

# Notes of Hydrogen System Review at CM22

**Time & Date:** 13:30 22<sup>nd</sup> October 2008

**Location:** G06, R66 (RAL)

## **Present**

M Courthold	RAL
M Hills	RAL
A Nichols (part)	RAL
I Mullacrane	DL
P Warburton	DL
J Webb	DL
C White	DL
M Green	LBNL
M Zisman	LBNL

## **1. R&D SYSTEM**

### **1.1 Status**

Progress on the manufacture of the R&D system items at AS Scientific is slow. This should be followed up through contracts as the technical issues that had been holding up manufacture have now been resolved. **(AI#1)**

It remains unclear how to incorporate equipment manufactured outside the EU into an ATEX approved system. This issue is currently preventing the use of US built level sensors and may also cause problems when incorporating the KEK absorber into the R&D system. RAL to investigate how this can be handled whilst staying within the ATEX regulations. **(AI#2)**

A room has been allocated opposite the MLCR for the hydrogen control system. David Pyke (Building Projects Group) is organising the civil work needed to make the room ready – AN will monitor progress on this.

### **1.2 Milestones**

The first version of the control system will be needed at the end of January 2009 to allow preliminary testing of the R&D components.

### **1.3 Open Issues and Safety**

Safety aspects of the system were discussed at length. The following steps outline the proposal for ensuring the system is safe and demonstrating this fact to the relevant bodies:

1. Re-visit the mechanical design of the system and assess the hazards that could result from any inappropriate operation of the valves. This assessment should be made against the criterion that *the system is intrinsically safe if the three elements needed to cause an explosion (H<sub>2</sub>, O<sub>2</sub> and an ignition source) cannot come together under two simultaneous failures or inappropriate actions.*
2. In light of the above, choose an appropriate SIL (Safety Integrity Level) rating for the entire system.
3. Get the SIL assessment reviewed by an external expert (this could be part of the IEC61508 training organised for the beginning of December)
4. Design the control system and select hardware to meet this rating.

5. Subject the entire system to an internal review - the exact format of this (e.g. HAZOP, FMECA) is TBD.
6. Subject the entire system to a laboratory safety review.

It was agreed that steps 1 and 2 should be completed before the IEC61508 training in December.  
**(AI#3)**

A meeting at DL is proposed on November 12<sup>th</sup> for this purpose.

## 2. SYSTEM A AND AFC MODULE

Detailed discussion of this step was not possible due to limited time. However, RAL will need to liaise closely with TESLA to ensure that the R&D system is compatible with the AFC module both in terms of instrumentation and piping connections.

## 3. ACTION ITEM LIST

AI	Description	Comments	Responsible	Due	Status
1	Ask contracts department to assist in expediting the manufacturing work at AS Scientific.	Possible visit to AS with contracts staff.	MH	End Nov '08	
2	Investigate how items manufactured outside the EU can be used in an ATEX approved system.		MC	End Nov '08	
3	Organise meeting to make first pass at determining system SIL rating	Meeting on 12/11/08 proposed at DL	MH	End Nov'08	