

## Rachel Browder

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**From:** Goodstein, Penny H [penny.goodstein@bp.com]  
**Sent:** Tuesday, December 16, 2008 7:14 PM  
**To:** Rachel Browder  
**Subject:** Reference specific license 50-27789-01, non-routine maintenance  
**Attachments:** 12.16 08-Non Routine Maintenance description.doc

Here is the updated procedures. I made a few changes to the one that Berthold submitted for non-routine maintenance of the devices.

- **Added sections that require use of radiation meter when approaching sealed sources.** The training included it, from what the students said. It wasn't in the procedure, however.
- Changed a few words-
  - **I wasn't sure what** : "in the presence of a person specifically licensed by the NRC or an Agreement State" meant- I wasn't sure that was the RSO. So I changed to: "by personnel trained to perform these duties, under direction of the RSO."
  - **Added:** "If the device has radiation levels at or greater than 5 mRem/hr at 12 inches (1 foot) from the device, do not approach. Contact the RSO and the manufacturer."
  - **Added:** An alternative method of determining if the shutter is operating properly is to contact the control room after closing it, to ensure that the device is no longer emitting gamma radiation. **I understand that this is an acceptable method of testing the shutter, but Berthold didn't add it in. I am using these same instructions in our BP-wide procedure and there are some Ohmart Vega devices that are located very high up on a tank, but have long handles to test the shutter without climbing ladders. If they can contact the control room and find out if the readings have changed, we eliminate the safety hazard of someone climbing high ladders while carrying a radiation meter twice a year. The original Berthold instructions only allow testing the detector to determine if radiation levels decrease when the shutter is closed. This works for the particular Berthold devices but not for our whole field.**

Although I left the wording in, I have a problem with the term "dose rate" that Berthold used throughout the procedure. It is not truly a "dose" rate, just a radiation level or radiation rate. I changed it in our BP procedure. Perhaps I am being finicky but dose, to me, indicates the quantity of radiation **absorbed** per unit time. This is just radiation emitted, not necessarily absorbed by a body.

I am changing our sealed source procedure to better reflect the program. The new procedure will specifically prohibit any activities concerning the devices except shutter and leak tests except as authorized on the license, as you and I discussed. It will also include the instructions Berthold provided for shutter and leak tests, with the changes I indicated above. I want both documents to be consistent. Should I send you a copy of the new procedure when I have completed it? I made the changes you suggested in our first conversation.

The Berthold devices are model LB 7440 D.

Thanks for all your help. Have a GREAT holiday season.

(If you are in Houston, I understand you experienced snow last week. A white Christmas for Texas-what a novelty.)

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## **Guide for Removing and Mounting Devices**

In general keep the time of hand-contact (body contact) with the device as short as possible. This can be achieved by planning the mounting process and having all necessary parts and tools before starting to mount the device.

- a) Maximize the distance between you and the device at all times.
1. You must perform a visual inspection for damage and ensure that the device is in the closed locked position. If damage is evident or suspected, prevent access to the vicinity of the device and contact Berthold Technologies immediately at 1-865-483-1488 and ask for instructions.
2. Use a gamma detector when approaching the device. Levels must read less than 5 mRem/hour at 12 inches from the device before you can proceed.
3. If the device is undamaged, you may proceed to mount or unmount the device to the process locations. The device may only be mounted in a location compatible with the "Conditions of Normal Use" on the registration certificate and as described in the Operator's Manual. Berthold Technologies will have sanctioned the mounting location prior to shipment of the device to your location. The device must remain in the sealed and locked closed condition at all times during the mounting process and may ONLY be unlocked (prior to commissioning) by personnel trained to perform these duties, under direction of the RSO.
4. Normal and general safety precautions must be used when mounting the device, consistent with the size, shape and weight of the device and the process location.
5. The device may not be modified in any way or at any time.
6. You are to ensure that all labels and instructions affixed to the device are not removed and that the labels are maintained in legible condition.
7. You are to ensure that leak tests and shutter tests indicated on the labels are performed at appropriate intervals and you are to maintain records of all tests and service of the device. You are also required to maintain records of receipt and copies of Source certificate, radiation surveys upon installation and serial numbers of the source and shielding.
8. Never abandon the device. It contains radioactive material.

### **Perform Leak Test**

#### **1.0 Preamble**

Radiation safety demands periodic testing of sealed radioactive sources and the shielding containers. This must be done as frequently as dictated by the applicable device registration granted by the Licensing State and the US Nuclear Regulatory Commission. Sealed sources must be leak tested at intervals of not more than 6 months prior to installation in their working shields. The device Registration defines the frequency of leak testing of an installed working shield. Any leakage and/or removable contamination level in excess of 0.005 micro curies must be reported to the distribution Licensing Authority and the appropriate specified actions must be taken.

## **2.0 Scope**

Leak Testing of sealed sources and shielding containers shall be performed according to this procedure. Only persons designated by the RSO as having been trained to perform these tests are allowed to do so. The tests shall be performed using an approved kit and the instructions contained therein.

This procedure is based on the use of an external contractor to supply each leak test kit and to provide the analysis of the leak test sample. The U.S. Nuclear Regulatory Commission must license such a contractor.

### **2.1 Location of Testing and Precautions**

#### **2.1.1 Sealed Sources**

The leak testing of sealed sources may only be performed in a suitably shielded area or at sufficient distance so that the dose rate to the general public at no time exceeds 0.002 rem/hr (2 mRem/hr). If the device has radiation levels at or greater than 5 mRem/hr at 12 inches (1 foot) from the device, do not approach. Contact the RSO and the manufacturer. The leak testing of sealed sources shall be under the direct control of the RSO. The precautions to be followed by the person performing the test are:

- a) The work shall be planned to minimize the exposure time of the person performing the test.
- b) Surgical gloves shall be worn; direct contact with the source should be avoided.
- c) Any items such as gloves, tools or tweezers in direct contact with the source during testing shall be stored in a container under the care of the RSO until the results of the tests are known.

#### **2.1.2 Shielding Containers with Sealed Sources**

Normal safety precautions are required when leak-testing a shielding container.

## **3.0 Leak Testing**

3.1 Read and follow the Leak Testing Instructions provided with the leak-testing kit. Avoid touching the swab before inserting it into its tube and sealing it. Complete the information on the ID sticker and attach to the tube containing the swab. Complete the certificate.

Make a copy of the certificate for the RSO.

Pack the tube in the shipping box and **Survey** the outside of the box using a survey meter capable of detecting 0.5 mrem/hr prior to shipping. If less than 0.5 mrem/hr, ship.

If the dose rate exceeds 0.5 mrem/hr **DO NOT SHIP**. Contact the RSO for further instructions.

## **Survey and Shutter Test**

### **1.0 Preamble**

Considerations of radiation safety require that devices containing radioactive sources are surveyed periodically and that records are maintained which show the results of such surveys. The level and frequency of such surveys are dictated by the Radioactive Material Device License granted by the US Nuclear Regulatory Commission or an Agreement State.

### **2.0 Permissible Levels**

Each type of shielding has a specified radiation level when loaded with the highest activity of source allowable by the device registration. This is stated as a dose rate at 12 inches (30cm) from the surface of the source. Under no circumstances may the dose rate exceed this number.

Frequently, shielding contain sources with activities under the maximum permissible levels.

The device is surveyed prior to shipment and at installation. The records of the surveys are maintained at Berthold Technologies USA and at the user site.

### **3.0 Survey Equipment**

The surveys shall be conducted using instruments capable of detecting a dose rate of better than 0.01 mrem/hr of gamma radiation. The equipment shall be periodically calibrated under the QA procedures of Berthold Technologies USA. Calibration records shall be maintained according to the requirements of ISO 9000.

### **4.0 Documentation**

The device to be surveyed shall be identified by Model, Serial Number, Isotope, Activity, and Source Serial Number. If in service, the previous survey records shall be reviewed and the previous date noted on the new survey record. The new date and survey results will be noted and compared to the previous results.

### **5.0 Survey**

The shutter operation shall be tested for ease of operation at least 5 times and placed in the closed position. The device shall be surveyed at the same distance from the surface as previous surveys but at no further than 12 inches from the surface, with the shutter closed. An alternative method of determining if the shutter is operating properly is to contact the control room after closing it, to ensure that the device is no longer emitting gamma radiation.

### **6.0 Action**

Any survey which indicates that the dose rate specified for the device is being exceeded, must immediately be reported to the Radiation Safety Officer and only persons licensed by the US Nuclear Regulatory Commission or an Agreement State may approach or deal with the device until the problem is resolved.