

## Infrastructure upgrades to the Texas A&M University Accelerator Laboratory

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Engineering Experiment  
Station

**Collaborators:** *N/A*

**Program:** General Scientific  
Infrastructure

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### ABSTRACT:

This project is to upgrade the Texas A&M University Accelerator Laboratory, a Nuclear Science User Facilities (NSUF) partner, to acquire the new capability of high dpa (displacements per atom) rate proton irradiation and simultaneous corrosion testing in molten salts. The objective is to enrich our current capabilities to provide more advanced irradiation capabilities to satisfy the NSUF needs in molten salt reactor (MSR) materials testing. The first task is to upgrade the current radiofrequency plasma ion source to a commercial TORVIS source which increases the proton beam current by at least one order of magnitude. The second task is to install a target chamber with the necessary beam focusing system, allowing proton bombardment into a molten salt corrosion cell. The system further includes a proton-based, Rutherford backscattering spectrometry analysis setup for in-situ characterization of the specimen under proton irradiation and corrosion testing. The project will (1) increase the efficiency of proton irradiations; (2) gain the new capability of MSR corrosion testing under simultaneous proton irradiation; (3) develop an innovative in-situ characterization capability to quantitatively measure specimen thickness changes and monitor composition changes. The upgrade will impact a wide range of light-water reactor and MSR related studies.