

# Holtec International, A Major Nuclear Firm

*By John Benson*

*August 2025*

## 1. Introduction

No, Holtec was not on my radar until a few days ago either. Then I saw a brief piece, and started drilling into various sites, and found that they are a really major force in the U.S. Nuclear Industry, but one without a major-name grandfather (like GE or Westinghouse). However, their story is complicated, so I decided to parse it and write this paper.

So, let's start at the beginning...

## 2. History

*Holtec International was founded in 1986 by Dr. Kris Singh with small capital and big ambition. Intending to be an innovation-focused enterprise, the Company adopted the motto "A Generation Ahead by Design." During its first year of business, the Company had five personnel operating out of an office in Mount Laurel, NJ. The following year, the Company added a second operation center in Palm Harbor, Florida led by the eminent nuclear physicist Dr. Stanley Turner (1926-2010). Holtec's initial business was focused on developing innovative solutions to power plants' operating problems, such as flow induced vibration and corrosion in heat exchange equipment. Holtec also worked diligently toward solving the emerging on-site fuel storage challenge facing nuclear power plants. Special industrial, patent-protected products such as "anti-vibration stakes" and "non-segmental baffles" were introduced to solve operating problems in tubular heat exchangers of all types, including feedwater heaters, surface condensers, and steam generators, with great success. These 1980s era innovations are still in demand in the heat exchanger industry.<sup>1</sup>*

**Author's comment:** since I worked in the nuclear industry until 1980, I'm well aware of the "...emerging on-site fuel storage challenge facing nuclear power plants." The issue was that, in the 1970s and 80s, the US nuclear industry never developed a method for central reprocessing of spent fuel, or even central storage of this highly-radioactive waste. At one time the "storage" facility was supposed to be developed at the Nevada Test Site (NTS), just north of Las Vegas (I've been to NTS), but due to political pressure (read: NAMBY), this facility was never developed. It's tough to do development when you have really rich neighbors.

However, spent nuclear fuel was continuing to accumulate at reactor sites. Initially, this needed to be stored in pools of water (yes, it was literally "hot"), but over a few years, as short-lived radioisotopes decayed, the spent fuels could be transferred in to "Dry Cask Storage," but still at reactor-sites. And there it sits today. However, someone needed to develop the wet storage, "Dry Casks" and the on-site storage systems, and that would be Holtec.

---

<sup>1</sup> Holtec International, Company, Corporate Overview, "Glimpses of Our Corporate History," ©2025  
<https://holtecinternational.com/company/corporate-overview/history/>

## **2.1. Wet Storage of Used Nuclear Fuel**

*Holtec soon saw an uptick in business from the wet storage industry for storing used fuel discharged by nuclear reactors. In the wake of the ban on reprocessing in 1979, used fuel had begun to fill nuclear plants' fuel pools threatening their continued operation. It was in the backdrop of this looming crisis that Holtec introduced the "detuned honeycomb high density fuel rack" technology. Central to this pioneering innovation was the theoretical formulation of the fluid coupling phenomenon and its experimental validation by another Holtec stalwart Dr. Burton Paul (1931-2007) which forever changed the face of the wet storage industry. In two short years, Holtec had become the market leader in the so-called "re-rack" business. By 1992, propelled by its transformative fuel rack technology, Holtec essentially became the sole supplier of wet storage solutions to nuclear power plants; a dominance that continues to this day. By 2010, Holtec had over 120 re-racks worldwide with a spotless record of safety and on-time performance.<sup>1</sup>*

## **2.2. Dry Storage**

*In 1992, Holtec launched the dry storage and transport cask product line, once again betting the success of the endeavor on the industry and regulatory acceptance of new ground-breaking technologies. New ideas developed to secure client acceptance including the industry's first multi-purpose canister, the first dual purpose metal cask, the first transport cask qualified for high burn-up and MOx fuel<sup>2</sup>, and the first double wall canister. By 2010, Holtec had approximately fifty dry storage patents and forty dry storage clients. By 2018, the number of patents held by the Company approached 90.*

## **2.3. The First Manufacturing Plant**

*In 2003, Holtec acquired Westinghouse's former mammoth manufacturing plant in Pittsburgh, PA, and renamed it the Holtec Manufacturing Division (HMD). With the HMD acquisition, Holtec became a turnkey provider of engineering, licensing, manufacturing and site services to the power industry. HMD has expanded to become the nation's largest exporter of capital equipment to the international nuclear industry.*

## **2.4. And so-on**

*Holtec was part of a large industry with emerging needs, and they were able to capitalize on these and develop products and systems to meet them. See link in Reference 1.*

## **3. Reactors**

*Although Holtec designed and manufactures several smaller reactors, these evolved into the standard small modular reactors (SMR) described below.*

### **3.1. SMR-300**

*The SMR-300 is an advanced, passively safe, pressurized light water nuclear power plant with 300 MW(e) rated net electric output. The SMR-300 is designed with forced circulation utilizing two cold legs each with a vertically mounted reactor coolant pump, two hot legs, and a single once-through steam generator (OTSG) with an integral pressurizer stacked on top of the OTSG. The use of reactor coolant pumps during normal operation is necessary to produce the rated power. However, the design utilizes passive, gravity driven safety systems that do not rely on external resources.*

---

<sup>2</sup> MOx Fuel is an acronym for Mixed Oxide fuel, which is a type of nuclear fuel made from a mixture of plutonium and uranium oxides, primarily used in light-water reactors. Light water reactors are the primary reactor technology used in the US, whereas Canada uses heavy-water (D<sub>2</sub>O where "D" is deuterium).

*The annular reservoir, the large body of water situated between the containment structure and containment enclosure, serves as the SMR-300 ultimate heat sink.<sup>3</sup>*

### **3.1.1. Holtec's SMR-300 Mountain West New Nuclear Ecosystem**

*Following Utah Governor Spencer Cox's 2024 "Operation Gigawatt" and "Built Here" strategy announcement to double power production in the state within ten years and enhancing clean energy policies including support for nuclear power, Holtec International is pleased to report that we have signed a strategic cooperation agreement with the State of Utah and Hi Tech Solutions, a leading nuclear services provider based in Kennewick, Washington, to collaborate in the deployment of SMR-300s in Utah and the broader Mountain West region. Hi Tech will play a leading role in the project development and workforce training to support the rise of new nuclear in the region.<sup>4</sup>*

*Holtec, in cooperation with Hi Tech Solutions, is advancing plans to deploy a fleet of SMR-300 reactors across the Mountain West. To accomplish this goal, the companies will work to build a permanent training facility in Utah by 2028 to focus on operations, maintenance and future technologies. The training facility will focus on developing a skilled workforce for both the existing US reactor fleet and next-generation SMR technology with alliances with Utah's Universities, technical colleges, and trade schools.*

### **3.1.2. US DOE Authorizes Holtec to Provide SMR-300 to India**

*We are pleased to report that the US Department of Energy has granted a specific authorization under 10CFR810.9 to Holtec International, with the Indian Government's (GOI) concurrence, to sell the Company's flagship small modular reactor SMR-300™ for deployment in the Republic of India. The authorization names three Indian companies – Larsen & Tubro (Mumbai), Tata Consulting Engineers (Mumbai) and the Company's own subsidiary, Holtec Asia (Pune) – as eligible entities with whom Holtec can share necessary technical information to execute its SMR-300™ program.*

*The action to add additional GOI-owned entities such as NPCIL, DAE, AERB and NTPC, to the eligible list has been delayed until assurances are resolved to both countries' satisfaction. Adding other Indian companies to the authorized list, needed to execute our SMR-300 program, will require an amendment to this authorization (IN-2023-001 dated March 26, 2025), which we expect shortly, says Dr. Kris Singh, Holtec's CEO who led Holtec's drive to win the acceptance of both governments.<sup>5</sup>*

*We thank the officials of DOE, National Nuclear Security Administration (NNSA), State and White House National Security Council (NSC) who spearheaded the evaluation of our application and their counterparts in the GOI for implementing this authorization which promises to deliver on the expectations set by the historic 123 Agreement<sup>6</sup> signed by the two governments in 2008.*

*"We are thrilled that the US and India are authorizing the introduction of the pressurized water reactor (PWR) technology to India which, after 80 years of extensive operational experience, has emerged as the de facto global standard for commercial reactors that has been adopted by every major nuclear energy producer country in the world.*

---

<sup>3</sup> <https://www.nrc.gov/reactors/new-reactors/advanced/who-were-working-with/pre-application-activities/holtec/smr300.html>

<sup>4</sup> <https://holtecinternational.com/2025/05/01/hh40-10/>

<sup>5</sup> <https://holtecinternational.com/2025/03/31/hh-40-07/>

<sup>6</sup> Section 123 of the U.S. Atomic Energy Act generally requires the conclusion of a peaceful nuclear cooperation agreement for significant transfers of nuclear material or equipment from the United States.

*“Furthermore, our SMR-300™ checks every box relevant to India’s needs and circumstances, such as a standardized design that is seismically competent to be deployed anywhere in India, one that requires only 25 acres (and no exclusion zone!) of land to house two reactors (600 MWe power output), one that can be operated using air (in lieu of water) as the “waste heat sink” in a water-challenged region, and one that can be substantially shop manufactured requiring minimal field erection effort,” says Dr. Kris Singh, Holtec’s CEO who personally led Holtec’s drive to win the acceptance of both governments.*

*The specific authorization granted to Holtec to build our SMR-300™ reactors in India with the participation of eligible Indian companies shows the USG’s and GOI’s shared interest in boosting India’s nuclear energy output which, presently at 8.5 GW, must be increased multi-fold by 2047 (the year that would mark the centennial of India’s independence) when PM Modi has vowed that the country’s economic prosperity would reach the level of the world’s leading developed economies.*

*However, to realize a rapid build-out of nuclear plants, India still needs to remove the legal barriers that stand in the way because of previously enacted laws that:*

- 1. Prohibit ownership of nuclear plants by private industry, and*
- 2. Expose the private sector reactor suppliers to unlimited liability.*

*We understand that the GOI is actively working on legislation to permit private sector investment in the nuclear sector and to align the suppliers’ financial exposure with global norms. Considering India’s similar breakthroughs in other cutting edge technology areas such as space, drone, semi-conductors, and jet engines in recent years, we are reasonably certain that the necessary laws will be passed this year to remove the barriers to enable the rise of nuclear power in the country. With the necessary legislation passed by Lok Sabha, we believe that the nuclear renaissance, now sweeping the world, will arrive in that vast land transforming its clean energy generation landscape.*

## **4. Initial Public Offering**

*Holtec International, a key player in the nuclear industry, plans to go public within several months, CEO Krishna Singh told Barron’s on Monday.<sup>7</sup>*

*The IPO would almost certainly be the largest nuclear-energy offering in years, giving investors one of the few pure-play ways of buying into the industry. Unlike some other nuclear names, Holtec already produces substantial revenue from activities like decommissioning nuclear plants and handling nuclear waste. The company could be worth more than \$10 billion.*

*Holtec is also on the verge of doing something never before attempted in America—bringing back a decommissioned nuclear plant. The company is restoring a reactor at the Palisades Nuclear Plant in Michigan, which had been shut down in 2022 for financial reasons. It has received hundreds of millions of dollars of support from the state of Michigan and the Department of Energy for the project.*

---

<sup>7</sup> Avi Salzman, Barrons via MSN, “Nuclear Power’s Biggest IPO in Years Is on the Way,” June 26, 2025, <https://www.msn.com/en-us/money/savingandinvesting/nuclear-power-s-biggest-ipo-in-years-is-on-the-way/ar-AA1HgQeR?ocid=msdgnpt&pc=DCTS&evd=fd7ea3f8b12400e82a5279434d3bf00&ei=41>

*In addition, Holtec plans to place another two small modular reactors, or SMRs, at the Michigan site, although it has not yet received federal or state approval to do so. Holtec is already building the equipment for those reactors in conjunction with Hyundai Engineering & Construction...*

*Singh said the company will use proceeds from the equity sale to help it expand construction of small modular reactors. "The real driver for us is we are on our own calendar," he said. "We're going to be building, we think, in the next decade 10-20 small modular reactors at the same time."*

*Assuming the company perfects the process of building them, each of those reactors could cost about \$3 billion to construct. "The capital needed for that is enormous," he said. Singh said he is open to Holtec operating the units themselves, or selling them to third parties...*

## **5. Second Nuclear Power Plant to be Relicensed**

See the last paragraph on page 4. As I was proofing this post I came across a news site that let me know that a second previously shut-down power plant is being recommissioned.

*NextEra Energy has taken the first steps to open the Duane Arnold power plant, Iowa's only nuclear power plant, by late 2028.<sup>8</sup>*

*Duane Arnold operated in Palo, Iowa, from 1974 until 2020, when a derecho, or a series of severe windstorms, damaged the cooling towers.*

*NextEra Energy filed notice with the Nuclear Regulatory Commission in late January to request a licensing change as "an important first step in establishing the regulatory pathway to restore the facility's operating license and potentially restart plant operations as early as the end of 2028," wrote NextEra Energy Spokesperson Bill Orlove in an email to The Daily Iowan.*

*Orlove walked through different factors that must be considered for reopening the plant, including, but not limited to, restoring the plant systems, training staff, and securing a license from the Nuclear Regulatory Commission.*

*"The company is taking the necessary time to look at all aspects needed to make an informed decision about resuming operations at the facility," he wrote.*

*Palo Mayor Eric Van Kerckhove noticed from his observations that some local businesses were hurt by the plant closure in 2020.*

*"As the traffic died off, some of our local businesses, restaurants, gas stations, that type of thing, their business slowed down," he said. "We had a few residents that lived in Palo and worked at the nuclear plant, who have since found employment elsewhere and have moved out of the community..."*

---

<sup>8</sup> Jacob Calvin, The Daily Iowan, "Iowa's only nuclear power plant could reopen late 2028," February 6, 2025, <https://dailyiowan.com/2025/02/06/iowas-only-nuclear-power-plant-could-reopen-late-2028/>