



Stainless steel has a history of being specified for components that will be directly exposed to radioactive materials. Here are several examples of nuclear-related applications for stainless steel:

- 304/316L/316H for vessel internals, cladding, and structural supports in nuclear reactor pressure vessels.
- Borated 304B/316B for liners, racks, and pool structures for the spent fuel storage.
- 304 and 316L for piping, pumps, valves, and heat exchangers for the cooling systems.
- 304L, 316L, and 2205 for the waste containers, drums, processing equipment, hot cells, and shielded boxes for the decommissioning and waste processing aspect of the nuclear reactor.

## AI Boom Spurs Data Center Investment... and Stainless Demand

The United States, under the leadership of President Donald Trump, is in a new race—the race for world dominance in artificial intelligence (AI). Considered by Trump to be an important aspect of national security, the data centers that generate AI are growing exponentially in the U.S., resulting in a voracious appetite for energy to power and cool the processors and chips that generate AI.

This race to remain the world leader in AI generation means the United States, and the big tech companies responsible for most of the AI content being generated today, will need to move quickly to increase production of electricity to power the 5,000+ data centers across the country. By some estimates, data centers could account for more than 12% of the electricity demand within the U.S. by as early as 2030.

To meet this demand, the federal government and the private sector are collaborating in a series of nuclear energy initiatives. Many of these budding programs will require stainless steel plate for a range of applications. Stainless steel is suitable for reactor containment vessels and components; fuel rods; piping and pump networks; spent fuel wet containment pools and dry storage canisters; cooling systems components; and core structural aspects within the nuclear facility.

“Data centers themselves are not big consumers of stainless steel. But the energy sources, the back-up systems, and to a lesser extent the cooling systems for data centers present massive opportunities for stainless steel applications,” explained Tony Palermo, VP Commercial for New Castle Stainless Plate.

He pointed to stainless grades such as 316H with low cobalt levels for nuclear reactor components, borated 304L and 316L stainless for wet storage of spent nuclear fuel, and regular 304L and 316L for dry spent fuel storage.



### 316H Stainless Steel

- Ni % = 10.0 – 14.0
- Cr % = 16.0 – 18.0
- Co/Mo % = -/2.0 – 3.0
- Max temp for 100K hr = 1350 °F (700°C)

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Low cobalt levels—sometimes less than 0.05%—are required in certain components because cobalt has isotopes that, when irradiated, become radioactive and can reduce material performance. “To avoid opportunities for radioactivity, New Castle Stainless Plate sources slabs for nuclear-related applications that use virgin raw material in the stainless steel melt. This helps to minimize cobalt contamination in the scrap supply,” noted Palermo.

Some of the Generation III, small modular nuclear reactors are passively cooled—requiring little external water in the event of an excursion—and are designed for a 60-year lifecycle (compared to a 40-year life for Gen II plants). Stainless steel components, and their attendant corrosion resistance and relative ease of maintenance, support the extended life expectancy of these new designs.

## Big Tech: Becoming Big Energy Users

The International Energy Agency (IEA) anticipates the doubling of demand for global electricity between 2024 and 2030. Much of this demand is coming from the proliferation of artificial intelligence (AI).

As of March 2025, there were 5,426 data centers across the U.S. Collectively, these centers consumed about 17 gigawatts (GW) of power in 2022. For context, a large nuclear power plant generates about 1 GW of power annually, according to an April 2025 article written by Miguel Yanez-Barneuvo.

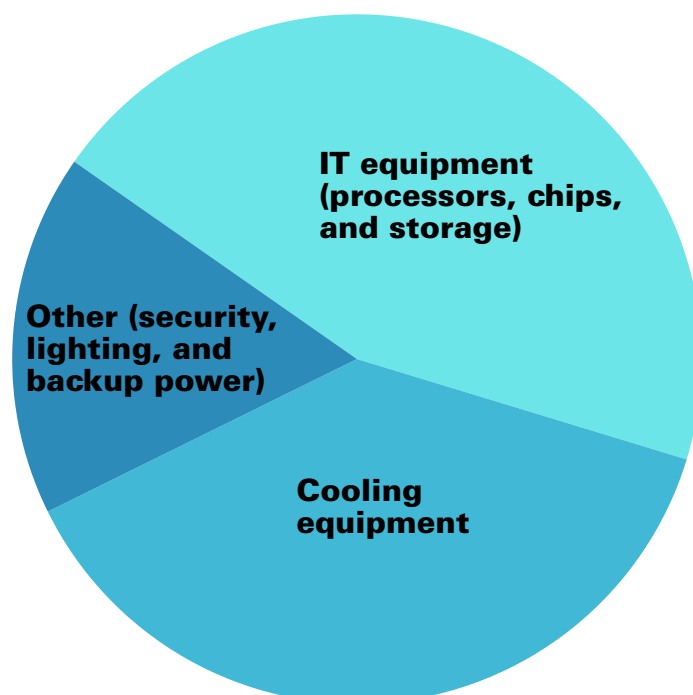
Yanez-Barneuvo estimates that about 45% of a data center’s energy usage is consumed by the site’s IT equipment (processors, chips, storage, etc.). The cooling equipment engaged to keep the server rooms—and the servers themselves—cool requires about 38% of the center’s energy. The balance of the energy usage is dedicated to security measures, lighting, back-up power, etc.

The Electric Power Research Institute (EPRI) estimates that data centers could account for as much as 9% of U.S. electricity generated as soon as 2030, more than doubling 2023 consumption levels. The U.S. Department of Energy projects data centers could even top out at 12% of total U.S. electricity consumption by 2028.

### LINKS:

[Yanez-Barneuvo article](#)

[EPRI May 28, 2024 Abstract:  
Powering Intelligence](#)



# Trump Views AI Critical to National Security

An executive order issued on May 23, 2025 by U.S. President Donald Trump draws the connection between reliable energy and the demand for artificial intelligence. The order stated: "Advanced computing infrastructure for artificial intelligence (AI) capabilities and other mission capability resources at military and national security installations and national laboratories demands reliable, high-density power sources that cannot be disrupted by external threats of grid failures.



[Read the Executive Order](#)

"These facilities and resources' vulnerability to energy disruption represents a strategic risk that must be addressed. Advanced nuclear reactors include nuclear energy systems like Generation III+ reactors, small modular reactors, microreactors, and stationary and mobile reactors that have the potential to deliver resilient, secure, and reliable power..."

The order sets the stage for "designating AI data centers within the 48 contiguous States and the District of Columbia... that are located at or operated in coordination with Department of Energy facilities... as critical defense facilities, where appropriate."

## DOE Approves Private Partners on Federal Lands

On July 24, 2025, the Department of Energy announced that four Federal lands may invite private sector partners to "develop cutting edge AI data center and energy generation projects" on these sites. The selected sites are the Idaho National Laboratory, Oak Ridge Reservation, Paducah Gaseous Diffusion Plant, and the Savannah River Site. "By leveraging DOE land assets for the deployment of AI and energy infrastructure, we are taking a bold step...ensuring U.S. AI and energy leadership," said Energy Secretary Chris Wright. "These sites are uniquely positioned to host data centers as well as power generation to bolster grid reliability, strengthen our national security and reduce energy costs," Wright added.

[Link to the DOE Announcement](#)

## Industry Close-Up: Data Centers

With the rapid increase in AI data centers sprouting up across the U.S., we reached out to Tony Palermo, VP Commercial at New Castle Stainless Plate to highlight the impact this segment is having on stainless steel.

Here is an excerpt from our conversation: "Spent fuels (from nuclear reactors) are initially cooled in pools (known as wet storage) for about five years before moving into dry storage. Wet storage is essentially a large stainless steel-lined pool with compartments of spent fuel separated by more stainless steel. Dry storage is a large cask of thick stainless steel plate that contains bundles of used fuel assemblies within a stainless steel canister. New Castle Stainless Plate supplies thick plate in 304 grade for these storage canisters."

### Industry Close Up

#### Data Centers

October 2025



Tony Palermo, VP Commercial for New Castle Stainless Plate recently shared insights relating to the growing demand for stainless steel in projects supporting the energy and cooling sectors for data centers. Here's what Tony had to say about the growing market and the opportunities for stainless.

**Question:** How is artificial intelligence (AI) impacting the demand for energy to power data centers?  
**Answer:** AI data centers require significant amounts of power to train the advanced models that perform AI computations. This extensive workload is demanding exponentially more power than that consumed by data centers simply storing and retrieving information. Some experts predict that energy demand for AI data centers could double to as high as 15% of the entire U.S. energy demand by 2030. In the U.S. alone, there are more than 5,000 data centers, accounting for about 6% of our current energy demand in the U.S.

**Q:** Is all this power required just for the computational?  
**A:** No. Energy is also required to cool the super computers used to generate AI. As much as 30% of the energy required to run an AI data center is devoted to the system that cools the processors, chips, and other computational and modeling equipment.

**Q:** Is there anything unique about this power demand, aside from its sheer volume?  
**A:** Unlike other power demands, AI data centers must have consistent and reliable energy. A power out is not an option. So clean energy options like wind and solar are less favorable. The reliability of nuclear as a clean energy source is a strong consideration.

**Q:** What is the government and the private sector doing to meet this energy demand?  
**A:** President Trump wants to see the U.S. maintain its leadership position in AI production, calling it "hard domination." He views AI as a form of national security which has led to several executive orders and Department of Energy announcements paving the way for public-private collaborations exploring nuclear energy options to power data centers.



[Read the entire interview on our website.](#)

## Big Tech Taps into Nuclear

“The deployment of advanced nuclear reactors is essential to U.S. AI dominance and energy leadership,” said U.S. Energy Secretary Chris Wright in a statement announcing the selection of Tennessee as the location of an advanced nuclear power plant. The site, a collaboration between Google, Kairos Power, and the Tennessee Valley Authority (TVA), is intended to supply electricity to Google’s data centers in Tennessee and Alabama.



Through a new purchase power agreement (PPA), Kairos Power’s Hermes 2 Plant in Oak Ridge, TN will deliver up to 50 MW of energy to the TVA grid. The Hermes 2 project is part of a larger Master Plant Development Agreement between [Google](#) and Kairos Power (signed in October 2024) to deploy a fleet of advanced nuclear power projects by 2035. These U.S.-based projects will generate 500 MW of power for the tech company.

Another agreement announced in October 2024 pairs Microsoft with Constellation Energy Corporation. The collaboration will restart the reactor at Three Mile Island Unit 1 under the new name Crane Clean Energy Center (CCEC). Through this purchase agreement, [Microsoft](#) will purchase energy from the renewed plant to power its data centers in Pennsylvania-New Jersey-Maryland (PJM) power grid. The new CCEC is expected to be online by 2028 and add more than 800 megawatts (MW) of carbon-free electricity to the PJM grid.

**LINKS:**    [Kairos Power press release](#)  
                  [Constellation Energy press release](#)

## NCSP Donates to Secret Families

Earlier this year, New Castle Stainless Plate announced a \$5,000 donation to Secret Families of Henry County, a local non-profit aimed at bringing Christmas joy and family necessities to local residents. The organization partners with area schools to identify students and families in need of help during the holidays.

“This support is more than gifts,” noted Brent Crabtree, NCSP VP Operations and a Secret Families board member. “The support includes dental and medical visits, gift cards to local grocery stores, a Christmas tree, and holiday ornaments,” Crabtree said. The organization’s goal for the 2025 season is to support 100 families in Henry County.





## Meet Brent Crabtree

**Birthplace:** New Castle, Indiana

**Education:** Ivy Tech Community College in New Castle, IN

**Personal Motto:** You must strive to learn and become a better person every day. I'm still learning new things!

**Hobbies:** I love to golf, spend time with my family, and volunteer with several non-profit organizations to help assist our community. I'm also active in the Elks Club supporting area veterans, cancer programs, and collecting Coats for Kids.

**Favorite Stainless Applications:** Rail tank cars. Everybody that works here can see something made from NCSP materials whenever they are stopped at a railroad crossing. I think that's cool!

After high school and six years with the Air Force, Brent Crabtree returned to New Castle, enrolled at the community college, and landed a job at the local stainless steel facility (Avesta Sheffield). Little did Brent know 31 years later he would be overseeing general operations, shipping, and strategic planning for the site. In May 2025, Brent was promoted from Dir. Of Operations to VP Operations after the passing of Brian Chew, our previous VP Operations.

Brent has seen several ownership changes at the mill over the years but noted a consistent commitment to be the easiest company to do business with. "One thing that hasn't changed over the years is the pride we take in delivering quality plate to our customers and in doing everything we can to make it right if something doesn't turn out as a customer wished," he said.

## Questions with Brent Crabtree



### Plasma Cutting Upgrades at NCSP

In March, one of the two plasma cutting systems at New Castle Stainless Plate was upgraded and the second system is being installed now. Each system is a Hypertherm HPR800XD.



The systems are identical and have the ability to plasma cut stainless plate in thicknesses from 1/2" to 6". "We are now able to plasma cut our full product offering on either machine, thus enhancing productivity and our overall capacity—especially in cutting plate over 2" thick," reported Brent Crabtree, VP Operations. Other benefits of installing identical equipment are the efficiencies realized in operator training and parts replacements.

What's New is published by New Castle Stainless Plate, LLC. Please tell us how we are doing and share your comments and suggestion for future articles. Send your feedback to :

[Tony.Palermo@ncstainlessplate.com](mailto:Tony.Palermo@ncstainlessplate.com)

[ncstainlessplate.com](http://ncstainlessplate.com)

