

April 8, 1979

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The NRR Technical Review Team was briefed by Westinghouse (Clem Eicheldinger, et al.) on 4/7/79 on the preliminary conceptual design of modifications of the TMI-2 decay heat removal system. The modifications are intended to increase the long term reliability of the DHR and to reduce its radiological impact on the auxiliary building and the environment in the event it is eventually needed to cool the TMI-2 core. We understand that the DHR system is intended for use only in the event other preferred modes of long term cooling are not accomplished.

The existing DHR system is a redundant, two train system with a pump and heat exchanger in each train capable of delivering required flow and heat removal under normal core coolability conditions. The conceptual design being developed by Westinghouse for GPU has three principal features, as follows:

- 1) Provide piping and isolation valves from existing DHR inlet piping to a location outside the auxiliary building where a permanent structure could be erected over the next six months to house a new, leaktight, DHR capable of running and cooling the core for several years with the present state of TMI-2 as the system design basis.
- 2) Add a third train to the present DHR system to increase its overall reliability for the short term (6 months) until the long term modification in item 1 is completed.
- 3) Improve the leak tightness and the high radiation area reliability of the equipment in the existing two train DHR system.

The NRC staff fully endorses items 1) and 3) and urges that they be accomplished as soon as possible. In addition, with certain revisions that we believe can reasonably be accomplished in the relatively short time available (two to three weeks is assumed at this juncture), the staff also endorses the second item. Our suggestions for item 2, the third DHR train, are as follows:

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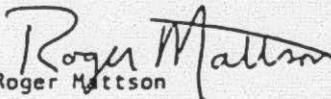
- a) Find and use better (more leaktight) pumps than those currently being offered by BCW (we are aiding in a nation-wide search for better pumps at this writing).
- b) Collect pump and valve leakage for confinement in a volume separate from the auxiliary building waste gas and liquid systems, but with remote control relief capability to those systems.
- c) Use welded connections.
- d) Augment the normal DHR instrumentation to provide long term reactor coolant monitoring, sampling, ~~and~~ chemistry control, etc.
- e) Shield or obtain radiation hardened instrumentation.
- f) Build in preoperational leak detection capability.
- g) Provide boron measurement and control for the reactor coolant system.
- h) Use ASME code requirements where practical.
- i) ~~Provide~~ grade all equipment to extent practical.
- j) Characterize piping and equipment seismic capability and provide OBE seismic capability to extent practical.
- k) Provide administrative or design features to prevent DHR isolation by spurious high pressure or containment isolation signals.
- l) Provide for remote monitoring of pump seals.

Our suggestions for item 3, improvement of the two existing DHR trains, are as follows:

- a) Collect pump and valve leakage for confinement in a volume separate from the auxiliary building waste gas and liquid systems, but with remote control relief capability to these systems.
- b) Weld existing bolted connections, where possible.

- c) Shield or replace existing instrumentation with known radiation ~~sensitivity~~ vulnerability.
- d) Leak test and weld leaks.
- e) Augment instrumentation if not done for the third train.
- f) Same as item k) for third train.

I believe it is imperative that GPU, Westinghouse and the NRC staff meet early tomorrow afternoon to consider these suggestions and to mutually agree upon and freeze the conceptual design of the improved DHR system so that fabrication and installation can proceed as rapidly as possible.


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