

SIS: Summary of changes

Jorg and Laurette

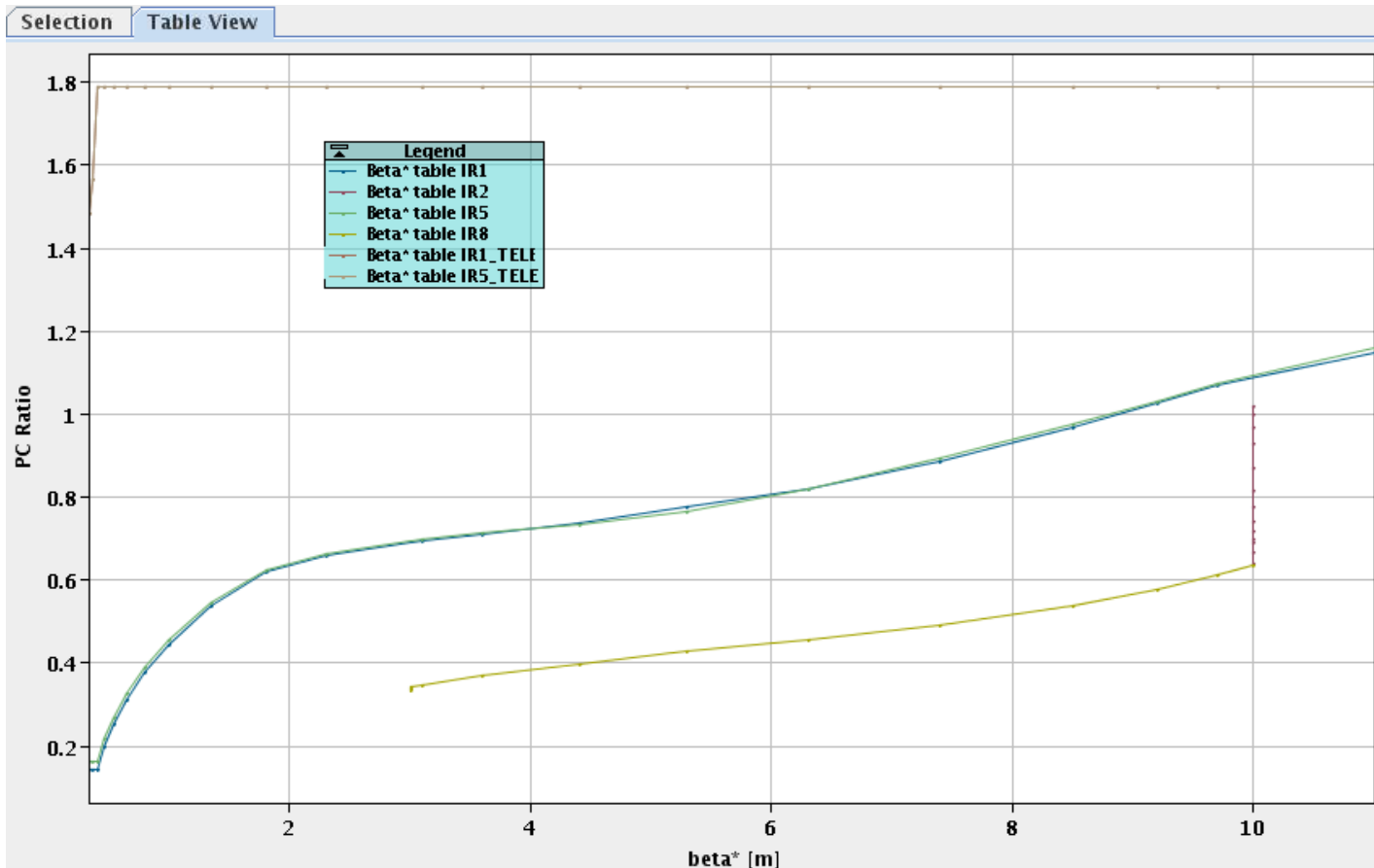


- ❑ The ATS telescopic optics breaks the logic of β^* reconstruction in SIS as the telescope is no longer 'local' to the IP.
- ❑ To include the TELE part of ATS, the logic based on the ratio of 2 local IR PCs has to be expanded to include the IR(s) that generate the telescope.
 - *For IR1, both IR2 and IR8 are involved in the telescope, but as they have their own squeeze on top, they cannot be used easily.*
 - The IR1 β^* in TELE mode is therefore using IR4 (!) which in fact corresponds to the IR5 β^* . This works as long as IR1 and IR5 are perfectly equal (in β^*).
- ❑ Since so far it was not planned to use the TELE squeeze at startup, there was NO urgency to test the new feature. But we may use the TELE squeeze immediately (blame on CT-PPS) → yet untested logic must be made operational rapidly.

- ❑ Test can be done as soon as the PCs are available (even in simulation)

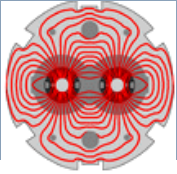


- PC ratio tables including new tables for the TELE squeeze.
 - *In practice the table for IR1(5) + TELE-IR1(5) are summed up, and the same is done for the PC ratios.*





- ❑ Ring permit active in 2016:
 - *Simple check that values of gauge VGMA.6894700.B and VGMA.6294700.R are in range 1.1-1.35 bar*
 - *Proven to be reliable last year*
- ❑ New after YETS:
 - *New piezo gauge, old gauge changed names*
 - *Parameters OK, just need to agree on the logic*
- ❑ Recommendation from MPP:
 - *Beam dump if values < 1 bar (1 min temporization for bad readings + communication lost)*
 - *Combination of the 2 gauges or only new one?*
 - *Tempo is OK for loss of communication, not for bad readings*
 - more complex code needed
- ❑ For injection inhibit:
 - *Either of the 2 readings is < 1.025 bar OR readings diverge by ≥ 0.1 bar*
 - Again more complex logic to be implemented and tested



LHC SIS GUI

File Operation Unlatch all channels Help

RBA: lhcop

SIS GUI \ JAPC Monitoring GUI \

Permits Tree

- SPS_BEAM_INTERMEDIATE_INT
 - IQC_PERMIT_B2
 - [AND] MKI8_STATUS
 - [OR] ORBIT_INJECTION_B2
 - [OR] ORBIT_INJREGION_B2
 - [AND] PC-CURRENTS-B2
 - [AND] PC-STATES_B2
 - REQUEST_R2
 - [AND] RF_INJ_B2
 - [AND] TDI_GAP_B2
 - [AND] XPOC_B2
 - [AND] INJ_PERMIT
 - [AND] IPQ_POWERING_PERMITS
 - [AND] POWERING_FPA_PERMITS
 - [AND] POWERING_PERMITS
 - [AND] RCBX_PERMITS
 - [AND] RING_B1_PERMIT
 - [OR] RING_B1_SBF_MASKED
 - BEAM1_SAFE
 - [AND] RING_B1_SBF_CONDITIONED
 - RING_PHYS_B1
 - [OR] ORBIT_PHYS_B1
 - [OR] SBF_RESTRICTED_B1
 - TDE_PRESSURE_B1_OK
 - [AND] RING_B2_PERMIT
 - [OR] RING_B2_SBF_MASKED
 - [AND] RING_PHYS_B2
 - [OR] SBF_RESTRICTED_B2
 - TDE_PRESSURE_B2_OK
 - [AND] RING_PERMIT
 - [AND] RP_PERMITS

Properties \ Analysis \ Operations \

Latching protection: DEFAULT

Mask effect: (UNDEFINED)

Tags:

Counters:

Slot	Max Value Policy	PPM?
DEFAULT	1	RESET true

Exporters:

Condition:

Id:

Name:

Description:

Type: SIMPLE

Init value: true

Cycle aware: false

Acq window: 60000

Parameter id: TDE_PRESSURE_B2_ACQ

Field: value

Index: -1

Operator: in_range

Value: [1100;1350]

No value policy: TRUE

Class/Bean id:

Class config:

Factory class:

Script lang: Groovy

Script:

Console \ Running tasks \ Combined \

09:35:48 - LastPerformed login is: LOCATION
09:35:48 - Token is still valid (lifetime > 1 hour)
09:40:48 - Validating existing token...

09:19:52 - Connection with the Core reestablished

Recommendation for 2017 operation

- As before: XPOC injection inhibit
 - Update to new operational range
XPOC limit at 1.025 bar instead of previous 1.1 bar
 - Change to newly installed gauge at the dump volume
- SIS interlock:
 - New: Injection inhibit if either of the two pressure readings is < 1.025 bar OR if pressure readings diverge by ≥ 0.1 bar (temporization by 1 min, allowing for bad readings + communication loss)
 - As before: Beam dump if pressure reading on piezo gauge on dump volume is < 1 bar (1min temporization for bad readings + communication loss)
- New: Hardware channel from newly installed piezo gauge connected for additional diagnostic (using 2 controllers and locally programmable thresholds)
 - Warning/Alarm if pressure reading on piezo gauge on dump volume is < 1 bar
 - Following outcome of studies this channel might be consolidated for appropriate reliability (detailed via ECR) to become an active interlock channel (beam inhibit or dump)



- ❑ SIS surveillance of the redundancy of LBDS FEC power supply:
 - *Pending request since last year*
 - *Deployed as injection inhibit*
 - *Still missing the FESA class for the MKISS*
- ❑ (+ sequencer check during ramp down to anticipate intervention)
- ❑ To be tested during machine check-out: on site switch off



- ❑ The introduction of the variable AGK has impact on the SIS interlock that blocks injection when the requested bucket is too high (to avoid sending beam onto the TDI [if AGK works]).
 - *Last authorized injection bucket was Hardcoded*
 - *The logic must now include a parameter that defines the maximum length of a train from the SPS: no bunches + N x SPS MKP gap.*
 - *Implementation work has not yet started.*
- ❑ SIS should also read back the length of the AGK, the length of the MKI pulse (setting) and perform a consistency check with the train length quoted above.
 - *Implementation work has not yet started.*
- ❑ Validation with pilot beam (2 shifts)

=> Details of implementation still under discussion



- ❑ Change of BSRT alignment system:
 - *Corresponding BSRT_ALIGN_MIRROR SIS injection inhibit to be updated with the new devices*
- ❑ BPM collimator interlocks to be made active when new settings defined
 - *May also add the BPM status*