SSINS No.: 6835
IN 83-67

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

October 11, 1983

IE INFORMATION NOTICE NO. 83-67: EMERGENCY-USE RESPIRATOR MATERIAL DEFECT CAUSES PRODUCTION OF NOXIOUS GASES

Addressees:

All nuclear power reactor facilities holding an operating license (OL) or construction permit (CP), research and test reactor licensees, fuel cycle licensees, and Priority I material licensees.

Purpose:

This information notice is provided to inform licensees of a potentially serious problem with the Bio-Pak 60-P respirator manufactured by Rexnord Company (NIOSH/MSHA approval number TC 13F-85). This respirator is approved for emergency use by the National Institute for Occupational Safety and Health (NIOSH) and is a closed-circuit, positive-pressure self-contained breathing apparatus (SCBA). The oxygen supply valve seat of the high pressure oxygen bottle (manufactured prior to 1981) tends to shear during valve operation, creating Kel-FTM fibers. During startup for operation, these fibers ignited in the pure oxygen supply stream, releasing combustion products including C02, Co, CF4 and HF. It is expected that licensees will review the information for applicability to their facilities. Further NRC action may result from feedback from the ongoing NIOSH review effort. No written response to this notice is required.

Description of Circumstances:

During a July 1983 training session conducted at Southern California Edison Company's San Onofre Nuclear Generating Station (SONGS), hot gases and noxious odors filled the facepiece of a Bio-Pak 60-P respirator being used as a training aid. SONGS contacted the manufacturer and learned that Rexnord had become aware of the problem sometime during 1981 and had subsequently directed the oxygen-bottle vendor to replace the Kel-F valve seat with another material, Vespel TM. In discussions with the licensee, Rexnord

stated that their previous findings were that the combustion products liberated by the burning Kel-F were in concentrations less than their respective threshold limiting values (TLVs). The previously produced units with the defective Kel-F materials were not recalled, and customer/users and NIOSH were not notified of the problem or the unauthorized change to the respirator.

8308300759

Following the discussion with the manufacturer, the licensee then notified the NRC Region V Office, and asked NIOSH about the approval status of the "modified" Bio-Pak 60-Ps. NIOSH had not approved this modification, thus voiding the respirator's certification. As a consequence of this information, the licensee then petitioned NIOSH to extend the approval of the respirator for 10 days to allow time to take compensatory measures to comply with site emergency planning (EP) and fire protection requirements. On September 19, 1983, NIOSH honored this request for extension; in the interim, SONGS determined that their facility had enough pressure demand SCBA respirators to meet the EP and fire protection requirements.

Although the manufacturer had not specifically requested a NIOSH review and approval for the change, the valve seat material change had been tested when the device was submitted for other unrelated respirator modifications that were implemented after 1981. However, NIOSH has requested that the manufacturer submit documentation of the valve seat change and obtain a written certification from the oxygen-bottle vendor that they will not modify the bottle's form, materials, and function without specific authorization/ notification by the Rexnord Company.

Discussion:

Use of defective equipment produced prior to and during 1981 could pose danger to the user from the toxic materials liberated from ignited fibers of Kel-F. Although the manufacturer claims the concentrations of the combustion products may not exceed the TLVs in most cases, inhalation of the toxic substances may incapacitate the wearer or force the wearer to remove the respirator in otherwise hazardous or life-threatening situations. Additionally, the degradation of the valve seats can make valve operation physically difficult, and can cause leakage of oxygen from the supply

bottle. This unaccountable loss of oxygen may also jeopardize the wearer's safety. Although the device happened to have been retested subsequent to replacement of the valve seat with Vespel, the manufacturer had not obtained the oxygen-bottle vendor's written commitment, documenting the change in the bottle materials and specifications. NIOSH considers such an omission and unapproved change to an apparatus to void the equipment's approval. NRC regulations prohibit the use of emergency respiratory equipment unless specifically certified by NIOSH.

The manufacturer of the Bio-Pak 60-P respirator, (Biomarine Corp. which was later purchased by Rexnord Co.), has made two other material changes to this SCBA without making the required notification to NIOSH. Without formal manufacturer submittals of all changes to equipment, NIOSH is unable to perform its design reviews to ensure that user safety has not been adversely affected (see NIOSH's Stop-Sales and Recall Letter dated April 11, 1980 and IE Information Notice 83-21: Defective Emergency-Use Respirator, dated April 15, 1983).

If you need additional information about these matters, please contact the Regional Administrator of the appropriate NRC Regional Office, or this office.

Edward L. Jordan Director
Division of Emergency Preparedness
and Engineering Response
Office of Inspection and Enforcement

Technical Contacts: J. E. Wigginton, IE
(301) 492-4967

L. Hendricks, RES
(301) 442-7970

Attachment:
List of Recently Issued IE Information Notices