IP-10

Holtec SMR-300: From First-of-a-Kind Deployment to Global Fleet Readiness

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Holtec's SMR-300 is an advanced Gen III+ small modular reactor incorporating passive safety features and based on proven PWR technology, commercially available fuel, and established licensing frameworks. The design emphasizes inherent safety, constructability, and economic performance to support scalable fleet deployment.

Technical Highlights:

- High power density core; dual-unit configuration rated at over 680 MWe net output.
- Fully passive safety systems enabling walk-away safety (no off-site power, no off-site water, no immediate operator action) and simplified plant architecture.
- Exclusion Area Boundary, Low Population Zone, and Emergency Planning Zone contained within the Protected Area, supporting flexible siting near industrial or urban demand centres.
- Hybrid and fully air-cooled condenser options enabling deployment in water-constrained regions.
- High secondary steam superheat suitable for non-electrical applications.

SMR-300 is progressing toward construction readiness after more than 10 years of development. Major Nuclear Island design activities—including NSSS, containment, and passive safety systems—have been completed. Part 1 of the Construction Permit Application (CPA) was submitted to the U.S. NRC in December 2025 after extensive pre-application engagement initiated in 2019. In parallel, the design is undergoing the UK Generic Design Assessment (GDA), having completed Step 1 and progressing through Step 2, providing cross-validation of the safety case and alignment with European standards. Continuous regulatory engagement supports licensing predictability and construction efficiency.

The program builds on the First-of-a-Kind SMR-300 project at Palisades (Michigan, USA), scheduled for commercial operation in 2031. Engineering, licensing, long-lead procurement, and site preparation are underway. Palisades will serve as a reference plant supporting licensing, modular construction, supply chain qualification, and cost optimization for global fleet deployment. Manufacturing readiness is backed by Holtec's integrated U.S. industrial base.

Delivery is executed through a world-class consortium including Hyundai E&C (EPC), Framatome (fuel, licensing support and first core), and Mitsubishi Electric (I&C) under a turnkey, fixed-price model.

The SMR-300 represents a construction-ready and licensable pathway for secure, clean, and scalable nuclear generation.

Keywords: *Small Modular Reactor, Passive Safety Systems, Flexibility, Low Risk Licensing Approach, Turnkey Delivery Model, Non-Electrical Applications*