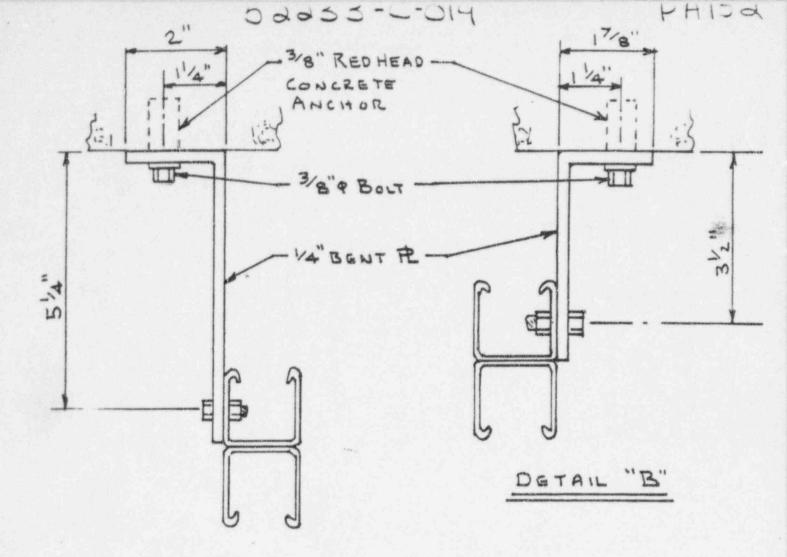
Evaluated by: Paul

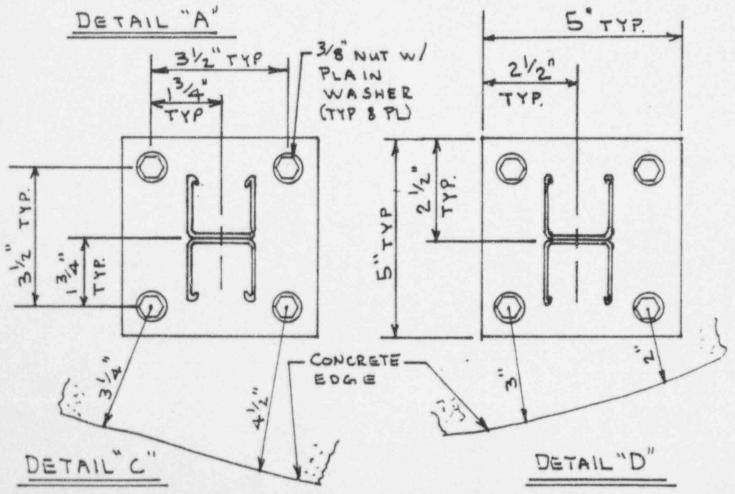
Date: Nov 2ND 1995 11-2-95

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 Sheet B-1 of 6

 Job No.: 52233 Job: Duquesne Beaver Valley Power Station By: <u>RC</u> Date: <u>//-30-75</u>

 Calc No.: 019

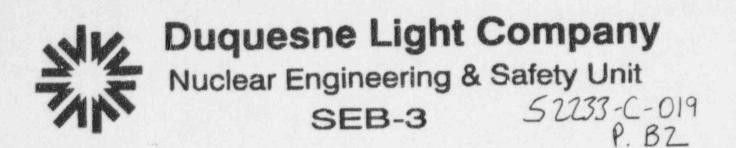
 Chk: Ofmodel Date: //-30-15

Subject: Anchorage Evaluation for Various Instruments

Attachment B

FAX'ed INFORMATION FOR DUQUESNE LIGHT COMPANY MASONRY BLOCK WALLS

(\_\_\_\_\_\_ pages in Attachment B)

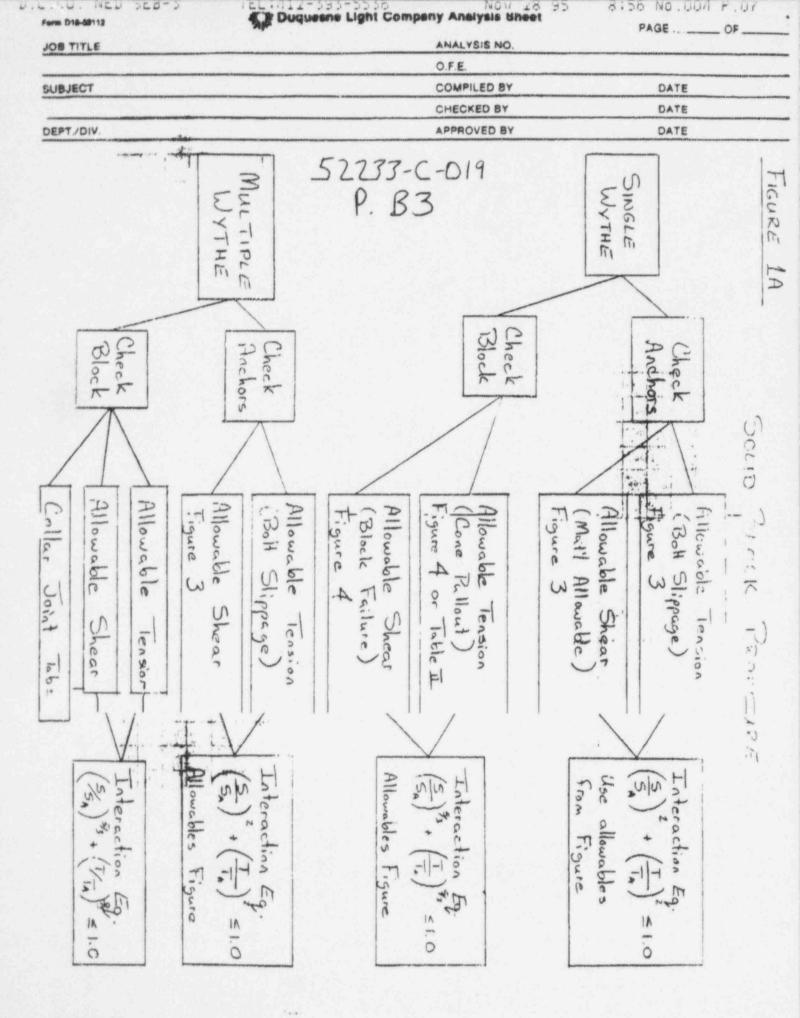


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# **Telecopy Transmittal**

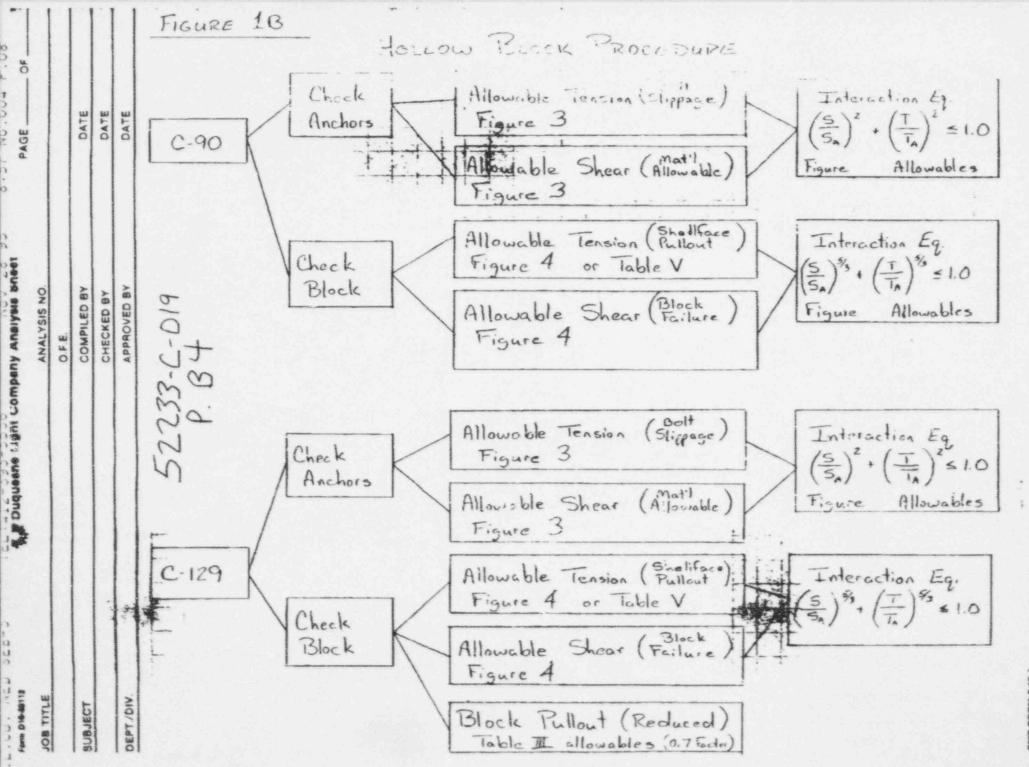
	DATE: 11 - 28 - 95
TO: Ron Cushing TELECOPIER PH	IONE NO .: 714 - 833 - 3392
LOCATION: EQE, Truine, CA	
FROM: Tom Westbrook TELECOPIER PH	IONE NO .: 412-393-5536
LOCATION: BUPS, Shippingport, PA	L
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PLEASE CALL AT VERIFY RECEIPT OF THIS TELECOPY.	то
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360-3 IEL:412-333-5550 NOV 28 95 8:57 NO.004 P.09 Duquesne Light Company Analysis Sheet FORM DI 8-23112 (12-66) PAGE \_\_\_\_OF \_\_ DATE CHECKED BY L COMPILED BY DATE ANALYSIS NO. 52233-C-019 P.B5 FIGURE 2 BLOCK TYPES C-145 (2300 psi) Solid block - Load bearing C-90 (2000 psi) Hollow block - Load bearing 9 10 C-129 (700psi) Hollow block - Non-load bearing 11 (Lightweight block) 12 13 14 15 Location of Types 16 27 Blog Type of Wall Wall No. 18 9 Aux. Bldg. Solid block (C-145) All walls 2 23 CU-1-44+10-7 Cable Vault Solid block (C-145) 22 CV-2-1 23 CU-2-2 24 25 CV:11,2,3 Hollow filled (C.90) 26 27 (c-90) Service Blog 53-1-1 thm 15 Hollow Filled 28 Hollow Block (C-90) SB-3-8,9#12 29 (C.129) All others Hollow Block 30 31 Fuel Bldg. All walls Hollow Block (C.90) 32 33 34 35 16 2 6 39 40 41 5

FIGURE 4		5	2233-C-01	9 P. B	6
Socio Bu			owakle Los	zds_	
Anchor Size Diameter (12)	Min. Ctr to Ctr Spacing (IN)		n Loads Mont (LBS) DBE	based o	Load h block (LBS)
1/4	3 1/4	385	650	08E 700	DBE 1175
3/8	4 3/8	700	1170		
1/2	5 Yz	1100	1850	Ļ	ţ
HOLLOW BL	oek (C-90	)			
Anchor Size Diameter (IN)	Min. Spacing		Load based ace Pullout (LOB) DBE	Sheer 1 based of failure	on block
1/4	N/A	260	435	OBE	DBG
3/8	N/A	275	460	700	1175
1/z	N/A	415	690	Ļ	Ļ
Notes	anden anver an den view andersverse verse ander			. An one of the second s	

2. If anchor spacing is less than min. reduce the allowables by straight line interpolation. 3. If more than one anchor per block the loads shall be combined before comparing to allowables. 

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## **ENCLOSURE 2**



## SUPPLEMENTAL DATABASE INFORMATION: BATTERY CHARGER CABINETS

One of the major benefits of the SQUG program for the resolution of USI A-46, was the recognition that seismic analyses of standard electrical cabinets for earthquake loads were not justified based on actual earthquake experience. The performance record of electrical equipment in actual earthquakes demonstrates that cabinets conforming to standard industrial construction do not suffer structural damage unless subjected to overturning or severe impact (precluded by the requirements of GIP).

The specific equipment category of battery chargers (AC/DC rectifiers) provides an illustration. The SQUG/EPRI database currently includes some 120 examples of battery chargers and inverters (the two types of cabinets are very similar in structure and mass). These 120 examples are spread among some 40 different industrial and power plant sites, affected by a total of 18 different earthquakes. These sites were subjected to earthquakes ranging in magnitude from 5.4 to 8.0, with resulting ground shaking intensities from MMI VII to MMI IX (Modified Mercalli Intensity), and peak ground accelerations from 0.20 to 0.60g. Throughout this inventory coexamples, there are no instances of damage to the cabinets enclosing the charger/inverter internals.





The battery chargers illustrated above are typical examples of rectifiers supplied by major U.S. manufacturers in the late 1960s and early 1970s. The same model La Marche charger is found at the Beaver Valley Unit 1 Nuclear Station (left), and at the Glendale Power Plant (right). The Glendale Plant withstood peak ground accelerations of about 0.30g in the San Fernando earthquake of 1971, and again in the Northridge earthquake of 1994.

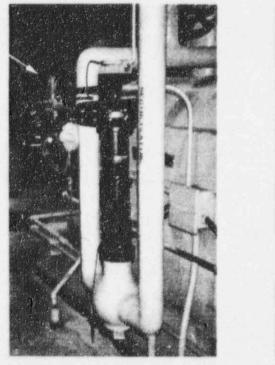


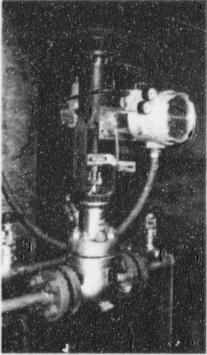
### SUPPLE... "ITAL DATABASE INFORMATION: COMPONENTS ATTACHED TO AIR-OPERATED VALVES

Pneumatic actuators for control valves normally carry components bolted to the valve yoke or the diaphragm casing. Such components typically include pneumatic positioners, electro-pneumatic transmitters, pressure regulators, and solenoid valves. The normal mounting details are sufficiently rigid that there is no potential for significant out-of-phase motion between the valve yoke and its attachments.

The SQUG/EPRI database currently includes over 600 examples of pneumatic-actuated valves subjected to strong motion earthquakes. This category of equipment is by far one of the most common items encountered in the power plants and heavy industrial facilities that are the focus of post-earthquake investigations. The inventory of database examples of pneumatic valves are drawn from some 25 sites, affected by 13 different earthquakes. These sites that contain significant numbers of pneumatic valves experienced peak ground accelerations ranging from 0.20 to over 0.60g.

Instances of damage are limited to a few cases of impact, where valves supported on flexible piping swayed into adjacent steelwork. There is also one instance where excessive sway of a pneumatic actuator disconnected a tubing attachment. There are no instances of damage due to interaction effects between the valve body and its attached components, nor are there instances of components detaching from the valve.





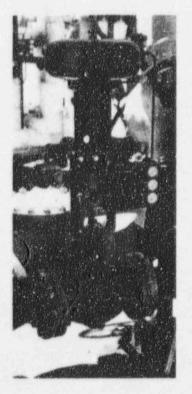
Typical attachments to pneumatic valves are illustrated by the solenoid mounted on the diaphragm casing for a control valve at El Centro Steam Plant (arrow, left). The site experienced peak ground accelerations of 0.42g in the earthquake of 1979, and 0.26g in the earthquake of 1987. More recent-vintage valve attachments include pressure regulators and electro-pneumatic transmitters attached to a control valve at the Gilroy Cogen Plant (right), which withstood 0.32g in the 1989 Loma Prieta earthquake.

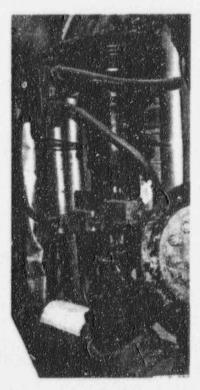


### SUPPLEMENTAL DATABASE INFORMATION: CAST IRON YOKES FOR AIR-OPERATED VALVES

Cast iron as a load-bearing material in mechanical equipment is an issue of particular focus in the SQUG A-46 review. Caveats within the GIP prohibit cast iron for certain load-bearing applications, such as for the supports of motor-operated valves. Standard pneumatic diaphragm-actuated valves, however, use cast iron as a standard material for valve yokes. The large representation of cast iron yokes for diaphragm valves in the database eliminates any reasonable concern about the material's ability to withstand the relatively modest reaction forces from the mass of the pneumatic actuator. The SQUG/EPRI database currently includes over 600 examples of pneumatic-actuated valves subjected to strong motion earthquakes. This category of equipment is by far one of the most common items encountered in the power plants and heavy industrial facilities that are the focus of post-earthquake investigations. The inventory of database examples of pneumatic valves are drawn from some 25 sites, affected by 13 different earthquakes. These sites that contain significant numbers of pneumatic valves experienced peak ground accelerations ranging from 0.20 to over 0.60g.

Instances of damage are limited to a few cases of impact, where valves supported on flexible piping swayed into adjacent steelwork. There is also one instance where excessive sway of a pneumatic actuator disconnected a tubing attachment. There are no instances of damage to cast iron yokes where inertial loads alone were the cause. Checking valve mounting configurations for the impact potential as part of the GIP review is therefore sufficient to preclude diaphragm valve yoke damage regardless of the material.





The Fisher Type 657 is one of the more common diaphragm actuators found at database sites. This actuator features cast iron as the standard material for construction for the valve yoke. Examples of these valves are found at the Union Oil Butane Plant (left), which withstood a peak ground acceleration of about 0.60g in the 1983 Coalinga sequence of earthquakes. On the right is an example of a Fisher Type 657 at the Cool Water Power Plant, which withstood 0.35g in the 1992 Landers earthquake.

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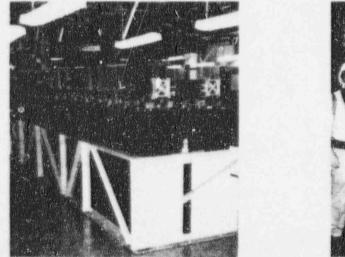
#### SUPPLEMENTAL DATABASE INFORMATION:

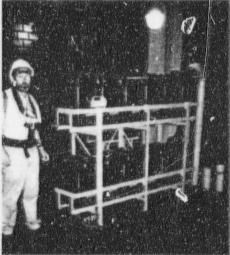
#### WEIGHT OF BATTERIES

Based on the range of sizes of stationary batteries subjected to strong motion within the SQUG/EPRI database, the GIP places an upper limit on the weight of individual batteries at 450 pounds. This upper limit is reasonably close to the maximum size of individual batteries supplied by the more common manufacturers used in power plants and individual facilities.

Data added from investigations of recent earbiquakes tends to expand the range of battery mass represented by the database. Batteries up to about 500 pounds in mass are found on racks at database facilities subjected to particularly strong motion (approaching or exceeding ground motion as characterized by the SQUG Reference Response Spectrum). Floor-mounted batteries of even greater mass are found at telephone switching stations included in the database. These floor-mounted "submarine" batteries used for DC power supply in phone systems weigh about 800 pounds per battery, almost twice the mass limit currently listed in the GIP. Based on actual earthquake experience, the mass of individual batteries does not appear to be a factor except for the inertial load that must be supported by the steel battery rack and its floor anchorage. As long as calculations indicate that the rack and anchorage can support the batteries for the required design-basis earthquake loads, the current database indicates that large mass in individual batteries does not present a source of earthquake damage.

The SQUG/EPRI database currently includes some 140 examples of battery racks, representing some 45 sites and 20 different earthquakes. Within this inventory there are several instances of damage to batteries, most often due to toppling from racks that lacked any form of restraint or confinement. Other causes of damage are anchorage failure leading to overturning of the rack, and inter-battery impact leading to internal damage within the cells. There are no instances of damage to battery racks that conformed to the requirements cit-cked in the GIP, and no correlation between battery damage and the mass of individual batteries.





The Manzanillo Power Plant in Mexico uses Exide Type FHC Size 29 batteries for its DC power supply (left). These are among the largest batteries provided by Exide, with a weight of about 500 pounds each. The several racks at the plant withstood long-duration broad-band motion during the 1995 earthquake, for which the response spectra from the site's free-field instrument approximate that SQUG Reference Spectrum. More massive batteries within the database are found at certain telephone switching stations (right), such as the floor-mounted "submarine" batteries at the Pacific Bell Rosemead Station, which withstool 331 estimated peak ground acceleration of 0.40g in the 1987 Whittier earthquake.

## **ENCLOSURE 3**