Italian National Agency for New Technologies,
Energy and Sustainable Economic Development

CONTRIBUTION TO PLENARY IV: “RESEARCH AND INNOVATION SUPPORTING SAFETY, SECURITY AND SAFEGUARDS

FISA-EURADWASTE 2025 & SNETP Forum, Thursday, May 15, 9:00-10:30

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INTRODUCTION

- **Fulvio Mascari** holds a Master's Degree in **Nuclear Engineering (2006)** and the **doctorate PhD in "Nuclear, Chemical and Safety Technology" (2010)** at the University of Palermo
- **He has been a researcher at ENEA (Italy)** since 2013, with expertise in **nuclear safety**, particularly in **deterministic safety analyses**
- ENEA is the National Agency for New Technologies, Energy and Sustainable Economic Development, a public body aimed at research, technological innovation and the provision of advanced services to enterprises, public administration and citizens in the sectors of energy, the environment and sustainable economic development (article 4, Law no. 22 of 28 December 2015)
- He is specialist in **thermal-hydraulics**, **severe accidents**, **scaling issue**, **passive safety systems, code validation, SMR, and BEPU.** He is expert in the **use of state-of-art computational deterministic safety analyses tool** such as RELAP5, TRACE, ASTEC, MELCOR.
- **He is involved in several collaborative activities:**
  - **Coordinator** of the Horizon Euratom **SASPAM-SA project;**
  - **WP Leader** in several EURATOM projects: **MUSA, R2CA, EASI-SMR, ASSAS**
  - Active in **SNETP**, **IAEA**, **OECD/NEA (WGAMA)**, **CAMP**, **CSARP**, **ETSON** activities, etc

RESEARCH: THE ENGINE OF NUCLEAR SAFETY ENHANCEMENT AND ROLE OF EURATOM

- **Research** contributes to **enhancing the safety of operating reactors** and supports the **continuous development** and **robust demonstration** of the safety features and approach in **advanced technologies**.

- **EURATOM funds nuclear research to:**
  - Ensure a safe, sustainable, and competitive nuclear sector;
  - Support the Green Deal and energy independence;
  - Strengthen European leadership in nuclear innovation.

- **Strategic Keywords:** Safety, Net-Zero, Competitiveness, Independence, Collaboration, Excellence, Skills, Innovation, Sustainability, Together

SMRS & AMRS: CONTRIBUTION TO SHORT AND MEDIUM-TERM NUCLEAR TECHNOLOGY DEPLOYMENT

- **SMRs & AMRs can be one of the key options** for the short and medium-term deployment of nuclear technology for their advantageous features: e.g. inherent safety, design simplicity, lower core inventory, modularization and manufacturability, enhanced flexibility, etc

- **Over 15 Projects EURATOM-funded projects**
  - Light Water SMRs (tangible impacts expected by 2025–2030): ELSMOR, McSAFER, SASPAM-SA, EASI-SMR, SANE
  - Innovative Reactors (tangible impacts expected after 2025): GEMINI Plus, ECC-SMART, GEMINI for zero emission, TREASURE, LESTO, ANSELMUS, ESFR-SIMPLE, MIMOSA, ENDURANCE
  - Hybrid projects: TANDEM, HARMONISE

- **Topics addressed** include passive safety systems, accident scenarios identification and analyses (including severe accidents), advanced fuels, fast reactors, hybrid energy systems, licensing harmonisation, multi-physics and multi-scale modeling techniques, experimental research, validation of computational tools, potential of AI in accident analyses, etc .

- **EURATOM-funded projects contribute to GIF activities** and foster interaction with industry.

- **TOGETHER:** EURATOM turns European collaboration into credible, innovative and sustainable nuclear solutions, while also strengthening skills and fostering scientific excellence across generations.

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