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**Sent:** Wednesday, March 01, 2006 9:23 AM  
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**Cc:** Michael Poehler  
**Subject:** FW: ILC - quelques questions ...

Dear All,

Please find hereafter a mail from our cooling and ventilation specialists Yannick Body and Joaquin Inigo-Golfin on pending decisions or missing parameters for their sector, following a meeting we held yesterday.

Such list might help to set up an overall list of missing information for CFS design that we could disclose/publish in Bangalore next week.

Best regards  
Jean-Luc

### Beam tunnel

- with a minimum slope of 1% (if less we take the risk of a blocage) determine the location of the intermediate sumps to re-pump water. Keep in mind that if no additionnal pipes are installed, the size of the drain may need to be variable if infiltration occurs along the tunnel. Otherwise said do we keep pumping into the same central drain (only regaining the height after each sump) or do we install discharge pipes along the tunnel (pense au LEP ou il n'y a pas ce problème car la machine a une forte pente) mais de toutes facons on sort l'eau a chaque puits pour eviter un debordement dans le secteur suivant.
- find out if there is any cooling needs in the beam tunnel, even if cryogenic, is there electronics or warm elements to cool down (modules de transfer, amenees de courant, etc.)? If liquid cooling is needed, what circuits (chilled water, mixed water or warm water)? Is there any need for demineralised water? if so, a production station (surface) will be needed.
- If cooling is required in the underground, it will make sense to install at the bottom of the shafts intermediate stations (like our UWs) to avoid having equipment at very high pressure rates (no one has power converters at PN25).
- Try and have the cryogenics build their own compressed air, as well as He or other recovery lines.
- Air dissipations in the beam tunnel ? (again, electronics under the machine elements?)
- Warm elements (magnets or others)? Localized or dispersed? Is there a beam dump, is it radioactive, do we need separate cooling circuits? If so, we also probably need a separated ventilation for this area.

### Service tunnel

- Internal partitions (specific requirement for any particular equipment)? if so ducting will be needed (not shown in their schematic) or booster fans now and then.
- How is the smoke extraction done in this area? I saw no ducts in the sections. Is this so on purpose or just a mistake? This is the accessible area!!!!
- I take it that all internal air loads are to be cooled with the fan-coils. This means that there will be chilled water piping all along to be taken into account in the cross section drawings. Also we may need to add pumping station along the service tunnel. Make sure they are taking into account the dissipation from cables all along.
- Is there liquid cooling needed (for racks for instance)? It should be much cheaper than all-to-the-air-solutions. If so, what temperature regime(s)??
- Same problem for the rising pumps.

### **Experimental areas**

- Even if cryogenic detectors, find out if there are electronics to cool down (temperature regimes, power, type of fluid, etc.). Is this electronic housed in a dedicated room (air conditioning)?
- PC farms : water cooled(hope so), air cooled ?
- Control rooms : air conditioning, ...
- Specific gases (Ar???). Specific extraction needed?

### **Surface buildings** (Partie FM à faire par qui ???)

- Air conditioning surface buildings
- Hot water production and distribution (heating of buildings and air conditioning of buildings, machines, ...)
- Fire-fighting water circuits, hydrants? And linked to it, drinking water supply?
- Toilettes in buildings (and underground by the way)? Sewers?
- Already mentioned above, demineralised water production and distribution?

### **Specific questions linked to other equipments**

- Are there safe rooms to air-condition on the surface or in the underground?
- Water-cooled cables?
- Discharge water. RP controls, hydrocarbons, turbidity?
- Please, make sure they understand that items like sprinklers, etc. are to be treated by other specialists.

Salutations,

YB/JIG