ITEA 2

INFORMATION TECHNOLOGY FOR EUROPEAN ADVANCEMENT

openETCS

Requirements Verification in openETCS: API- Requirements

supported by:

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API Review Meeting

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Methodology of Verification and Validation

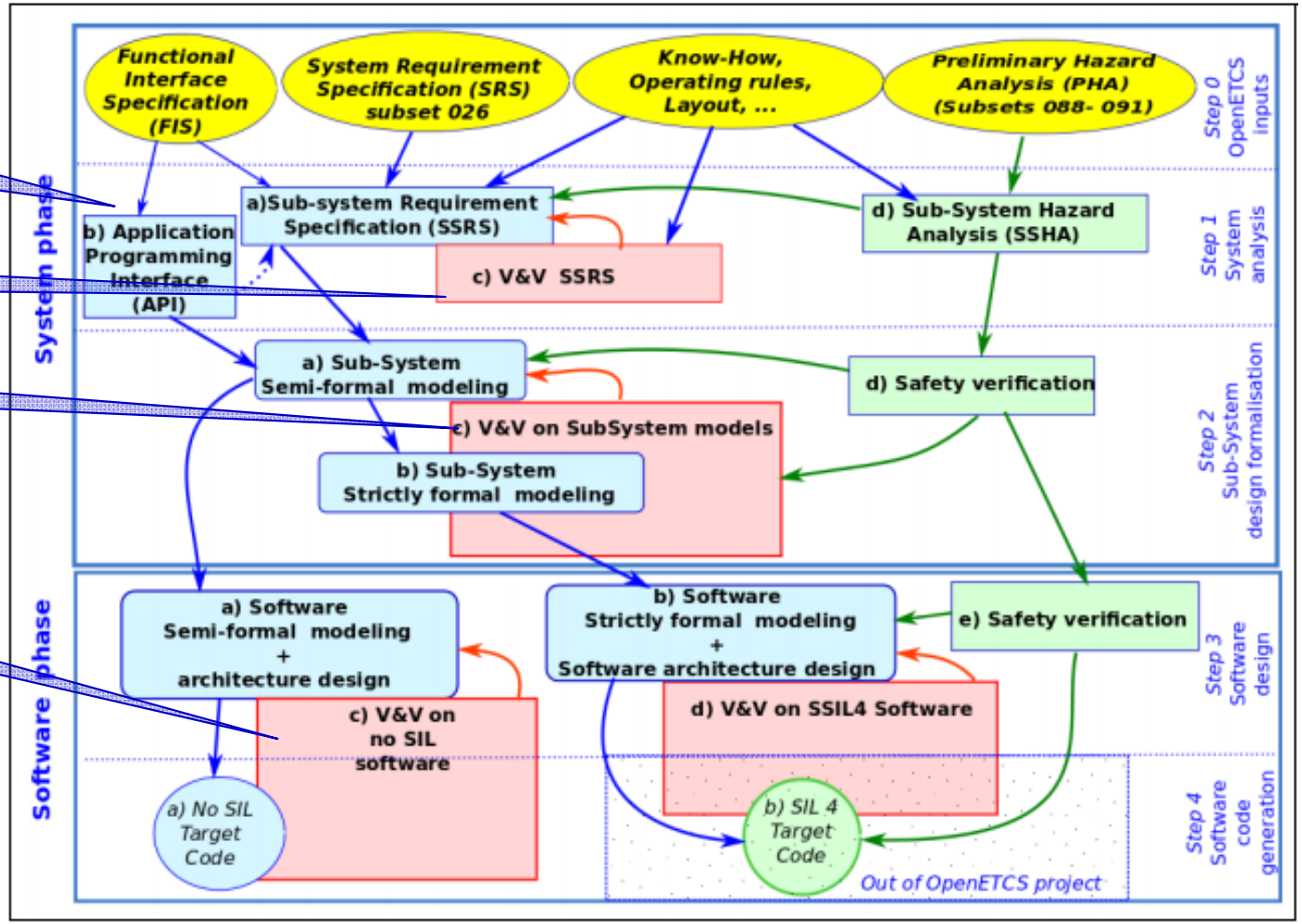
Verification objects

Requirement

Model

Models

Code



WP4 Deliverable Status: 1st level VnV

no.	title	due	state	actual/planned delivery
D4.1	Report on V&V Plan & Methodology	2013/Q3	100%	2013/Q4
D4.2.1	1st V&V report on model	2013/Q4	95%	2014/Q2
D4.2.2	1st V&V report on implementation / code	2013/Q4	95%	2013/Q2
D4.2.3	Safety Plan	2013/Q4	90%	2014/Q2

- **Input freeze to the first level of Validation and Verification was 2013/Q3. API is not part of the 1st level V&V report.**
- **API will be considered for the second level of Validation and Verification.**

Second-Level Verification: On Requirements – specific to current API

- **Objectives**
  - **Take API technical requirements and check the documents on consistency (vs. openETCS req.), correctness and coverage (vs. TSI).**
- **Approach**
  - **Take up available input from other WPs (models, code, tools, specs)**
  - **Check a single line on the technical requirements document if this is a requirement.**
  - **Classify the line [„No Requirements“| “conform“| “additional“| „derived“ | “deviating“]**
  - **Reference the classes: „conform“, „deviating“ and „derived“ and give explanation on the deviation.**
- **Results**
  - **Report on correctness and coverage of the requirement document.**

Second-Level Verification: On Model

- **Objectives**
  - **Verify that the model is robust (enough).**
- **Approach**
  - **Take the model provided within WP3 and accepted by Alstom.**
  - **Perform a risk analysis on the model.**
    - ***Analysis each (selected) elementary component of the architecture for robustness.***
- **Results**
  - **FMEA**
  - **Proposed architectural complements**
  - **Refine test for verification on the real system.**

Validation: On demonstrator scenarios

- **Objectives**
  - **Check that the (operational) demonstrator scenarios are correct using the API.**
- **Approach**
  - **Define the Data input for the operational scenarios.**
  - **Get input on demonstrator scenarios and data from operators.**
  - **Refine the operator specific signalling aspects.**
  - **Transform the operational scenarios into test cases. (All4Tec)**
  - **Define the API to run the test cases on the platform.**
  - **Run and evaluate the tests.**
- **Results**
  - **Test report on demonstrator scenarios**

Questions to the state of the API

State of the document need clarification:

- Is it accepted by the WP2 as requirement document?
- What is the decision process to open point of the document?
- Will the requirements document be converted/ available as a LaTeX document? (automatic versioning on text basis)

Starting Assumption:

- For verification the API is considered a detailed level requirements document.
- ➔ For verification of future models will be verified against the API document – and it‘s appendixes.

Open issues

- **Collaboration between data dictionary stream and API is still open producing a machine readable formal normalized structure.**
- **(System) Architecture of the openETCS functional kernel is still to be defined.**
  - ***Where and how is the Architecture of the Kernel defined?***
  - ***What functions are inside the application or inside the platform?***
- **What is the smallest entity for the process (to model/ implement/ verify): Variable/ Compound/ Function?**
- **Which part of the ALSTOM API document is vendor specific?**
  - ***➔ Should timing specific/ operating system specific requirements be the basis on verification / validation? ➔ who provides alternatives?***
  - ***➔ Alternative solutions are needed to be provided to identify the vendor specific parts.***

How to verify rejected & designer‘s choice?

Thank you for your attention.