



SIF Alert: FINAL communication

For leaders to discuss with their team



Title:	Fresno Flash Burn Incident
Purpose:	Reviewing this Serious Injury and Fatality (SIF) Potential investigation, will allow us to learn what improvements need to be made to provide workers greater capacity to perform their work safely. Please inform your employees of the incident take-aways at your next safety tailboard.
Incident summary: CAP 121718149	<p>On July 12, 2021, at 21:34 hours, the Woodward 2102 circuit breaker in Fresno relayed and opened causing an outage to 3,380 customers. A Troublemaker from the Electric Operations Fresno Division Restoration department was dispatched by the South Distribution Control Center (DCC) Operator to troubleshoot the section of Woodward 2102 that was de-energized.</p> <p>At 22:23, 49 minutes after the original event, the Woodward 2106 circuit breaker relayed and then reclosed and opened, resulting in a circuit breaker lock-out state, causing a sustained outage to 1735 customers. The trouble was later determined to be at the same underground 600 Ap 3-way Trayer switch.</p> <p>The Troublemaker the saw power go out, then noticed a flash and smoke coming from an enclosure across the street. He then drove to the switch enclosure and resumed communication with the Distribution Operator (DO).</p> <p>At 22:26, the switch catastrophically failed when 9443 was closed-in (energized) by FLISR automation. An arc flash occurred, and hot oil was sprayed out of the enclosure onto the back of the Troublemaker causing burns to the scalp, neck, hands, and wrist.</p> <p>The Troublemaker was transported to the Clovis Regional Hospital, treated for burns and released the same day.</p>
Cause:	<p>AC-1: There is not a formal requirement in procedures for 3-way communication between the DO and Troublemaker in instances where a circuit with FLISR experiences a fault and FLISR automation may be in-process.</p> <p>CC-1: Procedures and associated training for Apprentice and Journeyman Troublemakers and Distribution Operators (DO) do not discuss the inability to fully disable FLISR until all automation sequences are completed, and the need to remain clear of equipment until the DO confirms FLISR is disabled.</p>
Summary of findings:	<ul style="list-style-type: none"> • There is no requirement for formal 3-way communication between the DO and Troublemaker in instances where a circuit with FLISR experiences a fault and FLISR automation may be in process. • There is a lack of knowledge by the Operators and Troublemakers regarding the inability to immediately and completely disable FLISR. • Troublemakers must remain clear of the equipment while the system is running and until FLISR is confirmed to be disabled by the DO. • When experiencing lockouts on circuits equipped with FLISR, the Distribution Operators need to disable FLISR on the associated tie switches involved in the scheme. • The Trayer 600 Amp submersible switch showed signs of arcing inside the housing and melted holes near the bushings. This indicates the oil was likely low and not providing adequate dielectric insulation for the internal energized switch gear components. The switch was built 24 years ago in 1997 and has a 30-year maintenance free life per the manufacturer.
Corrective actions summary:	<ul style="list-style-type: none"> • Revise Utility Procedure TD-2700P-05, FLISR Operating Guideline / Procedure and Utility Procedure TD-2908P-01, Distribution Switching Procedure to: <ul style="list-style-type: none"> - Require formal 3-way communication between the DO and field personnel during outages when FLISR circuits are involved.

- Add language that FLISR automation cannot be stopped immediately and is programmed to complete automation sequences which can allow it to close. When FLISR is running, the Operator cannot disable until it is in idle state.
- Add an instruction for Operators to disable tie circuits when they get a circuit lockout.
- Add language instructing Operators to not allow Troublemakers to approach equipment until the DO confirms FLISR is idle and the SCADA screen indicates “disabled” status.
- Targeted awareness of this issue and corrective actions is being provided to Electric Distribution Operators, Troublemakers, Restoration field personnel, Contract Safety Supervisors, Field Safety Specialists, Contact Construction Inspectors and Supervisors, and System Inspections (Compliance Inspectors).
- Training for Apprentices and Journeymen will be revised to reflect changes to the procedures and processes.

Lessons learned:

- Field personnel may not be aware of the danger of being near equipment that has a FLISR scheme activated.
- Once FLISR has begun restoration it cannot be disabled.
- For this reason, the FLISR scheme on the circuit and the associated tie switches must be cut out or confirmation that FLISR has completed its restoration before field employees can come in proximity to the equipment.
- 3 Way Communication is necessary between the distribution control center operator and the associated field personnel to confirm that FLISR is inoperative before field personnel are given the ok to come in proximity of the equipment.

Pictures:

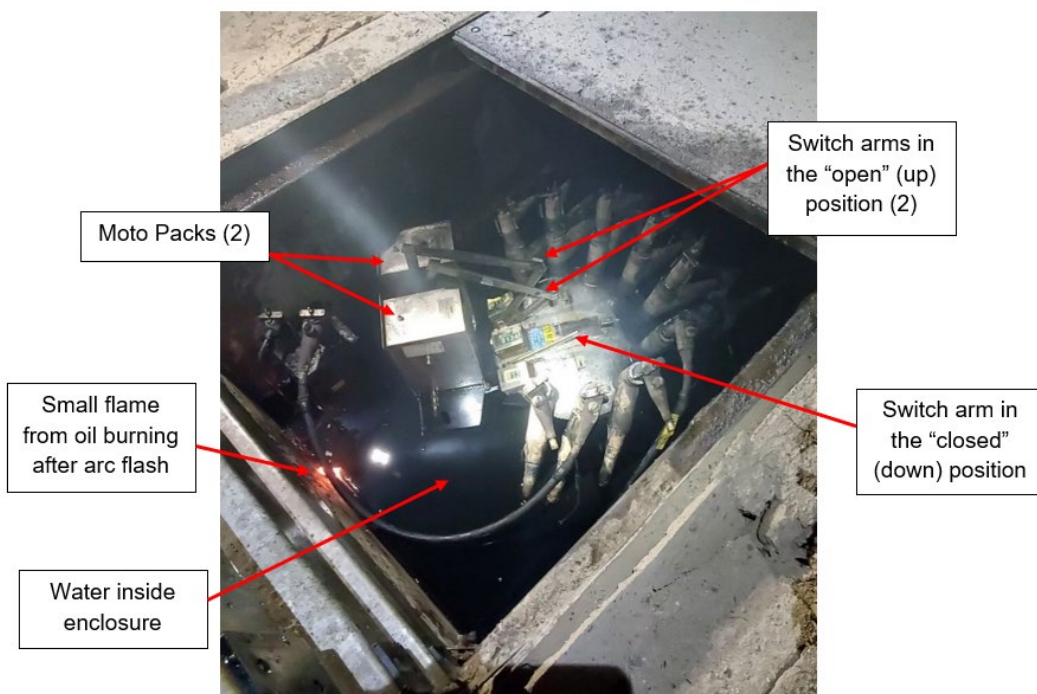


Image 1: Failed 600 Amp Trayer Switch inside enclosure



Image #2: Failed 600 Amp Trayer Switch with bottom tank weld rupture.

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