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Keynote Paper

New concepts for ocean nuclear power plants

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ABSTRACT

We present recently developed new concepts for ocean nuclear power plants (ONPPs) using gravity based structures (GBS) and tension leg platforms (TLP) [1-3]. For GBS-type ONPPs, the large nuclear reactor (APR 1400) and the small and medium nuclear reactors (SMART) are mounted, respectively. For TLP-type ONPP, SMART is mounted. We introduce basic design concepts including new general arrangements (GAs) obtained through a modular design method. Integrated passive safety system (IPSS) is applied to enhance their safety. In order to evaluate their safety and stability, fully coupled dynamic analysis considering GBS-seawater-soil interaction is performed for GBS-type ONPP, and hydrostatic and dynamic analyses are conducted for TLP-type ONPP. We believe that ONPPs are the next generation nuclear power plants with enhanced safety useful for mankind.

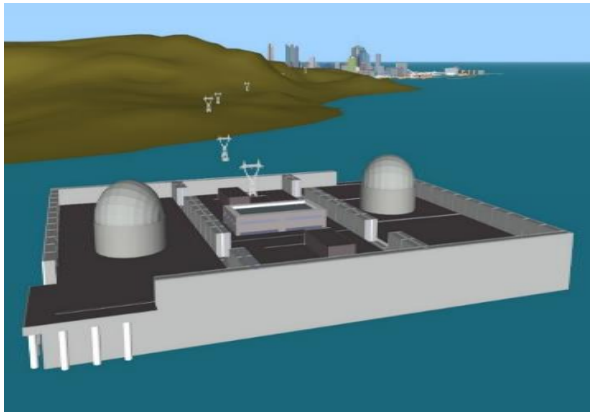

Fig. 1. GBS-type ONPP.

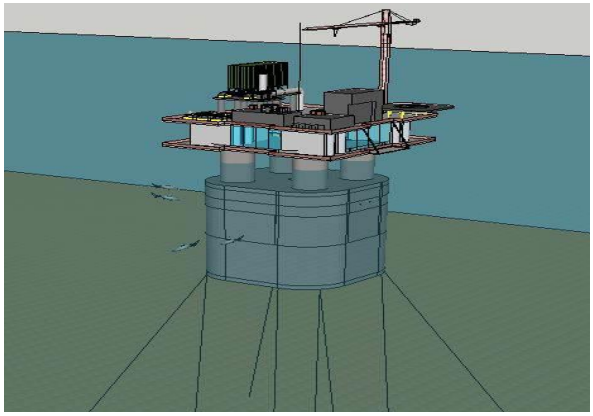

Fig. 2. TLP-type ONPP.