



## Stainless steel is ideal for nuclear power projects requiring:

- Good corrosion resistance
- Higher carbon content, suitable for applications above 1000°F
- Low cobalt levels offering less propensity for radiation contamination
- Long service life, low life-cycle cost
- Reduced maintenance costs in service
- Improved process reliability/up time



## Nuclear Resurgence Good for Stainless

From water-cooled to salt-cooled reactors and from coolant storage tanks to waste storage, stainless steel is the go-to material for a range of nuclear power applications. Recent government funding; shifting public opinion; and safer, less expensive technologies are converging to boost nuclear energy investments in the U.S. “The U.S. is lagging other countries in making nuclear energy a larger part of the energy mix. The addition of measurable nuclear energy capacity will likely not take place in the U.S. until 2030. But there may be quite a bit of that capacity coming on stream in 2030 to 2040,” reported Tony Palermo, VP Commercial at New Castle Stainless Plate.

Newer technologies in nuclear energy include small modular reactors (SMR). Small in scale—about one-third the capacity of a traditional reactor—SMRs have the potential to make a big impact on the industry. With power capacity of up to 300 MW(e) per unit, an SMR footprint is a fraction of the size of a conventional nuclear power reactor. Their modular design allows for factory assembly and easy transport. This benefit is especially important in rural areas lacking sufficient transmission or grid capacity. SMRs are also more affordable to build.

Under the U.S. Department of Energy (DOE), the Office of Nuclear Energy is supporting development of light water-cooled SMRs, some that will likely be deployed in the late 2020s to early 2030s, according to the DOE’s website.

### Stainless steel nuclear grades

All this activity in nuclear is driving demand for stainless steel. Grade 347 stainless steel is being specified for molten salt tanks within specific SMRs. “Grade 347 stainless has excellent high temperature strength and corrosion resistance to store the molten salt. Salt-cooled reactors operate at temperatures above 1000°F, much higher than boiling water reactors,” explained Palermo.

Some nuclear reactor components specify 316H stainless with low cobalt levels. This variation of 316 provides higher strength and less propensity for radiation contamination. For several years, New Castle Stainless Plate has also produced thick plate in grade 304 for nuclear waste storage canisters.

## DOE Funding for Nuclear Energy

In May 2023 the Department of Energy's (DOE) Office of Nuclear Energy announced plans to award \$22.1 million to advance promising nuclear technologies. The funding will support ten industry-led projects, including one that moves a small modular reactor (SMR) closer to deployment. Other projects in the funding award will address nuclear regulatory hurdles, improve operations of existing reactors and facilitate new advanced reactor developments.

These projects are on the heels of a significant investment in nuclear energy launched in 2018. Since that time, the Office of Nuclear Energy's industry funding opportunity announcement (iFOA), has invested more than \$230 million into 48 projects from 31 different companies across 18 states, according to the DOE website. To date, 28 of the selected projects have been completed successfully.

[Learn more at the DOE website.](#)



## Nucor Powered By Nuclear in Future

The U.S. Department of Energy is partnering with NuScale Power (in which Nucor is an investor) and Utah Associated Municipal Power Systems (UAMPS) to demonstrate a small modular reactor (SMR) at the Idaho National Laboratory by 2030. According to the DOE website, "Significant technology development and licensing risks remain in bringing advanced SMR designs to market and government support is required to achieve domestic deployment of SMRs by the late 2020s or early 2030s." Through the partnership, the DOE hopes to resolve technical and licensing issues inherent to SMR technologies, to accelerate development of future SMRs.

NuScale Power also recently announced the exploration of co-locating NuScale's SMR (VOYGR™) power plants at Nucor steel mill sites to provide nuclear power-generated baseline electricity for the producer's scrap-based electric arc furnaces (EAF).

## Nuclear Power Projects on the Horizon

In the United States and Canada, a combination of public and private investments are helping to bring a number of nuclear power projects closer to commissioning. These projects include, but are not limited to, the following:

- Kemmerer, WY. The nuclear innovation company founded by Bill Gates, TerraPower, is building its first reactor near the site of a retiring coal facility. This project is a joint effort with the U.S. DOE's Advanced Reactor Demonstration Project. Once fully operational, the plant is projected to provide enough electricity to power 400,000 homes.
- Idaho Falls, ID. A SMR is planned for the Idaho National Laboratory. The demonstration project is a joint effort with NuScale Power and Utah Associated Municipal Power Systems (UAMPS).
- Darlington, ON. GE Hitachi Nuclear Energy along with Ontario Power Generation, SNC-Lavalin and Aecon, signed an agreement for the deployment of a SMR, the first commercial contract for a grid-scale SMR.

## Meet Jen Faletic

When customers have a question about credit or accounts receivables, Jen Faletic is the go-to gal. As the Accounting Manager at New Castle Stainless Plate, Jen is responsible for AR, AP, part of the plant's payroll, and preparing month-end reports.

Jen has been at the New Castle location for more than 16 years, supporting various accounting activities. "I really like the people at NCSP. We have a good team in all the departments. The human resources and accounting teams work especially well together. We really support each other. And that helps our customers, too!" Jen said.

### Questions with Jen Faletic



**Birthplace:** Valparaiso, Indiana

**Education:** I have a degree in accounting from Ball State University. I still live in Muncie.

**Personal Motto:** Enjoy the little things.

**Hobbies:** I like spending time outdoors and reading. I set a goal this year to read 52 books, I already passed that milestone!

**Favorite Stainless Application:** Things we can visit. I've taken my family to see The Bean (Cloud Gate) in Chicago and the Air Force Memorial in Arlington, VA. It's great to see people enjoying the work from New Castle.

## NCSP Supports Local Community

"We are committed to supporting our customers as well as our community," noted Brent Crabtree, Director of Operations Control at NCSP. In June, we were the primary sponsor for the Purvis Youth Foundation's golf outing. Funds raised at the outing assist children from low-income homes in covering the cost of uniforms, equipment and fees so they can participate in youth sports. "Every child should be given equal opportunity to compete," emphasized Crabtree. Funds have also been used to build six diamonds in the last two years. "We are now working to establish a Miracle League facility in the community," he added.

This summer, NCSP sponsored a benefit with proceeds going to Indiana University and Purdue University cancer research. And in September we sponsored two events: a Walk for Life, supporting our local pregnancy care center and a benefit for our local veterans and veterans' hospital, honoring those who have served our country.



# Nuclear Power Close Up Now Available

Following the recent advancements in SMRs and growing investments in nuclear power projects domestically, we reached out to **Tony Palermo, VP Commercial at New Castle Stainless Plate** to highlight the impact nuclear energy is having on stainless steel. Here is an excerpt from our conversation: "Because of its sustainability benefits and its relative cost efficiencies, nuclear power acceptance is growing worldwide. Ten percent of the world's power is generated through 450 nuclear reactors around the world. Russia, India, China, and France are leaders in the use of nuclear power. SMRs have already been built in Russia and Canada. Another is under construction in the U.S. (the TerraPower project in Kemmerer, WY)."

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

**Question:** Small modular nuclear reactors (SMRs) are the trend in nuclear power. What benefits do SMRs offer?

**Answer:** SMRs are modular, so they are built off site and transported to the site location for quick assembly. This makes them a viable energy option for rural, remote communities. SMRs also can be used to provide on-site power to large users of electricity like steel mills and massive data storage facilities. Because of their size and modularity, SMRs have lower up-front costs and can be increased in capacity over time. Because of the self-cooling capability and less reliance on outside systems, SMRs are safer than traditional nuclear technologies.

**Q:** Is interest in nuclear power increasing only in the United States?

**A:** Because of its sustainability benefits and its relative cost efficiencies, nuclear power acceptance is growing worldwide. Ten percent of the world's power is generated through 450 nuclear reactors around the world. Russia, India, China, and France are leaders in the use of nuclear power. SMRs have already been built in Russia and Canada. Another is under construction in the U.S. (the TerraPower project in Kemmerer, WY).

**Q:** The U.S. Department of Energy (DOE) wants to triple nuclear power production in the U.S. by 2050. Is there sufficient interest in nuclear to make this happen?

**A:** The U.S. is lagging other countries in making nuclear energy a larger part of the energy mix. France has had a nuclear-heavy energy mix for quite a while. Eastern European and Asian countries—and our neighbor Canada—are in the process of adding new nuclear SMR capacity in the next few years. The addition of measurable nuclear energy capacity will likely not take place in the U.S. until 2030. But there may be quite a bit of that capacity coming on stream in 2030 to 2040, well in advance of the 2050 targets.

**New Castle Stainless Plate, LLC**  
ncstainlessplate.com

## Stainless Steels for Nuclear Power

New Castle Stainless Plate provides a number of important corrosion-resisting grades that perform well under high temperature conditions. These grades are suitable for various applications within the nuclear power industry including the reactor materials and nuclear waste storage cannisters. These grades include 304, 316, 316H, and 347. Specifiers are advised to consult our product datasheets for more details about our grades.

**304** is a versatile, general purpose stainless steel with good resistance to atmospheric corrosion as well as organic and inorganic chemicals.

**316** is intended to provide improved corrosion resistance relative to 304 in moderately corrosive process environments, particularly those containing chlorides or other halides. **316H** offers improved corrosion resistance as well as higher carbon content, making this grade suitable for applications with temperatures above 932°F. **316H** provides higher strength and, with its low cobalt levels, has less propensity for radiation contamination —making the grade suitable for nuclear reactors.

**347** is a chromium nickel grade often specified for high temperature applications, up to 1500°F. This grade provides excellent corrosion and oxidation resistance at these high temperatures.

**304**

**316 316H**

**347**

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)

