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Systems Thinking Based on the'Linglong 1' Operational Readiness Study

Abstract: The world's first "Linglong-1" reactor, as a SMR, has operational characteristics that are different from those of conventional large pressurised water reactors (PWRs). As the department responsible for the production and operation of SMR, it is facing new and unknown challenges. In order to reduce the construction period, make adequate preparations, and improve the safety and stability of the SMR after commercial operation, it is necessary to intervene in the construction of the SMR in advance. Therefore, how to carry out preparatory work for the operation of small reactors is a major topic that needs to be studied.
Based on the concepts of systematic thinking and top-level design, this paper, from the perspective of operational readiness, firstly clarifies the goal needed to be achieved and analyses what should be done around this goal, forming a guiding framework and a standardized process. Secondly, according to the above framework and process, the efforts made by the operation department to achieve the goal and the results and values achieved are elaborated in detail in terms of personnel preparation, design participation, engineering participation, commissioning participation, technical research, document preparation, and co-operation. Finally, the current work is summarised and reflected upon, and optimisation and improvement of the next work content is proposed. The research in this paper has reference value for the operation of subsequent small reactors, which is conducive to improving the safety and economy of small reactors.

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