Minutes ITS engineering meeting 5 March 2002-03-17

Main Points

Documents have to be prepared on the following points:

- Requirements for the piping outside the ITS
- A requirements document for the design of the cooling system outside the ITS
- A document on the decision for the cooling fluid
- A review of corrosion in other detectors using de-ionized water

Cooling

The ST/CV group will take care of the cooling system outside the ITS
For the next meeting the will prepare comment on the requirements document and give a schedule which gives an estimate of the time needed for the work on the cooling circuit outside the ITS including control.

The sub-detector groups presented a schedule for the work to be done for the completion of the cooling of the sub detectors

The SPD group assumes, based on current information, a two phase cooling based on C_4F_{10} is the most for promising for the SPD. More test will be done before there will be a final decision.

Results of the CFD simulations where presented.
The results show for the SSD a gradient of approximately 3 to 4 degree from the bottom to the top of the ITS.
The results for the SDD show an extreme heating of the 3rd layer, though for the moment it is assumed that the model is not yet good enough to give a good estimate of the thermal behaviour of the SDD.
The model for the SSD was based on a simulation of a single ladder, where the parameters where tuned according to the results of measurements. Similar measurement results are not yet available for the SDD. For the SDD these measurements are under consideration, as there is also the model of a quarter section, which was prepared by the St. Petersburg group

Corrosion

From the corrosion work it was reported that no test could be set up for SS, which would give information on the corrosion problems, otherwise then already available from literature.
It was decided that a test will be set up for Phynox, as little corrosion data is available from literature and the material is the most promising in terms of the tubes. Also a test will be set up testing the behaviour of polyurethane in combination with de-ioninzed water, as it is most likely that polyurethane will be used in the detector.

Space envelopes

A space envelope has been defined for the FMD, a clearance line of 10mm is defined in front of the FMD, given its new configuration.
The clearance between the services support cone and the V0 needs further study.

The clearance given the current proposal for the third cone and the position of the beam pipe support flange needs further study, to verify that there is sufficient space for the services of the SPD between the pixel cone and the third cone.

The given position of the beam pipe support flange requires a modification of the current proposal of the pixel cone.

The current proposal for the design of the third cone will be verified by the vacuum group in terms of the stiffness requirements for the beam pipe support.
There where no specific comments from the FMD regarding the possibilities for mounting of the FMD on the third cone. (The FMD is assumed to be mounted on the third cone).
The proposals for the installation of the third cone seemed to be in line with the requirements of the FMD.

Alignment
Drawings need to be prepared showing the lines of sight of the alignment system, particularly defining the space needed for the electronics boxes, as these are in front of the PMD. Main concern about the current proposals for the alignment system is the produced stray light, which would cause noise on the silicon detectors.
Current proposals assume a monitoring of the ITS from both RB 24 and from the RB26 side. Given the limited space for services at the muon plug, the necessity of monitoring from both sides has to be reconsidered.
The installation group requested the ITS, to use an absolute measuring system for the alignment, so that the measuring system could also give information during installation.

Alignment – re-alignment of the beam pipe.
A wire support system for the beam pipe, with the wires extending beyond the TPC was proposed by the vacuum group.
This proposal is not acceptable for the ITS as it can guaranty the clearance between the beam pipe and the pixels.
The ITS group assumes that for re-alignment of the beam pipe the TPC is moved to meet the requirements for re-alignment.

Services
A proposal for the cable routing in front of the ITS cones was presented, this information will be used for the calculation of the noise influences of the services of the ITS on the FMD.
The proposal assumes that for the cooling services plastic tubes are used, in case the SPD decides to use a two phase cooling system the services will be all metal.

A mock up with all the services will be prepared at CERN based on the current information. The study will first be focused on the services on the cone.

A first definition of the electronics cables and connectors was now available from the sub detector groups. The groups are now requested to make a first designs proposal for their patch panels on the cone.
The groups are also asked to review the their proposals for the cooling services as they take up about half the space needed for services.

Only half the space needed for the current proposal of services is available.

It will be studied whether or not the patch panels for the FMD can be moved on to the third cone. Main problem is that the patch panels on the third might be in the acceptance of the V0 or might produce an unacceptable amount of secondaries.