GHN Notes from 4/17/08 visit to ORNL

(Notes on discussions with ORNL team regarding design, interface, and Title III issues. Thanks to ORNL team for good meeting)

WBS 161 LN2 manifolds

• PDR is scheduled for June 3.

• Level 3 "progress milestones" Approx. 4 between now and PDR will be identified to facilitate schedule tracking (Goranson)

• Thermocouples that will be used to monitor LN2 temperature supply and return of each MC LN circuit.

- Are they in the baseline? (Probably not)
- What WBS should be assigned? (Probably WBS 161. Hutch follow up with Phil and Mike Cole)

• Paul needs transient thermal response of the MC coolant after a pulse. (Williamson / Freudenberg) Is this in the plan?

• Need peer review and check of Paul's flow calculations.

- Present design and calculations at cryo. peer review on April 23. Solicit expert feedback.
- Perform independent check of calculations. (Kalish? Hutch follow up)

• Need peer review of the hose layout & integration before PDR. (Hutch follow up with Brown)

• Manage interfaces in advance of the PDR. Hutch to follow up

622- LN2 delivery system- Raftopoulos
623- GN2 supply system? (if it is decided to run the cooldown gas through the manifolds in series.)
13- TF & PF coils- Kalish
1355- Conv. coils Local I&C- Cole
14- Modular coils- thermal analysis - WIlliamson / Freudenberg.
18- Field Period Assembly- Viola- Need constructibility input on what is being designed.

WBS 162 Electrical leads

• PDR is scheduled for August 22.

• Level 3 "progress milestones" Approx. 4 between now and PDR will be identified to facilitate schedule tracking. Finer granularity will be needed in a couple of months. (Goranson)

• Paul will size the leads. Goal is to make them as small as possible, with acceptable temperature rise.

• Field error issues have been addressed with Art Brooks.

• Lead stub drawing release is scheduled for Sept. 30 (6 months ahead of FDR). Does schedule benefit justify the risk? Action: Hutch follow up.

• Structural interfaces between leads and cryostat. Goranson should define structural support requirements and provide input regarding the location and construction of the cryostat floor. This is basically a design integration issue. Goranson, Fogarty.

WBS 12 NB Transition Ducts

• PDR is scheduled for Sept. 30. Project requests acceleration by one month.

• Design is close to PDR level already, based on work completed for VV FDR in 2004. Simmons to assist in locating posted documentation.

• Interfaces need to be reviewed. Hutch arrange peer review to confirm interfaces with neighboring WBS.

WBS 19 Cryostat Integration (Fogarty)

• Guidance was provided (by GHN) to layout a conformal cryostat. Fogarty cautions that this will require complete or partial cryostat disassembly when we need to do maintenance. However, a larger cryostat would severely restrict placement of diagnostics and other equipment around the machine. Also huge gas flow volumes inside the cryostat

WBS 12 VV Title III issues

1. Heating & cooling hoses. There is a concern that if one failed, the escaping 350 C gas could damage a coil, which suggests there should be some sort of a shield. Kevlar was suggested. Also, what are the consequences of losing some number of tubes due to failures?
Status: There already is a FMECA posted, from 2004 design review. Catastropic leak not considered credible on hoses of this design whhich have working load in the thousands of pounds pressure. Leak would be slow and detectible with TCs. Coils would not be damaged as blanklets protect near surfaces and analyses show small exposure permissible. (Kevin F) Kevlar no good at this temperature. Consequences of loss of tube covered in FMECA. Only partially recoverable. There is redundant circuit but loss of whole side would force other heating schemes such as TF heating. Project will review existing FMECA. Hutch to distribute and schedule follow-up discussion.

2. Port thermocouple & heater tape leads. On Day 1, many of the ports will not have the outer (stainless) port extension that protrudes through the cryostat. How do the heater tape and thermocouple leads get out of the cryostat when there is no outer extension there?
Status: WBS 12 (Goranson) is responsible for the leads all the way out to the heater tape control system (also WBS 12). Penetration through cryostat (WBS 17, Raftopoulos) must be defined as an interface. Machine assembly (WBS 7, Perry) is responsible for installation. Needs to be included in assembly sequence plan (Brown) and WBS 7 estimate (Perry) if not already.

3. Port insulation. Viola has expressed a lot of concerns about the material and the dimensions. Some of the ports are misaligned, I gather, and he is worried about differential thermal expansion of the VV and the shell, and the vessel being pushed outward during assembly until the joint is made up. Plus the material is unpleasant to work with.
Status: Issue is being worked by Viola, Goranson, and Brown. Problem is considered manageable but not resolved yet. Owner: Viola

4. NB Transition duct. We need to get all the interfacing WBS managers (esp., vacuum pumping, NBI, and diagnostics) to review the design well before the PDR.
Status: Peer review will be scheduled. See above. Hutch