

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGION IV

I. E. Investigation Report No. 79-01

License No. SUA-1139

Subject: Exxon Minerals Company, U.S.A.
Post Office Box 2180
Houston, Texas 77001

Investigation of the reported airborne exposures of two welders
to airborne soluble uranium in Glenrock, Wyoming.

Period of Investigation: March 28, 1979

Investigator: *Lorenzo Wilborn* 4/25/79
Lorenzo Wilborn, Radiation Specialist Date

Reviewed by: *R. J. Swett Jr* 4/25/79
Glen D. Brown, Chief, Fuel Facility and Date
Material Safety Branch

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REASON FOR INVESTIGATION

On March 23, 1979, the licensee notified Region IV by telephone that two welders at a shop in Glenrock, Wyoming, were exposed to airborne concentrations of natural uranium during the period of March 1, 1979, to March 16, 1979. The exposures resulted from sandblasting of a contaminated filter press that had been inadvertently shipped from the Highland Uranium Mill located in Converse County, Wyoming. Region IV initiated an investigation to determine the circumstances surrounding the exposures.

SCOPE OF INVESTIGATION

On March 28, 1979, a Region IV inspector visited the licensee's Highland Uranium Mill and the contractor's welding shop in Glenrock, Wyoming, to (1) inspect the licensee with respect to inadvertently shipping a Shriver Filter Press to the welding shop in Glenrock, (2) interview the two welders with respect to their exposures resulting from sandblasting the press and (3) observe the licensee's remedial action. The investigation involved six (6) hours on site by one inspector.

SUMMARY OF FACTS

A plate and frame filter which had been removed from the licensee's inactive Ray Point, Texas, uranium mill site was purportedly disassembled, cleaned to meet the applicable requirements of the Department of Transportation, reassembled and shipped to the licensee's Highland uranium mill in Converse County, Wyoming, in late June 1978, for reconditioning and use. Licensee representatives from the Texas site intended that further cleaning to remove small quantities of tightly bound rust and uranium concentrate within the interior of the filter press would be done within the Highland facility's restricted area. The licensee representatives at the Highland facility misunderstood these intentions and inadvertently shipped the press to a contractor's shop in Glenrock, Wyoming, on or about March 1, 1979. Two contractor employees worked a total of 32 hours and 13 hours, respectively, sandblasting filter parts in a room 17 feet wide, 34 feet long and 12 feet in height. On the evening of March 21, 1979, the licensee's headquarters health physicist, who had supervised the initial cleaning and shipment of the filter from Ray Point, noted that part of the filter was sitting at a contractor's shop in Glenrock and that some sandblasting had been done on parts of the filter. He immediately notified the Highland Radiation Safety Officer, who in turn, investigated, obtained and analyzed urine samples from the two contractor employees, evaluated the extent of the contamination and decontaminated the contractor's shop.

The incident received some publicity from the local news media.

In the course of the investigation, the NRC inspector did not identify any apparent items of noncompliance with NRC regulations during his discussions and observations.

DETAILS

A. General

On March 28, 1979, a Region IV Radiation Specialist inspected the licensee's inadvertent shipping of a Shriver Filter Press to a contractor's welding shop where two employees of the contractor were exposed to airborne soluble uranium and the licensee's remedial actions.

B. Persons Contacted

The following lists (by title) the individuals contacted during this investigation. Other individuals were contacted during the investigation but the extent of their input to this investigation effort was not significant to the findings reported in this report.

Mine Manager
Environmental Coordinator and Radiation Safety Officer
Metallurgical Laboratory Supervisor (supervised the decontamination efforts)
Owner, Contractor's Welding Shop
Individual "A," Welder, Contractor's Welding Shop.

C. Inspection Findings

The Shriver Filter Press, consisting of the plate and frame pressure filter, was removed from the licensee's inactive Ray Point, Texas, uranium mill site on May 31, 1978. The unit had been used to filter uranium concentrate slurry at the Ray Point facility prior to about April 1973. The unit was disassembled, cleaned to meet applicable requirements of the Department of Transportation, reassembled and shipped by truck to the Highland facility. The truck arrived at the Highland facility on June 7, 1978. The licensee's representative at Ray Point intended that further cleaning to remove small quantities of tightly bound rust and uranium concentrate within the interior of the unit would be done within the Highland facility restricted area.

Purportedly, during the period June 7, 1978, and March 1, 1979, individuals responsible for further cleaning of the unit changed hands several times and during the changes of responsibilities, the intentions of the Ray Point representative were misunderstood or not transmitted and on about March 1, 1979, the unit was shipped to a contractor's welding shop in Glenrock, Wyoming.

During the period March 1 to March 21, 1979, the plates and frames were removed from the main structure and placed inside a room measuring 17 feet wide, 34 feet long and 12 feet in height. Two of the contractor's

employees worked on the filter. The work included sandblasting of individual plates and frames from the unit. These employees are identified in the attachment. Employee (individual) "A" worked a total of 32 hours on the filter parts during the period March 4 through March 8, 1979. Individual "B" worked a total of 13 hours on the filter parts during the period March 15 through March 16, 1979. Of the 44 plates and 44 frames, sandblasting had been completed for all 44 frames and 16 of the plates. The sandblasting was done in the 17 foot by 34 foot by 12 foot room.

On the evening of March 21, 1979, the licensee's Headquarters Health Physicist, who had supervised the initial cleaning and shipment of the filter from Ray Point, noted that part of the filter was sitting at a contractor's shop in Glenrock, and that some sandblasting had been done on parts of the filter. He immediately notified the Highland Radiation Safety Officer (RSO), who, in turn, began an investigation.

The results of the RSO's investigation showed that the filter had been taken by truck to the contractor's shop, the removal of the tightly bound internal rust and uranium concentrate had not been done and sandblasting had been done on the filter parts.

The RSO promptly told the contractor that uranium concentrate probably was adhering to some surfaces of the internal parts of the filter, ordered that no further work be done and advised that persons should not be allowed in the area where the sandblasting had been done on the filter parts.

Radiation measurements by the licensee on March 22, 1979, in the room where the sandblasting was performed showed that gamma radiation levels were in the range of 10 to 20 microroentgens per hour. Alpha radiation measured on the walls ranged up to 39 disintegrations per minute per square centimeter (d/m/Cm²). Alpha radiation from sandblasting sand on the floor ranged from 11 to 16 d/m/Cm². Essentially all of this activity was removable by wiping. Chemical analysis of a sample of used sandblasting sand on the floor of the contractor's workroom showed a uranium content equivalent to about 2% U₃O₈. A soil sample taken immediately outside a large door of the workroom showed uranium content equivalent to about 0.2% U₃O₈.

Urine samples were collected on March 22, 1979, from individuals "A" and "B" and analyzed. The analysis showed 5 micrograms per liter and 29 micrograms per liter, respectively. Individual "B" was resampled on March 24, 1979, and showed 20 micrograms per liter. Based on these data and the assumption that the uptake was acute, the uptake of 24.7 milligram for the highest exposed welder (individual B) is below the level to cause a nephrotoxic reaction based on the recommendation of WASH-1251.

Clean-up of the contractor's shop was completed on about March 24, 1979. Licensee follow-up radiation surveys were performed and established that the affected areas had been decontaminated to meet NRC guidelines.

On March 28, 1979, the NRC inspector made radiation measurements of the contractor's shop and the surrounding area with a Ludlum Measurements, Inc., Model 3, Geiger Counter with a Ludlum Measurement, Inc., Model 43-1, SN P53, thin window probe, calibrated February 22, 1979. The calibration resulted in a conversion of 16.9 counts per minute equals D/M/100 Cm². All radiation levels observed by the inspector were less than or equal to 5 D/M/100 Cm², thus verifying the findings of the licensee evaluations.

The licensee collected 14 barrels total of waste as a result of cleanup and decontamination.

No items of noncompliance were identified during this investigation.

D. Exit Interview

The inspector summarized the inspection findings with mill personnel. The licensee agreed to file a full report in his office for observation by the NRC during the next regularly scheduled inspection. This report will confirm the completion of the licensee's investigation and cleanup as well as identify corrective steps planned to prevent recurrence.