

Pbar beam dump operating note

The beam dump cooling circuit #2 was flushed today. It is thought that the circuit may have been isolated for the entire operating history of the dump which would lead to relatively high levels of radioactivity buildup and hydrogen gas accumulation. In addition, isolation of a water filled piping system could result in undesirable corrosion effects, microbiological activity or some synergistic combination of them.

Water samples were collected for analysis of radioactivity. Hydrogen gas concentrations were monitored during the flushing procedure and concentrations as high as 60% of the lower explosive limit were measured at the opening of the waste container. The job was completed without incident.

Upon completion of the flushing operation, the circuit two cooling lines were reconnected and a series of pump skid operating scenarios were attempted. The following are our conclusions on the current pump skid configuration:.

1. A selector switch on the pump skid electrical panel allows only one pump to be operable at a time.
2. Either pump can supply cooling water to either dump cooling circuit but neither pump cannot supply water to both cooling circuits simultaneously. This is probably due to an interlock trip caused by a low differential pressure across whichever pump is operating.

It is apparent from pump skid operation that the original intention was to provide one cooling circuit with a second circuit provided for redundancy. In order to operate both cooling circuits simultaneously, some reconfiguration of the pump skid electrical will be required. It remains to be determined whether the pump skid has sufficient electrical power to operate both pumps simultaneously.

In the interim, we plan to periodically alternate dump cooling circuits to keep them relatively active. A better long term solution (assuming pump wiring changes are not made in the near term) is to purge/drain/dry one of the circuits to keep the spare circuit in dry storage.

To answer the question about whether both cooling circuits are required or would be sufficient requires a thermal analysis with a CASIM calculation for energy deposition as input. The real question is will the graphite survive Run II operating parameters. This might be a good ANSYS problem for me to "cut teeth on" with help from Ryan and Pat.

I'm posting this message on the pbar target station web page. It might be a good idea to add some new tasks to Pat's target station list.