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Novel design features of proposed light-water SMRs —a Swedish perspective

Deployment of land-based light-water SMRs is one of the options considered for adding new nuclear capacity in Sweden. In comparison with the currently and previously operating Swedish reactors, the proposed SMR designs entail a number of novel features. In this ongoing work such novelties are being identified and the need for further research is evaluated.

A shortlist of five SMRs, one BWR and four PWRs, that are deemed the most probable to be constructed in Sweden in the relatively near future has been compiled. Notable technical differences compared with the Swedish reactor fleet include:

- Novel passive approaches to safety
- Novel containment designs
- Integral PWR designs
- Boron-free PWR coolant
- Increased load-following capability

Some of the features have not been widely tested in commercial reactors. There is thus a need to verify the adequate functionality of these novelties, both experimentally and theoretically. Other of the features are already utilised in reactors outside Sweden. The need to investigate them from a technical perspective is thus not as high as for the untested ones. However, there might still be regulatory aspects to consider before being able to implement them in Sweden. This poster will present critical investigation needs related to the novelties to enable licensing, construction, and operation of the shortlisted SMRs.

Country OR International Organization

Sweden

Email address

ejoha@chalmers.se

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Author: ERIKSSON, Johan (Nuclear Chemistry, Chalmers University of Technology)

Co-author: RETEGAN VOLLMER, Teodora (Nuclear Chemistry, Chalmers University of Technology)

Presenter: ERIKSSON, Johan (Nuclear Chemistry, Chalmers University of Technology)

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