



Capstone Design Project Abstract

Project Title: Georgia Power Remote Control Live Line Tool Tree Trimming/Removal Attachment

Sponsor: Georgia Power Company

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Severe weather events such as thunderstorms and high winds frequently cause tree limbs to disrupt electrical distribution lines, resulting in infrastructure damage and widespread power outages. Georgia Power has identified a need for improved tools that allow Distribution Engineers, Linemen/Troublemakers, or other personnel to safely and efficiently remove these obstructions without the use of bucket trucks, particularly in areas where bucket trucks cannot reach. The objective of this project is to design, prototype, and test a lightweight, remotely operated attachment for existing live line tools capable of cutting and removing tree limbs up to 3 inches in diameter while maintaining a total weight under 5 pounds. The scope includes ensuring compatibility with standard live line tool connections, providing reliable operation throughout an entire work shift, capability of operation by an individual, and compliance with OSHA safety regulations.

Key design challenges include minimizing weight while maintaining structural integrity, ensuring stability during cutting operations at extended heights, and mitigating vibration to ease stress on the user and improve efficiency. Additional considerations include electrical hazards associated with operating near energized lines, minimizing the effect of environmental conditions such as wind and rain, and the reaction of power lines when the stress from the interference of limbs is released. Due to the limited market competition for a similar product, this tool will provide a fresh method for limb removal resulting in market opportunity for Georgia Power to present to manufacturing companies.

The selected solution is a lightweight aluminum mold with an adapter to firmly connect to the live line tool designed to securely hold a handheld Milwaukee reciprocating saw on a live line tool. The tool includes a remote-powered system incorporating a motorized lever to compress the trigger. The remote is attached to the backside of the live line tool for ease of operation. Deliverables include detailed CAD models, engineering drawings, a functional prototype, and performance testing results. This solution aims to improve response efficiency, enhance safety, and reduce outage duration.

