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CSN I Technical Opinion Paper

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Applications using computational fluid dynamics (CFD) are gaining interest as complementary methods to evaluate nuclear reactor safety (NRS) cases implying thermo-fluid dynamics. CFD resolves a higher level of phenomenological detail compared to the established system-scale tools. While this appears promising, it also raises new questions in the valuation and integration of CFD-based safety studies, which are still limited to a relatively small number of applications. For this reason, and given that the development of CFD is a fast-evolving and relatively recent activity in nuclear safety, the CFD Task Group (CFDTG), which is part of the Working Group on Analysis and Management of Accidents of the NEA's Committee for the Safety of Nuclear Installations, has been conducting collaborative work in this field since 2002. This Technical Opinion Paper aims to provide the nuclear safety community with a clear picture of the current uses and capabilities of CFD. It also outlines the main challenges hindering greater use of CFD in nuclear safety studies and discusses ways to overcome them.