

Docket File

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Docket No. 40-7580

MEMORANDUM FOR: Bernard Singer, Chief
Radioisotopes Licensing Branch, NRCSS

FROM: L. G. Hulman, Chief
Hydrology-Meteorology Branch, DSE

SUBJECT: HYDROLOGIC ENGINEERING DISCUSSION

PLANT NAME: Faststeel Metals
DOCKET NUMBER: 40-7580
TAC NUMBER: 4655
RESPONSIBLE BRANCH: Radioisotopes Licensing Branch, NRCSS
NRCSS CONTACT: E. Wright

We have reviewed and evaluated the information submitted by the applicant and performed our own independent analysis with regard to the proposed pond. As a result we have been able to satisfactorily resolve all potential problem areas except for the following.

Regulatory Guide 3.11 "Design, Construction, and Inspection of Embankment Retention Systems for Uranium Mills" suggests storage adequate for a flood series consisting of the Probable Maximum Flood (PMF), preceded by 40% of the PMF 3 to 5 days earlier and preceded or followed by the 100-year flood. The above cited criteria would require storage of 73 inches. In addition to the above, Regulatory Guide 3.11 suggests that sufficient freeboard be provided to prevent overtopping by wind generated waves and runup. The coincident wave runup is 7 inches, for a total required freeboard of 80 inches.

The applicant states that when the pond is filled, a minimum of 3 feet of freeboard will be maintained. This clearly will not meet the criteria in Regulatory Guide 3.11. If rainfall in excess of the available freeboard were to occur water would spill over the sides of the pond and would eventually leave the site. The overtopping water could erode the outer embankment of the pond resulting in embankment failure and further release of liquids and bottom material. It is possible for embankment erosion to allow a top layer of semi-solidified bottom slag material to escape during the design rainfall.

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There are several alternatives to resolve the problems cited above.

1. Require the applicant to maintain a freeboard of at least 80 inches at all times. In its present design this will reduce the storage potential of the pond by approximately 330,000 cubic feet, but the pond will be in compliance with Regulatory Guide 3.11.
2. The suggested criteria as given in Regulatory Guide 3.11 is for uranium mills, not for processing plants such as Fansteel. If you can conclude that the potential risk to the public from a release of material from Fansteel's pond is not comparable to that from a uranium mill, you may conclude that the criteria in Regulatory Guide are too stringent. The hydrologic design basis we have used are severe. The design bases proposed by the applicant (36 inch freeboard) will accommodate the 100 year precipitation plus 40% of the Probable Maximum Precipitation coincident with 40 mile per hour wind waves. Alternately, it will accommodate a 6 hour PMP with 40 mile per hour wind generated waves. Both of these event series are rare.
3. Require the applicant to ensure protection of the embankment during a rainfall series in excess of the freeboard. This can be done, for example, by constructing a spillway and overflow channel below the top of the embankment. A riprapped channel down the side of the embankment, properly sized and graded for the maximum flow expected, would have to be built. This option, while resulting in the release of some water from the pond during the severe events described in Regulatory Guide 3.11, would contain most of the precipitation and slag material and thus prevent release of most of the radioactivity in the pond. In addition, any activity in the water released from the pond would be quickly diluted during a flood event severe enough to cause the release.

Subsequent to resolution of this issue our final evaluation report will be prepared.

Original Signed by
Earl H. Markee, Jr.

EM
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