Agenda MPWG   27 February 2004

- **Comments to minutes**
- **General Information**
    - recent presentation of fast failures and what can be done to LTC
    - upcoming visit to DESY / HERA
    - future presentation to AB-CO and possibly to MPWG members
    - SubWG on reliability issues – still to get started

- **Proposal for the distribution of safety critical parameters (energy, intensity...) - P. Nouchi**

- **AOB**
    - **Tolerances on Q4 settings in IR6 - J. Uythoven**

Next meeting: BCT, Reliability of BLMs, Report from DESY, TOTEM (?)

Report from the
Machine Protection Working Group

General issues
Beam Safety Flag

The presentation to the LTC is essentially based on the discussions in the MPWG
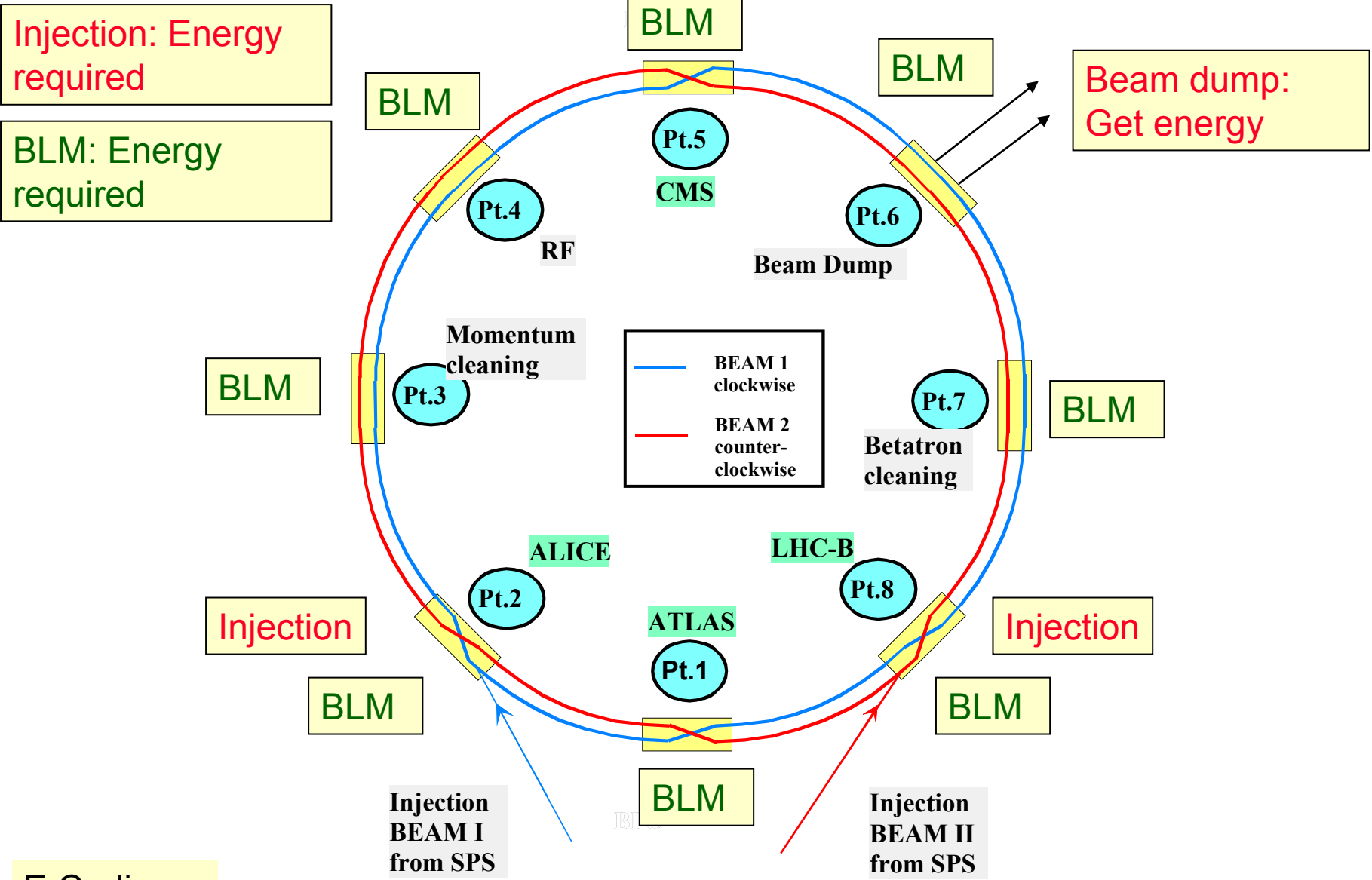
R.Schmidt + J.Wenninger
29 October 2003

Masks and safety beam flags

Some inputs cannot be masked (Powering interlock system for main magnets, vacuum valves, access system…). When the client does not provide green light => NO BEAM

Some inputs can be masked

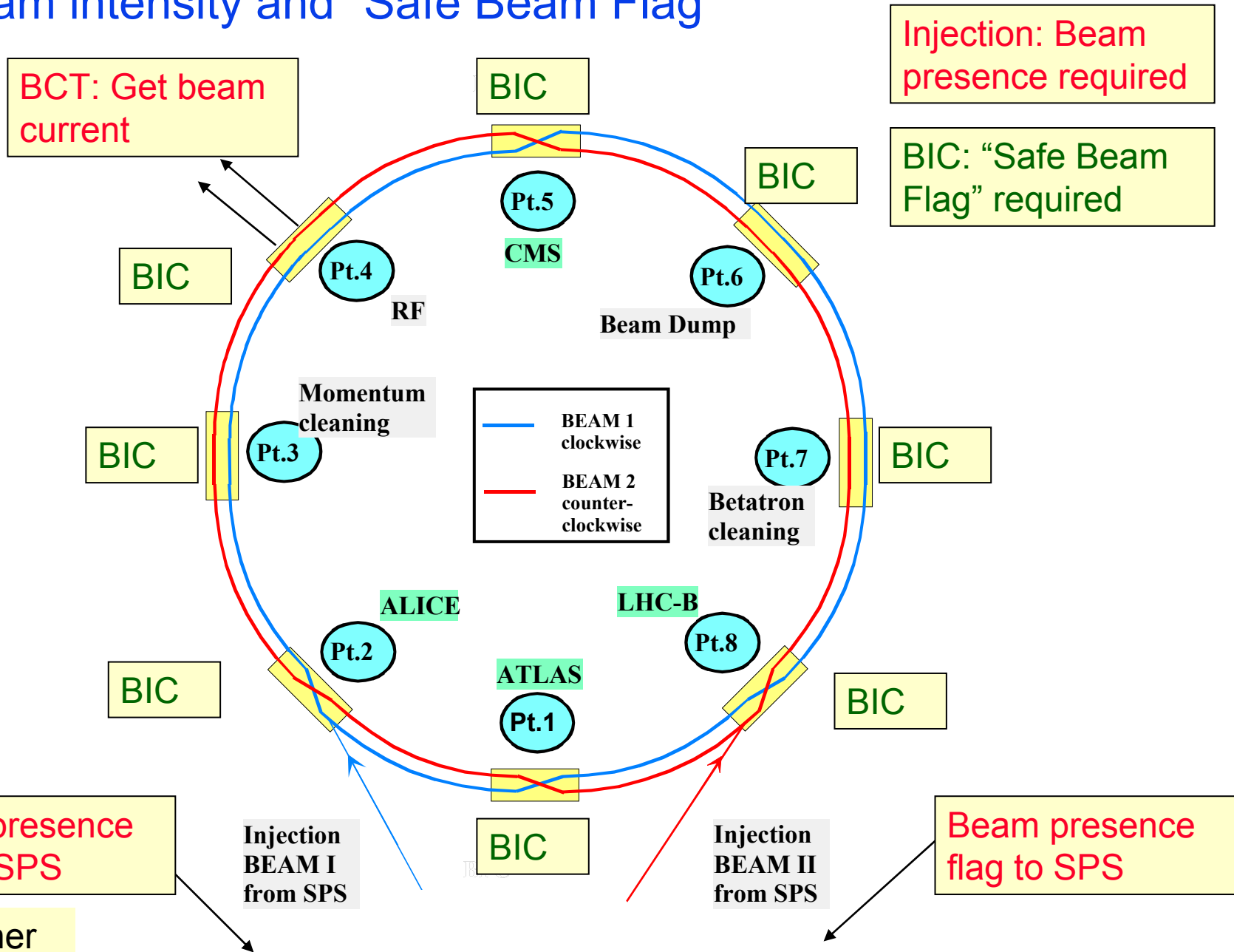- Masking using the **safe beam flag**
  - If **safe beam flag** = YES – then some inputs ae ignored

- **Safe beam flag** depends on beam current and energy
  - for example, if ($I_{beam} \bullet$ **Energy** < threshold) => **Safe beam flag** = 1

Energy tracking for beam dump system – and other

Injection: Energy required

BLM: Energy required

Beam dump: Get energy

BLM

BLM

BLM

BLM

BLM

BLM

BLM

BLM

Pt.5

CMS

Pt.4

RF

Pt.6

Beam Dump

Momentum cleaning

Pt.3

— BEAM 1 clockwise	
— BEAM 2 counter-clockwise	

Pt.7

Betatron cleaning

ALICE

Pt.2

LHC-B

Pt.8

ATLAS

Pt.1

Injection

Injection

Injection BEAM I from SPS

Injection BEAM II from SPS

E.Carlier

Beam intensity and "Safe Beam Flag"

BCT: Get beam current

BIC

Injection: Beam presence required

BIC

BIC: "Safe Beam Flag" required

BIC

Pt.5

CMS

Pt.4

RF

Pt.6

Beam Dump

Momentum cleaning

BEAM 1 clockwise

BEAM 2 counter-clockwise

Pt.3

Pt.7

Betatron cleaning

BIC

BIC

ALICE

LHC-B

Pt.2

Pt.8

ATLAS

BIC

Pt.1

BIC

Beam presence flag to SPS

Injection BEAM I from SPS

BIC

Injection BEAM II from SPS

Beam presence flag to SPS

C.Fischer

Conclusions

- Safe information on beam energy will be provided by AB-BT (ongoing)

- Proposal for a "Safety Beam Flag" for both, LHC and SPS

- Safe information on beam intensity should be provided by AB-BDI (Functional Specification for LHC-BCT being written)

- Distribution of this information (energy and intensity) across the LHC and to the SPS: could be done by the same system – to be provided by whom (AB-CO)?
  - issues of budget and manpower to be clarified

- **LTC - Recommendation to go ahead?**

- Detailed proposal to beworked out and discussed in the MPWG

- Functional Specification to be written (CO – BT – BDI)

LTC recommentations

The LTC encourages the AB-BT group to further investigate the distribution of the beam energy and 'safe beam' information around the machine and considers the definition of a 'safe beam' flag a useful concept. Since the 'safe beam' flag is a general service it could be distributed by the AB-CO group. The LTC encourages the MPWG to go ahead with this proposal for the LHC and the SPS tests in 2004.

ACTION: The MPWG will provide a detailed proposal with definition of 'safe beam' and tolerances for intensity and energy.

Conclusions

- Who needs the safe beam flag at SIL 3 level?

  - Beam Interlock Controller and SPS. Someone else?

- Who needs the LHC energy at SIL 3 level?

  - Beam Loss Monitors and Injection Kickers? Someone else?
  - Hardware interface (VME, ….)? to be clarified

- Who needs the LHC intensity at SIL 3 level? Anyone?

- Who needs the safe beam flag and the energy at lower SIL?

  - Hardware interface (VME, ….)? to be clarified

- One safe beam flag – using both beam currents?

- Redundancy? via Machine Timing? Via Ethernet?

- Definition of threshholds and equations (less urgent)

- Who does what?