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Managing the risk of 120v electric shock – Outcomes from recent electric shock events

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Electric shock events in the Jansen shafts

- Shock received when using a pendent for an electric hoist
- Shock received when retrieving a bell knocker rope


Shotcrete deck drill

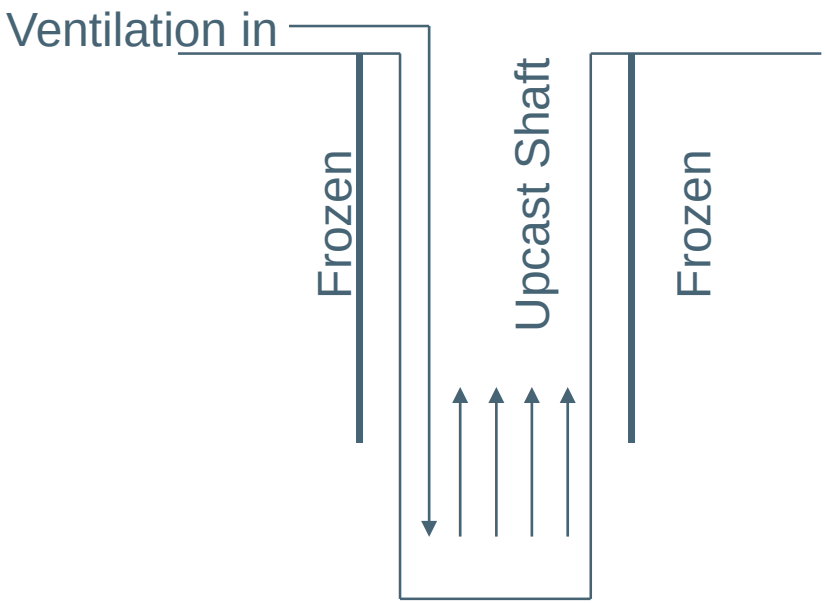
Events

1. Winch Pendent 120V control

2. Bell Knocker Cables

Shaft conditions while sinking

- Upcast shaft
- Ground surrounding shafts is frozen to ~700m
- Inside the shaft, conditions vary from cold and dry to snow, fog and even rain



Wet conditions

Shaft liner and bracket

Floor of Shaft Boring Roadheader (SBR)

Frosty conditions

Causes

1. Electric winch shock – equipment not suited to environment

- No ground provision
- Systems not reviewed for potential hazards in wet conditions
- Equipment design and selection did not consider all potential operating conditions

2. Bell system shock

- Material buildup pulled the cable sheath back, exposing conductor
- Change Management that occurred did not include a review of Electrical Inspections and Controls
- Frequent human interaction = frequent exposure to hazard


Bottom of the Excavation

Lessons learned

- 120v circuits can be fatal – treat them as such!
- GFCI protection beyond what is required by code
- When conditions change, review potential hazards and risks with a broad spectrum of experts

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