



Control System Upgrade for Canal ARC SAW

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Changing the World's Energy Future

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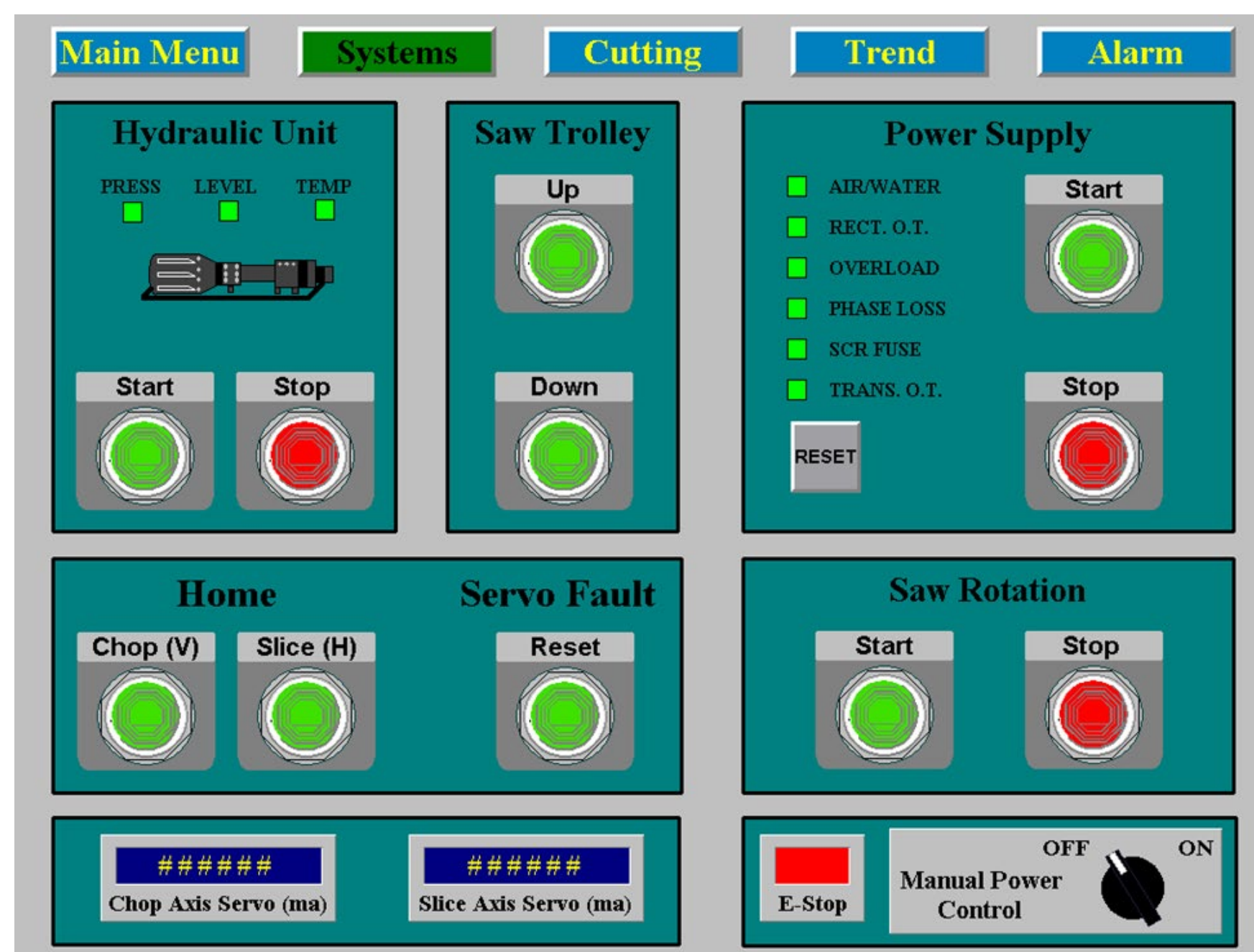


Figure 1: Control System Dashboard

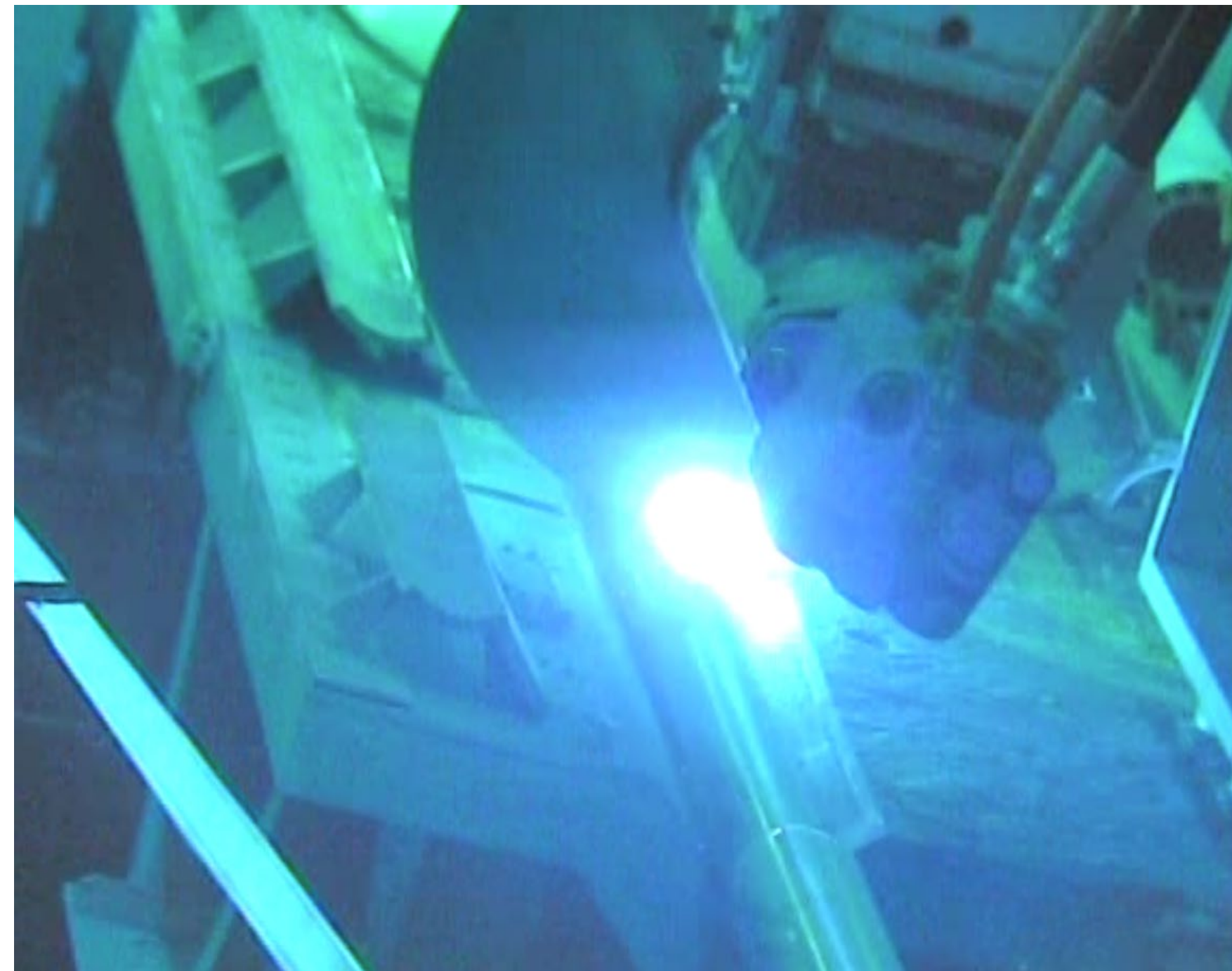


Figure 2: Canal ARC SAW

BACKGROUND & OBJECTIVE

- The Arc Saw plays a critical role in managing and disposing of fuel elements from the Advanced Test Reactor (ATR). This tool, in conjunction with a PLC console, is employed to safely cut spent fuel elements for storage. This cutting process uses low voltage DC (<30V) and high amperages to melt materials like an arc welder, forming near-spherical pellets the size of No. 10 birdshot without direct contact.
- The outdated status and lack of current support for the PLC control system associated with the Arc Saw, there is a need for an updated system. This upgrade is crucial to maintain operational efficiency, ensure safety, and complying with regulatory standards in handling nuclear materials.
- The upgraded control system will include a Human Machine Interface (HMI) touchscreen monitor, updated control ladder logic, updated Input/Output (I/O) modules, Servo Motor module, and PLC module.

New Technology, Same Principle



Figure 3: ControlLogix System

The ControlLogix system communicates via EtherNet/IP to monitor and control I/O devices across the ControlLogix backplane and I/O links. This integration enhances efficiency and boosts productivity, optimizing the overall control system.



Figure 4: HMI touchscreen monitor

A Human Machine Interface (HMI), is a feature or component of a technological device that enables humans to engage and interact with machines. This provides a user-friendly interface for monitoring and controlling complex systems.

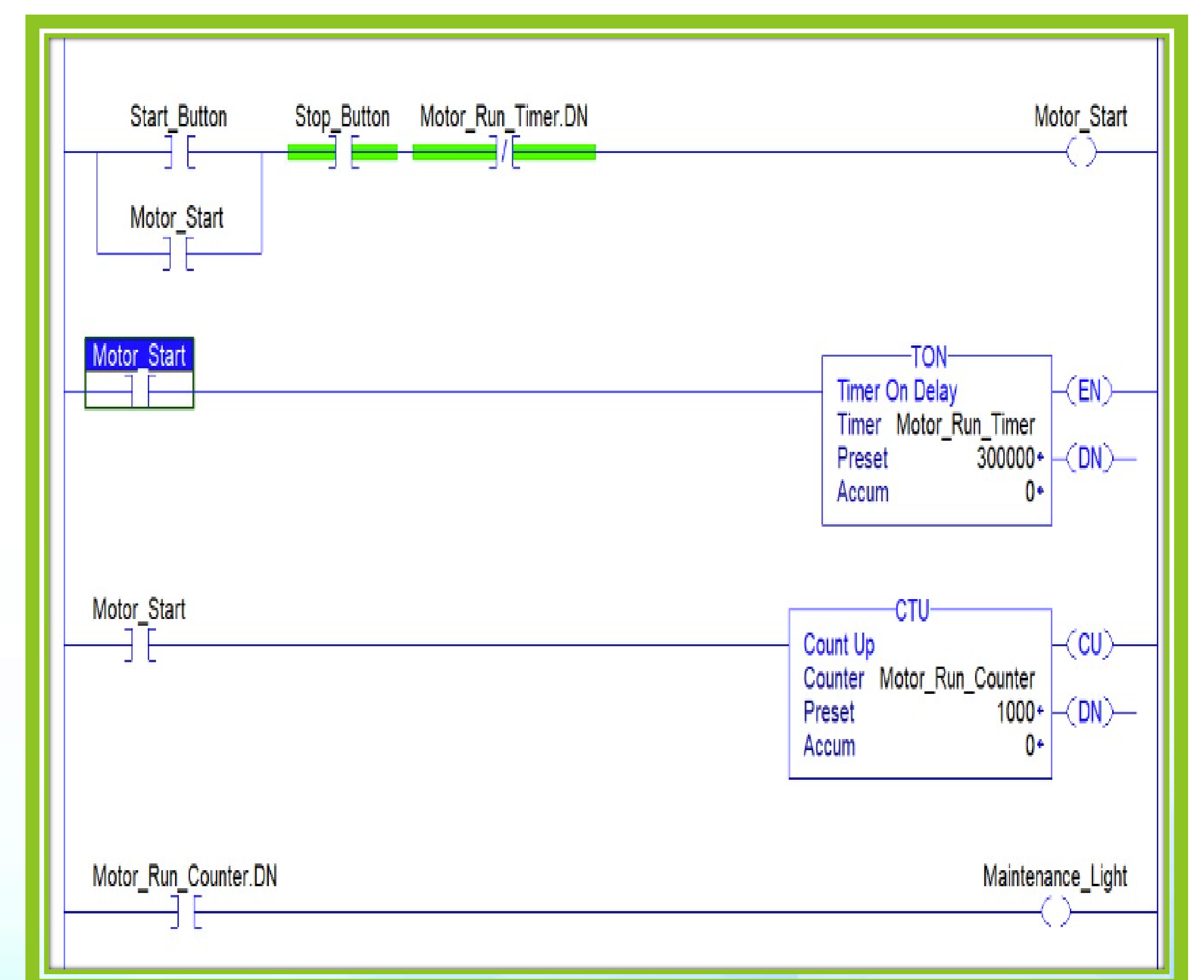


Figure 5: Ladder Logic

Longevity

Upgrading the specific components of the Arc Saw, such as the HMI, the components of the chassis involving the I/O modules, servo motor module, and PLC module offers numerous advantages. By enhancing the HMI, the operators benefit having a user-friendly interface, enabling smoother control and monitoring of the ARC SAW's functionality. Upgrading the modules contribute to an improved precision and responsiveness in changing modes of the ARC SAW as well as the adjusting the saw blades position, further enhancing the system's overall performance. The upgrades, while maintaining the same functionality, enable the latest technological advancements without needing significant changes or disruptions to existing operations.