

APPENDIX M

LOCKOUT PROCEDURES

I. Scope and Purpose

This procedure establishes the minimum requirements for the lockout of fixed nuclear gauges when maintenance or servicing is performed on or near gauges such that workers could be exposed to the gauge's primary radiation beam or scattered radiation.

This procedure shall be used to ensure that gauges are properly locked out and/or tagged out before personnel perform any work where operating gauges could cause unnecessary radiation exposures.

As used in this procedure, "lockout/tag-out" refers to methods used to safeguard workers from exposure to radiation emitted by radioactive sources contained in fixed gauges installed on process equipment. Lockout devices provide protection by serving as positive restraints that no one can remove without a key or other unlocking mechanism, or through extraordinary means, such as bolt cutters. Tag-out devices, by contrast, are prominent warning devices used to warn workers not to open a gauge shutter or otherwise expose a gauge source while the service or maintenance activity is being performed. Tag-out devices are easier to remove and, by themselves, provide workers with less protection than do lockout devices.

All workers are required to comply with the restrictions and limitations imposed upon them when conditions require gauge lockout/tag-out.

II. Conditions Requiring Lockout

A gauge source holder will be locked out by locking the on/off or shutter mechanism into a safe position – the "off" or closed position:

- Prior to any work being performed in the immediate vicinity of a gauge radiation beam when a distance or gap exists between a gauge's radioactive source and the radiation detector that permits entry of all or a portion of a person's body into the primary radiation beam;
- During any manipulation of a gauge, including the source holder or the detector, which involves physical movement of the device or separation from a pipe, vessel, etc. including installation, relocation or storage;
- When individuals are working on or adjacent to a gauge during periods of shutdown;
- Whenever an individual enters a vessel in which such a gauge is located; and
- Whenever a vessel with such a gauge is empty and an individual is working around the exterior of the vessel.

III. Lockout/Tag-out Specifications

Tag-out devices will consist of a durable tag and a means of attachment that can be securely fastened to the gauge to indicate that the gauge may not be operated until the tag-out device is removed.

Tag-out devices will be substantial enough to prevent inadvertent or accidental removal, and able to withstand the ambient environment for the maximum period of time that exposure is expected.

Tag-out devices will warn against hazardous conditions if the gauge is operated and must include a legend such as **Do Not Open** or **Do Not Operate**. Tags shall be legible and understandable to all personnel who may be in the area.

Lockout and/or tag-out devices will indicate the identity of the individual applying the device(s). Lockout and/or tag-out devices will be standardized in at least one of the following criteria: color; shape; or size, and the print and format of tag-out devices.

IV. Lockout/Tag-out Sequence

Only the Radiation Safety Officer (RSO) and fixed gauge users designated by the RSO are authorized to lockout/tag-out a gauge. All workers, upon observing a gauge that is locked and/or tagged, shall not attempt to operate the gauge or remove the lock and/or tag.

1. When work is required on or near a gauge, notify all affected personnel that the gauge shutter must be closed, locked-out, and tagged prior to initiating the work.
2. The RSO or another authorized fixed gauge user will lockout/tag-out the gauge in accordance with manufacturer recommendations, using lockout/tag-out devices meeting the specifications described in this procedure.
3. When locking out a gauge, the on/off or shutter mechanism will be tagged to indicate that the gauge is locked out. If a gauge is incapable of being locked out, a tag-out device must still be used.
4. The RSO or fixed gauge users designated by the RSO will verify that the gauge has been effectively locked out. Radiation surveys are required to verify gauge lockout. The surveys may be performed by using a radiation survey meter or, as appropriate, by using the gauge's radiation detector.
5. A warning sign will be posted at each entryway to areas where it is possible to be exposed to the primary radiation beam from the gauge. Such warning signs will include safety instructions (e.g., "Contact the Radiation Safety Officer Before Entering Vessel").