

**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF FEDERAL AND STATE MATERIALS  
AND ENVIRONMENTAL MANAGEMENT PROGRAMS  
WASHINGTON, DC 20555**

September 18, 2009

NRC INFORMATION NOTICE 2009-18:      PERFORMANCE OF REQUIRED SHUTTER  
CHECKS AND REPORTING OF GAUGE  
SHUTTER FAILURES

**ADDRESSEES**

All U.S. Nuclear Regulatory Commission (NRC) specific and renewal fixed gauge materials licensees. All Agreement State Radiation Control Program Directors and State Liaison Officers.

**PURPOSE**

The NRC is issuing this Information Notice to alert fixed gauge specific and general licensees about the potential for the failure of shutter closure mechanisms on fixed gauges and the requirements for reporting these events to the NRC. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar incidents. Recommendations contained in this Information Notice are not new NRC requirements; therefore, neither specific action nor written response is required. Information herein is based upon an Information Notice issued by the State of Ohio in December 2008. NRC is providing this Information Notice to the Agreement States for their information, and for distribution to their licensees as appropriate.

**DESCRIPTION OF CIRCUMSTANCES**

Since 1990, NRC received numerous 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.

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3. 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.

During the investigation of the reported shutter failures, it was also noted that additional mechanical means, such as a pry-bar or hammer, were sometimes used to attempt to move a stuck shutter operating mechanism. Furthermore, Ohio's investigation revealed that many additional similar events had occurred involving fixed gauges, but were not reported as required. These incidents were identified through service and maintenance reports from manufacturers and service providers.

## **DISCUSSION**

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. Additionally, shutter closure is necessary to allow licensee or service personnel to perform certain operations or maintenance activities on or near the gauge. Therefore, 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 NRC 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 NRC licensee which possesses a fixed gauge with a shutter that cannot be closed is required to notify NRC within twenty-four hours of any such incident, in accordance with 10 CFR 30.50(b)(2). In addition, the licensee is required to follow-up the initial report within 30 days with a written report describing the circumstances which led to the shutter failure and the corrective actions taken. The 30-day follow-up report is required by 10 CFR 30.50(c)(2).

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 NRC fixed gauge licensees to conduct these checks is found in 10 CFR 31.5 (c)(2) for general licensees, and by license condition for specific licensees. Licensees are required to document that the checks have been performed. The typical timeframe for conducting a shutter check is every six months.

Licensees should promptly contact the manufacturer or other licensed service provider for guidance on necessary maintenance or service and whenever the gauge requires repair. 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.

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

## CONTACTS

This Information Notice requires no specific licensee action or response. If you have any questions about the information in this notice, please contact one of the technical contacts below, or the appropriate regional office.

Terry Reis for */RA/*  
Robert J. Lewis, Director  
Division of Materials Safety  
and State Agreements  
Office of Federal and State Materials  
and Environmental Management Programs

Technical Contacts: J. Bruce Carrico, FSME  
(301) 415-7826  
E-mail: [Jbruce.Carrico@nrc.gov](mailto:Jbruce.Carrico@nrc.gov)

Jim Lynch, Region III  
(630) 829-9661  
E-mail: [james.lynch@nrc.gov](mailto:james.lynch@nrc.gov)

Enclosure: List of Recently Issued FSME  
Generic Communications

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OFC	RIII/DNMS	RIII/DNMS	FSME/RMSB	FSME/LB	FSME/RMSB	FSME/MSSA
NAME	JLynch: sxx6	SReynolds	AMcIntosh	JFoster	CEinberg	RLewis
DATE	07/09/09	07/09/09	07/27/09	07/27/09	08/10/09	09/18/09

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List of Recently Issued Office of Federal and State Material and Environmental Management Programs Generic Communications			
Date	GC No.	Subject	Addressees
03/30/09	IN-2009-07	Withholding of Proprietary Information from Public Disclosure	All current holders of and potential applicants for licenses, certificates of compliance, permits, or standard design certifications, as well as any other persons submitting a request that information be withheld from public disclosure under the provisions of Title 10 of the <i>Code of Federal Regulations</i> (10 CFR) Section 2.390, "Public inspections, exemptions, requests for withholding.
07/27/09	IN-2009-12	Exempt Distribution Licensing Requirements For Irradiated Gemstones	All holders of NRC exempt distribution licenses authorized to distribute irradiated gemstones. Organizations associated with importing, distributing or selling irradiated gemstones or jewelry containing irradiated gemstones. All Radiation Control Program Directors and State Liaison Officers.
07/29/09	IN-2003-22, Supplement 1	Heightened Awareness for Patients Containing Detectable Amounts of Radiation from Medical Administrations	All U.S. Nuclear Regulatory Commission (NRC) medical-use licensees and NRC master material licensees; all Agreement State Radiation Control Program Directors and State Liaison Officers.
04/29/09	RIS-2009-05	Uranium Recovery Policy Regarding: (1) The Process for Scheduling Licensing Reviews of Applications for New Uranium Recovery Facilities and (2) The Restoration of Groundwater at Licensed Uranium In-Situ Recovery Facilities	All holders of operating licenses for uranium recovery facilities and all companies who have submitted applications to construct new uranium recovery facilities of all types (conventional mills, heap leach operations, and in-situ recovery facilities) or letters of intent to submit such applications.
05/07/09	RIS-2009-07	Status Update for the Implementation of NRC Regulatory Authority for Certain Naturally Occurring and Accelerator-Produced Radioactive Material	All U.S. Nuclear Regulatory Commission material and fuel cycle licensees. All Radiation Control Program Directors and State Liaison Officers.
07/13/09	RIS-2009-09	Use Of Multiple Dosimetry and Compartment Factors in Determining Effective Dose Equivalent from External Radiation Exposures	All U.S. Nuclear Regulatory Commission licensees, Agreement State Radiation Control Program Directors, and State Liaison Officers.
<p>Note: This list contains the six most recently issued generic communications, issued by the Office of Federal and State Materials and Environmental Management Programs (FSME). A full listing of all generic communications may be viewed at the NRC public website at the following address: <a href="http://www.nrc.gov/reading-rm/doc-collections/gen-comm/index.html">http://www.nrc.gov/reading-rm/doc-collections/gen-comm/index.html</a></p>			