

PROGRESSIVE DEPLOYMENT OF MBSE METHODS IN FRENCH NUCLEAR INDUSTRY

Context

AREVA NP is an industrial company focusing on the design and servicing of major components of Nuclear Power Plants - nuclear heat production systems, some auxiliary systems, and nuclear instrumentation and safety automation systems, both for new builds and for the installed base of nuclear power plants in many countries.

Designing a Nuclear Power Plant requires:

- Over 20 years from first Basic Design phase to plant start-up
- Over 20 engineering disciplines involved (Nuclear Island Part only)
- Over 100 elementary systems
- Hundreds of thousands of bulk equipment to be specified and assembled (Nuclear Island Part only)

In order to face the high technical complexity of nuclear power plant projects (large scale of the projects, numerous engineering disciplines involved, strong requirements for nuclear safety) and the current needs to shorten both project duration and cost, AREVA NP is currently assessing a stronger implementation of Systems Engineering and MBSE practices in its activities.

Solution

Strong engineering processes such as Systems Engineering methodologies provide valuable structure and collaboration support in order to manage such product complexity while reducing project cost and delay. The setup of data integration capabilities and associated strategies will ensure the consistency and the follow-up of technical data all along the project life. Moreover, the use of Capella as support for the analysis of system needs and the definition of its architecture, coupled with a PLM tool will provide a strong engineering working environment in support of the deployment of SE practices.

Results

The use of MBSE Capella solution on several pilot systems from different integration levels and involving different disciplines appears to provide a very good collaboration environment for system architects, with good guidance from the methodology steps, and with a rather low entry cost, thanks to the graphical interface to architecture work.

The Capella tool is under progressive adoption on a few major projects, and offers good ground for the implementation of further practices like MBSA and wider technical data integration, both between disciplines, and along the successive phases of a large technical project.



Philippe TANNERY

Philippe Tannery acts transversally to Areva NP as the operational sponsor of MBSE Capella evaluation and progressive implementation, in addition of his role of Transformation director in the I&C business unit of Areva NP.

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AREVA NP deals with the design of highly complex and large systems.

The progressive evaluation and integration of a Capella solution in support of our development process, especially once interface with our PLM solution, promises to be a strong asset in the deployment of efficient SE practices.

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