

## **PRESSURE SAFETY**

### **1.0 Objective**

The objective of this surveillance is to evaluate the laboratory's implementation of programs to ensure the integrity of pressure vessels and minimize risks from failure of vessels to the public and to workers. Facility Representatives or Environmental, Safety, and Health Support Specialists will examine the installed configuration of pressure vessels, observe pressure testing and review documentation associated with maintenance or repair of pressure vessels. In performing the surveillance, Facility Representatives or Environmental, Safety, and Health Support Specialists will examine implementation of applicable DOE requirements and best practices.

### **2.0 References**

- 2.1 DOE O 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*
- 2.2 DOE 5480.4, *Environmental Protection, Safety and Health Protection Standards*
- 2.3 American Society of Mechanical Engineers, *Boiler and Pressure Vessel Code*
- 2.4 American National Standards Institute Standard B31.1, *Power Piping Code*
- 2.5 *Department of Energy Pressure Safety Manual, DRAFT*, December 1993
- 2.6 29 CFR Parts 1910.101-106

### **3.0 Surveillance Activities**

In performing this surveillance, the Facility Representative or Environmental, Safety, and Health Support Specialists completes the following activities:

1. Walkdown an existing pressure vessel and connected piping.
2. Observe a pressure test to verify structural integrity of piping and components.
3. Review a maintenance work package for repairs or modifications to a pressure vessel or pressurize system piping.
4. Walkdown an installation of compressed gas cylinders.

**Surveillance Guideline  
 PRESSURE SAFETY**

Surveillance No.: \_\_\_\_\_

Facility: \_\_\_\_\_

Date Completed: \_\_\_\_\_

**Activity 1 - Walkdown a pressure vessel and connected piping**

	<u>YES</u>	<u>NO</u>	<u>N/A</u>
1. Does the pressure vessel have a tag or nameplate attached or connected to it showing the following information:			
a. Component identification number?	_____	_____	_____
b. Maximum allowable working pressure?	_____	_____	_____
c. Fluid?	_____	_____	_____
d. Temperature (expressed as a range)?	_____	_____	_____
e. Date tested?	_____	_____	_____
f. Expiration date?	_____	_____	_____
g. Inspected by?	_____	_____	_____
h. Date?	_____	_____	_____
2. Is the vessel and associated piping free of any sign of strain, deformation, distention, swelling, damage, or corrosion?	_____	_____	_____
3. Is the vessel equipped with a pressure relief device to prevent over-pressure?	_____	_____	_____
4. Is the relief device set at the required pressure?	_____	_____	_____
5. Is the discharge from the pressure relief device free of any valves until the discharge reaches a blowdown tank or atmosphere?	_____	_____	_____
6. Is the relief device pointed away from areas where personnel may be located if it is not piped to a vent?	_____	_____	_____
7. Does the as-installed condition of the pressure vessel and attached piping match the design documents?	_____	_____	_____

8. Are all fittings and vessel seals tight? \_\_\_\_\_

<b>Surveillance Guideline</b>		<u>YES</u>	<u>NO</u>	<u>N/A</u>
<b>PRESSURE SAFETY</b>				
9.	Is adequate instrumentation provided to monitor process conditions in the pressure vessel as appropriate, including pressure, temperature and level?	_____	_____	_____
10.	Is documentation available to substantiate that the pressure vessel has been adequately pressure-tested within the last five years?	_____	_____	_____
<b>Activity 2 - Observe a Pressure Test</b>				
11.	Are tests performed in accordance with formal procedures that have been subjected to a thorough independent review?	_____	_____	_____
12.	Was the procedure reviewed by the designer and the safety organization before approval?	_____	_____	_____
13.	Is the equipment and piping to be tested shielded or barricaded to minimize the potential for injury to personnel if the vessel or piping fails during testing?	_____	_____	_____
14.	Are all extraneous personnel evacuated from the area before testing commences?	_____	_____	_____
15.	Is the area where the testing will be conducted posted with signs indicating "DANGER - HIGH PRESSURE TEST IN PROGRESS - KEEP OUT" or similar warning?	_____	_____	_____
16.	Are all prerequisites for testing completed before testing commences?	_____	_____	_____
17.	Do test personnel use means for performing leak testing other than open flames?	_____	_____	_____
18.	Are vessels and piping always depressurized before any efforts to repair leaks are initiated?	_____	_____	_____
19.	At the conclusion of the test, are measurements taken to confirm	t	h	a

t the vessel has not plastically deformed?

\_\_\_\_\_

**Surveillance Guideline  
 PRESSURE SAFETY**

YES      NO      N/A

- 20. Are data sheets signed by appropriate personnel?      \_\_\_\_\_
- 21. Do training records substantiate that personnel conducting the test have received appropriate pressure-safety training?      \_\_\_\_\_

**Activity 3 - Review of Work Package**

- 22. Does the work package require depressurization of the component or portion of the system before work begins?      \_\_\_\_\_
- 23. Does the work package specify appropriate materials to be used in performing the work?      \_\_\_\_\_
- 24. Does the work package specify appropriate welding processes to be used for the work?      \_\_\_\_\_
- 25. Are appropriate non-destructive examinations specified in the work package for welds or repair work?      \_\_\_\_\_
- 26. Are quality assurance hold points or quality control inspection points specified in the work package?      \_\_\_\_\_
- 27. Are post-maintenance or repair pressure tests to verify system integrity specified in the work package?      \_\_\_\_\_

**Activity 4 - Walkdown of Compressed Gas Cylinder Installation**

- 28. Are cylinders stored in racks and with appropriate restraints?      \_\_\_\_\_
- 29. Are oxidizers and flammable gases stored separated from each other?      \_\_\_\_\_
- 30. Are compressed gas cylinders located well away from sources of heat and stored out of the sun?      \_\_\_\_\_
- 31. Are cylinders appropriately labeled to identify contents,      m      a      x

imum allowable working pressure, and date of last  
inspection or test? \_\_\_\_\_

**Surveillance Guideline  
PRESSURE SAFETY**

YES      NO      N/A

32. Are cylinders equipped with appropriate pressure-relief devices? \_\_\_\_\_

OTHER:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

NOTES/COMMENTS:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Surveillance Guideline  
PRESSURE SAFETY**

PERSONNEL CONTACTED: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**IF MORE SPACE IS NEEDED FOR FINDINGS, OBSERVATIONS, AND FOLLOWUP  
ITEMS - USE ADDITIONAL SHEETS**

FINDINGS:

Finding No.: \_\_\_\_\_

Description: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Finding No.: \_\_\_\_\_

Description: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Surveillance Guideline**  
**PRESSURE SAFETY**

Finding No.: \_\_\_\_\_

Description: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**OBSERVATIONS:**

Observation No.: \_\_\_\_\_

Description: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Observation No.: \_\_\_\_\_

Description: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Surveillance Guideline**  
**PRESSURE SAFETY**

Observation No.: \_\_\_\_\_

Description: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**FOLLOWUP ITEMS:**

Followup Item No.: \_\_\_\_\_

Description: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Followup Item No.: \_\_\_\_\_

Description: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Surveillance Guideline**  
**PRESSURE SAFETY**

Followup Item No.: \_\_\_\_\_

Description: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

LABORATORY MANAGEMENT DEBRIEFED AND RESULTS: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Facility Representative or  
Environmental, Safety, and Health Support Specialist