

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

July 17, 1985

IE INFORMATION NOTICE NO. 85-60: DEFECTIVE NEGATIVE-PRESSURE, AIR-PURIFYING,
FULL FACEPIECE RESPIRATORS

Addressees:

All nuclear power reactor facilities holding an operating license (OL) or a construction permit (CP), research and test reactors, fuel facilities, and certain materials licensees.

Purpose:

This notice is provided to inform licensees of a potentially generic problem with Mine Safety Appliances (MSA) Company's negative-pressure, air-purifying, full facepiece respirator, the ULTRA-TWIN model (NIOSH/MSHA approval number TC-21C-155).

It is expected that addressees will review the information provided for applicability to their respiratory programs and consider actions, if appropriate, to preclude similar problems at their facilities. Suggestions contained in this notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

On June 3, 1985, the radiation protection manager of the Westinghouse Nuclear Fuels Plant in Columbia, South Carolina, notified NRC Region II that the licensee's maintenance vendor for respiratory protection devices had discovered defects in MSA ultra-twin masks. Pin holes and small slits, causing penetration of the respirator's facepiece, were found near the metal edge of the clamp holding the speaking diaphragm cover. The attached Department of Energy (DOE) safety alert provides further technical discussion/description of a similar facepiece leakage problem discovered at a DOE facility. This DOE alert was developed with cooperation of MSA, and it provides sound recommendations for problem identification and prevention. The National Institute for Occupational Safety and Health (NIOSH) requested that MSA investigate the respirator problems identified by Westinghouse for possible further generic implications.

Westinghouse and NIOSH report that these physical defects are very difficult to find with a routine visual check of the respirator. Typical facepiece leakage reported by Westinghouse was in the range of 2 to 4 percent with two units

indicating as much as 50 and 90 percent leakage. While routine, pre-use simple field tests (e.g., negative pressure test performed in accordance with NUREG-0041, Sections 8.5.2.3 and 10.2) may not detect facepiece leakage in the 2-to-4-percent range, significant leakages in the 50-to-90-percent range should be readily detected. With proper implementation of the maintenance and testing requirements for respirators [10 CFR 20.103(c)(2)], the NRC staff believes defective respirators with significant leakages would be identified and removed from service. Thus, the staff believes that no significant increases in exposures of workers to airborne radioactive material should have resulted from the reported facepiece penetration problem. Westinghouse reviewed and reevaluated potential personnel exposures of all MSA respirator users and found no overexposures.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the Regional Administrator of the appropriate regional office or this office.



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

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

R. L. Pedersen, IE
(301) 492-9425

Attachments:

1. DOE Safety Alert, DOE/PE-0051/1,
Issue No. 10, September, 1984
2. List of Recently Issued IE Information Notices

SAFETY ALERT



Assistant Secretary, Environmental Protection, Safety & Emergency Preparedness
Office of the Deputy Assistant Secretary for Environment, Safety & Health

DOE/PE-0050/1

Issue No. 10

September 1984

POTENTIAL: SMALL HOLES IN FULL FACE RESPIRATOR

PRODUCT:

Ultra-Twin Respirator
Mine Safety Appliance Company (MSA)



PROBLEM:

Small holes or cuts were found in the black rubber facepiece near the metal edge of the clamp holding the speaking diaphragm cover. Most of the respirators involved were four years old or older and in many cases the holes did not completely penetrate the facepiece. None of the cuts started from the inside of the mask.

The cause is abrasion from twisting the mask which occurs if the cartridges are over-tightened and if the wearer pulls the masks off by pulling the filter cartridges.

RECOMMENDATIONS:

- Inspect for deterioration by bending or flexing the mask inward.
- Install and remove cartridges by holding the cartridge receptacle in one hand and snugging it with the other.



- Maintain the clamp screw in the 5 o'clock position to help prevent abrasion (see photo on left).
- Remove the mask by holding the speaking diaphragm housing and the exhalation valve rather than by holding the filter cartridges.

NOTE: MSA has already increased the thickness of the rubber in problem areas and is currently investigating engineering changes to help eliminate the problem. For more information, contact Richard D. Grunberg, Product Line Manager, MSA, 600 Penn Center Boulevard, Pittsburgh, Pa. 15235.

LIST OF RECENTLY ISSUED
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
85-60	Valve Stem Corrosion Failures	7/17/85	All power reactor facilities holding an OL or CP
85-58	Failure Of A General Electric Type AK-2-25 Reactor Trip Breaker	7/17/85	All power reactor facilities designed by B&W and CE holding an OL or CP
85-57	Lost Iridium-192 Source Resulting In The Death Of Eight Persons In Morocco	7/16/85	All power reactor facilities holding an OL or CP; fuel facilities; and material licensees
85-56	Inadequate Environment Control For Components And Systems In Extended Storage Or Layup	7/15/85	All power reactor facilities holding an OL or CP
85-55	Revised Emergency Exercise Frequency Rule	7/15/85	All power reactor facilities holding an OL or CP
85-54	Teletherapy Unit Malfunction	7/15/85	All NRC licensees authorized to use teletherapy units
85-53	Performance Of NRC-Licensed Individuals While On Duty	7/12/85	All power reactor facilities holding an OL or CP
85-52	Errors In Dose Assessment Computer Codes And Reporting Requirements Under 10 CFR Part 21	7/10/85	All power reactor facilities holding an OL or CP
85-51	Inadvertent Loss Or Improper Actuation Of Safety-Related Equipment	7/10/85	All power reactor facilities holding an OL or CP

OL = Operating License
CP = Construction Permit