

## Radiation Monitor Minutes, Meeting 2, 22/10/13

### Present:

### Agenda:

1. Quick review of minutes from last week - Melissa
2. Action Items - Melissa
3. Slides and discussion – Norbert.
4. Discussion of document – Melissa
5. Update on using MAUS to determine beam characteristics and detector simulation - Chris
6. Plan for future. - All
7. Future meetings
8. AOB

### Minutes:

1. All Okay
2. Actions from last week

See below

1. Ask Tim Hayler if we are using the most up to date design of the window and if we can have some pictures of it, perhaps with a couple of figures. – **Norbert**  
**Yes See talk**
2. Get some electronics experts on board, Ian? – **Norbert**  
**Yes See talk**
3. Do we need thicker detectors or only thin ones. – **Melissa and Chris**  
**Carries over**
4. What is our deadline, do we retrofit or are we needed at the start of step IV? Alan Grant – **Norbert**  
The downstream Spectrometer is scheduled to arrive in the UK in the first week of 2014. The estimated completion date for the downstream unit is envisaged to be 13/03/2014. Infeasible. We will have to retrofit. End of 2014/beginning2015 for installation and commissioning to begin.
5. Determine timeline for work based on answer to action item 4. – **Melissa**  
**Carries over**
6. collect information on vacuum feedthroughs, preamps, connectors etc. – **Norbert**  
**See talk**
7. Add item 6 to document – **Melissa**  
**Carries over**
8. Determine field at 18m from shield and outside PRY (Holger W. and Paul S.) – **Melissa**  
**See document 5G field ok**
9. Do the ORTEC pre-amps have an understood sensitivity to magnetic field? What is it? Error? – **Norbert NO – New action determin method to check**
10. Detailed description of Pre-Amplifiers and how they work. – **Melissa**  
**See document**
11. What signals come from PreAmp and amplifier and how could they be read out (options)? – **Melissa**  
**See document**
12. Start thinking about possible interlock triggers, radiation levels monitoring etc. Elaborate on bullet but no need for a real plan yet. – **Melissa**

**Carries over**

13. Collate cabling info from 'backs of envelopes', Send to Melissa – **Norbert**

**Carries over**

14. Add item 13 to doc. – **Melissa****Carries over**

15. Calculate optimum distance of detector from beam centre. – **Chris**

**Carries over Broken down in detail**

16. Is the beam symmetric in all possible cases (including dangerous ones)? – **Chris**

**Carries over Broken down in detail**

17. Determine width of beam and beam cross section. – **Chris**

**Carries over Broken down in detail**

18. Do we need thick detectors? – **Chris / Melissa REPEAT Ignore action**

19. Begin thinking about the possibility of a shield closing radiation monitor, can we use part of the existing system or a logical extension? – **Melissa**

**Carries over**

20. Can we do next meeting at RAL? – **Norbert NO**

End of actions

3. Tim Hayler has taken lots of pics for us so we are now much more confident of the setup.

Now confident that our designs are correct so images on slide 2 and 3 are up to date

If we need to mount detectors on the flange there is still time but they have been built.

We only have 60mm space though (Slide 3)

Slide 6 shows the outcome of a discussion with Shane Taol.

A 142B preamp with 20m cable would give signal output for Signal then between few 10mV to a few 100s mV.

Rad monitor will be used to ensure an extra check for safe beam in step IV as well as for its main purpose for RF (photons, x rays).

4. Discussed and agreed. New sections (5.1- 5.3) added to document to describe pre-amplifiers and amplifiers and signal shapes etc, as per actions from last week. Main points were described and agreed no further action to be taken. New section of document added describing magnetic field around partial return yoke with figures etc. Basically if 12cm thick PRY is used then no horizontal field above 5G will be observed in Mice hall and therefore no major problems expected. Even if 10cm yoke is implemented the field drops to 5G quickly at 1m from PRY and so will not affect amplifier. None the less as no radiation “hardness” figures can be given by ORTEC a testing procedure should be determined for the electronics.

The cable which sits inside the PRY between detector and pre-amp could still be affected by field. This need proper consideration. Shielding?

5. MAUS is very big and there is a lot to learn, but Chris is doing well and coming up to speed fast. He thinks we can get good beam dynamics out of it without too much fuss and pullout the main beam features and what can be seen from detector positions. He feels he will be in a position to show some early calculations at the breakout meeting at the collaboration meeting.

6. The downstream Spectrometer is scheduled to arrive in the UK in the first week of 2014. The estimated completion date for the downstream unit is envisaged to be 13/03/2014. To have our system installed and ready for commissioning at this point is infeasible. We will therefore retrofit as per our discussion last week. Since the main role of the radiation monitor is for step VI and it is

an extra safety feature for Step IV then adding it during the long shut down seems the most sensible. End of 2014/beginning 2015 for installation and commissioning to begin is therefore decided.

We need to test the ability of our electronics to operate in magnetic field. To this end we need a plan for the cable and pre-amp. For the pre-amp a straightforward but and directly test in R9 is suggested and depending on cost is upheld. Cable procedure to be considered at face to face.

7. Collab Meeting breakout face to face. Then 26<sup>th</sup> Nov 4pm.

8. None.

#### **Action Items:**

1. Make webpage for meetings – **Melissa**
2. Book a breakout session during collab meeting – **Melissa**
3. Add new pictures to documentation – **Melissa**
4. Consider Germanium detectors what timing resolution do they have, cost, benefits, lead time and vs Silicon detectors – **Norbert**
5. Are dark current RF measurements highly desirable, why and how - **Jaroslav and Melissa**
6. Determine timeline for work based on answer to action item 5. – **Melissa**
7. Costings on vacuum feedthroughs, preamps, amps, connectors etc. – **Norbert**
8. Add item 7 to document – **Melissa**
9. Testing method for pre-amps in field – **all at face to face**
10. Start thinking about possible interlock triggers, radiation levels monitoring etc. Elaborate on bullet but no need for a real plan yet. – **Melissa**
11. Collate cabling info from 'backs of envelopes' and discuss at face to face – **All**
12. Begin thinking about the possibility of a shield closing radiation monitor, can we use part of the existing system or a logical extension? – **Melissa**
13. Determine sensible analysis/simulation action items. – **Chris, Jaroslav and Melissa**