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Office Memorandum • UNITED STATES GOVERNMENT

TO : Sheldon P. Wimpfen, Manager, Grand Junction Operations Office

DATE: April 29, 1953

FROM : W. B. Harris, Chief, Industrial Hygiene Branch, Health and Safety Division, New York Operations Office

SUBJECT: VISIT TO AEC PLANT IN MONTICELLO, UTAH

SYMBOL: HSH:WBH:rle

DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW
SINGLE REVIEW AUTHORIZED
REVIEWER (ADD):
NAME: Dennis W Murphy
DATE: 9/14/95

On April 4, 1953 I visited the Commission-owned uranium concentration plant at Monticello, Utah, which is operated by The Galigher Company. I discussed various health and safety aspects of the plant operation with Mr. Helmer Johnson, the plant manager, and in his company, inspected the facility.

PURPOSE

The purpose of the visit was to determine general health practices carried on by the contractor and to survey in a superficial way the potential health hazards to the plant workers. It was also thought desirable to become familiar with the plant process and the various materials which are involved.

PROCESS

In general the process used at this plant is as follows:

1. Stock-pile material is fed across a coarse grizzly, through a breaker, and is screened to about 10 mesh.

2. The fine ore is weigh fed with a measured amount of salt into an 18-foot diameter oil fired roaster.

3. The calcine from the roaster is quenched with mill solution containing carbonate to a slurry, which is fed to a classifier.

4. A Ball Mill-classifier circuit reduces the material to about 100 mesh and feeds it to a hot water leach-thickener series which separates the sand and mud from the pregnant solutions.

5. The solids are stored.

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REPOSITORY DOE Rec Hold Cent
COLLECTION RG 326
BOX No. 326-78-3 #2
FOLDER MHS 3-7 Col. Plat. Area 1949-53

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6. The pregnant solution is first precipitated with sulfuric acid at about pH 6, bringing down yellow cake, which is removed in a filter press, the filtrate being reprecipitated.

7. The second precipitation at about pH 35 brings down the red cake which is filtered in a tank filter; the filtrate from this going back to repulp.

8. The uranate is fused with reducing materials and solidified in pans from which it is broken and leached with water. The reduction solubilizes the vanadium and permits refiltration for removal of a black cake, permitting recycling of the carried over vanadium values.

9. The black cake is tray-dried and packaged.

10. The red cake, containing the vanadium, is fused, cast, and packaged as flake V_2O_5.

DISCUSSION

1. The operation of moving the ore into the plant and reducing it in size for feeding to the roaster is accompanied by severe dusting. A dust sample taken in the crushing room showed 400 micrograms of uranium per cubic meter.

2. The gaseous effluent from the roaster is accompanied by noticeable chlorine. No sample was taken of this material.

3. There should be no significant airborne contamination until the filtration of the cakes.

4. Handling of the yellow cake could be accompanied by airborne contamination unless rigorous housekeeping is maintained throughout the area.

5. Fumes from the fusion furnace and dust from breaking of the fused salt could be excessive.

6. Handling of the black cake, both before and after drying, could result in high concentrations of airborne dust.

7. The fumes from the fusion furnace and handling of flake vanadium oxide, although probably not toxic, have certainly been shown to be irritating.

8. Mechanical safety practices in the plant appeared, on the basis of this very superficial examination, to be fair.

9. It does not appear that sufficient liquid wastes are removed from the plant to create significant stream pollution. The solid wastes are stored on the site and should present no problem from leaching.

10. No significant radiation was found in any plant location. Housekeeping in the plant area is fair to poor.

11. The medical program includes the following items:

    a. Complete history and physical examinations, including chest x-ray, blood and urine analysis are done on each individual pre-employment and annually. No termination exams are given. All of the examination records are retained in the personnel folder of each individual.

    b. Monticello has a well equipped hospital which at present is operated by registered nurses. The city has only one M.D. at this time. However, the plant management is dissatisfied with him, and as a result temporarily uses physicians at Dove Creek, Utah, and Blanding, Utah, who are on call. These places are between 30 minutes and an hour from Monticello. The city at present is attempting to get full-time medical direction for the hospital.

    c. Medical facilities in the form of emergency and routine primary treatment is available at the local hospital. Major conditions are treated by physicians out of town.

12. The plant employs about 100 persons of whom not more than about 25 would have significant uranium exposures.

CONCLUSIONS

1. Several plant employees are exposed during at least a portion of their working day to dust and fume concentrations exceeding the present accepted maximum permissible level of 50 micrograms of uranium per cubic meter of air. Accompanying the uranium in the ore handling areas is a substantial amount of silica bearing dust. The significance of these exposures can not be determined from the visit of the type which was made, but does point the way toward a more careful examination of individual exposures.

2. Exposure to vanadium dust and fume in the fusion furnace and flake handling operation might possibly be high. This too should be studied.

3. With the exception of a possible exposure to chlorine from the roaster effluent, no other toxic exposure should be expected to exist.

4. No radiation hazard exists in the plant. Housekeeping in the plant area is fair to poor.

5. The handling of liquid, solid, and gaseous wastes from the plant appear to be adequate.

6. With the exception of the lack of an assigned physician, medical practices for the plant personnel are satisfactory. The lack of a physician is not believed to be serious.

7. Samples of urine from 70 employees of this plant were received at about the time of the survey. Analysis of these samples reveal only 4 individuals with higher than normal uranium concentrations in the urine. This would indicate that rate of absorption of uranium from these operations is unusually low. Repeat samples are being requested from those people showing high uranium concentrations to determine the reliability of the results.

CC: R. L. Faulkner, RMO, Washington
G. C. Marvin, RMO, Washington
C. L. Dunham, B&M, Washington
The Galigher Company, Monticello