**Comments on RAW System Review**
**October 24, 2001**

**Responses by Bruce Baller**
**May 7, 2004**

Water Systems
Presenter: D. Pushka

1. (Reviewer: D. Johnson) I held a meeting with members of the Operations Department to discuss some of the items from the review. We would like to be involved with the naming and addition of items to ACNET. This includes items for alarms too. We also suggest system graphics displays for the water systems. This will help people understand the system and makes it easier to troubleshoot. We are willing to assist in the creation of these displays. The degree of our involvement will depend on manpower and machine operations at the time of the request. We would also like to be involved in any special procedures for leaks and access requirements. I did not see anyone from BD ES&H or the Interlock Group at this meeting. Some of the systems will be connected to the safety system and have the capability of taking out the beam permit. This should be discussed in detail with them.

We agree and are coordinating these aspects with Operations.

2. (Reviewer: D. Plant) Absorber RAW system:

    a. It may be beneficial to install one or more conductivity probes in the full flow part of the system as well as the probes now measuring the ion beds only.

OK

    b. Consider some simple control for the various water modules within the absorber enclosure. It seems that there will be a large difference in heat load across all of the modules. Perhaps just a one piece, no moving parts, limiting orifice or squeezed pipe would suffice to but the flow where is it is needed most.

We decided not to include orifices.

    c. We should make sure that the resin beds we will be using are capable of the radiation levels and, temperatures that we will be exposing them to. Temperature problems have “gotten” us in the past.

OK

d. It may be wise to insert a low cost SS sieve filter downstream of the ion bed in each system. If the sieve was large in size, but small enough to get only resin beads, it probably would not be a high maintenance item.

OK

3. (Reviewer: D. Plant) We may need high level alarm for the expansion tank in the decay pipe system. This would alarm if there is a leak in the heat exchanger.

Done

4. (Reviewer: D. Plant) Think about adding klixons to all pumps. I understand that some of the pump motors are small in size but even small pumps can fail and break their castings. A klixon set at a relative high temperature may not protect the pump from some damage but we should be able to set the trip point to something before a catastrophic failure that could spill water.

Pump operation is monitored by the beam permit system.

5. (Reviewer: R. Rucinski) The cooling water to the absorber pile shielding has multiple parallel paths (and parallel/redundant paths) without an obvious means to equalize or set desired flow rates to the modules. It understood that the amount of energy deposited will vary among the different modules. I further understand that efforts were probably made to design in the correct flow impedances. It is worth designing in a convenient means of adding valves should flow balancing be necessary.

Valves and orifices are being avoided to prevent plugging and leaks.

6. (Reviewer: R. Rucinski) As mentioned by a different reviewer in the meeting, if the purpose of the expansion tank (at H5 on drg. ME-406229, rev.B) in the absorber raw system is to separate out evolved gas, the flow should be in one end of the tank and out the other.

OK

7. (Reviewer: R. Rucinski) Alternatively, an experience I have had with gas in water systems is that the air collects in the top of the full flow filters on the suction side of the pump. That is a bleed off point that we commonly use. You may consider moving the expansion tank at H5 to a large port connection on your filter at E5.

OK

8. (Reviewer: R. Rucinski) The back pressure regulator on the expansion tanks should be replaced by a manual flow control valve. The back pressure regulator and supply regulator will fight each other.

OK

9. (Reviewer: R. Rucinski) You probably should have plans to have a gas analyzer connection to the vent line of your expansion tank to determine the level of H2 in the nitrogen.

OK

10. (Reviewer: R. Rucinski) Your expansion tanks seem to fall outside of the scope of ASME boiler and pressure vessel code, but to save yourself time and energy with the safety committees, you might consider putting a diverter valve and an additional relief valve on such. It will allow you the means to pull off the relief and test it periodically.

OK

11. (Reviewer: R. Rucinski) I think the connections to the ejector pump may be incorrect. The horn drain should go into the throat of the ejector pump. The pump flow goes through the venturi.

OK

Calculation of Induced Activity
Presenter: K. Vaziri

1. (Reviewer: N. Grossman) Along the same lines, the project needs to look at the resultant rates versus time and finalize the amount of shielding needed for the various systems. This should be based on the frequency, time in the location and number of personnel in the vicinity of different parts of the RAW system. In most cases a 1-hour (or even more) cooldown time is probably realistic. The access information from the project needs to be appended to the RAW water document of Kamran's, clarifying our best guess of what shielding is needed and why.

OK