



Solutions.
People.
Energy.SM



Integrated Artificial Lift Excellence: Technologies, Operations, and the Digital Future

12 – 13 May 2026 | KUALA LUMPUR, MALAYSIA



Solutions.
People.
Energy.SM

**Integrated Artificial Lift Excellence:
Technologies, Operations, and the Digital Future**



First in Malaysia: Wireline-Retrievable ESP (WR-ESP) as an Alternative to Conventional ESP in Offshore Wells

M Farriz Ijaz Noordin / Khairul Riza Zainul Rahim – Hibiscus Oil & Gas Malaysia Limited
Zayful Hasrin / Muhammad Izzuddin – PETRONAS Carigali Sdn. Bhd.





Solutions.
People.
Energy.™

[Open]



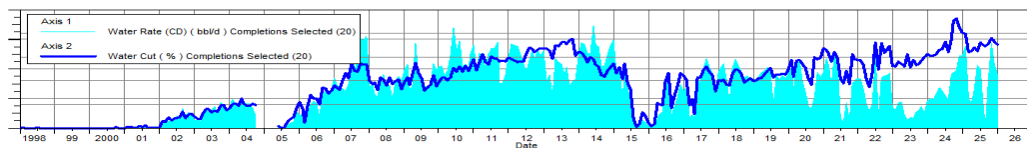
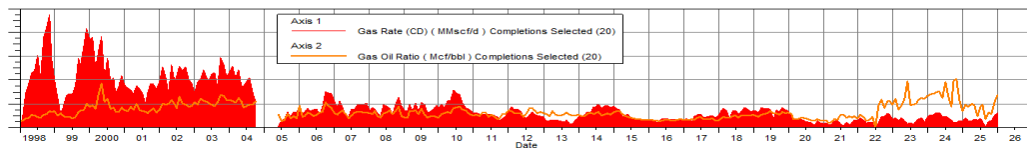
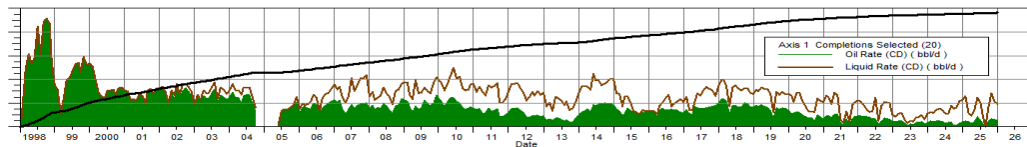
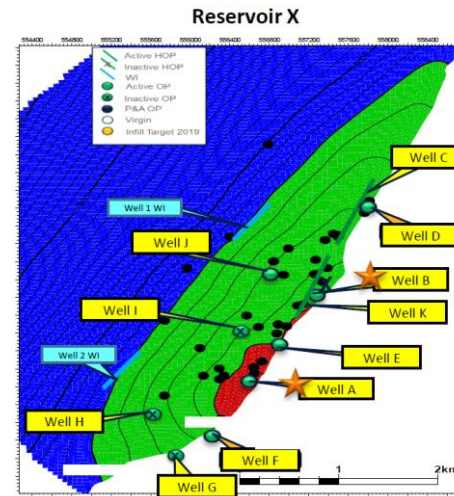
Presentation Outline

- Background
- ESP System Pilot Selection Strategy
- WR-ESP Components
- Production Monitoring & Troubleshooting
- WR-ESP Changeout Planning & Design Improvement
- WR-ESP Change Out Procedures
- WR-ESP Technology Challenges & Key Learnings

Background

FIELD BACKGROUND

- Field Location: 54 km NW of Labuan
- First Oil: December 1997
- Drive Mechanism: Aquifer drive + Gas cap expansion
- Primary AL: Gas lift
- Average WC: 70% – 80%



PROJECT BACKGROUND

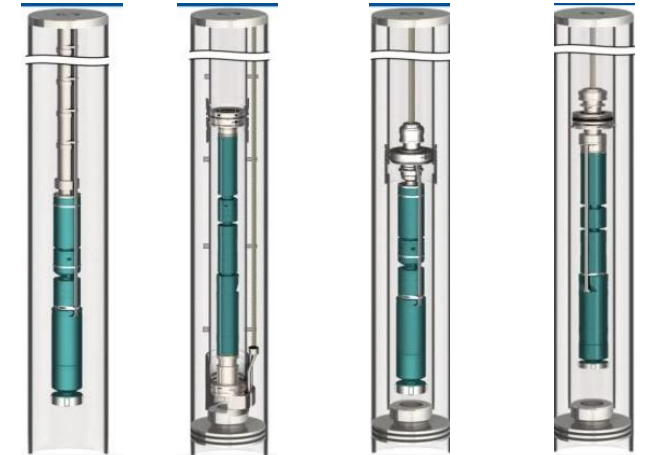
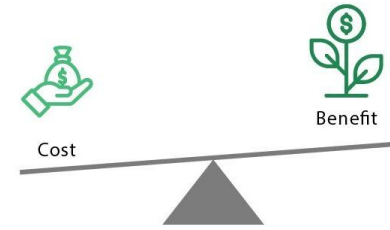
- Field challenges include **increasing field watercut**, posing constraints on **GL availability and distribution** to sustain oil production
- Motivation to explore and **diversify** alternative Artificial Lift Strategy
- **ESP** deemed as the most feasible alternative option

ESP FEASIBILITY SCREENING

- 1 **Subsurface** (pressure, temperature, production potential, WC, sand, contaminants, flow assurance, reserves)
 - 2 **Well Completion** (size, deviation, DLS, tangent, GVF, integrity)
 - 3 **Facilities** (power availability, capacity availability)
- ESP feasibility screening resulted in few viable candidates for pilot

ESP System Pilot Selection Strategy

- ❖ All 4 ESP systems (conventional ESP, WR-ESP, CT-ESP & TT-ESP) were evaluated and compared
- ❖ WR-ESP offered few distinct advantages suited for pilot implementation strategy as follows;
 - ✓ Ability to meet the technical requirements, on par with conventional ESP
 - ✓ Gives competitive lifecycle cost especially for pump change out
 - ✓ Shorter planning and mobilization time
 - ✓ Rigless capability for pump change out
 - ✓ Higher flexibility & adaptability; important for pilot phase
 - ✓ Rigless capability for change out



ESP TYPE	Conv. ESP	WR-ESP	CT-ESP	TT-ESP
Technical Requirements				
Lifecycle Cost	\$\$\$	\$\$\$	\$\$	\$\$
Rigless Change Out				

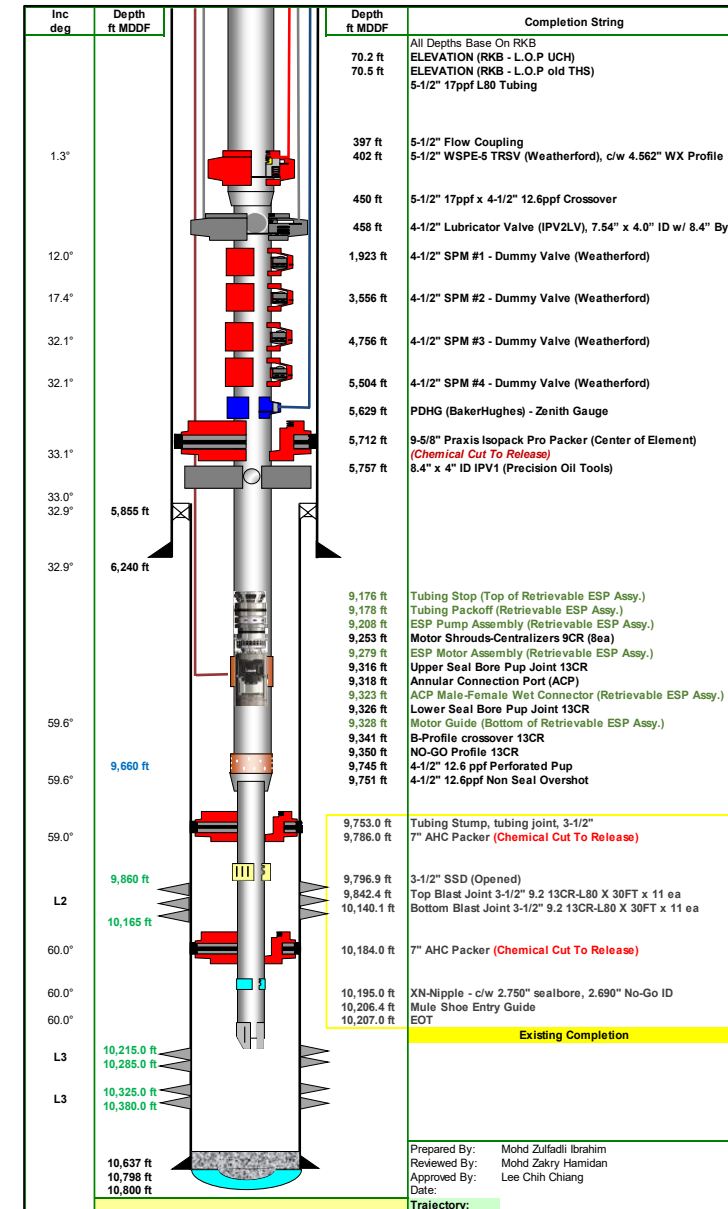
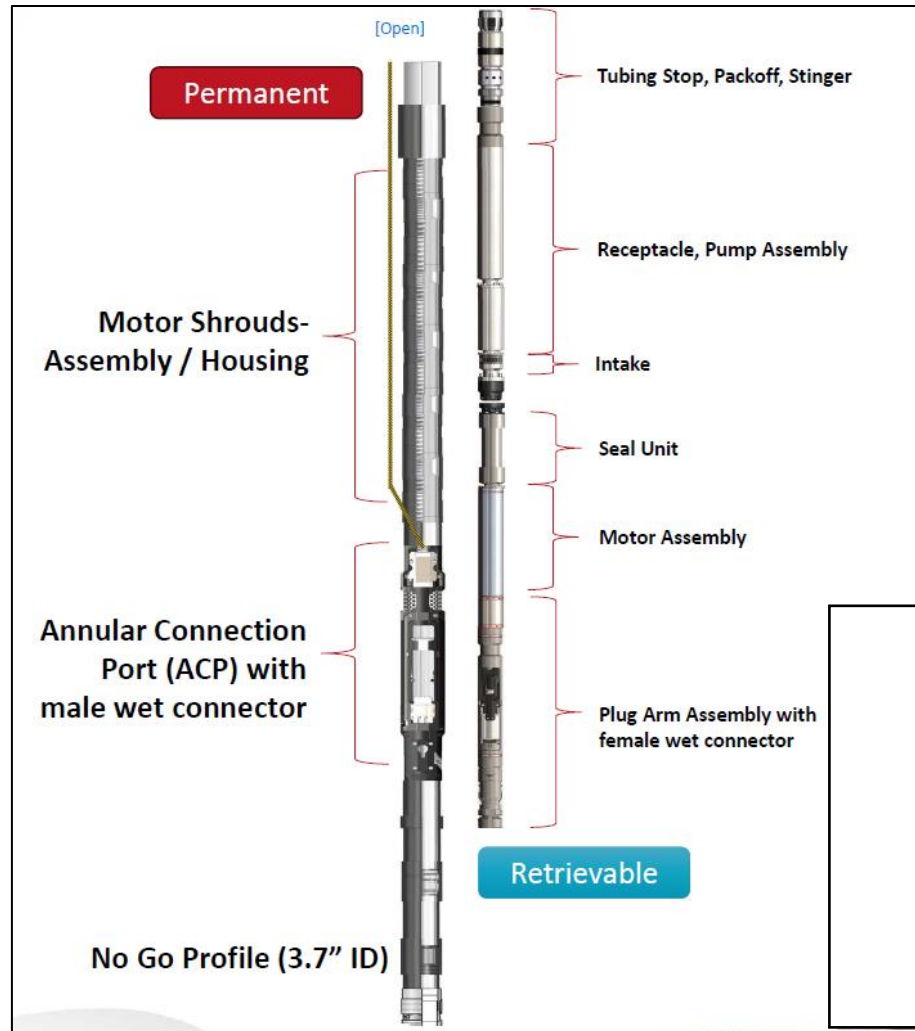


Solutions.
People.
Energy.™

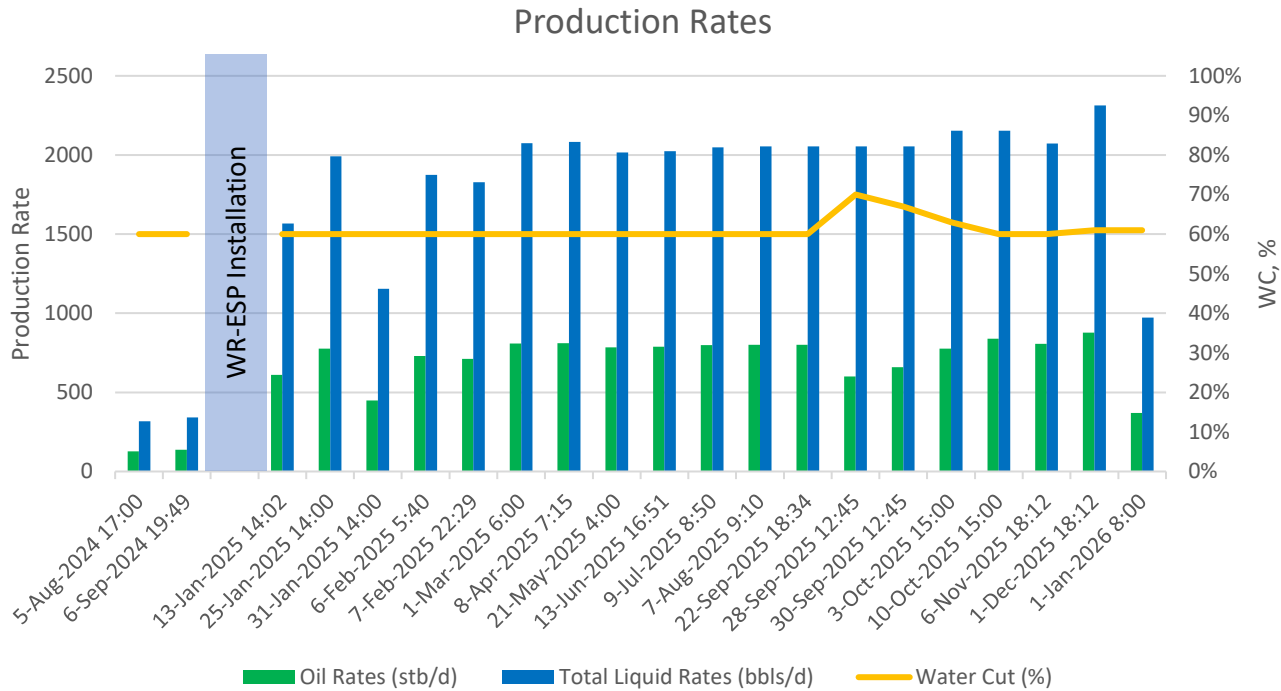
[Open]



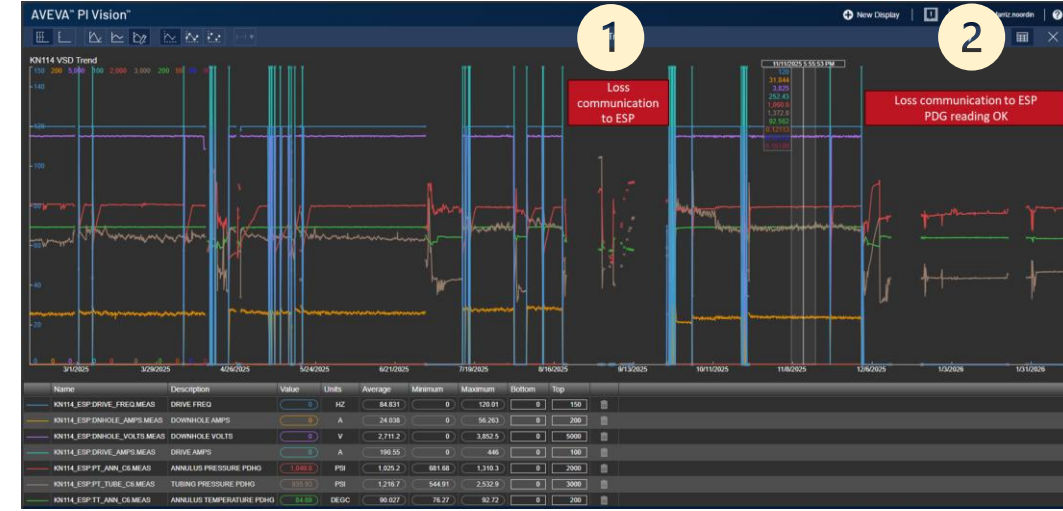
WR-ESP Components



Production Monitoring & Troubleshooting



- Production gain of 1500 bbl/d recorded
- Stable production trending observed average 2000 bbl/d



Event 1– Lost communication with DHG

- ESP tripped and loss DHG data.
- Found out DHG is malfunctioning & confirmed DHG faulty after troubleshoot.
- BH assisted on start-up; ESP able to continue running stably with no DHG data using underload setting to safeguard ESP motor.

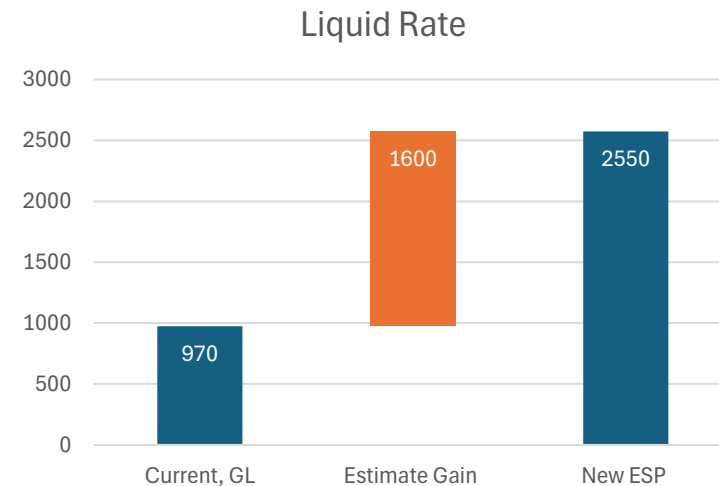
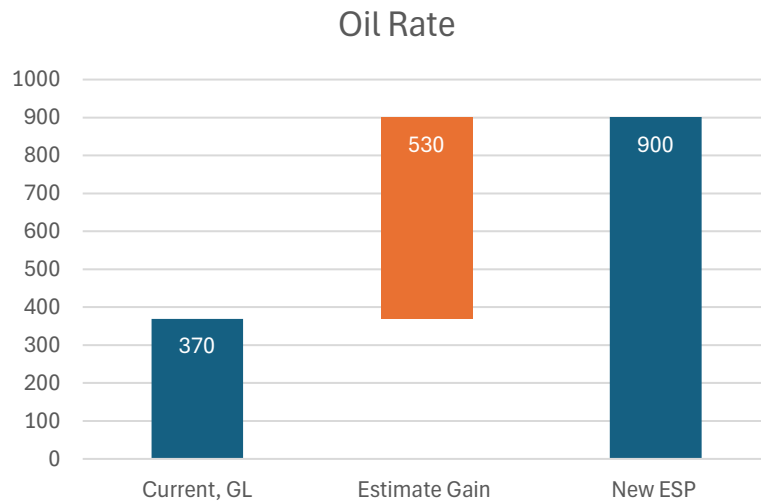
Event 2

- WR-ESP tripped, unable to restart
- Performed electrical checks – found the motor to be grounded (P-P: 13.4Ω, 11.2Ω, 13.4Ω (unbalanced); P-G: 0Ω)



WR-ESP Changeout Planning & Design Improvement

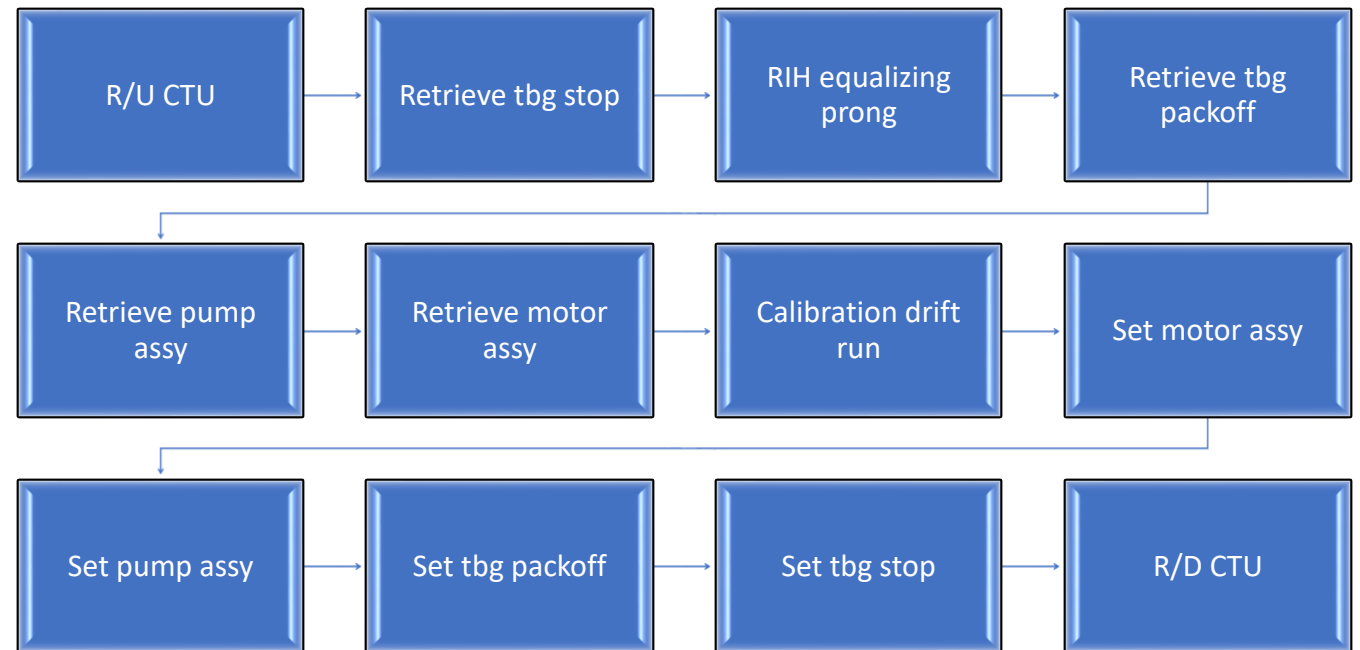
- WR-ESP enable quick response and fast well recovery through a rigless ESP change out strategy.
- With the availability of ESP inventory, well downtime can be minimized and production restored quickly.
- The pump design is improved with additional 500 bbl/d compared to the existing pump design.





WR-ESP Change Out Procedures

- Rigless WR-ESP retrieval and redeployment using CTU
- Enables rapid pump replacement without full workover rig mobilization
- Minimizes well downtime and production deferment





Solutions.
People.
Energy.™

[Open]



WR-ESP Technology Challenges & Key Learnings

Challenges

- WR-ESP run life recorded ~1 year, compared with the historical database average of ~2 years
- Operational learning curve during initial deployment, monitoring, and troubleshooting support
- Gap observed between initial design assumptions & actual well conditions

Key Learnings

- WR-ESP benefit observed based on the pilot well performance and production gain.
- WR-ESP provides major benefit through fast rigless changeout capability
- Spare pump inventory and backup equipment significantly reduce lead time and well downtime
- Continuous pump optimization based on actual field performance



Solutions.
People.
Energy.SM

Integrated Artificial Lift Excellence: Technologies, Operations, and the Digital Future



THANK YOU