

PRIME™ Fuel Advanced Features Package

Background

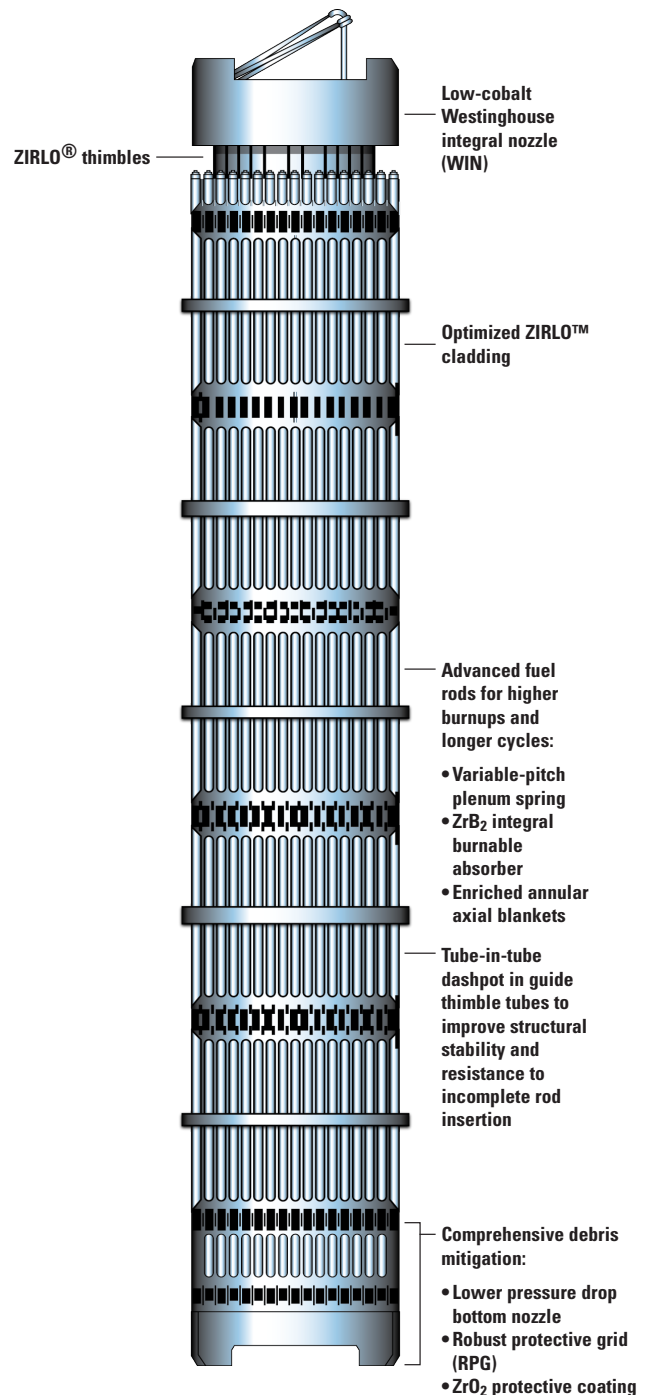
Westinghouse has developed advanced fuel assembly features to improve fuel performance, enhance fuel reliability, provide additional margin for uprates, improve operability and provide enhanced fuel cycle economics. Initially implemented in the Next Generation Fuel (NGF) assembly for pressurized water reactor (PWR) Westinghouse nuclear steam supply system (W-NSSS) reactors, the advanced features will now be available for the 17x17 Robust Fuel Assembly 2 (RFA-2) (12- and 14-foot versions), 17x17 Optimized Fuel Assembly (OFA) and 15x15 Upgrade fuel designs.

Description

The **PRIME™** fuel advanced features package that Westinghouse offers will further improve fuel reliability, dimensional stability and corrosion resistance of our 17x17 RFA-2, 17x17 OFA and 15x15 Upgrade fuel designs.

The **PRIME** fuel advanced features package includes:

- **Low Tin ZIRLO™** grid strap material – This material offers improved corrosion resistance and grid-to-rod fretting margin and is compatible with **Optimized ZIRLO™** fuel rod cladding material. Approximately 40 percent of Westinghouse-fueled reactors use or have elected to use **Optimized ZIRLO** fuel rod cladding for improved crud and corrosion resistance.
- **Tube-in-tube dashpot** in guide thimble tubes – The tube-in-tube dashpot design has been operating in a number of different Westinghouse fuel designs and has been proven to increase dimensional stability. Westinghouse will make this feature available for 17x17 RFA-2 and 17x17 OFA fuel designs. This feature is already included on our 15x15 Upgrade and 17x17 NGF product. The tube-in-tube design improves dimensional stability and resistance to incomplete control rod insertion.



PRIME fuel advanced features

- Lower pressure drop bottom nozzle – With the incorporation of a lower pressure drop bottom nozzle, the decreased resistance allows a higher proportion of flow through the fuel assembly, while maintaining debris resistance performance.

Benefits

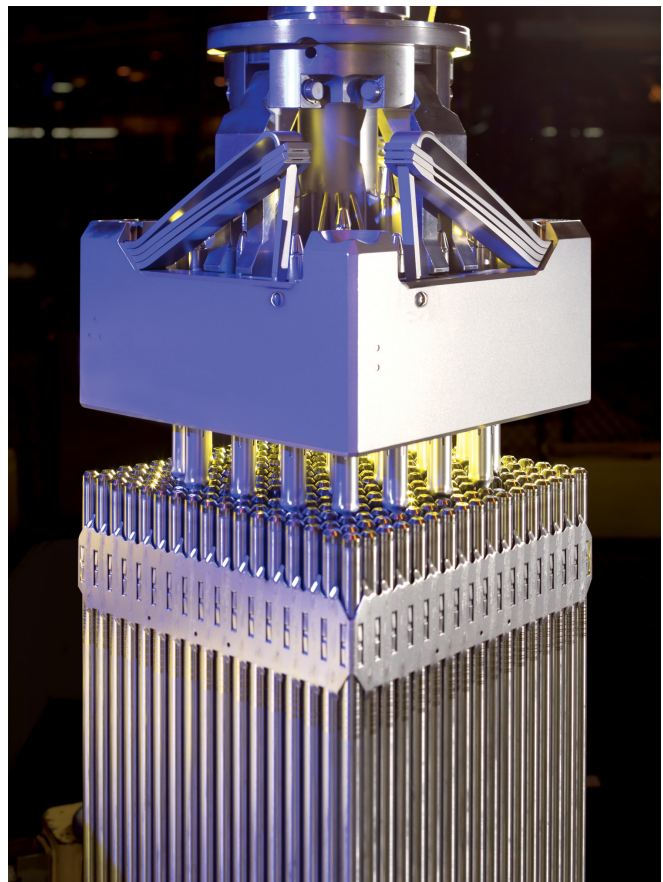
The **PRIME** fuel advanced features package is built on the proven fuel reliability of Westinghouse’s PWR fuel products and our world-class leadership in the design and manufacture of nuclear fuel. It provides the following benefits:

- Structural stiffness for margin against fuel assembly distortion
- Advanced materials – **Optimized ZIRLO** and **Low Tin ZIRLO** – to support high burnup and low corrosion
- Multiple layers of defense against debris

Experience

Westinghouse has successfully operated 24 NGF lead test assemblies (LTAs) in three PWRs. These LTAs included all of the **PRIME** fuel advanced features. In addition, **Low Tin ZIRLO** grids are included in the Westinghouse CE16NGF fuel design, which has been operating in region quantities since 2008. The 15x15 Upgrade design, which includes the tube-in-tube thimbles, has operated in region quantities since 2004.

The **PRIME** fuel advanced features further enhance the fuel performance of the Westinghouse 17x17 RFA-2, 17x17 OFA and 15x15 Upgrade fuel designs, optimizing the fuel performance, operational flexibility and fuel cycle economics.



Westinghouse PWR fuel assembly

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