

# Minutes ITS engineering meeting 1 June 2001

Points from the discussions during the ITS week.

## **Main points**

*The best option for the cooling fluid for the ITS is demineralized water.  
Tests of the corrosion rate demineralized water in the cooling system.  
Information is requested from the pixel group on the services pixels.  
Input is necessary on the control requirements for the cooling circuit  
Dew point of the air between the muon plug and the ITS  
Separate cooling units and pumps for the ITS*

## **Cooling fluid**

In the meeting about the cooling fluid we came to the conclusion that demineralized water is the best option for our cooling system.

There are separate minutes from this meeting explaining the conclusion.

## **Test corrosion rate**

As we were not able to give number to the expected corrosion rate, it was decided that a test has to be set-up.

The aim of the test is to get a number on the corrosion rate.

As manpower is limited we propose to set-up a test that can run fully automatic. The test ends when a leak occurs. Charles Gregory will ask what is available here at CERN, of importance here is the purification equipment for the fluid.

Of major importance is the definition of the process conditions. We have about one year left to simulate the effect of ten year in normal operation.

Proposed is to set-up a test circuit with only the SS tubes and another set-up with both the SS tubes and the plastic connecting tubes.

## **Information on services**

For the services mock-up information is needed from the pixel group about the electronics cables (services).

## **Control requirements cooling circuit**

A first set-up was made for the control requirements, the different sub-detector groups are asked to complete this document. To be discussed during the next ITS engineering meeting. This information is also requested by Charles Gregory, for the cooling meeting.

### **Dew point control**

The current designs propose to lower the dew point inside the ITS, to allow cooler fluid to be supplied to the ITS.

As insulation is not possible for the cooling tubes between the ITS and the Muon plug, there is the potential problem of condensation of the air on the cooling tubes in that region.

This potential problem has to be solved. There are two possibilities:

- Ensuring the dew point of the air is lowered throughout the volume enclosed by the TPC.
- Choosing a cooling fluid temperature which is always safely above the dew point.

### **Cooling system aspects.**

There is the discussion about having separate cooling units of each group of the ITS or being connected to a general cooling system for Alice.

We previously declared that we have a preference for small separate cooling system for the different layers of the ITS. The following points have to be taken into consideration.

- A general cooling machine for Alice could also supply the requested fluid flow. A possible obstacle for using the general cooling system for Alice is when the cooling fluid temperature for the ITS is lower than for other detectors.
- We do not know if our requirements for the purity of the cooling fluid are similar to those for other detectors.
- An important problem is that in case we use the general cooling system for Alice, it becomes impossible to use fluid level integration over time for leak detection.

To be able to defend our requirements to the cooling group we have to define our requirements in terms of fluid purity and temperature requirements.

The leak detection problem is at it self already a strong argument why we cannot be connected to a general cooling system for Alice.

If we put high requirements on the purity of the fluid, this also implies that special precautions have to be taken for the installation of the piping of the cooling circuit.