

A Key Topical Report on SMR-160 Submitted to the USNRC

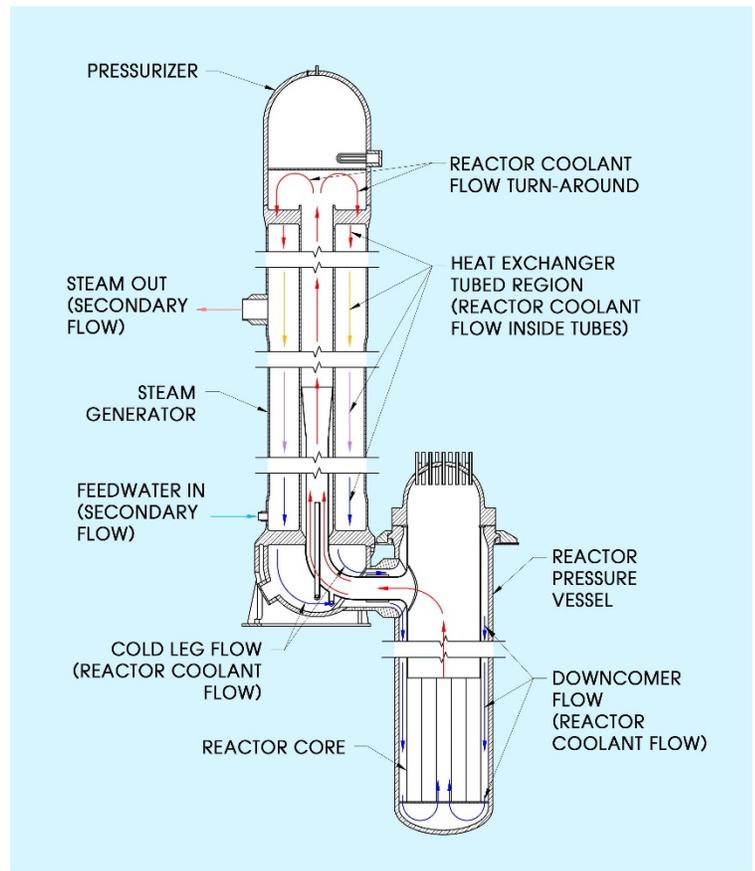
In a key milestone for the advancement of the SMR-160 Small Modular Reactor, Holtec International submitted the first of five planned Topical Reports on December 21, 2020 to the U.S. Nuclear Regulatory Commission (USNRC). This report demonstrates the innate safety of the reactor under any credible loss-of-coolant-accident (LOCA). In particular, the case of a “large break LOCA,” which theoretically requires evaluation in standard designs of light water nuclear reactors, is shown to be physically impossible for our reactor’s pressure retention boundary. As the illustration on this page shows, the Reactor Pressure Vessel, the Steam Generator and the Pressurizer form a single reactor pressure vessel assemblage *without any intervening piping* and all interfaces are made of heavy forgings welded to each other through full thickness welds designed and manufactured to the highest American Society of Mechanical Engineers (ASME) nuclear code.

In addition to presenting the self-evident basis for the elimination of the large break LOCA from safety considerations, this Topical Report unveils the gravity-actuated operation of the Reactor Coolant System (RCS) and the other safety systems of the SMR-160, which are engineered to annul the impact of a breakage of any piping in the containment building without the recourse to any pumps and motors. These passive cooling systems are at the heart of the SMR-160 design that undergird its promise of guaranteed safety under the various hypothetical accident scenarios that can be conceived to afflict the plant.

This submission also evaluates the current regulations, General Design Criteria and guidance applicable to LOCAs, and establishes plant specific acceptance criteria for the LOCA events, an important enabler to expedite future licensing efforts.

“This submittal is a key step in demonstrating to the regulator, our stakeholders and the public of the robust innovative design and safety systems that make Holtec’s SMR-160 the future of safe, clean and efficient energy for our nation and the world,” said Holtec’s President and Chief Executive Officer, Dr. Kris Singh.

The SMR-160 is a light-water based pressurized small modular reactor, which generates 160 MWe (525 MWth). The essential differentiator of the design is its absolute safety, which is essential to garnering public support and regulatory approval for diversified applications and distributed generation. Unlike today’s operating plants, the SMR-160 is designed such that all



Holtec’s SMR-160 Reactor Coolant System Has No Pumps or Valves

the cooling water needed for safe shutdown of the plant, under even the most severe accident scenarios, is housed within the plant to protect the reactor from overheating. The plant safety systems that access the plant's cooling water reserve are passive, meaning they operate under the force of gravity to enable cooling of the heat generated from reactor operations. In short, the safety of SMR-160 is assured under all conceivable accident events acting in concert in any combination.

The NRC submittal marks another significant milestone for Holtec's SMR-160. Last week, the U.S. Department of Energy (DOE) awarded a grant valued at \$147.5 million (DOE share is \$116 million with Holtec's investment share being \$31.5 million) to support further development of the SMR-160. To date, Holtec has invested \$400 million on the SMR-160 program.

Earlier this year, the SMR-160 completed Phase 1 of the Canadian Nuclear Safety Commission (CNSC) "Pre-Licensing Review of a Vendor's Reactor Design." A Vendor Design Review (VDR) is an assessment service CNSC provides to nuclear power plant designers. The CNSC staff concluded that "overall, SMR, LLC understands and has correctly interpreted the high-level intent of CNSC's regulatory requirements for the design of nuclear power plants in Canada pertaining to the scope of the Phase 1 VDR."