ESP Run Time Improvement in High H2S Wells

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Agenda

- Challenge
- Cable Component Review
- Action Plan
- Results and Recommendations
Challenge

- High H2S environment (2-6% concentration)
- H2S allowed to attack insulation = electrical failure
- Consistent failure pattern
  - Cable portion submerged in fluid is more susceptible (see yellow portion)
  - Run days
- General Perception – upgrade armor to corrosion resistant material (such as stainless steel)
  - Why wasn’t this a solid design solution?
Cable Component Review

- **Armor:**
  - Protection from mechanical damage/swelling

- **Barrier:**
  - Used to protect from

- **Insulation:**
  - Bonded to conductor

- **Conductor:**
  - Carries power to motor

**Diagram:**
- Armor (Galvanized steel)
- Barrier (lead)
- Insulation (EPDM)
- Conductor
Action Plan

• Goal – Increase Run Time by identifying weak point in system
  – Consistently bottom 2500-3000’ of cable deteriorated
  – Remaining cable and full ESP eligible for reuse

• Strategy – focus on lead barrier
  – Increase thickness
  – Create a seal

ELB Lead = 0.040 inches thick
EHLTB Lead = 0.050 inches thick + Tedlar tape barrier
Results

*Indicates run life still in progress
Conclusions
• Addition of cable with reinforced lead barrier was successful in increasing run life
• Successfully incorporated this design strategy for other high H2S wells

Recommendations
• Estimate length of cable expected to be consistently submerged in sour well fluid – incorporate appropriate length of heavy lead
• Failure investigation is key
  – Collaboration between operator and vendor
  – Beneficial to both relationship and finances
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