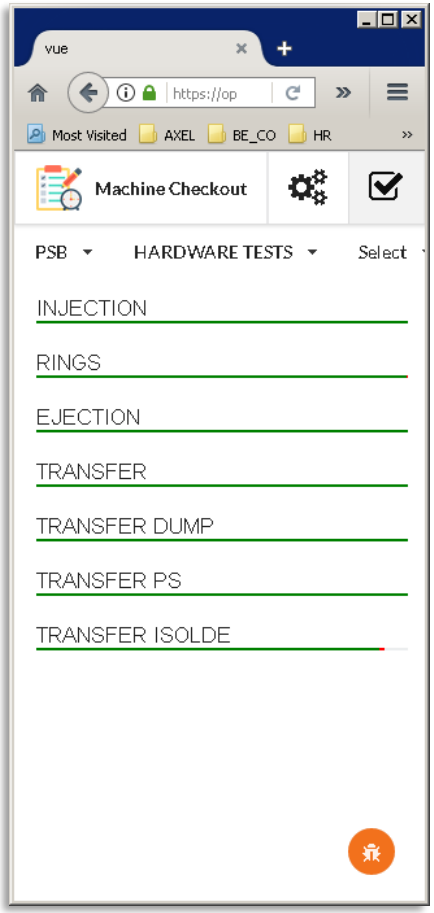
BCWG:

PSB Re-commissioning 2018
~ Hardware Test ~

A. Akroh, F. Chapuis
PSB Re-Commissioning Coordinators

CHECK LIST



Check List Structure:

- Main structure similar to Booster WorkingSet equipment grouping, separated by area;
- Sub-Structure and contents:
  - Improved yearly along with the machine changes;
  - Legacy from previous Re-commissioning Coordinators;
  - Efficient structure.
- Remark for beam commissioning: Structure is less evident (tbd with Emanuele and others).

Advantages:

- Common tools & easy to use;
- History of tests accessible.

Procedure:

- Propose already a Section Meeting before the Hardware-Test Period to discuss general points.
- Add short, simple procedures to explain how a test should be done.

"FORGOTTEN" DEVICES???

→ ***BTY.BVT101 was rather a combination of several factors than an oversight (resulted in a lost beam commissioning day)***

The Factors:

- PSB Recommissioning Coordinators not aware about the PS decabling details and the routing of the External Condition cables through the PS facility;
- The new Safety Rules concerning the HW & BEAM Permit with regard to the EIS lockout were applied.

The Solution:

- Procedure in preparation to allow the Test of the EIS before the HW & BEAM Permit release;
- External Conditions of the EIS can be checked during the DSO_Test (instruction to give to operators).

MACHINE PROTECTION TESTS

Booster Protection System: SIS, BIC, WIC, External_Conditions.

For common devices:

- Tests often made by OP team at the same time with the Powering Tests; could be useful to add procedures;
- Dry Runs done when changes are known (→ LT.BHZ20).

For the BOOSTER EIS: (not suitable to pulse before the DSO_Test)

- WIC Dry Run done together with TE-MPE experts in collaboration with TE-EPC equipment responsible → MPS (to make sure of its availability for DSO_Test).
- WIC tested before the Powering Tests of all the power converters.
- External conditions tested by operators in charge after the HW_Permit validation:

  → MPS;

  → Beam Stopper.

DRY RUNS (with eq. specialists)

DRY RUNS conducted this year:

- WIC vs MPS (→ TE-MPE);
- LIU Q-Strip (→ TE-EPC);
- BDump Fan External Cond. (→ EN-CV);
- Phase Pick-up 3L1 (→ BE-BI);
- SEPTA controls (→ TE-ABT);
- BTVs (→ BE-BI);
- TRIM1+4_Zero (→ BE-CO);
- LT.BHZ20 (→ TE-EPC + LINAC2 team);
- Dry run for Transverse Feedback planned (→ BE-RF), but system not ready → caused quite some problems during beam commissioning → **very important to be able to test all systems already during HW commissioning**.

BENEFITS:

- Proposed to Equipment Specialists when the device or software is:
  → New (ex: SEPTA Controls);

  or

  → Systematic for sensitive devices (ex: BTVs).
- Always appreciated by the equipment specialists;
- Opportunity for the operators to deepen equipment knowledge and improve contact to equipment specialists.

INDIVIDUAL SYSTEM TESTS

YEARLY SYSTEMATIC TESTS

- ACCESS SYSTEM Functional Test (→ BE-ICS);
- AUDIO/VISUAL Magnet Inspection + Insulation/Grounding Test (→ TE-MSC);
- CAVITIES Start-up (→ BE-RF);
- SEPTA Start-up (→ TE-ABT).

OTHER INDIVIDUAL EQUIPMENT TESTS

- During this period all equipment owners should perform locally equipment readiness tests

- Should clearly define a special period for individual system tests before HW commissioning period;
- Requires HW permit and all services being available;
- Collaboration between EN-ACE and BE-OP with equipment owners.

CONTROLS INTERFACE

CCR: General efficient procedure/practice.

To be taken into account for HW commissioning planning.

COORDINATION ACROSS THE MACHINE

No Issue to report.

GENERAL LOCKOUT

No Issue to report.

GENERAL LOCKOUT = Back in the past for the Booster Facility

Personal point of view: It is the best solution to make a Machine/Facility safe during a YETS/Shutdown period.

To be followed up: How to safely allow individual system tests during well-defined periods during the shutdown (very important for LS2) and sometimes only for a specific equipment. EN-ACE currently collecting individual equipment test requests for LS2; procedure is being discussed.

CHECKOUT AND PLANNING TOOL

First of all thanks a lot to E. Matli for his flexibility from the start of the IRWG (with really few specs, he managed with few iterations to provide us a very good tool). And thanks to BE-CO (B. Urbaniec) for the new planning tool!

The machine check-out tools:

Advantages:

- Machine check-out groups and sub-groups helped a lot to be as precise as possible;
- Database linked with the planning tool;
- History of tests and Summary very easy to access.

For improvements:

- Screenshots and Drawing plug-in to be added to the comment editor;
- Could be linked with OP e-logbook to avoid Copy/Paste event;
- Clarify how to best add procedures at every level;
- It might be useful to add an icon if presence of an equipment expert would be needed (with info about the person).

The planning tool:

Advantages:

- Versioning available for evolution of the planning history;
- Adapted for block to block tests.

Dis-advantages:

- The format is not adapted at all for **test to test** planning: it becomes very dense and un-readable (specially when we need to extract it for a report→***.xls*** extraction).

SUBSET TESTS

We don’t propose to test only a sub-set of the machine even after a YETS, as this could lead to delays during beam commissioning.

Nevertheless it might be possible if practically no interventions take place during a short YETS to keep the machine CLOSED → reduced test list and HW commissioning duration.

COMMISSIONING TIME

Good enough for this YETS.

But, 2 weeks is the minimum duration (even if the YETS is shorter).

CHECK LIST STATE

Checklist is complete, but it's content will need to be adapted to machine changes during LS2. To be seen if the structure needs to be slightly modified as well…

For next shutdown we should work on procedures or instructions, such as:

- As soon as the test on a device is fulfilled, the INIT_VALUES should be set;
- Take care of the External Conditions and BIC especially those from EIS;
- Consider test sequence and dependencies…