

ACTIONABLE LESSONS LEARNED: Operator Electrical Shock



Exposure to
Electrical Hazards

Incident Overview

Chino, March 6, 2024

A crane operator was harvesting cathodes from cell 8 inside a jumper frame. The employee was removing the second pull when a wet pantleg came into contact with the jumper frame above the boot. The operator sustained a minor shock.



Causal Factors

- The integrity of the crane hook insulator was compromised from excessive grease and moisture.
- The crane hook insulators lacked a weekly Megger Meter check for insulator resistance. Megger readings were not documented per Electrowinning/Electrorefining (EW/ER) policy.

Site Specific Actions

- **Engineering** – Retrofit tank house cranes with non-conductive cables.
- **Substitution** – Replace crane hook grease materials with non-conductive grease. Contractor preventative maintenance reports to be received and reviewed by Freeport site leadership to verify compliance.
- **Administrative** – Create process for crane hook Megger Meter checks at the start of each shift. Meter readings to be conducted by an electrician and reported to leadership. Equipment to be removed from service if insulator fails testing.
- **Administrative** – Corporate Operational Improvement Electrical Subject Matter Expert to inspect tank house and provide recommendations for safety improvements. Will evaluate potential for isolating jumper frame and insulate strongback.



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Hydromet Employees and Electricians

- Keep clothing dry, as much as possible.
- Verify an electrician has tested the crane hook insulator with an insulation tester (e.g. Megger) and that it is safe to proceed.
- Electricians – Make sure to test crane hook insulation with an insulation tester (e.g. Megger) every week as directed in policy. Chino, in particular, will do these readings daily.
- Read and become familiar with the [Electrowinning /Electrorefining \(EW/ER\) Electrical Safety Policy](#).



Freeport Leadership

- Read and become familiar with the [Electrowinning /Electrorefining \(EW/ER\) Electrical Safety Policy](#). Discuss policy with employees and verify understanding.
- Verify all tank house employees are trained on the EW/ER policy annually.
- Verify site processes meet EW/ER policy requirements. Specifically, electricians must conduct Megger readings, and identified maintenance issues should be resolved immediately.
- Audit established EW/ER processes regularly.



All of Us

- Do not enter work areas, especially tank houses, if you have not been assigned to the area or have appropriate training.
- Verify preventative maintenance is completed as scheduled in your work areas.
- Regularly inspect the condition of your personal protection equipment (PPE). Replace PPE that has lost its integrity.



Actionable Event: Operator Electrical Shock

Exposure to Electrical Hazards

Preliminary Incident Details

Operation	Chino
Date / Time	March 6, 2024 / 12:30 p.m.
Event Type	Injury, first aid – electrical shock
Summary	A crane operator was harvesting cathodes from cell 8 inside a jumper frame. The employee was removing the second pull when a wet pantleg came into contact with the jumper frame above the boot. The operator sustained a minor shock.
Risk Category	Actionable – Significant (3) Likely (3)
Findings / Missing Controls	<ul style="list-style-type: none"> The insulator on the crane hook was wet and offered no insulating value (showed no resistance) The insulating material on the strongback was worn
Applicable Policies / Procedures	FCX Policy - EW ER Electrical Safety Rev. 2.pdf
Employee Condition	Employee was evaluated and released to full duty.
Contact	Jim Cook, Manager-Health and Safety

Photos / Links



Strongback handle



Area the operator's leg contacted the jumper frame



Handle with replaced insulation