**Phone Meeting 22/1/2013 – notes**

**1) Quick update on modelling (Paul)**

Paul briefly went through the following

* Modelling of racks
* South side Buildings

 Improve model of RR2

 Add racks to buildings

*Due to discussion (see later on) about the accuracy of the Hall model at this resolution there is some doubt over what can be gained from adding this level of detail.*

 Extend MLCR

* Study of Biot Savart vs airframe model (Holger request)

*Holger has pointed out that there may be much to be learned from running Biot-Savart models before running FEA under certain specific circumstances.*

* Addition of a step VI shield to model.

*I will try and do this based upon current design ideas for completion of the Hall model.*

* Disentangled Rack code for Vicky and Holger – on website. Holger has now checked it and states that the code seems to work ok...

*The code works ok but it is clear that the model is not very accurate. See later discussion. There is much work to be done here in improving the rack model and our understanding of how this works. Mike intends to assist in this area.*

* R9 - Asked Vicky to keep a record of code – could Craig help with web links?

*Craig not present due to illness. I will ask him later*

Very fluid situation at the moment - Where do we progress with the Hall model from here?

*From this discussion it is becoming clear that we may have come to the limit to what can be gained from a ‘Hall Model’.*

Are we interested in having a separate modelling meeting once we get started with sub-modelling? Not formal – just a useful keep in touch given that the modelling effort will be spread about.

*I only asked Mike but he agreed that this could be useful.*

**2) Updates on Modelling (Mike)**

**3) Updates on Modelling (Holger)**

**4) Discrepancies between models (Mike)**

*From this point the discussion about the modelling covered many overlapping elements of sections 1-4 together.*

*I think the main points to take away from this are:*

*Holger’s higher resolution model shows a much lower field in the iron than in our Hall model. There is the distinct possibility that this is due to low mesh resolution in the Hall model. This has clear consequences for the modelling effort on the racks so far.*

*1) The Hall model has insufficient resolution to properly model fine detail.*

*2) The difference in resolution could explain the different results obtained between models produced by Holger, Mike, Vicky and Paul, but this would require much more effort to understand.*

*In the case of the racks on the West Wall there is a question over whether it would be worth the effort to understand the discrepancy as the field levels appear to be so low in that area that even large errors are not significant. However this conclusion clearly does have consequences for areas where the racks may be placed in higher fields.*

*Holger has suggested that in certain specific cases running Biot-Savart models can be a useful indicator of a results viability when considering model output. (The use of the technique needs careful consideration but where appropriate this should give ball park figures that are free from potential FEA errors.)*

*3) There has been some preliminary measurements of the field in R9 including inside the racks. The field inside the compressors is definitely > 0, however the compressor side had been removed from the compressor during these measurements.. No models to date are able to accurately predict what we should see – need more measurements and better models before drawing any conclusions.*

*It is possible that a much better sub-model of a rack is required to fully understand all of these issues.*

**5) Sub-modelling**

What needs sub-modelling – can we produce a more definitive list?

 Rack – better sub-model.

 Tracker – can we define this a bit better?

 Sub-station.

 Would like to discuss shield walls in light of last Wed meeting.

 Other areas?

*Quads? This area needs attention*

 *Is there are dipole moment due to asymmetric steel distribution?*

 *What happens when you turn them on?*

*Transformer in the Trench – protect or move?*

*Probably others but this is a good starting list...*

How would we like to divide this work?

Suggest – Detailed Rack model to Melissa – nice standalone training project and would be a useful addition.

*If Melissa agrees this would be a good starting point. There are indicators that there are still many issues with the racks to be understood.*

 Kiril

*The tracker is high priority and would require some modelling expertise to understand. This was considered to be the best sub-model to ask Kiril to model when we see him next week. (Default position until we speak to him.)*

**6) Meeting at DL – How do we approach?**

This is only a suggestion for discussion and I’m happy for it to be changed!

1) Requirement for modelling.

2) An overview of the Modelling work so far

 Describe the sub-modelling process.

(do we need a machine with OPERA at hand?)

*Mike suggests that he will take his laptop to demonstrate various features – such as sub modelling.*

3) Required Sub modelling (From 5. above)

I think all of these can be done with informal discussion but I might bring a few crib sheets with me to hand around – like list of required sub models etc as this might be useful. Thoughts?

Crib sheet on sub-modelling process?

*Due to time constraints this wasn’t discussed at length. However we did decide that it makes sense for me to go, Craig to represent the tracker, and probably Mike. It is not clear if there is any benefit for Melissa to go on this occasion but we will discuss this with her. (Discussed 23/01/2013 – Melissa feels that she wishes to be there.)*

*I’m not going to produce a formal agenda but I think I will try and direct the meeting on along the above lines with informal discussion.*