UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, D.C. 20555

August 12, 1992

NRC INFORMATION NOTICE 92-58: URANIUM HEXAFLUORIDE CYLINDERS - DEVIATIONS IN COUPLING WELDS

Addressees

All Fuel Cycle Licensees

Purpose

The U.S. Nuclear Regulatory Commission is issuing this information notice to alert addressees to a potential defect in the fabrication of uranium hexafluoride cylinders manufactured by Trinity Industries, Inc. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to address similar problems. However, suggestions contained in this information notice are not NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances

An NRC licensee recently discovered that the valve and plug couplings of model 48Y uranium hexafluoride cylinders manufactured by Trinity Industries, Inc., are attached by welds that are not full penetration welds, as called for in the purchase order specification. Due to thread damage, the licensee was replacing a coupling, and while cutting through the existing weld, noted the lack of full penetration. The licensee had expected a full penetration weld as shown in American National Standard, Packaging of Uranium Hexafluoride for Transport (ANSI N14.1 - 1971, figure 9.) After informing the NRC regional office, the licensee cut the valve and plug coupling welds from three other 48Y cylinders manufactured by Trinity. All six welds were found to be less than full penetration.

The licensee then had a contractor perform ultrasonic tests of the coupling welds on 15 48Y cylinders manufactured by Trinity. The couplings on four of these cylinders were removed to visually examine the welds and verify the results of the ultrasonic testing. The results showed that 11 of the 15 cylinders had coupling welds lacking full penetration, and a twelfth showed a full penetration weld with several small inclusions. The visual examinations of the removed couplings verified the results of the ultrasonic testing.

The licensee possesses cylinders that were manufactured by Trinity from 1972 to 1976, and has not tested cylinders manufactured in any other time frame. Six of the cylinders tested were obtained by the licensee from other NRC licensees or from Department of Energy facilities.

Discussion

The Department of Transportation (DOT) regulations governing the packaging of uranium hexafluoride for transport (10 CFR 173.420) require compliance with either the ANSI N14.1 edition in effect at the time of manufacture or the ASME Code, Section VIII, Division 1, in effect at the time of manufacture, provided the cylinder was manufactured on or before June 30, 1987. The ANSI N14.1 standard suggests, but does not require, full penetration welds for the couplings of 48Y cylinders. The standard also allows the use of any ASME code-approved joint detail providing that the alternate method meets with the purchaser's approval.

The ASME code, Section VIII, Division 1, Subsection B, Part UW-16(g), allows for several methods of connecting fittings with internal threads that do not use full penetration welds. Although full penetration welds are not actually required, Trinity has applied for an exemption from the DOT to allow the use of the cylinders for transport of uranium hexafluoride. However, the licensee's purchase order specified full penetration welds, and Trinity does not appear to be able to explain how the vessels were manufactured "out of spec" or to what standard the welds were made. This calls into question the controls that were present during manufacture of the cylinders and specifically the minimum coupling weld sizes.

Uranium hexafluoride cylinders with less than adequate valve and plug coupling weld sizes, or other weld defects, could result in a release of uranium hexafluoride when the cylinders are placed under pressure or involved in a transportation incident. However, the NRC is not aware of any reported failures or releases associated with these welds.

Licensees may want to identify those uranium hexafluoride cylinders in their inventory that were manufactured by Trinity Industries. Licensees may also want to consider taking steps to determine if these cylinders have valve and plug coupling welds that deviate from their purchase order specifications, and whether the weld sizes are adequate.

The licensee possessing the cylinders with suspect welds has taken the cylinders out of service. The NRC is continuing an investigation of this matter to further assess the scope of the problem, its safety significance, and possible corrective action.

This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact the technical contact listed below or the appropriate regional office.

Richard E. Cunningham, Director
Division of Industrial and
Medical Nuclear Safety
Office of Nuclear Material Safety
and Safeguards

Technical contact: Thomas Wenck, NMSS
(301) 504-2404

Attachments:
1. List of Recently Issued NMSS Information Notices
2. List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED
NMSS INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
92-38	Implementation Date for the Revision to the EPA Manual of Protective Action Guides and Protective Actions for Nuclear Incidents	05/12/92	All holders of OLs or CPs for nuclear power reactors, non-power reactors and materials licensees authorized to possess large quantities of radioactive material.
92-37	Implementation of the Deliberate Misconduct Rule	05/08/92	All Nuclear Regulatory Commission Licensees.
92-34	New Exposure Limits for Airborne Uranium and Thorium	05/06/92	All licensees whose operations can cause airborne concentrations of uranium and thorium.
92-14	Uranium Oxide Fires at Fuel Cycle Facilities	02/21/92	All fuel cycle and uranium fuel research and development licensees.
92-11	Soil and Water Contamination at Fuel Cycle Facilities	02/05/92	All uranium fuel fabrication and conversion facilities.
92-10	Brachytherapy Incidents Involving Iridium-192 Wire Used in Endobronchial Treatments	01/31/92	All Nuclear Regulatory Commission (NRC) licensees authorized to use iridium-192 for brachytherapy; manufacturers and distributors of iridium-192 wire for use in brachytherapy.
92-08	Revised Protective Action Guidance for Nuclear Incidents	01/23/92	All fuel cycle and materials licensees authorized to posses large quantities of radioactive material.

LIST OF RECENTLY ISSUED
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
92-57	Radial Cracking of Shroud Support Access Hole Cover Welds	08/11/92	All holders of OLs or CPs for boiling water reactors (BWRs)
92-56	Counterfeit Valves in the Commercial Grade Supply System	08/06/92	All holders of OLs or CPs for nuclear power reactors.
92-55	Current Fire Endurance Test Results for Thermo-Lag Fire Barrier Material	07/27/92	All holders of OLs or CPs for nuclear power reactors.
92-54	Level Instrumentation Inaccuracies Caused by Rapid Depressurization	07/24/92	All holders of OLs or CPs for nuclear power reactors.
92-53	Potential Failure of Emergency Diesel Generators due to Excessive Rate of Loading	07/29/92	All holders of OLs or CPs for nuclear power reactors.
91-52, Supp. 1	Nonconservative Errors in Overtemperature Delta-Temperature ($OT\Delta T$) Setpoint Caused by Improper Gain Settings	07/16/92	All holders of OLs or CPs for Westinghouse (W)-designed nuclear power reactors.
92-52	Barriers and Seals Between Mild and Harsh Environments	07/15/92	All holders of OLs or CPs for nuclear power reactors.
92-51	Misapplication and Inadequate Testing of Molded-Case Circuit Breakers	07/09/92	All holders of OLs or CPs for nuclear power reactors.
92-50	Cracking of Valves in the Condensate Return Lines of A BWR Emergency Condenser System	07/02/92	All holders of OLs or CPs for BWRs.

OL = Operating License
CP = Construction Permit

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