

A Summary of Findings From the Coolability and Concrete Interaction (MCCI-1) Program

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Abstract – The first phase of the OECD-sponsored Melt Coolability and Concrete Interaction (MCCI) program has been successfully completed. Key elements of this program included the conduct of reactor material experiments and associated analysis with the objectives of resolving the ex-vessel debris coolability issue, and to address remaining uncertainties related to long-term two-dimensional molten core-concrete interactions under both wet and dry cavity conditions. Achievement of these two objectives will demonstrate the efficacy of severe accident management guidelines for existing plants, and provide the technical basis for better containment designs for future plants. During the program, a total of eight separate effects tests were conducted to provide data on various core debris cooling mechanisms. In addition, three large scale integral tests were conducted to provide data on long-term two-dimensional core-concrete interaction under both wet and dry cavity conditions. These tests provided a broad database to support the development and validation of models and codes that can be used to extrapolate to plant conditions. This paper provides a summary overview of key experiment results obtained during the program. A discussion is then provided that describes the ramifications of the test results on debris coolability at plant scale. Finally, planned testing in the recently launched MCCI-2 program is summarized.