



MUSA Consortium
28 Organizations
(25% non EU)

4 years duration
from June 2019

630 person months
WP7 workforce 5.2%

MUSA overall costs
€ 5,768,452.50
including € 130,000
for mobility actions

This project has received funding from Euratom research and training programme 2014-2018 under grant agreement No 847441



7 WP leaders



Project Management Office



Project Coordinator
Prof. L.E. Herranz
CIEMAT Madrid
luisen.herranz@ciemat.es

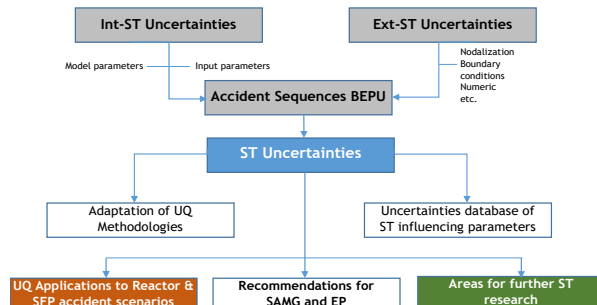
MUSA was founded in HORIZON 2020 EURATOM NFRP-2018 call on “Safety assessments to improve Accident Management strategies for Generation II and III reactors”

On June 15th, 2018 MUSA obtains the NUGENIA label that recognizes the excellence of the project

Numerical tools are widely used to assess Nuclear Power Plants (NPP) behaviour during postulated Severe Accidents (SA). However, uncertainties are intrinsically associated to their predictions. Even though, mathematical tools for quantification of code uncertainties have been under development for many years, Uncertainty Quantifications (UQ) with Best Estimate system codes have not been systematically used in SA analyses.

MUSA has an “innovative research agenda” to move beyond the state-of-the-art regarding the predictive capability of SA analysis codes by combining them with the best available UQ tools.

By doing so, not only the prediction of timing for the failure of safety barriers and of the radiological Source Term (ST) will be possible, but also the quantification of the uncertainty bands of selected analysis results, considering any relevant source of uncertainty, will be provided.



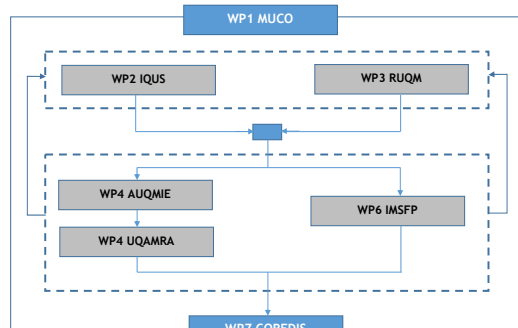
Objective of the MUSA project

Assess the capability of SA codes when modelling reactor/ SFP accident scenarios of GEN II, GEN III designs

- Identification of UQ methodologies to be employed, with emphasis on the effect of existing and innovative SA Management measures on the accident progression, particularly those related to the ST mitigation
- Determination of the state-of-the-art capability of SA codes regarding to prediction of the ST that potentially may be released to the environment, and to the quantification of the associated code’s uncertainties applied to SA sequences in NPPs and Spent Fuel Pools (SFP)

MUSA Work Packages WP

- WP1 MUSA COordination (MUCO), coordinated by CIEMAT**
- WP2 Identification & Quantification of Uncertainty Sources (IQUS), coordinated by GRS**
- WP3 Review of Uncertainty Quantification Methods (RUQM), coordinated by KIT**
- WP4 Application of Uncertainty Quantification Methods against Integral Experiments (AUQMIE) by ENEA**
- WP5 Uncertainty Quantification in the Analysis and Management of Reactor Accidents (UQAMRA) by JRC**
- WP6 Uncertainty Quantification and Innovative Management of SFP Accidents (IMSFP) by IRSN**
- WP7 COmmunication & REsults DIssemination (COREDIS), coordinated by UNIPI with the support of LGi for public communication activities**



Education and Training Activities

The “Education and Training” programme in MUSA inside WP7 is focusing on raising the competence level of university students (M.Sc. and Ph.D.), young researchers and engineers engaged somehow in SA

Towards this purpose the following main actions are in progress with some delays for the COVID-19 emergency:

- Production of a series of **public learning modules** compiling the major MUSA outcomes, including the assessment of ST uncertainties in Fukushima-like scenarios, to be published in the project website
- A **mobility exchange program** of European young researchers and M.Sc./Ph.D. students for training in the MUSA partners’ laboratories to enhance the dissemination of knowledge in the area of SA and Uncertainty tools (the **Mobility Manual**, explaining procedures and eligibility criteria, is available on MUSA website)
- Production of a lecture on “*Uncertainty Quantification in Severe Accident Analyses*” for the different international Courses that might be given on Severe Accidents and/or on “uncertainties”

Perspectives

- MUSA will mean a better exploitation of the research previously performed within the EU framework
- Over the years, reliable and experienced teams of modellers and analytical teams have been built-up, and MUSA is a unique opportunity to achieve a real feedback among them
- In addition, MUSA encourages cooperation in research, innovation, and young generation’s formation

MUSA will be an open results project for its importance on forthcoming SA analyses and on safety of NPPs