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NRC Licenses TRISO-X LLC Fuel Fabrication Facility in Tennessee

The Nuclear Regulatory Commission has issued a license to TRISO-X, LLC, a wholly owned subsidiary of X-energy, LLC, authorizing the commercial fabrication of nuclear fuel for advanced reactors known as tristructural isotropic fuel. This license marks the first-ever U.S. approval of a category II fuel fabrication facility.

"Commercial-scale production of this fuel is key to enabling the deployment of advanced reactor designs," said NRC Chairman Ho K. Nieh. "This license represents an important milestone that supports the Department of Energy's program to accelerate deployment of nuclear technologies and deliver more power to the grid."

The license allows TRISO-X to possess and use special nuclear material at a facility that is under construction on the 110-acre Horizon Center Site, a greenfield site in Oak Ridge, Tennessee.

TRISO fuel is composed of small spheres of enriched uranium that are coated with multiple layers of carbon and ceramic materials, forming a robust shell that can withstand high temperatures. Compared to the fuel used by the operating fleet, high-assay low-enriched uranium fuel, or HALEU, has a higher percentage of U-235, the form of uranium that is able to sustain a chain reaction. Enriched uranium is one form of special nuclear material, which is defined based on its ability to fission.

The NRC's review of the license application included a safety and security review and an environmental review. The application was approved three months ahead of the published schedule due to multiple efficiencies applied in the staff's review processes. A safety evaluation report documenting the technical review will be made public within 30 days. The final environmental impact statement was published on Feb. 12, 2026.

TRISO-X submitted its license application April 5, 2022, and its environmental report Sept. 23, 2022, then supplemented the application on Dec. 30, 2024.

The U.S. Nuclear Regulatory Commission was created as an expert, technical agency to protect public health, safety, and security, and regulate the civilian use of nuclear materials, including enabling the deployment of nuclear power for the benefit of society. Among other responsibilities, the agency issues licenses, conducts inspections, initiates and enforces regulations, and plans for incident response. The NRC is collaborating with interagency partners to implement reforms outlined in new Executive Orders and the ADVANCE Act to streamline agency activities and enhance efficiency.