Lithium Hydride Absorber Program Update

Alan Bross
LiH Discs

We want to Procure:

- An instrumented LiH disc (30 cm diameter, 4 cm thick) for measuring thermal properties
- Two small (1.25” diameter X 0.25” thick) samples for radiation stability tests
- One or Two LiH discs (50 cm diameter, 6.5 cm thick)
  - For use in MICE Step III.1
MICE Step III.1
Y12 National Security Complex

- Y12 will produce LiH
- Produced by Hot Isostatic Pressing (150 °C, 30,000 psi)
  - Will use existing mold
- Final parts will be
  - Tested for Chemical composition and purity
  - Radio-graphed to ensure no voids
  - Machined to size
  - Dimensional inspection
  - Coated with epoxy completely
Instrumented Disc

12 Blind holes for housing thermo-couples
The Set Up of the Thermal Test

- Foam board & gasket
- 1” copper tube with heaters
- High temp glass ceramic
- High temp low k gasket
- Machined LiH disc
- 12” dia steel ring
- Thermocouples X12
- Flexible cooling tube
- Stainless steel base structure
The Set Up Ready for the Thermal Test
The Hardware Ready to take the Disc
The absorber is fastened by two M8 screws and nuts first.

Now 45 cm Ø
Need final Clamp Design
Need to make new CF parts
Installation in MICE

The absorber is lowered down through the slot of the ss spool piece
Procurement

• The PO has been in place since June (of some year, I forget)
  u However, progress @ Y12 has been delayed
    s They have been offline since December 09 due to an equipment failure.
      - They are sweating! Because of their own program!

• Current Schedule

<table>
<thead>
<tr>
<th>Activity</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mold loading</td>
<td>4/2/2010</td>
</tr>
<tr>
<td>Pressing/annealing</td>
<td>4/15/2010</td>
</tr>
<tr>
<td>Machining</td>
<td>4/26/2010</td>
</tr>
<tr>
<td>Inspection</td>
<td>5/3/2010</td>
</tr>
<tr>
<td>Coating</td>
<td>5/12/2010</td>
</tr>
<tr>
<td>Packing</td>
<td>5/22/2010</td>
</tr>
</tbody>
</table>
I have been informed by Y12 that they are concerned about the contamination level of their starting material.

Heavy metal loading:
- Cu - 140 ppm
- Fe
- +???

Waiting for chemical analysis and then will distribute to Pavel et al.
Add - On

- Due to the delay, I have asked them about the possibilities of making a wedge for step III.x & tacking it on to the existing order
  - Much, Much cheaper than starting a New project
- Preliminary design from Pavel et al.