

*Low Output Impedance Driver Collaboration MEETING*

Issued by  
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15 February 2007

**Minutes of the meeting held on Wednesday 14 February 2007  
at 15:00 in CR3, R61 and by videolink to ANL (rescheduled from  
13 February 2007 due to adverse weather conditions in Chicago)**

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PRESENT:

|         |         |          |                  |
|---------|---------|----------|------------------|
| Derek   | Bayley  | Gerry    | McMichael        |
| Jeff    | Dooling | Mark     | Middendorf       |
| Ian     | Gardner | Ali      | Nassiri          |
| Doug    | Horan   | Akira    | Takagi           |
| Yoshiro | Irie    | John     | Thomason (Chair) |
| Bob     | Kustom  | Shaoheng | Wang             |

Apologies were received from Andy Seville and Steve Warner

**1. Progress to date**

- i) All modifications to R5.4 complete:
  - Mezzanine floor
  - TxR set platform and bund
  - Vacuum area partitioning moved to provide space for HPD and cavity
  - Control room partitioning
- ii) All major electrical infrastructure for LOI in place.
- iii) Rails, mounts, HPD, cavity and water manifold in place and aligned.
- iv) Stabbings to ISIS tower water system made.
- v) 195 kW chiller for tetrode in place
- vi) All ANL kit connected and tested:
  - TxR set run up to 32 kV
  - Buck regulator run to 5 kV and 0.4 mm wire test performed
  - Grid switcher

[Doug commented that the DTI connectors wouldn't fit, which meant that all 3 old connectors had to be reused. He would pursue this with DTI. Mark mentioned that the output connector from the Buck regulator had yet to be tested under load as an old cable assembly was used for the wire test.]

- vii) X-ray screen around HPD and cavity is 80% complete.
- viii) Testing of 110V/220V equipment has begun.

## 2. Work possible to 23 February 2007

- **Cabling:** If an ISIS crew member can be seconded to LOI work (which will also allow weekend working) it should be possible to complete the cabling to the breakout boxes and HPD by mid next week ( $\approx$  21 February).

- **PLC and controls:** Cables to the PLC have had to be replaced because the cable lengths were too short. This means approximately 50 inputs will need to be re-terminated. With the help of an ISIS crew member this should be possible by the end of Saturday 17 February. The ISIS control system should be installed by the end of Monday 19 February under Andy's supervision.

- **Contract electrical:** Three jobs remain 1) Provision of an earth strip for the HPD and cavity 2) Bonding together of cable trays 3) mains feeds to cavity and liquid resistor chillers. Walker Bros. have been booked for Friday 16 and/or Monday 19 February to complete these tasks. [John forgot to mention during the meeting that Walker Bros. also need to check one phase of the cabling to the 195 kW chiller.]

- **Plumbing:** Plumbing from the ISIS tower water system, 195 kW chiller and two 53 kW chillers is continuing with two men working full time. This may be the most difficult part of the work to complete by 23 February.

- **Equipment movements:** The remaining two 53 kW chillers will be in place by the end of Thursday 15 February.

- **Risk assessments:** These have been reviewed, but need to be approved by the ISIS Radiation Protection Advisor (RPA). John has an appointment to see the RPA at 14:00 on Tuesday 20 February. Dependent upon the outcome of this meeting it may be possible to run the HPD from Wednesday 21 February onwards.

Given the above timescales it may be possible to run RF into the cavity (with no bias current) before Friday 23 February. The completion of the plumbing work is probably the most critical factor in achieving this goal.

## 3. Date of next experimental period at RAL

John identified the period 8 May to 19 June as the most suitable for a period of 2 weeks for the next set of LOI experiments at RAL. This was bounded by a probable trip to JPARC by RAL staff in the first week of May, and PAC'07 in the last week of June.

*Action: John to check availability of ISIS tower water throughout this period.*

Depending on the outcome of work to 23 February it may be necessary to overcome problems with distortion in the driver stage. If so specialist KEK/ANL/RAL staff may be required.

*Action: After 23 February Yoshio to decide on a suitable dates and staff for next experiments at RAL.*

#### **4. Possible dates to run with beam in ISIS synchrotron**

John presented a draft ISIS run cycle schedule for the period July 2007 to December 2008. The earliest opportunity to move LOI equipment into the ISIS synchrotron (assuming successful experiments in R5.4 and subsequent approval of a move into the synchrotron by ISIS management) was identified as Christmas 2007.

*Action: John to check provision of tetrode cooling at SP6 in the synchrotron.*

Thereafter the earliest possible periods when LOI experimental work could be undertaken would be 21 January – 3 February and 14 – 16 March 2008. Ian commented that 4 days may not be enough to do anything useful.

#### **5. Date and location of next LOI Collaboration Meeting**

Three possible dates and locations were considered:

- i) At ANL immediately before PAC'07
- ii) At PAC'07 in Albuquerque
- iii) At ANL immediately after PAC'07

Whichever of the options is chosen it should be ensured that a videolink to KEK or JPARC is available in the event that Yoshiro is unable to travel to the USA.

Because of pressure to get RF systems running before the end of the ISIS shutdown Derek may not be able to attend if option iii) is chosen, and would prefer the earlier part of the week if option ii) is chosen.

*Action: Jeff to check his schedule for these time periods.*

*Action: Gerry to check availability of suitable meeting rooms at PAC'07.*

#### **6. AOB**

Other business was mostly more relevant to 2RF work than LOI, but is summarised below:

i) Bob asked about 1 and 2RF pulse shapes from the last ISIS cycle. Ian had provided Doug with a copy of these on CD which he would take back to ANL. Shaoheng would check their consistency with his modelling work.

ii) Bob asked about the investigation into the fire on 2RF system 6 APS. Derek said that FuG had visited RAL and were still conducting an internal enquiry, although it appeared at this stage that a faulty arm of the secondary rectifier may have been the problem.

iii) Bob asked about when ISIS would be undertaking 2RF machine physics. John showed a preliminary run-up programme showing 2RF work from 5 – 23 September and then optimisation of beam with 2RF 26 – 28 September.

iv) Ali asked about low level RF control of the LOI equipment. This would be done using the ISIS control system to provide gap voltage, grid voltage and bias functions, and the ISIS frequency law generator.

v) Doug and Mark had spoken to Mike Glover and Clive Appelbee about the details of ISIS low level control and future plans for a digital system.

vi) We need further discussion of how to run the LOI system in the synchrotron in conjunction with the existing 2RF system, and also whether the LOI system can perform if operated alone. This discussion could be held at the next LOI Collaboration Meeting (see 5 above).