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CASE STUDY

Driving the Right Decision:

De-risking Conductor Installation Offshore Vietnam



Location

Offshore Vietnam

Client

PVD/PVEP POC

Product

Platform Well Conductor Analysis

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Project Overview

When PVD/PVEP POC was planning a 12-well offshore development campaign in Vietnam, they needed to understand **two key operational goals.** Whether four 36-inch conductors could be driven to the target depth of 90 metres below the mudline, and whether the proposed conductor connectors could withstand the installation loads.

Aquaterra Energy used specialist pile-driving software to assess **conductor drivability, penetration depth and fatigue** across four hammer and soil-resistance scenarios. The study showed that the target depth could not be assured under the more resistant soil case and that the preferred connectors exceeded allowable fatigue limits. By **identifying these risks before offshore operations began** the analysis informed the client's decision to drill rather than drive the conductors. Consequently, avoiding potential **connector damage, operational disruptions and safety consequences.**





Challenge

Our client was preparing to drill **eight production wells and four injection wells.** The offshore development plan included installing four 36-inch by 1-inch conductors to a target penetration depth of 90 metres below the mudline.

Before committing to the installation approach, the client needed evidence that the **conductors could be driven to the required depth** and that the **selected connectors could tolerate the fatigue** accumulated during driving.

Planning without local drive-log data

No drive log was available for the area, **creating uncertainty around the resistance** the conductors would encounter.

The assessment therefore needed to:

- Account for a realistic range of soil conditions,
- Compare two potential hammers,
- Evaluate the fatigue performance of the proposed connector options.

To do this, the study needed to:

- Predict the **maximum achievable penetration depth** for the 36-inch conductor
- Assess the effect of **upper and lower soil resistance assumptions**
- **Compare the performance** of the IHC-S90 and IHC-S150 hammers
- Calculate fatigue damage in the **conductor body and proposed connectors**
- Give the client **clear evidence to select a safe and practical** installation method

Solution

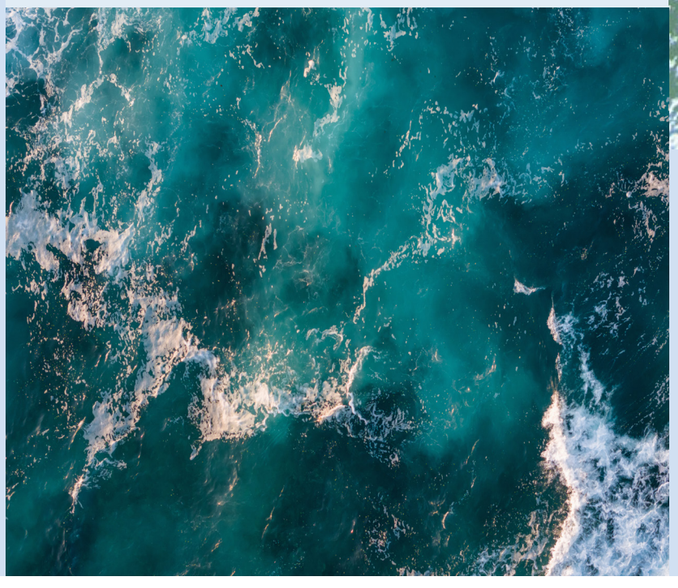
Aquaterra Energy completed the **driving analysis using GRLWEAP.** In the absence of local drive-log data, the team considered lower and upper soil resistance to driving values equal to 20% and 50% of the soil's static resistance.

Four combinations were assessed: the S90 hammer with lower and upper soil resistance, and the S150 hammer with lower and upper soil resistance. **The analysis predicted penetration ranges** of 57.3 to 89.3 metres below the mudline with the S90 hammer, and 63.1 to 90 metres with the S150 hammer.

Assessing connector fatigue before installation

The team calculated driving fatigue for the conductor pipe body and connectors **using the predicted axial stress ranges, conductor depth and blow count.** The analysis found that the Leopard SD2 EF, Dril-Quip HC 100MT and Leopard SD2 IF connectors **exceeded the allowable fatigue damage limit** of 100% with both hammers.

Aquaterra Energy then **assessed the XLC-S connector as an alternative,** drawing on previous experience of its driving-fatigue performance. The **alternative remained within the allowable fatigue limit** for both hammer options.





Turning the findings into practical recommendations

Because the **predicted penetration depth remained below the 90-metre target** for both hammers under the upper soil-resistance case, **Aquaterra Energy recommended an ultimate bearing-capacity assessment** to confirm whether the shallower depths could still support the well loads. The team **also recommended the XLC-S connector as the suitable option** if the driven installation method was retained.

Results

Whilst our client chose to retain one of their originally selected connectors, the analysis i**dentified the risk that this connector could experience fatigue damage beyond the allowable limits.** Consequently, our client made an **informed decision** not to drive the 36-inch conductors to the target depth and **rather to opt for a drilled installation method**, avoiding potential operational downtime and safety concerns.

Key results included:

- Early visibility of the achievable penetration range under **different soil assumptions**
- Evidence that the original connector options **exceeded allowable** driving-fatigue limits
- Identification of an alternative connector that **met the fatigue requirement** for both hammers
- A **clear recommendation** for further bearing-capacity assessment if shallower driven depths were considered
- An informed change to the installation method **before offshore operations began**





Offshore analysis, intelligently engineered

Make critical conductor design and installation decisions with greater confidence. **Discover how Aquaterra Energy's driving analysis can help reduce uncertainty, protect equipment and de-risk offshore operations.**