

# HOLTEC HIGHLIGHTS

A Summary Report to Our Clients, Suppliers, and Company Personnel

## Three Decades of Relentless Drive for Technology Improvement Cements Holtec's Role as the World's Preeminent Fuel Rack Supplier

Holtec has continued its technology leadership in the wet storage of nuclear fuel this past year with new contracts for development of high density racks for the latest generation reactors (APR-1400 and ABWR), for capacity expansion at operating plants, and for site construction services in which the Company has a storied past of heroic achievements going back to the 1980's. A new milestone in site services was reached last month when the Company successfully de-gassed storage cells at a U.S. Nuclear Plant using remote means, liberating eight (8) used fuel assemblies that had lain entrapped in constricted storage cells for decades. Other pioneering undertakings in 2012 included analyses (and technical solutions, as needed) of Fukushima inspired events such as severe earthquakes, boron dilution, postulated loss of water, and energy impacts of wind born projectiles entering the spent fuel pool. A new passive pool cooling technology, named HI-COOL, was also developed for retrofit at operating plants.

The contracts initiated in 2012 include the APR-1400 for Barakah Units 1-4 under construction in the United Arab Emirates. Under an agreement signed with Toshiba America Nuclear Energy Corporation (TANE), Holtec will leverage its high seismic fuel rack design and analysis methodology to develop freestanding storage racks for the Combined Operating License Application (COLA) for South Texas Project Units 3 & 4. A similar agreement with Westinghouse a few years ago has led to the design and licensing of high density racks for AP-1000 followed by (the ongoing) supply of rack modules for VC Summer Units 2 & 3, Vogtle Units 3 & 4, and four (4) AP-1000 plants in China (see photo). Separately, the Company is carrying out the development of a state-of-the-art rack design for MHI's US-APWR design certification.

Holtec has supplied wet storage racks to some 95 nuclear units in the US and almost one quarter of all operating plants in the world. The number of storage cells installed in the world's fuel pools exceeds 170,000 at the time of this writing.



AP-1000 (Region I) Rack Module  
Fabricated at Holtec Manufacturing Division  
(HMD) for Vogtle NPP



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This market dominance has been sustained by a string of technical innovations in all facets of fuel rack technology over the past quarter century. Among the notable hardware achievements is the introduction of industry's (first porosity-free) metal matrix composite, Metamic<sup>®</sup>, at the turn of the century that has become the industry's mainstay for reactivity control. Metamic has earned this status by permanently eliminating the risk of neutron absorber degradation and off-gassing that had plagued fuel racks since the inception of the high density racks in the late 1970s.

Experimentally validated dynamic simulation of the entire array of underwater free standing racks in a single dynamic model introduced in 1989, known as the Whole-Pool-Multi-Rack Analysis, is another vital technology bequeathed to industry by Holtec's R&D, which has become an indispensable means for safety analysis of densely arrayed racks in fuel pools.

Similar pioneering analysis techniques for critically safety analysis and for analysis of beyond-design-basis accidents such as loss of pool water, uncontrolled lowering of loads in the pool, missile impact, and the like spawned by Fukushima, have been deployed to serve our clients needs around the world. Our decades-long drive to ensure that our clients' in-plant fuel storage meets the most stringent criteria of safety will continue as we move forward into 2013.



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