

Water Environment Association of Texas

Operations Challenge

Electrical Event

Goal

Safely troubleshoot and repair an electric motor control panel in an efficient manner.

Procedure

We have assembled a panel that consists of a 3-phase motor starter/overload block, 3-phase motor circuit protector, control power transformer, HOA switch, start/stop pushbuttons, relays, etc. We have wired this using a very typical motor control circuit so that it can operate in "Auto" from level switches or in "Hand" from the start/stop pushbuttons. However, the circuit is not in a working condition. Teams will be asked to troubleshoot and repair the control circuit to return it to operation.

1. Each team will consist of two people.
2. Each team will be given the same wiring diagram, VOM, screw driver, wire, etc. to make all necessary repairs.
3. The actual problems in the control circuit encountered by each team may not be the same, but every effort will be made to make the type and number of problems similar for the various teams.
4. Each team will be timed. The intent is to repair the circuit quickly, efficiently, and, most importantly, safely.
5. Penalties will be assessed for various infractions:
 - a. If a team member attempts to touch an energized circuit with bare hands, screwdrivers, etc., a penalty of five minutes per infraction will be added to the overall time.
 - b. If a team blows a control fuse or trips a circuit breaker, a penalty of five minutes per infraction will be added to the overall time.
 - c. If a team breaks the VOM by blowing the internal fuse, the team will be disqualified.
 - d. If a team tests the circuit by attempting to run the "motor" more than four times in "Hand" or more than four times in "Auto", a penalty of one minute per attempt (in excess of four per side) will be added to the overall time.
 - e. If a team does not finish in 30 minutes, the team will be disqualified.

General Notes

This exhibition will be conducted in two different divisions:

1. The "Open" Division will consist of teams made up of electrical engineers, technicians, maintenance electricians, etc. These teams will compete on Wednesday with times to be scheduled.
2. The "Professional" Division will consist of the existing Texas Operations Challenge teams. These teams will compete on Thursday with times to be scheduled.

As with any new event, there is always the potential to identify, correct, or clarify parts of the procedure that may be problematic. As such, it is our intent to review and revise the procedure in order to improve competitiveness and safety.