

Framatome, TVA, Oak Ridge National Laboratory to load first 3D-printed component in commercial reactor

December 1, 2020 – Framatome recently collaborated with Oak Ridge National Laboratory (ORNL) to create a 3D-printed safety component that will be loaded in a U.S. commercial nuclear power plant. The stainless steel fuel assembly channel fasteners will be inserted in the Tennessee Valley Authority's (TVA) Browns Ferry Nuclear Plant during the spring 2021 refueling outage.

The fuel assembly channel fasteners were printed at ORNL using additive-manufacturing techniques, also known as 3D printing, as part of the lab's [Transformational Challenge Reactor Program](#) and installed on ATRIUM 10XM fuel assemblies at Framatome's nuclear fuel manufacturing facility in Richland, Washington. The channel fasteners secure the fuel channel to the boiling water reactor (BWR) fuel assembly. The fuel channel wraps around the assembly and guides coolant flow up through the fuel rods. Channel fasteners have traditionally been fabricated from expensive castings and required precision machining. Additive manufacturing is a more efficient way to achieve the tight specifications of these components.

"Our use of additive-manufacturing techniques is a major advancement for Framatome and the nuclear energy industry," said Ala Alzaben, senior vice president of the Commercial and Customer Center of the Fuel Business Unit at Framatome. "Working with industry leaders at ORNL and TVA, our team developed a new, innovative way to manufacture components that will help to reduce costs while maintaining plant safety and reliability."

As part of this effort, experts from Framatome, ORNL and TVA updated the technical drawings and the channel fastener specifications specifically for the 3D-printing process. Data collected from developing the component using additive manufacturing and from inspections during refueling outages will serve further efforts to certify the component's quality.

"This is one of the first steps in ORNL's coordinated efforts with the Nuclear Regulatory Commission's Office of Regulatory Research and the nuclear vendors to prove that a new and greatly accelerated approach for qualified part fabrication is possible," said Transformational Challenge Reactor Program Director Kurt Terrani.

"TVA is a leader in clean energy and innovation," said Dan Stout, TVA's director of Nuclear Technology Innovation. "Being the first to use these additively manufactured components supports an innovative manufacturing approach that could pave the path for use in future reactors across the industry."

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Framatome's initiative to introduce additive manufacturing to nuclear fuel began in 2015 and is focused on stainless steel and nickel-based alloy fuel assembly components. Framatome fuel experts in France, Germany and the U.S. developed this technology in close collaboration with customers worldwide. This initiative is also funded by the European Union and U.S. Department of Energy and relies on several industry partners around the world to progress and advance the use of these technologies.



3D-printed nuclear safety component to be loaded into U.S. reactor

About Framatome

Framatome is an international leader in nuclear energy recognized for its innovative solutions and value added technologies for the global nuclear fleet. With worldwide expertise and a proven track record for reliability and performance, the company designs, services and installs components, fuel, and instrumentation and control systems for nuclear power plants. Its more than 14,000 employees work every day to help Framatome's customers supply ever cleaner, safer and more economical low-carbon energy. Visit us at: www.framatome.com, and follow us on Twitter: [@Framatome](https://twitter.com/Framatome) and LinkedIn: [Framatome](https://www.linkedin.com/company/framatome). Framatome is owned by the EDF Group (75.5%), Mitsubishi Heavy Industries (MHI – 19.5%) and Assystem (5%).

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