

October 25, 1993

PRELIMINARY NOTIFICATION OF EVENT OR UNUSUAL OCCURRENCE

PNO-HQ-93-001

This preliminary notification constitutes EARLY notice of events of POSSIBLE safety or public interest significance. The information is as initially received without verification or evaluation, and is basically all that is known by the Office of Nuclear Material Safety and Safeguards staff on this date.

Facility

Arrow Terminal Industries

Industry, Pennsylvania

Dockets: NA License No: NA

Licensee Emergency Classification

Notification of Unusual Event

Alert

Site Area Emergency

General Emergency

X Not Applicable

SUBJECT: DETECTION OF COBALT-60 IN FERROPHOSPHORUS ALLOY

On October 19, 1993, the Pennsylvania Department of Environmental Resources (DER) notified NRC that radioactive material had been detected in a shipment of ferrophosphorus alloy at a steel facility in Indiana. NUCOR Steel, in Crawfordsville, IN, detected radiation from the alloy on October 14, 1993, which had been sent to NUCOR from Arrow Terminal Industries, Industry, PA (near Pittsburgh). NUCOR returned the shipment to Arrow, which arranged for further tests that confirmed the presence of radioactivity. On October 19, 1993, the Pennsylvania DER performed surveys and collected samples of the ferrophosphorus for analysis. Pennsylvania DER determined that the alloy contains cobalt-60. Pennsylvania DER measured radiation levels from the ferrophosphorus piles of an average 40 - 50 microRoentgen/hour ($\mu\text{R/hr}$) on contact. The pile of material returned from NUCOR has a maximum exposure rate of 100 $\mu\text{R/hr}$ on contact in a few locations. Background radiation levels in the area are approximately 10 $\mu\text{R/hr}$.

Arrow received the ferrophosphorus alloy via barge from New Orleans on May 31, 1993, and placed it into storage pending orders for it. The U.S. broker for the shipment, Minerais US, Inc., in Pittsburgh, PA, is a subsidiary of a Luxembourg firm that imports ferrophosphorus alloy from three locations in Kazakhstan and one in Russia.

Arrow has also shipped ferrophosphorus alloy from this batch, Lot #353, to three other facilities: Great Lakes Steel in Encorse, MI, National Steel in Granite City, IL, and LTV Steel in Cleveland, OH. The radiation levels of the alloy, which came from the same lot, at these other facilities are in the same range as that measured by the Pennsylvania DER. Preliminary information from Region III (Glen Ellyn, IL), based on company surveys of the material at these other sites, confirmed the average exposure readings of 10 - 50 $\mu\text{R/hr}$ (maximum radiation levels at one of the sites ranged from 100 - 200 $\mu\text{R/hr}$ on contact in a few locations). Some of the material at these other sites has already been used.

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The ferrophosphorus alloy is used as a constituent in the manufacturing of steel. The alloy is added during the steel production process with scrap metal and chemicals, so the ferrophosphorus alloy (and any contaminants) are naturally diluted in the production process and comprise a small fraction of the end products.

The Operations Branch (IMOB) of the Division of Industrial and Medical Nuclear Safety has the lead in follow-up to this matter. IMOB is coordinating with Regions I (King of Prussia, PA) and III, the Office of State Programs, the Office of International Programs, the Office of Public Affairs and the Pennsylvania DER. Region I is sending an inspector to the Arrow site to conduct surveys and to the broker, Minerais US, for further follow-up.

Because the levels of radiation from the cobalt-60 in the ferrophosphorus alloy are low and because the ferrophosphorus is diluted in the steel production process, IMOB does not plan to restrict distribution of the ferrophosphorus alloy or prevent its use in steel manufacturing. Measured radiation levels from the alloy are, on average, about half of the radiation levels experienced in other contaminated-steel cases. Based upon the results of the initial surveys and review thus far, the contamination does not pose a threat to public health and safety. This position is consistent with action NRC has taken in other steel-contamination cases.

This information is current as of 14:30 EDT on October 25, 1993.

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