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ATLAS™ FUEL DESIGN AND LICENSING FOR OPERATION IN THE EUROPEAN PRESSURIZED REACTOR OLKILUOTO UNIT 3

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Westinghouse **VISION & VALUES**



together

we advance technology
& services to power a
clean, carbon-free future.

- Customer Focus & Innovation
- Speed & Passion to Win
- Teamwork & Accountability

Safety • Quality • Integrity • Trust

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Westinghouse ATLAS™ fuel design for the EPR

- *Fuel design is primarily based on Westinghouse's AP1000® design (17x17 array).*
- *Main design features:*
  - *Removable Top Nozzle (WIN) design*
  - *24 ZIRLO® guide thimble tubes*
  - *Alloy 718 top-, bottom-, and Robust Protective (RPG) grids*
  - *Eight Low Tin ZIRLO™ mid grids with double bulge joints*
  - *Four Low Tin ZIRLO™ IFM grids*
  - *Low Profile Debris Filter Bottom Nozzle (DFBN)*
  - *265 Optimized ZIRLO™ fuel rods with oxide coating*



Example of Westinghouse 17x17 design

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Westinghouse ATLAS™ fuel design for the EPR

- All grids and nozzles were modified to accommodate a central fuel rod instead of an instrument tube according to EPR Plant design, while retaining proven features:
  - Minimize first-of-a-kind (FOAK) changes since design envelope is similar to existing plants

- Design verification through Integrated Development Process from conception to launch:
  - Mechanical design
    - Skeleton stiffness
    - Fuel Assembly stiffness
    - Grid performance
  - Thermohydraulic design
    - Fuel Vibration
    - Pressure Loss

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Licensing of ATLAS™ fuel design for operation in Olkiluoto 3 (OL3)

- All fuel related conditions have been analytically or experimentally substantiated, which include:
  - Normal conditions (operating conditions including transients and shipping and handling),
  - Anticipated Operational Occurrences (AOO), and,
  - Accident conditions.
- Analytical models, methods and methodologies are supported and verified by tests and validations in the ATLAS development program.
- The OL3 ATLAS fuel design licensing program was carried out as a split scope in close cooperation between TVO, its partners and Westinghouse.

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Licensing of ATLAS fuel design for operation in Olkiluoto 3 (OL3)

The OL3 ATLAS fuel design licensing program split scope:

- TVO:
  - AOOs,
  - Accidents,
  - Dynamic stability,
  - Decay heat,
  - Criticality safety,
  - Radiological consequences.
- Westinghouse:
  - Mechanical behavior (with support from TVO and its partners regarding the mechanical impact from a seismic and LOCA event),
  - Benchmark of the nuclear and core design,
  - Thermal mechanical fuel rod design,
  - Thermal hydraulic compatibility, and,
  - Subchannel Critical Heat Flux analyses.

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Licensing of ATLAS fuel design for operation in Olkiluoto 3 (OL3)

- After agreement between Westinghouse and TVO, development of the ATLAS fuel design began in 2022.
- Regulatory approval to operate the ATLAS fuel design in OL3 was granted October 2025.
- Eight ATLAS Lead Test Assemblies (LTAs) were delivered to OL3 on February 2026.
- The ATLAS LTAs were loaded in OL3 on September 2026 and mixed core operation started on October 2026.

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Program success factors

- The ATLAS fuel design is based on proven features from Westinghouse's existing and well-established fuel product portfolio.
- The excellent cooperation between all involved organizations, including Westinghouse, TVO and the Finnish nuclear regulatory body, STUK.
- The project has positioned Westinghouse as a viable fuel supplier to the EPR and contributed to increasing the security of supply of nuclear fuel in Europe, which is increasingly important in the current geopolitical situation.

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