



*Appendix G*  
***Screening Evaluation Work Sheets***  
***(SEWS)***

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## Appendix G

# Screening Evaluation Work Sheets (SEWS)

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### INTRODUCTION

The purpose of the Screening Evaluation Work Sheets (SEWS) is to provide a convenient summary and checklist of the seismic evaluation criteria described in Section 4, Screening Verification and Walkdown, and in Section 7, Tanks and Heat Exchangers Review. The equipment class caveats contained in Appendix B, the anchorage criteria contained in Appendix C, and the seismic interaction criteria contained in Appendix D are also summarized on the SEWS. <sup>[1]</sup>The short summaries of the criteria provided in the SEWS are for general guidance only. The detail criteria contained in Sections 4 and 7 and Appendices B, C, and D should be used as the basis for evaluating the seismic adequacy of equipment.

These SEWS, or a similar checklist, should be used during the plant walkdown to document the results of the evaluation. The SEWS in this appendix are designed to be compatible with the Screening Verification Data Sheets (SVDS) shown in Exhibit 4-1 of Section 4 so that the summary information from the SEWS can be transferred directly to the SVDS.

This appendix contains SEWS for Equipment Classes #0 through #21. See Section 3.3 for a summary of the equipment included within the scope of USI A-46. The checklist statements are very abbreviated; see Sections 4 and 7 and Appendices B and C for a complete description of each checklist item.

**Note: The work sheets cannot be used unless the user has a thorough understanding of this procedure and the reference documents.**

Most of the information at the top of each SEWS (Equipment ID Number, Equipment Description, Equipment Location, etc.) can be entered on the SEWS prior to the plant walkdown.

If a database program is used to develop the Safe Shutdown Equipment List (SSEL) as described in Section 3, then the information at the top of each page of the SEWS can be printed directly from the database file containing the SSEL information. Appendix B of the report “Results of PWR Trial Plant Review” (Reference 16) contains examples of SEWS used during a SQUG trial plant review with this information entered at the top of each page of the SEWS.

The SEWS can be used as a checklist by circling the appropriate symbol in response to each statement. The meaning of the symbols is given below:

- Y - Yes. This criterion is met. (“Y” is always the favorable response, i.e., all the “Y” symbols should be circled if an item of equipment is seismically adequate.)
- N - No. This criterion is not met.
- U - Unknown. It cannot be determined whether this criterion is met at this time. (This response can be used while the screening verification is in progress to identify criteria which must be evaluated later.)
- N/A - Not Applicable. Some of the criteria may not apply for a particular item of equipment.

Some of the statements on the SEWS ask which of several alternatives is being used in the Screening Verification and Walkdown. Circle the symbol for the selected alternative. The meaning of these symbols is self-explanatory. After circling all the appropriate responses in each section of the SEWS, the final statement in each section can then be answered as either Y, N, or U. Likewise, when all the sections have a final response, the last question on the SEWS can then be answered (“Is Equipment Seismically Adequate?”). The responses to the final question in each section and the last overall question can all be entered directly into the appropriate column in the SVDS (shown in Exhibit 4-1 of Section 4).

The SEWS also provide space to record information about the item of equipment <sup>[2]</sup>(e.g., manufacturer, model), to document any comments the Seismic Capability Engineers may wish to make, to document the reason why the intent of any caveats are met without meeting the specific wording of the caveat rule, to sketch the equipment, and to sign off.

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 2

Equipment ID No. \_\_\_\_\_ Equip. Class 0 – Other

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### **Seismic Capacity vs. Demand**

Does capacity exceed demand? <sup>[3]</sup>(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 N/A

### **Anchorage**

Is the anchorage adequate? Y N U N/A

### **Interaction Effects**

Is the equipment free of adverse seismic interaction effects? Y N U N/A

### **<sup>[4]</sup>Does the Equipment Meet the GIP Criteria?**

Y N U

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 2**

Equipment ID No. \_\_\_\_\_ Equip. Class 0 – Other

Equipment Description \_\_\_\_\_

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 3

Equipment ID No. \_\_\_\_\_ Equip. Class 1 – Motor Control Centers

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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. 600 V rating or less  | Y N U N/A |
| 3. Adjacent cabinets which are close enough to impact, or sections of multi-bay cabinets, are bolted together if they contain essential relays | Y N U N/A |
| 4. Attached weight (except conduit) less than about 100 lbs per cabinet assembly   | Y N U N/A |
| 5. Externally attached items rigidly anchored  | Y N U N/A |
| 6. General configuration similar to NEMA Standards   | Y N U N/A |
| 7. Cutouts in lower half less than 6 in. wide and 12 in. high  | Y N U N/A |
| 8. All doors secured by latch or fastener  | Y N U N/A |
| 9. Natural frequency relative to 8 Hz limit considered   | Y N U N/A |
| 10. Anchorage adequate (See checklist, below, for details.)  | Y N U N/A |
| 11. Relays mounted on equipment evaluated  | Y N U N/A |
| 12. 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

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 3**Equipment ID No. \_\_\_\_\_ Equip. Class 1 – Motor Control Centers

Equipment Description \_\_\_\_\_

**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 generic seismic testing equipment class	Y	N	U	N/A
2. Meets all Bounding Spectrum caveats	Y	N	U	N/A
3. Floor mounted cabinet	Y	N	U	N/A
4. <sup>[1]</sup> Maximum weight per section less than 800 pounds	Y	N	U	N/A
5. Base anchorage utilizing MCC base channels	Y	N	U	N/A
6. Adequate strength and stiffness in load transfer path from anchorage to base frame (only for “function after” GERS)	Y	N	U	N/A
7. Essential relays have GERS > 4.5g (only for “function during” GERS)	Y	N	U	N/A
8. Able to reset starters (only for “function after” GERS)	Y	N	U	N/A
<sup>[5]</sup> 9. <u>All</u> 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
11. <sup>[6]</sup> Anchorage capacity exceeds demand	Y	N	U	N/A
Are anchorage requirements met?		Y	N	U



**Screening Evaluation Work Sheet (SEWS) Sheet 3 of 3**Equipment ID No. \_\_\_\_\_ Equip. Class 1 – Motor Control Centers

Equipment Description \_\_\_\_\_

**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 |
| 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

<sup>[4]</sup>**Does the Equipment Meet the GIP Criteria?**

Y N U

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 3

Equipment ID No. \_\_\_\_\_ Equip. Class 2 – Low Voltage Switchgear

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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. 600 V rating or less   | Y N U N/A |
| 3. Side-to-side restraint of draw-out circuit breakers is provided  | Y N U N/A |
| 4. Adjacent cabinets which are close enough to impact, or sections of multi-bay cabinets, are bolted together if they contain essential relays                                | Y N U N/A |
| 5. Attached weight (except conduit) less than about 100 lbs per cabinet assembly  | Y N U N/A |
| 6. Externally attached items rigidly anchored   | Y N U N/A |
| 7. General configuration similar to ANSI C37.20 Standards   | Y N U N/A |
| 8. Cutouts in lower half of cabinet side sheathing less than 30% of width of side panel wide and less than 60% of width of side panel high excluding bus transfer compartment | Y N U N/A |
| 9. All doors secured by latch or fastener   | Y N U N/A |
| 10. Anchorage adequate (See checklist, below, for details.)   | Y N U N/A |
| 11. Relays mounted on equipment evaluated   | Y N U N/A |
| 12. 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

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 3**Equipment ID No. \_\_\_\_\_ Equip. Class 2 – Low Voltage Switchgear

Equipment Description \_\_\_\_\_

**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 generic seismic testing equipment class	Y	N	U	N/A	
2. Meets all Bounding Spectrum caveats	Y	N	U	N/A	
3. Floor-mounted enclosure	Y	N	U	N/A	
4. Manufactured by major vendor (ITE/Brown Boveri, Westinghouse, or GE)					
5. <sup>[1]</sup> Maximum weight per section less than 1600 pounds	Y	N	U	N/A	
6. Base anchorage adequate (See checklist, below, for details.)	Y	N	U	N/A	
7. Relays used for breaker function are <u>not</u> on “Low Ruggedness Relays” list	Y	N	U	N/A	
8. Relay evaluation completed for all relays that are essential to other equipment or cause unacceptable lockout	Y	N	U	N/A	
9. For 2.5 g level GERS, vertical restraint prevents breaker uplift	Y	N	U	N/A	
10. For 2.5 g level GERS, outside corners of end units are reinforced, if needed	Y	N	U	N/A	
<sup>[5]</sup> 11. <u>All</u> 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	
11. <sup>[6]</sup> Anchorage capacity exceeds demand	Y	N	U	N/A	
Are anchorage requirements met?		Y	N	U	

**Screening Evaluation Work Sheet (SEWS) Sheet 3 of 3**Equipment ID No. \_\_\_\_\_ Equip. Class 2 – Low Voltage Switchgear

Equipment Description \_\_\_\_\_

**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 |
| 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

<sup>[4]</sup>**Does the Equipment Meet the GIP Criteria?**

Y N U

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 3

Equipment ID No. \_\_\_\_\_ Equip. Class 3 – Medium Voltage Switchgear

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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. 2.4 kV to 4.16 kV rating   | Y N U N/A |
| 3. Internally mounted potential and/or control power transformers are restrained to prevent damage to or disconnection of contacts  | Y N U N/A |
| 4. Adjacent cabinets which are close enough to impact, or sections of multi-bay cabinets, are bolted together if they contain essential relays                                | Y N U N/A |
| 5. Attached weight (except conduit) less than about 100 lbs per cabinet bay   | Y N U N/A |
| 6. Externally attached items rigidly anchored   | Y N U N/A |
| 7. General configuration similar to ANSI C37.20 Standards   | Y N U N/A |
| 8. Cutouts in lower half of cabinet side sheathing less than 30% of width of side panel wide and less than 60% of width of side panel high excluding bus transfer compartment | Y N U N/A |
| 9. All doors secured by latch or fastener   | Y N U N/A |
| 10. Anchorage adequate (See checklist, below, for details.)   | Y N U N/A |
| 11. Relays mounted on equipment evaluated   | Y N U N/A |
| 12. 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 |

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 3**Equipment ID No. \_\_\_\_\_ Equip. Class 3 – Medium Voltage Switchgear

Equipment Description \_\_\_\_\_

**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 generic seismic testing equipment class	Y	N	U	N/A
2. Meets all Bounding Spectrum caveats	Y	N	U	N/A
3. Floor-mounted enclosure	Y	N	U	N/A
4. The switchgear is not a specially-designed type	Y	N	U	N/A
5. Circuit breakers are truck-mounted type, not jack-up or vertical-lift	Y	N	U	N/A
6. <sup>[1]</sup> Maximum weight per section less than 5000 pounds	Y	N	U	N/A
7. Base anchorage adequate (See checklist, below, for details.)	Y	N	U	N/A
8. Relays used for breaker function are <u>not</u> on “Low Ruggedness Relays” list	Y	N	U	N/A
9. Relay evaluations completed for all relays that are essential to other equipment or cause unacceptable lockout	Y	N	U	N/A
10. For 2.5 g level GERS, vertical restraint prevents breaker uplift	Y	N	U	N/A
11. For 2.5 g level GERS, circuit break arc chutes are restrained horizontally	Y	N	U	N/A
12. For 2.5 g level GERS, a Beaver Type Z relay is <u>not</u> used in Westinghouse MV switchgear for the “Y” anti-pump relay	Y	N	U	N/A
13. Separate evaluation of breaker racking mechanism completed; seismic positioner or sufficient side-to-side restrained used	Y	N	U	N/A
<sup>[5]</sup> 14. <u>All</u> 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

**Screening Evaluation Work Sheet (SEWS) Sheet 3 of 3**Equipment ID No. \_\_\_\_\_ Equip. Class 3 – Medium Voltage Switchgear

Equipment Description \_\_\_\_\_

**Anchorage (cont'd)**

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	
11. <sup>[6]</sup> Anchorage capacity exceeds demand	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	
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

**<sup>[4]</sup> Does the Equipment Meet the GIP Criteria?**

Y N U

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 3

Equipment ID No. \_\_\_\_\_ Equip. Class 4 – Transformers

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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. 4.16 kV rating or less   | Y N U N/A |
| 3. For floor-mounted dry- and oil-type unit, transformer coils are positively restrained within cabinet   | Y N U N/A |
| 4. For 750 kV or larger units, coils are top braced or adequacy shown by evaluation   | Y N U N/A |
| 5. For 750 kVA or larger units, 2-inch clearance is provided between energized component and cabinet  | Y N U N/A |
| 6. For 750 kVA or larger units, the slack in the connection between the high-voltage leads and the first anchor accommodates 3-inch relative displacement | Y N U N/A |
| 7. For wall-mounted units, transformer coils anchored to enclosure near enclosure support surface   | Y N U N/A |
| 8. For floor-mounted units, anchorage does not rely on weak-way bending of cabinet structures under lateral forces  | Y N U N/A |
| 9. Adjacent cabinets which are close enough to impact are bolted together if they contain essential relays  |           |
| 10. All doors secured by latch or fastener  | Y N U N/A |



**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 3**Equipment ID No. \_\_\_\_\_ Equip. Class 4 – Transformers

Equipment Description \_\_\_\_\_

**Caveats – Bounding Spectrum (Continued)**

11. Anchorage adequate (See checklist, below, for details.)	Y	N	U	N/A
12. Relays mounted on equipment evaluated	Y	N	U	N/A
13. 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** <sup>[7]</sup>(Identify with an asterisk (\*) those caveats which are met by intent without meeting the specific wording of the caveat rule and explain the reason for this conclusion in the Comments section below.)

1. Equipment is included in generic seismic testing equipment class	Y	N	U	N/A
2. Meets all Bounding Spectrum caveats	Y	N	U	N/A
3. Dry-type unit (not oil-filled)	Y	N	U	N/A
4. Wall or floor-mounted NEMA-type enclosure	Y	N	U	N/A
5. 120 to 480 VAC rating	Y	N	U	N/A
6. 7.5 to 225 kVA rating	Y	N	U	N/A
7. 180 to 2000 pound weight	Y	N	U	N/A
8. Internal supports provide positive attachment of transformer components	Y	N	U	N/A
9. There is a minimum clearance of 3/8-inches between bare conductors and enclosure	Y	N	U	N/A
<sup>[5]</sup> 10. <u>All</u> 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

**Screening Evaluation Work Sheet (SEWS) Sheet 3 of 3**Equipment ID No. \_\_\_\_\_ Equip. Class 4 – Transformers

Equipment Description \_\_\_\_\_

**Anchorage (cont'd)**

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	
11. <sup>[6]</sup> Anchorage capacity exceeds demand	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	
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

<b><u><sup>[4]</sup>Does the Equipment Meet the GIP Criteria?</u></b>					Y N U
---	--	--	--	--	-------

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 2

Equipment ID No. \_\_\_\_\_ Equip. Class 5 – Horizontal Pumps

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

Horsepower/Motor Rating (opt.) \_\_\_\_\_ RPM (opt.) \_\_\_\_\_ Head (opt.) \_\_\_\_\_ Flow Rate (opt.) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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       |
| 5. Demand based on: Ground Response Spectrum             | GRS       |
| 1.5 x Ground Response Spectrum                           | AGS       |
| Conserv. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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. Driver and pump connected by rigid base or skid  | Y N U N/A |
| 3. No indication that shaft does not have thrust restraint in both axial directions         | Y N U N/A |
| 4. No risk of excessive nozzle loads such as gross pipe motion or differential displacement | Y N U N/A |
| 5. Base vibration isolators adequate for seismic loads                                      | Y N U N/A |
| 6. Attached lines (cooling, air, electrical) 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

### 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 |

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 2**Equipment ID No. \_\_\_\_\_ Equip. Class 5 – Horizontal Pumps

Equipment Description \_\_\_\_\_

**Anchorage (cont'd)**

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	
11. <sup>[6]</sup> Anchorage capacity exceeds demand	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	
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

**<sup>[4]</sup> Does the Equipment Meet the GIP Criteria?**

Y N U

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 2

Equipment ID No. \_\_\_\_\_ Equip. Class 6 – Vertical Pumps

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

Horsepower/Motor Rating (opt.) \_\_\_\_\_ RPM (opt.) \_\_\_\_\_ Head (opt.) \_\_\_\_\_ Flow Rate (opt.) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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       |
| 5. Demand based on: Ground Response Spectrum             | GRS       |
| 1.5 x Ground Response Spectrum                           | AGS       |
| Conserv. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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. Casing and impeller shaft not cantilevered more than 20 feet, with radial bearing at bottom to support shaft | Y N U N/A |
| 3. No risk of excessive nozzle loads such as gross pipe motion or differential displacement                     | Y N U N/A |
| 4. Attached lines (cooling, air, electrical) have adequate flexibility  | Y N U N/A |
| 5. Anchorage adequate (See checklist, below, for details.)  | Y N U N/A |
| 6. Relays mounted on equipment evaluated  | Y N U N/A |
| 7. 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

### 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 |

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 2**Equipment ID No. \_\_\_\_\_ Equip. Class 6 – Vertical Pumps

Equipment Description \_\_\_\_\_

**Anchorage (cont'd)**

5. Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition and concrete cracking	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	
11. <sup>[6]</sup> Anchorage capacity exceeds demand	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	
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

**<sup>[4]</sup>Does the Equipment Meet the GIP Criteria?**

Y N U

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 2

Equipment ID No. \_\_\_\_\_ Equip. Class 7 – Fluid-Operated Valves

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Pipe Size and Design Classification: (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### **Seismic Capacity vs. Demand**

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 3. Capacity based on: Existing Documentation             | DOC       |
| Bounding Spectrum  | BS        |
| 1.5 x Bounding Spectrum                                  | ABS       |
| GERS   | GERS      |
| 4. Demand based on: Ground Response Spectrum             | GRS       |
| 1.5 x Ground Response Spectrum                           | AGS       |
| Conserv. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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 cast iron body  | Y N U N/A |
| 3. No cast iron yoke (for spring-operated pressure relief or piston-operated valves)  | Y N U N/A |
| 4. Mounted on 1-inch diameter pipe or larger  | Y N U N/A |
| 5. Centerline of pipe to top of operator within restrictions of Figure B.7-1 or Appendix B, or yoke can take static 3g load (for air-operated diaphragm, lightweight piston-operated, and spring-operated pressure relief valves) | Y N U N/A |
| 6. Centerline of pipe to top of operator within restrictions of Figure B.7-2 of Appendix B, or yoke can take static 3g load (for piston-operated valve of substantial weight)   | Y N U N/A |
| 7. Actuator and yoke not braced independently from pipe   | Y N U N/A |
| 8. Attached lines (air, electrical) have adequate flexibility   | 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 |

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 2**Equipment ID No. \_\_\_\_\_ Equip. Class 7 – Fluid-Operated Valves

Equipment Description \_\_\_\_\_

**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.) (Note that GERS for this class apply up to attachment point of valve to piping system; valve/pipe interface is not covered.)

- |   |   |   |   |     |
|---|---|---|---|-----|
| 1. Equipment is included in generic seismic testing equipment class                       | Y | N | U | N/A |
| 2. Meets all Bounding Spectrum caveats  | Y | N | U | N/A |
| 3. Air-operated gate or globe valve with spring-opposed diaphragm-type pneumatic actuator | Y | N | U | N/A |
| 4. Use amplified response spectrum of piping system at piping/valve interface             | Y | N | U | N/A |
| 5. Valve and operator will not impact surrounding structures and components               | Y | N | U | N/A |
| 6. Mounted on 1- to 3-inch nominal pipe line  | Y | N | U | N/A |
| 7. Carbon steel (not cast iron) yoke or bonnet  | Y | N | U | N/A |

Is the intent of all the caveats met for GERS? Y N U N/A**Interaction Effects**

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

Is equipment free of interaction effects? Y N U**<sup>[4]</sup>Does the Equipment Meet the GIP Criteria?**Y N U**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_



## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 2

Equipment ID No. \_\_\_\_\_ Equip. Class 8A – Motor-Operated Valves

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Pipe Size and Design Classification: (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 3. Capacity based on: Existing Documentation             | DOC       |
| Bounding Spectrum  | BS        |
| 1.5 x Bounding Spectrum                                  | ABS       |
| GERS   | GERS      |
| 4. Demand based on: Ground Response Spectrum             | GRS       |
| 1.5 x Ground Response Spectrum                           | AGS       |
| Conserv. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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 cast iron body   | Y N U N/A |
| 3. No cast iron yoke   | Y N U N/A |
| 4. Mounted on 1-inch diameter pipe or larger   | Y N U N/A |
| 5. Centerline of pipe to top of operator within restrictions of Figure B.8A-1 of Appendix B, or yoke can take static 3g load | Y N U N/A |
| 6. Actuator and yoke not braced independently from pipe  | Y N U N/A |
| 7. Attached lines (electrical) have adequate flexibility   | Y N U N/A |
| 8. 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.) (Note that GERS for this class apply to only motor operator and its connection to valve; valve itself and valve/pipe interface are not covered.)

- |   |           |
|---|-----------|
| 1. Equipment is included in generic seismic testing equipment class | Y N U N/A |
| 2. Meets all Bounding Spectrum caveats                              | Y N U N/A |

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 2**Equipment ID No. \_\_\_\_\_ Equip. Class 8A – Motor-Operated Valves

Equipment Description \_\_\_\_\_

**Caveats – GERS (cont'd)**

- |  |   |   |   |     |
|--|---|---|---|-----|
| 3. Use amplified response spectrum of piping system and valve at valve/operator interface                | Y | N | U | N/A |
| 4. Motor axis is horizontal  | Y | N | U | N/A |
| 5. Valve and operator will not impact surrounding structures and components                              | Y | N | U | N/A |
| 6. Motor controls remotely located   | Y | N | U | N/A |
| 7. If valve has side mounted actuator attached to secondary reducer, seismic brackets are used           | Y | N | U | N/A |
| 8. Manufactured by Limitorque or Rotork  | Y | N | U | N/A |
| 9. Any loose or missing valve-to-operator bolts are tightened or replaced (tightness check not required) | Y | N | U | N/A |

Is the intent of all the caveats met for GERS? Y N U N/A

**Interaction Effects**

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

Is equipment free of interaction effects? Y N U

**<sup>[4]</sup>Does the Equipment Meet the GIP Criteria?**

Y N U

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 2

Equipment ID No. \_\_\_\_\_ Equip. Class 8B – Solenoid-Operated Valves

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Pipe Size and Design Classification (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 3. Capacity based on: Existing Documentation             | DOC       |
| Bounding Spectrum  | BS        |
| 1.5 x Bounding Spectrum                                  | ABS       |
| GERS   | GERS      |
| 4. Demand based on: Ground Response Spectrum             | GRS       |
| 1.5 x Ground Response Spectrum                           | AGS       |
| Conserv. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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

- |  |           |
|--|-----------|
| 1. Equipment is included in earthquake experience equipment class  | Y N U N/A |
| 2. No cast iron body   | Y N U N/A |
| 3. No cast iron yoke   | Y N U N/A |
| 4. Centerline of pipe to top of operator within restrictions of Figure B.8B-1 of Appendix B, or yoke can take static 3g load for SOVs mounted on lines $\geq$ 1-inch | Y N U N/A |
| 5. Actuator and yoke not braced independently from pipe  | Y N U N/A |
| 6. Attached lines (electrical) have adequate flexibility   | Y N U N/A |
| 7. 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.) (Note that GERS for this class apply up to attachment point of valve to piping system or parent valve (if SOV is a pilot valve); valve/pipe interface or parent valve is not covered.)

- |   |           |
|---|-----------|
| 1. Equipment is included in generic seismic testing equipment class | Y N U N/A |
| 2. Meets all Bounding Spectrum caveats                              | Y N U N/A |

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 2**Equipment ID No. \_\_\_\_\_ Equip. Class 8B – Solenoid-Operated Valves

Equipment Description \_\_\_\_\_

**Caveats – GERS (cont'd)**

3. Use amplified response spectrum of piping system and valve at valve/operator interface	Y	N	U	N/A
4. Valve and operator will not impact surrounding structures and components	Y	N	U	N/A
5. Nominal pipe size is 1-inch or less	Y	N	U	N/A
6. Valve body is forged brass or steel	Y	N	U	N/A
7. Housing oriented in accordance with manufacturer's recommendations	Y	N	U	N/A
8. Height of valve (pipe centerline to top of housing) does not exceed 12 in.	Y	N	U	N/A
9. If SOV is a pilot on a larger valve, use amplified response spectrum at attachment point of SOV to larger valve	Y	N	U	N/A
10. Use 3.5g ZPA GERS for ASCO Type 206-381	Y	N	U	N/A
Is the intent of all the caveats met for GERS?			Y	N U N/A

**Interaction Effects**

1. Soft targets free from impact by nearby equipment or structures	Y	N	U	N/A
2. Attached lines have adequate flexibility	Y	N	U	N/A
3. Overhead equipment or distribution systems are not likely to collapse	Y	N	U	N/A
4. Have you looked for and found no other adverse concerns?	Y	N	U	N/A
Is equipment free of interaction effects?			Y	N U

**<sup>[4]</sup>Does the Equipment Meet the GIP Criteria?**

Y N U

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 2

Equipment ID No. \_\_\_\_\_ Equip. Class 9 – Fans

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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       |
| 5. Demand based on: Ground Response Spectrum             | GRS       |
| 1.5 x Ground Response Spectrum                           | AGS       |
| Conserv. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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. Drive motor and fan mounted on common base   | Y N U N/A |
| 3. For axial fan with long shaft between fan and motor, shaft supported at fan as well as motor | Y N U N/A |
| 4. No possibility of excessive duct distortion causing binding or misalignment of fan           | Y N U N/A |
| 5. Base vibration isolators adequate for seismic loads  | Y N U N/A |
| 6. Attached lines (electrical) have adequate flexibility  | Y N U N/A |
| 7. Anchorage adequate (See checklist, below, for details.)                                      | Y N U N/A |
| 8. 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

### 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 |

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 2**Equipment ID No. \_\_\_\_\_ Equip. Class 9 – Fans

Equipment Description \_\_\_\_\_

**Anchorage (cont'd)**

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. Base has adequate stiffness and effect of prying action on anchors considered	Y	N	U	N/A	
8. Strength of equipment base and load path to CG adequate	Y	N	U	N/A	
9. Embedded steel, grout pad, or large concrete pad adequacy evaluated	Y	N	U	N/A	
10. <sup>[6]</sup> Anchorage capacity exceeds demand	Y	N	U		
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. Distribution lines have adequate flexibility	Y	N	U	N/A	
3. Overhead equipment or distribution systems are not likely to collapse	Y	N	U	N/A	
4. Have you looked for and found no other adverse concerns?	Y	N	U	N/A	
Is equipment free of interaction effects?					Y N U

**<sup>[4]</sup>Does the Equipment Meet the GIP Criteria?**

Y N U

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 2

Equipment ID No. \_\_\_\_\_ Equip. Class 10 – Air Handlers

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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       |
| 5. Demand based on: Ground Response Spectrum             | GRS       |
| 1.5 x Ground Response Spectrum                           | AGS       |
| Conserv. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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. Anchorage of heavy internal components is adequate; internal vibration isolators have seismic stops to limit uplift and lateral movement | Y N U N/A |
| 3. All doors secured by latch or fastener   | Y N U N/A |
| 4. No possibility of excessive duct distortion causing binding or misalignment of any internal fan  | Y N U N/A |
| 5. Base vibration isolators adequate for seismic loads  | Y N U N/A |
| 6. Attached lines (water, air, electrical) 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

### 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 |

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 2**Equipment ID No. \_\_\_\_\_ Equip. Class 10 – Air Handlers

Equipment Description \_\_\_\_\_

**Anchorage (cont'd)**

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	
11. <sup>[6]</sup> Anchorage capacity exceeds demand	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	
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

**<sup>[4]</sup> Does the Equipment Meet the GIP Criteria?** Y N U

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_  
 \_\_\_\_\_



## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 2

Equipment ID No. \_\_\_\_\_ Equip. Class 11 – Chillers

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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       |
| 5. Demand based on: Ground Response Spectrum             | GRS       |
| 1.5 x Ground Response Spectrum                           | AGS       |
| Conserv. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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. Evaporator and condenser tanks reasonably braced between themselves for lateral forces without relying on weak-way bending of steel plates or structural steel shapes | Y N U N/A |
| 3. Base and/or compressor/motor vibration isolators adequate for seismic loads   | Y N U N/A |
| 4. Anchorage adequate (See checklist, below, for details.)   | Y N U N/A |
| 5. Relays mounted on equipment evaluated   | Y N U N/A |
| 6. 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

### 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 |

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 2**Equipment ID No. \_\_\_\_\_ Equip. Class 11 – Chillers

Equipment Description \_\_\_\_\_

**Anchorage (cont'd)**

5. Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition and concrete cracking	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	
11. <sup>[6]</sup> Anchorage capacity exceeds demand	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	
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

**<sup>[4]</sup>Does the Equipment Meet the GIP Criteria?**

Y N U

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 2

Equipment ID No. \_\_\_\_\_ Equip. Class 12 – Air Compressors

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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       |
| 5. Demand based on: Ground Response Spectrum             | GRS       |
| 1.5 x Ground Response Spectrum                           | AGS       |
| Conserv. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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. Base vibration isolators adequate for seismic loads            | Y N U N/A |
| 3. Attached lines have adequate flexibility                       | Y N U N/A |
| 4. Anchorage adequate (See checklist, below, for details.)        | Y N U N/A |
| 5. Relays mounted on equipment evaluated                          | Y N U N/A |
| 6. 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

### 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 |

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 2**Equipment ID No. \_\_\_\_\_ Equip. Class 12 – Air Compressors

Equipment Description \_\_\_\_\_

**Anchorage (cont'd)**

- |  |   |   |   |     |
|--|---|---|---|-----|
| 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 |
| 11. <sup>[6]</sup> Anchorage capacity exceeds demand   | 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 |
| 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**<sup>[4]</sup>Does the Equipment Meet the GIP Criteria?**Y N U**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 2

Equipment ID No. \_\_\_\_\_ Equip. Class 13 – Motor-Generators

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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       |
| 5. Demand based on: Ground Response Spectrum             | GRS       |
| 1.5 x Ground Response Spectrum                           | AGS       |
| Conserv. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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. Main driver and driven equipment connected by a rigid support or skid | Y N U N/A |
| 3. Base vibration isolators adequate for seismic loads                   | Y N U N/A |
| 4. Attached lines have adequate flexibility                              | Y N U N/A |
| 5. Anchorage adequate (See checklist, below, for details.)               | Y N U N/A |
| 6. Relays mounted on equipment evaluated                                 | Y N U N/A |
| 7. 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

### 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 |

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 2**Equipment ID No. \_\_\_\_\_ Equip. Class 13 – Motor-Generators

Equipment Description \_\_\_\_\_

**Anchorage (cont'd)**

5. Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition and concrete cracking	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	
11. <sup>[6]</sup> Anchorage capacity exceeds demand	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	
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

**<sup>[4]</sup>Does the Equipment Meet the GIP Criteria?**

Y N U

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 3

Equipment ID No. \_\_\_\_\_ Equip. Class 14 – Distribution Panels

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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. Contains only circuit breakers and switches   | Y N U N/A |
| 3. All latches and fasteners in door secured   | Y N U N/A |
| 4. Adjacent cabinets which are close enough to impact, or sections of multi-bay cabinets, are bolted together if they contain essential relays | Y N U N/A |
| 5. Wall- or floor-mounted NEMA-type enclosure  | Y N U N/A |
| 6. Anchorage adequate (See checklist, below, for details.)   | Y N U N/A |
| 7. Relays mounted on equipment evaluated   | Y N U N/A |
| 8. 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. Use panelboard GERS unless unit is free-standing and designated as a switchboard by manufacturer | Y N U N/A |

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 3**Equipment ID No. \_\_\_\_\_ Equip. Class 14 – Distribution Panels

Equipment Description \_\_\_\_\_

**Caveats – GERS (cont'd)**

4. <u>W</u> “Quicklag” Type E circuit breakers are <u>not</u> in distribution panel	Y	N	U	N/A
<sup>[5]</sup> 5. <u>All</u> 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
11. <sup>[6]</sup> Anchorage capacity exceeds demand	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
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

**<sup>[4]</sup>Does the Equipment Meet the GIP Criteria?**

Y N U



**Screening Evaluation Work Sheet (SEWS) Sheet 3 of 3**

Equipment ID No. \_\_\_\_\_ Equip. Class 14 – Distribution Panels

Equipment Description \_\_\_\_\_

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 3

Equipment ID No. \_\_\_\_\_ Equip. Class 15 – Batteries on Racks

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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. Plates of the cells are of lead-calcium flat-plate, PlantJ, or of Manchex design       | Y N U N/A |
| 3. Each individual battery weighs less than 450 lbs                                       | Y N U N/A |
| 4. Close-fitting, crush resistant spacers fill two-thirds of vertical space between cells | Y N U N/A |
| 5. Cells restrained by end and side rails   | Y N U N/A |
| 6. Racks have longitudinal cross bracing  | Y N U N/A |
| 7. Wood racks evaluated to industry accepted standards                                    | Y N U N/A |
| 8. Batteries greater than 10 years old specifically evaluated for aging effects           | Y N U N/A |
| 9. Anchorage adequate (See checklist, below, for details.)                                | Y N U N/A |
| 10. 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 |

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 3**Equipment ID No. \_\_\_\_\_ Equip. Class 15 – Batteries on Racks

Equipment Description \_\_\_\_\_

**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. Plates of the cells are of lead-calcium flat-plate design (i.e., not Manchex design)   | Y | N | U | N/A |
| 4. Batteries supported on two-step racks or single-tier racks; restrained by double side and end rails which are symmetrically located with respect to the cell center-of-gravity | 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. Base has adequate stiffness and effect of prying action on anchors considered  | Y | N | U | N/A |
| 8. Strength of equipment base and load path to CG adequate  | Y | N | U | N/A |
| 9. Embedded steel, grout pad, or large concrete pad adequacy evaluated  | Y | N | U | N/A |
| 10. <sup>[6]</sup> Anchorage capacity exceeds demand  | 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. Attached lines have adequate flexibility                              | Y | N | U | N/A |
| 3. Overhead equipment or distribution systems are not likely to collapse | Y | N | U | N/A |
| 4. Have you looked for and found no other adverse concerns?              | Y | N | U | N/A |

Is equipment free of interaction effects? Y N U

<sup>[4]</sup> **Does the Equipment Meet the GIP Criteria?**

Y N U

**Screening Evaluation Work Sheet (SEWS) Sheet 3 of 3**

Equipment ID No. \_\_\_\_\_ Equip. Class 15 – Batteries on Racks

Equipment Description \_\_\_\_\_

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 3

Equipment ID No. \_\_\_\_\_ Equip. Class 16 – Battery Chargers & Inverters

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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. Solid state type   | Y N U N/A |
| 3. For floor-mounted, transformer positively anchored and mounted near base, or load path is evaluated          | Y N U N/A |
| 4. Base assembly of floor-mounted unit properly braced or stiffened for lateral forces                          | Y N U N/A |
| 5. For wall-mounted units, transformer supports and bracing provide adequate load path to the rear cabinet wall | Y N U N/A |
| 6. All latches and fasteners in doors secured   |           |
| 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 |

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 3**Equipment ID No. \_\_\_\_\_ Equip. Class 16 – Battery Chargers & Inverters

Equipment Description \_\_\_\_\_

**Caveats – GERS (cont'd)**

- |   |   |   |   |     |
|---|---|---|---|-----|
| 3. Silicon-Controlled Rectifier (SCR) power controls; wall- or floor-mounted NEMA-type enclosure  | Y | N | U | N/A |
| 4. Within range of battery charger ratings:   |   |   |   |     |
| 24-250 VDC  | Y | N | U | N/A |
| 120-480 VAC   | Y | N | U | N/A |
| 25-600 amps   | Y | N | U | N/A |
| 150-2850 pounds (floor-mounted)   | Y | N | U | N/A |
| 150-600 pounds (wall-mounted)   | Y | N | U | N/A |
| 5. Within range of inverter ratings:  |   |   |   |     |
| 120 VDC only  | Y | N | U | N/A |
| 120-480 VAC   | Y | N | U | N/A |
| 0.5-15 kVA  | Y | N | U | N/A |
| 300-2000 pounds   | Y | N | U | N/A |
| 6. Heavy components are located in lower half of cabinet and are supported from base or rear panel with no panel cutouts adjacent to attachment | 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 |
| 11. <sup>[6]</sup> Anchorage capacity exceeds demand  | Y | N | U | N/A |

Are anchorage requirements met? Y N U

**Screening Evaluation Work Sheet (SEWS) Sheet 3 of 3**Equipment ID No. \_\_\_\_\_ Equip. Class 16 – Battery Chargers & Inverters

Equipment Description \_\_\_\_\_

**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 |
| 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

**<sup>[4]</sup>Does the Equipment Meet the GIP Criteria?**

Y N U

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 2

Equipment ID No. \_\_\_\_\_ Equip. Class 17 – Engine-Generators

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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       |
| 5. Demand based on: Ground Response Spectrum             | GRS       |
| 1.5 x Ground Response Spectrum                           | AGS       |
| Conserv. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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. Driver and driven equipment connected by a rigid support or common skid | Y N U N/A |
| 3. Base vibration isolators adequate for seismic loads                     | Y N U N/A |
| 4. Attached lines (cooling, air, electrical) have adequate flexibility     | Y N U N/A |
| 5. Anchorage adequate (See checklist, below, for details.)                 | Y N U N/A |
| 6. Relays mounted on equipment evaluated                                   | Y N U N/A |
| 7. 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

### 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 |



**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 2**Equipment ID No. \_\_\_\_\_ Equip. Class 17 – Engine-Generators

Equipment Description \_\_\_\_\_

**Anchorage (cont'd)**

5. Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/condition and concrete cracking	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	
11. <sup>[6]</sup> Anchorage capacity exceeds demand	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	
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

**<sup>[4]</sup>Does the Equipment Meet the GIP Criteria?**

Y N U

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 3

Equipment ID No. \_\_\_\_\_ Equip. Class 18 – Instruments on Racks

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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  |           |
| 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**Equipment ID No. \_\_\_\_\_ Equip. Class 18 – Instruments on Racks

Equipment Description \_\_\_\_\_

**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	
<sup>[8]</sup> 9. Rack capable of structurally transferring seismic demand loads to anchorage	Y	N	U	N/A	
<sup>[5]</sup> 10. <u>All</u> adjacent racks 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	
11. <sup>[6]</sup> Anchorage capacity exceeds demand	Y	N	U	N/A	
Are anchorage requirements met?		Y	N	U	

**Screening Evaluation Work Sheet (SEWS) Sheet 3 of 3**Equipment ID No. \_\_\_\_\_ Equip. Class 18 – Instruments on Racks

Equipment Description \_\_\_\_\_

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

**Interaction Effects (cont'd)**

- |   |   |   |   |       |
|---|---|---|---|-------|
| 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 |

<sup>[4]</sup>**Does the Equipment Meet the GIP Criteria?**

Y N U

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 2

Equipment ID No. \_\_\_\_\_ Equip. Class 19 – Temperature Sensors

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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       |
| 5. Demand based on: Ground Response Spectrum             | GRS       |
| 1.5 x Ground Response Spectrum                           | AGS       |
| Conserv. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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 possibility of detrimental differential displacement between mounting of connection head and mounting of temperature sensor | Y N U N/A |
| 3. Associated electronics are all solid state (no vacuum tubes)   | Y N U N/A |
| 4. Attached lines have adequate flexibility   |           |
| 5. 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

### Interaction Effects

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

Is equipment free of interaction effects? Y N U

**<sup>[4]</sup>Does the Equipment Meet the GIP Criteria?** Y N U

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 2**

Equipment ID No. \_\_\_\_\_ Equip. Class 19 – Temperature Sensors

Equipment Description \_\_\_\_\_

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 2

Equipment ID No. \_\_\_\_\_ Equip. Class 20 – Instr. & Control Panels & Cabinets

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### Seismic Capacity vs. Demand

- |  |           |
|--|-----------|
| 1. Elevation where equipment receives seismic input      |           |
| 2. Elevation of seismic input below about 40' from grade | Y N U N/A |
| 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       |
| 5. Demand based on: Ground Response Spectrum             | GRS       |
| 1.5 x Ground Response Spectrum                           | AGS       |
| Conserv. Desc. In-Str. Resp. Spec.                       | CRS       |
| Realistic M-Ctr. In-Str. Resp. Spec.                     | RRS       |

Does capacity exceed demand? <sup>[3]</sup>(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. No strip chart recorders  | Y N U N/A |
| 4. Steel frame and sheet metal structurally adequate   | Y N U N/A |
| 5. Adjacent cabinets or panels which are close enough to impact, or sections of multi-bay cabinets or panels, are bolted together if they contain essential relays | Y N U N/A |
| 6. Drawers and equipment on slides restrained from falling out   |           |
| 7. All doors secured by latch or fastener  |           |
| 8. Attached lines have adequate flexibility  |           |
| 9. Anchorage adequate (See checklist, below, for details.)   | Y N U N/A |
| 10. Relays mounted on equipment evaluated  | Y N U N/A |
| 11. 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 |

### 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 |

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 2**Equipment ID No. \_\_\_\_\_ Equip. Class 20 – Instr. & Control Panels & Cabinets

Equipment Description \_\_\_\_\_

**Anchorage (cont'd)**

- |   |   |   |   |     |
|---|---|---|---|-----|
| 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 |
| 11. <sup>[6]</sup> Anchorage capacity exceeds demand  | 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 |
| 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

**<sup>[4]</sup> Does the Equipment Meet the GIP Criteria?**

Y N U

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## Screening Evaluation Work Sheet (SEWS) Sheet 1 of 2

Equipment ID No. \_\_\_\_\_ Equip. Class 21 – Tanks and Heat Exchangers

Equipment Description \_\_\_\_\_

Location: Bldg. \_\_\_\_\_ Floor El. \_\_\_\_\_ Room, Row/Col \_\_\_\_\_

Manufacturer, Model, Etc. (optional but recommended<sup>[2]</sup>) \_\_\_\_\_

### **Shell Capacity vs. Demand**

Buckling capacity of shell of large, flat-bottom, vertical tank is equal to or greater than demand: Y N U N/A

### **Anchorage**

Capacity of anchor bolts and their embedments is equal to or greater than demand: Y N U N/A

### **Connection Between Anchor Bolts and Shell**

Capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand: Y N U N/A

### **Flexibility of Attached Piping**

Attached piping has adequate flexibility to accommodate motion of large, flat-bottom, vertical tank: Y N U N/A

**Screening Evaluation Work Sheet (SEWS) Sheet 2 of 2**Equipment ID No. \_\_\_\_\_ Equip. Class 21 – Tanks and Heat Exchangers

Equipment Description \_\_\_\_\_

**Tank Foundation**Ring-type foundation is not used to support large, flat-bottom,  
vertical tank:

Y N U N/A

**<sup>[4]</sup>Does the Equipment Meet the GIP Criteria?**

Y N U

**Comments**

Evaluated by: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

## REASONS FOR CHANGES TO GIP, PART II, APPENDIX G

Listed below are the specific reasons for making the changes marked with a vertical line in the margin of this appendix to create GIP-3A from GIP-3, Updated 5/16/97. The endnote numbers listed below correspond to the bracketed numbers (e.g., <sup>[1]</sup>) located in the text of this appendix where the changes are made.

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<sup>1</sup> SSER No. 2, Sec. III.7.1 – The Staff position is that the information in the SEWS is a summary of the criteria contained other sections of the GIP (e.g., Appendices B and C). Therefore, if there is any conflict between the information on the SEWS and these other sections of the GIP, these other sections should take precedence. For example, for motor control centers, the weight of 800 pound should be considered maximum instead of average.

The GIP has been amended in Part II, Appendix G, “Introduction,” to add a clarification that the short summaries of the criteria provided in the SEWS are for general guidance only. The detail criteria contained in Sections 4 and 7 and Appendices B, C, and D should be used as the basis for evaluating the seismic adequacy of equipment.

The GIP has also been corrected in Part II, Appendix G, SEWS for Classes 1, 2, and 3 to indicate that the maximum weight of each vertical section (not the average weight) should not exceed the limit provided in the SEWS caveat.

<sup>2</sup> SSER No. 2, Sec. III.7.2 – The Staff noted that the SEWS do not require documentation of manufacturer, model, etc. For information purposes only, the Staff strongly recommends that such information should be recorded if readily available.

The GIP has been amended in Part II, Appendix G, “Introduction” to address the Staff recommendation by adding “(e.g., manufacturer, model)” to the discussion of the information to be recorded on the SEWS.

Each of the SEWS in Appendix G has also been modified to indicate that although such information as manufacturer, model, etc. is optional, it is recommended that it be recorded.

<sup>3</sup> SSER No. 2, Sec. III.7.3 – The NRC position is that since GIP-2 allows the demand level to exceed the capacity level under certain conditions, in response to the question “Does capacity exceed demand?” on the Screening Evaluation Work Sheets (SEWS) for each piece of equipment, the reviewer must also identify whether the exceptions described on page 4-10 of GIP-2 were used in the comparison.

The GIP has been amended in Part II, Section 4.2, “Enveloping of Seismic Demand Spectrum,” to address the Staff position by requiring the SEWS to be marked to indicate if one of the special exceptions to having capacity envelop demand at all frequencies is invoked.

Each SEWS in Appendix G has also been modified to include a reminder, next to the question “Does capacity exceed demand?” to indicate if an exception is invoked.

<sup>4</sup> Editorial change in last question on each SEWS to ask whether the item of equipment meets the GIP criteria, rather than whether it is seismically adequate. An item of equipment may be seismically adequate (e.g., by resolving an outlier) however it may not meet the GIP criteria and therefore should be characterized as an outlier, i.e., the answer to the question should be No (N).

<sup>5</sup> SSER No. 2, Sec. III.2.3 – The Staff position is that sections of multi-bay cabinets should be bolted together, even if they do not contain essential relays, if the GERS capacities are used, since sections of such cabinets were bolted together during testing.

The GIP has been amended in Part II, Appendix B, Sections B.1.2, B.2.2, B.3.2, B.4.2, B.14.2, and B.18.2 and in the SEWS in Appendix G for Equipment Classes 1, 2, 3, 4, 14, and 18 to include a GERS caveat requiring adjacent cabinets to be bolted together.

<sup>6</sup> Editorial change to add a checklist item on each SEWS where anchorage is checked to evaluate the anchorage capacity of an item of equipment compared to the seismic demand imposed on it. This checklist item was inadvertently omitted in previous revisions of the GIP.

<sup>7</sup> Typographical error corrected.

<sup>8</sup> Editorial change in the SEWS for Instrument Racks (Class #18) to make the GERS Caveat #9 correspond to the Appendix B requirement that an evaluation should be done to show that the instrument rack is capable of transferring the seismic demand load (not the GERS capacity) to the anchorage.