LHC intensity increase – check list

Version 0.2 - 27-Oct-10

Bunch pattern / intensity	368 nominal bunches
Start date	24.10.2010
Fill numbers	1440, 1441, 1442, 1444
Next intensity	424 nominal bunches
Comment	**Ok to proceed to 424b**

Fill	Int B1/B2 [1E12]	Emittance [um]	Stable beams (h)	Dump reason
1440	43.0/43.0	~2.3	12	TCP scan triggered dump on collimator limit.
1441	43.0/43.0		0	UFO Q17.L4 on flat top
1442	43.0/43.0	~2.4	2.3	UFO MBA.Q8L7
1444	42.0/42.0	~2.6	7.2	OP dump

Check list

Non-conform points: the intensity increase is put on hold pending a satisfactory understanding / resolution of the issue.

Magnet powering	**Status**	**Who**
No unexplained IPOC failure in Post Mortem for FMCM and PIC	OK	JW
No magnet quench after beam dump in RQ4.R/L6	OK	JW
No unexplained quench of a magnet	OK	JW
No unexplained abort of the 3 previous fills by magnet powering system	OK	JW
No problems with loss of QPS_OK for main circuits following injection process	OK	JW
Comments:		

Beam interlocks	**Status**	**Who**
No unexplained IPOC failure in Post Mortem for BIC (1) (2)	OK	JW/MZ
No unexplained false beam dump from beam interlock system	OK	JW/MZ
No failure of BIS pre-operational check	OK	JW
Comments:		
(1) Failure of BIS IPOC due to double breaking of BPLs in fill 1442 (2) Problem with DC BCT PM data solved on 23rd (due to FESA change during tech stop)		

BLM	**Status**	**Who**
Internal test (sanity checks) results must be true	OK	JW/BD
Rise time (10 to 90%) of fast losses must be larger then 200 us	OK	JW/BD
No unexplained BLM check failures	OK	JW/BD
Expected losses for the to be injected beam must be 30 % below threshold level	n/a	BD
BLM system modification (ECRs) have to be agreed on, EDMS: notified persons signature is needed	n/a	BD
No nonconformities in the energy transmission to the BLM crates	OK	BD
Comments:		

Collimation	**Status**	**Who**
Betatron loss map	OK	Coll. Team
Off-momentum loss map	OK	Coll. Team
No observed violation of cleaning hierarchy	Seems OK	OP
Comments:		

Post-mortem	**Status**	**Who**
Loss leakage to TCTs below 0.5% during beam dump	OK	JW
UFO occurrences	2	JW
No unexplained PM event above 450 GeV	OK	JW
Comments:		

Orbit	**Status**	**Who**
Global orbit in tolerance in stable beams (< 0.2 mm rms)	OK	JW
Orbit IR3/IR7 collimators within $\pm$ 0.2 mm in stable beams	OK	JW
Check that orbit is correctly measured	OK	JW
BPM IP6 (interlock BPM) during first beam with higher intensity and different bunch pattern	OK	BG
Orbit at TCTs in tolerance in stable beams (≤ 1 sigma)	OK	JW
Comments:		

Feedbacks & operation	**Status**	**Who**
OFB operational status / no anomalies	OK (1)	JW
QFB operational status / no anomalies	~OK(2)	JW/OP
Comments:		
(1) OFB OK, but one fill dumped after incorrect OFB changes before the squeeze. (2) Short FB outages during the ramp for one fill, else OK.		

Beam dump	**Status**	**Who**
Asynchronous dumps understood? Protection worked correctly?	OK	BG
Parasitic asynchronous dump data show no loss of protection	OK (1)	BG
No positioning errors on TCSG/TCDQ	OK	BG
No settings or thresholds mistakes/wrong sequences/unexplained faults on TCSG/TCDQ	OK	BG
No unexplained MKD, MKB kicker, TSU or BETS faults	OK	BG
No potentially dangerous XPOC or IPOC failure on MKD or MKB	OK	BG
No unexplained synchronization problem with TSU	OK	BG
Pressure and temperature rise in TDE block within tolerances	OK (2)	BG
Requalification passed OK at 450 GeV and 3.5 TeV with pilot in case of any important component exchange	n/a	BG
Comments:		
(1) leakage from TCDQ to TCTs in range 4e-4 to 7e-4		
(2) pressure rise of ~13 mbar, corresponding to ~3 K average temperature rise		

Injection	**Status**	**Who**
Injection oscillations within tolerance for all injections	OK (1)	BG
No unexplained large beam loss on TCDIs	OK	BG
No issues in injection procedure, settings or tolerances	OK	BG
Orbit in injection region in tolerance wrt reference (tolerance <0.5 mm)	OK	BG
Resetting of TL trajectories and TCDIs done when needed	n/a	BG
No increased rate of MKI flashovers	OK	BG
No increased rate of MKI switch erratics or missings	OK	BG
No unexplained MKI vacuum or temperature activity	OK	BG
No machine-protection related injection system failures	OK	BG
Comments:		
(1) problem with acquisition of capture data for YASP and IQC means difficult to survey injection oscillations on each injection – EiCs have consigne to check also on damper traces for changes.		