EQE ENGINEERING CONSULTANTS

CALCULATION COVER SHEET

Calculation No: 52233-C-019

Project: DUQUESNE BEAVER VALLEY POWER STATION

Calculation Title: ANCHORAGE EVALUATION FOR VARIOUS INSTRUMENTS

References: SEE SECTION 2.0

Attachments: A

Total Number of Pages (Including Cover Sheet): 194

Revision Number	Approval Date	Description of Revision	Originator	Checker	Approver
Ø	12/6/95	ORIGINAL ISSUE	CRR	~~DH~~	RC
Ø	/	/	RC	CRR	RC
1	12/13/95	REVISE THE FOLLOWING PAGES:	RC	CRR	RC
↓	/	2, 5, 34, 36, 37	/	/	/

12312-01/Coversht (7/91)

EQE

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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-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	YARD/RWST	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.

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TAG No.	BUILDING	FLOOR ELEVATION
~~QS-RACK-3~~	YARD/RWST	735

~~THE SEWS INDICATES THAT THE ABOVE ITEM HAS AN INTERACTION CONCERN.~~ ⚠1

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
QS-RACK-3	YARD/RWST	735 ⚠1

THE SEWS INDICATES THAT THE ABOVE ITEMS ARE SEISMICALLY ADEQUATE.

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".

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

7. 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, "SEISMIC 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.

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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".

-- THE LONGEST CONSERVATIVE CANTILEVER LENGTH FROM BASEPLATE-TO-INSTRUMENT IS 18.25" (See 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.

EQE INTERNATIONAL

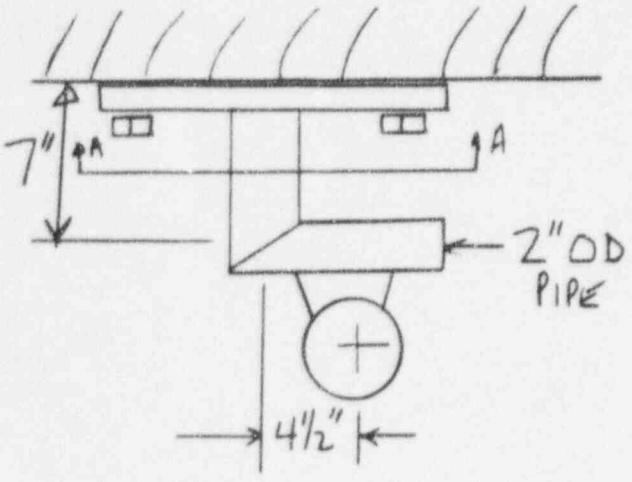
SHEET NO. 3

JOB NO. 52233 JOB DUQUESNE BEAVER VALLEY POWER STATION BY CRM DATE 9-29-95

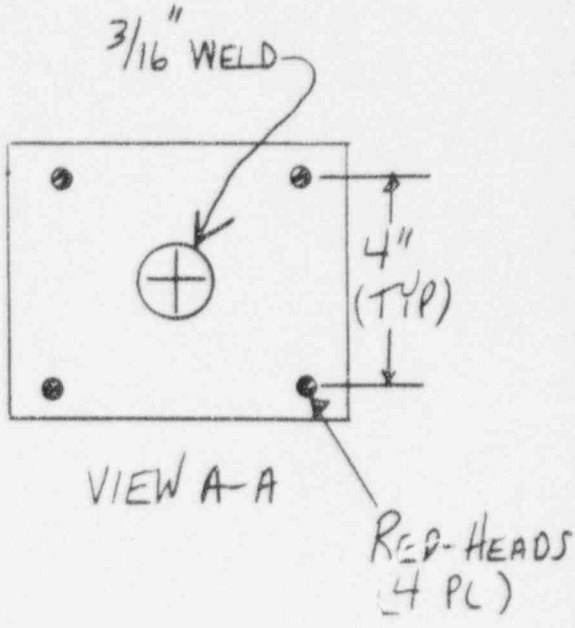
CALC NO. 017 SUBJECT INSTRUMENTS CHK'D ~~RM~~ DATE 10/18/95

FT-CH-150

FISHER & PORTER MODEL 10B 2496 P 13



ELEV VIEW



VIEW A-A

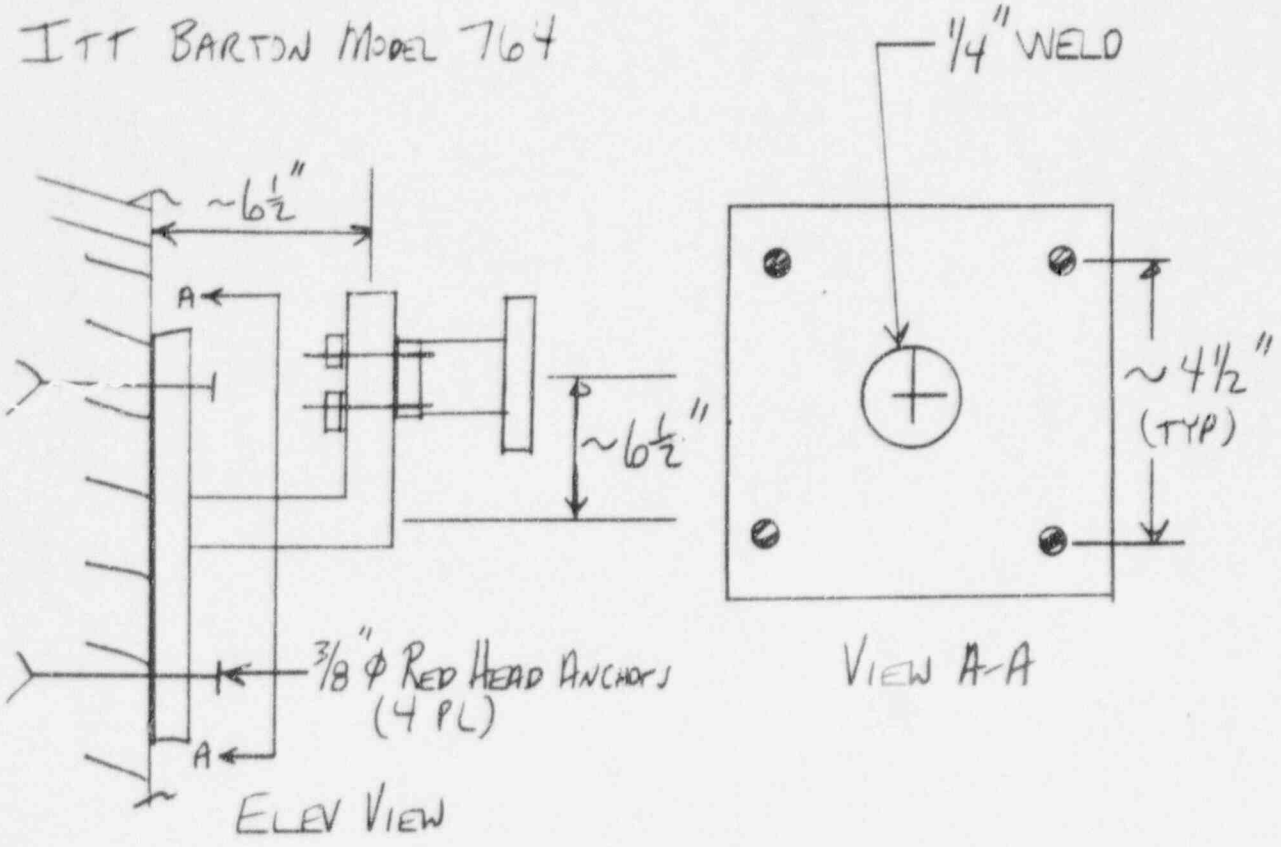
NOTES

1. SKETCH PER SEWS.
2. Wt ~ 50 LB (SIMILAR TO FT-CH-122)
3. ASSUME RED-HEAD = 3/8" ϕ (TYPICAL OF OTHERS)

FIGURE 1

LT-FW-496

ITT BARTON MODEL 764



NOTES

1. SKETCH PER BEAVER VALLEY SKETCH 3016-4
2. WT ~ 21 LB PER REF 4.

FIGURE 2

EQE INTERNATIONAL

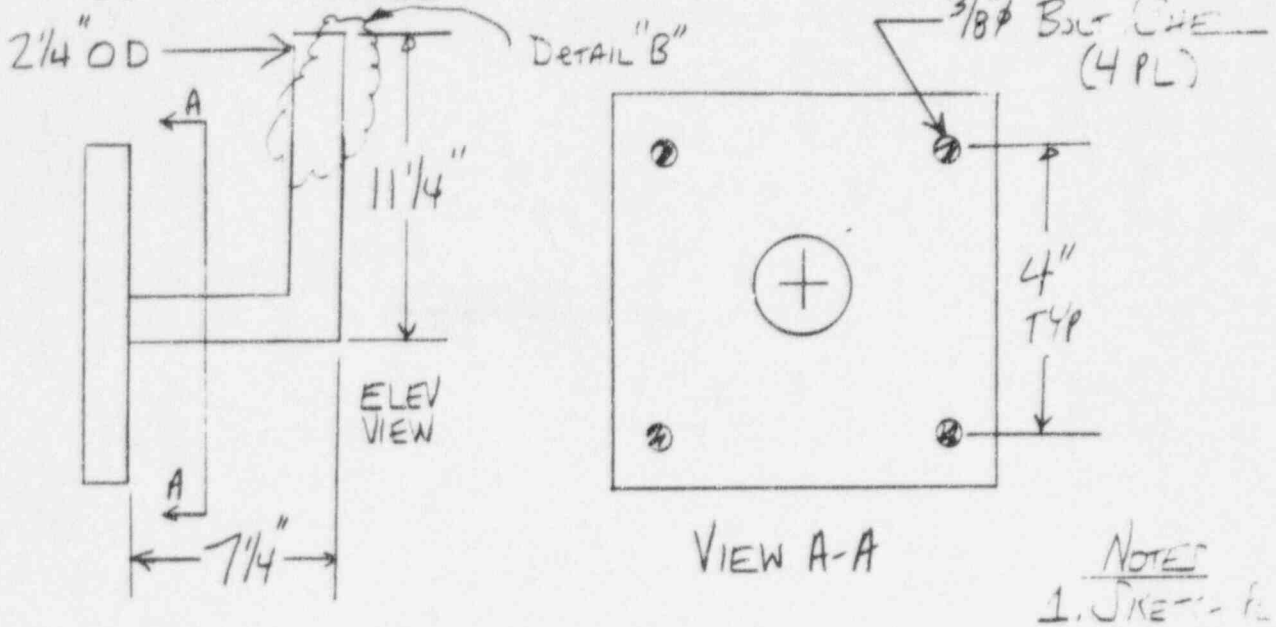
SHEET NO 10

JOB NO 52233 JOB DUQUESNE REFINERY POWER STATION BY CRM DATE 1-29-95

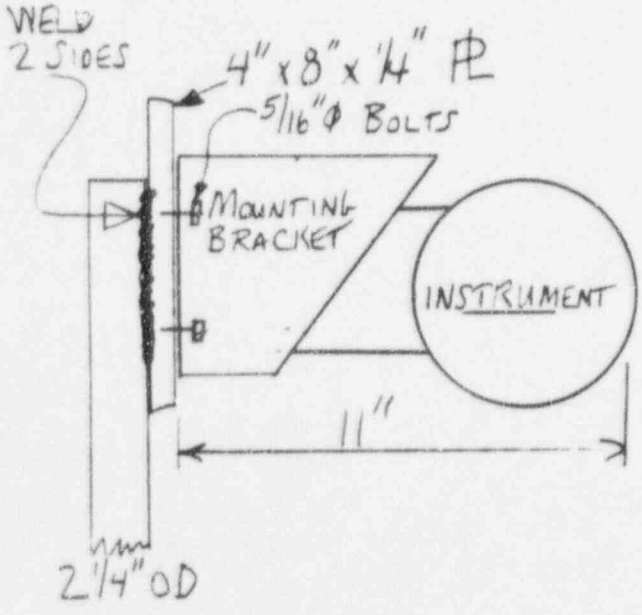
CALC NO 019 SUBJECT INSTRUMENTS CHK'D ~~DA~~ DATE 10/18/95

FT-CH-124 & -127 & -130

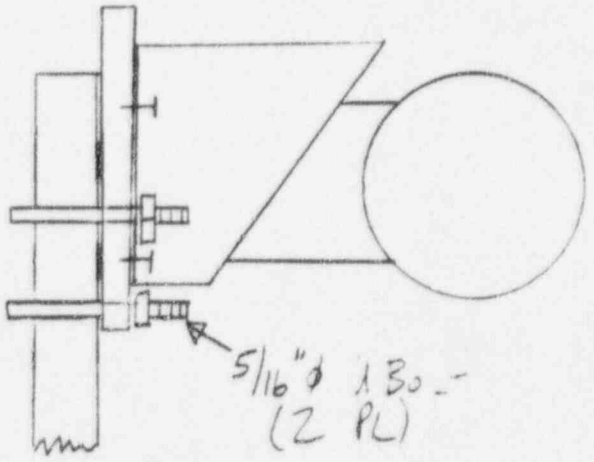
RACKMOUNT MODEL 115-HP4RB



NOTES
1. SKETCH FOR GENL.
2. WEIGHT EST ~20 LB



DETAIL "B"
ELEV VIEW
FT-CH-124 (WELD ~ 3¾" LONG)
FT-CH-127 (WELD ~ 3¼" LONG)
(PER SEWS-130)

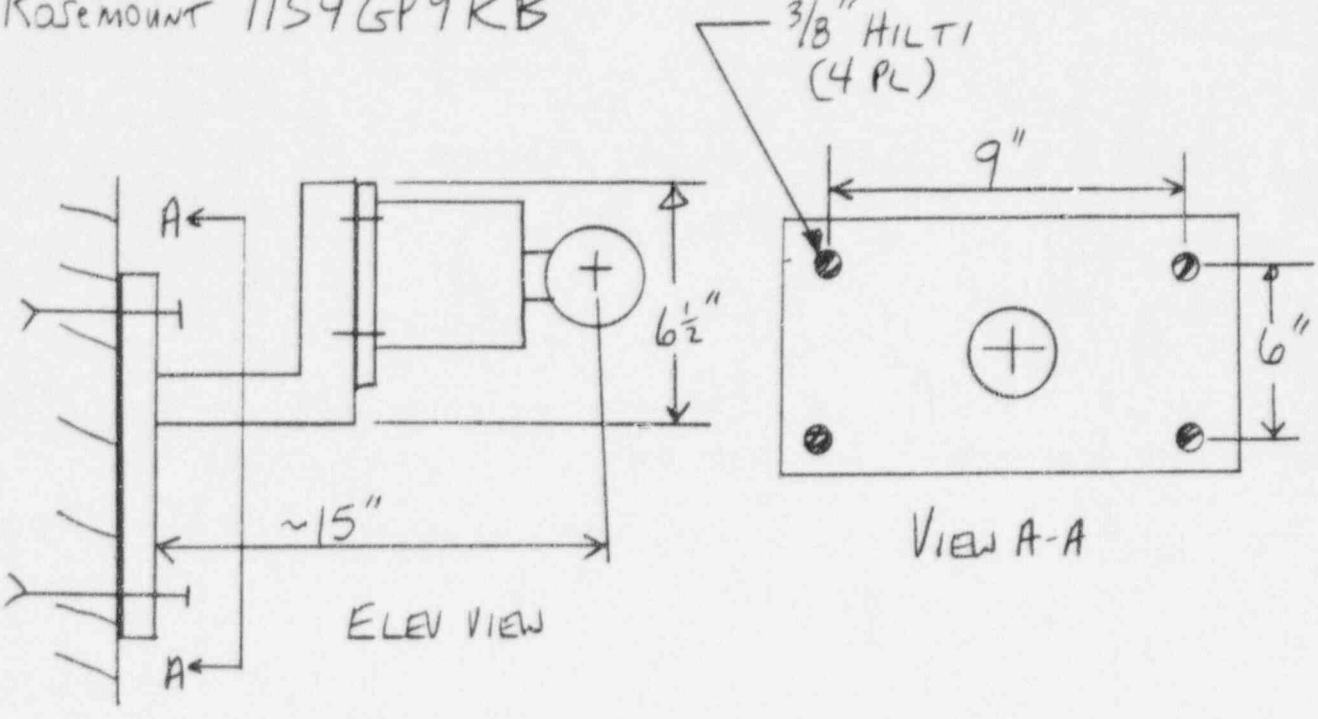


DETAIL "B"
ELEV VIEW
FT-CH-130

FIGURE 3

PT-RC-403

ROSEMOUNT 1154GP9RB



NOTES

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

FIGURE 4

EQE INTERNATIONAL

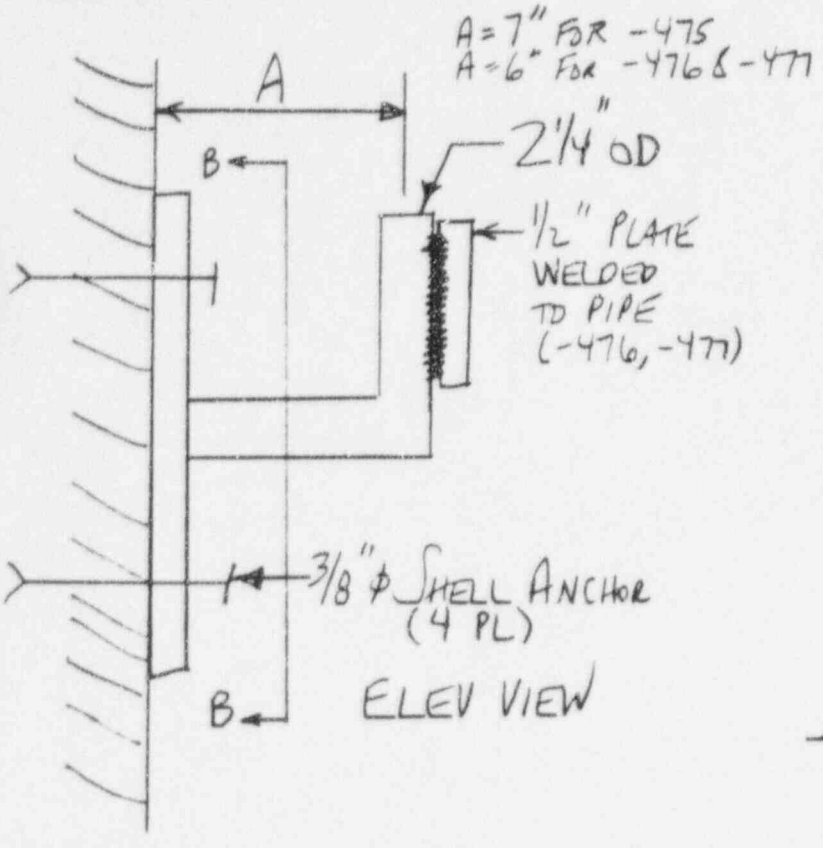
SHEET NO. 12

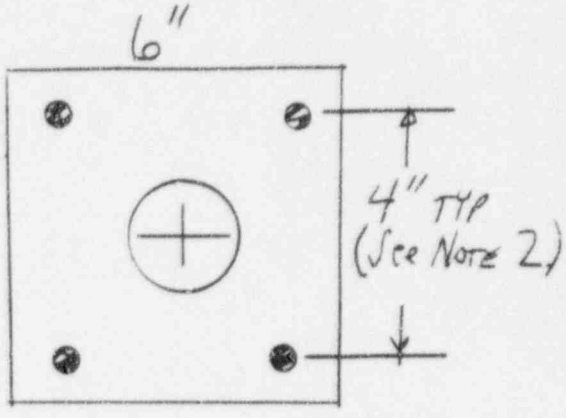
JOB NO 52233 JOB DUQUESNE BEAVER VALLEY POWER STATION BY CMM DATE 1-29-95

CALC. NO 019 SUBJECT INSTRUMENTS CHK'D ~~CM~~ DATE 2/16/95

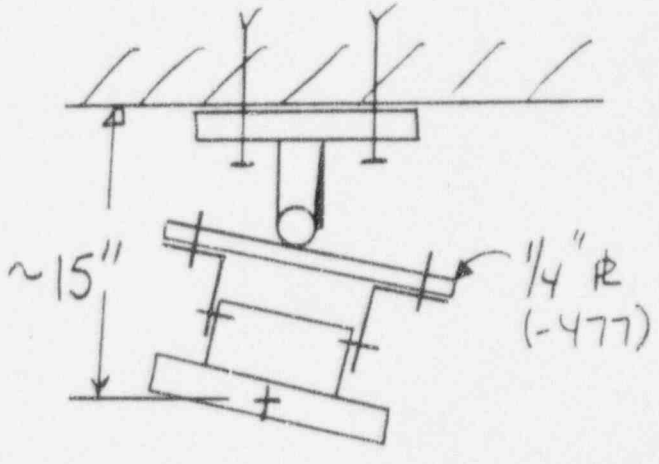
LT-FW-475 & -476 & -477

ITT BARTON MODEL # 764





VIEW B-B



PLAN VIEW

NOTES

1. SKETCH PER SEWS.
2. 4" IS TYPICAL OF OTHER INSTRUMENT BASE PLATES.
3. WT - 21 LB Per Ref 4.

FIGURE 5

EQE INTERNATIONAL

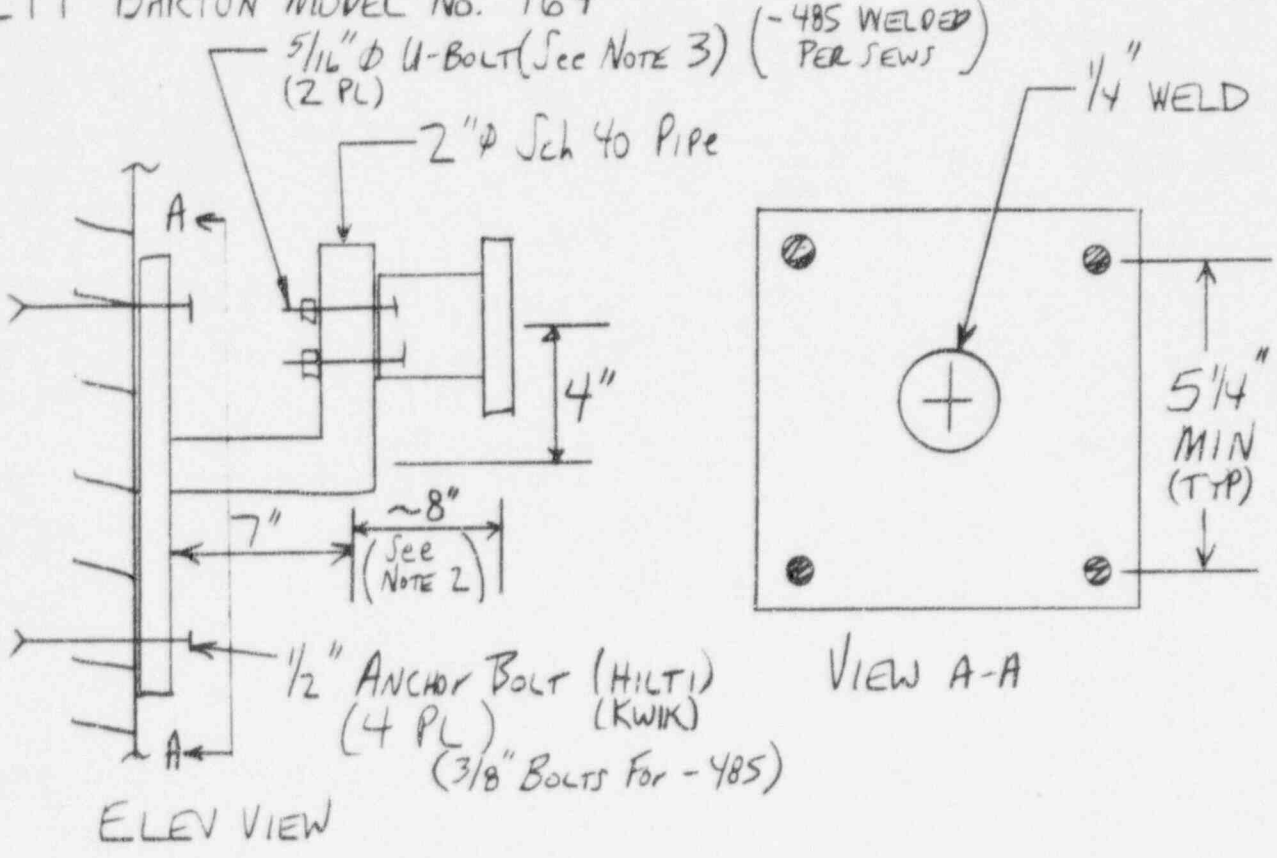
SHEET NO. 13

JOB NO 52233 JOB DUQUESNE BEAVER VALLEY POWER STATION BY [illegible] DATE 7-29-15

CALC. NO. 019 SUBJECT INSTRUMENTS CHK'D ~~DA~~ DATE 10/2/15

LT-FW-484 & -485 & -486 & -495

ITT BARTON MODEL No. 764



NOTES

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

FIGURE 6

EQE INTERNATIONAL

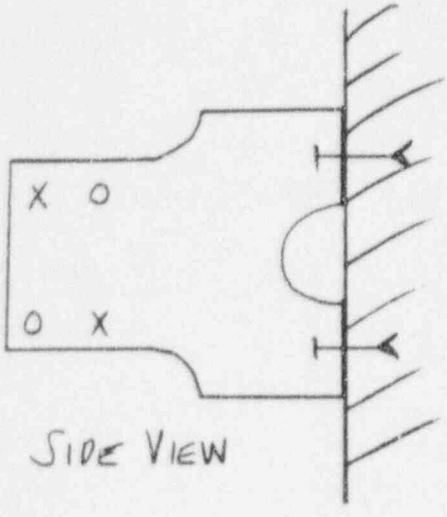
SHEET NO. 14

JOB NO 52233 JOB DUQUESNE BEAVER VALLEY POWER STATION BY CMM DATE 9-29-95

CALC NO. 019 SUBJECT INSTRUMENTS CHK'D ~~RM~~ DATE 10/18/95

LT-FW-474

ITT BARTON MODEL 764



SIDE VIEW

NOTES

1. SKETCH PER SEWS.
2. STANDARD 6"x6"x½" BASEPLATE WITH 4 3/8"Ø SHELL ANCHORS.
3. WE = 21 LBS PER REF 4 (SIMILAR TO FT-FW-100A)
4. INSTRUMENT IS WALL-MOUNTED PER SEWS.

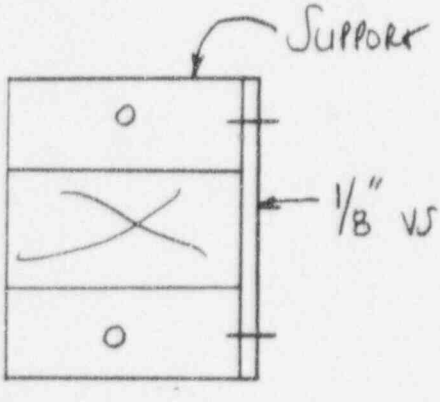


FIGURE 7

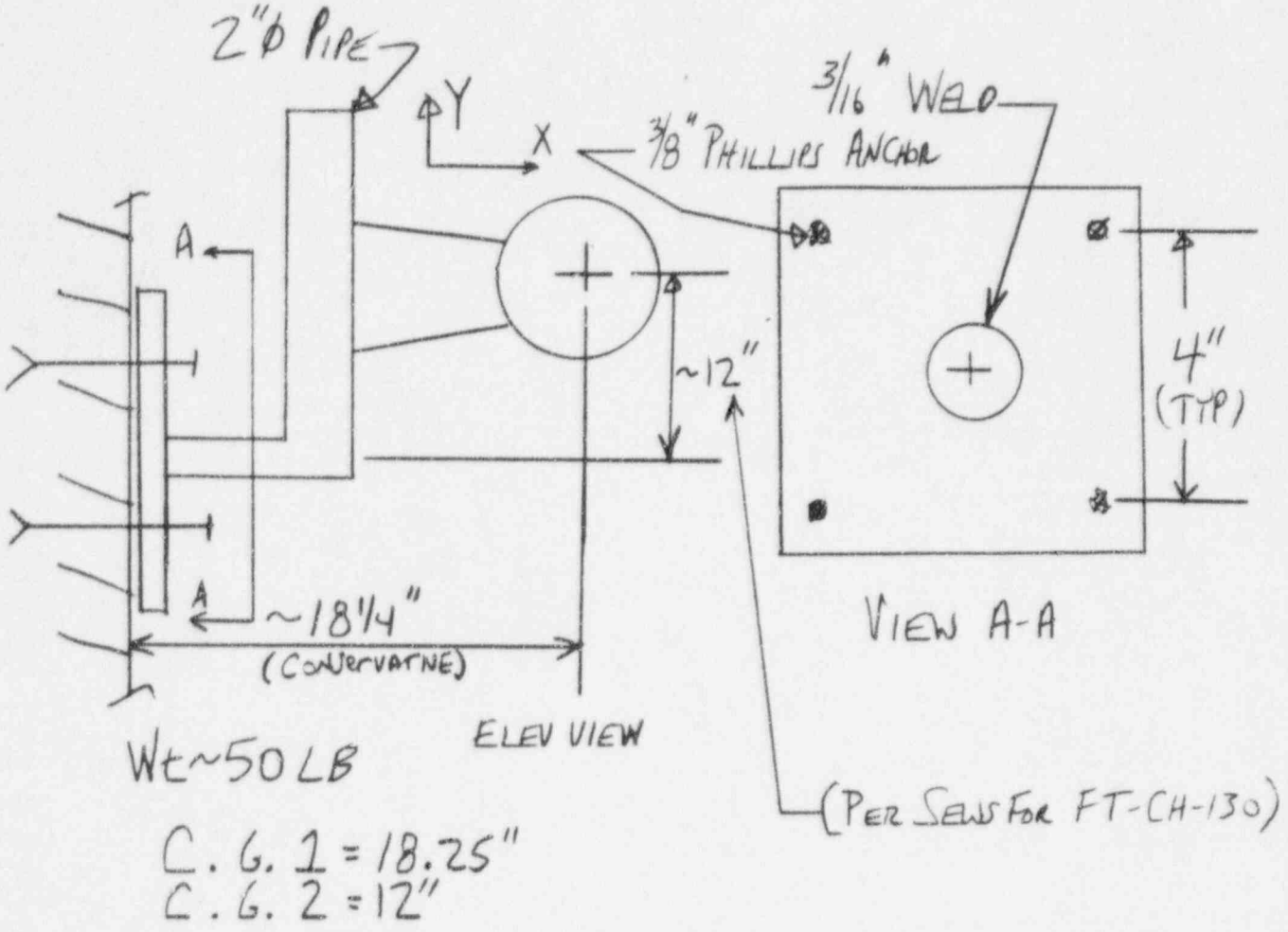


FIGURE 8
BOUNDING CONFIGURATION
for
FIGURES 1 THRU 7

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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

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

-- X-DIRECTION:

$Xaxial := \frac{WT \cdot ah}{Aw}$ Xaxial = 6

$BEND\_X := \frac{WT \cdot CG2 \cdot ah}{Sw}$ BEND_X = 151

SHR_X := 0 SHR_X = 0

-- Y-DIRECTION:

Yaxial := 0 Yaxial = 0

$BEND\_Y := \frac{WT \cdot CG1 \cdot av}{Sw}$ BEND_Y = 153

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$$SHR\_Y = \frac{WT \cdot av}{Aw} \qquad SHR\_Y = 4$$

-- Z-DIRECTION:

$$Zaxial = 0 \qquad Zaxial = 0$$

$$BEND\_Z = \frac{WT \cdot CG1 \cdot ah}{Sw} \qquad BEND\_Z = 229 \quad \text{(about Y axis)}$$

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

$$SHR\_Z = \frac{WT \cdot ah}{Aw} \qquad SHR\_Z = 6$$

-- DEAD LOAD:

$$BENDdl = \frac{WT \cdot CG1}{Sw} \qquad BENDdl = 290$$

$$SHRdl = \frac{WT}{Aw} \qquad SHRdl = 8$$

----- COMBINE WELD STRESSES:

-- X-DIRECTION:

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

(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).

-- Y-DIRECTION:

$$WELDy = SHR\_Y + SHRdl \qquad WELDy = 12$$

-- Z-DIRECTION:

$$WELDz = TORSION\_Z + SHR\_Z \qquad WELDz = 82$$

-- COMBINED STRESS ON THE WELD:

$$f = \sqrt{(WELDx^2 + WELDy^2 + WELDz^2)} \qquad f = 606$$

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

$$SIZEmin = \frac{f}{9600} \qquad SIZEmin = 0.063$$

$$SAFETY\_FACTOR = \frac{\frac{3}{16}}{SIZEmin} \qquad SAFETY\_FACTOR = 3 \quad \text{or} \quad \frac{1}{SAFETY\_FACTOR} = 0.34$$

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 COMPONENTS 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:

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

$$SHRx = 0 \cdot lb \qquad SHRx = 0 \cdot lb$$

-- Y-DIRECTION LOADS:

$$TENy := \frac{WT \cdot CG1 \cdot av}{(2 \cdot 4)} \cdot lb \qquad TENy = 60 \cdot lb$$

$$SHRy := \frac{WT \cdot av}{4} \cdot lb \qquad SHRy = 7 \cdot lb$$

-- Z-DIRECTION LOADS:

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

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

-- DEAD LOADS:

$$TENdl := \frac{WT \cdot CG1}{(2 \cdot 4)} \cdot lb \qquad TENdl = 114 \cdot lb$$

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$SHRdl := \frac{WT}{4} \cdot lb$ $SHRdl = 13 \cdot lb$

-- 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:

$Pnom := 1460 \cdot lb$ $Vnom := 1420 \cdot lb$

-- 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:

$Pallow := Pnom$ $Pallow = 1460 \cdot lb$

$Vallow := Vnom$ $Vallow = 1420 \cdot lb$

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

$\frac{P}{Pallow} + \frac{V}{Vallow} = 0.2 < 1.0$ 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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-- 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:

$$Pallow = 1170 \cdot \left(\frac{4}{4.375}\right) \cdot lb \qquad Pallow = 1070 \cdot lb$$

$$Vallow = 1175 \cdot \left(\frac{4}{4.375}\right) \cdot lb \qquad Vallow = 1074 \cdot lb$$

-- 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:

$$P := 4 \cdot P \qquad P = 860 \cdot lb$$

$$V := 4 \cdot V \qquad V = 149 \cdot lb$$

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

$$\left(\frac{P}{Pallow}\right)^{\frac{5}{3}} + \left(\frac{V}{Vallow}\right)^{\frac{5}{3}} = 0.73 < 1.0 \quad \text{OK} \quad \text{(MASONRY BLOCK WALL)}$$

THE MASONRY BLOCK WALL HAS BEEN SHOWN TO HAVE ADEQUATE CAPACITY TO ANCHOR THE BOUNDING CONFIGURATION INSTRUMENT INSTALLATION.

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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".

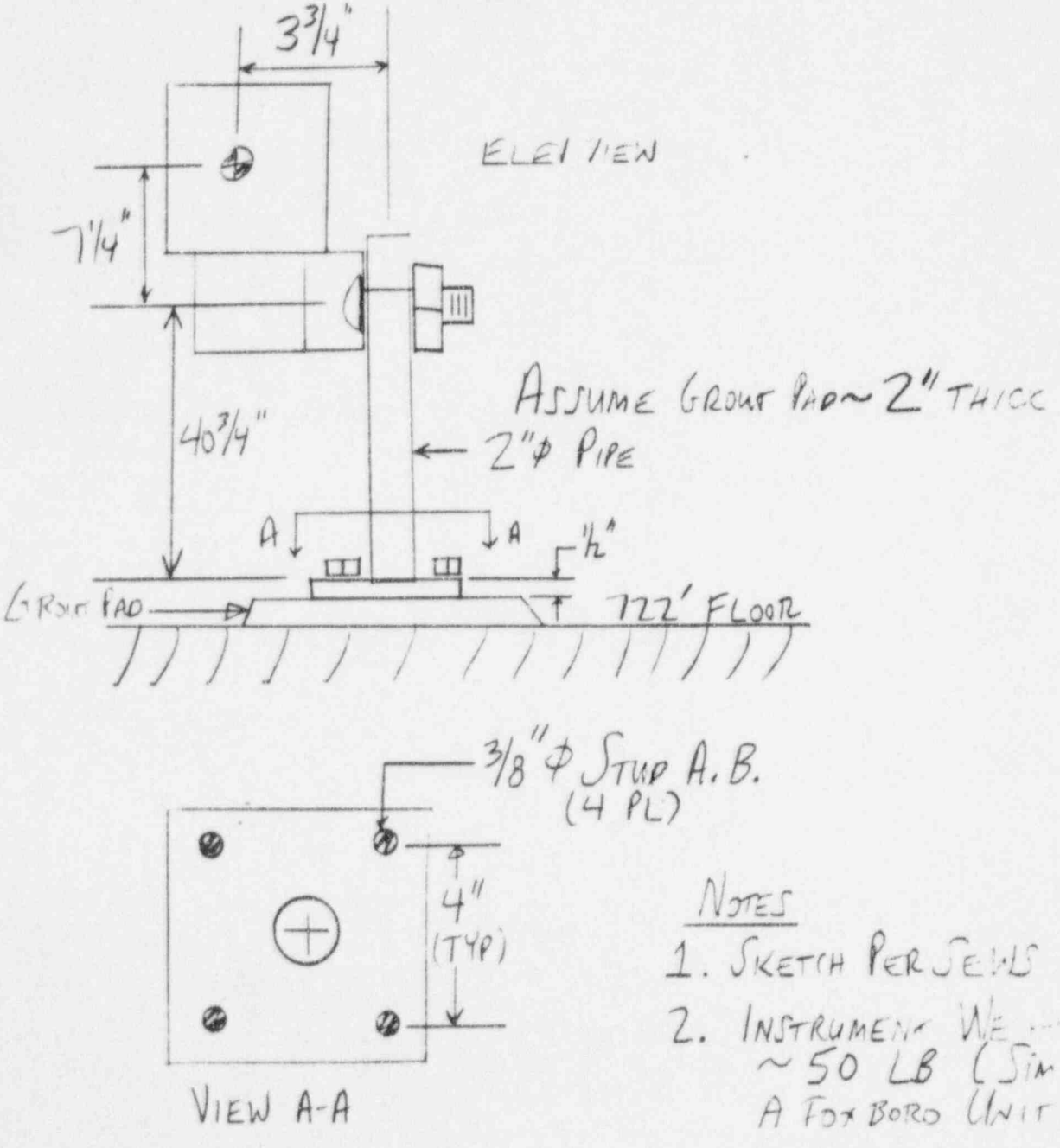
-- GROUT PAD MAXIMUM THICKNESS ASSUMED TO BE 2".

-- 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.

FT-CH-122

FISHER & PORTER MODEL 10B2495PB N/C



NOTES

1. SKETCH PER SEALS
2. INSTRUMENT WEIGHT EST ~ 50 LB (SIMILAR TO FOXBORO UNIT)

FIGURE 9

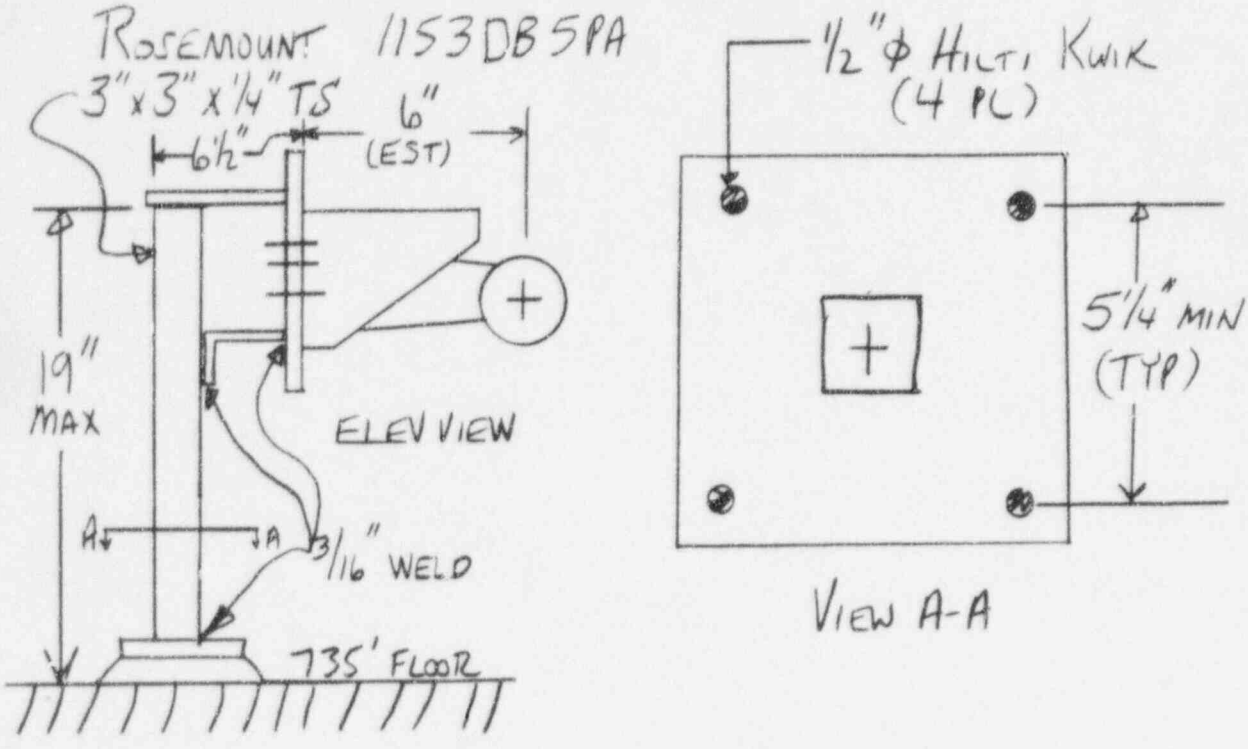
EQE INTERNATIONAL

SHEET NO 23

JOB NO 52233 JOB DUQUESNE BEAVER VALLEY POWER STATION BY CRM DATE 9-29-95

CALC NO 019 SUBJECT INSTRUMENTS CHK'D ~~DA~~ DATE 10/11/2?

LT-WT-104A1 & -104A2



NOTES

1. SKETCH PER REF 6 (-104A1) & Ref 7(-104A2).
2. Wt ~ 20 LB (ESTIMATED)

FIGURE 10

EQE INTERNATIONAL

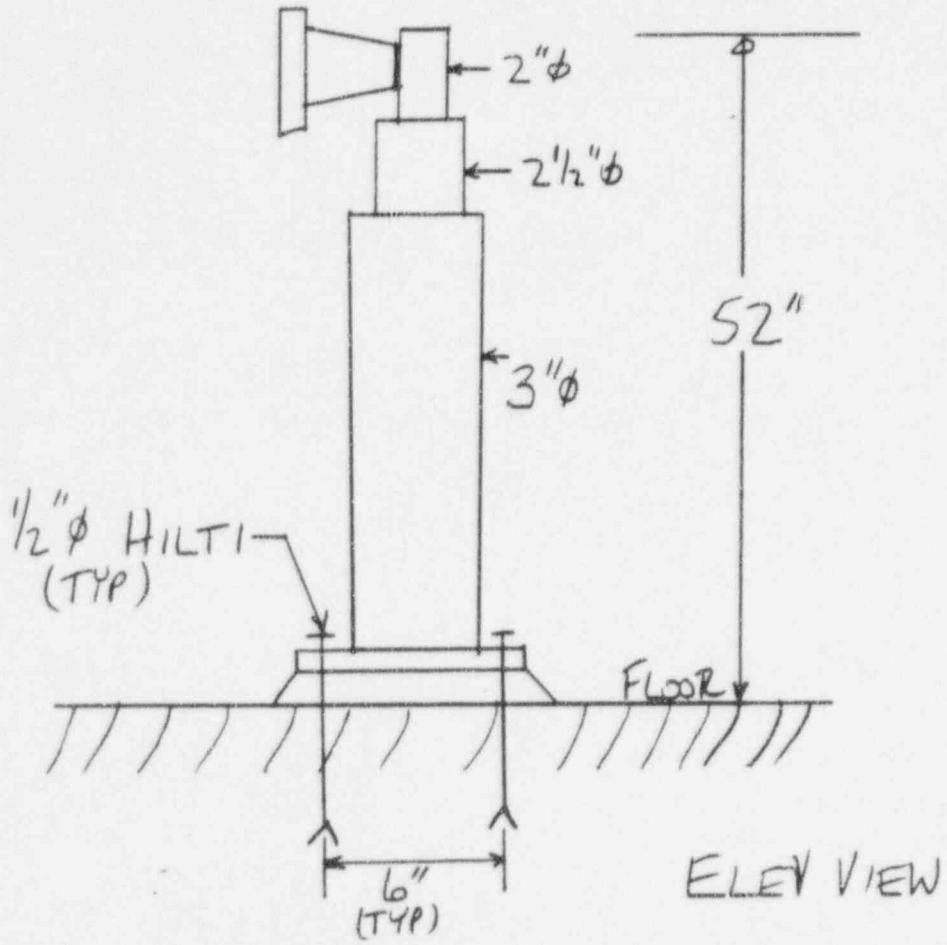
SHEET NO. 24

JOB NO. 52233 JOB DUQUESNE BEAVER VALLEY POWER STATION BY [illegible] DATE 9-29-15

CALC. NO. 019 SUBJECT INSTRUMENTS CHK'D [illegible] DATE 10/8/15

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

ITT-BARTON MODEL 764

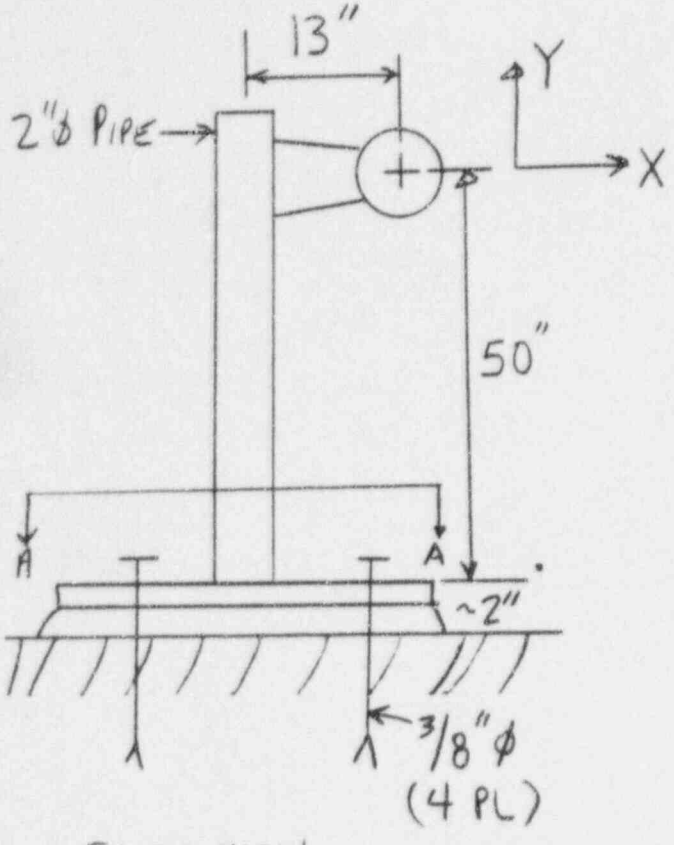


ELEV VIEW

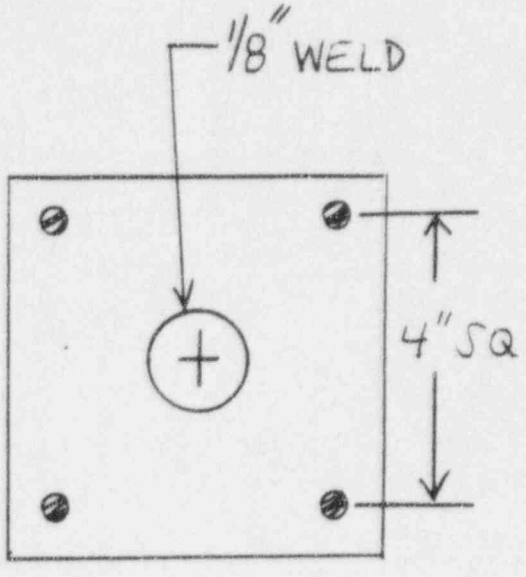
NOTES

1. SKETCH PER SEWS
2. WEIGHT ~21 LB PER REF 4.
   MODEL # 764 PER REF 4.

FIGURE 11



ELEV VIEW



VIEW A-A

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

FIGURE 12
BOUNDING CONFIGURATION
FOR
FIGURES 9 THRU 11

Job No.: 52233 Job: Duquesne Beaver Valley Power Station By: [illegible] Date: 9/29/95
Calc No.: 019 Chk: [illegible] Date: 11-22-95
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:

$SHR\_Y := 0$ $SHR\_Y = 0$

$BEND\_Y := \frac{WT \cdot CG2 \cdot av}{Sw}$ $BEND\_Y = 95$

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

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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)

$TORSION\_Z := \frac{\left[(WT \cdot CG2 \cdot ah) \cdot \left[(2) \cdot \frac{1}{2}\right]\right]}{Jw}$ $TORSION\_Z = 71$ (about Y axis)

$SHR\_Z := \frac{WT \cdot ah}{Aw}$ $SHR\_Z = 5$

-- DEAD LOAD:

$BENDdl := \frac{WT \cdot CG2}{Sw}$ $BENDdl = 207$

$AXIALdl := \frac{WT}{Aw}$ $AXIALdl = 8$

$SHRdl := 0$ $SHRdl = 0$

----- 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:

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

-- COMBINED STRESS ON THE WELD:

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

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Calc No.: 019 Chk: [illegible] Date: 11-22-95
Subject: Anchorage Evaluation for Various Instruments

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

$$SIZEmin := \frac{f}{9600} \qquad SIZEmin = 0.089$$

$$SAFETY\_FACTOR := \frac{\frac{1}{8}}{SIZEmin} \qquad SAFETY\_FACTOR = 1.41 \quad \text{or} \quad \frac{1}{SAFETY\_FACTOR} = 0.71$$

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:

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

$$SHRx := \frac{WT \cdot ah}{4} \cdot lb \qquad SHRx = 9 \cdot lb$$

-- 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:

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

$$SHRz := \left[\frac{WT \cdot CG2 \cdot ah}{4 \cdot \sqrt{\left(4^2 + 4^2\right)}} + \frac{WT \cdot ah}{4}\right] \cdot lb \qquad SHRz = 28 \cdot lb \quad \text{(Torsional and average shear)}$$

-- DEAD LOADS:

$$TENdl := \left(\frac{WT \cdot CG2}{2 \cdot 4} - \frac{WT}{4}\right) \cdot lb \qquad TENdl = 69 \cdot lb$$

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

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-- COMBINE ANCHOR BOLT LOADS:

$$P := \sqrt{TENx^2 + TENy^2 + TENz^2} + TENdl \qquad P = 377 \cdot lb$$

$$V := \sqrt{SHRx^2 + SHRy^2 + SHRz^2} + SHRdl \qquad V = 30 \cdot lb$$

-- 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:

$$Pnom := 1460 \cdot lb \qquad Vnom := 1420 \cdot lb$$

-- 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:

$$Pallow := Pnom \cdot 0.6 \qquad Pallow = 876 \cdot lb$$

$$Vallow := Vnom \cdot 0.6 \qquad Vallow = 852 \cdot lb$$

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

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

EQE INTERNATIONAL

SHEET NO. 30

JOB NO. 52233 JOB DUQUESNE BEAVER VALLEY POWER STATION BY RC DATE 11-30-95

CALC NO. 019 SUBJECT QS-RACK-4 CHK'D CRM DATE 11-30-95

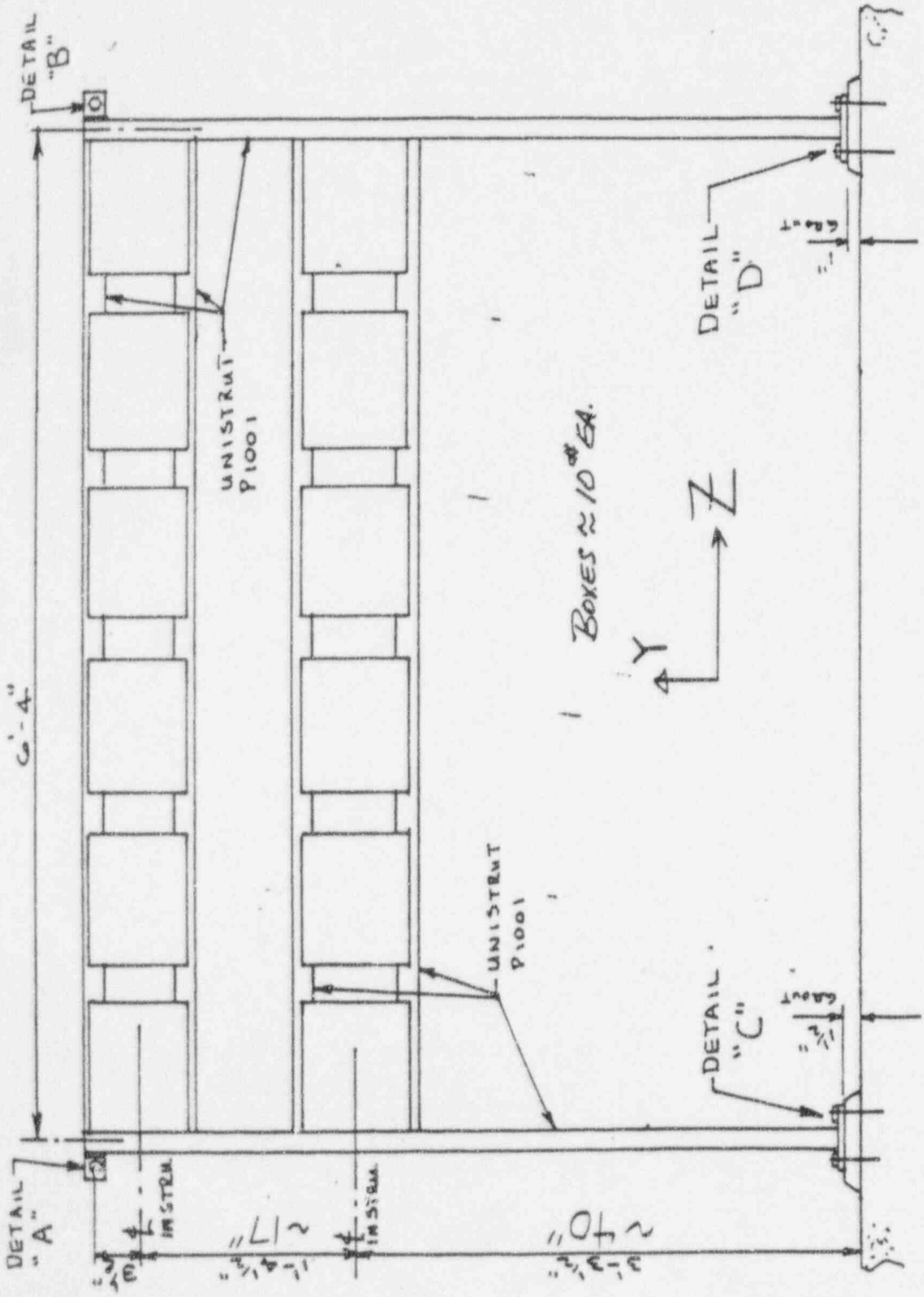
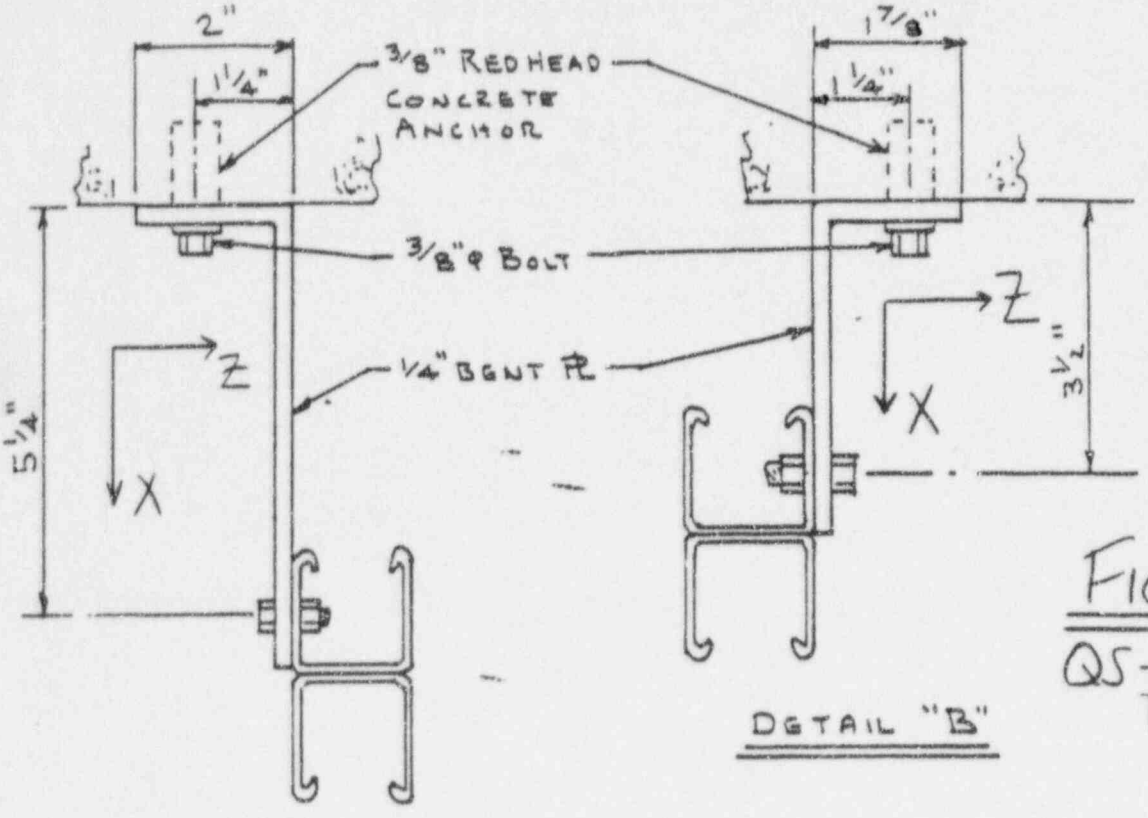


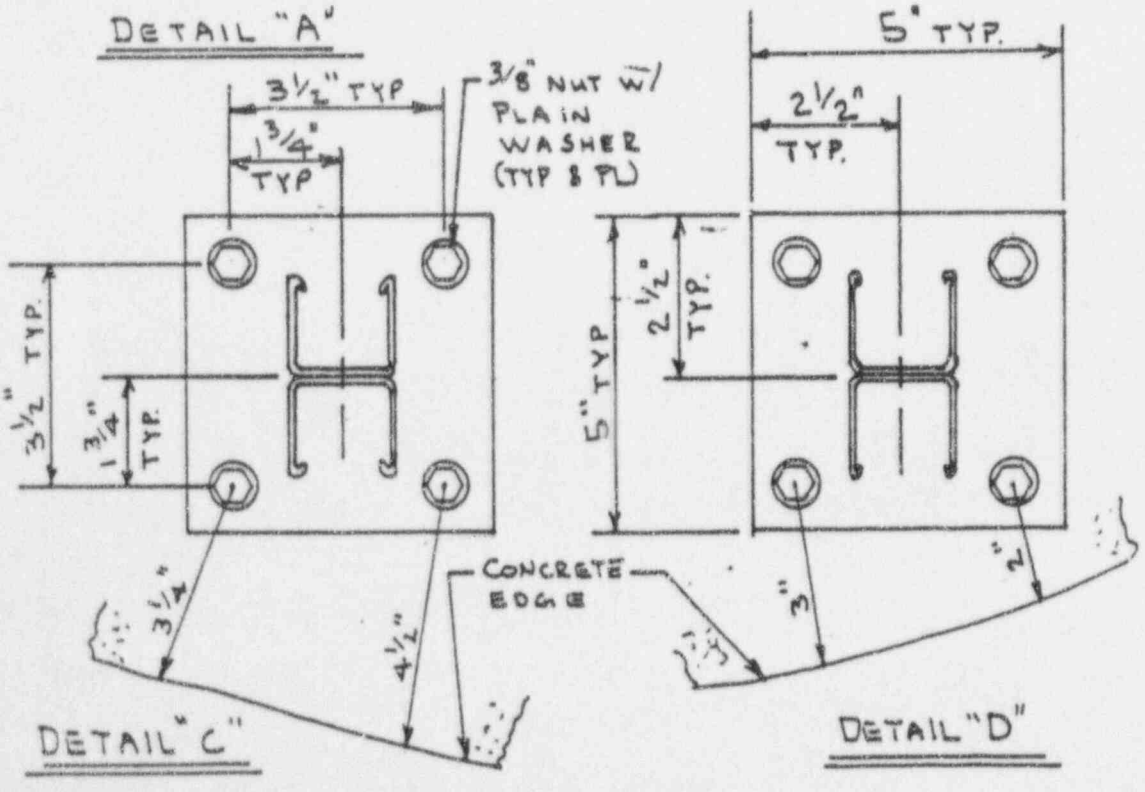
FIGURE 13
QS-RACK-4
LAYOUT



DETAIL "B"

FIGURE 14

QS-RACK-4 DETAILS



Job No.: 52233 Job: Duquesne Beaver Valley Power Station By: RC Date: 11-30-95
Calc No.: 019 Chk: CMM Date: 11-30-95
Subject: Anchorage Evaluation for Various Instruments

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:

$UPPERROW := 6 \cdot 10 \cdot lb$ $\quad UPPERROW = 60 \cdot lb$

$LOWERROW := 6 \cdot 10 \cdot lb$ $\quad LOWERROW = 60 \cdot lb$

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

-- 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:

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

$SHRx := 0 \cdot lb$ $\quad SHRx = 0 \cdot lb$

-- 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.

$TENy := 0 \cdot lb$ $\quad SHRy := 0 \cdot lb$

Job No.: 52233 Job: Duquesne Beaver Valley Power Station By: RL Date: 11-30-95
Calc No.: Q19 Chk: [illegible] Date: 11-30-95
Subject: Anchorage Evaluation for Various Instruments

-- 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.

$TENz := 0 \cdot lb$

$SHRz := \frac{UPPERROW \cdot ah + LOWERROW \cdot ah}{2}$ $SHRz = 20 \cdot lb$

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

$TENdl := 0 \cdot lb$ $SHRdl := 0 \cdot lb$

-- COMBINE ANCHOR BOLT LOADS:

$P := \sqrt{TENx^2 + TENy^2 + TENz^2} + TENdl$ $P = 16 \cdot lb$

$V := \sqrt{SHRx^2 + SHRy^2 + SHRz^2} + SHRdl$ $V = 20 \cdot lb$

-- 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:

$Pnom := 1460 \cdot lb$ $Vnom := 1420 \cdot lb$

-- 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.

$Pallow := Pnom$ $Pallow = 1460 \cdot lb$

$Vallow := Vnom$ $Vallow = 1420 \cdot lb$

---- 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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Calc No.: 019 Chk: CM Date: 11-30-95
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3.3 ~~INTERACTION~~ ANCHORAGE (1) EVALUATION FOR QS-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 PROTECTION, AND IS A WOODEN FRAMEWORK COVERED WITH VISQUEEN. AS SUCH, IT IS NOT CONSIDERED TO BE A RUGGED STRUCTURE NOR SEISMICALLY ADEQUATE.

THIS ITEM IS CONSIDERED TO BE AN OUTLIER. (1)

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Calc No.: 019 Chk: [illegible] Date: 11-30-95
Subject: Anchorage Evaluation for Various Instruments

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.

Job No.: 52233 Job: Duquesne Beaver Valley Power Station By: RL Date: 11-30-95
Calc No.: 019 Chk: [illegible] Date: 11-30-95
Subject: Anchorage Evaluation for Various Instruments

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	YARD/RWST	735

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 ~~RACK~~ QS-RACK-3 WAS SHOWN ~~TO BE~~ AN OUTLIER BASED ON THE INTERACTION CONCERN. 1

Job No.: 52233 Job: Duquesne Beaver Valley Power Station By: RL Date: 11-30-95
Calc No.: 019 Chk: CPM Date: 11-30-95
Subject: Anchorage Evaluation for Various Instruments

b. △ THE FOLLOWING INSTRUMENTS 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
QS-RACK-3	YARD/RWST	735 △

Job No.: 52233 Job: Duquesne Beaver Valley Power Station By: [illegible] Date: 9-19-95

Calc No.: 019 Chk: [illegible] Date: [illegible]

Subject: Anchorage Evaluation for Various Instruments

Attachment A

SEWS SHEETS FOR INSTRUMENTS

(152 pages in Attachment A)

E2233-C-5 A F1 A2
Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. FT-CH-122 Equip. Class 18 - Instruments on Racks

Equipment Description CH/CHARGING HEADER FLOW TRANSMITTER

Location: Bldg. AXLB Floor El. 722 Room, Row/Col BLENDER COL 10-1/4 & J

Manufacturer, Model, Etc. (optional) FISHER PORTER MODEL 10B2496PB N/S

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		722'-0
2.	Elevation of seismic input below about 40' from grade		(Y) 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.	Demand based on:	Ground Response Spectrum	GRS
		1.5 x Bounding Spectrum	(ABS)
		Conserv. Des. In-Str. Resp. Spec.	(CRS)
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

Does capacity exceed demand? (Y) N U

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	(Y) N U N/A
2.	No computers or programmable controllers	Y N U (N/A)
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or 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	Y N U (N/A)
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	Y N (U) N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

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
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
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? Y N U N/A

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	Y	N	(U)	N/A **
2.	Type of anchorage covered by GIP	(Y)	N	U	N/A
3.	Sizes and locations of anchors determined	(Y)	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 concrete cracking	(Y)	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 under base, capacity reduction for expansion anchors	Y	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 to CG adequate	(Y)	N	U	N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	(Y)	N	U	N/A

Are anchorage requirements met? Y N (U)

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	Y	N	U	(N/A)
3.	Attached lines have adequate flexibility	(Y)	N	U	N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 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 (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? Y N (U)

COMMENTS

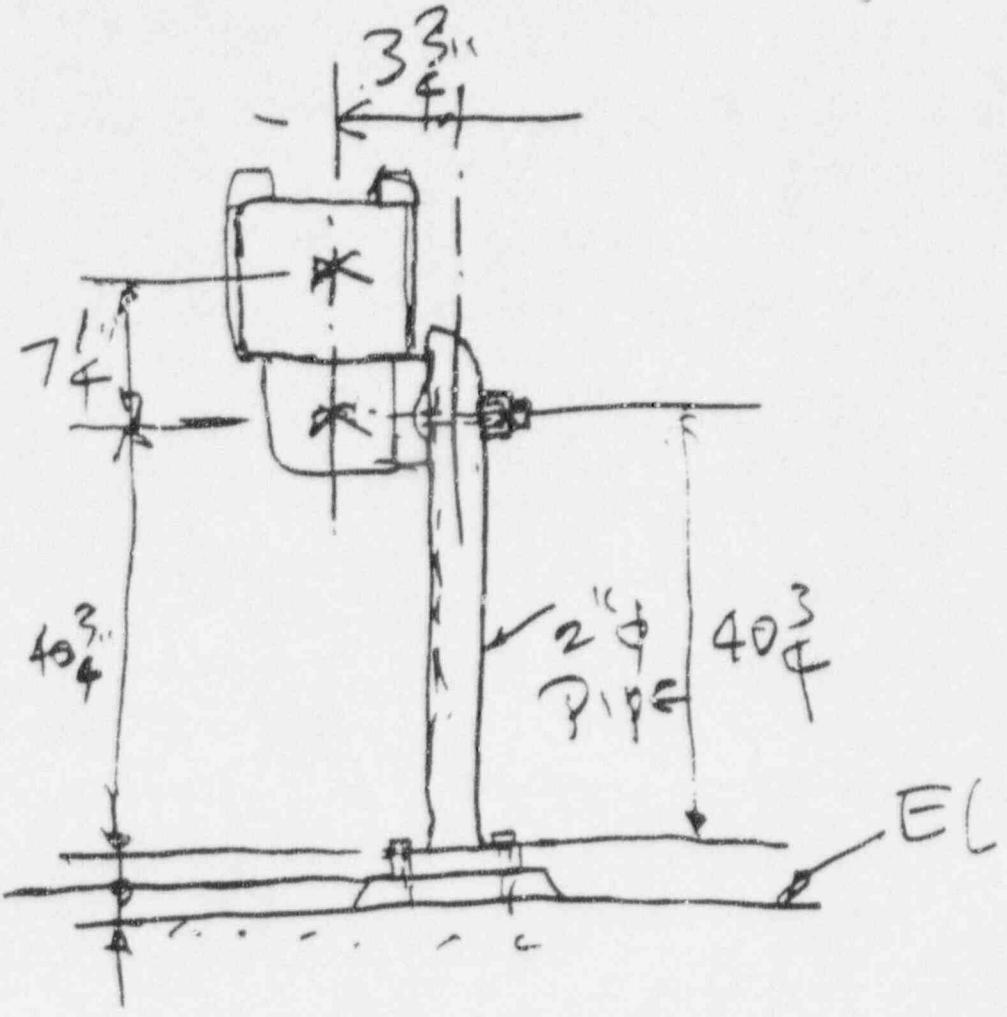
* - LIGHT FIXTURE OVERHEAD (O.K. BY ENGR JUDGEMENT)

** - NEED WT OF TRANS.

*** - TIGHTNESS CHK. REQ.

Evaluated by: Pat Pawlick Date: 5/10/93

W. Hwang 5/10/93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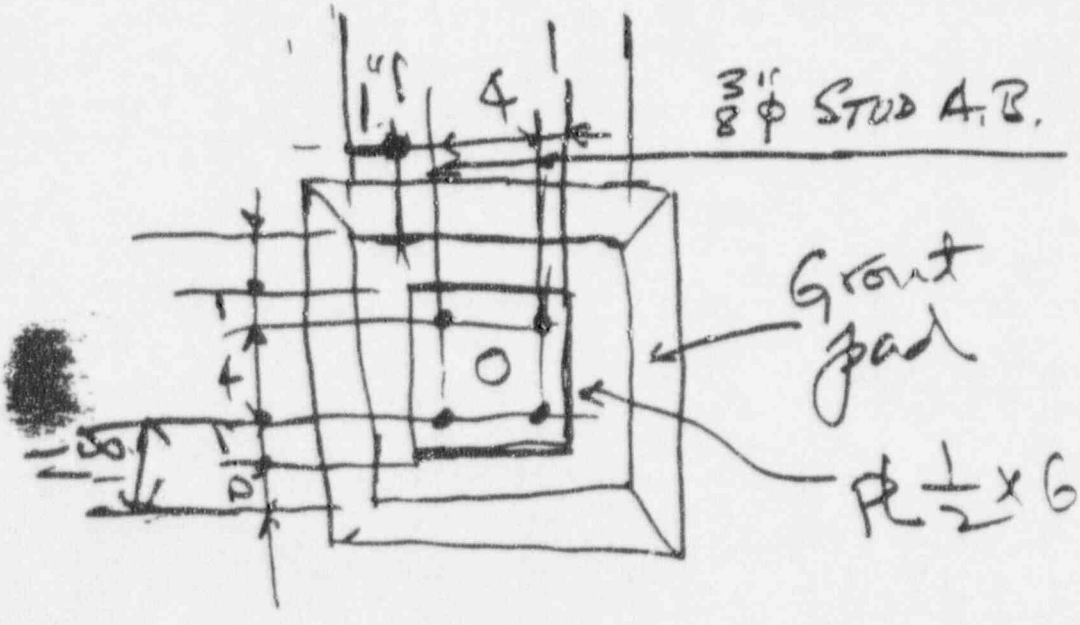
40 3/4"
2" ϕ PIPE
40 3/4"
EL 7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3/8" ϕ STUD A.B.
Grout pad
PL 1/2 x 6 x 6

52233-c-019 Pg A6
Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. FT-CH-124 Equip. Class 18 - Instruments on Racks

Equipment Description CH/RCP-1C SEAL INJECTION FLOW TRANSMITTER

Location: Bldg. SFGB Floor El. 722 Room, Row/Col PENT A

Manufacturer, Model, Etc. (optional) ROSEMOUNT MODEL 1154HP4RB

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input	727	
2.	Elevation of seismic input below about 40' from grade	(Y) 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.	Demand based on: Ground Response Spectrum	GRS	
	1.5 x Bounding Spectrum	ABS	
	Conserv. Des. In-Str. Resp. Spec.	CRS	
	Realistic M-Ctr. In-Str. Resp. Spec.	RRS	

Does capacity exceed demand? Y N U

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or 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	(Y) N U N/A
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	Y N (U) N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

Equip. ID No. FT-CH-124 Equip. Class 18 - Instruments on Racks

Equipment Description CH/RCP-1C SEAL INJECTION 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
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
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? Y N U N/A

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	(Y)	N	U	N/A
2.	Type of anchorage covered by GIP	Y	N	(U)	N/A
3.	Sizes and locations of anchors determined	(Y)	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 concrete cracking	(Y)	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 under base, capacity reduction for expansion anchors	(Y)	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 to CG adequate	(Y)	N	U	N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y	N	U	(N/A)

Are anchorage requirements met? Y N U

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	(Y)	N	U	N/A
3.	Attached lines have adequate flexibility	(Y)	N	U	N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. FT-CH-124 Equip. Class 18 - Instruments on Racks

Equipment Description CH/RCP-1C SEAL INJECTION FLOW TRANSMITTER

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? Y N U

COMMENTS

Evaluated by: GSR [signature] Date: 5/27/93

GTW [signature] 5/27/93

52233-C-019 Fig A-3

Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

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

Equipment Description CH/RCP-1B SEAL INJECTION FLOW TRANSMITTER

Location: Bldg. SFGB Floor El. 722 Room, Row/Col PENT A

Manufacturer, Model, Etc. (optional) ROSEMOUNT MODEL 1154HP4RB

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		727
2.	Elevation of seismic input below about 40' from grade		(Y) 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.	Demand based on:	Ground Response Spectrum	GRS
		1.5 x Bounding Spectrum	(ABS)
		Conserv. Des. In-Str. Resp. Spec.	(CRS)
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

Does capacity exceed demand? (Y) N U

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or 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	(Y) N U N/A
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	Y N U N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

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

Equipment Description CH/RCP-1B SEAL INJECTION 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
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
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? Y N U N/A

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	(Y)	N	U	N/A
2.	Type of anchorage covered by GIP	(Y)	N	U	N/A
3.	Sizes and locations of anchors determined	(Y)	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 concrete cracking	(Y)	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 under base, capacity reduction for expansion anchors	(Y)	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 to CG adequate	(Y)	N	U	N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y	N	U	(N/A)

Are anchorage requirements met? Y N U

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	(Y)	N	U	N/A
3.	Attached lines have adequate flexibility	(Y)	N	U	N/A

SCREENING EVALUATION WORK SHEET (SEWS) 52233-1-09 Sh A1
Sheet 3 of 3

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

Equipment Description CH/RCP-1B SEAL INJECTION FLOW TRANSMITTER

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? Y N U

COMMENTS

Evaluated by: GSR [signature] Date: 5/27/93

GTW [signature] 5/27/93

52233-C-019 Att 2

Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. FT-CH-130 Equip. Class 18 - Instruments on Racks

Equipment Description CH/RCP-1A SEAL INJECTION FLOW TRANSMITTER

Location: Bldg. SFGB Floor El. 722 Room, Row/Col PENT A

Manufacturer, Model, Etc. (optional) ROSEMOUNT MODEL 1154HP4RB

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		727
2.	Elevation of seismic input below about 40' from grade		(Y) 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.	Demand based on:	Ground Response Spectrum	GRS
		1.5 x Bounding Spectrum	(ABS)
		Conserv. Des. In-Str. Resp. Spec.	(CRS)
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

Does capacity exceed demand? (Y) N U

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or 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	(Y) N U N/A
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	Y N U N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

Equip. ID No. FT-CH-130 Equip. Class 18 - Instruments on Racks

Equipment Description CH/RCP-1A SEAL INJECTION 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
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
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? Y N U N/A

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	(Y)	N	U	N/A
2.	Type of anchorage covered by GIP	(Y)	N	U	N/A
3.	Sizes and locations of anchors determined	(Y)	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 concrete cracking	(Y)	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 under base, capacity reduction for expansion anchors	(Y)	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 to CG adequate	(Y)	N	U	N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y	N	U	(N/A)

Are anchorage requirements met? Y N U

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	(Y)	N	U	N/A
3.	Attached lines have adequate flexibility	(Y)	N	U	N/A

SCREENING EVALUATION WORK SHEET (SEWS) 52233-1-019 Sheet 3 of 3

Equip. ID No. FT-CH-130 Equip. Class 18 - Instruments on Racks

Equipment Description CH/RCP-1A SEAL INJECTION FLOW TRANSMITTER

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

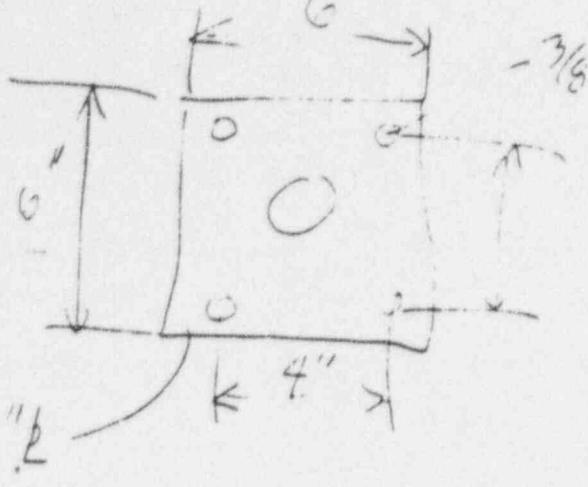
IS EQUIPMENT SEISMICALLY ADEQUATE? Y N U

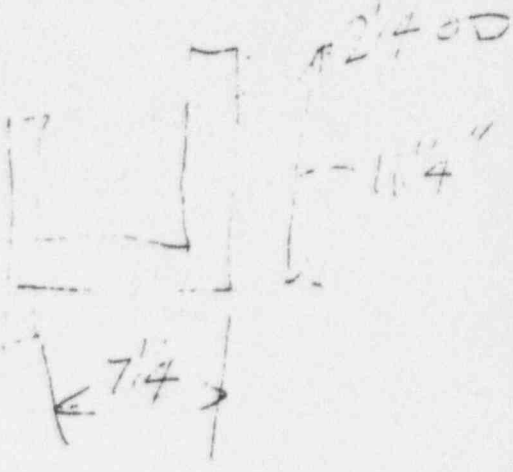
COMMENTS

Evaluated by: GSR [signature] Date: 5/27/93

GTW [signature] 5/27/93

5/27/93

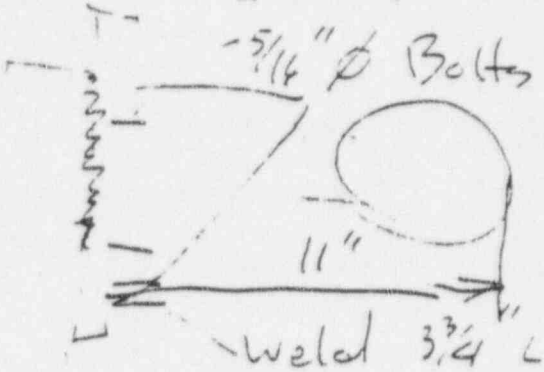


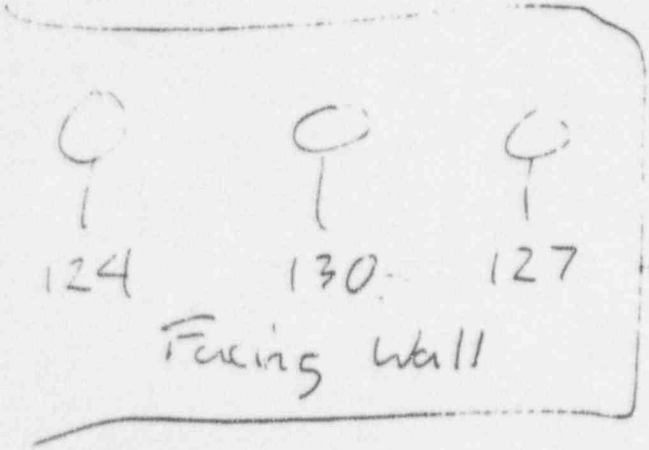


Mtd on Block Wall CU-1-

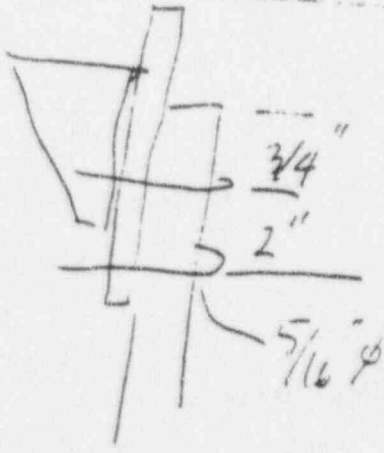
½" ℄ 4" x 6"

FT-CH-124
127
130





Pipe 124 - 3½" Lg
130 - U-Bolts



130

SSEL Line No. 3209A / 3208A
A

52233-C-010 Sh A 1.6

Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. FT-CH-150 Equip. Class 18 - Instruments on Racks

Equipment Description CH/LETDOWN FLOW TRANSMITTER

Location: Bldg. AXLB Floor El. 722 Room, Row/Col COL 11-1/2 & G

Manufacturer, Model, Etc. (optional but recommended) F120 FISHER & PORTER CO
MODEL # 10B2496 P13

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		722'-6"
2.	Elevation of seismic input below about 40' from grade		(Y) 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
		1.5 x Bounding Spectrum	(ABS)
		GERS	GERS
5.	Demand based on:	Ground Response Spectrum	GRS
		1.5 x Ground Response Spectrum	AGS
		Conserv. Des. In-Str. Resp. Spec.	(CRS)
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

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

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or 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	(Y)* N U (N/A)
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	(Y) N U N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	(Y) N U ~~N/A~~
2.	Meets all Bounding Spectrum caveats	(Y) N U N/A
3.	Component is a pressure, temperature, level or (flow) transmitter	(Y) N U N/A

SSEL Line No. 3208A

52233-C-SH PF A 7

SCREENING EVALUATION WORK SHEET (SEWS) 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 — 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
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) — Y N U (N/A)
9. Rack capable of structurally transferring 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 P.O

ANCHORAGE

1. Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation) — Y N (U) N/A
2. Type of anchorage covered by GIP RED-HEADS — (Y) N U N/A
3. Sizes and locations of anchors determined — (Y) N U N/A
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 No concrete cracking — Y 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 under base, capacity reduction for expansion anchors — Y 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 to CG adequate — (Y) N U N/A
10. Embedded steel, grout pad or large concrete pad adequacy evaluated — Y N U (N/A)

Are anchorage requirements met? — Y N U

INTERACTION EFFECTS

1. Soft targets free from impact by nearby equipment or structures — (Y) N U N/A 2
2. If equipment contains sensitive relays, equipment free from all impact by nearby equipment or structures — Y N U (N/A)
3. Attached lines have adequate flexibility — (Y) N U N/A

SSEL Line No. 3208A

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SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. FT-CH-150 Equip. Class 18 - Instruments on Racks

Equipment Description CH/LETDOWN FLOW TRANSMITTER

INTERACTION EFFECTS (Cont'd)

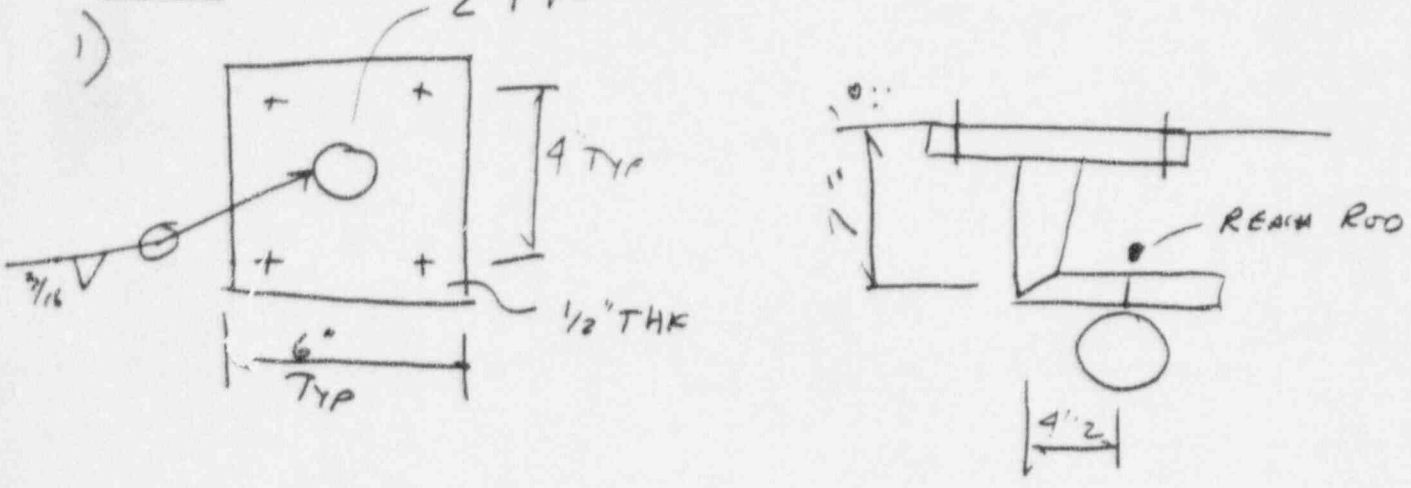
4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? Y N U

IS EQUIPMENT SEISMICALLY ADEQUATE? Y N U

COMMENTS

1)



2) REACH ROD ≈ 1/4" CLES - No interaction expected.

Evaluated by: Carm Marra Date: 5-24-94

Paul T. Davis MAY 1 - 5 3 1

52233-S-0-9

SSEL Line No. 4103A
A

Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. FT-FW-100A Equip. Class 18 - Instruments 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) I204 ITT-BARTON

SEISMIC CAPACITY VS DEMAND

1. Elevation where equipment receives seismic input: 735
2. Elevation of seismic input below about 40' from grade: (Y) 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
   - 1.5 x Bounding Spectrum: (ABS)
   - GERS: GERS
5. Demand based on:
   - Ground Response Spectrum: GRS
   - 1.5 x Ground Response Spectrum: AGS
   - Conserv. Des. In-Str. Resp. Spec.: (CRS)
   - Realistic M-Ctr. In-Str. Resp. Spec.: RRS

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

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: (Y) N U N/A
2. No computers or programmable controllers: (Y) N U N/A
3. Steel frame and sheet metal structurally adequate: (Y) N U N/A
4. Adjacent racks which are close enough to impact or 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: (Y) N U N/A
6. Attached lines have adequate flexibility: (Y) N U N/A
7. Anchorage adequate (See checklist below for details): (Y) N U N/A
8. Relays mounted on equipment evaluated: Y N U (N/A)
9. Have you looked for and found no other adverse concerns? (Y) N U N/A

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)

1. Equipment is included in the generic seismic testing equipment class: Y N U N/A
2. Meets all Bounding Spectrum caveats: Y N U N/A
3. Component is a pressure, temperature, level or flow transmitter: Y N U N/A

SSEL Line No. 4103A

52233-C-00 Pg A20

SCREENING EVALUATION WORK SHEET (SEWS) 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)	Y N U 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 amplification of floor 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	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)

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	(Y) N U N/A
2.	Type of anchorage covered by GIP	(Y) N U N/A
3.	Sizes and locations of anchors determined	(Y) N U N/A
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	(Y) 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 under base, capacity reduction for expansion anchors	Y 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 to CG adequate	(Y) N U N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y N U (N/A)

Are anchorage requirements met? (Y) N U

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	(Y) N U N/A
3.	Attached lines have adequate flexibility	(Y) N U N/A

SSEL Line No. 4103A

52233-F-09 Pg A21

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

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

Equipment Description FW/AUX FEED TO SGA TRANSMITTER

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

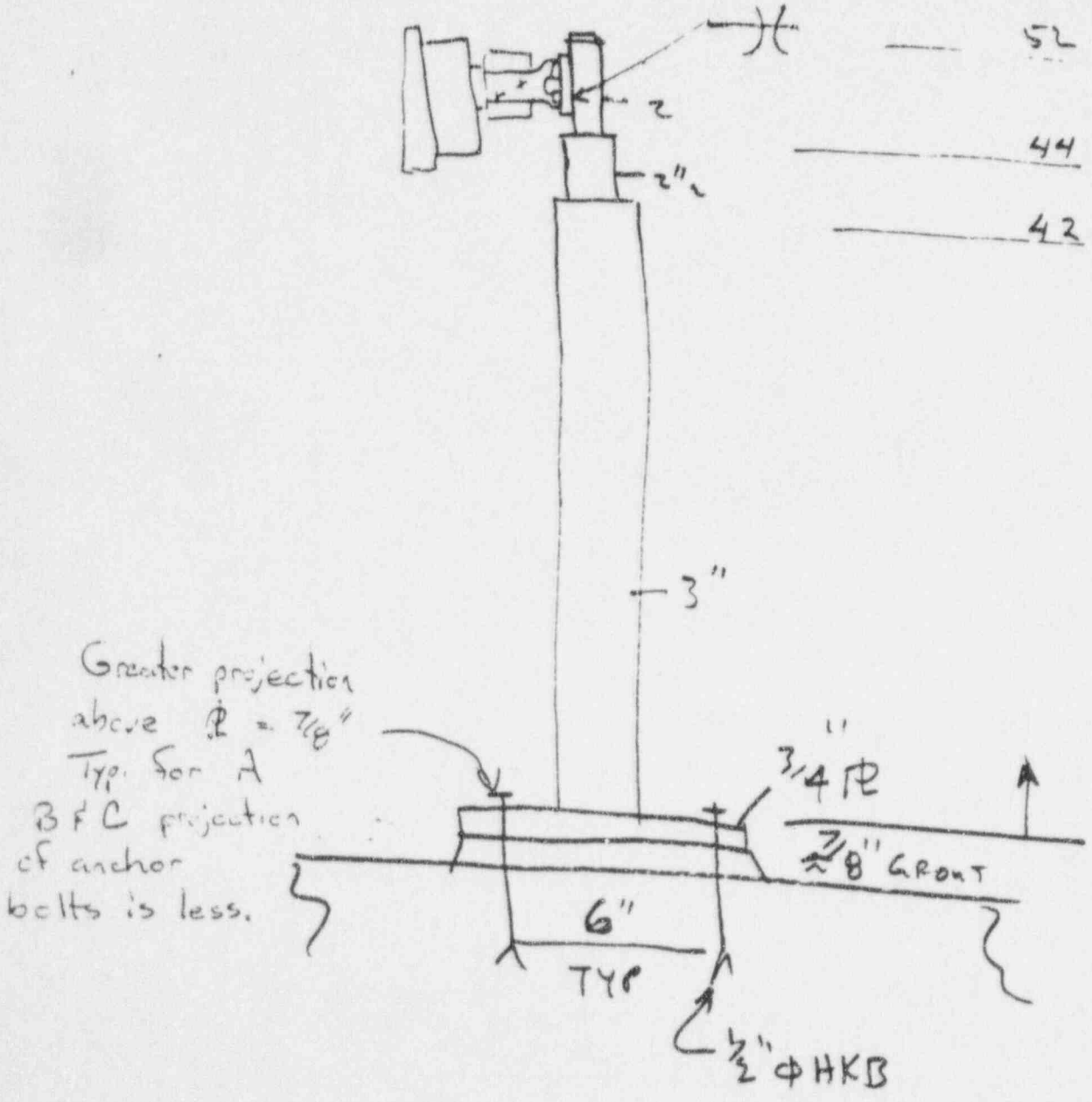
Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? (Y) N U

COMMENTS

Evaluated by: A. L. Woodbrook Date: 2/21/95

Paul V. Davis 2/21/95


52
44
42
2
2"
3"
Greater projection above ℄ = 7/8" Typ. for A B & C projection of anchor bolts is less.
3/4" ℄
≈ 3/8" GROUT
6"
TYP
½" ΦHKB

FT-FW-100A/B/C

SSEL Line No 4104A
A

Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

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

Equipment Description FW/AUX FEED TO SGB TRANSMITTER

Location: Bldg. SFGB Floor El. 735 Room, Row/Col AUX FEED PUMP

Manufacturer, Model, Etc. (optional but recommended) I204 ITT-BARTON

SEISMIC CAPACITY VS DEMAND

1. Elevation where equipment receives seismic input — 735
2. Elevation of seismic input below about 40' from grade — (Y) 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
   - 1.5 x Bounding Spectrum — (ABS)
   - GERS — GERS
5. Demand based on:
   - Ground Response Spectrum — GRS
   - 1.5 x Ground Response Spectrum — AGS
   - Conserv. Des. In-Str. Resp. Spec. — (CRS)
   - Realistic M-Ctr. In-Str. Resp. Spec. — RRS

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

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 — (Y) N U N/A
2. No computers or programmable controllers — (Y) N U N/A
3. Steel frame and sheet metal structurally adequate — (Y) N U N/A
4. Adjacent racks which are close enough to impact or 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 — (Y) N U N/A
6. Attached lines have adequate flexibility — (Y) N U N/A
7. Anchorage adequate (See checklist below for details) — (Y) N U N/A
8. Relays mounted on equipment evaluated — Y N U (N/A)
9. Have you looked for and found no other adverse concerns? — (Y) N U N/A

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)

1. Equipment is included in the generic seismic testing equipment class — Y N U N/A
2. Meets all Bounding Spectrum caveats — Y N U N/A
3. Component is a pressure, temperature, level or flow transmitter — Y N U N/A

SSEL Line No. 4104A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

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

Equipment Description FW/AUX FEED TO SGB 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
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 amplification of floor 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	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)

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	(Y)	N	U	N/A
2.	Type of anchorage covered by GIP	(Y)	N	U	N/A
3.	Sizes and locations of anchors determined	(Y)	N	U	N/A
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	(Y)	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 under base, capacity reduction for expansion anchors	Y	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 to CG adequate	(Y)	N	U	N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y	N	U	(N/A)

Are anchorage requirements met? (Y) N U

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	(Y)	N	U	N/A
3.	Attached lines have adequate flexibility	(Y)	N	U	N/A

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 (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

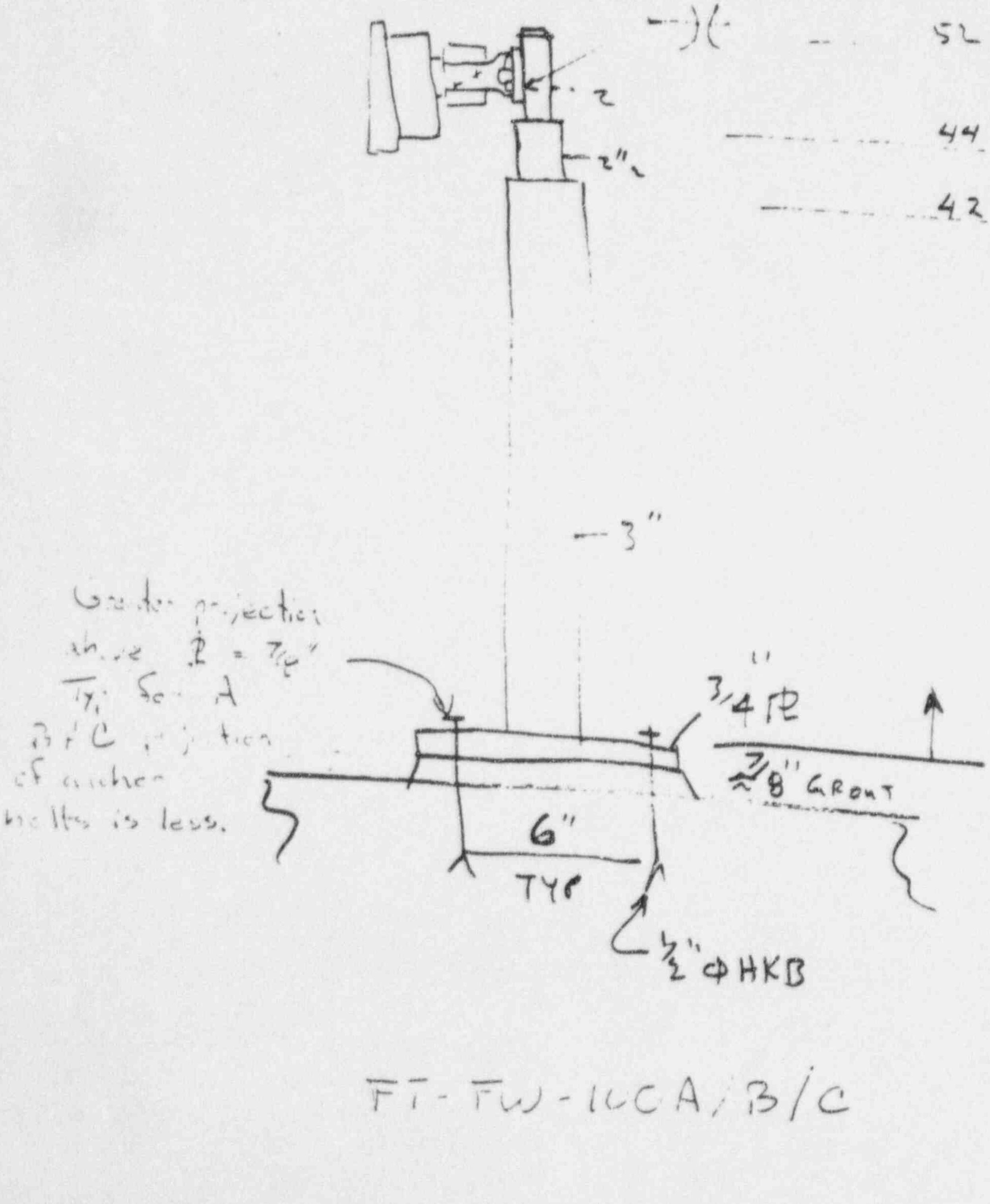
Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? (Y) N U

COMMENTS

Evaluated by: K. Westbrook Date: 2/21/95

Paul V. Lamie Feb 21st, 1995


52
2
44
2"
42
3"
Greater projection above PL = 7/8" Typ for A
B & C projection of anchor bolts is less.
3/4" PL
7/8" GROUT
6"
TYP
1/2" Φ HKB

FT-FW-16CA/B/C

SSEL Line No. 4105A Status Y N U

A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

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

Equipment Description FW/AUX FEED TO SGC TRANSMITTER

Location: Bldg. SFGB Floor El. 735 Room, Row/Col AUX FEED PUMP

Manufacturer, Model, Etc. (optional but recommended) I204 ITT-BARTON

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		735
2.	Elevation of seismic input below about 40' from grade		(Y) 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
		1.5 x Bounding Spectrum	(ABS)
		GERS	GERS
5.	Demand based on:	Ground Response Spectrum	GRS
		1.5 x Ground Response Spectrum	AGS
		Conserv. Des. In-Str. Resp. Spec.	(CRS)
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

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

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays	(N) N U (N/A)
5.	Natural frequency relative to 8 Hz limit considered	(Y) N U N/A
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	(Y) N U N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	(Y) N U N/A

SSEL Line No. 4105A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

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

Equipment Description FW/AUX FEED TO SGC 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
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 amplification of floor 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	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

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	(Y)	N	U	N/A
2.	Type of anchorage covered by GIP	(Y)	N	U	N/A
3.	Sizes and locations of anchors determined	(Y)	N	U	N/A
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	(Y)	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 under base, capacity reduction for expansion anchors	Y	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 to CG adequate	(Y)	N	U	N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y	N	U	(N/A)

Are anchorage requirements met? (Y) N U

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	(Y)	N	U	N/A
3.	Attached lines have adequate flexibility	(Y)	N	U	N/A

SSEL Line No. 4105A

52233-C-019 pg A-29

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 (Y) N U N/A

5. Have you looked for and found no other adverse concerns? (Y) N U N/A

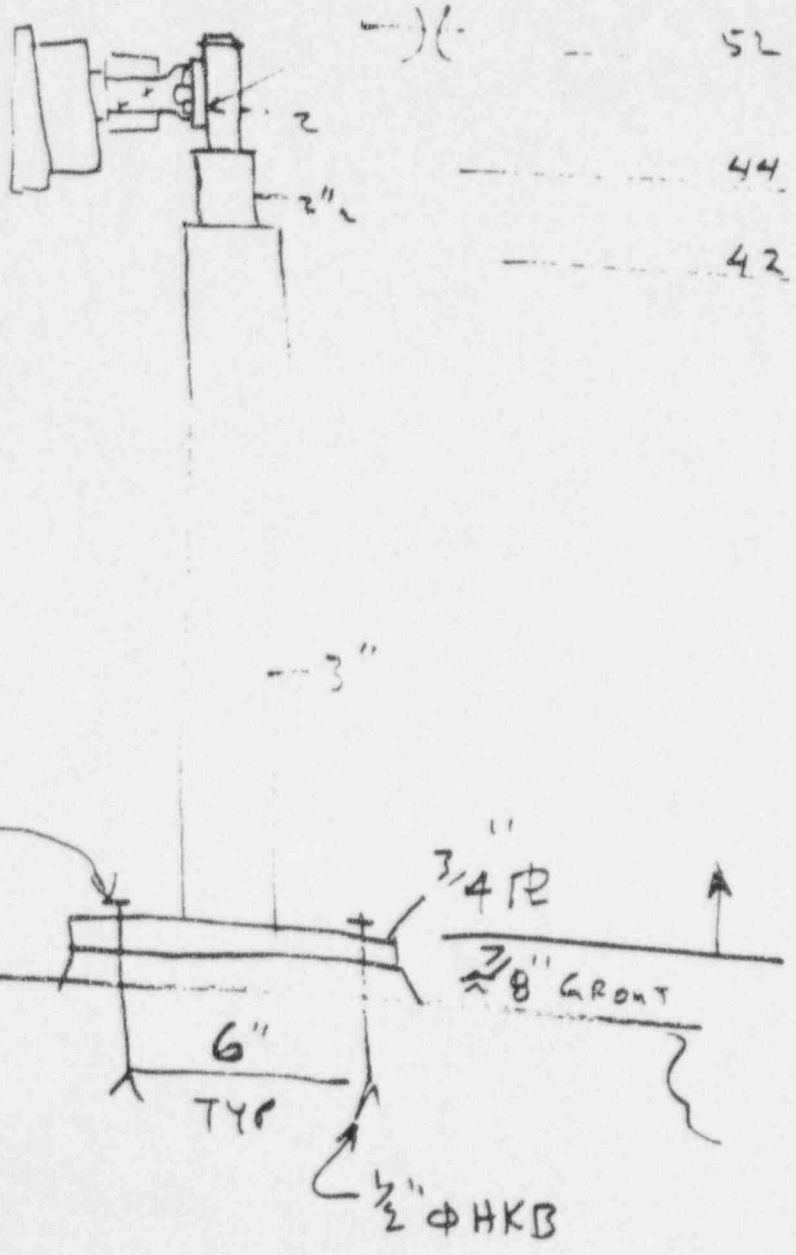
Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? (Y) N U

COMMENTS

Evaluated by: G. Trailbrook Date: 2/21/95

Paul V. Davis FEB 21 1995


52
44
42
2"
2"
3"
Greater projection above ℄ = 7/8" Typ for A & C projection of anchor bolts is less.
3/4" ℄
3/8" GROUT
6" TYP
½" Φ HKB

FT-FW-1CA/B/C

5228 3-C-019 > A31

Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. LT-FW-474 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1A NARROW RANGE LEVEL TRANSMITTER

Location: Bldg. RCBX Floor El. 718 Room, Row/Col ANNULUS COL 16

Manufacturer, Model, Etc. (optional) ± Π Barton Mod 764 S/N 415

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input	722	
2.	Elevation of seismic input below about 40' from grade	(Y) 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.	Demand based on: Ground Response Spectrum	GRS	
	1.5 x Bounding Spectrum	ABS	
	Conserv. Des. In-Str. Resp. Spec.	CRS	
	Realistic M-Ctr. In-Str. Resp. Spec.	RRS	

Does capacity exceed demand? Y N U

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays	No adj. Racks Y N U (N/A)
5.	Natural frequency relative to 8 Hz limit considered	(Y) N U N/A
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	Y N (U) N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

Equip. ID No. LT-FW-474 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1A NARROW RANGE 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)	Y N U 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 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 (mass, CG, natural freq., damping, center of rotation)	(Y) N U N/A
2.	Type of anchorage covered by GIP	(Y) N U N/A
3.	Sizes and locations of anchors determined	(Y) 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 concrete cracking	(Y) 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 under base, capacity reduction for expansion anchors	(Y) 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 to CG adequate	(Y) N U N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y N U (N/A) Wall Mounted

Are anchorage requirements met? Y N U

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	(Y) N U N/A
3.	Attached lines have adequate flexibility	(Y) N U 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

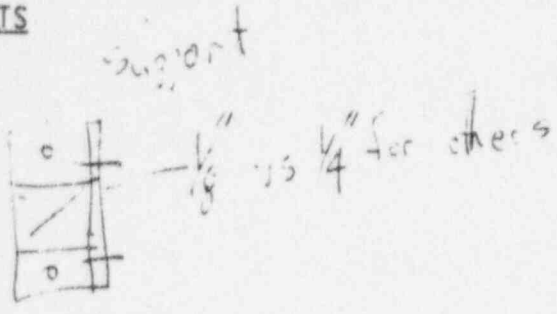
INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

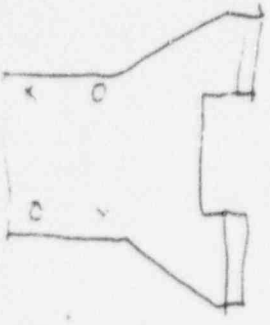
Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? Y N U

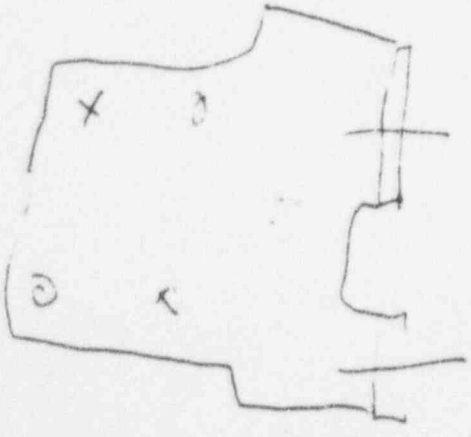
COMMENTS



Std 6" x 6" x 1/2" baseplate with 4 - 3/8" shell anchors All tight



Side View



Evaluated by: Gal. Westbrook Date: 5/15/93

Helen S. Zee 5-15-93

52232-100 pg A3-1

Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. LT-FW-476 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1A NARROW RANGE LEVEL TRANSMITTER

Location: Bldg. RCBX Floor El. 718 Room, Row/Col ANNULUS COL 15

Manufacturer, Model, Etc. (optional) ITT BARTON MODEL 764 S/N 1968

SEISMIC CAPACITY VS DEMAND

1. Elevation where equipment receives seismic input — 722
2. Elevation of seismic input below about 40' from grade — (Y) 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. Demand based on: Ground Response Spectrum — GRS
   1.5 x Bounding Spectrum — ABS
   Conserv. Des. In-Str. Resp. Spec. — CRS
   Realistic M-Ctr. In-Str. Resp. Spec. — RRS

Does capacity exceed demand? Y N U

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 — (Y) N U N/A
2. No computers or programmable controllers — (Y) N U N/A
3. Steel frame and sheet metal structurally adequate — (Y) N U N/A
4. Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays — No relays/No adj. Racks — Y N U (N/A)
5. Natural frequency relative to 8 Hz limit considered — (Y) N U N/A
6. Attached lines have adequate flexibility — (Y) N U N/A
7. Anchorage adequate (See checklist below for details) — Y N (U) N/A
8. Relays mounted on equipment evaluated — Y N U (N/A)
9. Have you looked for and found no other adverse concerns? — (Y) N U N/A

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)

1. Equipment is included in the generic seismic testing equipment class — Y N U N/A
2. Meets all Bounding Spectrum caveats — Y N U N/A
3. Component is a pressure, temperature, level or flow transmitter — Y N U N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equip. ID No. LT-FW-476 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1A NARROW RANGE 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)	Y	N	U	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	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 (mass, CG, natural freq., damping, center of rotation)	(Y)	N	U	N/A	
2.	Type of anchorage covered by GIP	(Y)	N	U	N/A	
3.	Sizes and locations of anchors determined	(Y)	N	U	N/A	- Location within dwg. tolerances
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 concrete cracking	(Y)	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 under base, capacity reduction for expansion anchors	(Y)	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 to CG adequate	(Y)	N	U	N/A	
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y	N	U	(N/A)	wall mounted

Are anchorage requirements met? Y N U

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	(Y)	N	U	N/A
3.	Attached lines have adequate flexibility	(Y)	N	U	N/A

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Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. LT-FW-475 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1A NARROW RANGE LEVEL TRANSMITTER

Location: Bldg. RCBX Floor El. 718 Room, Row/Col ANNULUS COL 16

Manufacturer, Model, Etc. (optional) IT Barton Mod 764 S/N 770

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		
2.	Elevation of seismic input below about 40' from grade	(Y) 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.	Demand based on: Ground Response Spectrum	GRS	
	1.5 x Bounding Spectrum	ABS	
	Conserv. Des. In-Str. Resp. Spec.	CRS	
	Realistic M-Ctr. In-Str. Resp. Spec.	RRS	

Does capacity exceed demand? Y N U

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays	No relays/No adj. racks Y N U (N/A)
5.	Natural frequency relative to 8 Hz limit considered	(Y) N U N/A
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	Y N U N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

Support Details same as 476, 477

Anchors All tight

Equip. ID No. LT-FW-475 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1A NARROW RANGE 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)	Y N U 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 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 (mass, CG, natural freq., damping, center of rotation)	(Y) N U N/A
2.	Type of anchorage covered by GIP	(Y) N U N/A
3	Sizes and locations of anchors determined	(Y) 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 concrete cracking	(Y) 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 under base, capacity reduction for expansion anchors	(Y) 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 to CG adequate	(Y) N U N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y N U (N/A) Will Monitored

Are anchorage requirements met? Y N U

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	(Y) N U N/A
3.	Attached lines have adequate flexibility	(Y) N U N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. LT-FW-475 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 (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? Y N U

COMMENTS

Evaluated by: K. L. Westbrook Date: 5/15/93

Coleman S. Kelly 5-15-93

No FILES

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Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

COPY

Equip. ID No. LT-FW-477 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1A WIDE RANGE LEVEL TRANSMITTER

Location: Bldg. RCBX Floor El. 718 Room, Row/Col ANNULUS

Manufacturer, Model, Etc. (optional) IT Barton Model 764 S/N 3423

SEISMIC CAPACITY VS DEMAND

1. Elevation where equipment receives seismic input — 722
2. Elevation of seismic input below about 40' from grade — (Y) 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. Demand based on: Ground Response Spectrum — GRS
   1.5 x Bounding Spectrum — (ABS)
   Conserv. Des. In-Str. Resp. Spec. — (CRS) 3%
   Realistic M-Ctr. In-Str. Resp. Spec. — RRS

Does capacity exceed demand? (Y) N U

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 — (Y) N U N/A
2. No computers or programmable controllers — (Y) N U N/A
3. Steel frame and sheet metal structurally adequate — (Y) N U N/A
4. Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays — No adj. racks — Y N U (N/A)
5. Natural frequency relative to 8 Hz limit considered — (Y) N U N/A
6. Attached lines have adequate flexibility — (Y) N U N/A
7. Anchorage adequate (See checklist below for details) — Y N (U) N/A
8. Relays mounted on equipment evaluated — Y N U (N/A) No relays
9. Have you looked for and found no other adverse concerns? — (Y) N U N/A

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)

1. Equipment is included in the generic seismic testing equipment class — Y N U N/A
2. Meets all Bounding Spectrum caveats — Y N U N/A
3. Component is a pressure, temperature, level or flow transmitter — Y N U N/A

SCREENING EVALUATION WORK SHEET (SEWS

Equip. ID No. LT-FW-477 Equip. Class 18 struments on Racks

Equipment Description FW/RC-E-1A WIDE RANGE 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)	Y N U 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 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 (mass, CG, natural freq., damping, center of rotation)	(Y) N U N/A
2.	Type of anchorage covered by GIP	(Y) N U N/A
3.	Sizes and locations of anchors determined	(Y) 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 concrete cracking	(Y) 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 under base, capacity reduction for expansion anchors	(Y) 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 to CG adequate	(Y) N U N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y N U (N/A) Wall Mounted (Y) N U

Are anchorage requirements met?

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	(Y) N U N/A
3.	Attached lines have adequate flexibility	(Y) N U N/A

SCREENING EVALUATION WORK SHEET (SEWS)

Equip. ID No. LT-FW-477 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1A WIDE RANGE LEVEL TRANSMITTER

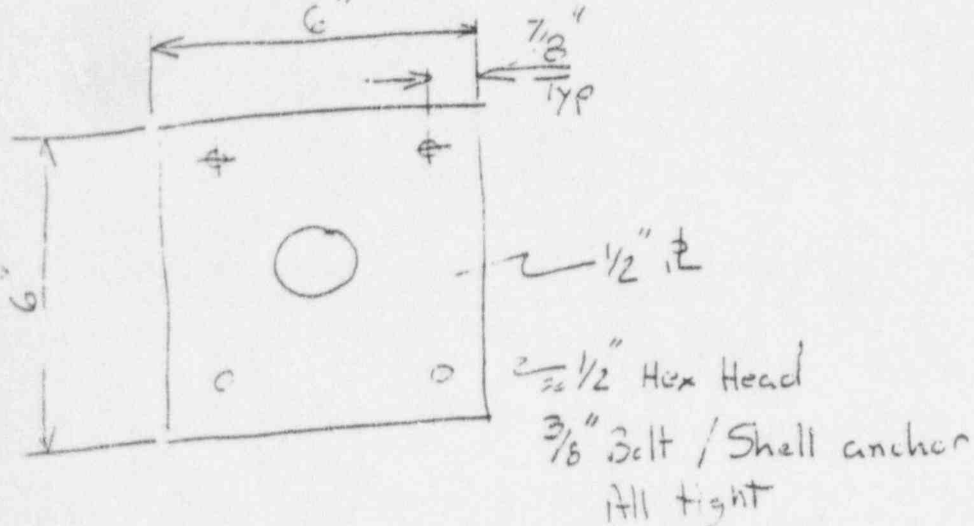
INTERACTION EFFECTS (Cont'd)

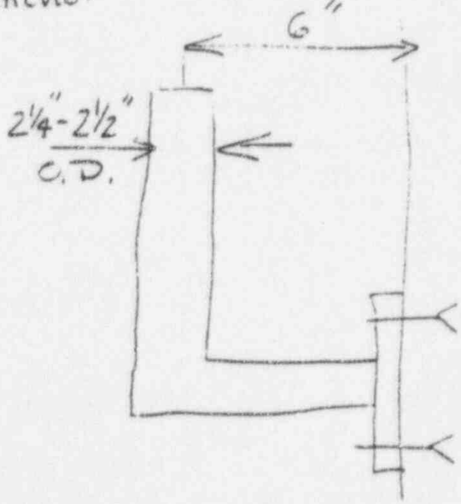
4. Overhead equipment or distribution systems are not likely to collapse — (Y) N U N/A
5. Have you looked for and found no other adverse concerns? — (Y) N U N/A

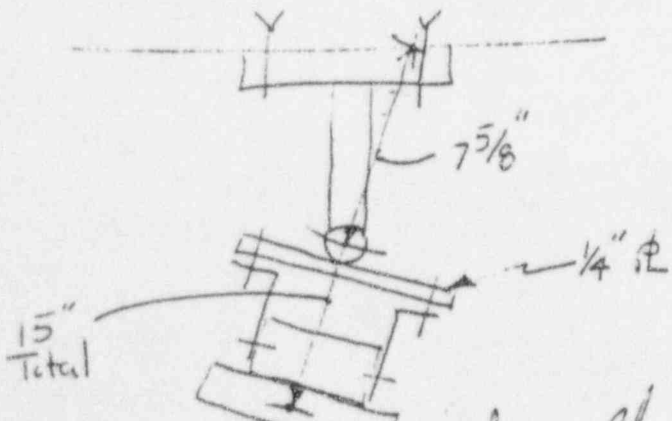
Is equipment free of interaction effects? — (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? — Y N (U)

COMMENTS







Evaluated by: [signature] Date: 5/15/93
[signature] 5-15-93

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Status Y N U

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-1B NARROW RANGE LEVEL TRANSMITTER

Location: Bldg. RCBX Floor El. 738 Room, Row/Col ANNULUS COL 9

Manufacturer, Model, Etc. (optional) ITT BARTON MODEL 764

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		740
2.	Elevation of seismic input below about 40' from grade		Y (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.	Demand based on:	Ground Response Spectrum	GRS
		1.5 x Bounding Spectrum	ABS
		Conserv. Des. In-Str. Resp. Spec.	CRS
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

Does capacity exceed demand? Y N (U)

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays	No relays/No adj. Rack Y N U (N/A)
5.	Natural frequency relative to 8 Hz limit considered	(Y) N U N/A
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	Y N (U) N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equip. ID No. LT-FW-484 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1B NARROW RANGE 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) — Y N U 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 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 (mass, CG, natural freq., damping, center of rotation) — (Y) N U N/A
2. Type of anchorage covered by GIP — (Y) N U N/A
3. Sizes and locations of anchors determined — (Y) N U N/A
4. Adequacy of anchorage installation evaluated (weld quality and length, nuts and washers, expansion anchor tightness, etc.) — (Y) N (N) N/A — 4/25/95
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 — No relays No adj. racks
6. For bolted anchorages, gap under base less than 1/4-inch — (Y) N U N/A
7. Factors affecting essential relays considered: gap under base, capacity reduction for expansion anchors — (Y) 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 to CG adequate — (Y) N U N/A
10. Embedded steel, grout pad or large concrete pad adequacy evaluated — Y N U (N/A) — Wall Mtd

Are anchorage requirements met? (Y) N U

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 — (Y) N U N/A
3. Attached lines have adequate flexibility — (Y) N U N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. LT-FW-484 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1B NARROW RANGE LEVEL TRANSMITTER

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? Y N U

COMMENTS

Installation per 6700-RK-1F

H.H. Kuk-3.11, Checked - All tight

Evaluated by: [signature] Date: 5/15/93

[signature] 5-15-93

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Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. LT-FW-485 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1B NARROW RANGE TRANSMITTER

Location: Bldg. RCBX Floor El. 738 Room, Row/Col ANNULUS COL 9

Manufacturer, Model, Etc. (optional) IT Barton Model 764 S/N 1969

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		738 Mtd on Wall
2.	Elevation of seismic input below about 40' from grade		Y (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.	Demand based on:	Ground Response Spectrum	GRS
		1.5 x Bounding Spectrum	ABS
		Conserv. Des. In-Str. Resp. Spec.	CRS
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

Does capacity exceed demand? Y N (U)

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays	No relays/No adj. rack Y N U (N/A)
5.	Natural frequency relative to 8 Hz limit considered	(Y) N U N/A
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	Y N (U) N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

SCREENING EVALUATION WORK SHEET (SEWS)

Equip. ID No. LT-FW-485 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1B NARROW RANGE 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)	Y	N	U	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	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 (mass, CG, natural freq., damping, center of rotation)	(Y)	N	U	N/A
2.	Type of anchorage covered by GIP	(Y)	N	U	N/A
3.	Sizes and locations of anchors determined	(Y)	N	U	N/A
4.	Adequacy of anchorage installation evaluated (weld quality and length, nuts and washers, expansion anchor tightness, etc.)	(Y)	N	(N)	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
6.	For bolted anchorages, gap under base less than 1/4-inch	(Y)	N	U	N/A
7.	Factors affecting essential relays considered: gap under base, capacity reduction for expansion anchors	Y	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 to CG adequate	(Y)	N	U	N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y	N	U	(N/A)

No relays
No gap
Wall mounted

Are anchorage requirements met? (Y) N U

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	(Y)	N	U	N/A
3.	Attached lines have adequate flexibility	(Y)	N	U	N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. LT-FW-485 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1B NARROW RANGE TRANSMITTER

INTERACTION EFFECTS (Cont'd)

Speaker, above on wall / Transmitter shielded by fire protection pipe.

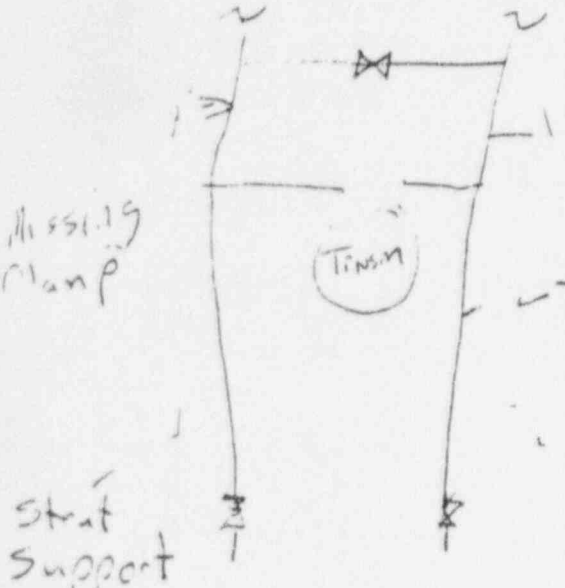
4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

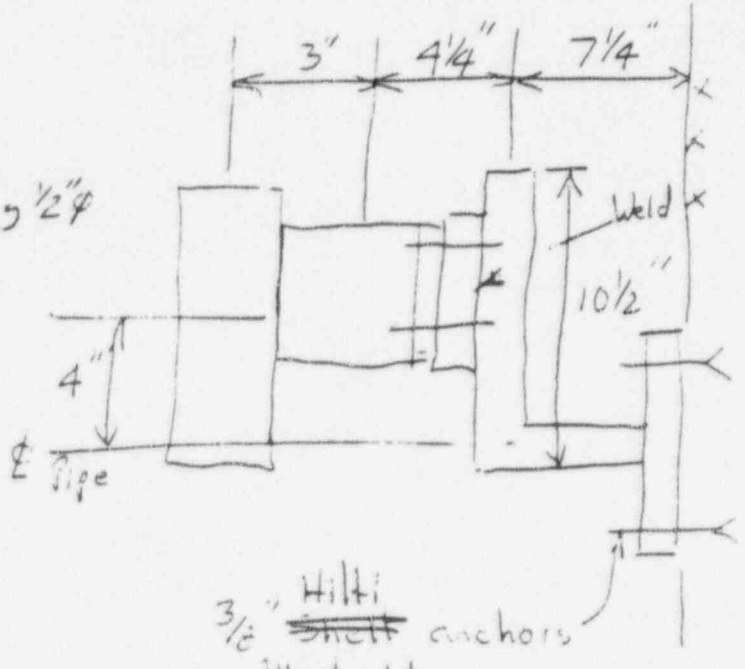
IS EQUIPMENT SEISMICALLY ADEQUATE? Y N U

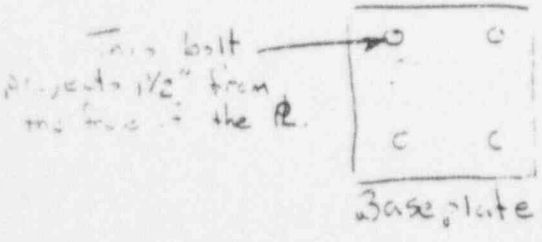
COMMENTS

Tubing clamp missing at first support (MWR 19992 written to complete)



Transmitter Mounting Brackets bolted to ℄ which is welded to pipe





Evaluated by: [signature] Date: 5/15/93

[signature] 5-15-93

52233-C-019 Fig. A-18
Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. LT-FW-486 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1B NARROW RANGE LEVEL TRANSMITTER

Location: Bldg. RCBX Floor El. 718 Room, Row/Col ANNULUS COL 9

Manufacturer, Model, Etc. (optional) IT Barton Model 764

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		722
2.	Elevation of seismic input below about 40' from grade		(Y) 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.	Demand based on:	Ground Response Spectrum	GRS
		1.5 x Bounding Spectrum	ABS
		Conserv. Des. In-Str. Resp. Spec.	CRS
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

Does capacity exceed demand? Y N (U)

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays	No relays / No adj. racks Y N U (N/A)
5.	Natural frequency relative to 8 Hz limit considered	(Y) N U N/A
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	Y N (U) N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equip. ID No. LT-FW-486 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1B NARROW RANGE 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) — Y N U 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 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 (mass, CG, natural freq., damping, center of rotation) — (Y) N U N/A
2. Type of anchorage covered by GIP — (Y) N U N/A
3. Sizes and locations of anchors determined — (Y) 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 concrete cracking — (Y) 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 under base, capacity reduction for expansion anchors — Y N U (N/A) No relays No gap
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 to CG adequate — (Y) N U N/A
10. Embedded steel, grout pad or large concrete pad adequacy evaluated — Y N U (N/A) Wall mounted

Are anchorage requirements met? (Y) N U

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 — (Y) N U N/A
3. Attached lines have adequate flexibility — (Y) N U N/A

SCREENING EVALUATION WORK SHEET (SEWS)

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)

4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? Y N U

COMMENTS

Ht. Baseplate Detail ½"ϕ Kwik Bolts / All tight
8"x8" ℞
Baseplate within tolerance of Detail D, RK-1F

Evaluated by: [signature] Date: 5/15/93

[signature] 5-15-93

52233-C-019 P1 A51

Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. LT-FW-495 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1C NARROW RANGE LEVEL TRANSMITTER

Location: Bldg. RCBX Floor El. 718 Room, Row/Col ANNULUS COL 5

Manufacturer, Model, Etc. (optional) ITT BARTON MODEL 764 S/N 3856

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		722
2.	Elevation of seismic input below about 40' from grade		(Y) 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.	Demand based on:	Ground Response Spectrum	GRS
		1.5 x Bounding Spectrum	ABS
		Conserv. Des. In-Str. Resp. Spec.	CRS
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

Does capacity exceed demand? Y N U

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays	No Relays / No adjacent racks Y N U (N/A)
5.	Natural frequency relative to 8 Hz limit considered	(Y) N U N/A
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	Y N (U) N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equip. ID No. LT-FW-495 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1C NARROW RANGE 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)	Y	N	U	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	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 (mass, CG, natural freq., damping, center of rotation)	(Y)	N	U	N/A
2.	Type of anchorage covered by GIP	(Y)	N	U	N/A
3.	Sizes and locations of anchors determined	(Y)	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 concrete cracking	(Y)	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 under base, capacity reduction for expansion anchors	(Y)	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 to CG adequate	(Y)	N	U	N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y	N	U	(N/A) Wall Mounted

Are anchorage requirements met? (Y) N U

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	(Y)	N	U	N/A
3.	Attached lines have adequate flexibility	(Y)	N	U	N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. LT-FW-495 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1C NARROW RANGE LEVEL TRANSMITTER

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? Y N U

COMMENTS

Hilti Bolt baseplate detail / All anchors tight.

Evaluated by: [signature] Date: 5/15/93

[signature] 5-15-93

Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. LT-FW-496 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1C NARROW RANGE LEVEL TRANSMITTER

Location: Bldg. RCBX Floor El. 718 Room, Row/Col ANNULUS COL 4

Manufacturer, Model, Etc. (optional) ITT BARTON MODEL 764 S/N 3857

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		722
2.	Elevation of seismic input below about 40' from grade		(Y) 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.	Demand based on:	Ground Response Spectrum	GRS
		1.5 x Bounding Spectrum	ABS
		Conserv. Des. In-Str. Resp. Spec.	CRS
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

Does capacity exceed demand? Y N (U)

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays	No relays Y N U (N/A) No adj Racks
5.	Natural frequency relative to 8 Hz limit considered	(Y) N U N/A
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	Y N (U) N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equip. ID No. LT-FW-496 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1C NARROW RANGE 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) — Y N U 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 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 (mass, CG, natural freq., damping, center of rotation) — (Y) N U N/A
2. Type of anchorage covered by GIP — (Y) N U N/A
3. Sizes and locations of anchors determined — (Y) 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 concrete cracking — (Y) 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 under base, capacity reduction for expansion anchors — (Y) 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 to CG adequate — (Y) N U N/A
10. Embedded steel, grout pad or large concrete pad adequacy evaluated — Y N U (N/A) wall mounted

Are anchorage requirements met? (Y) N U

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 — (Y) N U N/A
3. Attached lines have adequate flexibility — (Y) N U N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. LT-FW-496 Equip. Class 18 - Instruments on Racks

Equipment Description FW/RC-E-1C NARROW RANGE LEVEL TRANSMITTER

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? Y N U

COMMENTS

Stcl pipe support mounting detail.
6" x 6" x ½" Baseplate with 4 - ⅜" ϕ Shell anchors. All tight

Evaluated by: Gary T. Hawbrook Date: 5/15/93

5-15-93

SSEL Line No. 4101A
A

Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip ID No. LT-WT-104A1 Equip. Class 18 - Instruments on Racks

Equipment Description WT/WT-TK-10 LEVEL TRANSMITTER

Location: Bldg. YARD Floor El. 735 Room, Row/Col YARD

Manufacturer, Model, Etc. (optional but recommended) R369 ROSEMOUNT

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		735.5'
2.	Elevation of seismic input below about 40' from grade		(Y) 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)
		1.5 x Bounding Spectrum	ABS
		GERS	GERS
5.	Demand based on:	Ground Response Spectrum	(GRS)
		1.5 x Ground Response Spectrum	AGS
		Conserv. Des. In-Str. Resp. Spec.	CRS
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

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

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or 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	(Y) N U N/A
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	Y N (U) N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

SSEL Line No. 4101A

52233-C-019 Pg 457

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

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
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 amplification of floor 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	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)

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	Y N (U) N/A
2.	Type of anchorage covered by GIP	(Y) N U N/A
3.	Sizes and locations of anchors determined within design	(Y) N U N/A
4.	Anchorage installation adequate, e.g., drawing tolerances 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	Y N (U) N/A
6.	For bolted anchorages, gap under base less than 1/4-inch Grouted	(Y) N U N/A
7.	Factors affecting essential relays considered: gap under base, capacity reduction for expansion anchors	Y 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 to CG adequate	(Y) N U N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y N (U) N/A

Are anchorage requirements met? Y N (U)

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	(Y) N U N/A
3.	Attached lines have adequate flexibility	(Y) N U N/A

SSEL Line No. 4101A

52233-C-019 Pg A59

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

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 (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? Y N (U)

COMMENTS

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

Evaluated by: GTW [signature] Date: 12/14/94

GSR [signature] 12-14-94

52233-C-019 Pg A v D

CSEL Line No. 4102A
A

Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. LT-WT-104A2 Equip. Class 18 - Instruments on Racks

Equipment Description WT/WT-TK-10 LEVEL TRANSMITTER

Location: Bldg. YARD Floor El. 735 Room, Row/Col YARD

Manufacturer, Model, Etc. (optional but recommended) R369 ROSEMOUNT

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		735.5'
2.	Elevation of seismic input below about 40' from grade		(Y) 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)
		1.5 x Bounding Spectrum	ABS
		GERS	GERS
5.	Demand based on:	Ground Response Spectrum	(GRS)
		1.5 x Ground Response Spectrum	AGS
		Conserv. Des. In-Str. Resp. Spec.	CRS
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

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

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or 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	(Y) N U N/A
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	Y N (U) N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

SSEL Line No. 4102A

52233-C-019 Pg A-61

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)

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
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)	Y N U N/A
9.	Rack capable of structurally transferring 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)

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	Y N (U) N/A
2.	Type of anchorage covered by GIP	(Y) N U N/A
3.	Sizes and locations of anchors determined	(Y) N U N/A
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	Y 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 under base, capacity reduction for expansion anchors	Y 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 to CG adequate	(Y) N U N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y N (U) N/A

Are anchorage requirements met? Y N (U)

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	(Y) N U N/A
3.	Attached lines have adequate flexibility	(Y) N U N/A

SSEL Line No. 4102A

52233-C-019 pg A-V-2

SCREENING EVALUATION WORK SHEET (SEWS) 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)

4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? Y N (U)

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: GTW [signature] Date: 12/14/94

GSR [signature] 12-14-94

5233-C-019 Pg 4 of 2

Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. PT-RC-403 Equip. Class 18 - Instruments on Racks

Equipment Description RCS/WIDE RANGE RCS PRESSURE TRANS

Location: Bldg. RCBX Floor El. 701 Room, Row/Col A CUBICLE

Manufacturer, Model, Etc. (optional) VTI 7.31-0053 ROSEMOUNT

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		700'-11"
2.	Elevation of seismic input below about 40' from grade		(Y) 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.	Demand based on:	Ground Response Spectrum	GRS
		1.5 x Bounding Spectrum	(ABS)
		Conserv. Des. In-Str. Resp. Spec.	CRS
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

Does capacity exceed demand? Y N (U)

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	Y N (U) N/A
4.	Adjacent racks which are close enough to impact or 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	Y N U (N/A)
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	Y N (U) N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

SCREENING EVALUATION WORK SHEET (SEWS)

Equip. ID No. PT-RC-403 Equip. Class 18 - Instruments on Racks

Equipment Description RCS/WIDE RANGE RCS PRESSURE TRANS

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
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~~ SUPPORT 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? Y N U N/A

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	Y	N	(U)	N/A
2.	Type of anchorage covered by GIP	(Y)	N	U	N/A
3.	Sizes and locations of anchors determined	(Y)	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 concrete cracking	(Y)	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 under base, capacity reduction for expansion anchors	Y	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 to CG adequate	(Y)	N	U	N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y	N	U	(N/A)

Are anchorage requirements met? Y N (U)

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	Y	N	U	(N/A)
3.	Attached lines have adequate flexibility	(Y)	N	U	N/A

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. PT-RC-403 Equip. Class 18 - Instruments on Racks

Equipment Description RCS/WIDE RANGE RCS PRESSURE TRANS

INTERACTION EFFECTS (Cont'd)

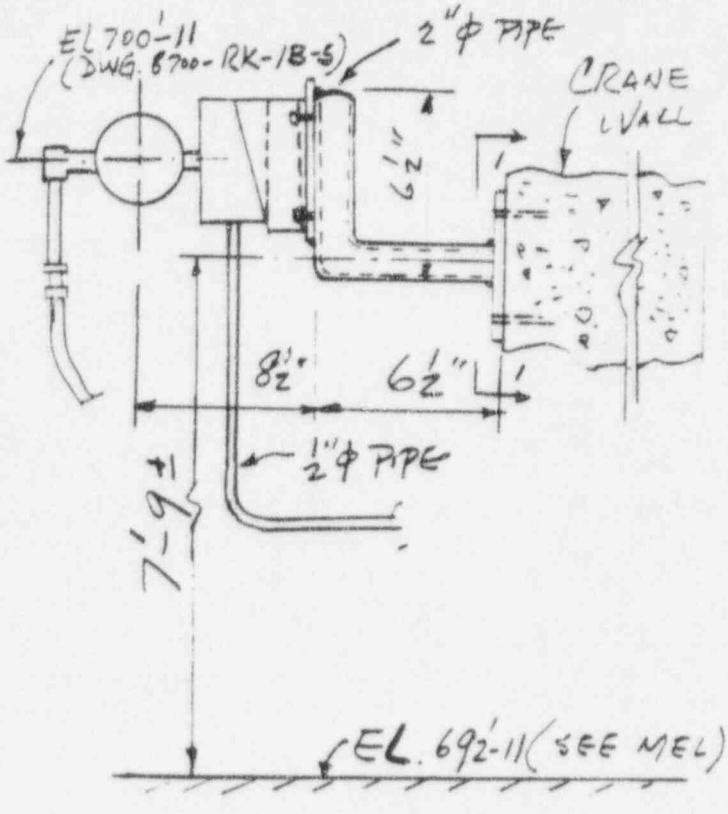
4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

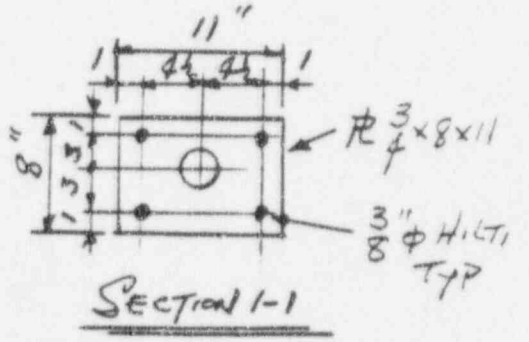
Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? Y N (U)

COMMENTS

* - LIGHT FIXTURE ABOVE





SECTION 1-1

Evaluated by: Pat Pandel Date: 5/13/93

C. Hwang 5/13/93

52233-C-019 P.A66

SSEL Line No. 4107D Status Y N U

Copy

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. FIS-FW-151A Equip. Class 18 - Instruments on Racks

Equipment Description AUX FW PUMP FW-P-3A SUCTION LINE FROM WT-TK-10 FIS

Location: Bldg. SFGB Floor El. 722 Room, Row/Col AFW ROOM

Manufacturer, Model, Etc. (optional but recommended) I204/BARTON INSTRUMENT/7.23-20

SEISMIC CAPACITY VS DEMAND

1. Elevation where equipment receives seismic input — 726'-7"
2. Elevation of seismic input below about 40' from grade — (Y) 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
   - 1.5 x Bounding Spectrum — (ABS)
   - GERS — GERS
5. Demand based on:
   - Ground Response Spectrum — GRS
   - 1.5 x Ground Response Spectrum — AGS
   - Conserv. Des. In-Str. Resp. Spec. — (CRS)
   - Realistic M-Ctr. In-Str. Resp. Spec. — RRS

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

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 — (Y) N U N/A
2. No computers or programmable controllers — (Y) N U N/A
3. Steel frame and sheet metal structurally adequate — (Y) N U N/A
4. Adjacent racks which are close enough to impact or 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 — (Y) N U N/A
6. Attached lines have adequate flexibility — (Y) N U N/A
7. Anchorage adequate (See checklist below for details) — (Y) N U N/A
8. Relays mounted on equipment evaluated — Y N U (N/A)
9. Have you looked for and found no other adverse concerns? — (Y) N U N/A

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)

1. Equipment is included in the generic seismic testing equipment class — Y N U N/A
2. Meets all Bounding Spectrum caveats — Y N U N/A
3. Component is a pressure, temperature, level or flow transmitter — Y N U N/A

SSEL Line No. 4107D

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equip. ID No. FIS-FW-151A Equip. Class 18 - Instruments on Racks

Equipment Description AUX FW PUMP FW-P-3A SUCTION LINE FROM WT-TK-10 FIS

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	Y N 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)	Y N U N/A
9.	Rack capable of structurally transferring 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)

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	(Y) N U N/A
2.	Type of anchorage covered by GIP	(Y) N U N/A
3.	Sizes and locations of anchors determined	(Y) N U N/A
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	(Y) 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 under base, capacity reduction for expansion anchors	Y 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 to CG adequate	(Y) N U N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y N U (N/A)

Are anchorage requirements met? (Y) N U

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	Y N U (N/A)
3.	Attached lines have adequate flexibility	(Y) N U N/A

SSEL Line No 4107D

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. FIS-FW-151A Equip. Class 18 - Instruments on Racks

Equipment Description AUX FW PUMP FW-P-3A SUCTION LINE FROM WT-TK-10 FIS

INTERACTION EFFECTS (Cont'd)

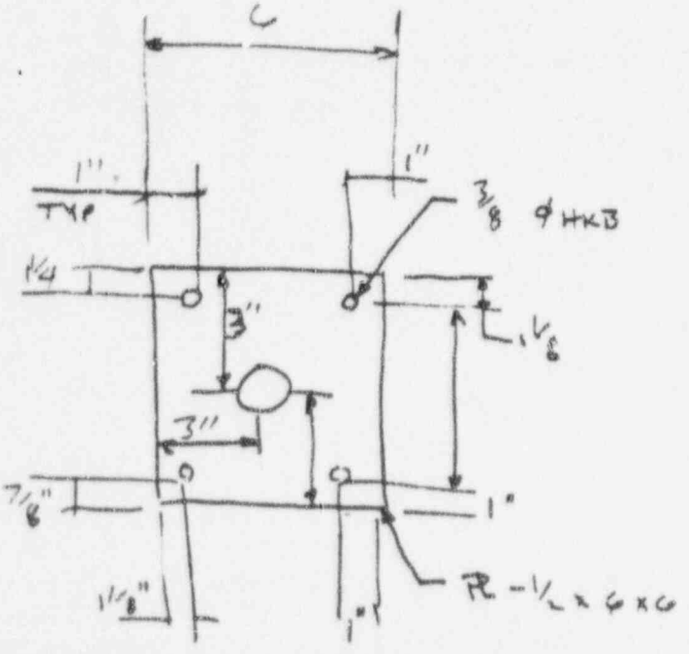
4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? (Y) N U

COMMENTS

NOTE: DRAFTING REQUEST SUBMITTED NOV. 6TH, 1995 TO CORRECT DRAWING ERROR ON 8700-G.24-3833 SH. 2 DETAIL OF THIS SUPPORT.



Evaluated by: Paul V. Davis / E. T. Westbrook Date: Nov. 6TH, 1995 / 11/6/95

Corporate Nuclear Services Unit

DESIGN ANALYSIS COVER SHEET

Design Analysis ☑ Alternate Calculation ☐ Unit 1	PAGE 1 OF 14
CALCULATION TITLE (Indicative of the Objective): FIS-FW-151A,B - EVALUATION OF SEISMIC QUALIFICATION & RELOCATION OF TERMINAL BOX FOR FIS-FW-151A,B & 152	QA CATEGORY ☒ I - NUCLEAR SAFETY RELATED ☐ II ☐ III ☐ F ☐ OTHER

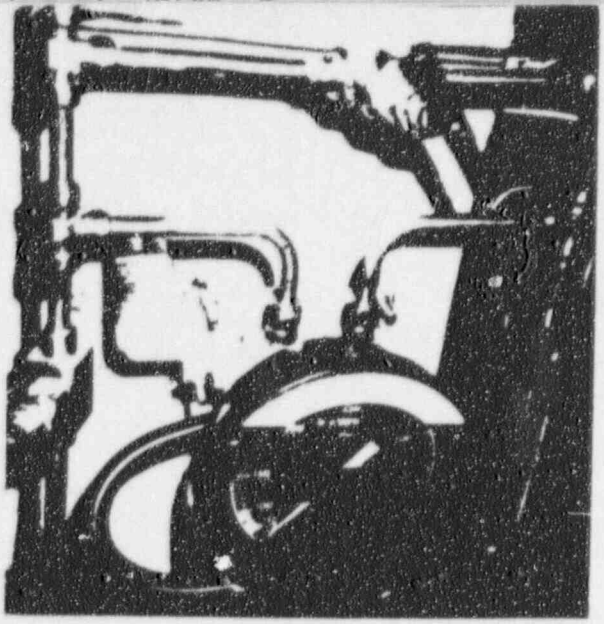
System No.	Building	Calculation No.	DCP/~~TER No.~~	Seismic
24	MSCV	8700-DQC-0020	1747	Yes ☒ No ☐

8700.24.88

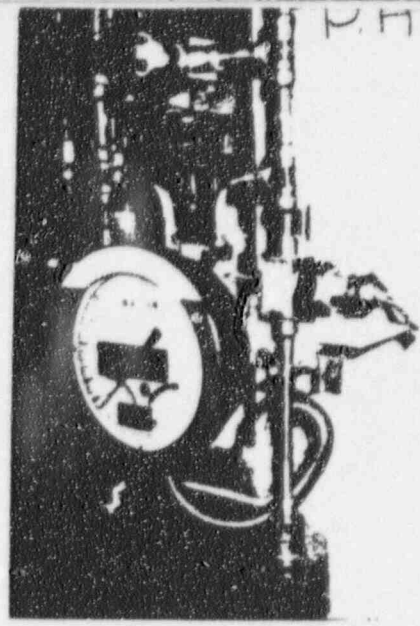
Prepared by/Date	Checked by/Date	Verified by/Date	REV. NO. ~~OR ADDENDUM NO.~~	SUPERSEDES CALC NO. OR REV. NO.	CONFIRMATION REQUIRED YES	CONFIRMATION REQUIRED NO
[signature] 6/7/91	Carmen Mancuso 6/7/91	Carmen Mancuso 6/7/91	ϕ	N/A		✓
Approved By/Date: [signature] 6/7/91						
Approved By/Date:						
Approved By/Date:						
Approved By/Date:						
Approved By/Date:						
Approved By/Date:						

CONTROLLED BVPS UNIT 1

Purpose/Scope/Conclusion: Evaluate seismic qualification report for spare FIS-FW-151A,B and engineering modification to relocate terminal box for FIS-FW-151A,B & 152.
Seismic qualification is acceptable. Terminal box must be [illegible] to simulate test configuration.



FIS-FW-151A



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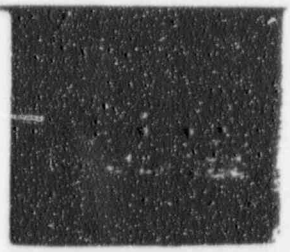
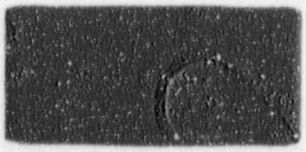




SSEL Line No. 4108D Status Y N U

COPY

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. FIS-FW-151B Equip. Class 18 - Instruments on Racks

Equipment Description AUX FW PUMP FW-P-3B SUCTION LINE FROM WT-TK-10 FIS

Location: Bldg. SFGB Floor El. 722 Room, Row/Col AFW ROOM

Manufacturer, Model, Etc. (optional but recommended) I204/BARTON INSTRUMENT/7.23-20

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		726'-7
2.	Elevation of seismic input below about 40' from grade		(Y) 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
		1.5 x Bounding Spectrum	(ABS)
		GERS	GERS
5.	Demand based on:	Ground Response Spectrum	GRS
		1.5 x Ground Response Spectrum	AGS
		Conserv. Des. In-Str. Resp. Spec.	(CRS)
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

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

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or 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	(Y) N U N/A
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	(Y) N U N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

50823-C-019 P.H7a

SSEL Line No. 4108D

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equip. ID No. FIS-FW-151B Equip. Class 18 - Instruments on Racks

Equipment Description AUX FW PUMP FW-P-3B SUCTION LINE FROM WT-TK-10 FIS

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	Y N 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)	Y N U N/A
9.	Rack capable of structurally transferring 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)

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	(Y) N U N/A
2.	Type of anchorage covered by GIP	(Y) N U N/A
3.	Sizes and locations of anchors determined	(Y) N U N/A
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	(Y) 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 under base, capacity reduction for expansion anchors	Y 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 to CG adequate	(Y) N U N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y N U (N/A)

Are anchorage requirements met? (Y) N U

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	Y N U (N/A)
3.	Attached lines have adequate flexibility	(Y) N U N/A

SSEL Line No. 4108D

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. FIS-FW-151B Equip. Class 18 - Instruments on Racks

Equipment Description AUX FW PUMP FW-P-3B SUCTION LINE FROM WT-TK-10 FIS

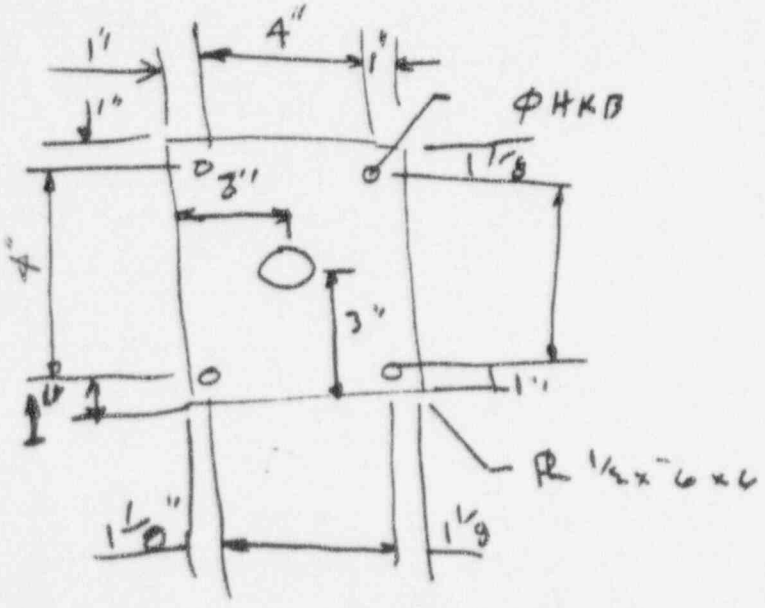
INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? (Y) N U

COMMENTS



L. NORTH

Evaluated by: Paul V. Darrigo Date: Nov. 6th, 1995

A. Westbrook 11/6/95

5dd53-C-014 Corporate Nuclear Services Unit P.H 14

DESIGN ANALYSIS COVER SHEET

Design Analysis ☑ Alternate Calculation ☐ Unit 1	PAGE 1 OF 14
CALCULATION TITLE (Indicative of the Objective): FIS-FW-151A,B - EVALUATION OF SEISMIC QUALIFICATION & RELOCATION OF TERMINAL BOX FOR FIS-FW-151A,B,S,T	QA CATEGORY ☒ I - NUCLEAR SAFETY RELATED ☐ II ☐ III ☐ F ☐ OTHER

System No.	Building	Calculation No.	DCP/~~TER No.~~	Seismic
24	MSCV	8700-DQC-0020	1747	Yes ☒ No ☐

8700.24.93

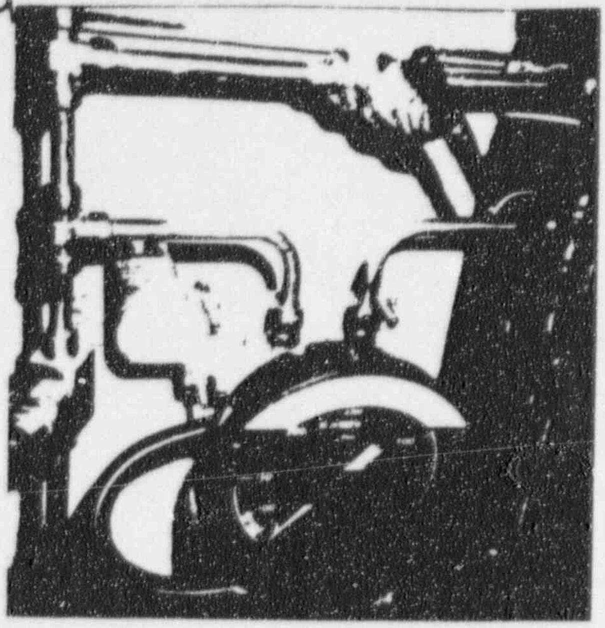
Prepared by/Date	Checked by/Date	Verified by/Date	REV. NO. ~~OR ADDENDUM NO.~~	SUPERSEDES CALC NO. OR REV. NO.	CONFIRMATION REQUIRED YES	CONFIRMATION REQUIRED NO
[illegible] 6/7/91	CARMEN MANUNO 6/7/91	CARMEN MANUNO 6/7/91	0	N/A		✓
Approved By/Date: [illegible] 6/7/91						
Approved By/Date:						
Approved By/Date:						
Approved By/Date:						
Approved By/Date:						
Approved By/Date:						

CONTROLLED BVPS UNIT 1

Purpose/Scope/Conclusion: [illegible]

522532-019

P.A75a



FIS-FW-151A

FIS-FW-151B

5a153-2014 P.A 10

SSEL Line No. 4205E A Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

COPY

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

Equipment Description ATMOSPHERE STEAM DUMP S.G. 1A

Location: Bldg. SFGB Floor El. 768 Room, Row/Col MSVH

Manufacturer, Model, Etc. (optional but recommended) B70/BARKSDALE CONTROL DIV/B2T-M12SS/

SEISMIC CAPACITY VS DEMAND

1. Elevation where equipment receives seismic input ≈ 771'-6"
2. Elevation of seismic input below about 40' from grade Y (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
   - 1.5 x Bounding Spectrum — (1.5BS)
   - GERS — GERS
5. Demand based on:
   - Ground Response Spectrum — GRS
   - 1.5 x Ground Response Spectrum — 1.5GRS
   - Conserv. Des. In-Str. Resp. Spec. — (CRS)
   - Realistic M-Ctr. In-Str. Resp. Spec. — RRS

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

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 (Y) N U N/A
2. No computers or programmable controllers (Y) N U N/A
3. Steel frame and sheet metal structurally adequate (Y) N U N/A
4. Adjacent racks which are close enough to impact or 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 (Y) N U N/A
6. Attached lines have adequate flexibility (Y) N U N/A
7. Anchorage adequate (See checklist below for details) (Y) N U N/A
8. Relays mounted on equipment evaluated CONTACTORS (Y) N U N/A
9. Have you looked for and found no other adverse concerns? HUNT (Y) N U N/A

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)

1. Equipment is included in the generic seismic testing equipment class Y N U N/A
2. Meets all Bounding Spectrum caveats Y N U N/A
3. Component is a pressure, temperature, level or flow transmitter Y N U N/A

52233-019 P.HTT

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)

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
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)	Y	N	U	N/A
9.	Rack capable of structurally transferring 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)

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	(Y)	N	U	N/A
2.	Type of anchorage covered by GIP	(Y)	N	U	N/A WGLOSD
3.	Sizes and locations of anchors determined	(Y)	N	U	(N/A) PVD 10/7/95
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	Y	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 under base, capacity reduction for expansion anchors	Y	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 to CG adequate	(Y)	N	U	N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y	N	U	(N/A)

Are anchorage requirements met? (Y) N U

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	(Y)	N	U	N/A
3.	Attached lines have adequate flexibility	(Y)	N	U	N/A

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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 (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

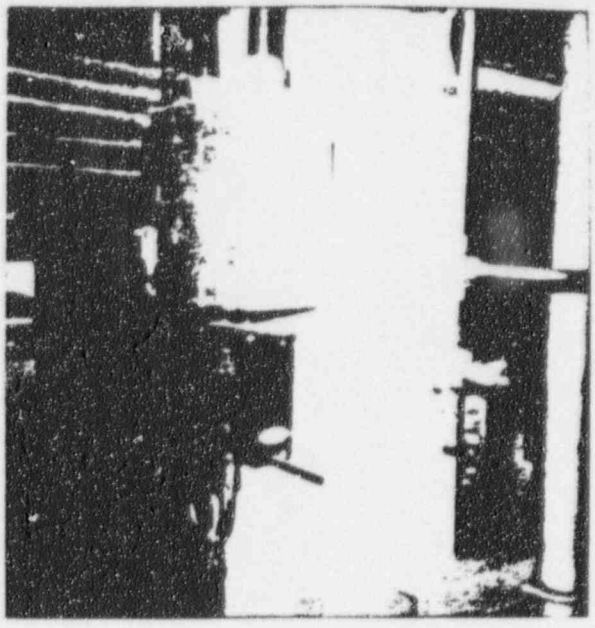
IS EQUIPMENT SEISMICALLY ADEQUATE? (Y) N U

COMMENTS

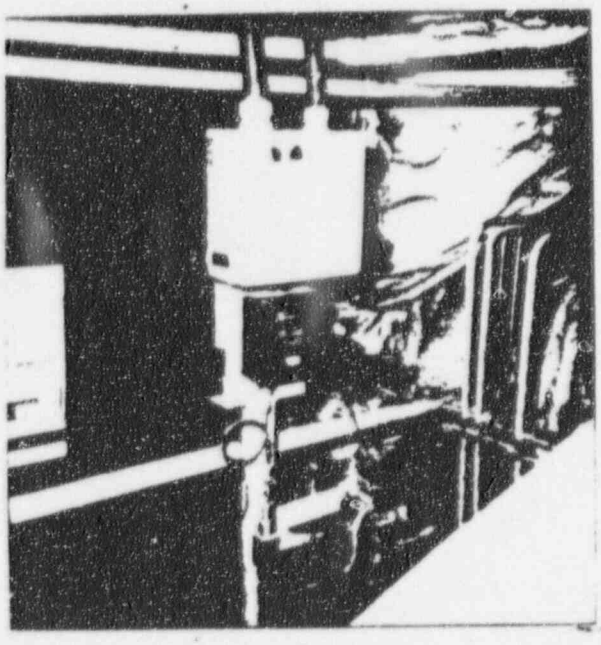
Evaluated by: Paul V. Davis / G. Westbrook Date: Nov. 7TH, 1995 / 11/7/95

C-1355-L-OM P.H H

[redacted]



PS-MS-101A



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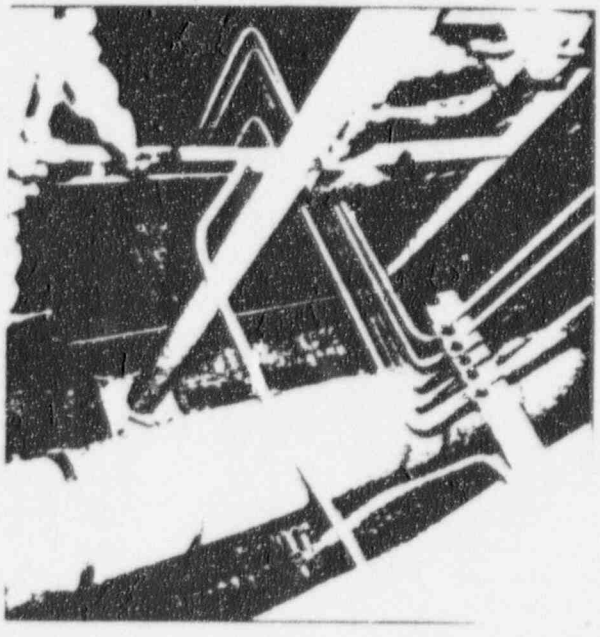

Stand for
PS-MS-101B

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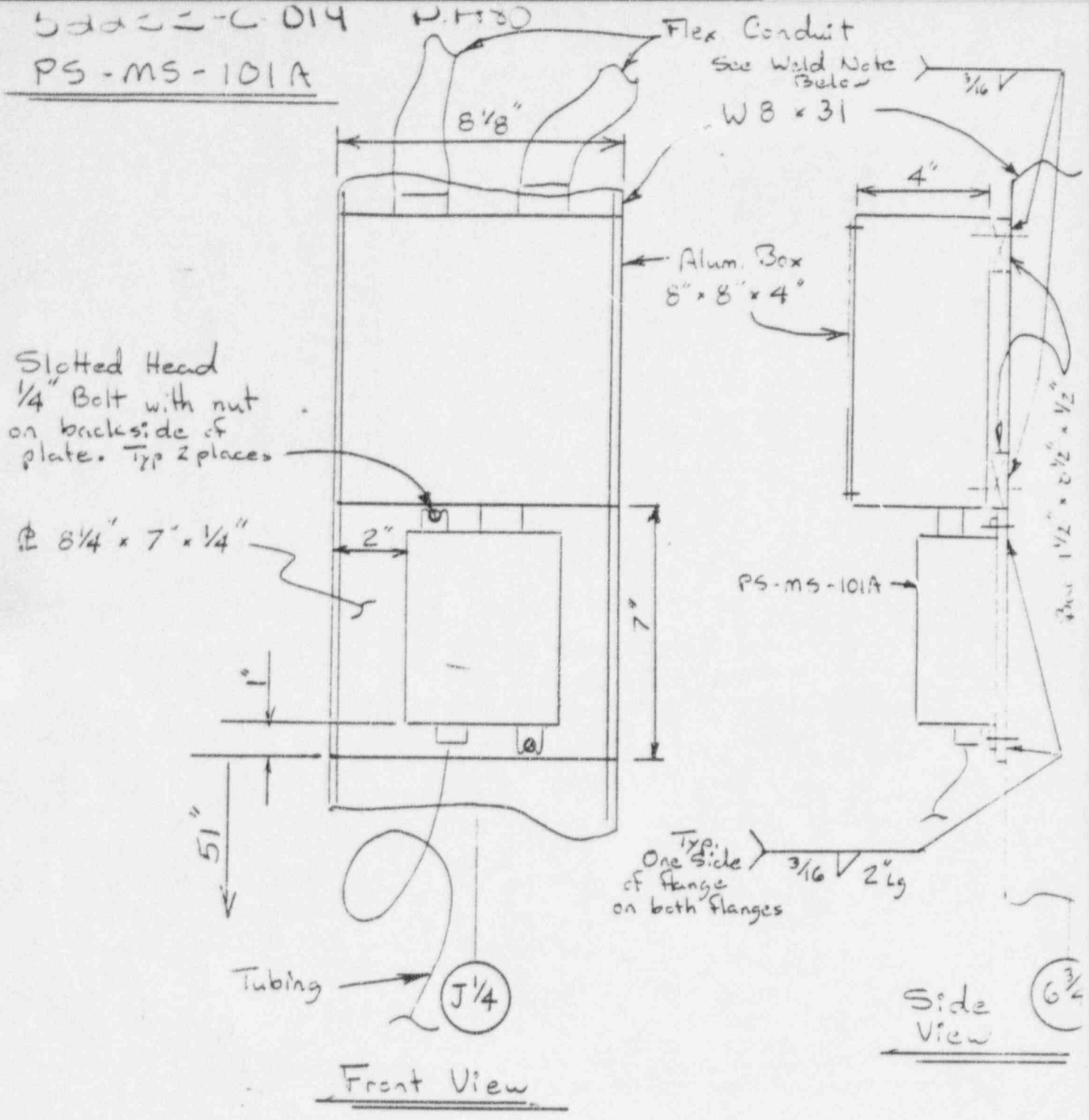
PS-MS-101A



Building Steel Dwg 8700-RS-193

5aa23-C-019

BARKSDALE CONTROLS DIVISION•3211 Fruitland Ave. P.O. Box 58843•Los Angeles, CA 90058•(213) 589-6181

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

B1T SINGLE SETTING B2T DUAL CONTROL

OPERATING CHARACTERISTICS • ORDERING DATA

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

Proof (Test) Pressure	Adjustable Range				Approx. Actuation Value (Differential)	Wetted Material*	B1T Catalog Number	B2T Catalog Number	IN STOCK
	Decreasing		Increasing						
	Min.	Max.	Min.	Max.					
1800	50	1180	70	1200	10 to 20	Bronze	B1T-H12	B2T-H12	
1800	50	1173	77	1200	11 to 27	316	B1T-A12SS	B2T-A12SS	
4800	160	3170	190	3200	15 to 30	Bronze	B1T-H32	B2T-H32	
4800	160	3161	199	3200	16 to 39	316	B1T-H32SS	B2T-H32SS	
7200	240	4715	325	4800	40 to 85	316	B1T-A48SS	B2T-A48SS	
**9750	325	6385	440	6500	54 to 115	316	B1T-A65SS	B2T-A65SS	
**18000	600	11450	1150	12000	275 to 550	316	B1T-A120SS	B2T-A120SS	
**24000	600	17450	1150	18000	275 to 550	316	B1T-A180SS	B2T-A180SS	
Approximate shipping 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 ¼" OD tube connection. To change -A65SS and -A120SS switches to ¼" npt, add -P4 suffix to model number. Price addition required.

DETAIL DATA

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 37-38.

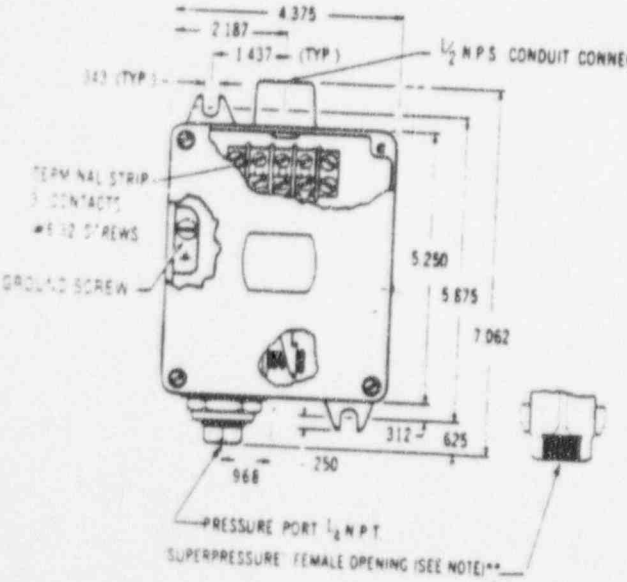
ELECTRICAL CONNECTION: To screw terminals on covered terminal strip through ½" nps conduit connector.

PRESSURE CONNECTION: ¼" N.P.T. internal thread, except as noted**, models with Proof Pressures above 8,000 P.S.I. have "SUPERPRESSURE" female opening for ¼" O.D. tube connection.

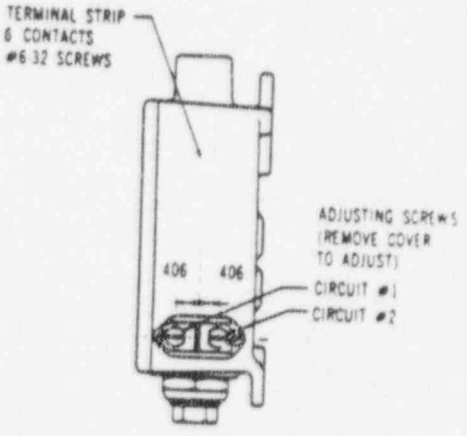
ADJUSTMENT INSTRUCTIONS
Turn adjustment screw clockwise to lower actuation point (switch setting).

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

B1T



B2T



Note: All other dimensions for B2T are the same as B1T (left).

Barksdale Bulletin No. 870420-A

BARKSDALE CONTROLS DIVISION • 3211 Fruitland Ave. P.O. Box 58843 • Los Angeles, CA 90058 • (213) 589-6181

Conventional electromechanical pressure switches use various 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 the pressure switch most ideal for your application.

Comparison Table

Characteristic	Switching Technology				
	Solid-State	Diaphragm	Bourdon Tube	Piston	Dia-Seal Piston
Life (Typical)	10,000,000 cycles	1,000,000 cycles	1,000,000 cycles	2,500,000 cycles	1,000,000 cycles
Operating Range	1.5 to 10,000 psi	Vacuum to 150 psi	50 to 18,000 psi	15 to 20,000 psi	Vacuum to 1,000 psi
Accuracy	±0.5% adjustable range	±0.5% adjustable range	±0.5% adjustable range	±2.0% adjustable range	±2.0% adjustable range
Resistance to Vibration	Excellent	Good	Good	Good	Good
Switch Differential Range	2 to 100% adjustable range	2 to 7% adjustable range	2 to 7% adjustable range	2 to 7% adjustable range	2 to 7% adjustable range
Operating Ambient Temperature Range	0°F to 160°F	−65°F to +165°F	−65°F to +165°F	−20°F to +165°F	−20°F to +165°F
Proof Pressure	15,000 psi	300 psi	24,000 psi	20,000 psi	2,000 psi
Operating Indicators	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.

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.

ACTUATION VALUE (Differential, Dead Band, Hysteresis) BY CLASS OF ELECTRICAL SWITCH USED

Actuation value tolerances on diaphragm and bourdon tube switches are due ... manufacturing tolerances on limit switches and sensing elements. The actuation value of each pressure switch remains fixed within the tolerances shown.

BOURDON TUBE PRESSURE SWITCHES — Values given in P.S.I. (Gauge)

Bourdon Tube Pressure Sensing Element	Proof Pressure for Stripped Models	Proof Pressure for Housed Models	Approximate Actuation Value (Differential, Dead Band, Hysteresis) by Class of Electrical Switch																
			A	B	C	D	E	F	H	J	K	M	S**	T***	W	GH	X	AA****	HH****
—12	1500	1800	17 to 38	28 to 95	73 to 145	70 to 203	86 to 308	140 to 265	10 to 20•	8 to 28	28 to 118	17 to 38	135 to 285	108 to 239	302 Max	10 to 20	17 to 38	24 to 124	13 to 68
—12SS	1500	1800	11 to 27•	20 to 65	51 to 100	53 to 104	58 to 202	101 to 185	7 to 14	6 to 20	20 to 80	11 to 27	95 to 190	77 to 164	200 Max	7 to 14	11 to 27	17 to 85	9 to 49
—22 UL		4800	26 to 59	42 to 147	111 to 224		133 to 482	212 to 405	15 to 30•	13 to 44	42 to 182	26 to 59	206 to 440				26 to 59	—	—
—32	4000	4800	26 to 59	42 to 147	111 to 224	106 to 312	133 to 482	212 to 405	15 to 30•	13 to 44	42 to 182	26 to 59	206 to 440	111 to 370	470 Max	15 to 30	26 to 59	38 to 191	21 to 106
—20SS UL		4800	19 to 79	51 to 171	132 to 260		154 to 547	261 to 474	16 to 39•	16 to 52	51 to 212	19 to 79	243 to 508				19 to 79	—	—
—32SS	4000	4800	19 to 79	51 to 171	132 to 260	131 to 365	154 to 547	261 to 474	16 to 39•	16 to 52	51 to 212	19 to 79	243 to 508	124 to 413	524 Max	16 to 39	19 to 79	44 to 222	28 to 142
—32SS UL		7200	40 to 85•	59 to 226	163 to 341		204 to 787	295 to 597	22 to 40	18 to 65	59 to 281	40 to 85	300 to 695				40 to 85	—	—
—48SS	6000	7200	40 to 85•	59 to 226	163 to 341	136 to 466	204 to 787	295 to 597	22 to 40	18 to 65	59 to 281	40 to 85	300 to 695	231 to 566	752 Max	22 to 40	40 to 85	58 to 294	30 to 153
—65SS	8125	9750	54 to 115•	76 to 301	215 to 454	173 to 618	272 to 1064	383 to 787	29 to 52	23 to 86	76 to 374	54 to 115	396 to 930	301 to 754	1010 Max	29 to 57	54 to 115	78 to 391	41 to 207
—72SS UL		18000	275 to 550•	366 to 1520	1061 to 2289		1375 to 5532	1834 to 3895	144 to 246	111 to 427	366 to 1897	275 to 550	1950 to 4750	?			275 to 550	—	—
—120SS	15000	18000	275 to 550•	366 to 1520	1061 to 2289	786 to 3085	1375 to 5532	1834 to 3895	144 to 246	111 to 427	366 to 1897	275 to 550	1950 to 4750	1454 to 3808	5213 Max	144 to 246	275 to 550	395 to 1976	198 to 990
—180SS	20000	24000	275 to 550•	366 to 1520	1061 to 2289	786 to 3085	1375 to 5532	1834 to 3895	144 to 246	111 to 427	366 to 1897	275 to 550	1950 to 4750	1454 to 3808	5213 Max	144 to 246	275 to 550	395 to 1976	198 to 990

*Plain numbers represent Phosphor Bronze tube, SS represents Stainless Steel **Not available on dual or U.L. listed switches ***Available on B1S, B2S, & B1T Models only ****Not available on Stripped, Dual or UL listed switches

HI-P (DIA-SEAL PISTON) PRESSURE SWITCHES

Pressure Sensing Element	Approx. Actuation Value (Differential, Dead Band, Hysteresis) By Class of Electrical Switch							
	B	F	H/GH	J	K	M	AA	HH
30	4 to 20•	1.0 to 4.0	1 to 1.0x	1 to 1.5x	4 to 24•	1 15	5 to 26	4 to 20
—30SS	4 to 20•	1.0 to 4.0	1 to 1.0	1 to 1.5x	4 to 24•	1 15	—	—
—85	8 to 70•	3.0 to 11.0	25 to 25	25 to 35x	8 to 84•	10 50	18 to 91	14 to 70
85SS	8 to 70•	3.0 to 11.0	25 to 25	25 to 35x	8 to 84•	10 50	—	—
340	2.0 to 22.0•	9.0 to 45.0	1.0 to 6.0	1.0 to 8.5x	2.0 to 26.5•	2.0 10.0	5.7 to 28.6	4.4 to 22.0
—340SS	2.0 to 22.0•	9.0 to 45.0	1.0 to 6.0	1.0 to 8.5x	2.0 to 26.5•	2.0 10.0	—	—
—600	6.0 to 30.0	15.0 to 70.0	2.0 to 17.0•	2.0 to 19.0x•	6.0 to 35.0	3.6 23.0	7.8 to 39.0	6.0 to 30.0
—600SS	6.0 to 30.0	15.0 to 70.0	2.0 to 17.0•	2.0 to 19.0x•	6.0 to 35.0	3.6 21.0	—	—
—1600	25 to 100	60 to 275	20 to 70	20 to 80	25 to 125	20 95	—	—
—1600SS	25 to 100	60 to 275	20 to 70	20 to 80	25 to 125	20 95	—	—

*Plain numbers represent Anodized Aluminum Fitting. SS represents Stainless Steel Fitting.

**Fixed at any pressure, varies as shown from lowest to highest setting.

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

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

Pressure*** Sensing Element		Approximate Actuation Value (Differential, Dead Band, Hysteresis) By Class of Electrical Switch**						
		B	H	J	K	M	R	GH
—15	—15†	2 to 2.2	1 to 8•	1 to 1.0	2 to 2.5	2 to 1.2	SEE CHARTS PG 37	1 to 8
—90	—90†	1.9 to 10.5	5 to 8.0•	5 to 9.0	1.0 to 12.0	1.0 to 10.0		5 to 8.0
—250	—250†	2.0 to 27.0	1.0 to 20.0•	1.0 to 23.0	2.0 to 30.0	2.0 to 21.0		1.0 to 20.0
—500		6.0 to 50.0	4.0 to 28.0•	4.0 to 35.0	6.0 to 55.0	6.0 to 40.0		4.0 to 28.0

***Plain numbers represent untreated aluminum fitting
†Represents polysulfone fitting

•'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 switches 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 Boot 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.
- Class T switches are Double Make-Double Break (one normally open and one normally closed circuit) with fine 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-S-6743.

52233-C D19 P.A84

SSEL Line No. 4206E Status Y N U

A

COPY

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

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

Equipment Description ATMOSPHERE STEAM DUMP S.G. 1B

Location: Bldg. SFGB Floor El. 768 Room, Row/Col MSVH

Manufacturer, Model, Etc. (optional but recommended) B70/BARKSDALE CONTROL DIV/B2T-M12SS,

SEISMIC CAPACITY VS DEMAND

1. Elevation where equipment receives seismic input ≈771'-6" MS T.V. GRTG PLTF.
2. Elevation of seismic input below about 40' from grade Y (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
   - 1.5 x Bounding Spectrum — (ABS)
   - GERS — GERS
5. Demand based on:
   - Ground Response Spectrum — GRS
   - 1.5 x Ground Response Spectrum — AGS
   - Conserv. Des. In-Str. Resp. Spec. — (CRS)
   - Realistic M-Ctr. In-Str. Resp. Spec. — RRS

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

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 (Y) N U N/A
2. No computers or programmable controllers (Y) N U N/A
3. Steel frame and sheet metal structurally adequate (Y) N U N/A
4. Adjacent racks which are close enough to impact or 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 (Y) N U N/A
6. Attached lines have adequate flexibility (Y) N U N/A
7. Anchorage adequate (See checklist below for details) (Y) N U N/A
8. Relays mounted on equipment evaluated CONTACTORS (Y) N U N/A
9. Have you looked for and found no other adverse concerns? HEAT (Y) N U N/A

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)

1. Equipment is included in the generic seismic testing equipment class Y N U N/A
2. Meets all Bounding Spectrum caveats Y N U N/A
3. Component is a pressure, temperature, level or flow transmitter 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 - Instruments on Racks

Equipment Description ATMOSPHERE STEAM DUMP S.G. 1B

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 — Y N 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) — Y N U N/A
9. Rack capable of structurally transferring 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)

ANCHORAGE

1. Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation) — (Y) N U N/A
2. Type of anchorage covered by GIP — (Y) N U N/A WELDED
3. Sizes and locations of anchors determined — (Y) N U (N/A) PVO 11/7/95
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 — Y 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 under base, capacity reduction for expansion anchors — Y N U (N/A)
8. Base has adequate stiffness and effect of prying action on anchors considered — (Y) N U ~~N/A~~ PVO W 7/95
9. Strength of equipment base and load path to CG adequate — (Y) N U N/A
10. Embedded steel, grout pad or large concrete pad adequacy evaluated — Y N U ~~N/A~~

Are anchorage requirements met? (Y) N U

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 — (Y) N U N/A
3. Attached lines have adequate flexibility — (Y) N U N/A

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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

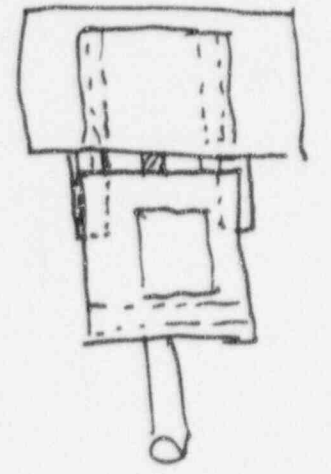
INTERACTION EFFECTS (Cont'd)

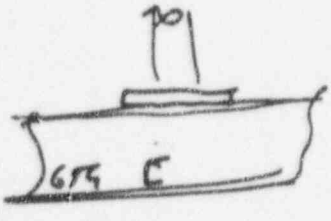
4. Overhead equipment or distribution systems are not likely to collapse — (Y) N U N/A
5. Have you looked for and found no other adverse concerns? — (Y) N U N/A

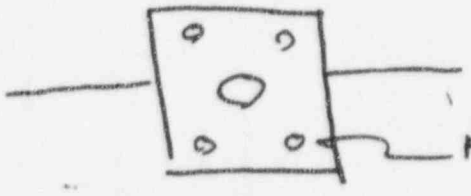
Is equipment free of interaction effects? HEAT OK — (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? — (Y) N U

COMMENTS





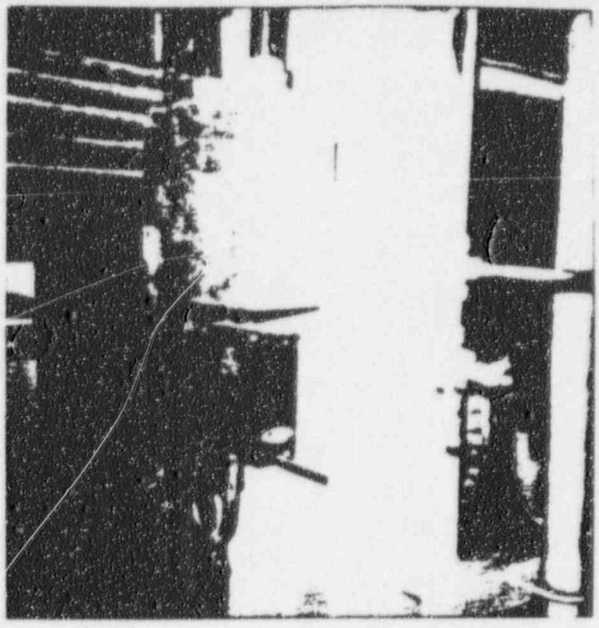


Evaluated by: Paul V Dimmig Date: Nov. 7TH, 1995

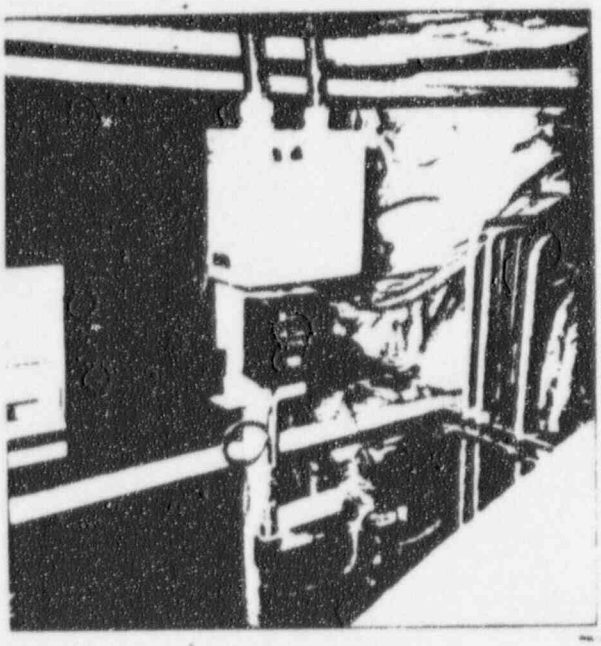
Jeff Westbrook 11/7/95

52233-C-0M P.A87

[redacted]



PS-MS-101A



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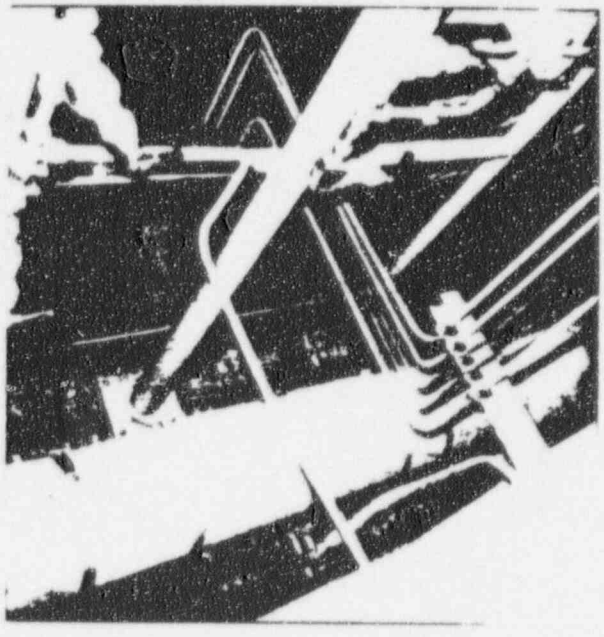
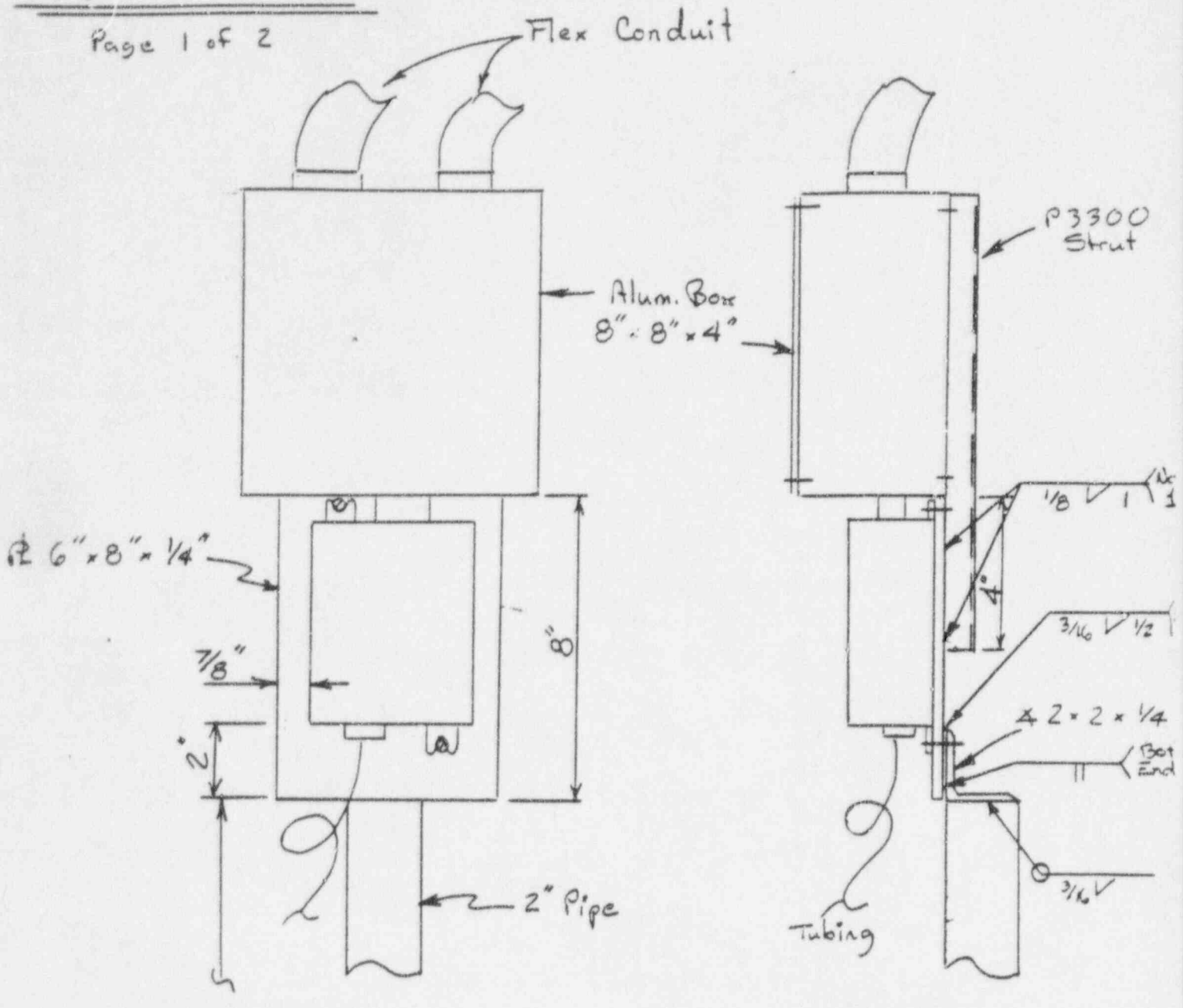


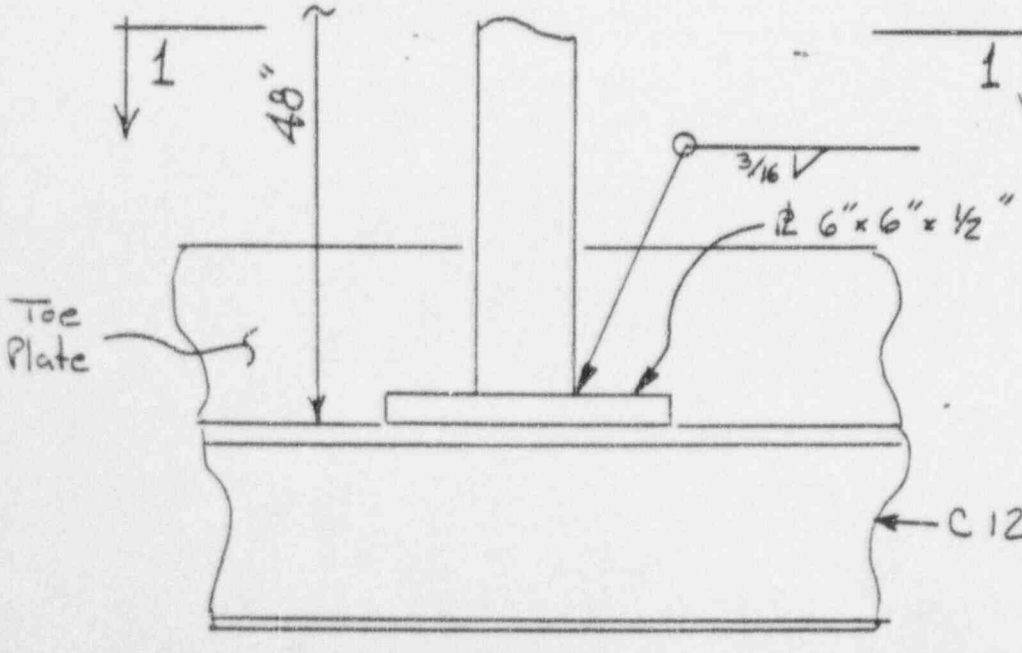
Stand for
PS-MS-101B

5a235-C-014 PH35

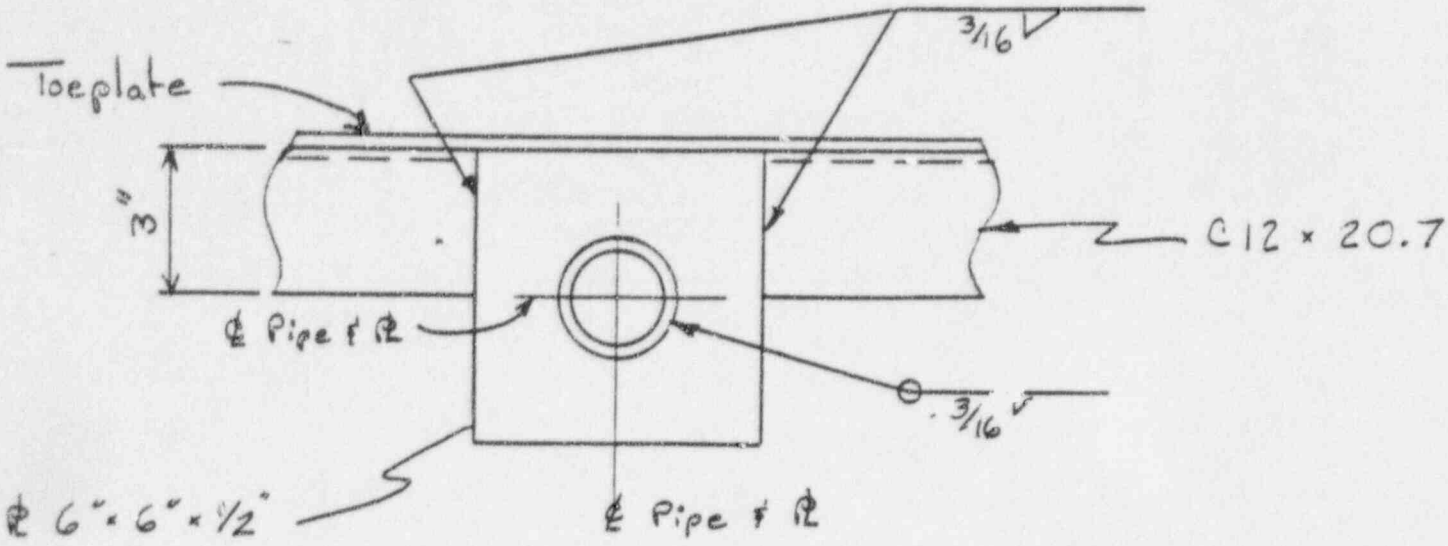
PS-MS-101B



Page 2 of 2



Note 1: Weld present on both sides of strut on west strut. East strut weld only present on outside (East Side)

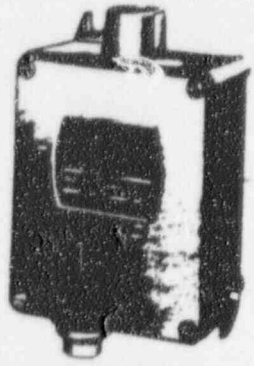


1-1

5333-C-019 P.H90

BARKSDALE CONTROLS DIVISION • 3211 Fruitland Ave. P.O. Box 58843 • Los Angeles, CA 90058 • (213) 589-6181

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



B1T SINGLE SETTING B2T DUAL CONTROL

OPERATING CHARACTERISTICS • ORDERING DATA

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

Proof (Test) Pressure	Adjustable Range Decreasing Min.	Decreasing Max.	Increasing Min.	Increasing Max.	Approx. Actuation Value (Differential)	Wetted Material*	B1T Catalog Number	B2T Catalog Number	IN STOCK
1800	50	1180	70	1200	10 to 20	Bronze	B1T-H12	B2T-H12	
1800	50	1173	77	1200	11 to 27	316	B1T-A12SS	B2T-A12SS	
4800	160	3170	190	3200	15 to 30	Bronze	B1T-H32	B2T-H32	
4800	160	3161	199	3200	16 to 39	316	B1T-H32SS	B2T-H32SS	
7200	240	4715	325	4800	40 to 85	316	B1T-A48SS	B2T-A48SS	
**9750	325	6385	440	6500	54 to 115	316	B1T-A65SS	B2T-A65SS	
**18000	600	11450	1150	12000	275 to 550	316	B1T-A120SS	B2T-A120SS	
**24000	600	17450	1150	18000	275 to 550	316	B1T-A180SS	B2T-A180SS	
Approximate shipping 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 ¼" OD tube connection. To change -A65SS and -A120SS switches to ¼" npt, add -P4 suffix to model number. Price addition required.

DETAIL DATA

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 37-38.

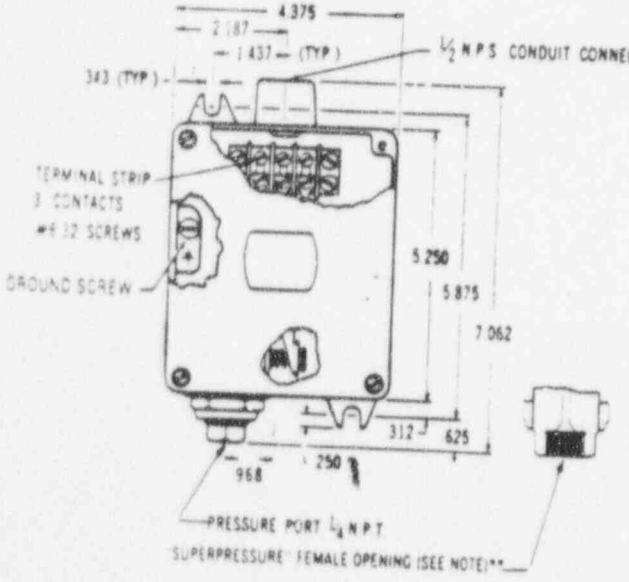
ELECTRICAL CONNECTION: To screw terminals on covered terminal strip through ½" nps conduit connector.

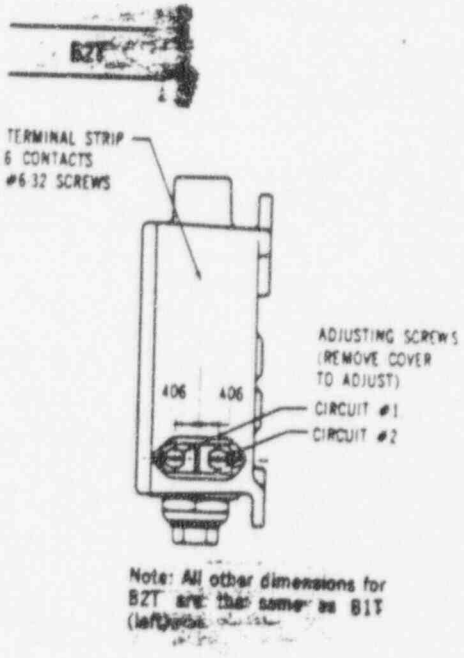
PRESSURE CONNECTION: ¼" N.P.T. internal thread, except as noted**, models with Proof Pressures above 8,000 P.S.I. have "SUPERPRESSURE" female opening for ¼" O.D. tube connection.

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

B1T





Note: All other dimensions for B2T are the same as B1T (left).

Barksdale Bulletin No. 870420-A

5a233-C-01 P. A91

Conventional electromechanical pressure switches use various 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 the pressure switch most ideal for your application.

Comparison Table

Characteristic	Switching Technology				
	Solid-State	Diaphragm	Bourdon Tube	Piston	Dia-Seal Piston
Life (Typical)	10,000,000 cycles	1,000,000 cycles	1,000,000 cycles	2,500,000 cycles	1,000,000 cycles
Operating Range	1.5 to 10,000 psi	Vacuum to 150 psi	50 to 18,000 psi	15 to 20,000 psi	Vacuum to 1,000 psi
Accuracy	±0.5% adjustable range	±0.5% adjustable range	±0.5% adjustable range	±2.0% adjustable range	±2.0% adjustable range
Resistance to Vibration	Excellent	Good	Good	Good	Good
Switch Differential Range	2 to 100% adjustable range	2 to 7% adjustable range	2 to 7% adjustable range	2 to 7% adjustable range	2 to 7% adjustable range
Operating Temperature Range	0°F to 160°F	−65°F to +165°F	−60°F to [illegible]	−20°F to +165°F	−20°F to +165°F
Proof Pressure	15,000 psi	300 psi	24,000 psi	20,000 psi	2,000 psi
Operating indicators	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.

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.

SSEL Line No. 4207E A Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

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

Equipment Description ATMOSPHERE STEAM DUMP S.G. 1C

Location: Bldg. SFGB Floor El. 768 Room, Row/Col MSVH

Manufacturer, Model, Etc. (optional but recommended) B70/BARKSDALE CONTROL DIV/B2T-M12SS/

SEISMIC CAPACITY VS DEMAND

1. Elevation where equipment receives seismic input ≈771'-6"
2. Elevation of seismic input below about 40' from grade Y (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
   - 1.5 x Bounding Spectrum (1.5BS)
   - GERS GERS
5. Demand based on:
   - Ground Response Spectrum GRS
   - 1.5 x Ground Response Spectrum AGS
   - Conserv. Des. In-Str. Resp. Spec. (CRS)
   - Realistic M-Ctr. In-Str. Resp. Spec. RRS

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

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 (Y) N U N/A
2. No computers or programmable controllers (Y) N U N/A
3. Steel frame and sheet metal structurally adequate (Y) N U N/A
4. Adjacent racks which are close enough to impact or 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 (Y) N U N/A
6. Attached lines have adequate flexibility (Y) N U N/A
7. Anchorage adequate (See checklist below for details) (Y) N U N/A
8. Relays mounted on equipment evaluated CONTACTORS (Y) N U N/A
9. Have you looked for and found no other adverse concerns? HSMT (Y) N U N/A

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)

1. Equipment is included in the generic seismic testing equipment class Y N U N/A
2. Meets all Bounding Spectrum caveats Y N U N/A
3. Component is a pressure, temperature, level or flow transmitter Y N U N/A

SSEL Line No. 4207E

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

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

Equipment Description ATMOSPHERE STEAM DUMP S.G. 1C

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	Y	N	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)	Y	N	U	N/A	
9.	Rack capable of structurally transferring 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)

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	(Y)	N	U	N/A	
2.	Type of anchorage covered by GIP	(Y)	N	U	N/A	WELDED
3.	Sizes and locations of anchors determined	(Y)	N	U	N/A	
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	Y	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 under base, capacity reduction for expansion anchors	Y	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 to CG adequate	(Y)	N	U	N/A	
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y	N	U	(N/A)	

Are anchorage requirements met? (Y) N U

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	(Y)	N	U	N/A
3.	Attached lines have adequate flexibility	(Y)	N	U	N/A

52233-C-019 P.A94

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 not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

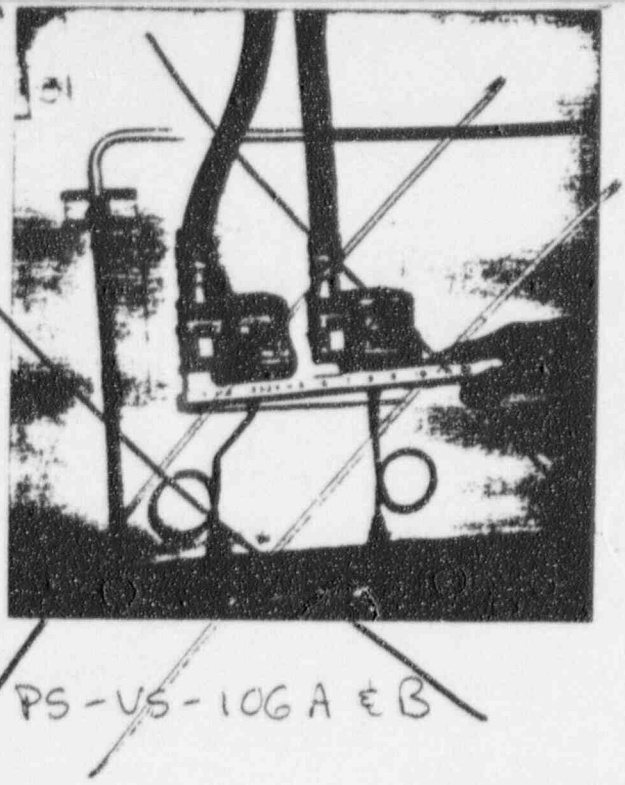
Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? (Y) N U

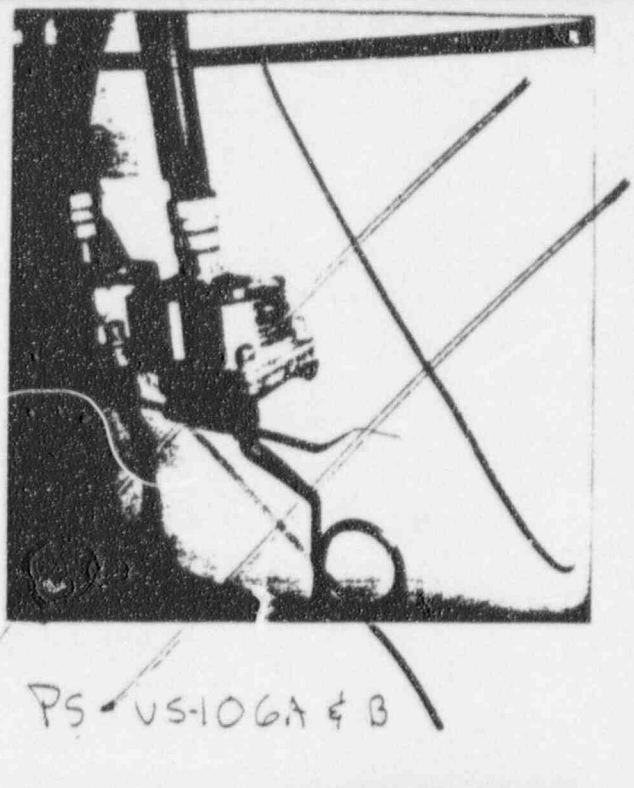
COMMENTS

Evaluated by: Paul V. Squires Date: Nov 7TH, 1995

J. F. Westbrook 11/7/95



PS-VS-106A & B



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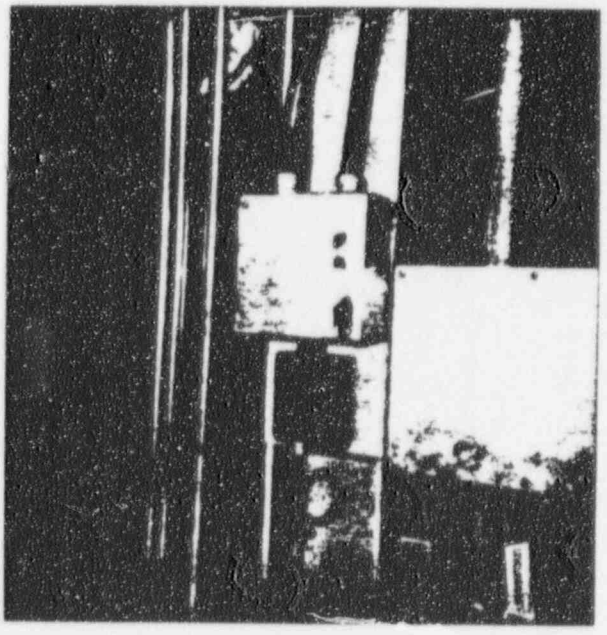
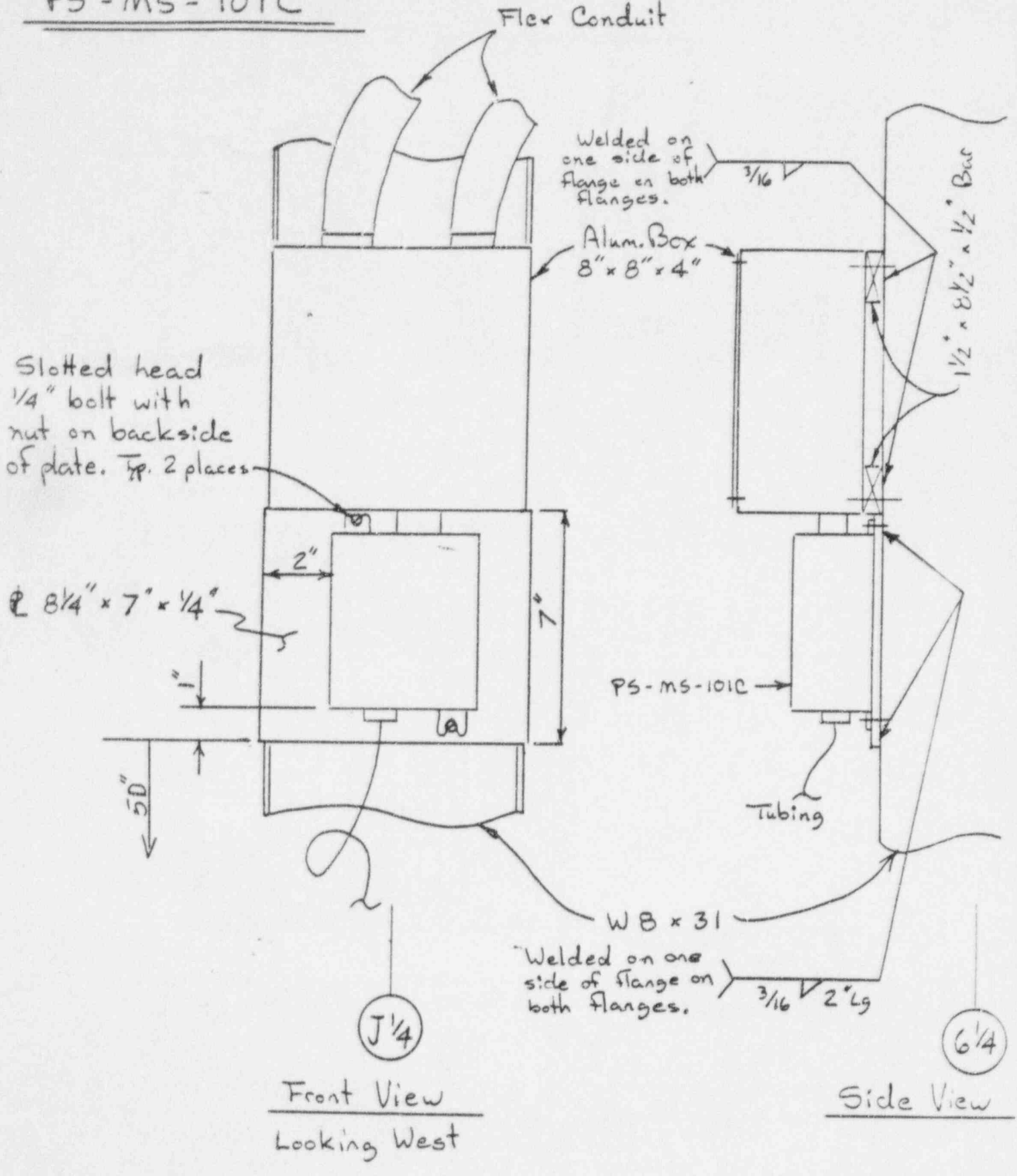


PS-MS-101C

PS-MS-101C



Building Steel Dwg 8700-RS-19B

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

B1T SINGLE SETTING B2T DUAL CONTROL

OPERATING CHARACTERISTICS • ORDERING DATA

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

Proof (Test) Pressure	Adjustable Range				Approx. Actuation Value (Differential)	Wetted Material*	B1T Catalog Number	B2T Catalog Number	
	Decreasing		Increasing						
	Min.	Max.	Min.	Max.					
1800	50	1180	70	1200	10 to 20	Bronze	B1T-H12	B2T-H12	IN STOCK
1800	50	1173	77	1200	11 to 27	316	B1T-A12SS	B2T-A12SS	
4800	160	3170	190	3200	15 to 30	Bronze	B1T-H32	B2T-H32	
4800	160	3161	199	3200	16 to 39	316	B1T-H32SS	B2T-H32SS	
7200	240	4715	325	4800	40 to 85	316	B1T-A48SS	B2T-A48SS	
**9750	325	6385	440	6500	54 to 115	316	B1T-A65SS	B2T-A65SS	
**18000	600	11450	1150	12000	275 to 550	316	B1T-A120SS	B2T-A120SS	
**24000	600	17450	1150	18000	275 to 550	316	B1T-A180SS	B2T-A180SS	
Approximate shipping 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 ¼" OD tube connection. To change -A65SS and -A120SS switches to ¼" npt, add -P4 suffix to model number. Price addition required.

DETAIL DATA

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 37-38.

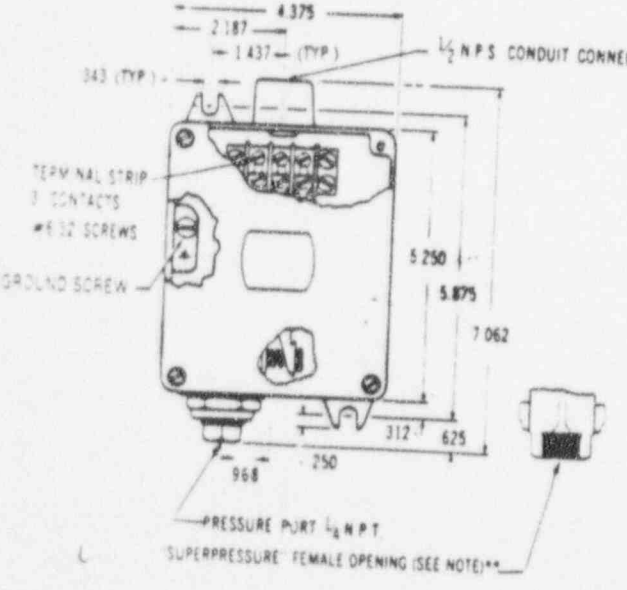
ELECTRICAL CONNECTION: To screw terminals on covered terminal strip through ½" nps conduit connector.

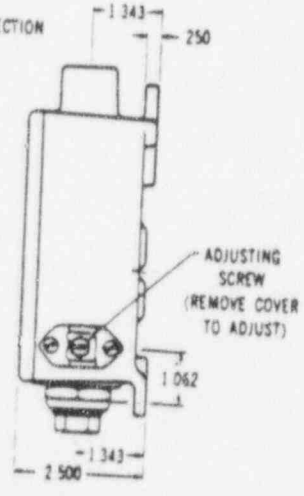
PRESSURE CONNECTION: ¼" N.P.T. internal thread, except as noted**, models with Proof Pressures above 8,000 P.S.I. have "SUPERPRESSURE" female opening for ¼" O.D. tube connection.

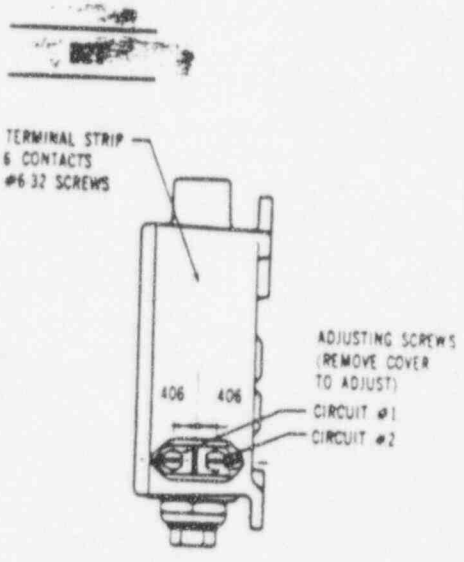
ADJUSTMENT INSTRUCTIONS
Turn adjustment screw clockwise to lower actuation point (switch setting).

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

B1T







Note: All other dimensions for B2T are the same as B1T (left).

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 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.

Comparison Table

Characteristic	Switching Technology				
	Solid-State	Diaphragm	Bourdon Tube	Piston	Dia-Seal Piston
Life (Typical)	10,000,000 cycles	1,000,000 cycles	1,000,000 cycles	2,500,000 cycles	1,000,000 cycles
Operating Range	1.5 to 10,000 psi	Vacuum to 150 psi	50 to 18,000 psi	15 to 20,000 psi	Vacuum to 1,000 psi
Accuracy	±0.5% adjustable range	±0.5% adjustable range	±0.5% adjustable range	±2.0% adjustable range	±2.0% adjustable range
Resistance to Vibration	Excellent	Good	Good	Good	Good
Switch Differential Range	2 to 100% adjustable range	2 to 7% adjustable range	2 to 7% adjustable range	2 to 7% adjustable range	2 to 7% adjustable range
Operating Ambient Temperature Range	0°F to 160°F	−65°F to +165°F	[illegible]	−20°F to +165°F	−20°F to +165°F
Proof Pressure	15,000 psi	300 psi	24,000 psi	20,000 psi	2,000 psi
Operating Indicators	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.

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.

5225-C-014 P. 1 of 4

SSEL Line No. 5222C Status Y N U

Copy

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

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

Location: Bldg. AXLB Floor El. 768 Room, Row/Col

Manufacturer, Model, Etc. (optional but recommended) B070/BARKSDALE CONTROL DIV/DIT-M3

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		773 ft
2.	Elevation of seismic input below about 40' from grade		Y (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
		1.5 x Bounding Spectrum	(ABS)
		GERS	GERS
5.	Demand based on:	Ground Response Spectrum	GRS
		1.5 x Ground Response Spectrum	AGS
		Conserv. Des. In-Str. Resp. Spec.	(CRS)
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

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

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or 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	(Y) N U N/A
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	(Y) N U N/A
8.	Relays mounted on equipment evaluated CONTRACTOR	(Y) N U ~~N/A~~ ? PVD 11/6/85
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A 1)

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

5223-C-SH1 P.H100

SSEL Line No. 5222C

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

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

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	Y N 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)	Y N U N/A
9.	Rack capable of structurally transferring 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)

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	PVD 1/6/95 (Y) N (U) N/A
2.	Type of anchorage covered by GIP	(Y) N U N/A
3.	Sizes and locations of anchors determined	(Y) N U N/A
4.	Anchorage installation adequate, e.g., weld quality and length, nuts and washers, expansion anchor tightness TUG TEST, FINGER TIGHT, PAINT OVER	(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	(Y) 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 under base, capacity reduction for expansion anchors	(Y) N U N/A CONTACTOR
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 to CG adequate	(Y) N U N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y N U (N/A)

Are anchorage requirements met? (Y) N U

INTERACTION EFFECTS

1.	Soft targets free from impact by nearby equipment or structures	(Y) N U N/A 1)
2.	If equipment contains sensitive relays, equipment free from all impact by nearby equipment or structures	(Y) N U N/A CONTACTO
3.	Attached lines have adequate flexibility	(Y) N U N/A 2)

5222C-C-019 P.H101

SSEL Line No. 5222C

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

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)

4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

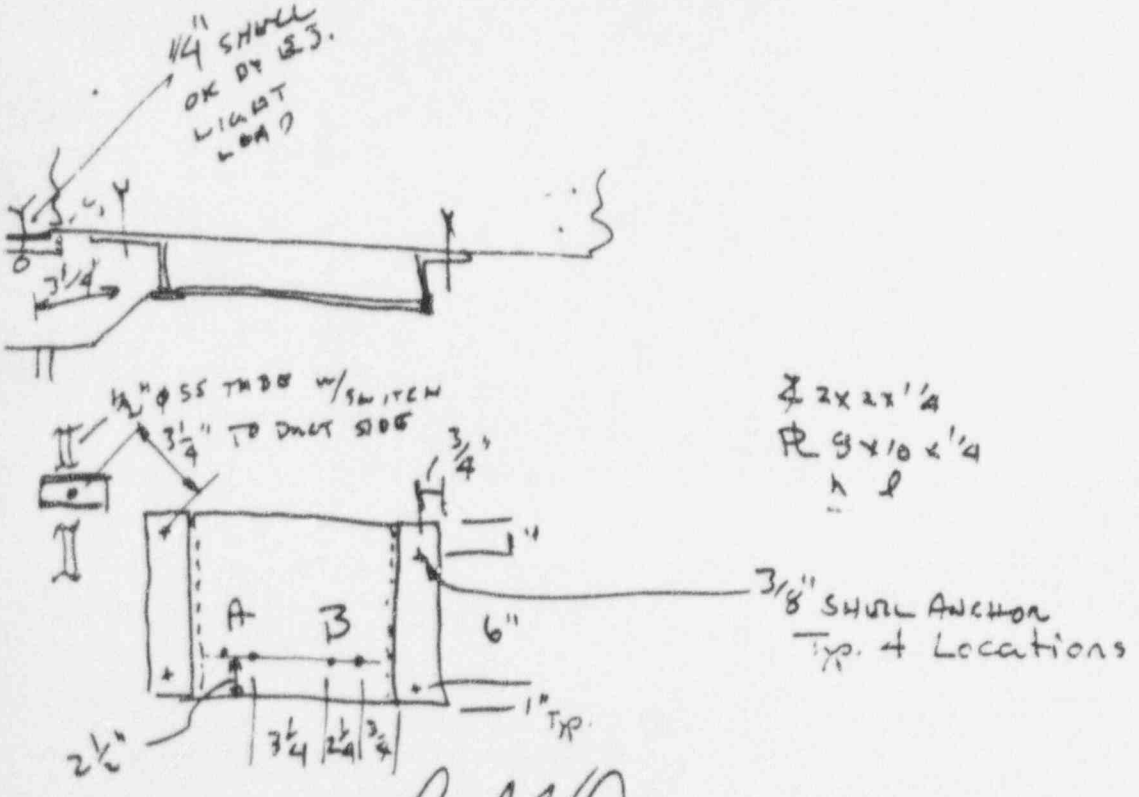
Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? (Y) N U

COMMENTS

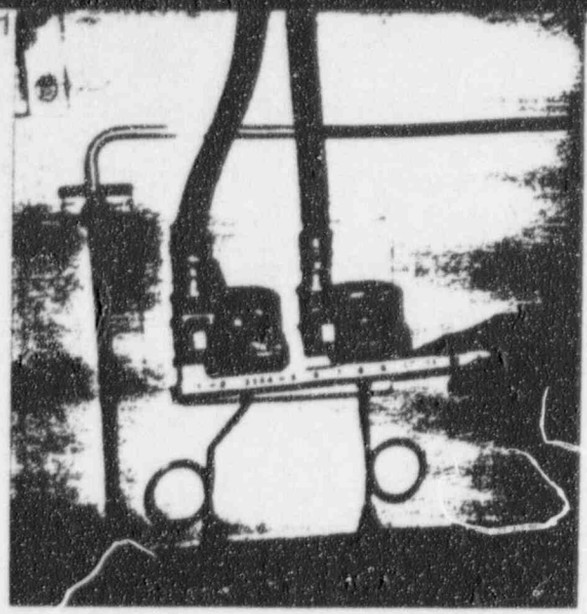
1) OVERHEAD PIPING, TUBING & DUCTWORK SUPPORTED NON-SEISMIC. HOWEVER, IT APPEARS ADEQUATE TO RESIST FALLING DURING A SEISMIC EVENT. OVERHEAD LIGHT FIXTURE WILL CAUSE NO DAMAGE IF IT FAILS.

2) LINES & CONDUIT & INSTRUMENTS ALL SUPPORTED OF CONCRETE WALL - WILL MOVE IN UNISON. ALSO, FLEXIBLE.

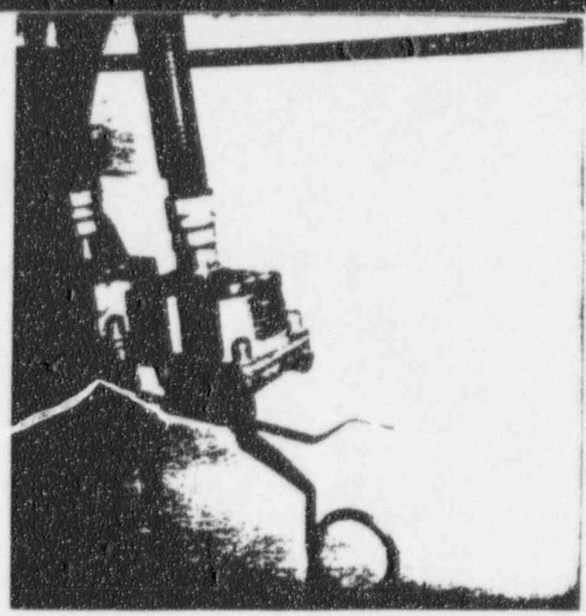


Evaluated by: Paul V. Davis Date: 11/6/95

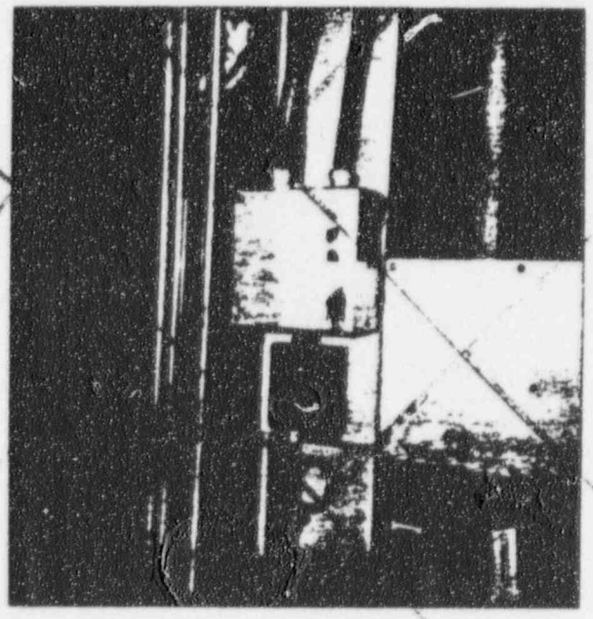
J. T. Westbrook 11/6/95



PS-VS-106A & B



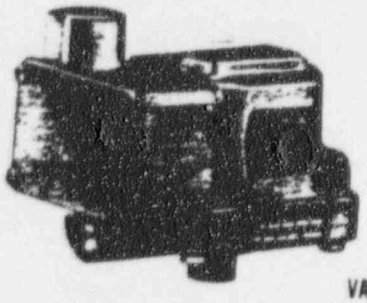
PS-VS-106A & B



PS-MS-101C

OPERATING CHARACTERISTICS • ORDERING DATA

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



D1T SINGLE SETTING

D2T DUAL CONTROL

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

Proof (Test) Pressure	Adjustable Range Decreasing Min.	Decreasing Max.	Increasing Min.	Increasing Max.	Approx. Actuation Value (Differential)	Wetted Material*	D1T Catalog Number	D2T Catalog Number
3	.018	1.654	.054	1.7	.018 to .046	B 25	D1T-H2	D2T-H2
3	.018	1.65	.068	1.7	.02 to .05	17-7PH	D1T-H2SS	D2T-H2SS
10	.03	2.89	.14	3.	.05 to .11	B 25	D1T-A3	D2T-A3
10	.03	2.85	.18	3.	.07 to .15	17-7PH	D1T-A3SS	D2T-A3SS
60	.4	17.80	.60	18.	.1 to .20	B 25	D1T-H18	D2T-H18
60	.4	17.74	.66	18.	.12 to .26	17-7PH	D1T-H18SS	D2T-H18SS
160	.5	77.2	3.3	80.	1.4 to 2.8	B 25	D1T-A80	D2T-A80
160	.5	76.6	3.9	80.	1.6 to 3.4	17-7PH	D1T-A80SS	D2T-A80SS
300	1.5	144.8	6.7	150.	2.2 to 5.2	B 25	D1T-A150	D2T-A150
300	1.5	144.	7.5	150.	2.3 to 6.0	17-7PH	D1T-A150SS	D2T-A150SS
Approximate shipping weight lbs.							2.0	2.0

IN STOCK

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

Proof (Test) Vacuum	Proof (Test) Pressure	Adjustable Range Dec. Vacuum Min.	Dec. Vacuum Max.	Incr. Vacuum Min.	Incr. Vacuum Max.	Approx. Actuation Value (Differential)	Wetted Material*	D1T Catalog Number	D2T Catalog Number
6	10 PSI	.06	5.8	.26	6.	.09 to .20	B 25	D1T-A3	D2T-A3
6	10 PSI	.06	5.72	.34	6.	.14 to .28	17-7PH	D1T-A3SS	D2T-A3SS
30	60 PSI	.8	29.34	1.46	30.	.4 to .66	B 25	D1T-H18	D2T-H18
30	60 PSI	.8	29.2	1.6	30.	.4 to .8	17-7PH	D1T-H18SS	D2T-H18SS
Approximate shipping weight lbs.								2.0	2.0

*B 25 Beryllium Copper, 17-7PH Stainless

DETAIL DATA

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 through ½" npa conduit connector.

PRESSURE (VACUUM) CONNECTION: ¼" npt internal thread. ½" npt available stainless steel only add —P2 to catalog number when ordering.

ADJUSTMENT INSTRUCTIONS

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

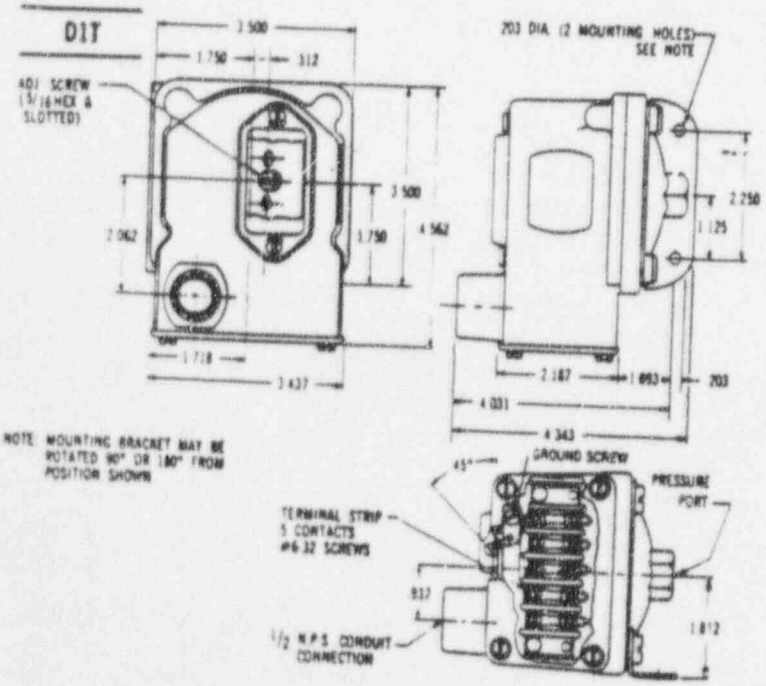
Vacuum: Turn adjustment screw counterclockwise to approach atmospheric pressure.

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

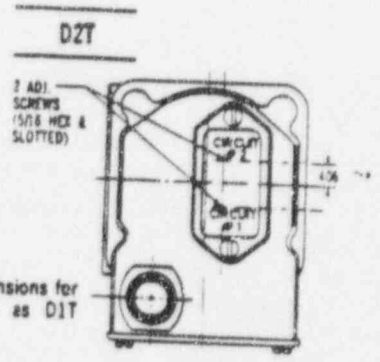
WIRE CODING — VACUUM
Circuit #1: Common — P...
Normally Closed — ...
Normally Open — B...
Circuit #2: Common — Br...
Normally Closed — Y...
Normally Open — O...

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

D1T



D2T



Note: All other dimensions for D2T are the same as D1T (left).

Barksdale
Bulletin No. 870420-A

52233-C-019 P. A104

SSEL Line No. 5223C Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

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

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

Location: Bldg. AXLB Floor El. 768 Room, Row/Col

Manufacturer, Model, Etc. (optional but recommended) B070/BARKSDALE CONTROL DIV/DIT-M3

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		773 ft
2.	Elevation of seismic input below about 40' from grade		Y (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
		1.5 x Bounding Spectrum	(ABS)
		GERS	GERS
5.	Demand based on:	Ground Response Spectrum	GRS
		1.5 x Ground Response Spectrum	AGS
		Conserv. Des. In-Str. Resp. Spec.	(CRS)
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

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

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or 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	(Y) N U N/A
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	(Y) N U N/A
8.	Relays mounted on equipment evaluated CONTACTOR	(Y) N U N/A
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

5223C - 019 P.1 of 3

SSEL Line No. 5223C

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 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

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	Y	N	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)	Y	N	U	N/A	
9.	Rack capable of structurally transferring 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)	

ANCHORAGE

1.	Appropriate equfpment characteristics determined (mass, CG, natural freq., damping, center of rotation)	(Y)	N	U	N/A	
2.	Type of anchorage covered by GIP	(Y)	N	U	N/A	
3.	Sizes and locations of anchors determined	(Y)	N	U	N/A	
4.	Anchorage installation adequate, e.g., weld quality and length, nuts and washers, expansion anchor tightness TUG TEST, FINGER TIGHT, PAINT OVER BOLT ENDS	(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	(Y)	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 under base, capacity reduction for expansion anchors	(Y)	N	U	N/A	CONTACTOR
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 to CG adequate	(Y)	N	U	N/A	
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y	N	U	(N/A)	
Are anchorage requirements met?					(Y) N U	

INTERACTION EFFECTS

1.	Soft targets free from impact by nearby equipment or structures	(Y)	N	U	N/A	1)
2.	If equipment contains sensitive relays, equipment free from all impact by nearby equipment or structures	(Y)	N	U	N/A	CONTACTOR
3.	Attached lines have adequate flexibility	(Y)	N	U	N/A	2)

5002-C-014 P.A106

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 — (Y) N U N/A
5. Have you looked for and found no other adverse concerns? — (Y) N U N/A 3)

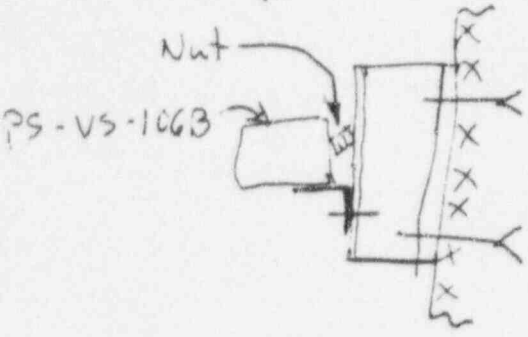
Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? (Y) N U

COMMENTS

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

3) A nut is wedged between the switch housing and the plate. The nut should be removed.

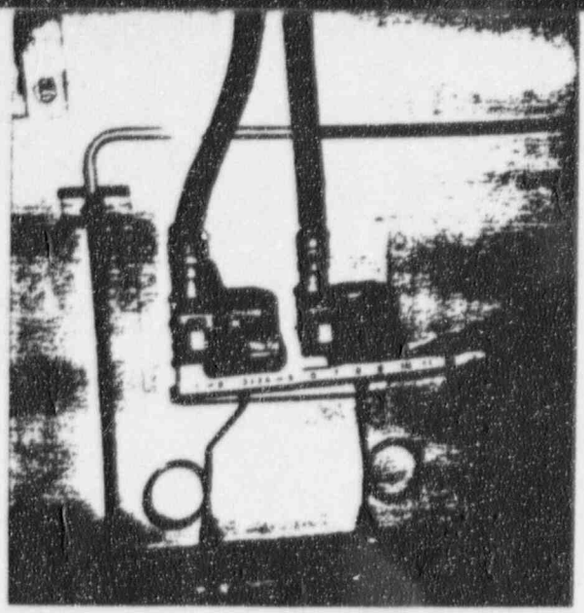


MWR 047686 WRITTEN TO REMOVE WEDGED NUT

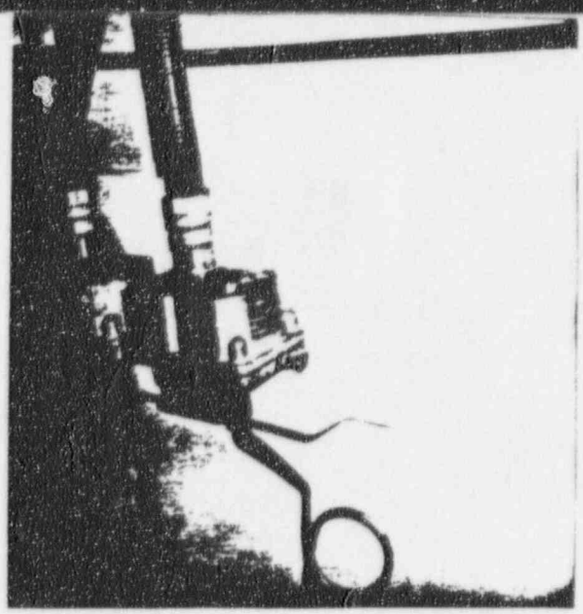
For support and anchorage details refer to PS-VS-106A.

Evaluated by: J. T. Wattbrook Date: 11/2/95

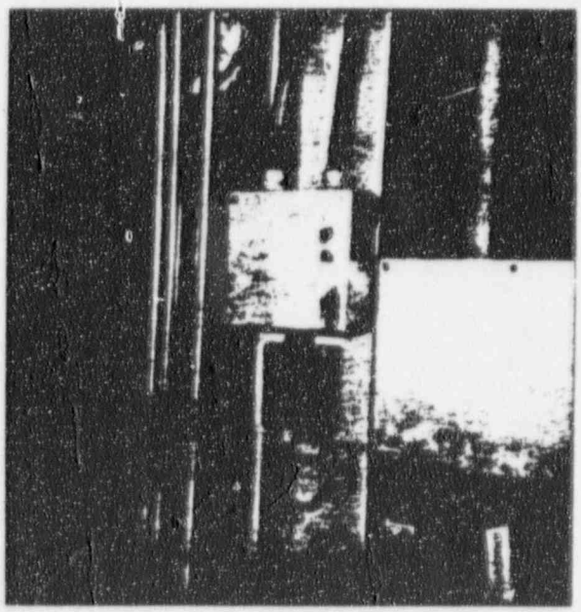
Paul V Davis Nov, 6TH, 1995



PS-VS-106A & B



PS-VS-106A & B



PS-MS-101C

FORM D37 – 101246 NO. 23180

WORK REQUEST SUBMITTED

MARK NO. PS-VS-106B

PROBLEM NUT WEDGED BETWEEN SWITCH HOUSING AND MOUNTING PLATE

NO. 23180

W. R. SUBMITTED NO. 23180 DATE

23180

DATE: Nov. 6TH, 1995 ☒ BV1 ☐ BV2

MARK NO. PS-VS-106B

Equip. Name: PRESSURE SWITCH FOR SLCRS EXH. FAN VS-F-4B TRIP

LOCATION: BUILDING: AUXB ELEV.: 768

ON WALL @ 773 FT IN SOUTH WEST CORNER NEAR CONTAINMENT AIRLOCK DOORS

PROBLEM DESCRIPTION: NUT WEDGED BETWEEN SWITCH HOUSING AND MOUNTING PLATE TO BE REMOVED.

☐ Caution Tags ☐ OOS Tags ☐ Lifted Lead Tags

Location of tags to be removed after repair:

PLACED BY:	EMP. NO.	MWR NO.
PAUL V. DAVIS	78	047686
APPROVED BY:	EMP. NO.	DATE:

50833-2-01 P-R10M

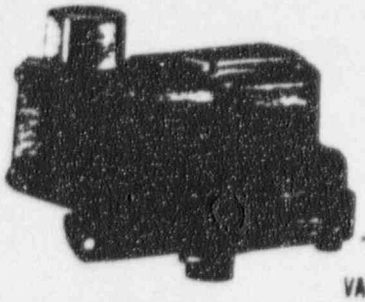
```
BVPOWR19          BEAVER VALLEY POWER STATION WORK REQUEST              BVPMW19
                    SECTION 1: ORIGINATOR                    ORANGE   OOS   CAUTION
NUMBER PRIORITY: 4 REPAIR MODE: 7 EQ ITEM.: N IST PUMP/  TAG NO  LOG NO  TAG NO
  7686 QA CAT. : 1 TEST MODE:   7 TYPE C:   N VALVE: N   023180 N/A      N/A
 /IT SYSTEM NO EQUIPMENT MARK NO        NPRD CODE       TASK NO
 01     16     PS-VS-106B               INSTRU          N/A
BLDG AUXILIARY                    ELEV 768 BLDG AREA SOUTH-WEST WALL
PRA: N      R.G.1.97: N       G.L. 89-10: N      SEISMIC CLASS:          SBO: N
EQUIPMENT FUNCTIONAL DESCRIPTION: SLCRS EIH FAN VS-F-4E TRIP UPON
                                  VAC COND IN CNMT PURGE EIH DUCT
MANUFACTURER B070   BARKSDALE CONTROL DIV / DELAVAL
MODEL NO DIT-M3                   SERIAL NO N/A
REQUEST  ********TECH  SPEC******** OPEN ITEM **** ORIGINATING SUPERVISOR ***
DATE     DATE  TIME NUMBER          NO. Y/N: N      EMP.#  NAME
951106 N/A     N/A  N/A             N/A - N/A       0078   P V DAVIS

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
```

OPERATING CHARACTERISTICS • ORDERING DATA

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



D1T SINGLE SETTING

D2T DUAL CONTROL

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

Proof (Test) Pressure	Adjustable Range Decreasing Min.	Decreasing Max.	Increasing Min.	Increasing Max.	Approx. Actuation Value (Differential)	Wetted Material*	D1T Catalog Number	D2T Catalog Number
3	.018	1.654	.064	1.7	.018 to .046	B 25	D1T-H2	D2T-H2
3	.018	1.65	.068	1.7	.02 to .05	17-7PH	D1T-H2SS	D2T-H2SS
10	.03	2.89	.14	3.	.05 to .11	B 25	D1T-A3	D2T-A3
10	.03	2.85	.18	3.	.07 to .15	17-7PH	D1T-A3SS	D2T-A3SS
60	.4	17.80	.60	18.	.1 to .20	B 25	D1T-H18	D2T-H18
60	.4	17.74	.66	18.	.12 to .26	17-7PH	D1T-H18SS	D2T-H18SS
160	.5	77.2	3.3	80.	1.4 to 2.8	B 25	D1T-A80	D2T-A80
160	.5	76.6	3.9	80.	1.6 to 3.4	17-7PH	D1T-A80SS	D2T-A80SS
300	1.5	144.8	6.7	150.	2.2 to 5.2	B 25	D1T-A150	D2T-A150
300	1.5	144.	7.5	150.	2.3 to 6.0	17-7PH	D1T-A150SS	D2T-A150SS
Approximate shipping weight lbs.							2.0	2.0

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

Proof (Test) Vacuum	Proof (Test) Pressure	Adjustable Range Dec. Vacuum Min.	Dec. Vacuum Max.	Incr. Vacuum Min.	Incr. Vacuum Max.	Approx. Actuation Value (Differential)	Wetted Material*	D1T Catalog Number	D2T Catalog Number
6	10 PSI	06	5.8	26	6.	.09 to .20	B 25	D1T-A3	D2T-A3
6	10 PSI	06	5.72	34	6.	.14 to .28	17-7PH	D1T-A3SS	D2T-A3SS
30	60 PSI	.8	29.34	1.46	30.	.4 to .66	B 25	D1T-H18	D2T-H18
30	60 PSI	.8	29.2	1.6	30.	.4 to .8	17-7PH	D1T-H18SS	D2T-H18SS
Approximate shipping weight lbs.								2.0	2.0

IN STOCK

*B 25 Beryllium Copper, 17-7PH Stainless Steel

DETAIL DATA

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 through ½" nps conduit connector.

PRESSURE (VACUUM) CONNECTION: ¼" npt internal thread. ½" npt available stainless steel only add —P2 to catalog number when ordering.

ADJUSTMENT INSTRUCTIONS

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

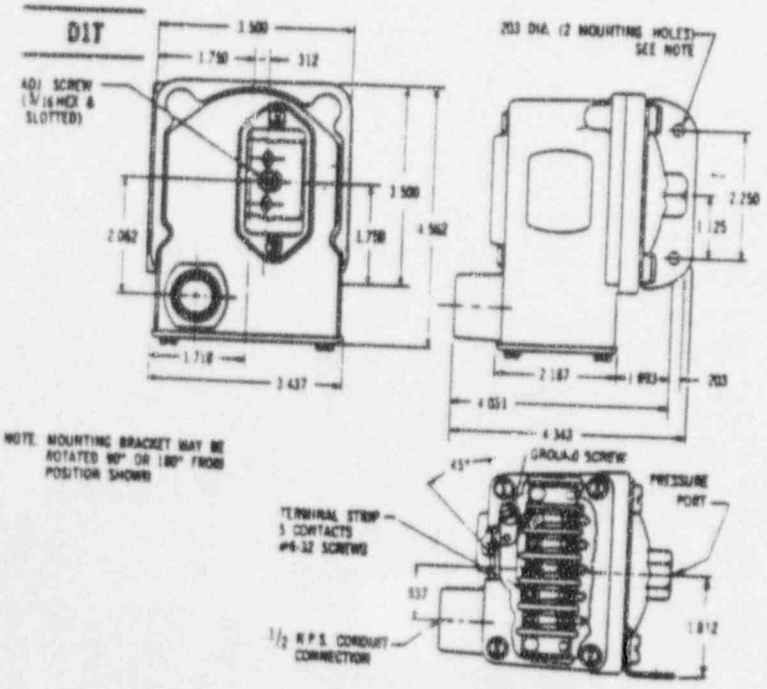
Vacuum: Turn adjustment screw counterclockwise to approach atmospheric pressure.

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

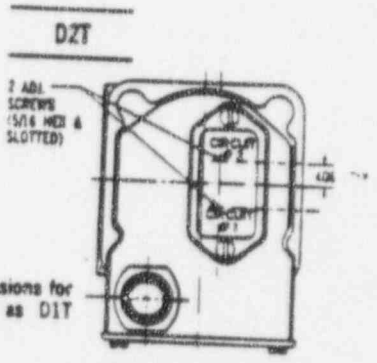
WIRE CODING — VACUUM
Circuit #1: Common — P...
Normally Closed — ...
Normally Open — B...
Circuit #2: Common — Br...
Normally Closed — Ye...
Normally Open — Or...

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

D1T



D2T



Note: All other dimensions for D2T are the same as D1T (left).

Barksdale
Bulletin No. 870420-A

SSEL Line No. 5201C
A

Status Y N U

COPY

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. TS-HV-55A Equip. Class 18 - Instruments on Racks

Equipment Description TEMP SWITCH FOR VS-F-55A

Location: Bldg. SRVB Floor El. 713 Room, Row/Col SW EMERG SWGR

Manufacturer, Model, Etc. (optional but recommended) _____

SEISMIC CAPACITY VS DEMAND

1. Elevation where equipment receives seismic input — 725.5'
2. Elevation of seismic input below about 40' from grade — (Y) 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
   - 1.5 x Bounding Spectrum — (ABS)
   - GERS — GERS
5. Demand based on:
   - Ground Response Spectrum — GRS
   - 1.5 x Ground Response Spectrum — AGS
   - Conserv. Des. In-Str. Resp. Spec. — (CRS)
   - Realistic M-Ctr. In-Str. Resp. Spec. — RRS

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

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 — (Y) N U N/A
2. No computers or programmable controllers — (Y) N U N/A
3. Steel frame and sheet metal structurally adequate — (Y) N U N/A
4. Adjacent racks which are close enough to impact or 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 — (Y) N U N/A
6. Attached lines have adequate flexibility — (Y) N U N/A
7. Anchorage adequate (See checklist below for details) — (Y) N U N/A
8. Relays mounted on equipment evaluated — (Y) N U N/A
9. Have you looked for and found no other adverse concerns? — Y N U N/A

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)

1. Equipment is included in the generic seismic testing equipment class — Y N U N/A
2. Meets all Bounding Spectrum caveats — Y N U N/A
3. Component is a pressure, temperature, level or flow transmitter — Y N U N/A

52233-C-014 P.A 112

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 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	
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)	Y	N	U	N/A	
9.	Rack capable of structurally transferring 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)	

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	(Y)	N	U	N/A	
2.	Type of anchorage covered by GIP	(Y)	N	U	N/A	Supported
3.	Sizes and locations of anchors determined	(Y)	N	U	N/A	by substra
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 TS is attached to strut that is attached to building steel.	Y	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 under base, capacity reduction for expansion anchors	Y	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 to CG adequate	(Y)	N	U	N/A	
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y	N	U	(N/A)	
Are anchorage requirements met?					(Y) N U	

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	(Y)	N	U	N/A
3.	Attached lines have adequate flexibility	(Y)	N	U	N/A

52233-C-014 PH12

SSEL Line No. 5201C

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. TS-HV-55A Equip. Class 18 - Instruments on Racks

Equipment Description TEMP SWITCH FOR VS-F-55A

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

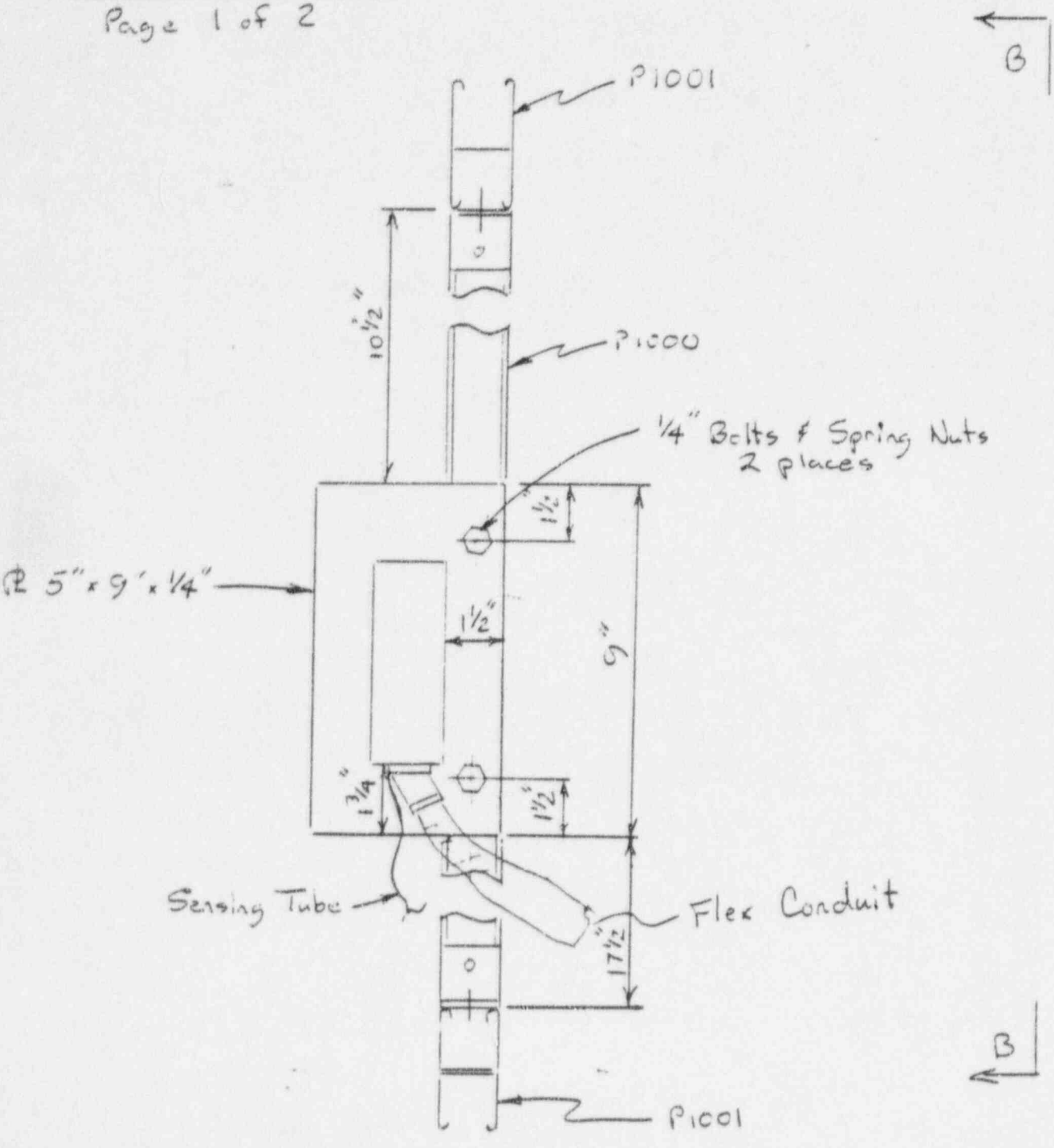
Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? (Y) N U

COMMENTS

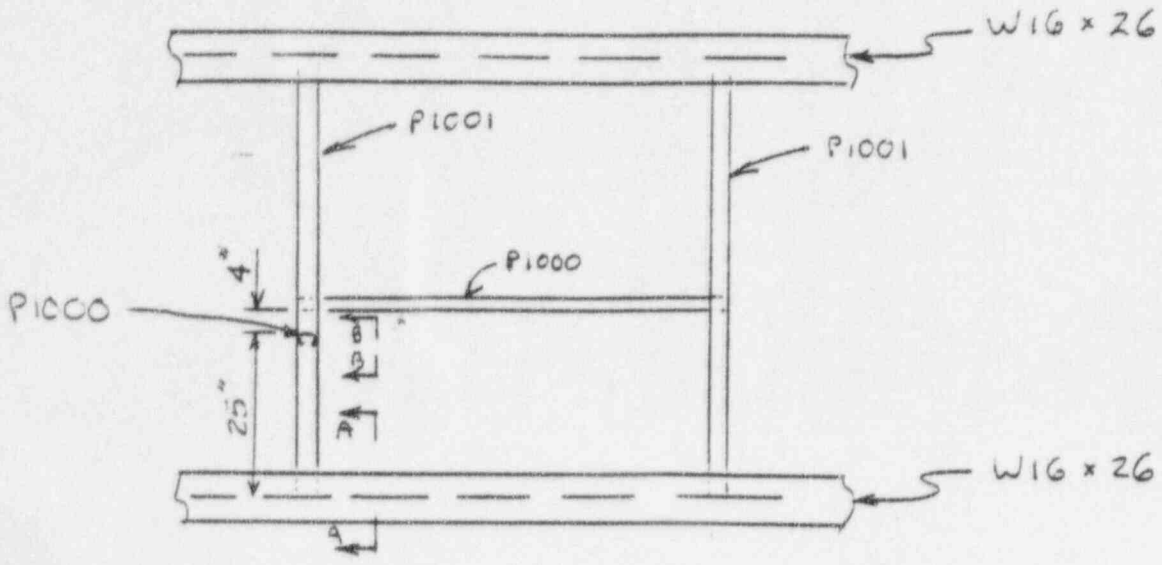
Evaluated by: Thomas Westbrook Date: 11/2/95
Paul V Davis Nov. 2nd, 1995

TS - HV - 55A

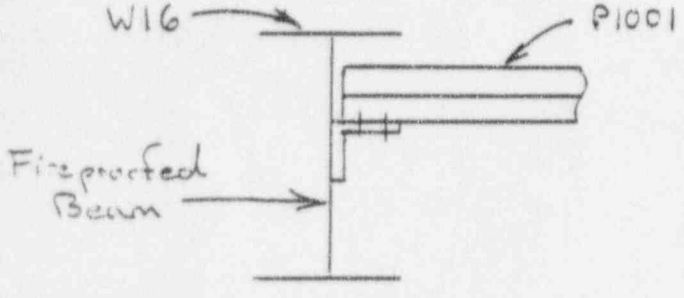

B
P1001
10½"
P1000
¼" Bolts & Spring Nuts
2 places
1½"
R 5" x 9" x ¼"
1½"
9"
1¾"
1½"
Sensing Tube
Flex Conduit
17½"
B
P1001

TS - HV - 55A

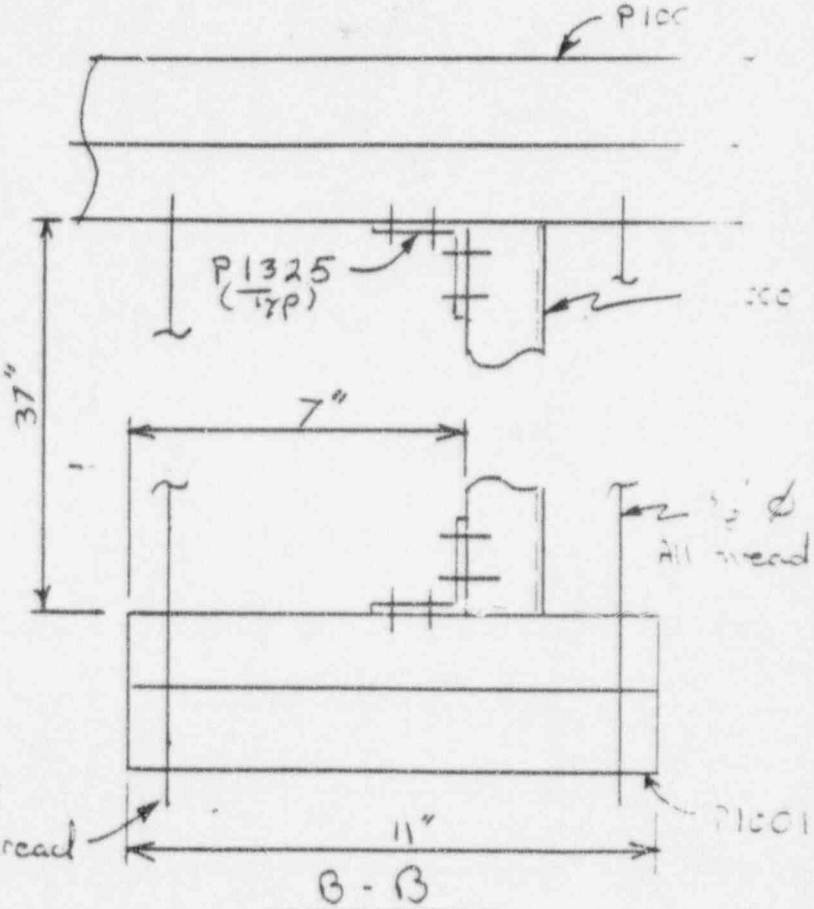
Page 2 of 2



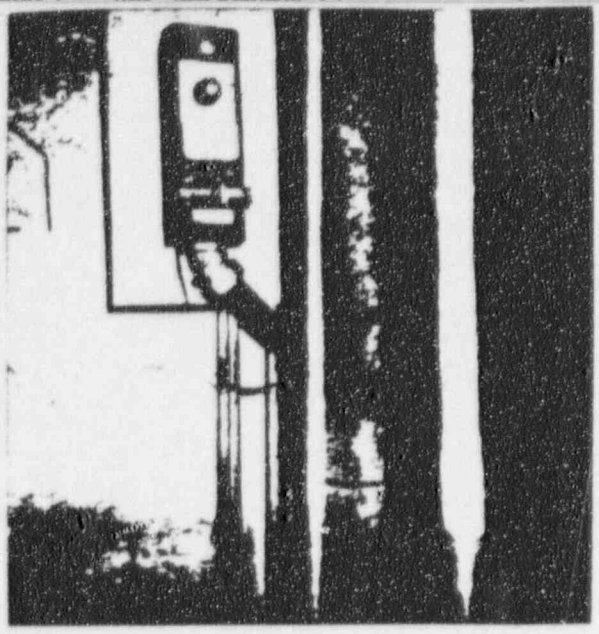
Plan View



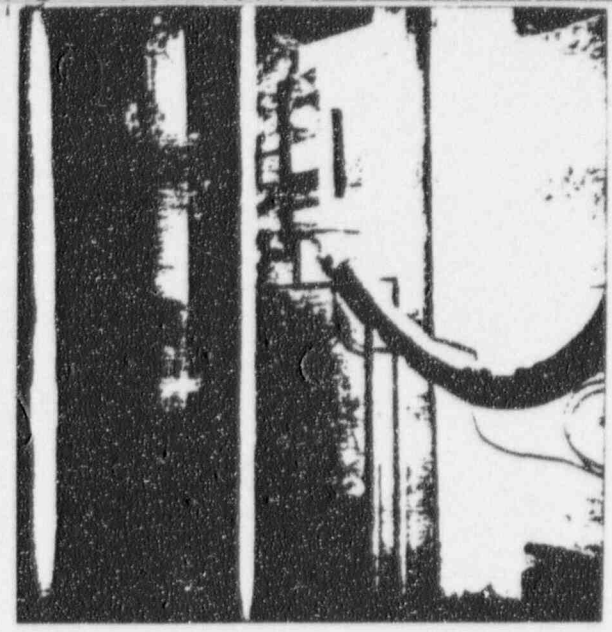
A - A



B - B

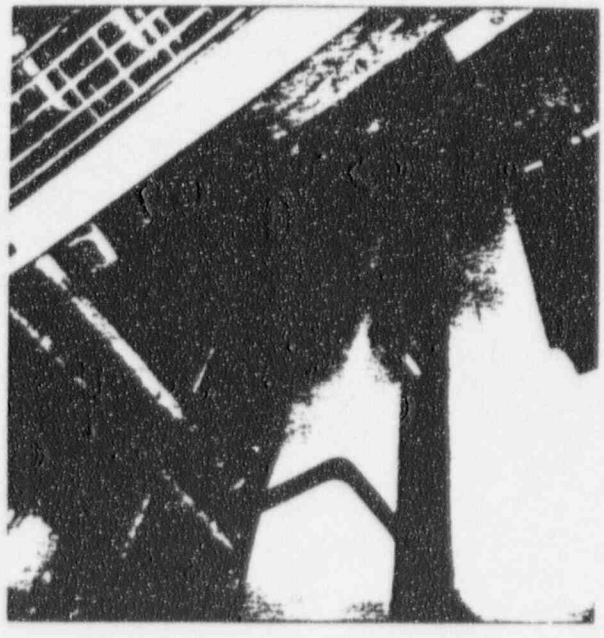


TS-HV-55A



TS-HV-55A

TS-HV-55B



TS-HV-55B

SSEL Line No. 5202C Status Y N U

A

Copy

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip ID No. TS-HV-55B Equip. Class 18 - Instruments on Racks

Equipment Description TEMP SWITCH FOR VS-F-55B

Location: Bldg. SRVB Floor El. 713 Room, Row/Col SW EMERG SWGR

Manufacturer, Model, Etc. (optional but recommended) _____

SEISMIC CAPACITY VS DEMAND

1. Elevation where equipment receives seismic input — 725
2. Elevation of seismic input below about 40' from grade — (Y) 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
   - 1.5 x Bounding Spectrum — (ABS)
   - GERS — GERS
5. Demand based on:
   - Ground Response Spectrum — GRS
   - 1.5 x Ground Response Spectrum — AGS
   - Conserv. Des. In-Str. Resp. Spec. — (CRS)
   - Realistic M-Ctr. In-Str. Resp. Spec. — RRS

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

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 — (Y) N U N/A
2. No computers or programmable controllers — (Y) N U N/A
3. Steel frame and sheet metal structurally adequate — (Y) N U N/A
4. Adjacent racks which are close enough to impact or sections of multi-bay racks are bolted together if they contain essential relays Single Inst. on Strut — Y N U (N/A)
5. Natural frequency relative to 8 Hz limit considered — (Y) N U N/A
6. Attached lines have adequate flexibility — (Y) N U N/A
7. Anchorage adequate (See checklist below for details) — (Y) N U N/A
8. Relays mounted on equipment evaluated — (Y) N U N/A
9. Have you looked for and found no other adverse concerns? — (Y) N U N/A

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)

1. Equipment is included in the generic seismic testing equipment class — Y N U N/A
2. Meets all Bounding Spectrum caveats — Y N U N/A
3. Component is a pressure, temperature, level or flow transmitter — Y N U N/A

SSEL Line No. 5202C

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equip. ID No. TS-HV-55B Equip. Class 18 - Instruments on Racks

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)	Y	N	U	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 amplification of floor 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	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)

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	(Y)	N	U	N/A
2.	Type of anchorage covered by GIP	(Y)	N	U	N/A
3.	Sizes and locations of anchors determined	(Y)	N	U	N/A
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 TS is attached to strut that is attached	Y	N	U	(N/A)
6.	For bolted anchorages, gap under base less than 1/4-inch to bldg steel.	(Y)	N	U	N/A
7.	Factors affecting essential relays considered: gap under base, capacity reduction for expansion anchors	Y	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 to CG adequate	(Y)	N	U	N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y	N	U	(N/A)

Are anchorage requirements met? (Y) N U

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	(Y)	N	U	N/A
3.	Attached lines have adequate flexibility	(Y)	N	U	N/A

5202C-C-04 P.A119

SSEL Line No. 5202C

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. TS-HV-55B Equip. Class 18 - Instruments on Racks

Equipment Description TEMP SWITCH FOR VS-F-55B

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

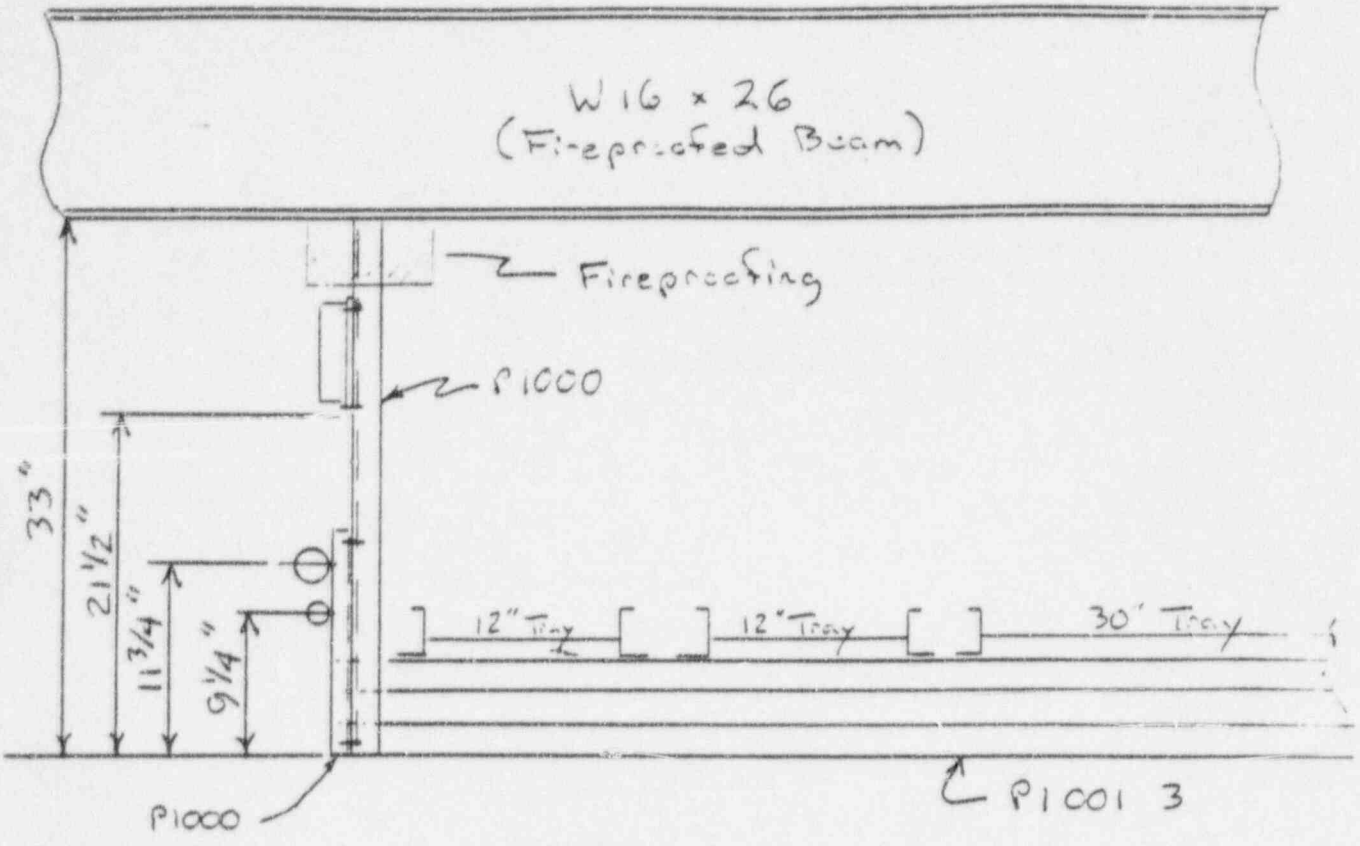
Is equipment free of interaction effects? (Y) N U

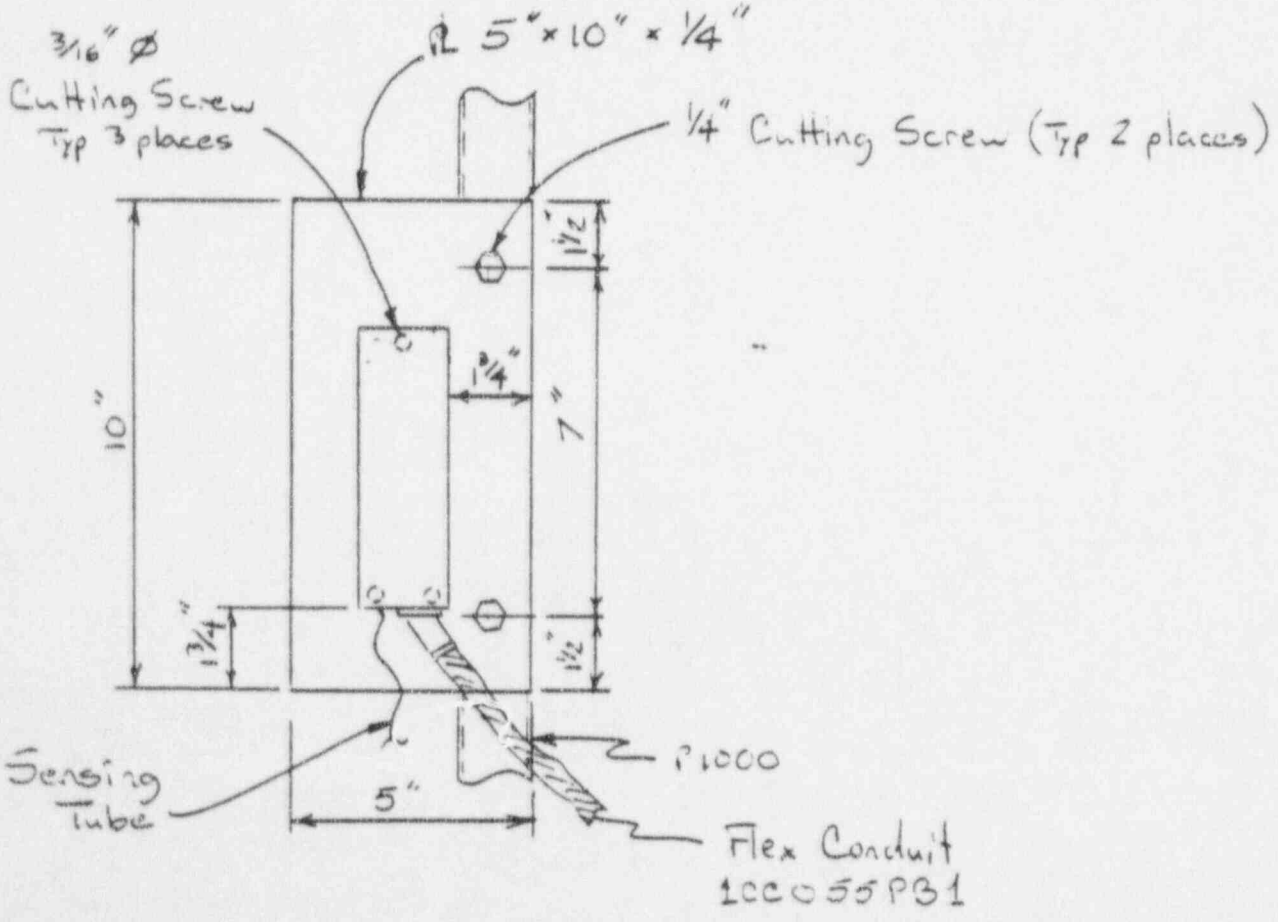
IS EQUIPMENT SEISMICALLY ADEQUATE? (Y) N U

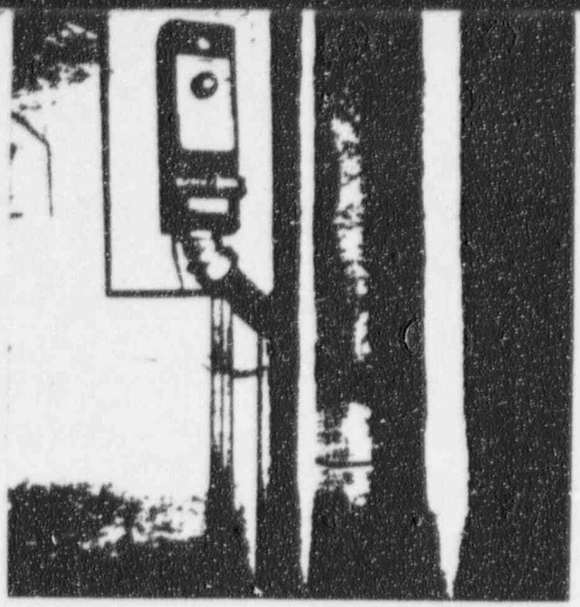
COMMENTS

Evaluated by: R. Thomas Nietstock Date: 11/6/95
Paul V Davis Nov. 6th, 1995

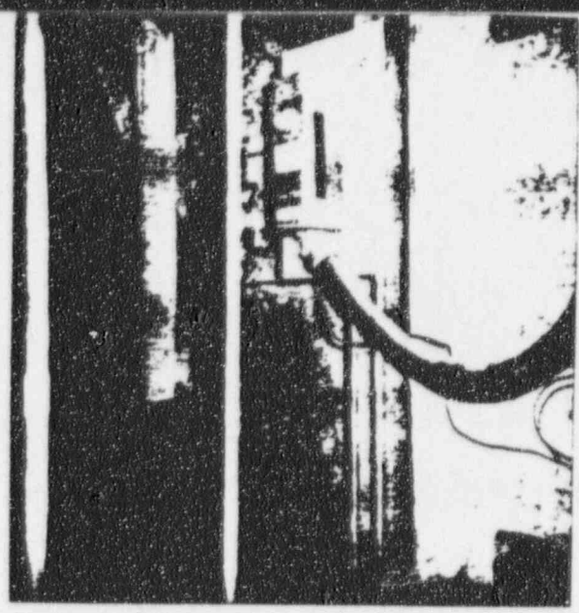
TS - HV - 55B


W16 x 26
(Fireproofed Beam)
Fireproofing
P1000
33"
21½"
11¾"
9¼"
12" Tray
12" Tray
30" Tray
P1000
P1001 3


3/16" Ø
Cutting Screw
Typ 3 places
L 5" x 10" x ¼"
¼" Cutting Screw (Typ 2 places)
1½"
1¾"
10"
7"
1¾"
1½"
P1000
Sensing
Tube
5"
Flex Conduit
1CC055PB1

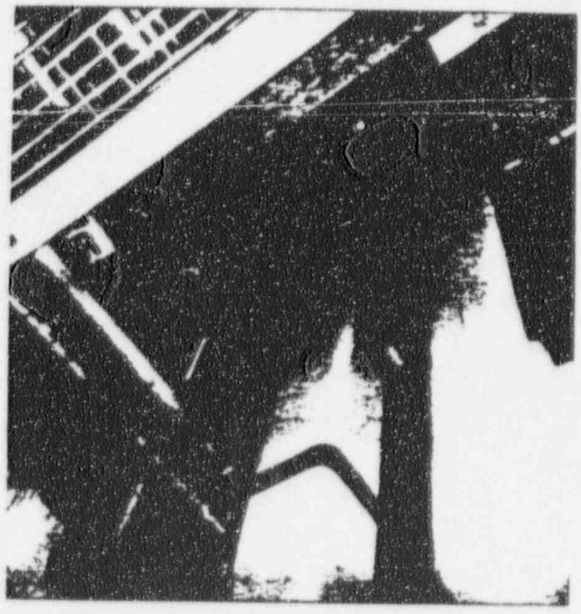


TS-HV-55A



TS-HV-55A

TS-HV-55B



TS-HV-55B

52233-C-019 PA122

SSEL Line No. 4205E Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Copy

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

Equipment Description INSTRUMENT RACK FOR SOV-MS-101A AND SOV-MS-101A4

Location: Bldg. SFGB Floor El. 751 Room, Row/Col MSVH

Manufacturer, Model, Etc. (optional but recommended) DCP 721

SEISMIC CAPACITY VS DEMAND

1. Elevation where equipment receives seismic input 751
2. Elevation of seismic input below about 40' from grade 722 (Y) N U
3. Equipment has fundamental frequency above about 8 Hz (Y) N U N/A 1)
4. Capacity based on:
   - Existing Documentation — DOC
   - Bounding Spectrum — BS
   - 1.5 x Bounding Spectrum — (ABS)
   - GERS — GERS
5. Demand based on:
   - Ground Response Spectrum — GRS
   - 1.5 x Ground Response Spectrum — AGS
   - Conserv. Des. In-Str. Resp. Spec. — (CRS)
   - Realistic M-Ctr. In-Str. Resp. Spec. — RRS

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

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 (Y) N U N/A
2. No computers or programmable controllers (Y) N U N/A
3. Steel frame and sheet metal structurally adequate (Y) N U N/A
4. Adjacent racks which are close enough to impact or 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 (Y) N U N/A 1)
6. Attached lines have adequate flexibility (Y) N U N/A
7. Anchorage adequate (See checklist below for details) (Y) N U N/A
8. Relays mounted on equipment evaluated Y N U (N/A)
9. Have you looked for and found no other adverse concerns? (Y) N U N/A

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)

1. Equipment is included in the generic seismic testing equipment class (Y) N U N/A
2. Meets all Bounding Spectrum caveats Y N U N/A
3. Component is a pressure, temperature, level or flow transmitter SVP 10.19.92 (Y) N U N/A

SSEL Line No. 4205E

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

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

Equipment Description INSTRUMENT RACK FOR SOV-MS-101A AND SOV-MS-101A4

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	Y	N	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)	Y	N	U	N/A
9.	Rack capable of structurally transferring 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)

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	(Y)	N	U	N/A
2.	Type of anchorage covered by GIP	(Y)	N	U	N/A
3.	Sizes and locations of anchors determined	(Y)	N	U	N/A
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	(Y)	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 under base, capacity reduction for expansion anchors	Y	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 to CG adequate	(Y)	N	U	N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y	N	U	(N/A)

Are anchorage requirements met? (Y) N U

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 (pull out switches)	(Y)	N	U	(N/A)
3.	Attached lines have adequate flexibility	(Y)	N	U	N/A

52d33-C-01 PA124

SSEL Line No. 4205E

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

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

Equipment Description INSTRUMENT RACK FOR SOV-MS-101A AND SOV-MS-101A4

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A

5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

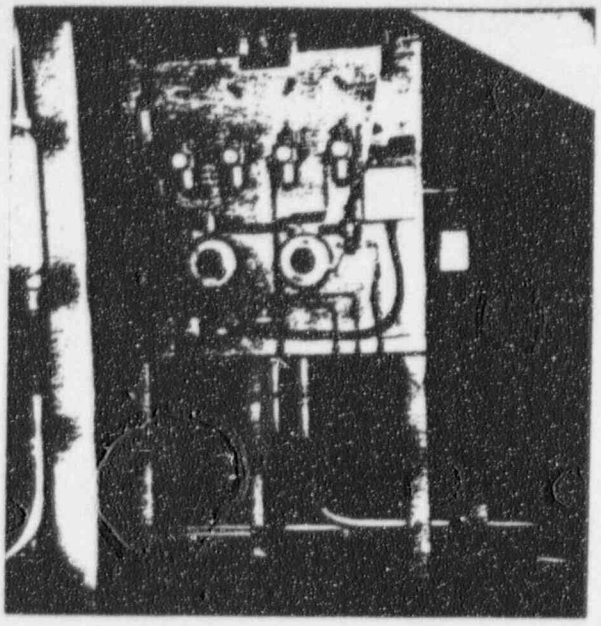
IS EQUIPMENT SEISMICALLY ADEQUATE? (Y) N U

COMMENTS

1) RACK IS RIGID PER ANALYSES 8700-DMC-2268 & 8700-DQC-0004.

Evaluated by: Paul V Davis Date: OCT 10TH, 1995

10-10-95



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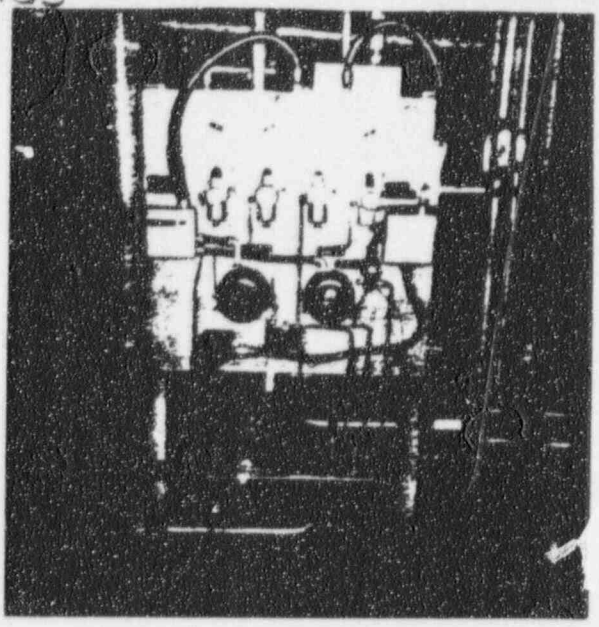
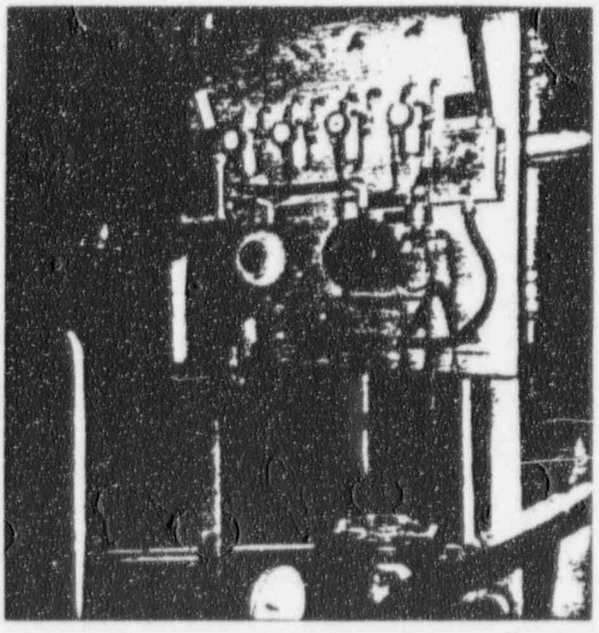


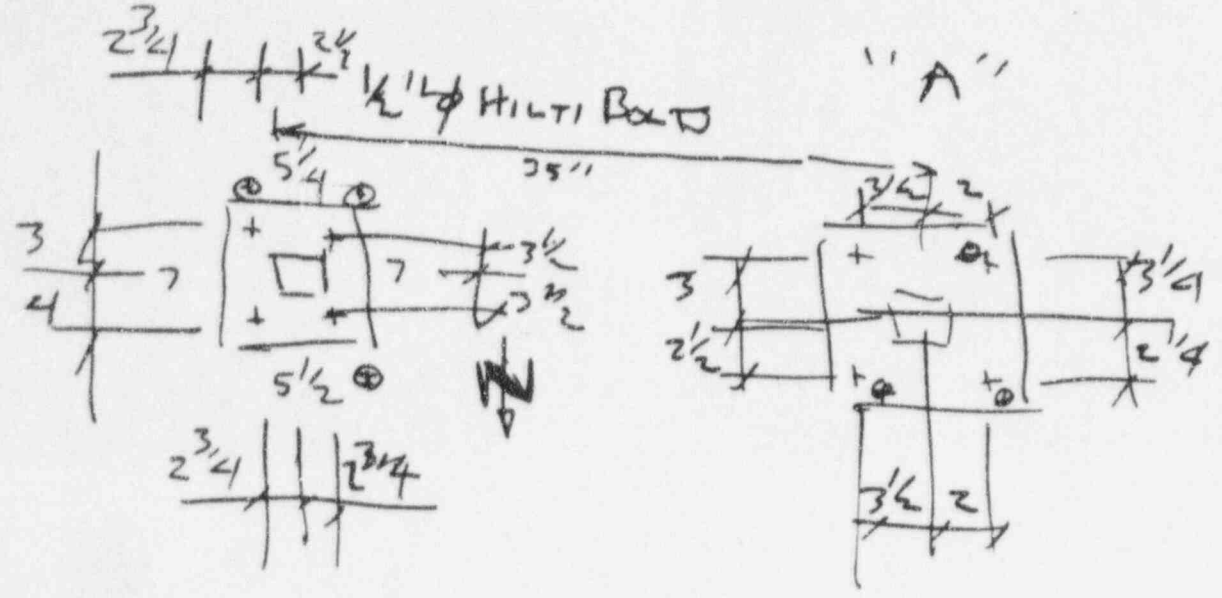
"A" PNL-MS-101A



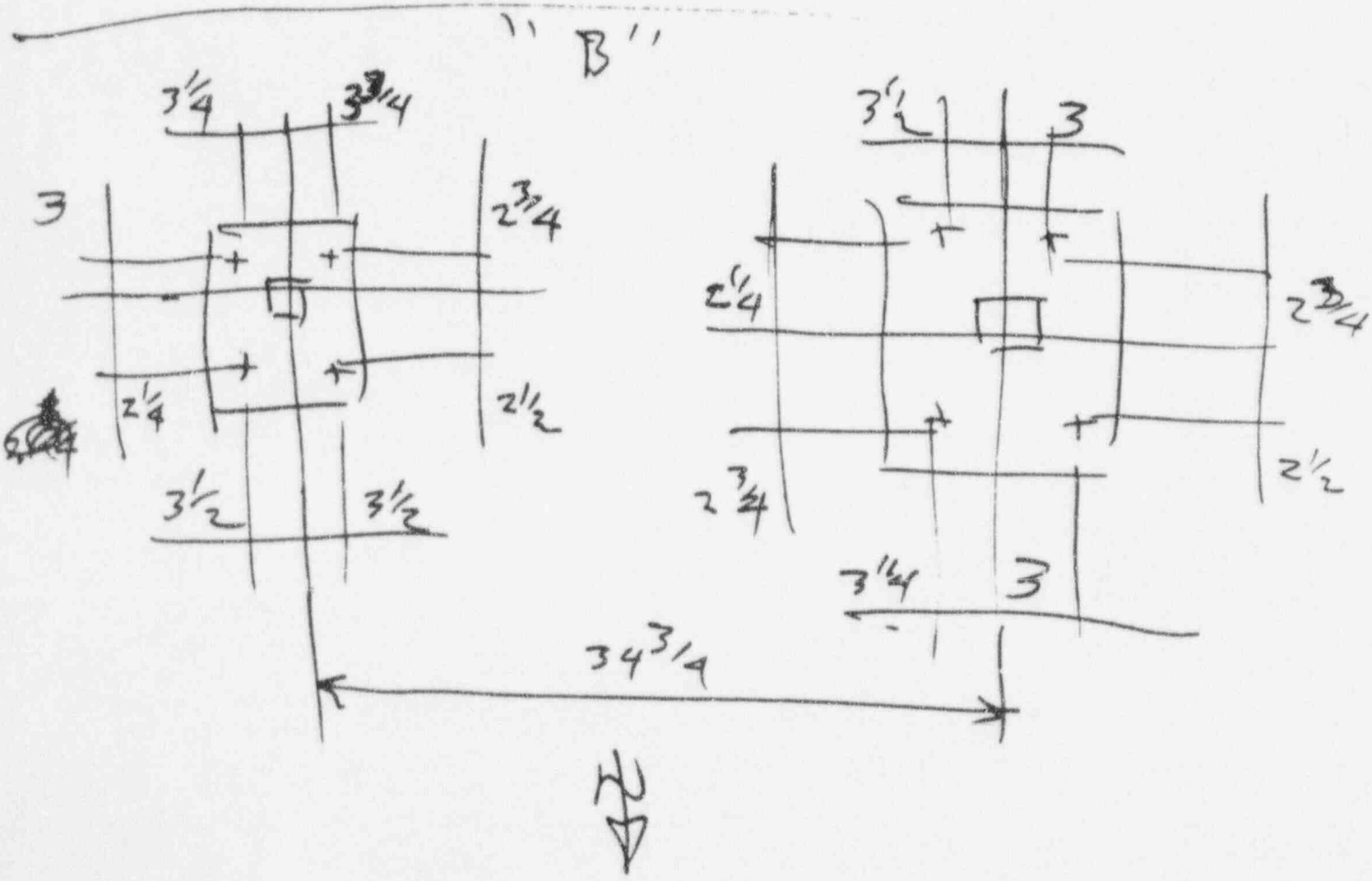
"C" PNL-MS-101C

[redacted]

5003572-014 [TB-727A1 I/P CONTROL] ψH120



⊕ SLIGHT TURN



5d233-C-014 PH101

DUQUESNE LIGHT COMPANY
Nuclear Engineering and Records Unit

DESIGN ANALYSIS COVER SHEET

Design Analysis ☒ Alternate Calculation ☐ Unit No. 1

DCP No.	Safety Related	Verification Required	Seismic	Analysis No.
721	Yes ☒ No ☐	Yes ☒ No ☐	Yes ☒ No ☐	8700-DSC-0004

Title: 8700.21.33
ATMOSPHERIC STEAM DUMP SOLENOID VALVES-SEISMIC EVAL.

Purpose and Scope:
TO DETERMINE WHETHER S.V.'s AVAILABLE @ BV-2 ARE SEISMICALLY QUALIFIED FOR USE @ BV-1. THE BV-2 S.V.'s ARE MODEL #206-381-6RF BY ASCO.

Design Base Document(s) Affected: System No. 21
CALC. 8700-DSC-226B
BV-2 EQ. RPT. #EQDP-NE-2/NE-5, REV. 5, 4/85

CONTROLLED
BVPS UNIT 1

Conclusion:
S.V. IS QUALIFIED FOR INTENDED USE @ BV-1.

Rev.	Prepared By/Date	Checked By/Date	Approved By/Date
0	[illegible]	John A. Jan 12/5/89	for R. Hamm 12/4/89
1			
2			

5??3-C-019 RC-R'D   P.H106 DMK-213

DUQUESNE LIGHT COMPANY
Nuclear Engineering and Records Unit

DESIGN ANALYSIS COVER SHEET

Design Analysis ☒   Alternate Calculation ☐   Unit No. 1

DCP No.	Safety Related	Verification Required	Seismic	Analysis No.
721	Yes ☐ No ☒	Yes ☐ No ☒	Yes ☒ No ☐	8700-DMC-2268 8700.21.13

Title:
Atmospheric Steam Dump Valves Control Instrument Rack & Sup

Purpose and Scope:
To design an instrument rack for mounting the Atmospheric Steam Dump Valves controls. This rack is mounted in the Main Steam Valve House & is seismically designed.
To Analyze Associated Tubing Supports | Rev 1

Design Base Document(s) Affected: System No. 21

8700-DMK-213*A
8700-DMK-221*A
8700-DMK-222*A
8700-DMK-223*A
-224*A
-225*A

Rev 1

QA CAT II
Seismic

Rev 1

Conclusion:
See Page 11A for conclusion.
See Body of Analysis for individual conclusions | Rev 1

CONTROLLED
BVPS UNIT 1

Rev.	Prepared By/Date	Checked By/Date	Approved By/Date
0	C Mancuso 3/10/89	F Carbone 3/10/89	[signature] 3-10-89
1	C Mancuso [signature] 11-11-89	William Vahte 12-1-89	[signature] 12-4-89
2			

1.0 SCOPE/BACKGRND

To design an instrument rack for mounting the Atmospheric Steam Dump valves controls. This rack will be mounted in the Mainsteam Valve House and requires seismic design.

2.0 REFERENCES

2.1 AISC Manual of Steel Construction, 8th Edition

2.2 "Design of Welded Structures," O. Blodgett, 1966

2.3 "Formulas for Stress and Strain" 5th Edition, Roark & Young

2.4 SD-STGP 6, May 3, 1979 S&W Design Procedure

2.5 EMTR-612 Oct 1977

2.6 Unistrut Catalogue, Rev 10R

2.7 Williams and Company Catalogue 33

2.8 EMD-79-23

3.0 DESIGN INPUTS

3.1 Mainsteam valve house bottom elevation is considered 2g area.

3.2 Weight of Instruments to be mounted is 51.5# per LE F. Gardner

3.3 8700-DMK-213 *A2

3.[redacted] 5:640

3.[redacted]700-DMK-221 *A - 225 * A

3.6 Analysis 8700-DMC-2136

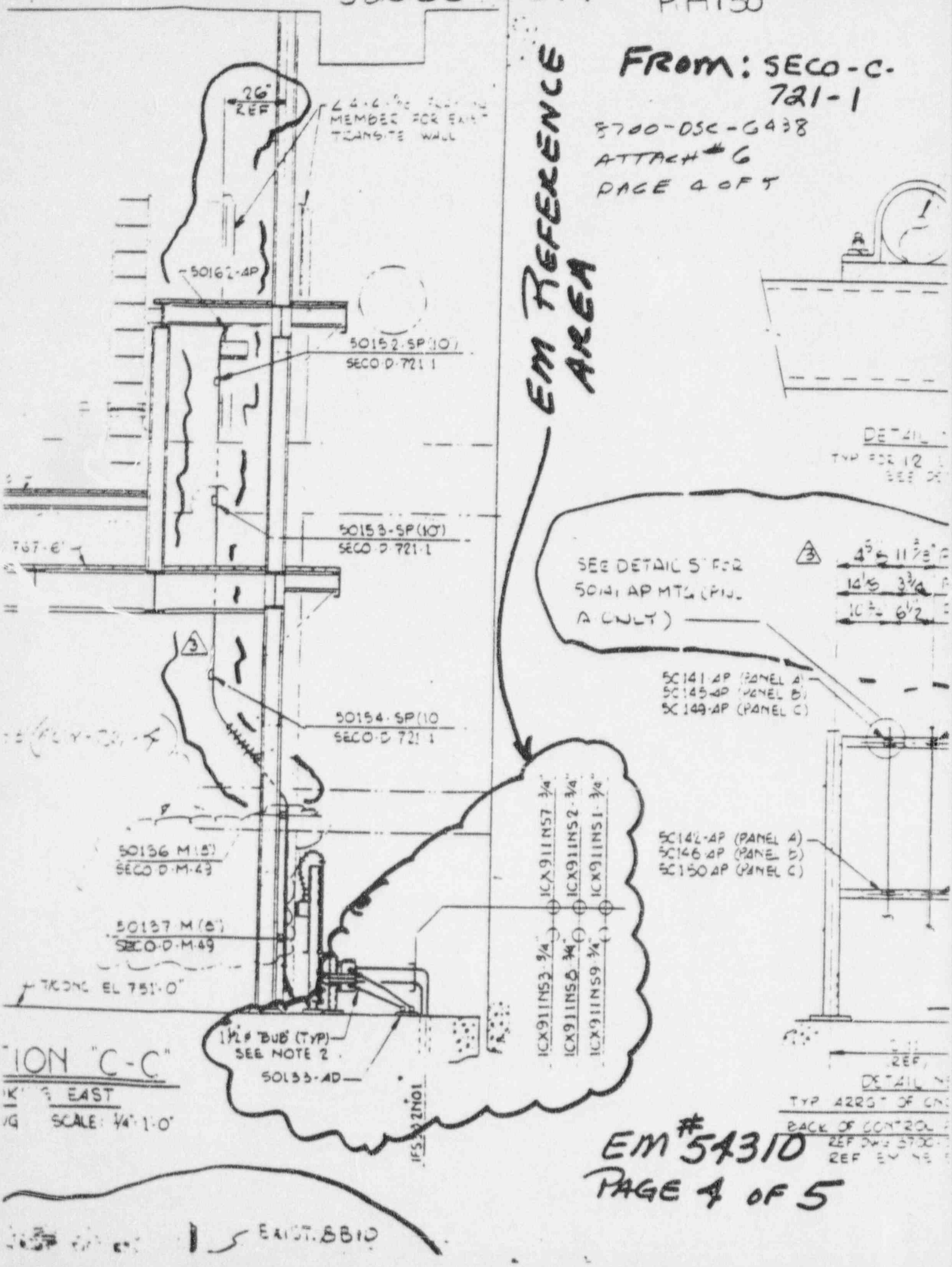
3.7 EM 54099

3.8 EM 54088

5aaaa-4014 PA130

FROM: SECO-C-721-1

5700-OSC-G438
ATTACH # 6
PAGE 4 OF 7



EM # 54310
PAGE 4 OF 5

SSEL Line No. 4206E Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Copy

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

Equipment Description INSTRUMENT RACK FOR SOV-MS-101B AND SOV-MS-101B4

Location: Bldg. SFGB Floor El. 751 Room, Row/Col MSVH

Manufacturer, Model, Etc. (optional but recommended) DCP 721

SEISMIC CAPACITY VS DEMAND

1. Elevation where equipment receives seismic input 751
2. Elevation of seismic input below about 40' from grade 722. (Y) N U
3. Equipment has fundamental frequency above about 8 Hz (Y) N U N/A 1)
4. Capacity based on:
   - Existing Documentation DOC
   - Bounding Spectrum BS
   - 1.5 x Bounding Spectrum (ABS)
   - GERS GERS
5. Demand based on:
   - Ground Response Spectrum GRS
   - 1.5 x Ground Response Spectrum AGS
   - Conserv. Des. In-Str. Resp. Spec. (CRS)
   - Realistic M-Ctr. In-Str. Resp. Spec. RRS

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

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 (Y) N U N/A
2. No computers or programmable controllers (Y) N U N/A
3. Steel frame and sheet metal structurally adequate (Y) N U N/A
4. Adjacent racks which are close enough to impact or 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 (Y) N U N/A 1)
6. Attached lines have adequate flexibility (Y) N U N/A
7. Anchorage adequate (See checklist below for details) (Y) N U N/A
8. Relays mounted on equipment evaluated Y N U (N/A)
9. Have you looked for and found no other adverse concerns? (Y) N U N/A

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)

1. Equipment is included in the generic seismic testing equipment class Y N U N/A
2. Meets all Bounding Spectrum caveats Y N U N/A
3. Component is a pressure, temperature, level or flow transmitter Y N U N/A

5aa33-c-019 F-A 158

SSEL Line No. 4206E

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equip. ID No. PNL-MS-101B 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)	Y N U 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 amplification of floor 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	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)

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	(Y) N U N/A
2.	Type of anchorage covered by GIP	(Y) N U N/A
3.	Sizes and locations of anchors determined	(Y) N U N/A
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	(Y) 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 under base, capacity reduction for expansion anchors	Y 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 to CG adequate	(Y) N U N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y N U (N/A)

Are anchorage requirements met? (Y) N U

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	Y N U (N/A)
3.	Attached lines have adequate flexibility	(Y) N U N/A

50233-C-014 P.A.I.

SSEL Line No. 4206E

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

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

Equipment Description INSTRUMENT RACK FOR SOV-MS-101B AND SOV-MS-101B4

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? (Y) N U

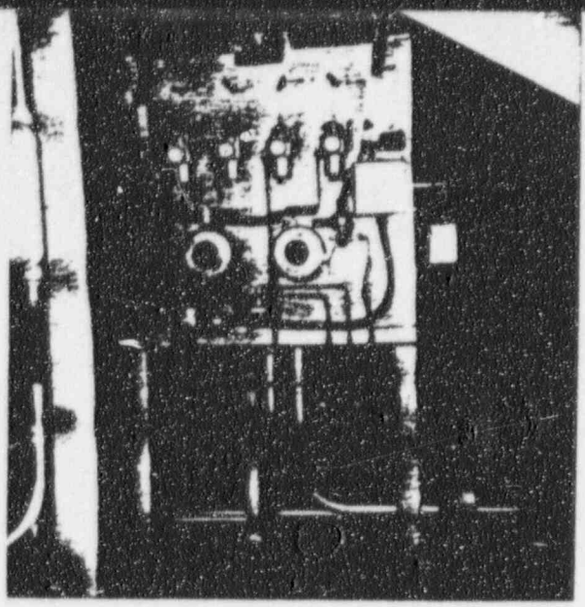
COMMENTS

1) RACK IS RIGID PER ANALYSES 8700-DMC-2268 & 8700-DQC-0004

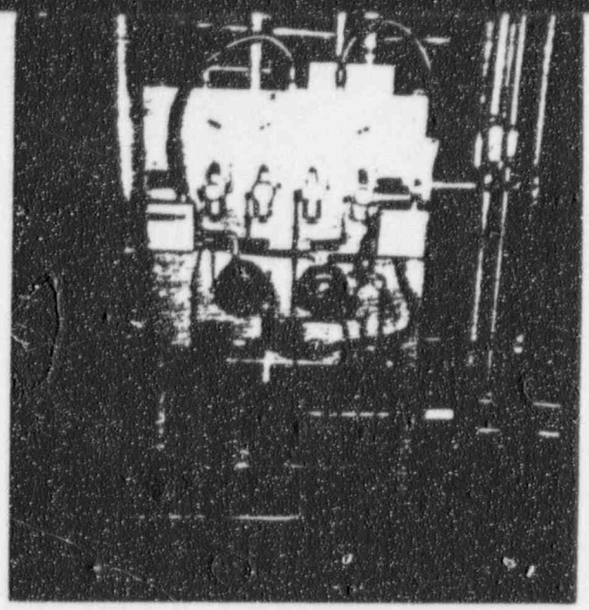
NOTE: SEE SEWS FOR SOV-MS-101B & SOV-MS-101B4

Evaluated by: Paul V Davis Date: Oct 10TH, 1995

10-10-95



"B" PNL-MS-101B



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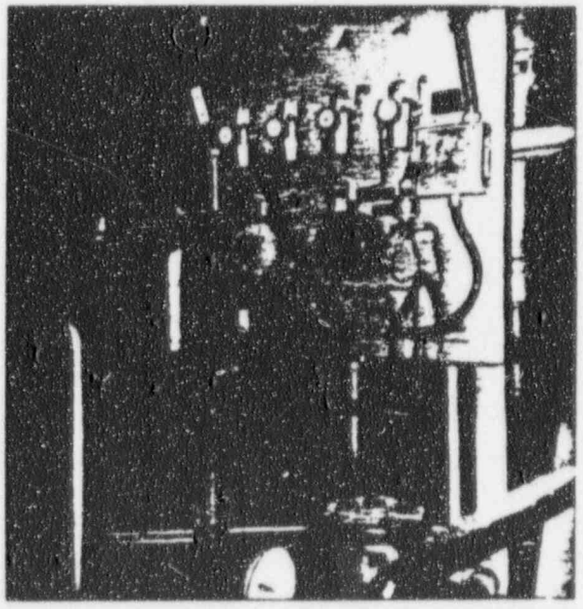

"C" PNL-MS-101C

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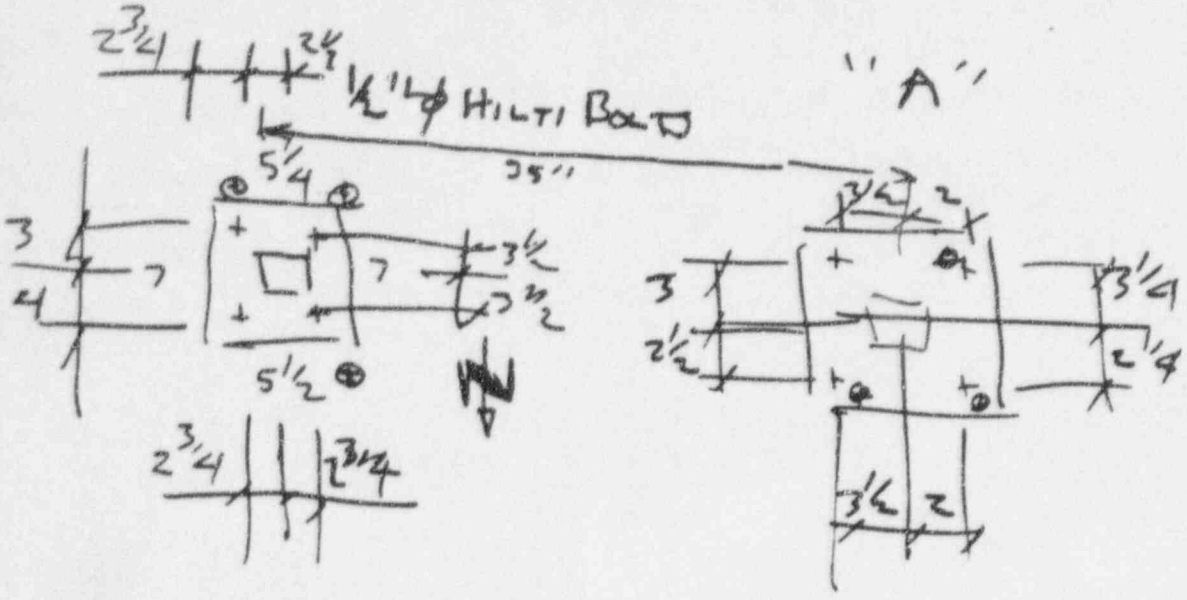
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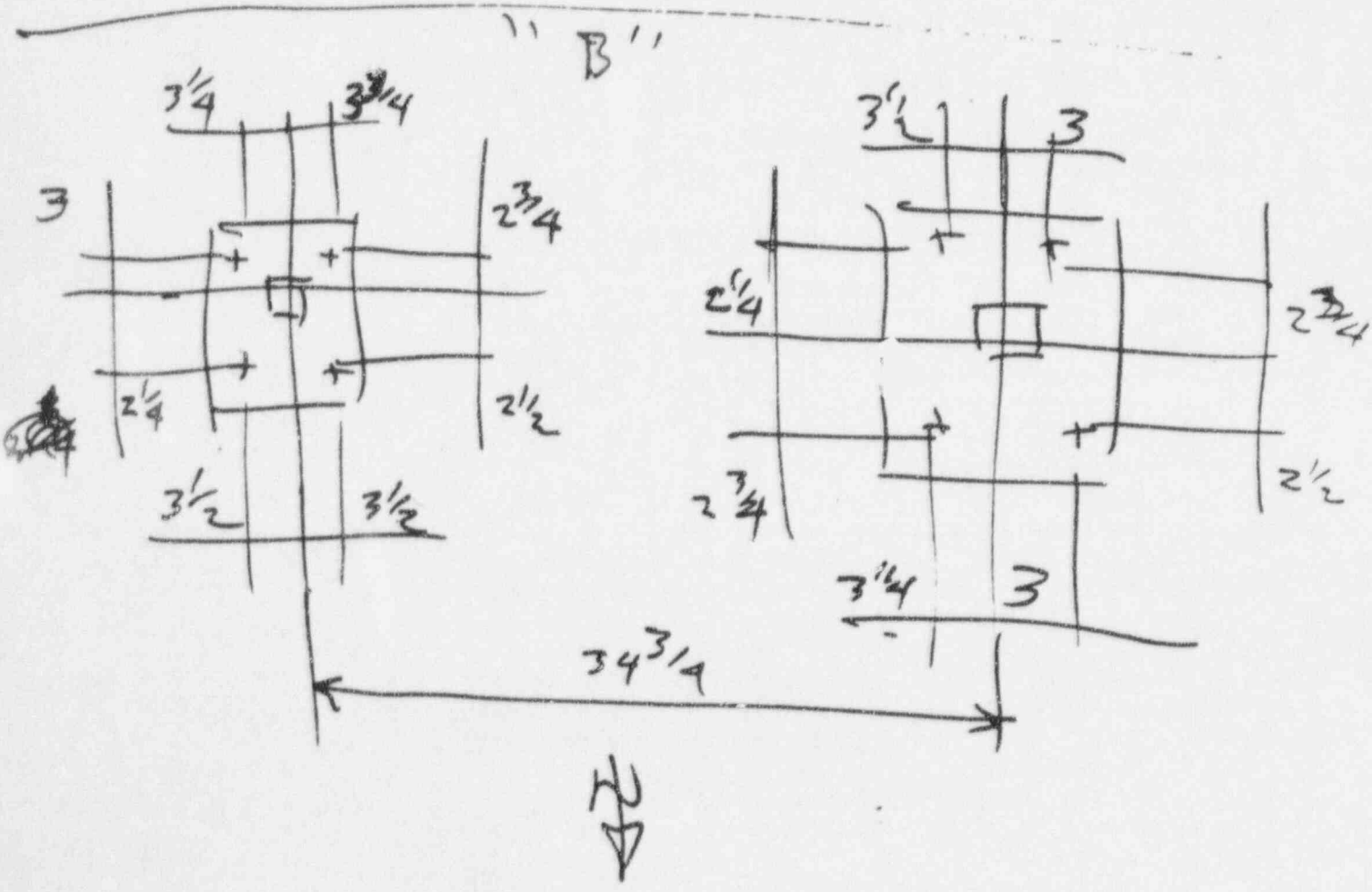
⊕ SLIGHT TURN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34 3/4

SSEL Line No. 4207E Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Copy

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

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

Location: Bldg. SFGB Floor El. 751 Room, Row/Col MSVH

Manufacturer, Model, Etc. (optional but recommended) DCP 721

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		751
2.	Elevation of seismic input below about 40' from grade 722		(Y) N U
3.	Equipment has fundamental frequency above about 8 Hz		(Y) N U N/A 1)
4.	Capacity based on:	Existing Documentation	DOC
		Bounding Spectrum	BS
		1.5 x Bounding Spectrum	(ABS)
		GERS	GERS
5.	Demand based on:	Ground Response Spectrum	GRS
		1.5 x Ground Response Spectrum	AGS
		Conserv. Des. In-Str. Resp. Spec.	(CRS)
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

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

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	(Y) N U N/A
2.	No computers or programmable controllers	(Y) N U N/A
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A
4.	Adjacent racks which are close enough to impact or 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	(Y) N U N/A 1)
6.	Attached lines have adequate flexibility	(Y) N U N/A
7.	Anchorage adequate (See checklist below for details)	(Y) N U N/A
8.	Relays mounted on equipment evaluated	Y N U (N/A)
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

SSEL Line No. 4207E

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 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

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	Y N 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)	Y N U N/A
9.	Rack capable of structurally transferring 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)

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	(Y) N U N/A
2.	Type of anchorage covered by GIP	(Y) N U N/A
3.	Sizes and locations of anchors determined	(Y) N U N/A
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	(Y) 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 under base, capacity reduction for expansion anchors	Y 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 to CG adequate	(Y) N U N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	Y N U (N/A)

Are anchorage requirements met? (Y) N U

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	(Y) N U (N/A)
3.	Attached lines have adequate flexibility	(Y) N U N/A

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 (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? (Y) N U

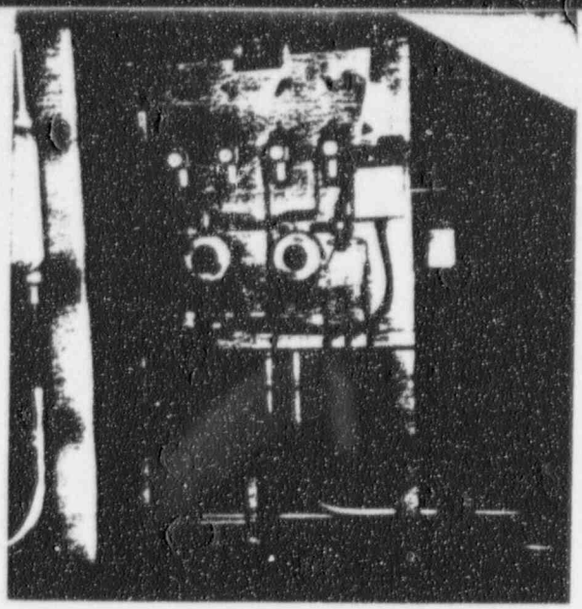
COMMENTS

1) RACK IS RIGID PER ANALYSES 8700-DMC-2268 & 8700-DQC-0004.

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

Evaluated by: Paul V Davis Date: OCT 10TH, 1995

10-10-95



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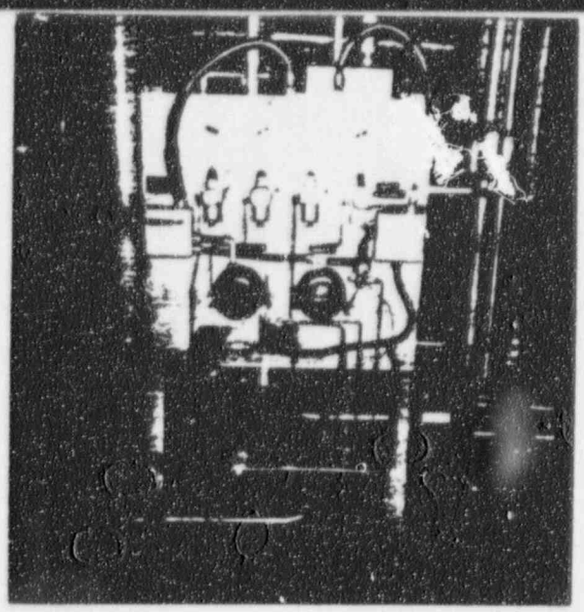

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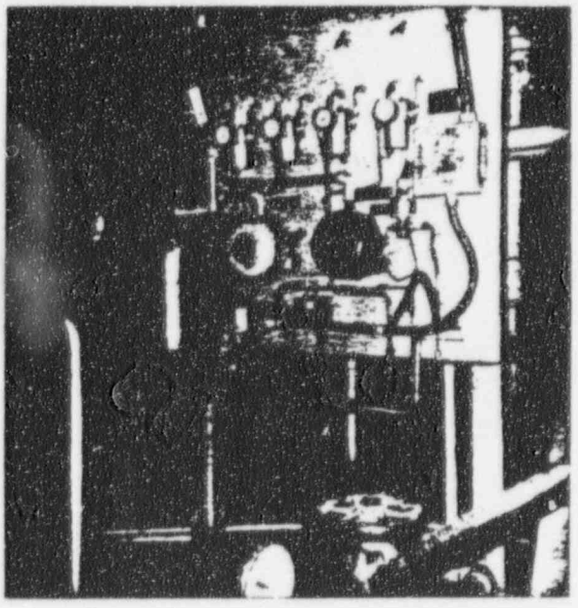

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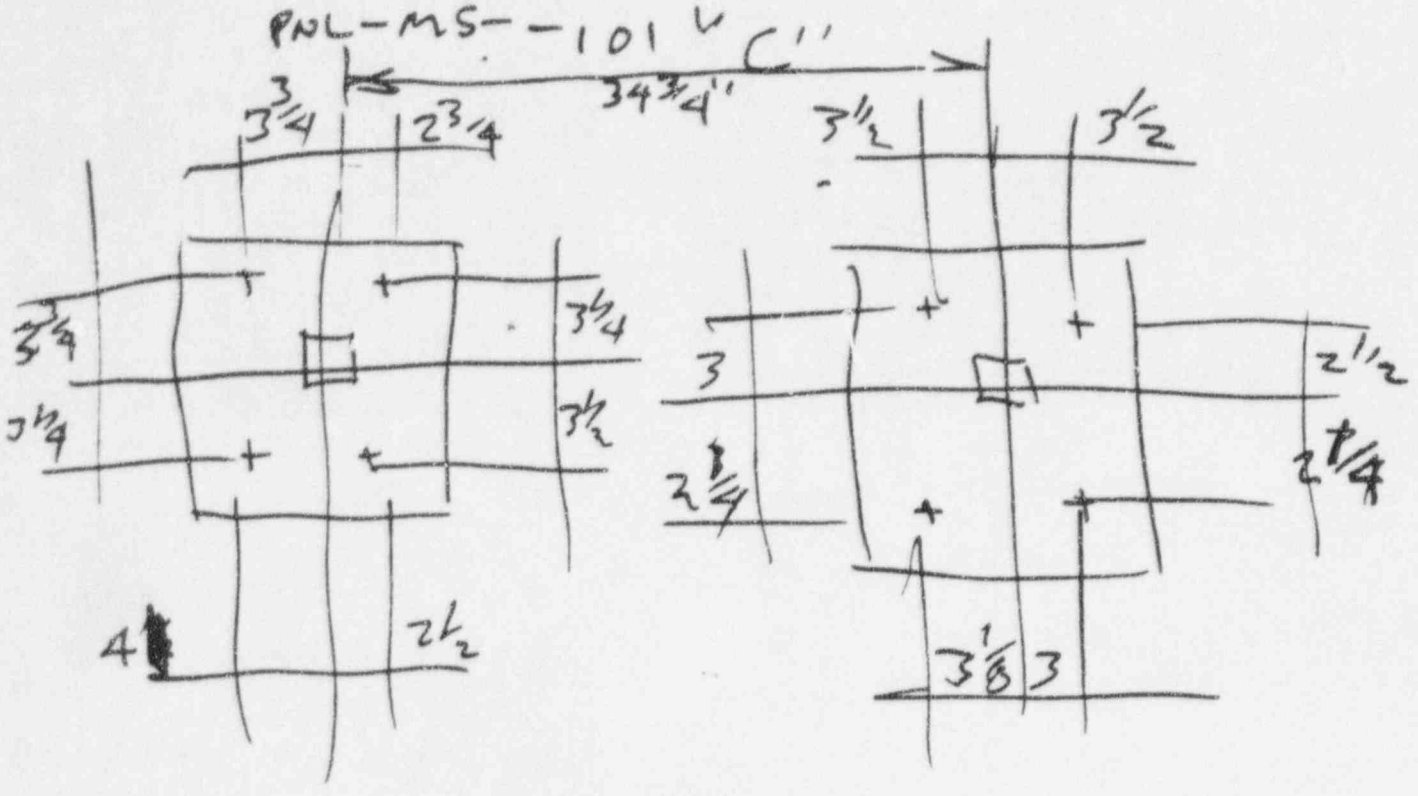
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50053-C-014 P.H 141

SSEL Line No. 8121 Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

COPY

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

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

Location: Bldg. YARD/RWST Floor El. 735 Room, Row/Col YARD

Manufacturer, Model, Etc. (optional but recommended) _____

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input	≈ 739	
2.	Elevation of seismic input below about 40' from grade	(Y) 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)	
	1.5 x Bounding Spectrum	ABS	
	GERS	GERS	
5.	Demand based on: Ground Response Spectrum	(GRS)	
	1.5 x Ground Response Spectrum	AGS	
	Conserv. Des. In-Str. Resp. Spec.	CRS	
	Realistic M-Ctr. In-Str. Resp. Spec.	RRS	

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

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	(Y) N U N/A	
2.	No computers or programmable controllers	(Y) N U N/A	
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A	*1
4.	Adjacent racks which are close enough to impact or 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	(Y) N U N/A	
6.	Attached lines have adequate flexibility	(Y) N U N/A	*2
7.	Anchorage adequate (See checklist below for details)	(Y) N U N/A	*3 BY INSPECT
8.	Relays mounted on equipment evaluated	(Y) N U N/A	*4
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A	

Is the intent of all the caveats met for Bounding Spectrum? (Y)* 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	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

SSEL Line No. 8121

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

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

Equipment Description QS/RACK FOR RWST HEAT TRACE (~~SE~~ SOUTH 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	Y N 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)	Y N U N/A
9.	Rack capable of structurally transferring 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)

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	PVD 11/7/95 (Y) N ~~(U)~~ N/A
2.	Type of anchorage covered by GIP	~~(Y)~~ N U N/A
3.	Sizes and locations of anchors determined	~~(Y)~~ N U N/A
4.	Anchorage installation adequate, e.g., weld quality and length, nuts and washers, expansion anchor tightness	(Y) N ~~(U)~~ PVD 11/7/95 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)~~ PVD 11/7/95 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 under base, capacity reduction for expansion anchors	Y 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 to CG adequate	(Y) N U N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	(Y) N U N/A

Are anchorage requirements met? (Y) N (U) PVD 11/7/95

INTERACTION EFFECTS

1.	Soft targets free from impact by nearby equipment or structures	Y (N) U N/A *5
2.	If equipment contains sensitive relays, equipment free from all impact by nearby equipment or structures	Y N U (N/A)
3.	Attached lines have adequate flexibility	(Y) N U N/A

52253-C-014 P.H 1/3

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)

4. Overhead equipment or distribution systems are not likely to collapse — Y (N) U N/A *5
5. Have you looked for and found no other adverse concerns? (Y) N U N/A

Is equipment free of interaction effects? Y (N) U

IS EQUIPMENT SEISMICALLY ADEQUATE? Y N (U)

* 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 REDUNDANT, VERY STIFF

4) NO RELAYS, THERMCOUPLES REVIEWED / RUGGED

5) WOODEN ROOF COULD FALL AFFECTING SENSING LINES; NO OTHER SOFT TARGETS.

Evaluated by: Paul V Davis Date: Nov. 2ND, 1995

11-2-95

9303310244 PH144

Nuclear Engineering Memorandum
Duquesne Light Company

Record Type A1.105C

Sh 1 of 3

EM NO. 107301	Unit No. 1	System No. 13	TMD / DCP / SMR / TER/ EM No.
Date Prepared 1/27/94	MWR No.	Commitment ☐Y ☒N Date / /	No.
Target Due Date 1/28/94	EM classification 3	Comp. Code N/A	Mark No. N/A
Subject To (Dept. Code): ~~8~~ PVD 2		Outage Related N/A R	Response Required ✓ Y __ N

E.M. Title: ENCLOSURE AT UNIT 1 RWST.

Subject: IN ORDER TO PROVIDE WEATHER PROTECTION AND REDUCE THE LIKELIHOOD OF SPREADING CONTAMINATION AT THE BASE OF THE UNIT 1 RWST BIO SHIELD WALL NORTHEAST SIDE, IT IS NECESSARY TO ERECT AN ENCLOSURE. THE MOST DESIREABLE ENCLOSURE WOULD BE CONSTRUCTED FROM FIRE RETARDANT WOOD AND VISQUEEN. SUCH A STRUCTURE HAS BEEN REVIEWED AND APPROVED BY THE FIRE PROTECTION ENGINEER. THE SECOND CHOICE WOULD BE A WOOD AND VISQUEEN STRUCTURE REINFORCED BY SCAFFOLD PIPE OR OTHER MEANS TO BE SEISMICALLY ACCEPTABLE. THE THIRD CHOICE IS A SCAFFOLD AND VISQUEEN

References:	Orig. Dept.	Cost Center	Prepared By:	Emp/SS No.	Extension:	Mail Drop
	B	668	JOHN B. SOWDEN	3175	4987	SOSB-6
			Approved By: [signature]	Emp. No. 1905	Date: 1/27/94	

COMPUTER ON LINE

Subject Recd. Date	Assigned Section:	Assigned To:	Response To (Dept. Code):
PVD JAN 28 1994	Q	RLH ~~BOSE~~ Emp. No. P.V. DAVIS 78	B

FOR INFORMATION ONLY

Eng. Classification

Response:

THE EXISTING TEMPORARY WOOD FRAMED VISQUEEN COVERING STRUCTURE IS ACCEPTABLE WITH A FEW MODIFICATIONS AS SHOWN ON SHEET 3 OF THIS EM. NOTE THAT DEGRADED WOOD (SUCH AS IS PLACES WHERE MAKING CONTACT WITH WET CONCRETE) SHOULD BE REPLACED

MWR No.

Resources used: ☒ Internal ☐ External — Manhours used by Responder 6

References:	Eng. Change Notice	Station Mod. Req.	Technical Eval. Report	Answered By:	Ext.	Emp. No.
	Required? ☐Y ☒N	SMR? ☐Y ☒N	TER? ☐Y ☒N	Paul V Davis	5676	78
	ECN No.	SMR No.	TER No.	Approved By: [signature]	Date: 1-28-94	Emp. No. 4664

DISTRIBUTION

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X X	Originator	X	Director System Engineering	X X	G. GUZAK	SOSB-6
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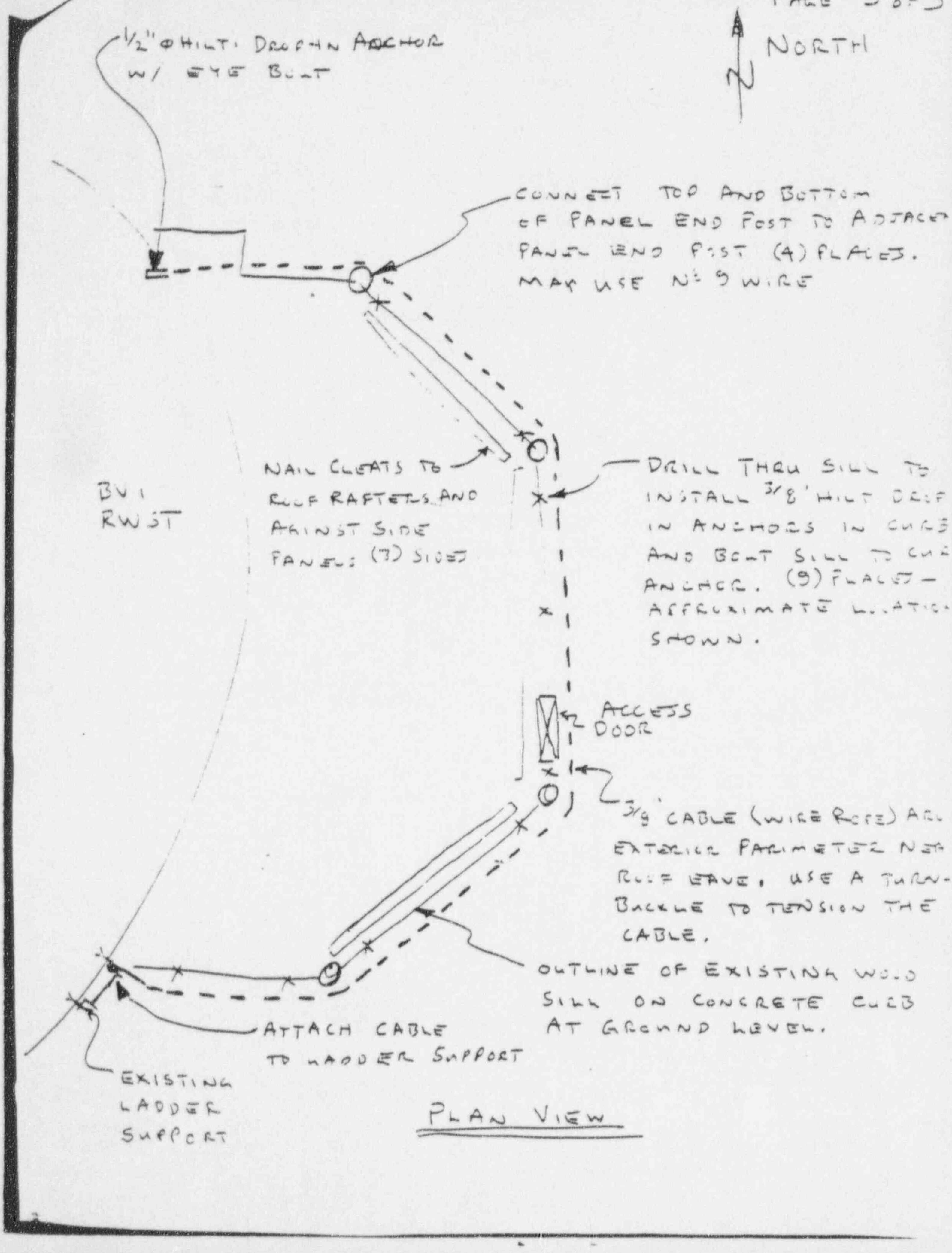
			~~P. DAVIS SOSB-3~~	X X	M. WALLACE	SOSB-6
		X	A. CHILLCOTT NCD-2	X X	D. HUFF	SOSB-5

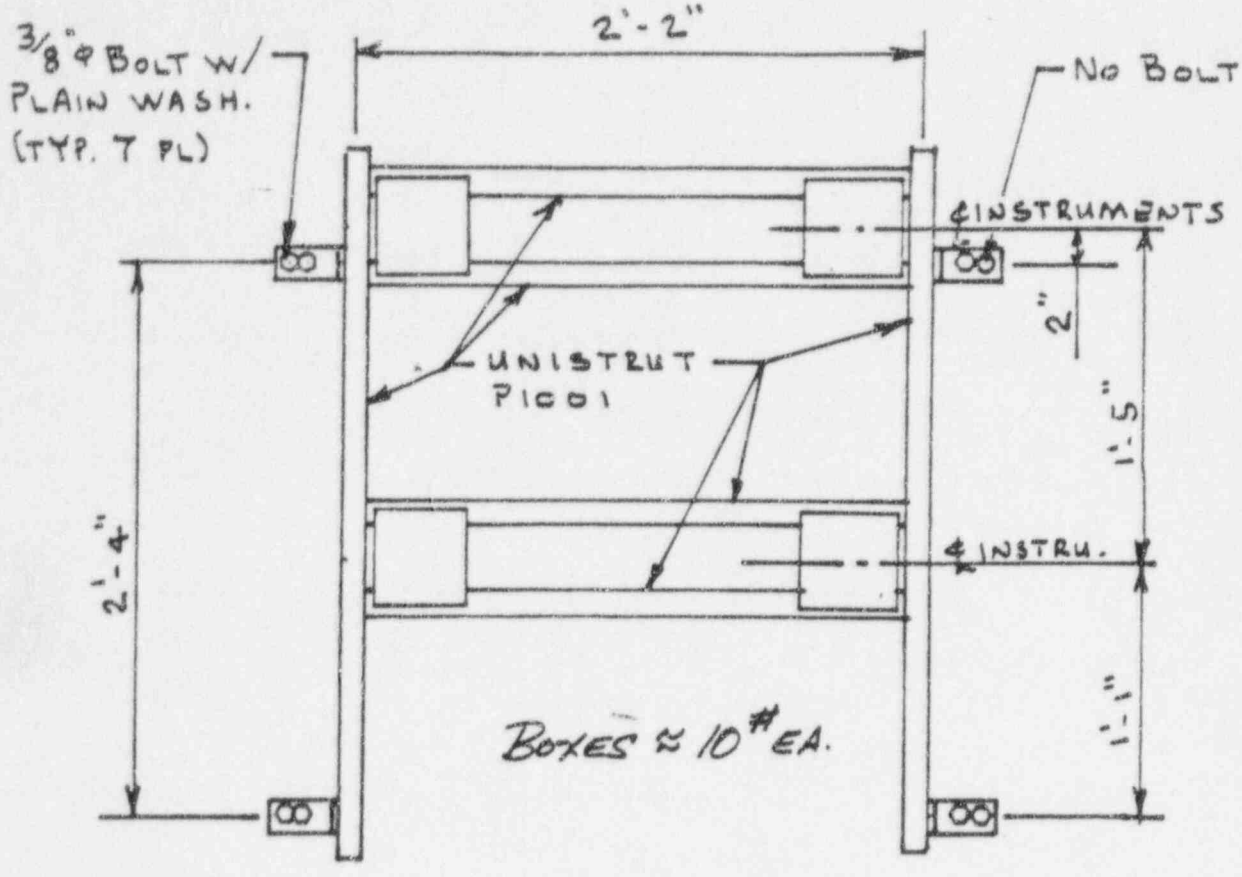

NORTH
1/2" Φ HILTI DROP-IN ANCHOR W/ EYE BOLT
CONNECT TOP AND BOTTOM OF PANEL END POST TO ADJACENT PANEL END POST (4) PLACES. MAY USE No 9 WIRE
NAIL CLEATS TO ROOF RAFTERS AND AGAINST SIDE PANELS (3) SIDES
BV-1 RWST
DRILL THRU SILL TO INSTALL 3/8" HILTI DROP IN ANCHORS IN CURB AND BOLT SILL TO CURB ANCHOR. (9) PLACES — APPROXIMATE LOCATION SHOWN.
ACCESS DOOR
3/8" CABLE (WIRE ROPE) ALL EXTERIOR PARIMETER NEAR ROOF EAVE, USE A TURN-BUCKLE TO TENSION THE CABLE.
OUTLINE OF EXISTING WOOD SILL ON CONCRETE CURB AT GROUND LEVEL.
ATTACH CABLE TO LADDER SUPPORT
EXISTING LADDER SUPPORT

PLAN VIEW

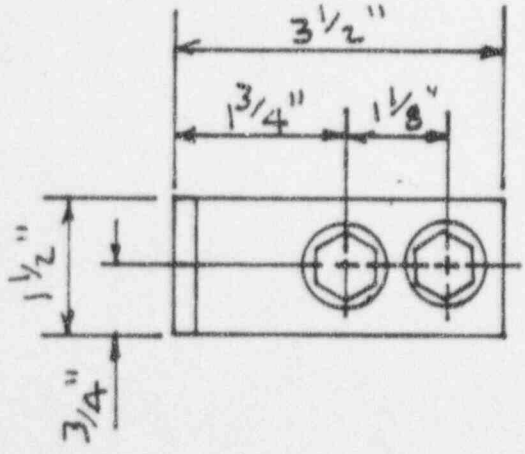
52252-C-09

QS-RACK-3

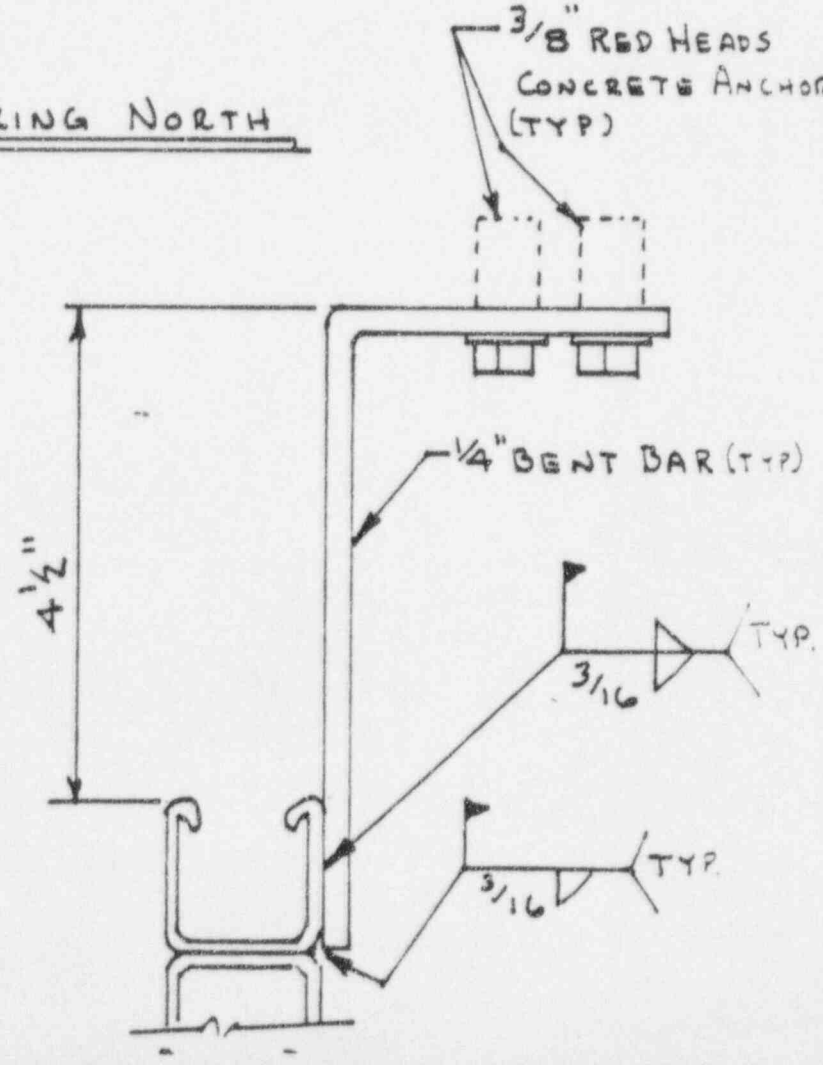
PIT 140

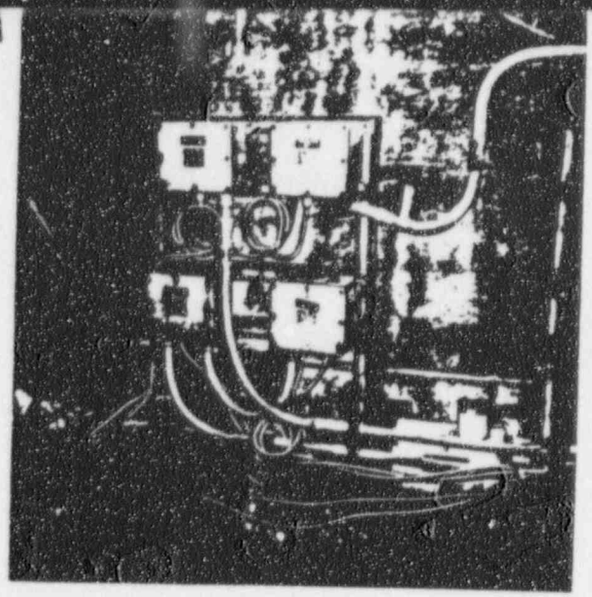


ELEV. LOOKING NORTH

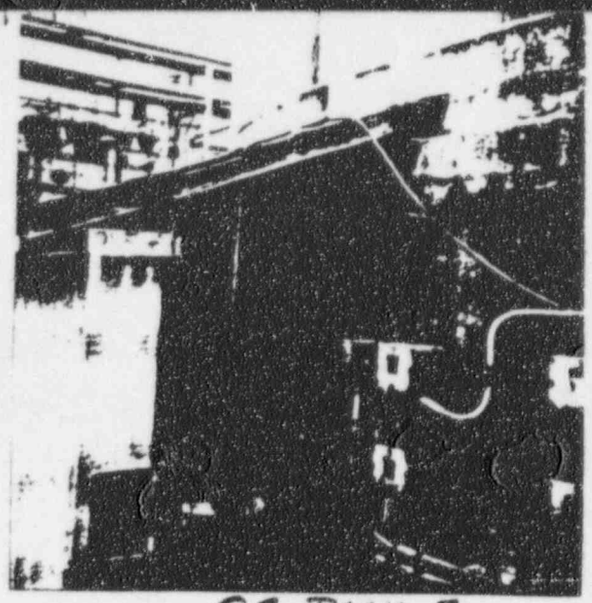


CLIP DETAILS

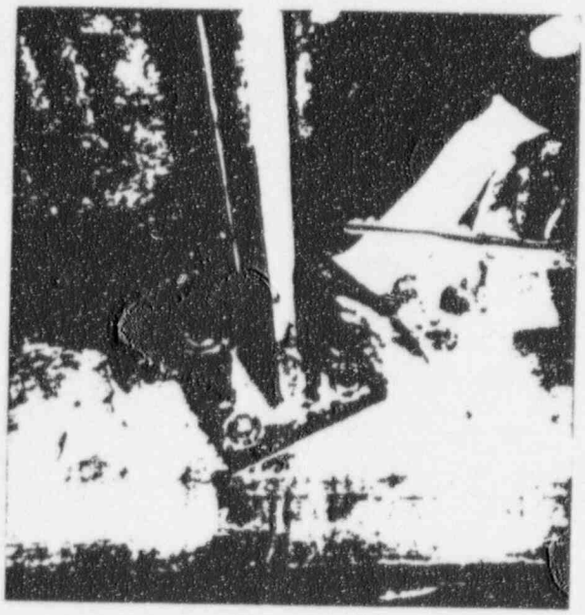


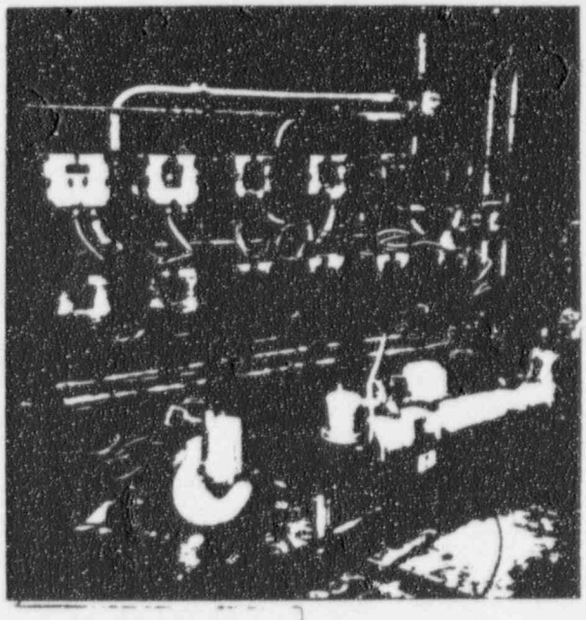


~~S RK~~ QS-RACK-3



~~S RK~~ QS-RACK-3 INTERACTION





~~S1 RK~~ FOOT x.

LEFT

RIGHT FT.

5223-C-04 P.A 140

SSEL Line No. 8124 Status Y N U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

COPY

Equip. ID No. QS-RACK-4 Equip. Class 18 - Instruments on Racks

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

Location: Bldg. YARD/RWST Floor El. 735 Room, Row/Col YARD

Manufacturer, Model, Etc. (optional but recommended) _____

SEISMIC CAPACITY VS DEMAND

1.	Elevation where equipment receives seismic input		≈ 739
2.	Elevation of seismic input below about 40' from grade		(Y) 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)
		1.5 x Bounding Spectrum	ABS
		GERS	GERS
5.	Demand based on:	Ground Response Spectrum	(GRS)
		1.5 x Ground Response Spectrum	AGS
		Conserv. Des. In-Str. Resp. Spec.	CRS
		Realistic M-Ctr. In-Str. Resp. Spec.	RRS

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

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	(Y) N U N/A	
2.	No computers or programmable controllers	(Y) N U N/A	
3.	Steel frame and sheet metal structurally adequate	(Y) N U N/A	* 1
4.	Adjacent racks which are close enough to impact or 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	(Y) N U N/A	
6.	Attached lines have adequate flexibility	(Y) N U N/A	* 2
7.	Anchorage adequate (See checklist below for details)	(Y) N U N/A	BY INSPECTION * 3
8.	Relays mounted on equipment evaluated	(Y) N U N/A	4
9.	Have you looked for and found no other adverse concerns?	(Y) N U N/A	

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)

1.	Equipment is included in the generic seismic testing equipment class	Y N U N/A
2.	Meets all Bounding Spectrum caveats	Y N U N/A
3.	Component is a pressure, temperature, level or flow transmitter	Y N U N/A

5223 5-C-014 P.A 149

SSEL Line No. 8124

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 2 of 3

Equip. ID No. QS-RACK-4 Equip. Class 18 - ~~Instruments~~ Racks on Racks

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	Y	N	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)	Y	N	U	N/A
9.	Rack capable of structurally transferring 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)

ANCHORAGE

1.	Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	Y	N	(U)	N/A
2.	Type of anchorage covered by GIP	(Y)	N	U	N/A
3.	Sizes and locations of anchors determined	(Y)	N	U	N/A
4.	Anchorage installation adequate, e.g., weld quality and length, nuts and washers, expansion anchor tightness	(Y)	N	(N/A) PVD 11/13/95	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
6.	For bolted anchorages, gap under base less than 1/4-inch	(Y)	N	U	N/A
7.	Factors affecting essential relays considered: gap under base, capacity reduction for expansion anchors	Y	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 to CG adequate	(Y)	N	U	N/A
10.	Embedded steel, grout pad or large concrete pad adequacy evaluated	(Y)	N	U	N/A

Are anchorage requirements met? Y N (U)

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	Y	N	U	(N/A)
3.	Attached lines have adequate flexibility	(Y)	N	U	N/A

SSEL Line No. 8124

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. QS-RACK-4 Equip. Class 18 - Instruments on Racks

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

INTERACTION EFFECTS (Cont'd)

4. Overhead equipment or distribution systems are not likely to collapse (Y) N U N/A
5. Have you looked for and found no other adverse concerns? (Y) N U N/A PVD 11/2/95
Is equipment free of interaction effects? (Y) N U

IS EQUIPMENT SEISMICALLY ADEQUATE? Y N (U)

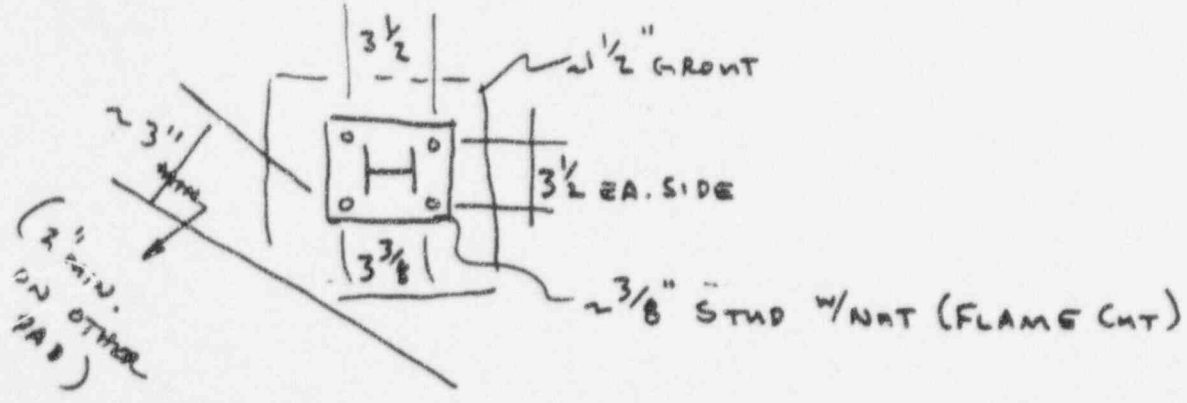
* COMMENTS

1) RUSTING OF PLATES, STRUT & ANCHORS EVIDENT, HOWEVER NO APPARENT STRUCTURAL CAPACITY REDUCTION.

2) NO RELATIVE MOTION POSSIBLE, ALL LINES OK.

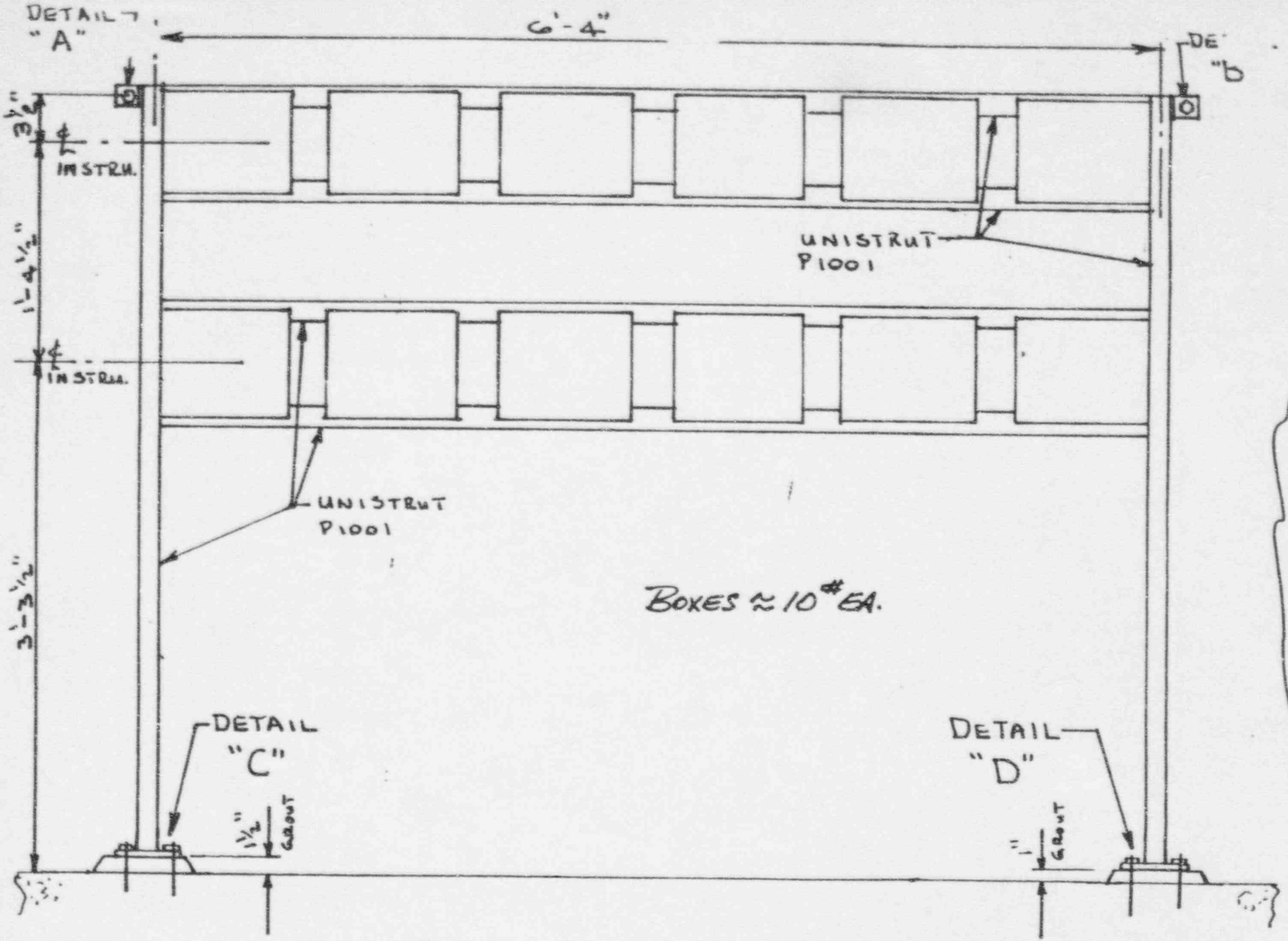
3) MASS LOW, SUPPORT REDUNDANT, VERY STIFF

4) NO RELAYS, THERMOCOUPLES REVIEWED / RUGGED



Evaluated by: Paul V Davis Date: Nov 2ND, 1995

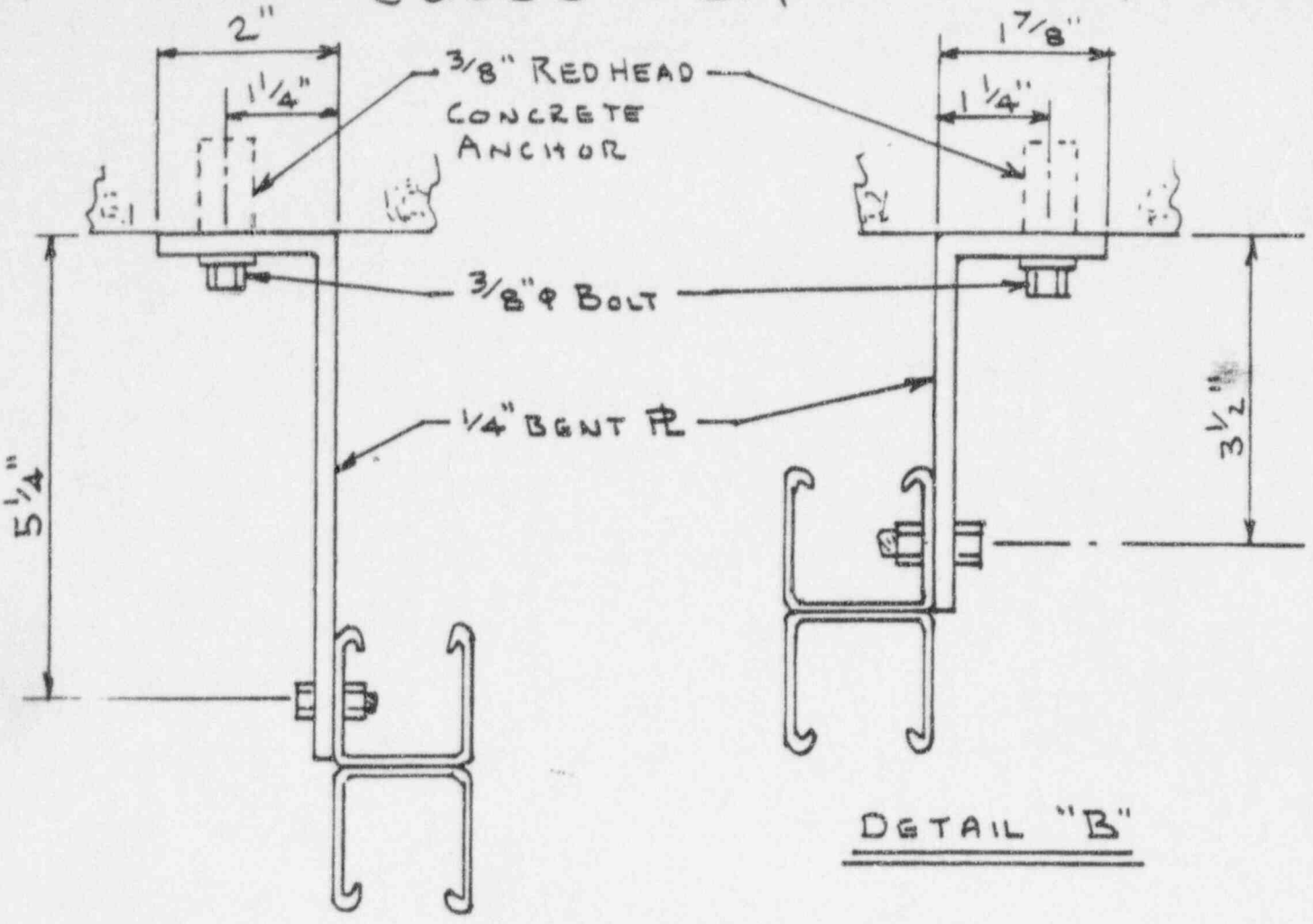
11-2-95



ELEV. LOOKING NORTH

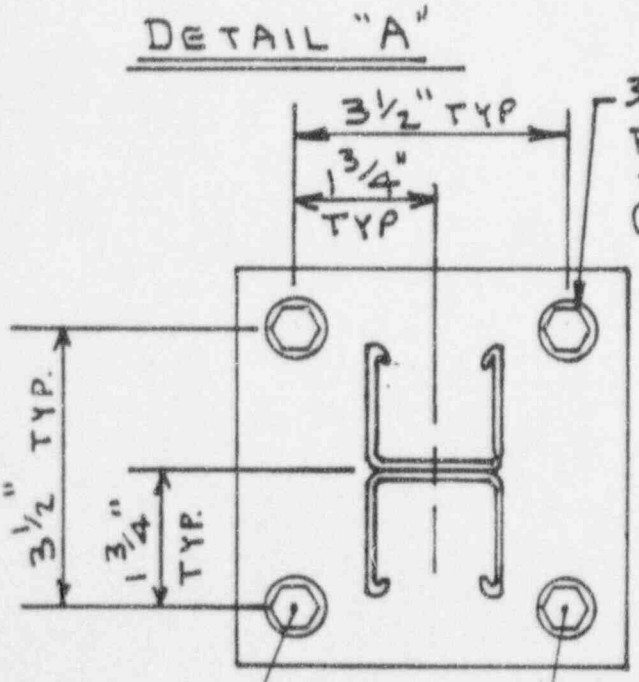
5233-C-019 QS-RACK-4 PH151

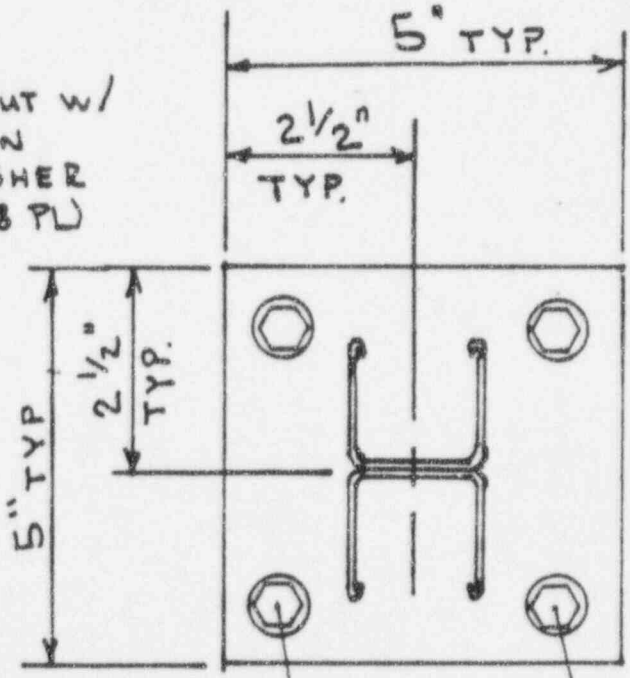
02033-C-014 PH1 of 2

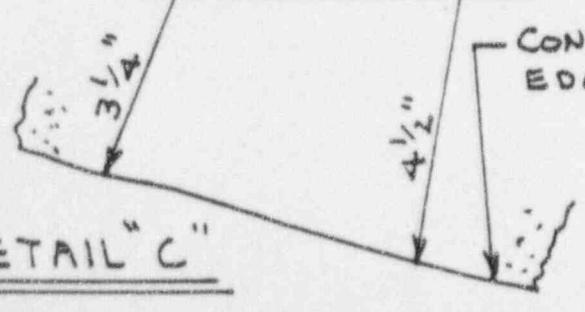


DETAIL "B"

DETAIL "A"







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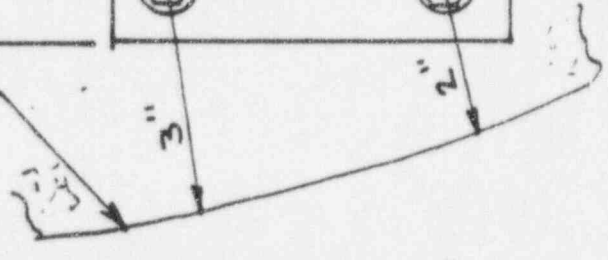


DETAIL "D"

Job No.: 52233 Job: Duquesne Beaver Valley Power Station By: RL Date: 11-30-95
Calc No.: 019 Chk: CAM Date: 11-30-95
Subject: Anchorage Evaluation for Various Instruments

Attachment B

FAX'ed INFORMATION FOR DUQUESNE LIGHT COMPANY MASONRY BLOCK WALLS

(6 pages in Attachment B)

Duquesne Light Company

Nuclear Engineering & Safety Unit

SEB-3

52233-C-019
P. 82

Telecopy Transmittal

DATE: 11-28-95

TO: Ron Cushing TELECOPIER PHONE NO.: 714-833-3392

LOCATION: EQE, Irvine, CA

FROM: Tom Westbrook TELECOPIER PHONE NO.: 412-393-5536

LOCATION: BVPS, Shippingport, PA

TOTAL NUMBER OF PAGES (including transmittal): 11

PLEASE CALL _____ AT _____ TO VERIFY RECEIPT OF THIS TELECOPY.

DATE AND TIME SENT: _____

COMMENTS:

BLOCK WALL

SENDING TELECOPIER IS A KONICA 810L.

Form D18-SB112 **Duquesne Light Company Analysis Sheet** PAGE ___ OF ___

JOB TITLE	ANALYSIS NO.	
	O.F.E.	
SUBJECT	COMPILED BY	DATE
	CHECKED BY	DATE
DEPT./DIV.	APPROVED BY	DATE

52233-C-019
P. B3

FIGURE 1A

SOLID BRICK MASONRY

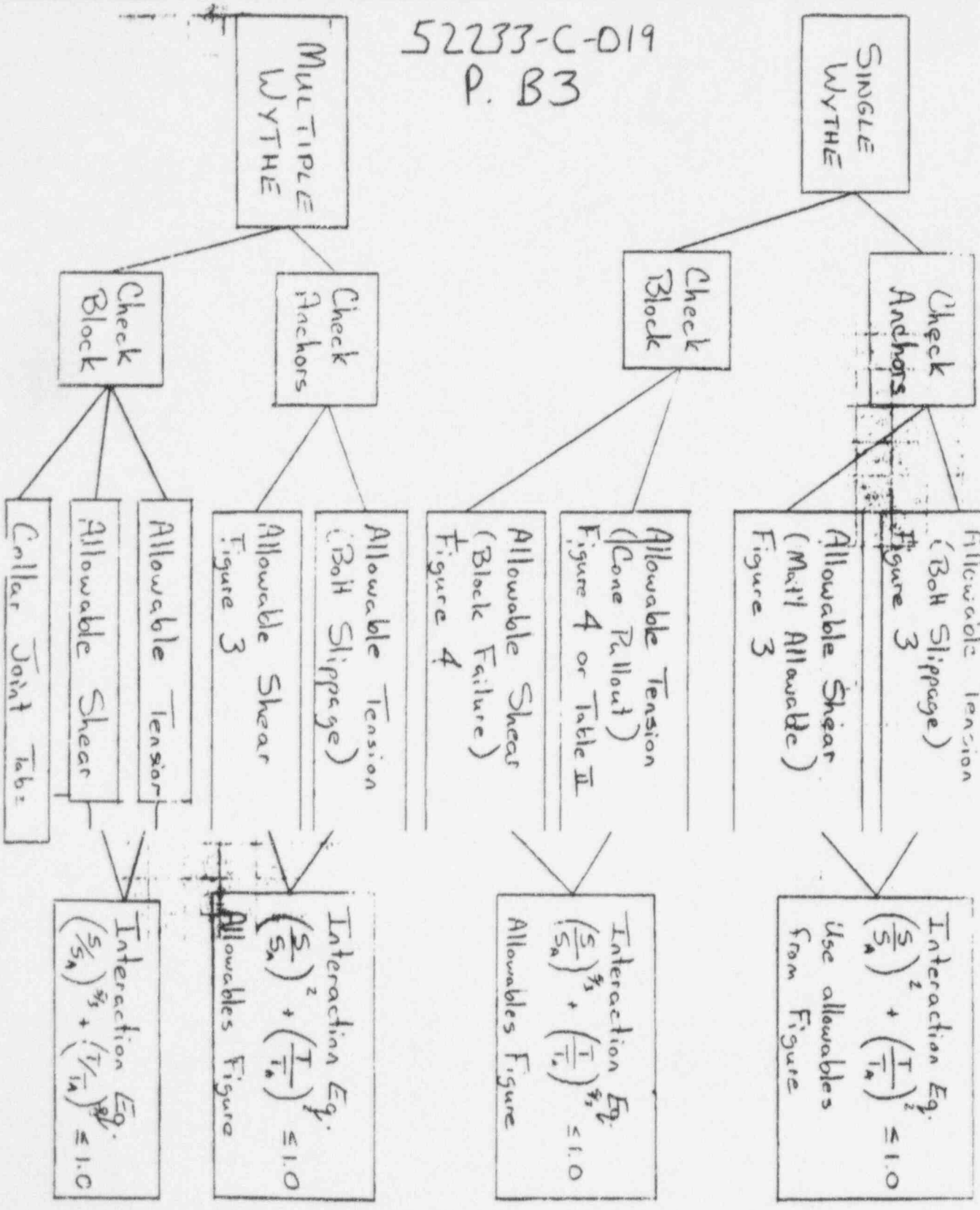
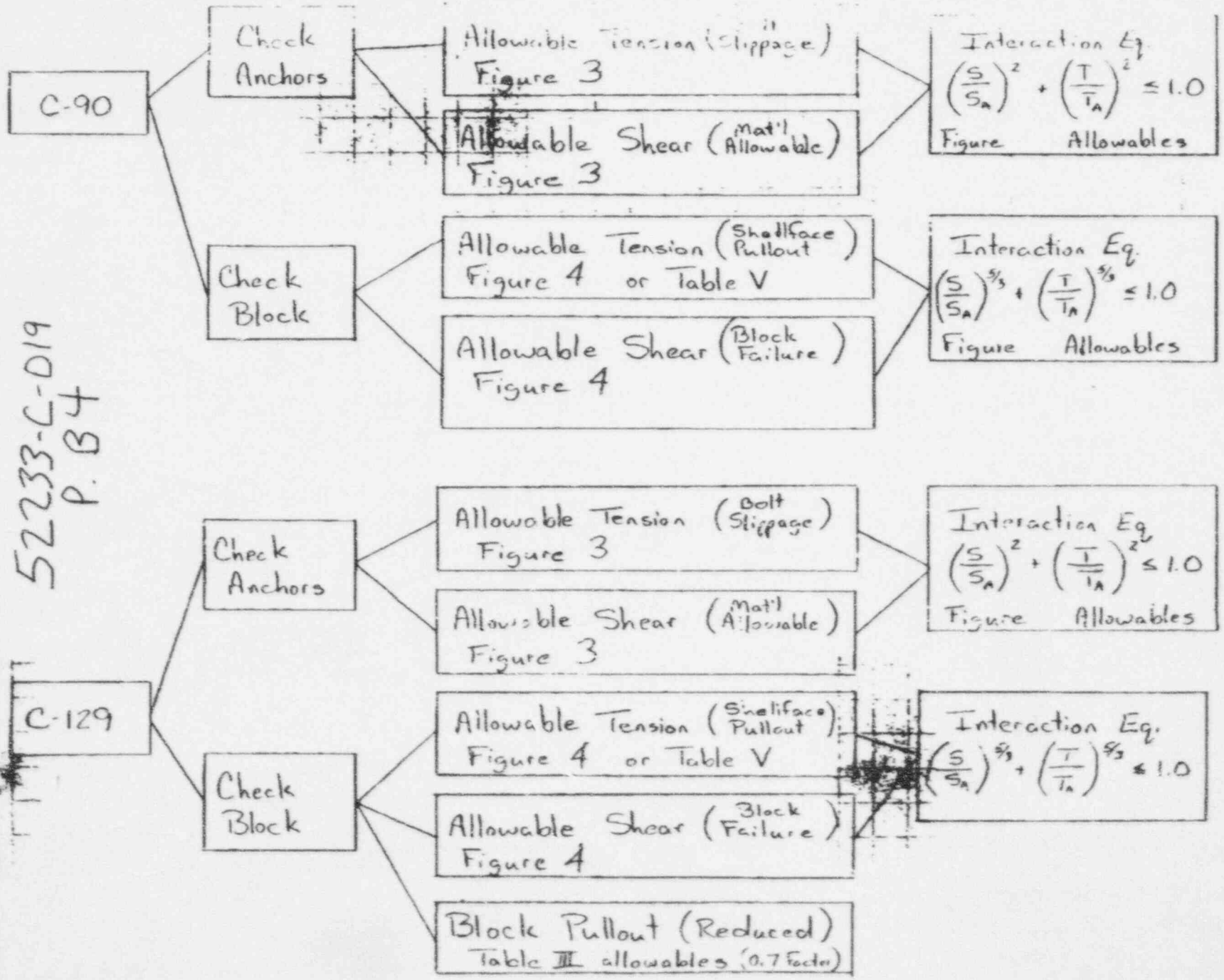


FIGURE 1B

HOLLOW BLOCK PROCEDURE



FORM D16-23112 (12-68) Duquesne Light Company Analysis Sheet PAGE ____ OF ____

COMPILED BY DATE CHECKED BY DATE ANALYSIS NO.

52233-C-019 P.B5

FIGURE 2

BLOCK TYPES

C-145 (2500 psi) Solid block - Load bearing

C-90 (2000 psi) Hollow block - Load bearing

C-129 (700 psi) Hollow block - Non-load bearing
(Lightweight block)

Location of Types

Bldg	Wall No.	Type of Wall
Aux. Bldg.	All walls	Solid block (C-145)
Cable Vault	CV-1-1 thru 7	Solid block (C-145)
	CV-2-1	
	CV-2-2	
	CV-1-1, 2, 3	Hollow filled (C-90)
Service Bldg	SB-1-1 thru 15	Hollow filled (C-90)
	SB-3-8, 9 & 12	Hollow Block (C-90)
	All others	Hollow Block (C-129)
Fuel Bldg.	All walls	Hollow Block (C-90)

FORM D18 33112 (12-86) Duquesne Light Company Analysis Sheet PAGE _____ OF _____

COMPILED BY DATE CHECKED BY DATE ANALYSIS NO.

52233-C-019 P. B6

FIGURE 4

Unit Masonry Allowable Loads

SOLID BLOCK (C-145)

Anchor Size Diameter (IN)	Min. Ctr to Ctr Spacing (IN)	Tension Loads Cone Pullout (LBS) OBE	DBE	Shear Load based on block failure (LBS) OBE	DBE
1/4	3 1/4	385	650	700	1175
3/8	4 3/8	700	1170	↓	↓
1/2	5 1/2	1100	1850		

HOLLOW BLOCK (C-90)

Anchor Size Diameter (IN)	Min. Spacing	Tension Load based on Shell Face Pullout (LBS) OBE	DBE	Shear Load based on block failure (LBS) OBE	DBE
1/4	N/A	260	435	700	1175
3/8	N/A	275	460	↓	↓
1/2	N/A	415	690		

NOTES

1. Values for hollow block are for C-90 block. For C-129 block, multiply by 0.6.
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.

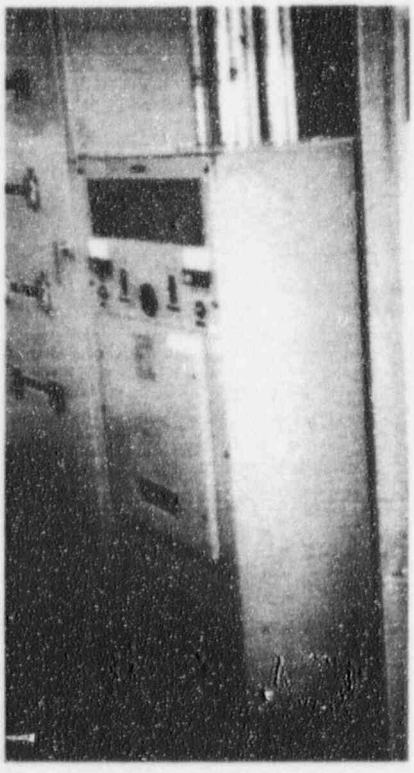
ENCLOSURE 2

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 of examples, there are no instances of damage to the cabinets enclosing the charger/inverter internals.



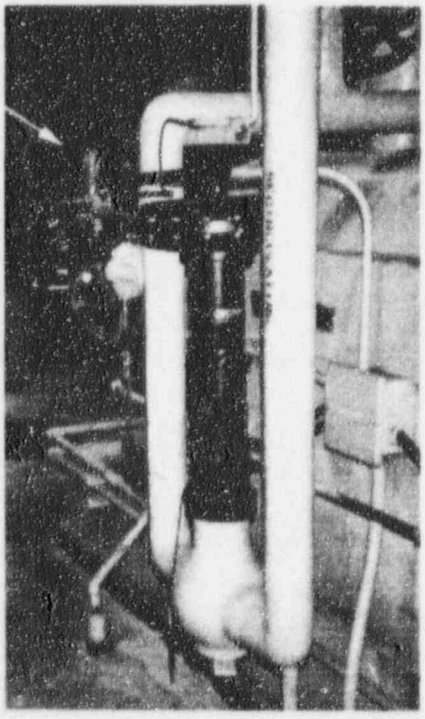
The battery chargers illustrated above are typical examples of rectifiers supplied by major U.S. manufacturers in the late 1960s and early 1970s. The same model La Marche charger is found at the Beaver Valley Unit 1 Nuclear Station (left), and at the Glendale Power Plant (right). The Glendale Plant withstood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

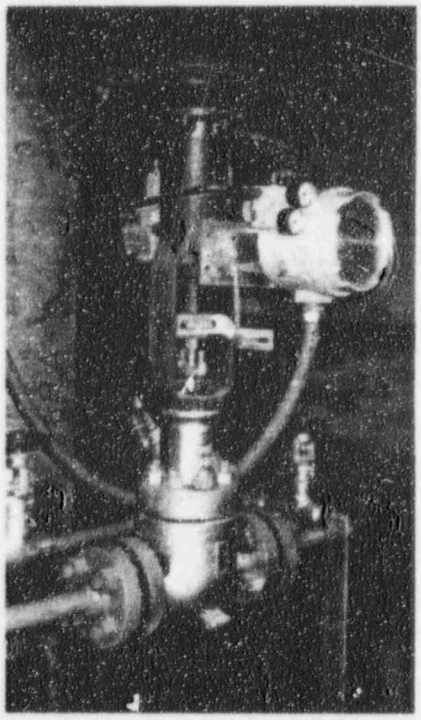
SUPPLE... ...NTAL DATABASE INFORMATION:
COMPONENTS ATTACHED TO AIR-OPERATED VALVES

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.



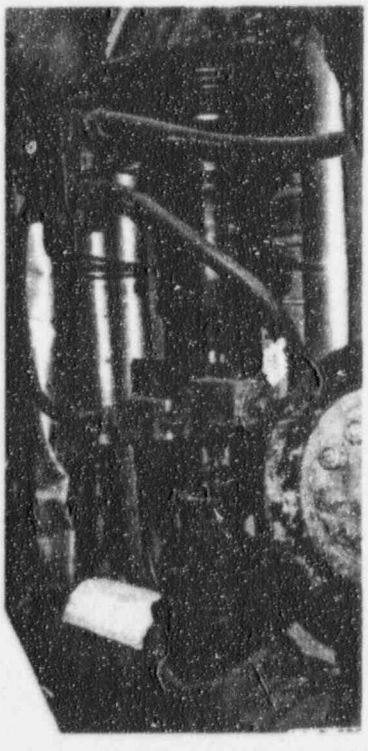


Typical attachments to pneumatic valves are illustrated by the solenoid mounted on the diaphragm casing for a control valve at El Centro Steam Plant (arrow, left). The site experienced peak ground accelerations of 0.42g in the earthquake of 1979, and 0.26g in the earthquake of 1987. More recent-vintage 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.

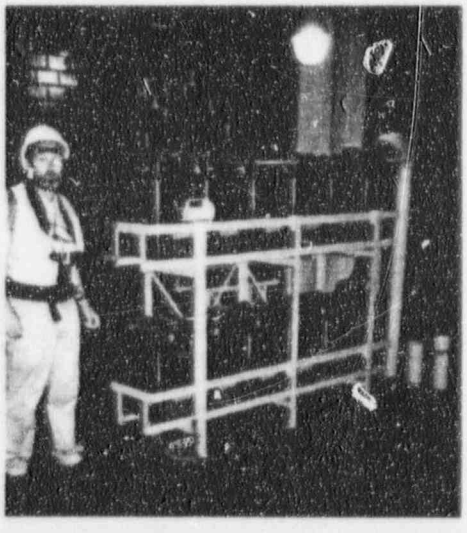
SUPPLEMENTAL DATABASE INFORMATION:

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 industrial facilities.

Data added from investigations of recent earthquakes 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 checked 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 withstood an estimated peak ground acceleration of 0.40g in the 1987 Whittier earthquake.

ENCLOSURE 3