



**Matthew Rodriguez**  
Secretary for  
Environmental Protection



## Department of Toxic Substances Control

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**Edmund G. Brown Jr.**  
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## SEISMIC EQUIPMENT WALKDOWN CHECKLISTS

### INSTRUCTIONS FOR COMPLETION OF SEISMIC WALKDOWN WORK SHEET FOR EQUIPMENT

The walkdown team shall complete each work sheet as follows:

The **Equipment Type block** shall include the type and name of equipment inspected (i.e., Lean-Rich Heat Exchangers).

The **Equipment ID block** should show the equipment ID or mark number.

The **Location block** shall indicate the location of the equipment inspected, including building and elevation as applicable.

The **Drawing No. block** shall include any drawing number that was used for inspection.

The **Conclusion block** shall be completed to identify the conclusion of the inspection. If modification is suggested or required, it shall be detailed in the **Comments block**. Additional pages may be used to describe any modification.

The **Inspection Attributes blocks** shall be completed for each attribute. If an attribute is not applicable, "NA" shall be so indicated. Completed may be made in the **attribute box** or the **Comments block** (e.g., weld is damaged on the backside of panel).

#### Bolts, Nuts, Washers

All bolts, nuts, and washers used to support equipment shall be inspected. If any of these items are missing, a check in the **"YES" column** shall be made and a note as to what item is missing.

A tightness check of the bolting hardware shall be performed by hand. If the hardware is loose when turned by hand, a check in the **"YES" column** shall be made, together with an indication of the condition.

If there is any significant corrosion present, a check in the **"YES" column** shall be made, together with an indication of the condition. The walkdown engineer shall use judgement in evaluating the level of significant corrosion.

## Welds

All welds used to support equipment shall be visually inspected for cracks/damage. A check in the "**YES**" **column** shall be made if the same is present and an indication of the condition.

## Supports

All supports shall be visually inspected for damaged or missing components (i.e., cotter pins, stiffeners, etc.). If any components are missing, a check in the "**YES**" **column** shall be made, along with an identification of the missing component.

An inspection for corrosion shall be made similar to that of the bolting hardware.

## Seismic Clearance/Flexibility

All seismic sensitive equipment shall be inspected to check that adequate clearance exists to prevent any adverse interaction with adjacent systems, structures, or components.

Commodities in close proximity shall be evaluated for potential interaction. Suspended systems that are supported with rod hangers or other flexible dead load supports with little or no lateral restraint will result in large displacements due to a seismic event. The walkdown engineer shall use judgement in estimating displacements of commodities in close proximity based on the flexibility of the commodity. If commodities are in close proximity, a check in the "**YES**" **column** shall be made, along with the identification and location of the commodity.

An evaluation of the flexibility of the system shall be made.

For commodities in close proximity, an inspection of the support system is required to check for structural integrity. (A commodity may not have an adverse interaction due to "swing," but the anchorage may not be sufficient to prevent the commodity from falling and impacting the sensitive seismic commodity.) Documentation of this inspection shall be performed on a separate **Seismic Walkdown Work Sheet**.

The **Comments block** shall include a description of any modification. It also should include any comments on the seismic adequacy, general condition of the equipment, or any unacceptable condition that is not specifically identified as an inspection attribute.

SEISMIC EQUIPMENT WALKDOWN WORK SHEET Page\_\_ of

SYSTEM DESCRIPTION	LINE NUMBER	LOCATION	DRAWING NO.
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<b>CONCLUSION</b> ___ ACCEPTABLE ___ ACCEPTABLE (Modifications required) ___ UNACCEPTABLE (see comments) ___ INACCESSIBLE (acceptability not determined)	<b>ENGINEER:</b>  <b>DATE:</b>
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**INSPECTION ATTRIBUTES**

	YES	NO	INAC	COMMENTS
<b>A.BOLTS,NUTS,WASHERS</b>				
MISSING				
LOOSE				
CORROSION				
<b>B.WELDS</b>				
CRACKED/ DAMAGED				
<b>C.SUPPORTS</b>				
MISSING PARTS				
CORROSION				
<b>D.SEISMIC CLEARANCE</b>				
PROXIMITY				
FLEXIBILITY				
ADJACENT EQUIPMENT				

COMMENTS

# SEISMIC PIPING WALKDOWN CHECKLISTS

## INSTRUCTIONS FOR COMPLETION OF SEISMIC WALKDOWN WORK SHEET FOR PIPING

The walkdown team shall complete each work sheet as follows:

The **System Description block** shall include the system description inspected (i.e., 10" Rich DEA).

The **Line Number block** should show the line number.

The **Location block** shall indicate the location of the line inspected, including building and elevation as applicable.

The **Drawing No. block** shall include any drawing number that was used for inspection.

The **Conclusion block** shall be completed to identify the conclusion of the inspection. If modification is suggested or required, it shall be detailed in the **Comments block**. Additional pages may be used to describe any modification.

The **Inspection Attributes blocks** shall be completed for each attribute. If an attribute is not applicable, "NA" shall be so indicated. Comments may be made in the **attribute box** or the **Comments block** (e.g., strap is missing on third pipe support from Lean-Rich Heat Exchanger).

### Piping

Piping shall be inspected for cracks or damaged components. If cracking or damaged components exist, a check in the **"YES" column** shall be made, along with an indication of the piping condition.

If there is any significant corrosion present, a check in the **"YES" column** shall be made, along with an indication of the condition. The walkdown engineer shall use judgement in evaluating the level of significant corrosion.

### Supports

All supports shall be visually inspected for damaged or missing components (i.e., cotter pins, stiffeners, etc.). If any components are missing, a check in the **"YES" column** shall be made along with an identification of the missing components.

An inspection for corrosion shall be made similar to that of the piping.

Support hardware (i.e., straps, rods, steel, etc.) shall be inspected for damaged and/or loose components. If an adverse condition exists, a check in the **"YES" column** shall be made, along with an indication of the adverse condition.

### Seismic Clearance/Flexibility

All piping shall be inspected to check that adequate clearance exists to prevent any adverse interaction with adjacent systems, structures, or components.

Commodities in close proximity shall be evaluated for potential interaction. Suspended systems that are supported with rod hangers or other flexible dead load supports with little or no lateral restraint will result in large displacement due to a seismic event. The walkdown engineer shall use judgement in estimating displacement of commodities in close proximity, a check in the "**YES**" **column** shall be made, along with the identification and location of the commodity.

For commodities in close proximity, an inspection of each commodity's support arrangement is required to check for structural integrity. (A commodity may not have an adverse interaction due to "swing," but the anchorage may not be sufficient to prevent the commodity from falling and impacting the sensitive seismic commodity.) Documentation of this inspection shall be performed **on a separate Seismic Walkdown Work Sheet**.

The **Comments block** shall include a description of any modification. It also should include any comments on the seismic adequacy, general condition of the equipment, or any unacceptable condition that is not specifically identified as an inspection attribute.

**SEISMIC PIPING WALKDOWN WORK SHEET**

Page \_\_\_ of

<b>SYSTEM DESCRIPTION</b>	<b>LINE NUMBER</b>	<b>LOCATION</b>	<b>DRAWING NO.</b>
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<b>CONCLUSION</b> <input type="checkbox"/> ACCEPTABLE <input type="checkbox"/> ACCEPTABLE (Modifications required) <input type="checkbox"/> UNACCEPTABLE (see comments) <input type="checkbox"/> INACCESSIBLE (acceptability not determined)	<b>ENGINEER:</b>  <b>DATE:</b>
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**INSPECTION ATTRIBUTES**

	YES	NO	INAC	COMMENTS
<b>A. PIPING</b>				
DAMAGED				
CORROSION				
FLG/THRD/JTS				
BURIED RUN				
ADEQUATE BRANCH FLEXIBILITY				
RIGIDLY SPANS COMPONENTS				
<b>B. SUPPORTS</b>				
PIPE SPANS OK				
MISSING HARDWARE				
CORROSION				
HARDWARE DAMAGED/LOOSE				
<b>C. SEISMIC INTERACTION</b>				
ADEQUATE CLEARANCE				
ADJ COMPONENTS SECURE				
CLEARANCE AT AOV'S/MOV'S				

SEISMIC WALKDOWN WORK SHEET

Page \_\_\_\_ of

SYSTEM  
DESCRIPTION

LINE NUMBER

LOCATION

DRAWING NO.

COMMENTS/SKETCHES/PHOTOGRAPHS

