

Framatome receives six patent awards for nuclear innovations

Framatome received six patent awards for innovations that solve unique challenges in the nuclear energy industry. The patents cover inventions to improve safety and operational excellence in nuclear energy facilities.

Framatome's fuel experts received three patents for the company's work to support high-performance, ever-safer fuel for utilities throughout the world:

- [**Strip for a Nuclear Fuel Assembly Spacer Grid**](#) – This spacer grid strip is comprised of an integrated spring design and a scalloped leading edge. These features improve fuel performance by reducing the risk of debris entrapment within the spacer, lessening corrosion and reducing neutron absorption.
- [**Composite Fuel Rod Cladding**](#) – This fuel cladding innovation uses ceramic fiber layers on the outside surface and within the cladding of a fuel rod for better, safer and more efficient plant operations.
- [**Nuclear Fuel Rod Cladding Including a Metal Nanomaterial Layer**](#) – This technology involves coating a fuel rod with one or more nanomaterial layers. During normal operation, the method improves the fuel's wear resistance by reducing the susceptibility to debris fretting, which is one of the most common pressurized water reactor (PWR) fuel issues. Additionally, a coating with elevated temperature resistance reduces or delays the oxidation of the rods during accident scenarios.

Experts in Framatome's Installed Base Business Unit, which works to enhance the availability and competitiveness of nuclear facilities worldwide, also received three patents:

- [**Boiling Water Reactor \(BWR\) Feedwater Sparger End Bracket Pin Clamp**](#) – This pre-assembled clamp reduces wear on components that provide support for the feedwater sparger, which allows for even distribution of water as it enters the reactor vessel. The innovation increases the lifetime of the part and supports longevity in plant operations.
- [**Excavation and Weld Repair Methodology for Pressurized Water Reactor Piping and Vessel Nozzles**](#) – This repair methodology provides a robust solution to partially replace PWR piping nozzles and vessel nozzles. This innovative approach significantly reduces weld volume in comparison to a standard approach, decreasing time needed and risks associated with component repair.
- [**Control Rod Drive Mechanism Inner Diameter Annulus Ultra-High-Pressure Cavitation Peening**](#) – This innovation allows Framatome's ultra-high-pressure (UHP) cavitation peening process to be applied to the inside diameter of control rod drive mechanism nozzles while the thermal sleeve assemblies remain in place. When applied to this susceptible region, UHP cavitation peening can mitigate the potential for stress- and corrosion-related cracking, resulting in safer operations, cost savings and longer component life.

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These patents demonstrate the company's dedication to continuous improvement of its products and methods.

About Framatome

Framatome is an international leader in the nuclear energy market recognized for its innovative solutions and value-added technologies for designing, building, maintaining and advancing the global nuclear fleet. The company designs, manufactures and installs components, fuel, and instrumentation and control systems for nuclear power plants and offers a full range of reactor services.

With 14,000 employees worldwide, every day Framatome's expertise helps its customers improve the safety and performance of their nuclear plants and achieve their economic and societal goals.

Framatome is owned by the EDF Group (75.5%), Mitsubishi Heavy Industries (MHI – 19.5%) and Assystem (5%).