ALLEN CRABTREEE

Oak Ridge National Laboratory
P.O. Box 2008
Oak Ridge, TN 37831-6466
865-384-0558

December 1, 2007

Geoffrey Greene
Oak Ridge National Laboratory
P.O. Box 2008
Oak Ridge, TN 37831-6356

Dear Geoff,

A Committee composed of Robert Dean, Ian Evans, Phil Ferguson, Max Gildner, Ken Herwig, Hal Lee, George Rennich, Patrick Thorton, Steve Withrow, and Allen Crabtree met in Room C-156 of the CLO on September 25, 2007 at your request to review the Preliminary Design of the NPDGamma Hydrogen Target. The Committee heard presentations from you and Seppo Penttila on the overall design of this instrument and in particular details regarding the liquid hydrogen target. On the basis of this limited review, we hereby make the following findings:

- The overall design is quite mature due to the fact that this instrument was actually previously operated at LANL.
- The test enclosure that houses the hydrogen target has not yet been classified.
- The decision to fabricate an ASME code-stamped cryostat ensures a robust design.
- Some mechanical fittings and couplings could be eliminated or located in ventilated areas.
- Hydrogen cylinder storage cabinet location has not been finalized.
- Hydrogen vent lines are currently routed through normally occupied areas between the sample cave and the roof (in particular, next to the mezzanine walkway).
- Currently the projected dose rate at the sample cave roof exceeds the 0.25 mrem/h limit.
- In some areas, Beamline 13B relies on beamline 14 shielding in order to meet design objectives for radiation exposure during operations.
- The 13A beamline pipe stub extends into the 13B sample cave.
- ODH issues have not been adequately addressed.

Based on these findings, we recommend:

- The test enclosure be classified according to its appropriate hazard category.

The Committee will provide whatever assistance may be needed in this effort, as this important step will very likely impact others in the Target Building. Once the area has been classified, one should identify any exemptions or equivalencies that will need to be submitted to DOE for approval.

- Hydrogen cylinder storage cabinets be located external to the Target Building so as to minimize any impact to the building's combustible loading.

- Hydrogen vent lines be armored where necessary to protect against potential damage.

- Roof shielding be reworked to meet the dose rate goal of 0.25 mrem/h or roof access be restricted during operation.

- Beamline shielding (temporary or otherwise) be coordinated with Beamline 14 to ensure that the design objective of 0.25 mrem/h or less in occupied areas is met during operations.

- Neutronics be consulted regarding the 13A beamline pipe stub that extends into the 13B sample cave.

- Discussions be initiated with Paul Wright regarding your various PPS needs (will ODH monitors be required, etc; if so, will it be considered an credited system).

Sincerely,

Allen Crabtree