D. McKnight
O-P1-17

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555-0001

December 28, 1999

NRC INFORMATION NOTICE 99-34: POTENTIAL FIRE HAZARD IN THE USE OF POLYALPHAOLEFIN IN TESTING OF AIR FILTERS

Addressees

All holders of licenses for nuclear reactors and fuel cycle facilities.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to alert addressees to a recent event in which a flame was emitted from a thermal aerosol generator being used for in-place testing of a high-efficiency particulate air (HEPA) filter. The aerosol was generated from a synthetic aliphatic hydrocarbon, polyalphaolefin (PAO). The flame did not result in personnel injury, but it had the potential to create serious consequences. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate. However, suggestions contained in this information notice are not NRC requirements; therefore, no specific action or written response to this notice is required.

Description of Circumstances

On April 28, 1999, at the Department of Energy's West Valley Demonstration Project (WVDP), operations personnel were conducting in-place testing of a high-efficiency particulate air (HEPA) filter on a main filter bank using a thermal aerosol generator (NUCON F-1000-DG Model F) to produce a test aerosol of polyalphaolefin (PAO).

In accordance with West Valley's established procedure, the generator heater temperature had stabilized at 720 °F. The liquid flow valve was placed in the "on" position and adjusted to produce a predetermined flow rate. Then the vapor adjust control valve (carrier air) was opened slowly until a steady supply of aerosol was observed. As the vapor adjust control valve was slowly opened, a 2-to 3-foot-long flame was emitted from the generator discharge port. The attending operator was able to extinguish the flame by immediately closing both the vapor control valve and the liquid flow valve.

The thermal aerosol generator had earlier been used to generate dioctyl phthalate (DOP) test aerosol. Such an aerosol is produced in the generator at a heater block temperature of approximately 720°F; the auto-ignition temperature of DOP is 735°F. The heater block temperature is not adjustable, but the temperature regulator can be replaced with one that will maintain the heater block temperature at about 625°F, which is adequate for producing the PAO aerosol while maintaining a margin below the PAO auto-ignition temperature of 650°F. WVDP had changed the test aerosol to PAO but had not modified the heater controls to produce the lower temperature applicable to PAO.

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The operators actuated the two control valves in an order opposite to the order presented in the vendor's operating manual. The vendor's manual recommends that air flow ("carrier air") be initiated before establishing liquid flow.

Following the event, West Valley suspended all HEPA filter testing on site until corrective actions were completed. The vendor of the thermal aerosol generator simulated the event under the same flow conditions and valve manipulations. The vendor observed flames at the aerosol discharge port in approximately 75 percent of the tests.

West Valley has modified its generator heater block controls and its valve operating procedures appropriately and, in conjunction with the vendor, has modified the carrier air valve so that it remains open a small amount even when in the closed position.

This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact one of the technical contacts listed below, the appropriate regional office, or the appropriate Project Manager of the Office of Nuclear Reactor Regulation (NRR) or of the Office of Nuclear Material Safety and Safeguards (NMSS).

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and Safeguards
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Ledyard B. Marsh, Chief
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2. List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED NMSS INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
99-33	Management of Wastes Contaminated With Radioactive Materials	12/28/99	All medical licensees
99-32	The Effect of the Year 2000 Issues on Medical Licensees	12/17	All NRC medical licensees
99-31	Operational Controls to Guard Against Inadvertent Nuclear Critically	11/17/99	All NRC licensed fuel cycle conversion, enrichment and fabrication facilities
99-30	Failure of Double Contingency Based on Administrative Controls Involving Laboratory Sampling and Spectroscopic Analysis of Wet Uranium Waste	11/8/99	All fuel cycle licensees and certificates performing laboratory analysis to determine uranium content, in support of administrative criticality safety controls
99-29	Authorized Contents of Spent Fuel Casks	10/28/99	All power reactor licensees and spent fuel storage licensees and applicants
99-28	Recall of Star Brand Fire Protection Sprinkler Heads	9/30/99	All holders of licenses for nuclear power, research and test reactors, and fuel cycle facilities
99-27	Malfunction of Source Retraction Mechanism in Cobalt-60 Teletherapy Treatment Units	9/2/99	All medical licensees authorized to conduct teletherapy treatments
99-26	Safety and Economic Consequences of Misleading Marketing Information	8/24/99	All Distributors and/or Manufacturers of Generally Licensed Products
99-24	Broad-Scope Licensees' Responsibilities for Reviewing and Approving Unregistered Sealed Sources and Devices	7/12/99	All medical licensees' of broad-scope and master materials licensees

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99-01, Rev. 1	Degradation of Prestressing Tendon Systems in Prestressed Concrete Constrainments	10/7/99	All holders of operating licensees for nuclear power reactors
99-28	Recall of Star Brand Fire Protection Sprinkler Heads	9/30/99	All holders of licenses for nuclear power, research and test reactors, and fuel cycle facilities
99-27	Malfunction of Source Retraction Mechanism in Cobalt-60 Teletherapy Treatment Units	9/2/99	All medical licensees authorized to conduct teletherapy treatments
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OL = Operating License
CP = Construction Permit

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