RADIATION SAFETY MANUAL

FANSTEEL INC.
METALS DIVISION
Muskogee Plant

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from the containers into a hopper below the ramp level which feeds a belt conveyor. This conveyor is shielded and transfers the material inside the building over a sizing screen and onto a second conveyor which loads the feed hoppers. The hoppers are then raised to the third floor level by use of a mechanical hoist. They are then placed in position on a support stand and secured to a screw feeder which is attached to a covered digestion tank. A valve between the hopper and feeder is opened and the material is fed from the hopper through the screw feeder into the acid contained in the tank. It is possible that some of the raw material could be spilled or dusting occur during the time it is transferred to the Chemical "C" Building until such time the feed hopper is secured to the screw feeder and dissolution tank.

After dissolution, the slurry is discharged into an extraction tank where the soluble fluorides of tantalum and columbium are preferentially extracted by contacting with methyl isobutyl ketone. During the batch extraction, the tantalum and columbium are separated from other constituents of the raw materials. They contain no radioactive materials and are further processed into semifinished and finished tantalum and columbium products.

Upon completion of the above extraction, the residues remaining which consist primarily of insoluble fluorides and in which the source material is included, are discharged from the tank and transferred by pipeline to storage ponds. Water is added to the residues prior to piping in order to facilitate their flow.

Upon reaching the storage ponds, the solids settle out and are retained while the supernatant is removed by decantation and treated with lime.

Alternately, after dissolution, the slurry may be filtered through a filter press or some other mechanical separation device. The liquid is to be the feed stock for the liquid extraction process. The solids from the separation are to be stored in poly-lined drums. The drum containing the residue will be stored on site until authorization is obtained for disposal. The drums will be stored in such a manner as to preclude any unauthorized release of material. Any spillage will be washed into the neutralization system.

An evaluation of the potential radiation hazards associated with each step of the specified operations of Fansteel as described above is as follows:

1. Potential radiation hazards associated with storage of raw materials.

2. Potential radiation hazards associated with pulverizing and handling certain raw materials.

3. Potential radiation hazards associated with chemical extraction of tantalum and columbium minerals from raw materials.

4. Potential radiation hazards associated with handling of residues undergoing settlement.

5. The likelihood of exposure of personnel to substantial amounts of radioactive materials so as to render the exposure hazardous to them is held to a minimum by means of control of the quantity which can reach the air.

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