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Date: July 25, 2011
To: Specific and General Fixed Gauges Licensees
From: Minnesota Department of Health, Radioactive Materials Unit
Subject: Fixed Gauge Shutter Failures Due to Operating in Harsh Working Environments

Informational Notice 2011-02

The Minnesota Department of Health is issuing this Information Notice to alert licensees of the potential of failure of shutter closure mechanisms due to fixed gauges operating in harsh working environments. Minnesota Department of Health expects that licensees will review this information and consider actions, as appropriate, to avoid similar incidents. The recommendations contained in this Information Notice are not new Agreement State requirements; therefore, neither specific action nor written response is required.

Summary of the Issue:

The Nuclear Regulatory Commission has recently reported an increase in reports of fixed gauge shutter failures occurring during shutter closure checks performed by licensees since Minnesota Department of Health's Informational Notice 2009-05 "Required Shutter Checks and Reporting of Shutter Failures". As reported in IN 2009-05, failures of the shutter open/close mechanisms were sudden and unexpected. Most failures resulted in the shutters being stuck in the open position. Causes for the stuck shutters operated in harsh working environments could include corrosion, rust or debris in the operating mechanism interfering with the movement of the shutter.

Discussion:

The fixed gauge shutter is a safety feature designed to eliminate or significantly reduce the radiation levels at the opening of a fixed gauge when the shutter is closed. The inability to close the shutter, due to the presence of corrosion or foreign materials or some other cause, is considered a failure of equipment to operate as designed. As such, a Minnesota Department of Health licensee that possesses a fixed gauge with a shutter that cannot be closed is required to notify Minnesota Department of Health within 24 hours of any such incident, in accordance with 4731.3110. In addition within 30 days, the licensee is required to follow-up the initial report with a written report describing the circumstances which lead to the shutter failure and the corrective actions taken.

The concern with the shutters that are stuck in the open position is that when the process or line is stopped workers performing maintenance or other work in the area could receive exposures. For workers considered non-radiation workers, under certain circumstances it would not take long to exceed the applicable regulatory limits for radiation exposure.

Fixed gauges containing licensed radioactive materials are used by both specific and general licensees in a wide variety of environments. Fixed gauges routinely operate in a continuous mode with the shutter open, exposing the radioactive source inside to the environment. The

shutter closure check is a periodic maintenance activity to be performed by licensees possessing fixed gauges in accordance with the manufacturer's procedures. For fixed gauges under general licenses, Minnesota Chapter 4731.3215, Subpart 3, requires shutter mechanisms to be tested for proper operation at least every 6 months. Fixed gauges under specific licenses have a license condition requiring testing at intervals at least every 6 months. Licensees are required to maintain records of the tests. For fixed gauges operating in environments where the gauges may be subject to corrosives, water build-up, or debris, consideration should be given to performing shutter checks more frequently than required by the license condition.

As always, fixed gauge users should consult their operator's manuals for proper maintenance. Gauge manufacturers should be contacted for assistance if the licensee notices corrosion or debris build-up around the shutter mechanism.