TopFuel 2026:
Nuclear Reactor Fuel Performance Conference

October 12-15, 2026
Tokyo, Japan
Shinagawa Intercity Hall & Conference

TopFuel 2026 TOKYO

TopFuel 2026 – Call for Papers

Succeeding from the Asia's collaborative Water Reactor Fuel Performance Meeting (WRFPM), TopFuel 2026 will be held in Japan as the leading international conference on developments in nuclear reactor fuel performance. It brings together leading experts who are engaged in all aspects of nuclear fuel technology such as operations, fuel design, advanced fuel concepts, modeling and simulation, safety studies, and backend fuel cycle technologies. The conference also serves as a global platform for exchanging the latest knowledge, innovations, and experience, including advanced fuels.

TRACKS

I. Operation and Experience

- Fuel operating experience and performance: reliability and leakers, fuel assembly and component distortion, degradation and failures, handling issues, water-side corrosion and hydriding, stress corrosion cracking, poolside examination and hot cell PIE;
- Fuel assembly repair and reconstitution;
- Failed fuel monitoring, water chemistry and corrosion/crud/dose countermeasures;

- In core fuel management: mixed core operation; reload variability; flexible operation (power modulation or load follow), extended operating domain, end of reactor life (management of final cycles);
- Fuel supply strategy;
- Fluence reduction to reactor components.

II. Advances in Designs, Materials, and Manufacturing

- Fuel assembly design innovations;
- Processing and manufacturing including progress in additive manufacturing;
- Cladding and structural materials development; mechanical and corrosion behavior; irradiation experience in materials testing reactors (MTRs);
- Fuel design improvements for higher than 5% enrichment, high burnup, fluence reduction and efficient disposal;
- Development strategy for SMR fuels.

III. Evolutionary and Innovative Advanced Technology Fuels (ATF)

- In-MTR and in-LWR LTR / LTA experience with advanced fuel and control rod designs, fuel pellet, cladding and component materials behavior;
- Qualification, licensing, deployment scenarios;
- Life-cycle implementation from manufacturing to reactor operation and back-end;
- In-reactor performance of ATFs in normal operation and AOOs;
- Economics aspects of ATFs deployment strategy.

IV. Modeling, Analysis, and Methods

- Development, verification, validation, and uncertainty quantification (VVUQ) of fuel performance modelling codes;
- Multi-physics multi-scale modelling; water chemistry and crud modelling;
- Validation databases;
- Transposition to in-reactor and back-end conditions;
- Fuel design and safety analysis methods, including uncertainty analysis;
- Data-driven and artificial intelligence technology applications;
- Modelling of ATF and SMR fuels.

V. Transient Fuel Behavior and Safety Related Issues

- Transient fuel behavior (RIA, LOCA, ATWS, PCI/SCC, PCMI, post-CHF);
- Safety and design criteria (including DEC conditions), safety analysis and licensing for current fuel and ATF;
- Fuel safety related issues (e.g., fuel fragmentation, relocation, and dispersal; long term coolability; re-criticality; transient fission gas release; cladding ballooning and burst mechanisms; fuel behavior under extended loss of cooling);
- Quantification and management of margins;
- Small- and large-scale fuel testing facilities;
- In-pile and out-of-pile test results and analyses.

VI. Used Fuel Storage, Transportation, and Re-Use

- Closed fuel cycles and strategies
- Re-use after transportation/storage;
- Interim storage, dry storage, wet storage, and long-term storage strategies (including ATF);
- Handling and transportation of damaged, high BU and nonstandard fuels (including ATF); handling and treatment of leaking fuel;
- Spent fuel safety: R&D activities, ageing issues, criteria, and regulations;
- Long-term fuel database management.

VII. Advanced Reactor Fuel Designs and Performance

- Fuel qualification of advanced reactors
- Fuel performance modeling and safety analysis of fuel for advanced reactors
- Accelerating qualification of new materials for advanced reactors
- Fuels for FR, HTGR, MSR, etc.
- Spent fuel and decommissioning of advanced reactors
- Supply chain challenges and opportunities (Enrichment, HALEU, Transportation)
- Fuel management and core design of advanced reactors

Abstract submission

Authors should submit their one page abstract briefly describing the objectives, methods and main findings. The abstract should be written in English in the length 250 - 500 words (text only). Its submission should be made through the Abstract Submission System on our website by February 16, 2026.

Abstract review

The abstracts received will be peer reviewed under the auspices of the TopFuel 2026 Program Committee. Authors will be notified of paper acceptance by March 16, 2026.

Important dates

Deadline for abstract submission: February 16, 2026.
Author notification for acceptance: March 16, 2026.
Deadline for draft paper submission: April 24, 2026.
Review of papers and author notification: June 19, 2026.
Deadline for final paper: July 17, 2026.

Visit our website for more information: https://web.apollon.nta.co.jp/topfuel2026/index.html
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