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Thyratron Stability Improvements of SNS Extraction Kicker System

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The spallation neutron source (SNS) extraction kicker is a high power 60Hz pulsed system used to eject a proton beam from an accumulator ring and transfer it to the target. The system has 14 blumlein PFN modulators that require timing synchronization and fast rise times, with timing jitter resulting in a modulator potentially firing outside of the ideal target time and reducing transfer efficiency. Controlling extensive jitter via reservoir and filament adjustments can also reduce the lifetime of the thyratrons that are used to switch the PFN. This paper discusses the thyratron system itself, focusing on the control of the filaments and reservoirs to eliminate line sync issues and further stabilize the grid to extend lifetime in new and aging thyratrons and the results of the improvements made.

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