

Beam Interlock System MPS YETS 2015-2016

CERN
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LHC

EDMS NO. 889281	REV. 2.2	VALIDITY DRAFT
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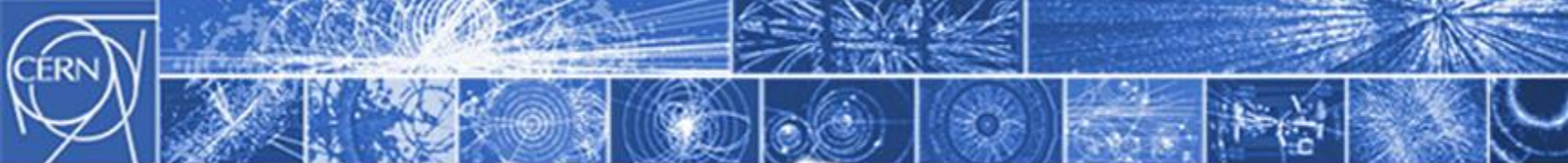
REFERENCE
LHC-OP-MPS-0004

Date: 2015-03-30



MPS COMMISSIONING PROCEDURE

MPS Aspects of the Beam Interlock System Commissioning



List of MPS BIS test to performed:

Hardware commissioning

(Prior any MPS test, the BIS IST have been validated)

Test A – Test links from User Systems to BIS

Test B – Test links from Software Interlock System to BIS

Test C – Test the Setup Beam Flag transmission through the GMT

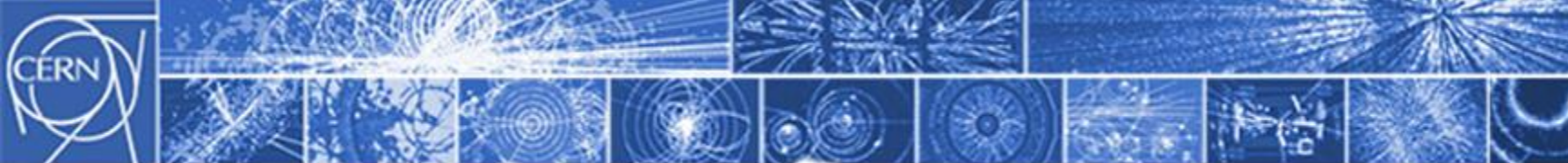
Test D – Test links from BIS to Beam Dump

Test E – Test links from BIS to Injection Interlock System

Machine Checkout

Execute the BIS Pre-operational Checks => no error must be received

Provoke a Dump event and check BIS IPOC => results must be coherent



TEST A consideration (slide 1):

(**Test A** – Tests links from User Systems to BIS)

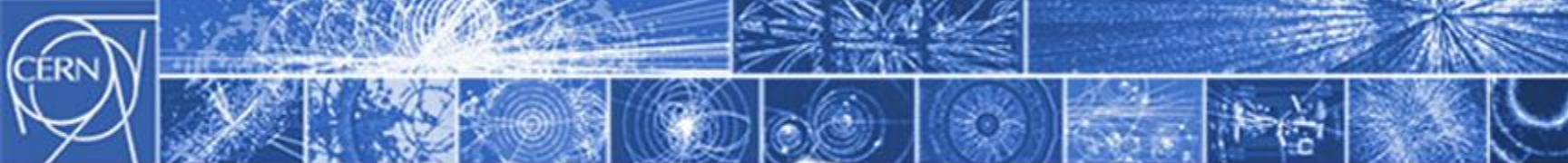
Users with automatic test method

System Name	Connections(*)	Automatic test mode
Collimators	36	Yes
Powering Interlock Controllers	32	Yes
Vacuum	30	Yes
Beam Loss Monitor System	16	Yes
Fast Magnet Current Change Monitor	12	Yes
Warm Magnet Interlocks	8	Yes

The automatic tests represent 70 % of the LHC BIS User connection

For these Users the connection between the User electronic and the BIS is automatically checked

- The equipment owner is responsible for the procedure and the execution of these tests.



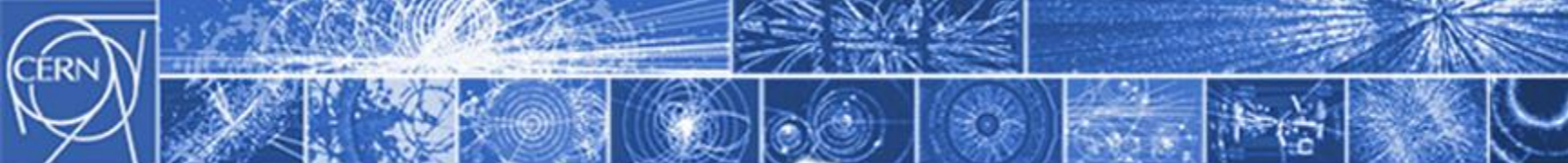
TEST A consideration (slide 2):

Users without automatic test method

System Name	Connections(*)	Automatic test mode
Beam Screens	9	No
Kicker Systems (LBDS & MKI)	6	No
TCDQ & BETS-TCDQ	5	No
RF	4	No
ATLAS	6	No
CMS & TOTEM	4	No
ALICE	2	No
<u>LHCb</u>	3	No
BCCM (Beam Lifetime)	2	No
BPM (Beam Excursion)	4	No
Access System	4	No
Operator Push-Buttons	2	No
Programmed Dump	2	No
CIBDS	2	No
Crystal collimator (UA9 experiment)	1	No

For these Users, there is no systematic tests performed. The tests are performed User by User on demand.

- **REMINDER** : if a user system is modified (even refurbished...) the interlock team must be always informed in order to take the relevant actions (partial or full recommissioning)



Test B – Test links from Software Interlock System to BIS

- need to be performed with LHC operator (10’)

Test C – Test the Setup Beam Flag transmission through the GMT

- ✓ Test performed with automatic software

Test D – Test links from BIS to Beam Dump

- need to be performed with ABT team (30’)

Test E – Test links from BIS to Injection Interlock System

- ✓ Test performed manually

During Machine Checkout

Execute the BIS Pre-operational Check during Machine Checkout (10’)

Provoke a Dump event, checked the BIS IPOC, analyzed the result (30’)