ENHANCING SEVERE ACCIDENT MANAGEMENT THROUGH RESEARCH

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Since the Three Mile Island accident, the main target of severe accident (SA) research was to achieve a thorough understanding of phenomena governing accident unfolding. Based on such knowledge, the analytical tools used for safety analysis have been improved extensively in the last decades. After the Fukushima Dajichi accident, a new wave of research projects was sparked with a higher ambition: to enhance accident management. This is the case of MUSA (Management and Uncertainties of Severe Accidents), AMHYCO (Towards and enhanced Accident Management of the H₂ and CO combustion risk) and SOCRATES (Assessment of liquid Source Term for accidental post management phase). All the three projects devised to support accident management from a different perspective. MUSA has explored an innovative analytical approach by bringing uncertainties quantification in the severe accident analysis so that sounder insights into the effect and timing of accident management actions can be gained. AMHYCO has challenged the actions foreseen for combustion risk management by systematically investigating the complementarity of lumped-parameter, 3D and CFD (Computational Fluid Dynamics) simulation approaches when used in an accident environment, including safety systems, and by adding further experimental data on recombination and combustion of H₂ and CO gas mixtures and carbon monoxide (CO). Finally, SOCRATES is planned to hit accident management related to liquid source terms even in the long-run of the accident by obtaining data on physical and chemical interactions of fission products in aqueous contaminated systems, including potential mitigating absorbent materials.

This paper discusses the major impacts that these project outcomes might bring up for a better accident management.

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