



MUSA

Management and Uncertainties of Severe Accidents - subjects and focal points of the project

L.E. Herranz (CIEMAT), S. Paci (UNIPI), I. Ivanov (TUS), P. Groudev (INRNE)



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



CIEMAT is the MUSA' coordinator

MUSA has the SNETP NUGENIA label that recognises the project' excellence

<h3>MUSA in Numbers</h3> <ul style="list-style-type: none"> ▶ 48 months ▶ Budget of € 5,768,452.50 ▶ 28 partners* ▶ 16 countries <p>*including partnerships with non-European institutions (Canada, China, Japan, South Korea and USA).</p>	<h3>MUSA Consortium Members</h3>	<h3>Project Governance</h3>
---	----------------------------------	-----------------------------

MUSA Objectives & Scope

- ▶ Assess the capability of the codes employed for the study of severe accidents when modelling accidental scenarios of existing and planned reactor designs
 - ▶ identification of methodologies to be employed for the Uncertainties Quantification (UQ)
 - ▶ determination of the state-of-the-art for codes' capability
 - ▶ quantification of the resulting uncertainties when these code are applied to severe accident sequences
- ▶ Emphasis will be on:
 - ▶ effects of possible actions for Severe Accident Management (SAM) to control the accident progression
 - ▶ mitigation of radioactive releases into the environment (Source Term)

Specific MUSA Impacts

- ▶ Assessment of the uncertainties affecting the radioactive releases (Source Term) in accident sequences that are relevant (risk dominant) for a specific nuclear plant
- ▶ Guidelines to systematic conduct these uncertainties analysis
- ▶ A database for helping the code users in the characterization of uncertainties related to the Source Term
- ▶ Insights into the key elements affecting an effective SAM implementation (i.e., time of a specific management action)
- ▶ Knowledge dissemination including Education and training actions

<http://musa-h2020.eu/>

MUSA Approach

Functional Structure

- WP1 MUSA Coordination**
- WP2 Identification & Quantification of Uncertainty**
- WP3 Review of Uncertainty Quantification Methods**
- WP4 Application of Uncertainty Quantification Methods against Integral Experiments**
- WP5 Uncertainty Quantification in the Analysis and Management of Reactor Accidents**
- WP6 Uncertainty Quantification and Innovative Management of SFP Accidents**
- WP7 Communication & Results Dissemination**

Knowledge Dissemination

- ▶ MUSA education and training activities target Masters and PhD students, as well as young researchers in the Source Term field
 - Public learning modules on MUSA major outcomes
 - Mobility exchange programme under which university students and young researchers go to internship programmes in MUSA laboratories
 - Production of an open access lecture on "Uncertainty Quantification in Severe Accident Analyses" for the different international courses that might be given on Severe Accidents and on "uncertainties"

Generic Expected Outcomes

- ▶ Close the open issues still present: uncertainties governing the Source Term estimates will be identified so that future research can reduce the predictions uncertainties
- ▶ Increase safety margins of nuclear power plants under operation
- ▶ Improve the emergency response measures and SAM strategies
- ▶ Enhance Nuclear Safety