

## Some considerations

RCS design study to be carried out by LIU-PSB, i.e. the same team that did the PSB@2GeV feasibility study and costing

### advantages:

- same set of people, ensures objective approach and comparable results
- avoid two competing teams, which is socially not nice and could potentially falsify the conclusions

### problems:

present Booster Upgrade Working Group is technically oriented, and has only partly the appropriate competences to do a design study. The technical competences are well represented (power, vacuum, ...) and need to be kept alive (and used!)

→ need to add accelerator physics competences, without making the 2 GeV working group obsolete; must be integral part; no parallel working group.

## Some considerations

### Furthermore:

The PSB@2GeV team must be kept alive as

- a) some issues need to be continued although the study is officially on hold (H-injection)
- b) there is a non-negligible chance that the RCS will turn out not to be a viable option, in which case the 2GeV team needs to be revived. That will be difficult if the team is dissolved and will rapidly disperse.

## RCS design unit within the frame of LIU-PSBU

### LIU-PSBU

#### Booster Upgrade Working Group

matrix of technical competences

- magnets
- power
- vacuum
- ...
- ...

#### RCS Design Unit

competences specific to a green-field design study

- beam physics
- design of injection, extraction and transfer lines
- civil engineering
- PS representative

small task force, can be extended as needs arise (suggestions?)

use



## RCS design unit, staffing

- beam physics:
  - ABP group contacted
  - C. Carli & S. Gilardoni already part of LIU-PSBU; natural candidates but remain to be confirmed;
  - other names have been proposed but pending confirmation
  - discussions ongoing in ABP, expect an answer soon
- design of injection, extraction and transfer lines [ATB contacted, B. Goddard has already started to look into it, confirmed]
- civil engineering: group contacted, no reply yet
- LIU\_PS: S. Gilardoni, already part of LIU-PSBU

## Time lines, meeting structure

### milestones and deadlines:

**end June:** short report to be written; not sure if it can be technically as advanced as the report of the 2GeV task force at this point.

must contain

- feasibility yes or no
- first rough cost estimate (+-25%)
- refined technical design
- estimate of performance for LHC beams
- impact on other users

**beginning July 2011** management decision

in case of positive answer:

**December 2011** project proposal including cost estimate and time lines (equivalent of 2GeV document)

### **meeting structure:**

weekly meetings of the RCS task force / time slot to be defined

bi-weekly meetings of the 2 GeV working group (usual time and place)

## First steps

Find out why 40 years ago preference was given to build a 4-ring Booster rather than a RCS; most plausible explanation is that the technology was not available. The present Booster circumference and number of rings is a trade-off. One could have added more rings, four seemed to be a reasonable limit which freezes the PSB circumference to  $\frac{1}{4}$  of the PS. Christian has done some literature studies, and there is only one paper which mentions an RCS as alternative (saying that it would be difficult).

Have a look at previous studies, e.g. the one done in the frame of the PS2 study

Have a closer look at civil engineering issues. This can become rapidly very expensive; study possible locations; complete the picture (e.g. add ISOLDE transfer line).

Have a more detailed look at achievable magnetic field levels.

etc etc