OHIO INFORMATION NOTICE 2008-02

PERFORMANCE OF REQUIRED SHUTTER CHECKS AND REPORTING OF SHUTTER FAILURES FOR FIXED GAUGES

December 1, 2008

ADDRESSEES: All Ohio Radioactive Material Fixed Gauge Specific and General Licensees

PURPOSE:

The Ohio Department of Health, Bureau of Radiation Protection (BRP) is issuing this Information Notice (IN) to alert fixed gauge specific and general licensees about events involving the failure of shutter closure mechanisms on certain models of fixed gauges and the requirements for reporting these and similar events to the BRP.

It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems and to ensure the reporting of fixed gauge shutter failures and other similar events to BRP. However, the suggestions and other information contained in this IN are not new Ohio requirements; therefore, no specific action or written response is required.

DESCRIPTION OF CIRCUMSTANCES:

Failure of Operating Mechanisms During Shutter Checks

Since 2003, BRP was notified of eleven reports of fixed gauge shutter closure failures occurring during shutter closure checks performed by licensees. The initial reports indicated that the failures of the shutter open/close mechanisms were sudden and unexpected and most resulted in the inability of the licensee to close the shutter on the device. In addition, most of these reports indicated a breakage of some part of the shutter closure mechanism. An investigation of the circumstances surrounding these events indicated several contributing factors:

1. The devices were typically operating in harsh environments with the presence of grit, dust, and other foreign materials which could get into the shutter operating mechanism or otherwise interfere with the movement of the shutter during operation.
2. Previous shutter checks performed prior to the reported failure may have indicated “sticking” or “binding” of the shutter during closure, although the licensee was eventually able to get the shutter closed and reopened.
3. Additional mechanical means, such as a pry-bar or hammer, were sometimes used to attempt to move a stuck shutter operating mechanism.
4. Periodic shutter mechanism checks were not always conducted by licensees as required, were sometimes neglected over a prolonged period of time, and the result was a buildup of foreign material or corrosion within the device and a stuck or frozen shutter which could not be closed.

Reporting of Shutter Check Failures

During the investigation of the reported shutter failures, BRP discovered that more than 60 additional similar events had occurred since 2003 involving fixed gauges in Ohio and other states. These incidents were identified through service and maintenance reports from manufacturers or service providers. BRP had received no notification of these additional shutter failures from affected Ohio licensees, and was unable to find reports in NMED of the events that occurred in other states.

The requirement for Ohio licensees to report a shutter failure event is found in Ohio Administrative Code (OAC) 3701:1-40-20(B)(2). The most common reason cited for not reporting these events to BRP was a misunderstanding on the part of Ohio licensees that the shutter closure mechanism was considered a safety device and failure of the mechanism is subject to the reporting requirements referenced above.

DISCUSSION:

Failure of Operating Mechanisms During Shutter Checks

Fixed gauges containing licensed radioactive materials are used by specific and general licensees in a wide variety of manufacturing and processing operations to measure parameters such as flow rates, thickness, density, or volume. The shutter on a fixed gauge is a safety feature designed to eliminate or significantly reduce the radiation levels at the opening of a fixed gauge when the shutter is in the closed position. Fixed gauges routinely operate in a continuous mode with the shutter open, exposing the radioactive source inside. A shutter closure check is a periodic maintenance activity to be performed by licensees possessing fixed gauges in accordance with the procedures included in the manufacturer's instructions. The requirement for Ohio fixed gauge licensees to conduct these checks is found in OAC 3701:1-46-05(C)(2) for general licensees, and by license condition for specific licensees. Licensees are required to document that the checks have been performed.

Many fixed gauges are installed in harsh operating environments and are subject to the buildup of corrosion and foreign materials. Because these may interfere with the operation of the shutter closure mechanism or movement of the shutter, it is important that licensees ensure that the shutter checks are performed as required. The typical timeframe for conducting a shutter check is every six months.

Shutters should move easily during the cycling of the closure mechanism. Binding or sticking of a shutter during closure indicates a problem with the shutter or closure mechanism and licensees should promptly contact the manufacturer or other licensed service provider for guidance on necessary maintenance or service. If a shutter cannot be closed during a required shutter check, the licensee should immediately contact the manufacturer or other licensed service provider to have the gauge repaired. At no time should the licensee attempt to apply additional force or pressure to the closure mechanism through the use of pry bars, hammers, or other mechanical means. Use of such methods is prohibited and may cause damage to or breakage of the operating handle or the bolts used in assembly of the device.

Licensees should contact the manufacturer or licensed service provider for additional information or to answer questions regarding recommended maintenance and service for their devices.

Reporting of Shutter Failure Mechanisms

The Nuclear Materials Event Database (NMED) is an on-line reporting and search tool for the US Nuclear Regulatory Commission (NRC) and Agreement States to use to report and track incidents involving radioactive materials. These events are typically reported first to the regulatory agency by the licensee in accordance with applicable regulations. Such reports include failure of safety devices, such as the fixed gauge shutters discussed in this IN. One of the benefits of this database is the ability to track common or similar events and determine potential trends.

A search of NMED for the period 2003 through 2008 showed eleven reports of fixed gauge shutter failures in Ohio which had been reported to BRP. During the investigation of these events it was discovered that there had been more than sixty additional similar incidents of shutter failures on fixed gauges possessed by specific and general licensees in Ohio, other Agreement States, or NRC regulated states. This information was obtained in a review of maintenance and service records from fixed gauge manufacturers and service providers. These events apparently were not reported by the licensees to their respective regulatory agency for subsequent inclusion in NMED.

The shutter on a fixed gauge performs a safety function, in that it is designed to eliminate or significantly reduce the radiation level at the opening of a fixed gauge when the shutter is in the closed position. Shutter closure is necessary to allow licensee or service personnel to perform certain operations or maintenance activities on or near the gauge. The inability to close the shutter - due to the presence of corrosion or foreign materials, breakage of the closure mechanism, or some other cause – is considered by BRP to be a failure of equipment to operate as designed and for which there is no redundant equipment to perform the required safety function. As such, an Ohio licensee which possesses a fixed gauge with a shutter that cannot be closed is required to notify BRP within twenty-four hours of any such incident, in accordance with OAC 3701-1-40-20(B)(2). In addition, the licensee is required to follow-up the initial report within thirty days with a written report describing the circumstances which led to the shutter failure and the corrective actions taken. The thirty day follow-up report is required by OAC 3701:1-40-20(C)(2).

Ohio fixed gauge licensees are advised that BRP will place additional emphasis during future inspections on licensee performance of required shutter checks, documentation of the checks, maintenance of records, and reporting of equipment failures such as those described in this IN.

CONTACT:

This IN requires no specific action or written response. If you have any questions about the information in this notice, please contact Stephen James, Supervisor, Industrial Licensing and Inspection, at 614-644-2727 or by e-mail: Stephen.James@odh.ohio.gov.