

Advanced Modular Nuclear Reactors & Their Application in The Kingdom's Energy Sector

Advanced modular nuclear reactors, commonly known as small modular reactors (SMRs) are new compact reactor designs, that produce considerably less power than conventional reactors, in exchange for faster, scalable and highly flexible deployments. In addition to the before mentioned aspects, these systems aim to retain and potentially enhance on all mandatory safety & reliability features, found in conventional reactors.

The objective of introducing modularity in the nuclear engineering sector, is mainly to overcome several constraints associated with massive scale energy projects, that involve huge capital costs, long span engineering cycles and large number of human work force. These reactor designs are proposed to be -pre-built in factories following a selected universal design, where the power rating and scale can be determined and adjusted by selecting the number of modules in service at a given time frame. This type of implementation, can alleviate few risks associated with uncertainty in energy and power system planning, such as the risk of over investing and excessive future proofing.

Finally, this paper will explore in depth the application of small modular reactors in the kingdom's energy sector, in terms of their safety, reliability, sustainability and economic feasibility

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