US Nuclear Reactor Manufacturers

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1. Introduction

Your author started his career in the Nuclear Industry, but after a few years of hearing about this sector's impending demise, I decided to move my career to a different sector. I believe this was a good move, considering the five decades of history between then and now. Nevertheless, I have always supported the Nuclear Industry, and feel it is an important and probably-necessary component in the overall U.S. Energy Industry.

Strange things happen occasionally, like today (July 29). I am in various stages of completion for several posts on nuclear power (this is the first time that has happened in several years). At some time in composing one of those posts, I researched the Three-Mile Island Incident. When I took a lunch break today, I turned on the TV to the Discovery Channel, and there was a program on, yes, the Three-Mile Island (TMI) Incident. In nuclear power plants like Three-Mile Island, there are at least three barriers, plus at least two emergency cooling systems between any major accident (like a loss of cooling (LOC) incident) and any release of radioactive material to the environment. The TMI LOC incident in 1979 breached two of the three barriers while utilizing all utilizing all of their emergency-cooling systems. Only the final (outer containment-building) held and saved this accident from emitting a huge quantity of radioactive gasses and particulates.[1] This would have caused the area for 10 to 15 miles around TMI to become uninhabitable for many months, even with heroic cleanup efforts. See the map on the top of page 2 of this paper. TMI is in the Susquehanna River. Elizabethtown is about 5 miles to the east of TMI.

I recently decided to revisit this industry with this paper, and see what the latest status is. To a certain extent, I was met with quite a bit chaos and confusion, but also perhaps a small glimmer of hope.

In another earlier post referenced below I focused on early prototype reactor designs. In this post we will focus on Reactor Manufacturers.

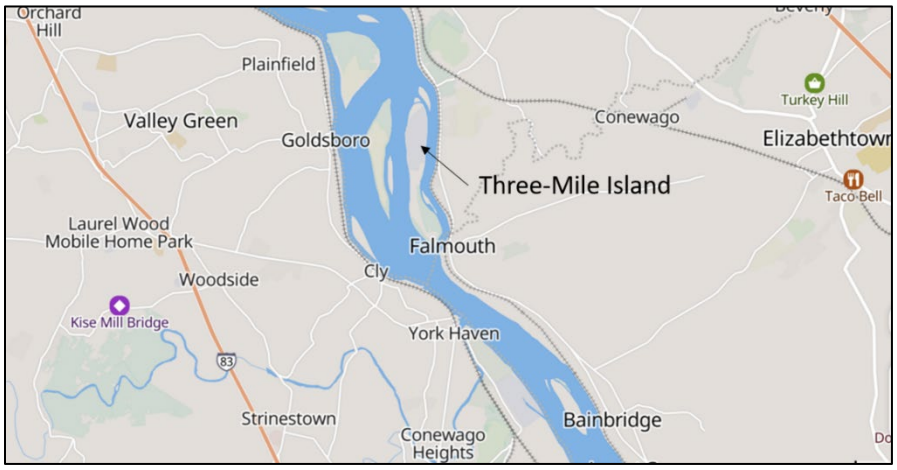
A Reactor Baby Boom -- posted on July 28

https://www.energycentral.com/nuclear/post/a-reactor-baby-boom-wLxZbi278m6JILc

2. Reactor Manufacturers (RMs)

I initially identified five active (or sort of active) U.S. Nuclear Reactor Manufacturers (RMs), two of which are being built on the bones of former industry-leading RMs. I will let you read their current status below. Note that rather than noting the primary references with footnotes as I usually do, I will put the (one or more) primary references' links at the beginning of each subsection, since each section's subject/title and the link(s) are about/to the section's RM.

[1] Wikipedia Article on the Three Mile Island accident, https://en.wikipedia.org/wiki/Three_Mile_Island_accident



2.1. Radiant Nuclear

https://www.radiantnuclear.com/blog/about

Radiant is a clean energy startup building a nuclear microreactor. *A climate-friendly alternative to diesel generators, Radiant's Kaleidos 1MW microreactor will be the world's first portable, zero-emissions power source that works anywhere.* They plan to test their development reactor by 2026 and if successful, it will be the first new commercial reactor design to achieve a fueled test in over 50 years. *"Our microreactor can bring power to remote parts of the world and provide backup power for life-saving applications in hospitals or disaster-relief scenarios."*

Radiant uses helium to transfer heat from the core and this gas (per Radiant) does not become radioactive by being exposed to neutron flux, eliminating the impact of leaks.

I believe that the Radiant Kaleidos microreactor uses thermo-electric generation to provide power, and can provide thermal energy via its circulating helium.

TRISO fuel, ceramic coated uranium particles, have been used in more than 30 grid-scale reactors since the 1960s.

Tri-structural isotropic (TRISO) fuel is a form of micro-particle nuclear fuel. Each particle consists of a kernel of uranium dioxide (UO_2) fuel (sometimes UC or UCO), which has been coated with four layers of three isotropic materials deposited through fluidized-bed chemical vapor deposition. TRISO fuel particles are designed not to crack from thermal or mechanical stresses at temperatures up to 1600 °C, and therefore can contain the radioactive fission products even during severe accidents.[2]

Kaleidos are assembled, fueled, and tested in the factory for streamlined deployment. The unit is delivered via truck on highway routes or delivery can be expedited by aircraft. No site excavation is required, Kaleidos is lowered from the truck and achieves full power the next day.

Hundreds of units can operate with data streaming back to Radiant's centralized 24/7 fleet monitoring system tracking the health of each reactor. After 5 or more years of operation the fuel is depleted, and the entire container can be shipped back for refueling. Kaleidos can be fueled a total of 4 times for a 20-year product lifetime.

Kaleidos Reactor Systems can be purchased through PPAs or direct unit sales.

[2] Wikipedia article on TRISO fuel. https://en.wikipedia.org/wiki/TRISO_fuel

2.1.1. Latest News from Radiant Nuclear

Although most of their website[3] wasn't real-current their News Area was. The News report from late this July is below.

DOE Selects Radiant for Second HALEU Allocation to Support First Commercial Microreactor at a U.S. Military Installation[4]

July 23rd, 2026 – Radiant, the company on the forefront of pioneering the world's first portable mass-produced nuclear microreactor, today announced that the U.S. Department of Energy (DOE) has conditionally selected the company to receive a second allocation of high-assay low-enriched uranium (HALEU). The allocation is intended to fuel Radiant's microreactor for the Department of the Air Force's Buckley Space Force Base in Aurora, Colorado, which will be delivered by 2028.

Radiant was the sole private-sector recipient in DOE's third round of HALEU allocations, named alongside NASA — whose allocation will fuel its SR-1 Freedom mission to Mars.

"This second HALEU allocation moves us a step closer to turning Buckley's national security requirement for resilient power into an operational reality," said Dr. Rita Baranwal, Chief Nuclear Officer of Radiant. "America's most important national security missions need power that remains available when the grid is disrupted, fuel supply lines are strained, or conventional infrastructure is vulnerable. DOE is helping put the fuel pathway in place for Radiant to deliver that resilience at Buckley."

The selection further advances the customer readiness of Kaleidos: a 1 MWe portable microreactor that delivers cost-effective power to commercial and government customers. In April 2026, the Department of the Air Force and the Defense Innovation Unit selected Radiant to develop and operate a microreactor at Buckley under the Advanced Nuclear Power for Installations initiative, with the first Kaleidos reactors planned for delivery in 2028. For Buckley, Kaleidos is intended to provide the sustained, uninterrupted energy needed to support installation resilience and mission readiness.

"Today's allocations spotlight the importance of fueling advanced nuclear reactors for space exploration and national security," said Assistant Secretary for Nuclear Energy Ted Garrish. "The U.S. Department of Energy's HALEU Availability Program is an important stepping-stone for the nuclear industry as we work to establish a domestic nuclear fuel supply in support of the American nuclear renaissance."

DOE previously selected Radiant for a HALEU allocation supporting its planned Kaleidos Development Unit test at Idaho National Laboratory based on prioritization criteria established through the program. Taken together, the two allocations support Radiant's mission of creating a clear path to put advanced American nuclear technology to work where dependable power matters most. Radiant is on track to meet the President's executive order of having nuclear power turn on at a military installation by 2028.

About Radiant

Radiant is a leading developer of advanced nuclear technologies focused on delivering reliable, resilient, and scalable energy solutions that are transportable by land, sea and air. Radiant is committed to enabling a new generation of nuclear applications for commercial, industrial, and defense customers.

[3] https://www.radiantnuclear.com/
[4] https://www.radiantnuclear.com/blog/

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2.2. GE Vernova Hitachi Nuclear Energy

https://en.wikipedia.org/wiki/GE_Vernova_Hitachi_Nuclear_Energy

https://www.gevernova.com/nuclear

For more than 60 years, GE Vernova Hitachi Nuclear Energy (GVH) has advanced nuclear technology to power communities worldwide. Today, we are redefining carbon-free generation with the innovative BWRX-300 small modular reactor (SMR), supported by our expertise in nuclear fuel and services.

GE Vernova Hitachi's (GVH) BWRX-300 is not a concept, a plan, or a PowerPoint. It's now under construction. Its configuration, based on proven technologies, has been selected for the leading project in the Western world with construction underway in Canada on the first BWRX-300. Construction of the first unit is estimated to be completed by the end of 2029 and in commercial operation by the end of 2030.[5]

2.3. UniStar Nuclear Energy

https://en.wikipedia.org/wiki/UniStar

Note that UniStar only has one project under development, Calvert Cliffs Unit 3 in Maryland - the reference plant for the Areva, U.S. EPR design. The U.S. EPR is an evolutionary pressurized-water reactor (PWR). The Nuclear Regulatory Commission is currently reviewing UniStar's Combined License (COL) application for this facility. UniStar is also assisting PPL Corporation with the development of their Bell Bend Unit 1 project, which is also a U.S. EPR design.

I would not consider UniStar a Reactor Manufacturer (RM), since they appear to use an Areva Reactor, and Areva thus would the RM.

2.4. Westinghouse Electric Company

https://en.wikipedia.org/wiki/Westinghouse_Electric_Company

Another deeply troubled company:

On 29 March 2017, Toshiba's Westinghouse filed for Chapter 11 bankruptcy, citing a yearly loss for Toshiba that could exceed $9 billion, almost 3-times its previous estimate.

The projects responsible for this loss were mostly the construction of four AP1000 reactors at Vogtle in Georgia and Virgil C. Summer Nuclear Generating Station in South Carolina. The Wall Street Journal reported that the four nuclear reactors being built in the southeastern U.S. would be left to an unknown fate.

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[5] GE Vernova Hitachi's BWRX-300 small modular reactor (SMR) is the world's first SMR in the Western Hemisphere, with its first unit under construction at Ontario Power Generation's Darlington site in Canada.
Construction approval: The Province of Ontario and OPG approved construction in May 2025, with early site preparation completed GE Vernova+1.
Completion of first unit: Estimated by the end of 2029 GE Vernova+1.
Commercial operation: Targeted for end of 2030 GE Vernova+1.
Total planned units: Four BWRX-300s at Darlington, with three more to be added in the future

On 6 April 2018, Toshiba announced the completion of the sale of Westinghouse's holding company to Brookfield Business Partners (a subsidiary of Canadian investment management company Brookfield Asset Management Inc.) and partners for $4.6bn.

In October 2022, Brookfield Renewable Partners (another subsidiary of Brookfield Asset Management) and Cameco announced the acquisition of Westinghouse Electric from Brookfield Business Partners in a US$7.9 billion deal including debt. Brookfield Renewable and its institutional partners will own a 51% interest in Westinghouse, while Cameco will own the remaining 49% as part of the deal. The acquisition was completed in November 2023.

In October 2025, Westinghouse announced an agreement with the Trump Administration to begin plans for $80 billion in new nuclear reactors throughout the United States, including AP1000 and AP300 models.

2.5. Holtec International

https://holtecinternational.com/products-and-services/smr/

Holtec International, a world leader in nuclear energy technology, advanced manufacturing and nuclear plant decommissioning, is pleased to announce its pivotal role in the Green River Advanced Nuclear Project, a transformative initiative advancing Utah's clean energy goals under Operation Gigawatt. This project leverages the innovative Holtec SMR-300 Small Modular Reactor technology, supporting reliable, carbon-free power generation tailored for the region's needs.

The Holtec SMR-300 stands out with its advanced design rooted in 80 years of proven pressurized water reactor technology. It offers a unique optional Air-Cooled Condenser (ACC) system, enabling operation in arid environments like Utah, where water resources are scarce. This flexibility means SMR-300 can effectively operate in desert climates, providing a reliable and environmentally responsible energy source.

Dr. Rick Springman, President of Holtec, summed up Holtec's vision for Utah: "With Holtec's restart of Palisades Nuclear plant in Michigan ongoing, the first two Holtec SMR-300s in the NRC licensing process and early site preparation, the work by our partners to acquire sites for next-of-kind deployment in Utah is paramount to our Mountain West expansion strategy. Supply chain development follows reactor deployments, making the advancement of this project crucial to downstream supply chain investments in the state across the nuclear ecosystem..."

The Green River site, benefiting from extensive environmental and technical analysis including meteorological, seismic, and groundwater studies, also offers important logistical advantages such as existing water rights, access to the Union Pacific railway, proximity to I-70, and multi-market transmission opportunities…[6]

[6] May 28, 2026, Holtec International is pleased to announce its role in the Green River Advanced Nuclear Project, a transformative initiative advancing Utah's clean energy goals under Operation Gigawatt. This project leverages the innovative Holtec SMR-300 Small Modular Reactor technology, supporting reliable, carbon-free power generation tailored for the region's needs. https://holtecinternational.com/hh-41-08/

The project will progress through federal licensing and toward reactor deployment, under an exclusive arrangement with Holtec to supply the SMR-300 advanced nuclear power plant. Hyundai E&C, Holtec's global construction partner, will join the project with Holtec following closure of key project development milestones and associated funding arrangements. Holtec is also supporting Fulcrum's Brigham City project under development in Utah, setting up the framework for a potential SMR-300 fleet deployment across the state.