

Beam Instrumentation systems verification

Clement Derrez
Test Engineer

www.europeanspallationsource.se

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Outline

- Naming convention
- Data management system
- Acceptance tests workflow
- After-installation tests sequence

Naming convention

- Every Field Replaceable Unit (FRU) is named. A FRU can be a simple part or an assembly
 - Ex: FEB-050ROW:PBI-PPC-002 for a cabinet cable

- Naming convention:

Sec-Sub:Dis-Dev-Idx

Two major areas of FRU installation slots are identified:

- **tunnel**: including stub, tunnel wall and gallery wall,
- **support**: front end building (FEB), klystron gallery, gallery support area (GSA) in A2T

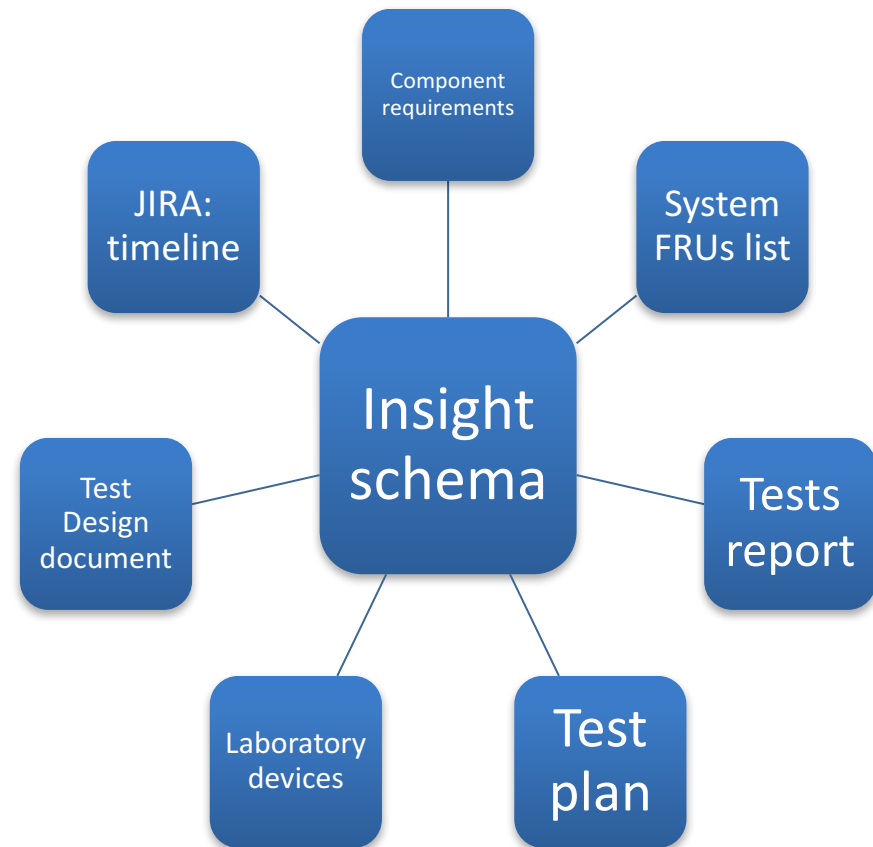
Data management system

- Data export / import with other software tools
- Systems and subsystems tests results coming from different locations (ESS, IK Partner, commercial partners...)
- We must be able to trace back acceptance tests results to laboratory measuring devices
- We need to be able to prepare an installation batch when an installation slot is ready: need for a dynamic tool

→ Having a reliable Data management system is critical!

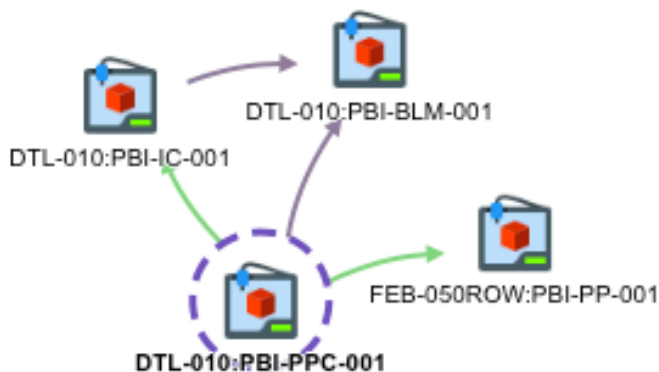
Data management system: Insight

- Ensures traceability between tests and production data, system components and laboratory devices.
- Objects' attributes store all FRU info: responsible, current status (procured, received, RFI...) etc.
- Added value, current installation or production progress... can be automatically extracted for each system or FRU
- Timeline is managed in Jira, tasks are linked to Insight.



Data management system: Insight

- No lost effort, as everything can be scripted to populate external tools and extract any needed information!
- Installation batch: installation status easily verified and prepared
- Data is uploaded by BD team.



PBI Shopping List / System / PSL-826

DTL-010:PBI-BLM-001

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Details

Name [DTL-010:PBI-BLM-001](#)

Type **BLM**

Model IC

SubSection [DTL-010](#)

Status **NOT STARTED**

Inbound References

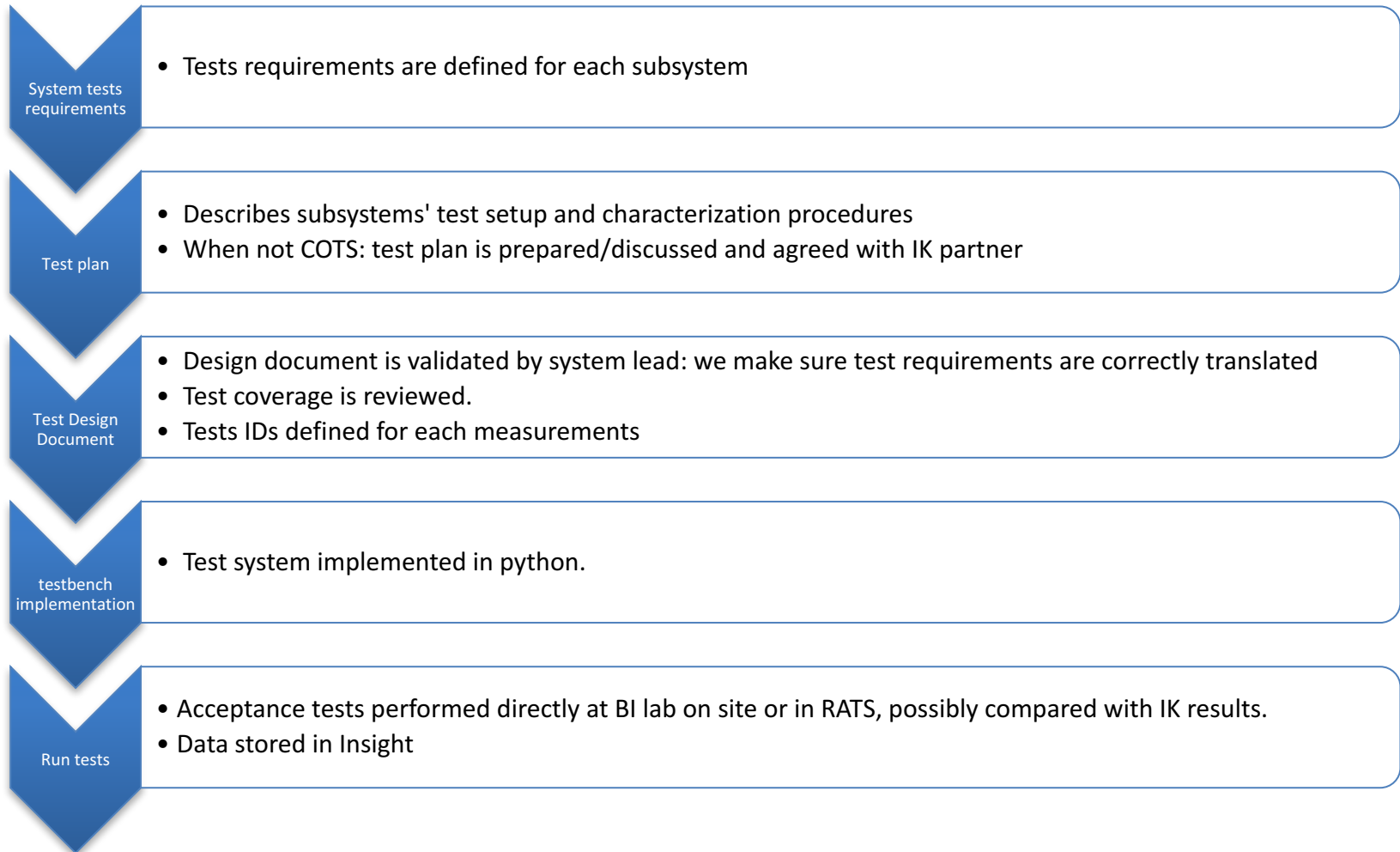
Object	Reference Type	Object Type
DTL-010:PBI-IC-001	Belongs	Beamline Slot
DTL-010:PBI-PPC-001	Belongs	Beamline Cable
FEB-050ROW:PBI-AMC-001	Belongs	Inter Chassis Slot
FEB-050ROW:PBI-AMC-002	Belongs	Inter Chassis Slot
FEB-050ROW:PBI-CPU-001	Belongs	Inter Chassis Slot
FEB-050ROW:PBI-EVR-001	Belongs	Inter Chassis Slot
FEB-050ROW:PBI-MCH-001	Belongs	Inter Chassis Slot
FEB-050ROW:PBI-MTCA-002	Belongs	Chassis Slot
FEB-050ROW:PBI-PPC-007	Belongs	Cabinet Cable
FEB-050ROW:PBI-PPC-008	Belongs	Cabinet Cable
FEB-050ROW:PBI-PS-001	Belongs	Inter Chassis Slot

Activity

Measurements files format

- Large amount of measurements parameters: Data logged in HDF5
- Data files produced at ESS follow a fixed format: Files, groups and datasets minimum mandatory attributes are defined
- Existing data received from IK and industry partners is reformatted to HDF5, adding the needed metadata

Acceptance tests workflow



Acceptance tests workflow

- Component received.
- Component tested.
- RATS / site lab: Component stored.
- RATS / site lab: System assembly and test → RFI
- RATS / site lab: System stored
- Installation slot ready: system installed.
 - **Guideline: Install and test as much as possible, as early as possible**
 - **Learning curve will help us moving faster with installation work after the first systems are processed**
- Last step: commissioning

After-installation tests sequence

- After-installation tests sequence:
 - **initial first-time commissioning**
 - **cold check-out**
 - **commissioning with beam**
 - **quick self-check**
- Sequential testing is important (tests timestamps are checked automatically). Otherwise the statement: **“the instrument is installed and working properly”** has less confidence.
- During debugging:
 - Relevant tests in each architectural layer are repeated until satisfactory results are obtained.
 - If the problem is identified and can be isolated within its layer, there is normally no need to repeat all of the tests which are sequentially following. Depending on the situation, some test might become mandatory nevertheless (for instance a software recompilation might entail a standard interface check, and a repaired connector might entail a signal transmission check).

After-installation tests sequence

- Cold check out: Testing of the whole instrument on all architectural layers:
 - monitor, front-end electronics, cables, mTCA-electronics, timing, data treatment, publishing, network transmission and machine protection interface.
- Commissioning with beam: Aims at verifying the correctness of the integration for machine operations.
 - Includes initial comparisons and cross-calibrations in order to gain confidence in the instrument. Performance limiting factors are identified.
- Quick self test: The self-test procedure includes testing of calibration, machine protection and data transmission.

Thank you!

Questions ?