

PSB Operation: Last 2 Weeks

Machine availability

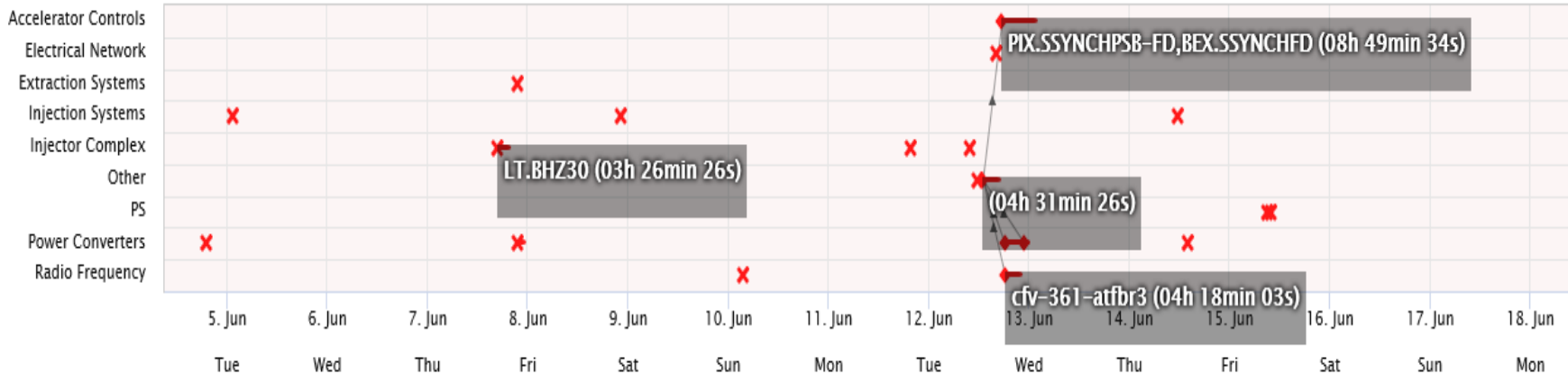
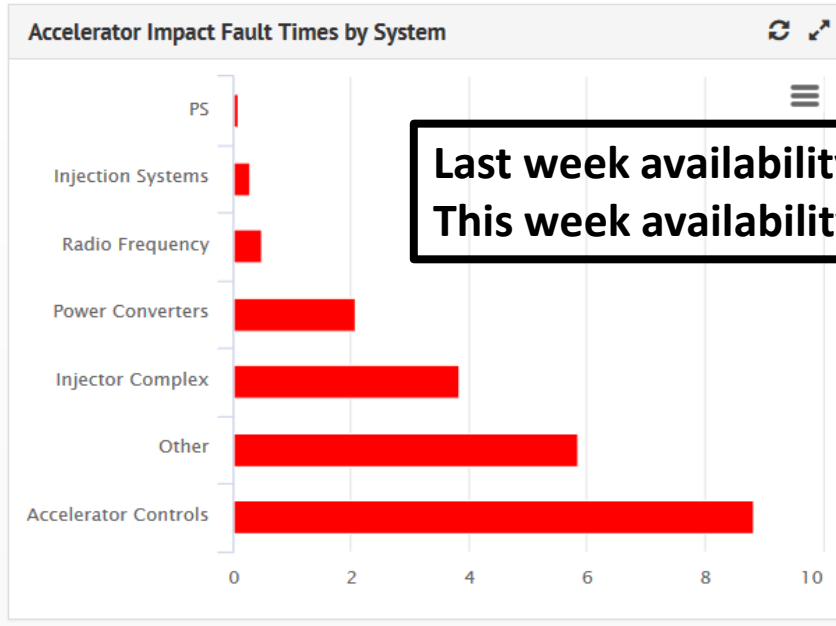
93.8%

Fault count

20

Fault Labels for PSB

TIOC



PSB Operation: Last 2 Weeks

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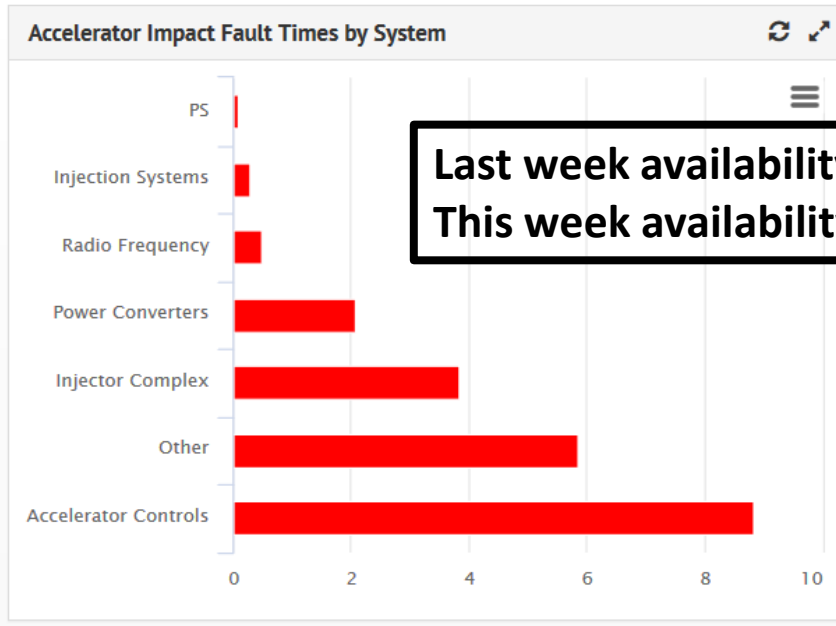
93.8%

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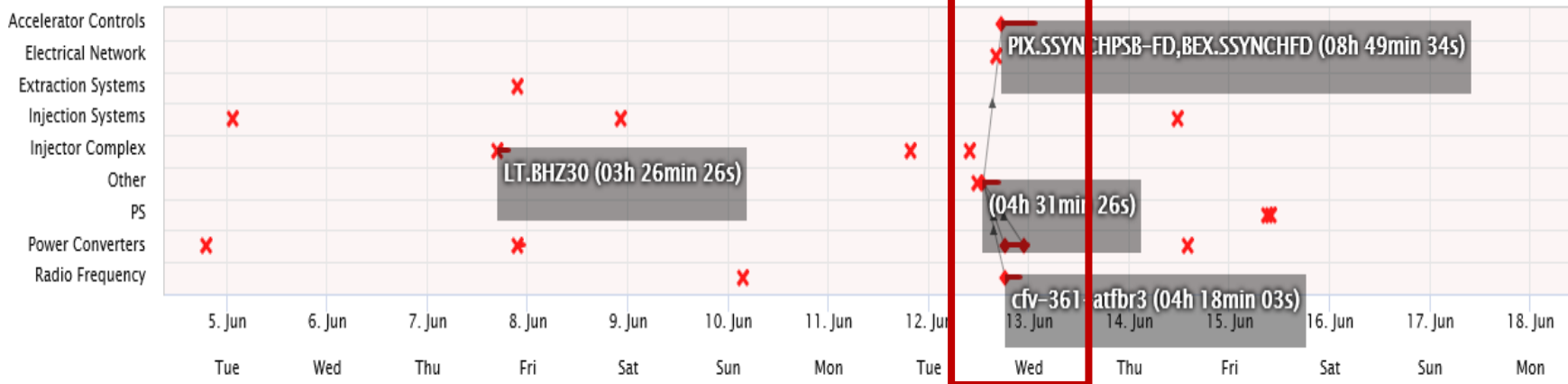
20

Fault Labels for PSB

TIOC



Last week availability: 96.8%
This week availability: ~90.9%



AUG activated → About 14.5h stop

PSB Operation: Major Event in the PSB

time



- **AUG button activated by accident in B361 at 11h40.**
 - About 1h20 in diagnosing and the time for EN-EL to re-enabling the powering in B361.

PSB Operation: Major Event in the PSB

time



- AUG button activated by accident in B361 at 11h40.
 - About 1h20 in diagnosing and the time for EN-EL to re-enabling the powering in B361.
- **PSB operators (Yu and Vincent) went to B361 and repowered all FECs and started contacting all experts in case of problems.** After about 4h30 we were left with the following issues:
 - Corrector in the injection line BI.DHZ40 not pulsing.
 - TFB in R3 not working, a timing issue.
 - Correctors at the PSB extraction BE1 HOR and BE2 VER not pulsing.
 - Synchronisation at extraction not working, a timing issue.

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- As time was passing and the issues were taking longer at around 21h40 we prepared a **patched version of LHCINDIV for LHC to perform the scheduled MD.**

PSB Operation: Major Event in the PSB

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- As time was passing and the issues were taking longer at around 21h40 we prepared a patched version of LHCINDIV for LHC to perform their MD
- **At 23h30 the TFB was patched.** Issue could not be solved so R3 TFB control was connected to the same timing control of R4. The day after the issue was tracked down to a broken CPU card.

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- PiPO could not immediately fix the issue so it required the expert intervention. Several components had to be replaced. **All correctors available at around midnight.**
 - The synchronisation was not still working perfectly but we managed to extract ISOLDE, AD.

PSB Operation: Major Event in the PSB

time



- After replacing all associated board, the timing issue with the PSB synchronisation at extraction was tracked back to the driver installer. **FESA expert came in and at around 2h20 all beams were finally back.**
- The remaining (not-stopping the beam) issues have been addressed in the next days,
 - BPMs setting corrupted, FEC issues for beam instrumentation, etc, etc.
- **My personal big thank to all experts involved for their support and commitment to systematically address the issues we were facing!**

Major Event in PSB 12/06

Bettina's slide at IEFC

Event discussed at TIOC 13/06.

Sequence of event and facts:

- **Tuesday 12/06 11:38: PSB down** due to lack of electrical power (alarms in ccc) → found **AUG EUB8*25A open** (located close to PSB elevator top floor of b.361)
- EN-EL piquet and fire brigade investigated → protection glass of AUG button intact → not pushed, but **AUG button holder clearly damaged**
 - Remark: **AUGs are tested every year** (1 per zone also opened); a deformed AUG holder would have been immediately repaired at this occasion
- During the event there were locally present: Contractors from ARCE CLIMAT (duct installation for ventilation of storage room); maybe also painters and carpenters (tbc); works were done in an **area not considered as machine-critical**
 - Not yet understood why/by whom the AUG button holder got damaged
 - Remark: Pushing unintentionally an AUG button was also considered the highest risk for the planned EN-EL interventions during the run (see IEFC 01/06/2018)
- **Total PSB downtime ~14.5h**

Major Event in PSB 12/06

Bettina's slide at IEFC

Consequential damage to PSB equipment (abrupt cut of 18 kV supply lines):

- **Power converters:**

- BTP.DVT30 and BI4.DHZ70: **VERO supplies replaced**
- BI.DHZ40, BE1.DHZ4L1/DHZ11L1, BE2.DVT4L1/DVT11L1: **Fuses of the power stage blown; some power stages also burnt** → replaced with voltage regulation boards
- BE1.DHZ4L1 required an additional regulation board and the tape connecting the power stage
- BR.QX (new Q-strip PC): **Current transformer to be replaced**

- **Transverse Feedback:**

- **CPU card of ring3 broken**; CPU card replaced by a malfunctioning one → took long to resolve

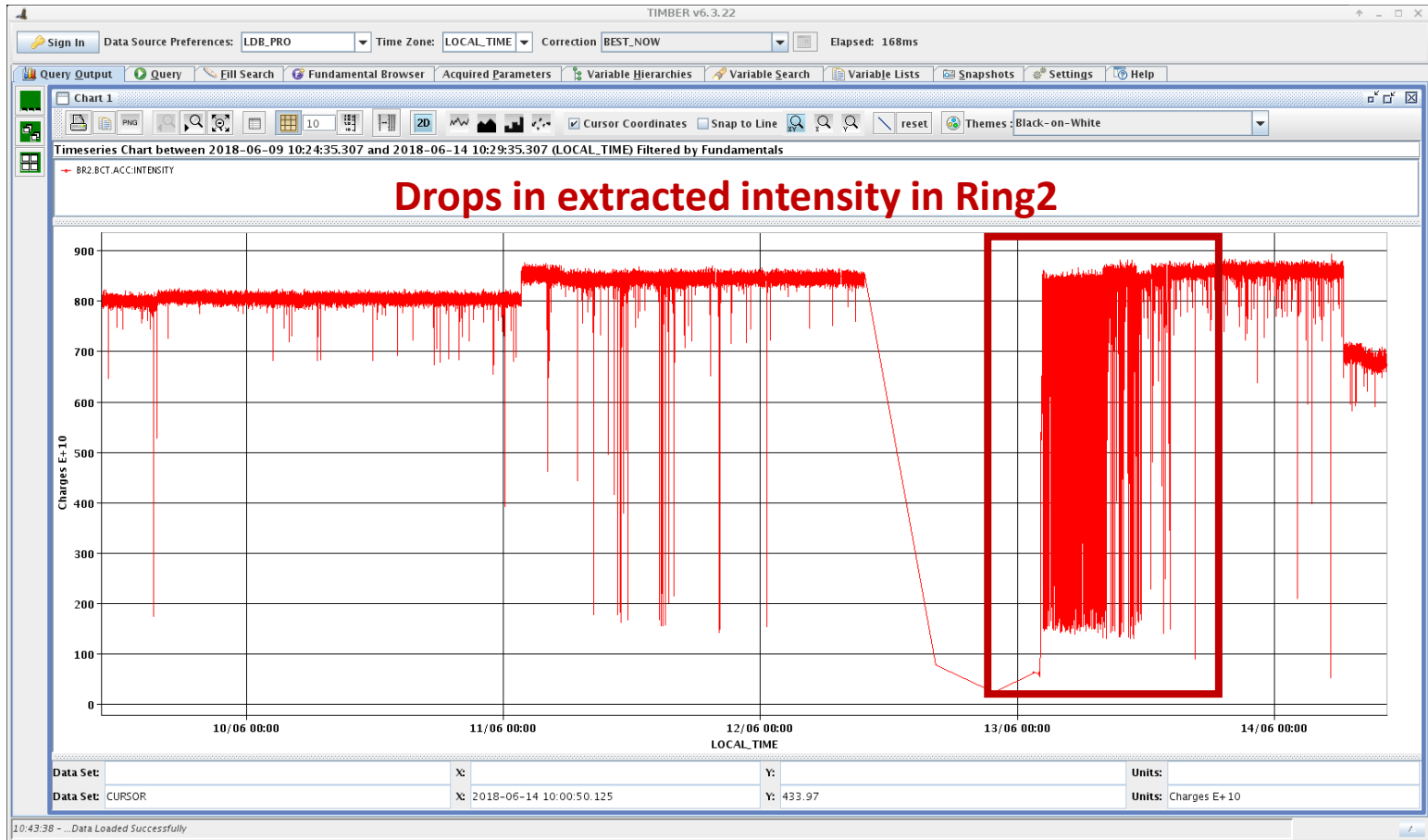
- **Beam Instrumentation:**

- FEC for BTVISO needed a **CPU replacement**

- **Timing:**

- Issue with PSB-PS synchronization timings; not a direct consequence of the power cut; first malfunctioning mezzanine boards were suspected and several HW exchanged, but after long debugging the issue was tracked back to the driver installer that was updated between the last two reboots and due to a bug the mapping of the mezzanine cards was incorrect → **solved**

PSB Operation: Issue with TOF (and high intensity beams)



- When the beam was back we noticed issues with TOF beam. Identified issue with one of the TFB **power amplifier broken**. Not due to the issue with the AUG as TIMBER showed occasional losses as well in previous days.
- Situation somehow improving over time (not clear why), nevertheless we **moved the production of TOF from R2 to R3 until ITS1**, when the amplifier will be replaced.

PSB Operation: Beam Status

Beam	Status and Comments
LHC PROBE	Ok
LHC INDIV	Ok
LHC25	Ok
BCMS25	Ok
ISOGPS	Ok for intensity up to $\sim 850E10$ p/ring
ISOHRS	Ok for intensity up to $\sim 850E10$ p/ring
STAGISO	Ok
TOF	Ok. Also available in R3.
EAST1	Ok incl. parasitic TOF
EAST2	Ok incl. parasitic TOF
AD	Ok
MTE	~ 675 per ring. Eh: 9.2 -> 10.6 Ev: 4.4 -> 6.2
MTE_Low_Int	Ok

- Otherwise all beams back and we are having the usual fun with the LHC MDs late/impromptu requests...