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June 2, 1949

Evan F. Wilson, Ass't Manager, Raw Materials Operations  
HEALTH PRECAUTIONS AT PORT HOPE REFINERY AND AT BEAR LAKE

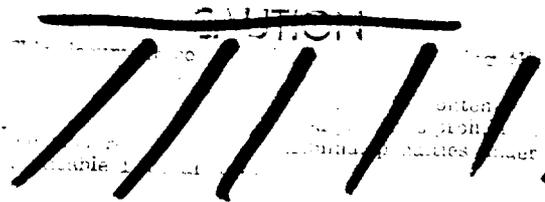
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Discussed health precautions with Mr. A. H. Ross, Manager of the Refinery of Eldorado Mining & Refining, Ltd., on the basis that his experience would be helpful to us in our contemplated pilot plant operations for Raw Materials Operations. Mr. Ross mentioned the following precautionary procedures that are being observed at the Port Hope Refinery.

1. Taking of blood counts of personnel; once per month in radium departments and once per year in departments handling uranium ore concentrates and products. Counts for personnel working in other areas are taken at a frequency corresponding to the presumptive hazard.
2. Breath analyses of personnel are taken at the same frequency as the blood counts for the same plant areas.
3. A complete physical examination including X-rays is made at the time of hiring, at intervals during employment and at severance of employment. This procedure is primarily for legal reasons and to establish whether or not impairment of health in any respect has resulted from employment.
4. Dust samples are analysed for uranium at different areas of the plant at regular intervals.
5. Film badges are examined periodically and where tolerance limits are exceeded the working area is cleaned up before further production is allowable.
6. Ventilation equipment and facilities are installed to bring air changes to within stated limits of tolerance closures, such as around conveyor systems, as well as utilization of exhaust fans to meet these requirements.
7. No smoking is allowed on the plant premises and employees are searched for smoking materials.

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8. Eating is permitted only in luncheon rooms. Drinking facilities are so placed as to minimize contamination.
9. Washing facilities are inspected frequently and personal cleanliness is an absolute requirement.
10. Coveralls which are washed at regular intervals are required in operating areas of the plant. Rubber overshoes are not required.
11. Removal of waste materials is accomplished mechanically wherever possible, such as by screw conveyors, to minimize personnel contamination.
12. All dumps are protected from the public by fencing.
13. Soil drainage from dumps or plants is so planned as to avoid health hazards.
14. The emphasis at Port Hope is placed upon personnel contamination by ingestion; experience having indicated that this constitutes the most frequent possibility of hazard.
15. All reports are made to the Department of Health of the Province of Ontario and precautions are established and monitored by this department.
16. The Medical Division of the Atomic Energy Commission of the United States has cooperated in inspection of the Port Hope Refinery with counter equipment.

At the mine at Bear Lake the precautions are based on the Port Hope experience, but I gathered that only recently has the necessary emphasis been placed on these matters. It has been felt that the hazard there is less critical and consequently systematic precautions have lagged somewhat.

The same precautions of blood counts, breath analysis, physical examination, dust sampling, work clothing and smoking restriction are maintained. Showers on leaving the mine are mandatory under the penalty of discharge. The ventilation problem is the most critical one and only recently an air-exchange system has been installed to reduce the air

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count from dusting. All drilling is wet and the usual mine precautions to aid dust settling are observed. However, the air count does not meet the radon limitation in the air of  $50 \times 10^{-12}$  curies per liter. This information is revealed in confidence to the writer and should be transmitted only on this basis. The breath count of  $5 \times 10^{-12}$  curies per liter is definitely met and the Bear Lake management assumes a satisfactory working condition on this tolerance limit.

The greater part of the operating personnel at Bear Lake are employed only for one year and only ten per cent continue for a second year. The employment continuance beyond the second year is a much smaller percentage and changes in the work assignment are usually effected for such employees. The shorter exposure interval is the main reason why less attention is paid to health precautions at Bear Lake, compared to Port Hope. However, on a long term basis, it is hoped to equal the standards at Port Hope which give a 40-year allowable working life of personnel without exceeding the tolerable exposure.

The writer was invited to inspect the Port Hope refinery at his pleasure.

cc - J. C. Johnson (in dup)

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