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Release-Category-Based Emergency Planning Zone Calculation Applied to a Light-Water Small Modular Reactor Design

Emergency Planning Zones (EPZs) are areas around a nuclear or radiological facility where arrangements to protect the public in case of nuclear emergency are planned. This paper presents and discusses the calculation of EPZ distances based on a novel approach for the analytical identification and classification of the source term for accidents with total or partial fuel damage. This approach is deterministic in so far as it starts with the postulation of a set of Plant Damage States (PDSs, rather than frequency-based). This approach is complemented by a methodological application for the analysis of the accident progression based on the facility response assessment, similar to the logic behind Containment Event Trees. Such extension to the deterministic postulation of PDSs stems from the recognition that deterministic approaches may lead to incompleteness in the selection of accident scenarios due to strongly relying on expert judgement. The case study applies to a 300 MWe integral Pressurized Water Reactor SMR, which is one of the two selected designs by the European-Union-funded SASPAM-SA project.

Country OR International Organization

European Commission Joint Research Centre

Email address

antonio.guglielmelli@ec.europa.eu

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Authors: DE LA ROSA BLUL, Juan Carlos (European Commission Joint Research Centre); Dr GUGLIELMELLI, Antonio (European Commission Joint Research Centre)

Presenter: Dr GUGLIELMELLI, Antonio (European Commission Joint Research Centre)

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