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## PARALLELED IDENTICAL MARX GENERATORS DRIVING A KLYSTRON THROUGH A PULSE TRANSFORMER IN A RADIATION ENVIRONMENT

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Two parallel Marx generators drive the primary of a pulse transformer with the transformer secondary driving a Klystron as part of a novel system developed by Stangenes Industries. A parallel Marx topology is used to reduce the current contribution of each Marx to an acceptable level so as to not require an export-controlled switch. This allows the system freedom of commercial convenience.

The Marx generator is designed to meet strict volume, lifetime, serviceability and environmental constraints as it must integrate into an existing system and operate quietly in a neutron environment for many years. High power IGBT switches are run at reduced voltages to minimize the probability of radiation damage. The system is water cooled with no forced air cooling to achieve a small footprint with minimal audible noise.

Comprised entirely of solid-state components, the MTTF of the system is reduced as various failure modes can be tightly controlled and prevented. A balance was achieved between performance and cost to maximize commercial viability. For instance, the two parallel Marx generators in the system are identical and replaceable reducing the cost of ownership and streamlining serviceability.

This paper reports experimental data and summarizes the operation of the parallel Marx driver into a Klystron load. Various fault modes and subsequent recovery are analyzed and projected lifetimes are considered. Methods of commercialization via reduced component cost and enhanced serviceability are discussed.

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