

Repeated ESP electrical failures in sour gas wells solved and leads to solution rollout to 50 wells

Installation of SPECTRUM ADVANCE I-LEAD encapsulated MLE into ESP system



An operator in Saudi Arabia suffered repeated short ESP run lives in a productive but harsh, high pressure offshore oil field.

Multiple electrical failures were attributed to sour gas ingress via the packer penetrator which corroded the lead sheath, insulation and conductor. To meet operator requirements for all new ESP installations, Alkhorayef developed the SPECTRUM ADVANCE I-LEAD™ (Patent Pending); a more robust MLE design for corrosive applications.

The SPECTRUM ADVANCE I-LEAD features three Polyether Ether Ketone (PEEK) insulated, solid copper conductors, individually encapsulated in seamless Monel tubes that connect to a specially designed Universal Motor Head (UMH). Plug in style motor terminal connections afford straightforward installation, and reduced rig time, while metal to metal sealing faces, and no electrical connections beneath the packer removes the risk of MLE/pothead failure due to H₂S penetration in high partial pressure environments.

The SPECTRUM ADVANCE I-LEAD was first installed in May 2016 and insulation integrity remains good. The success of the field trial has led to further installations with over 50 units now successfully installed and commissioned.

SAUDI ARABIA



RESULT

- Longer ESP run life
- Significantly reduced risk of MLE/pothead failure
- Better ROI for harsh wells
- Improved reliability – reduced workovers, deferred production
- Reduced rig time: quick, simplified field installation
- Reduced CAPEX & OPEX

BACKGROUND

- Offshore, high value oil field
- Seawater injection for reservoir pressure maintenance
- High H₂S and CO₂ partial pressures
- Short ESP run life due to sour gas ingress via packer penetrator & cable/MLE
- All future installations required to have encapsulated three leg pothead

SOLUTION

- Three 3/8" OD, seamless Monel encapsulated phases
- Four AWG solid copper conductors
- PEEK insulation, rated up to 500°F (260°C)
- Specially designed UMH power adaptor
- Metal to metal sealing faces
- Plug in style terminal connections
- Tube lengths up to 800' (243.8 m) available