

SigMon project:

automation of the HWC test analysis

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Collaboration CB & PE
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Goals:

- Uniform analysis by means of SWAN notebooks.
- Phasing out of EDSL and LabView.
- Automatic running of the analyses using scripted versions (and classes) as part of AccTesting.
- One single analysis tool per test, combining the 'signatures' of MP3, QPS, EPC, PIC (only mandatory for the automatized tests)

HWC after YETS 23/24

'Type test' for the IPQ tests, potentially IPD and 600A if achievable

HWC after YETS 24/25

Roll-out to all tests

Principle responsibilities:

CB takes care of the integration of the automated SigMon classes into the AccTesting framework, including the signature handling.

Validation and testing, to ensure the correct functioning of the automation process and long-term maintainability is under the responsibility of CB.

PE takes care of the contents of the analyses based on the existing HWC procedures, i.e. the checks that are performed, the acceptance criteria, and the methods by which the checks are done.

Testing, intended to ensure the correct analysis, consistent with previous analysis also covering potential corner cases is under the responsibility of PE.

The analysis should result in a FAIL or PASS result. A wrong result (i.e. FAIL instead of PASS or PASS instead of FAIL) due to incorrect analysis, or no result (i.e. tool not working) is under the responsibility of PE.

CB and PE are each responsible for the long-term maintenance of the automation respectively analysis part of the SigMon tool.

To be noted:

Successful passing of the HWC tests does not guarantee event-free operation of the circuits during the run. It reduces the probability of problems/damage during operation and allows for an early identification of issues. The protection systems will always ensure the correct protection of the circuits, and they are considered as fully operational after the IST. To further reduce this probability other tools are applied or under development (ML, TFM's, SigMon monitoring part, digital twins, ...).

Quenches (during HWC and during operation) will continue to be analysed manually (using one of the FPA notebooks) *offline*. Continuation of the powering is permitted via automatic analysis of the correct functioning of the QH's and EE, if present.

The analysis is in general not safety critical (as long as the QPS hardware is functioning correctly). If the analysis tool is not working, then the main user of the analysis software, namely the MP3, should ensure that the analysis can be done manually, either by using the corresponding SWAN notebook or by analyzing the data using the PM browser.

Some remarks:

CB is more experienced in coding and PE more experienced in the functioning of SC circuits. Combining both domains of expertise will result in a successful SigMon project. Any recommendation by CB on the work of PE and vice versa should be appreciated as this will lead to a general improvement of SigMon (e.g. in terms of quality of analyses, speed of queries, long-term maintenance, etc).

CB and PE will take care of the GitLab structure/branches linked to the automation and analysis tools respectively.

CB will clearly indicate the requirements for the analysis software needed for a successful automation process.

To smoothen this process a pair programming of the analysis classes is strongly advised.