

ATRIUM 11

Less fuel cycle cost, more efficient fuel cycles

Challenge

Fuel supply and management are critical factors in the operation of a nuclear power plant. Evolving demands require innovation in design and materials to assure your reloads will support operational excellence. Flexible fuel cycle solutions, from optimal core loading to enhanced ability to respond to changing grid demands, require more flexible fuel. The changing mix of energy generation also demands reduced generating costs from nuclear assets. Finally and foremost, fuel reliability is essential to maintaining maximum plant capacity factors and minimizing dose burdens.

Solution

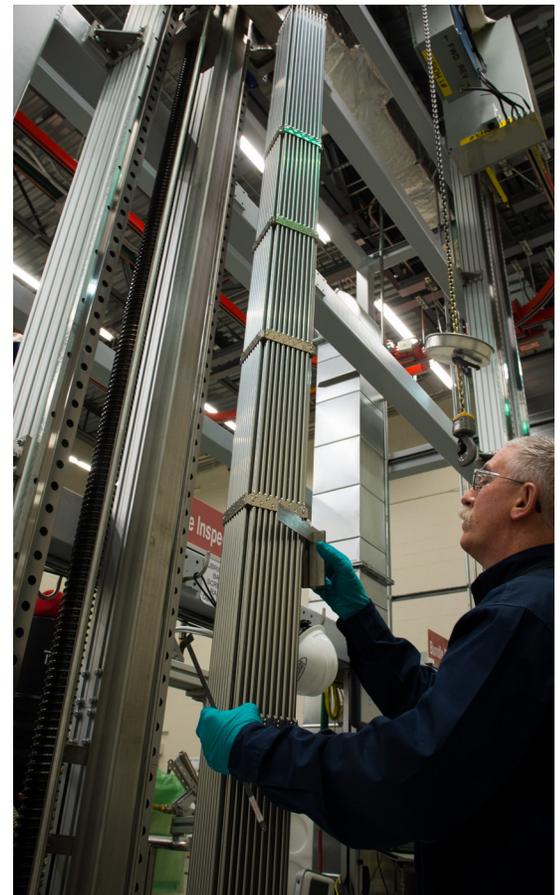
For more than four decades, Framatome's fuel assemblies have powered the growth of nuclear energy around the world, providing the highest performance, cost-competitiveness, and reliability. Backed by the global resources and by proven domestic success, our fuel designs provide effective solutions to current and anticipated demands for high reactor core performance and reliability. The advanced fuels feature superior debris protection, high resistance to corrosion, and fuel rod and structure designs for 18 to 24 month fuel cycles.

In addition, a more balanced moderator-to-fuel distribution results in better fuel utilization. Framatome's next generation BWR product brings enhancements to the proven ATRIUM principle and combines these with the inherent advantages of an 11 x 11 array.

Framatome's ATRIUM 11 is based on the ATRIUM principle of a square water channel replacing 9 fuel rods that serves as the load bearing structure. The number of part-length fuel rods is increased to 20 with two different lengths.

Particular attention has been paid to reliability and robustness by enhanced features like:

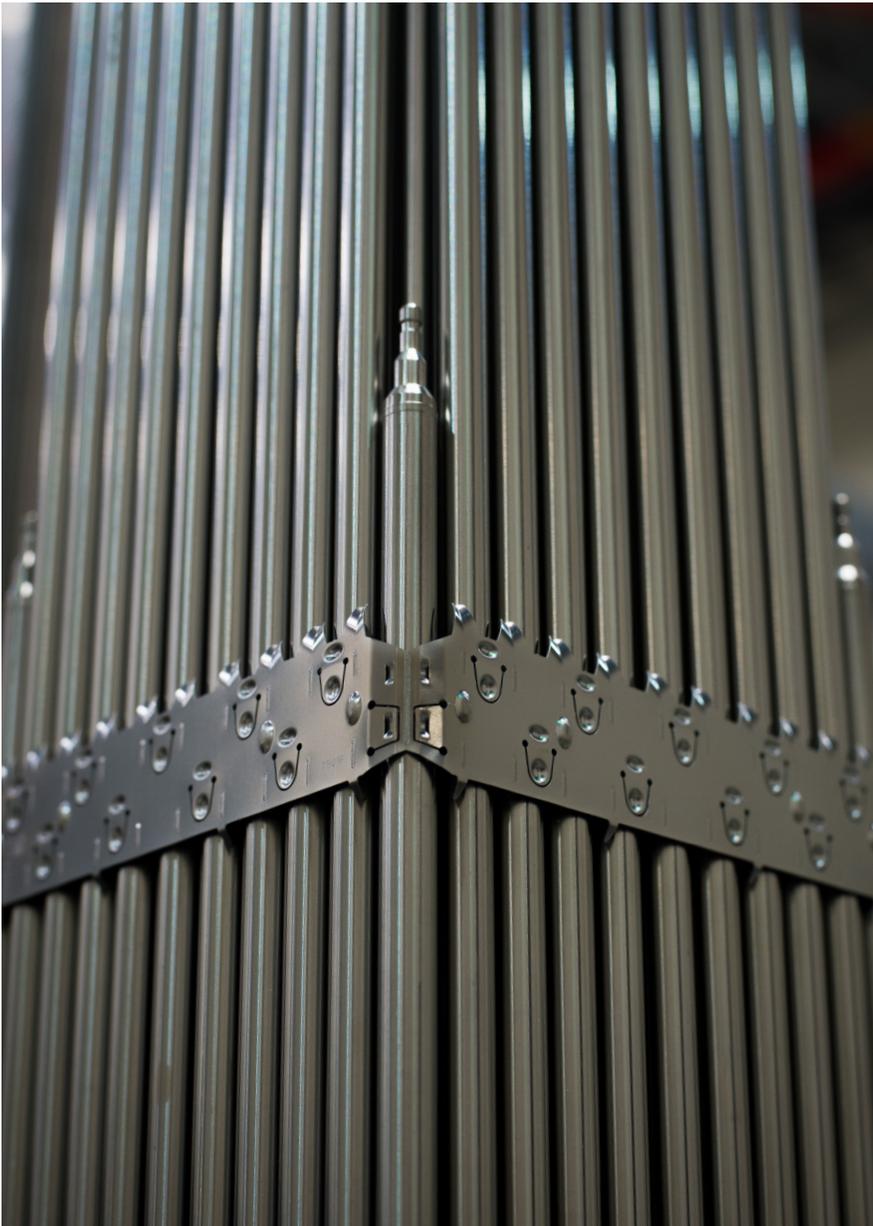
- 3rd Generation FUELGUARD filter for maximum debris resistance
- Nine Alloy 718 ULTRAFLOW spacers with integrated springs for robustness and reduced susceptibility to debris entrapment
- Fuel channel made of controlled beta-quenched Zry-BWR for better dimensional stability



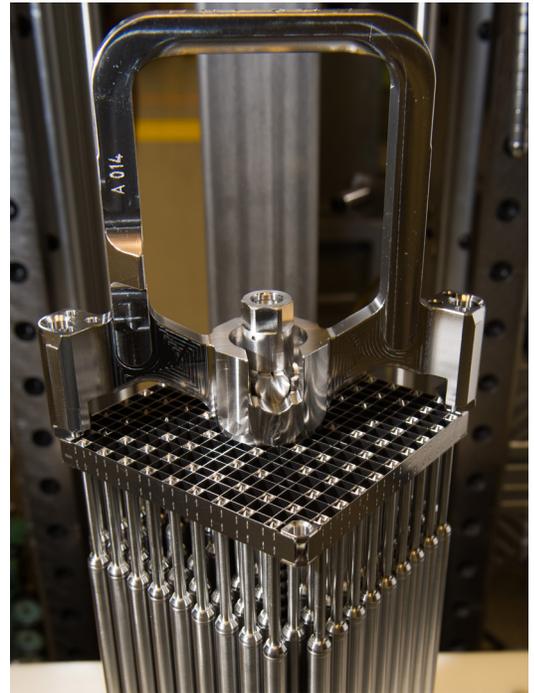
Customer benefits

- Reduces Generating Costs
- Solves Debris Fretting
- Maximizes Generation
- Margins for incore fuel management
- Flexibility for load follow

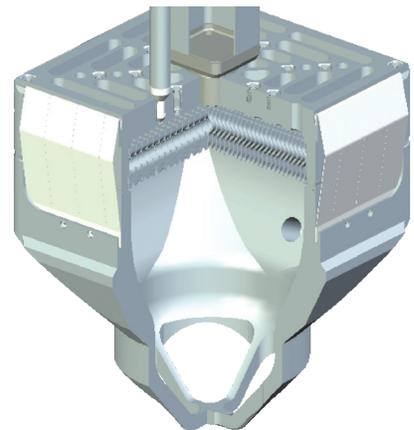
Your performance
is **our everyday commitment**



The innovative 11 x 11 rod array design increases tolerance for pellet-clad interaction. That means you can maneuver assemblies faster, and your plant can operate at a higher capacity factor.



The ATRIUM 11 geometry provides an unprecedented level of uranium utilization efficiency.



Features at the inlet, spacer grids and bundle exit provide the industry's best top-to-bottom fuel rod protection from debris.

Contact: sales-fuel@framatom.com

www.framatom.com

ATRIUM, FUELGUARD, and ULTRAFLOW are trademarks of Framatome or its affiliates, in the USA or other countries. The data and information contained herein are provided solely for illustration and informational purposes and create no legal obligations by Framatome. None of the information or data is intended by Framatome to be a representation or a warranty of any kind, expressed or implied, and Framatome assumes no liability for the use of or reliance on any information or data disclosed in this document. Property of Framatome or its affiliates. © 2019 Framatome. All rights reserved. PS_US_451_ENG_08-19

framatome