

## Project Title

Replacement and Upgrade of the Reactor Secondary Cooling Loop at the  
WSU 1 MW TRIGA Reactor

**PI:** C. Corey Hines, Director,  
Nuclear Science Center,  
Washington State University

**Collaborators:** N/A

**Program:** Infrastructure,  
Reactor Upgrades

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### ABSTRACT:

The Washington State University (WSU) Nuclear Science Center (NSC) is requesting funds to support partial replacement of the secondary loop of the cooling system consisting of a cooling tower, fan, sump heater, controls, and tie-ins to the reactor control room. The secondary cooling system loop of the reactor cooling system is responsible removal of heat generation during full power operation (1 MW), ensures operational stability of the reactor, reduces thermal cycling of the reactor pool structure and core components, and will provide unhindered operation of the reactor at full power through environmental conditions that the current system loop precludes continued daily operations. Variable frequency drives will enable fine tuning of the cooling tower heat capacity based on power level and environmental conditions. The last update to the cooling system was over two decades ago and is undersized for the current operational tempo, current utilization, and climate during the summer months.

The goal of this project is to enhance the operational reliability and efficiency of the WSU Nuclear Science Center 1.0 MW TRIGA conversion research reactor by replacing the aging, undersized equipment while simultaneously upgrading to a secondary cooling system appropriately sized for continuous heat removal and daily operations, especially during summer and winter seasons. The upgrades proposed in this application will also include installing variable frequency fan control to enable fine tuning of secondary loop heat removal to further reduce thermal cycling in the reactor pool, allowing for increased reliability and minimize prolonged negative operational impact to associated systems.