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Problem: Consolidated Grain and Barge has an ageing and retiring workforce, so new employees need to be trained. This paired with the recent advancements of technology creates a need for more in depth training in electrical safety and greasing applications.

Greasing Simulator Objective: The greasing trainer's main function is to train employees and to minimize downtime and bearing replacement expenses. The greasing trainer will allow employees to apply recommended amounts of grease, calibrate grease guns according to the grease volume meter and also to train employees on the use of a digital ultrasound machine.

Ultrasound Machine used to train employees how and when to properly lubricate bearings. This ultrasound instrument detects changes caused by friction. A properly lubricated bearing creates minimal friction. An improperly lubricated bearing produces friction, which is recognized by an ultrasound machine before bearing failure occurs.

- Hear when grease is being applied
- Recognize when to stop greasing
- Prolong bearing life
- Improve on maintenance efficiencies
- Prevent costly downtime



- Grease volume meter is used to train employees how to calibrate different grease guns, and apply a precise volumetric amount of grease with various grease guns.
- Greasing amount chart created to recommend volumetric amounts of grease based upon bearing size.



Total Cost: \$3,127

Alternative solutions considered:

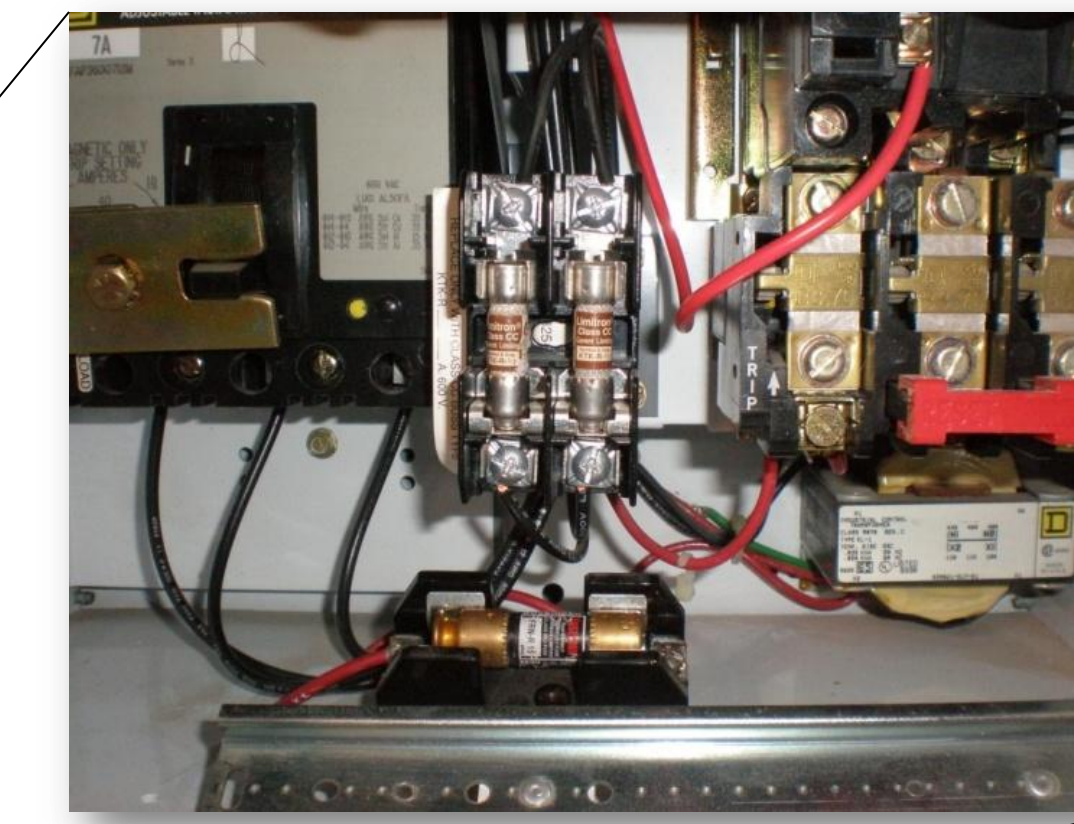
- Use of clear tubes to show volume from different grease guns
- Have a cut-away bearing to visually show grease entering bearing

Electrical Trainer Objective: To develop a motor control center (MCC) that can be used to safely train employees to troubleshoot a high voltage electrical box.

The MCC was modified from 480 V AC to 12 V DC by a 110 volt power convertor to protect employees from high voltage electrical shock.

Training Components:

- Proper PPE
- De-energizing procedure
- Lockout procedure
- Check fuses
- Check voltage
- Change fuses
- Reset breakers



The trainer is equipped with a tool cabinet that contains:

- ✓ the 12V power supply
- ✓ multimeters
- ✓ screwdrivers
- ✓ fuse pullers
- ✓ additional fuses.



Total Cost: \$1,909*

*Cost includes a salvaged electrical box valued at \$1500

Alternative solutions considered:

- Use a computer simulator to train how to troubleshoot electrical systems.
- Use high voltage electrical MCC that is not energized.
- Using electrical boxes without the entire MCC cabinet.