

L.E. Herranz (CIEMAT), S. Paci (UNIPI)

MUSA was founded in HORIZON 2020 EURATOM NFRP-2018 call on

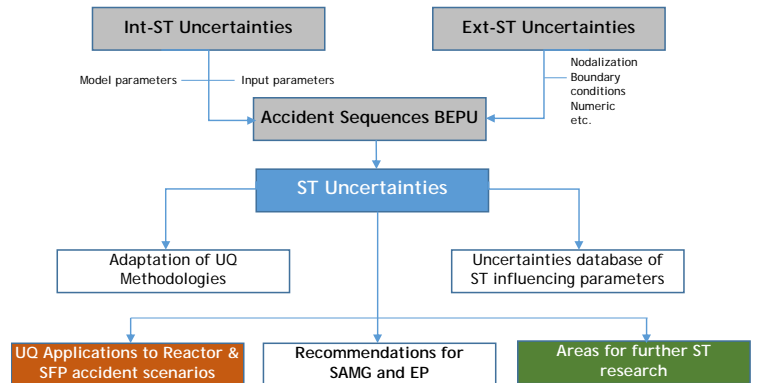
"Safety assessments to improve Accident Management strategies for Generation II and III reactors"

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

The dominant contribution of Severe Accidents (SA) to the risk of Nuclear Power Plants (NPP), the complexity of the processes taking place during these events and the inherent nature of numerical codes used to assess them, makes it **mandatory to quantify the uncertainties associated to their estimates.**

Even though mathematical tools for quantification of code uncertainties and sensitivities have been under development for many years, their application into the SA to Best Estimate (BE) system codes, has not been extensive nor systematic so far.

This is the challenge targeted in MUSA: **to move beyond the state-of-the-art and facilitate the adoption of Best Estimate Plus Uncertainty (BEPU) approach within the SA domain.** Special emphasis is to be given to Source Term (ST) related figures and the effect on uncertainties on Severe Accident Management (SAM). Both in-reactor and in-Spent Fuel Pools (SFP) scenarios are being addressed.

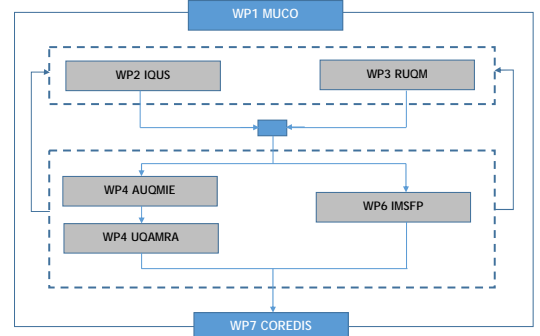


Objective of the MUSA project

- Identification of Uncertainty Quantification (UQ) methodologies to be employed, with emphasis on the effect of both existing and innovative Severe Accident Management (SAM) measures on the accident progression, particularly those measures related to the ST mitigation
- Determination of the state-of-the-art prediction capability of SA codes regarding the ST that potentially may be released to the external environment, and to the quantification of the associated code's uncertainties applied to SA sequences in NPPs and SFPs

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**



Dissemination of Knowledge

Special attention for knowledge transfer towards young researchers and Masters/PhD students

- Public learning modules to be published in the project open website
- Mobility programme under which students and young researchers go to internship programmes
- 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 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 an unique opportunity to achieve real feedback among them
- Recommendations for SAM Guidelines (SAMG) and Emergency Preparedness (EP)
- In addition, MUSA encourages cooperation in research, innovation and young generation's formation

Finally, MUSA will be an open results project for its importance on forthcoming SA analyses



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

MUSA Consortium
28 Organizations (25% non-EU)
4 years duration from June 2019
630 person months overall costs € 5,768,452.50

7 WP leaders



CONTACT:
Prof. L.E. Herranz
CIEMAT Madrid
luisen.herranz@ciemat.es