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Project: Sodium Fast Reactor Impurity Systems Advisor: Mark Anderson Sponsor: TerraPower







- The Sodium Fast Reactor (SFR) concept forms basis of TerraPower's Natrium reactor, expected 2028
- Experimental work needed to prove the safety and corrosion resistance of reactor components
- Oxygen concentration is a strong driver of SS316 corrosion in liquid sodium, requiring good control/measurement of oxygen in reactor and experimental systems
- Inactive standards exist for oxygen purification and monitoring, though are not well-suited to laboratory-scale loops at reactor purity levels
- Verifying and adding to body of regulatory standards will help transition to new age of US nuclear power





SFR schematic (left) compared with planned TerraPower Natrium facility





Experimental facility

- Perform plugging meter measurements with RDT standard and modified orifice plates (right)
- Perform rigorous testing and analysis of the vanadium wire equilibration technique
- Develop new standards for oxygen measurement in both labscale experiments and reactor settings
- Validate existing standards and develop additional standards for new nuclear



Orifice plates for oxygen measurement instrument



Vanadium wire