# Replacement Control Blade Drives at the University of Florida Training Reactor

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**Collaborators**: N/A

**Program**: Reactor Upgrades

**ABSTRACT:**

The University of Florida Training reactor (UFTR) control blade drives are the original units, which have been in service since 1959. The four control blades drives are the last major reactor component to not have been replaced under the ongoing facility refurbishment and upgrade. The UFTR has initiated its reactor restart plan and notified the NRC of operations resuming this fall, and the reliability of the control blade system is an area of concern.

The current blade drives have exceeded the design life by more than 20 years. Corrective maintenance activities have increased over the last two decades and have included replacing and/or modifying components of each drive. The continued operation of these drives will hamper plant restart, lead to future extended outages and reduce the facilities capability to provide education and research to the public.

The drives consist of a high-speed motor; primary reduction gears; an electro-mechanical clutch; and a right-angle gearbox that is connected to the control blade shaft. The overall gear reduction is approx. 17,000:1 to mechanically ensure the full travel of the control blade is greater than 100 seconds and that operators can easily control reactivity addition to the reactor. The system is designed to allow for gravity drop of the control blades within a short period of time with a signal from the scram/shutdown circuitry.

The UFTR has identified a regional integrated controls company (ITG) to design and manufacture control blade drives that meet the facilities design requirements. The new design utilizes a communications protocol that integrates well with the digital control system (SPPA-T3000) that Siemens Energy is supplying to the UFTR.

Implementation of a new control blade drive system at the UFTR will increase the performance and availability of the training reactor resulting in enhanced operating efficiency. This allows the operating and research staff to better focus on their training and research mission. The University of Florida Training reactor (UFTR) control blade drives have been in service since 1959. The control blades are the last major reactor component to not have been replaced under the ongoing facility refurbishment and upgrade.