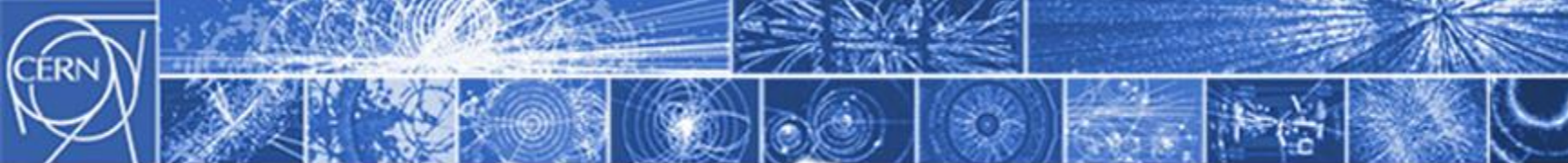


The BIS and SMP activities during LS1

MPE Group Review, 2 June 2015

Christophe Martin, Stephane Gabourin & Nicolas Bellego



Outline:

- Scope of the LS1 activity for the BIS and SMP
- Work planned and schedule
- Resources needed during LS1
- Example of aspects which worked well
- Example of aspects which gave difficulties
- Aspects to be changed or improved
- Conclusion

Main activities during LS1 for the BIS and SMP:

Was it properly planned ?

- **Upgrading BIS hardware parts**
 - CPU RIO3 replaced by MENA20
 - for all BIS crates
 - CIBO cards improvement



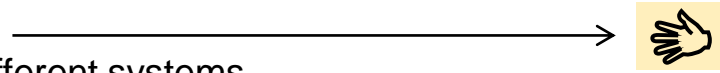
- **Relocation of BIS equipment (R2E)**
 - BIS in UJ56 moved to USC55
 - Move of the User Interfaces in TZ76



- **Measurement & checking campaign**
 - of the BIS optical loops for LHC (+ INJ, EXT & SPS)




- of all User Interfaces (CIBU)
 - 360 links re-checked with 20 different systems
 - Lengthy but fruitful exercise: a lot of non-conformities were identified !





Main activities during LS1 for the BIS and SMP:

Was it properly planned ?

- **Additional features of BIS**

- Design of a new Beam Dump trigger : the CIBDS → 
- Boards inserted in the BIS loops (UA63 & UA67)

- **Parameter changes for SMP**

- Change of equations for the setting of Set-up Beam Fag → 
- New parameters : "Optics-ID" → 

- **Commissioning of the BIS and SMP**

- Individual System Tests
 - Final MPS tests
- } → 



Resources for the BIS and SMP



from
Feb'13
up to
Mars'15

Role	Qty	FTE occupancy
Engineer	1	85 %
Technical engineer	1	60 %
Technician	1	10%
External collaborator	2	50 %

BIS team also involved in non-LS1 activities: like the deployment of the BIS in Linac4

The distribution of work during LS1 has not been regular.

The re-commissioning of BIS & SMP is highly dependent of other systems and cannot be realized before the last weeks/days of LS1.

Generally speaking, enough manpower was available to perform the BIS and SMP tasks related to LS1 period....

...except for the crash program over the 4 last weeks of LS1 where the 3 experienced engineers joined the BIS team in order to solve open issues and to perform the IST of both BIS & SMP systems.

- Replacement of the RIO3 by the MENA-20 VME processor board
 - *AB/CO has provided the processor boards in due time*
 - *The SW team has deployed the new GUI without major problems*
- BIS relocation in USC55 and TZ76 (R2E)
 - *All required cables and optical fibers have been pulled before LS1*
 - *All users connected on the BIS were ready in time for the re-commissioning of the related User Interfaces (CIBU)*
- The optical links measurement campaign
 - *The process is well proved (first campaign made during the 2011 TS)*
 - *We have reliable optical devices to perform these measurements*

- The deployment of the CIBDS (a.k.a. “the third channel” for LBDS triggering)
 - *Functional specification still a “draft for discussion” and engineering specification still “under approval”*
 - *No reliable tests **in real conditions** were performed before the startup*
 - *Integration within the LHC Sequencer was not defined*

- The commissioning of the 360 User Interfaces (CIBU) with the Users
 - *A huge number of connection were (are) identified as “not conform”*
 - *Some users don’t endorse the responsibility for these “non conformities”*
(“It works without problem since the beginning of the LHC, why it should be changed?”)

- The Individual System Tests (IST) of the BIS and SMP
 - *The existing procedures have not been adapted for the re-commissioning after LS1 (the procedures were established for the first start of the LHC)*
 - *For the Injection and Extraction BIS the procedures did not exist*
 - *We were allowed to access to the BIS loops on only the last week of LS1...*

- We should pay more attention to the all software tools available for the BIS maintenance, exploitation and supervision.

Many SW were available before LS1, but unfortunately not by the end of 2014 :

- the tests program needed to commission the BIS (like the one remotely closing the optical loops)
- the DIAMON tool for the Operational diagnostics
- many other programs (like the one performing the Timing alignment of the LHC Controllers....)

- We should advise the User System's responsible many months ahead of LS2 :
 - for the re-commissioning of their electronics interfaced with the CIBU
 - for the compliance to BIS connection standards (for those which have been identified as "not conform")
- All the requirements must be clearly established and documented before the LS (or TS)

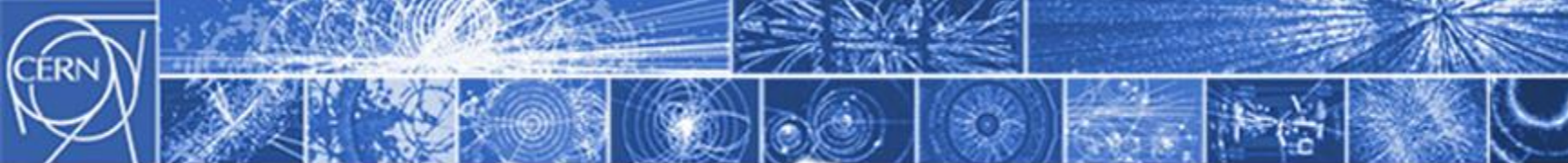
To conclude :

Overall, LS1 activities for BIS & SMP have been performed in relatively good conditions, mainly because most of the tasks were foreseen and planned before LS1.

Nevertheless, the last weeks of LS1 were very tough...

Mainly due to:

- Underestimation of the workload related to IST
- Lack of experienced people in this matter
- Lack of guidance for managing priorities



Thanks for your attention