S9-116

# Supporting Qualified Database for Uncertainty Evaluation

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Uncertainty evaluation constitutes a key feature of BEPU (Best Estimate Plus Uncertainty) process. The uncertainty can be the result of a Monte Carlo type analysis involving input uncertainty parameters or the outcome of a process involving the use of experimental data and connected code calculations. Those uncertainty methods are discussed in several papers and guidelines (IAEA-SRS-52, OECD/NEA BEMUSE reports).

The present paper aims at discussing the role and the depth of the analysis required for merging from one side suitable experimental data and on the other side qualified code calculation results. This aspect is mostly connected with the second approach for uncertainty mentioned above, but it can be used also in the framework of the first approach.

Namely, the paper discusses the features and structure of the database that includes the following kinds of documents:

1. The 'RDS-facility' (Reference Data Set for the selected facility): this includes the description of the facility, the geometrical characterization of any component of the facility, the instrumentations, the data acquisition system, the evaluation of pressure losses, the physical properties of the material and the characterization of pumps, valves and heat losses;
2. The 'RDS-test' (Reference Data Set for the selected test of the facility): this includes the description of the main phenomena investigated during the test, the configuration of the facility for the selected test (possible new evaluation of pressure and heat losses if needed) and the specific boundary and initial conditions;
3. The 'QP' (Qualification Report) of the code calculation results: this includes the description of the nodalization developed following a set of homogeneous techniques, the achievement of the steady state conditions and the qualitative and quantitative analysis of the transient with the characterization of the Relevant Thermal-Hydraulics Aspects (RTA);
4. The EH (Engineering Handbook) of the input nodalization: this includes the rationale adopted for each part of the nodalization, the user choices, and the systematic derivation and justification of any value present in the code input respect to the values as indicated in the RDS-facility and in the RDS-test.

***Keywords:** uncertainty, BEPU, Monte Carlo analysis*