Aquaterra ENERGY | INTELLIGENTLY ENGINEERED

CASE STUDY

Making Every Connection Count:

Delivering a landmark well tieback campaign, offshore Australia



Location

Australia

Client

Shell

Product

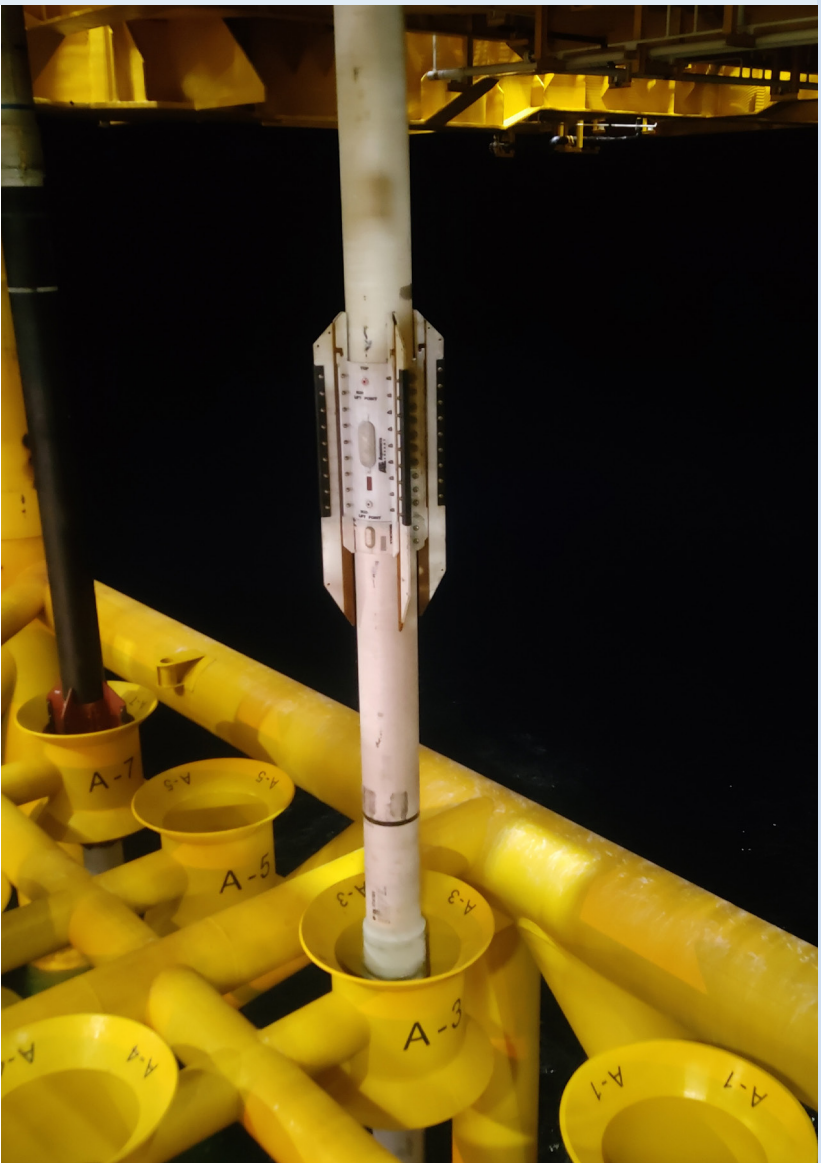
Tieback Engineering

Project Overview

Over the last five years, Aquaterra Energy has supported Shell's Crux development offshore Australia, contributing to the delivery of **one of the most technically challenging platform tieback campaigns undertaken in the region.** Beginning with early feasibility and concept studies, involvement expanded to include **pre-drilling planning, detailed tieback engineering, equipment supply, and offshore installation support.**

Working closely with the wider project team throughout the development lifecycle, Aquaterra Energy worked to address the **engineering challenges associated with connecting five pre-drilled wells to a fixed production platform in approximately 200m of water.**





Challenge

The Crux development involved the pre-drilling of five wells, followed by their tieback to a fixed production platform. Unlike **conventional platform tieback projects, the wells were drilled in approximately 200m of water using a semi-submersible rig**, creating additional challenges around well positioning, installation tolerances, and the safe execution of the subsequent tieback campaign.

To support the planned installation of the tiebacks, the project needed to:

- **Maintain conductor spacing and verticality** during the pre-drilling campaign.
- Determine the **optimum tieback configuration and riser lengths.**
- Plan for **installation tolerances and structural movement** following jacket installation.
- **Reduce the potential for costly offshore rework** during tieback operations.

Ensuring every component lined up

One of the project's most significant engineering challenges was **ensuring the wells, template, jacket, topsides and tieback system would align correctly** once installed. With the wells already in place before the jacket and topsides were installed, **variations in well position, installation tolerances, structural movement and settlement could all influence** the final tieback position.

Even **minor deviations across these independently installed components could affect** whether each tieback reached the required position offshore.

Solution

Aquaterra Energy's involvement began during the earliest phases of the Crux development, **carrying out feasibility studies and helping inform the design** of the pre-drilling template and overall tieback strategy. As the project progressed, the team **remained involved through key stages of development,** providing engineering support covering **riser analysis reviews, conductor installation strategies and detailed assessments** of how the various project components would ultimately come together offshore.

This **long-term involvement allowed Aquaterra Energy to provide continuity** between the project's early concept work and the practical requirements of the tieback phase, ensuring **engineering decisions made years earlier were aligned** with the final installation objectives.

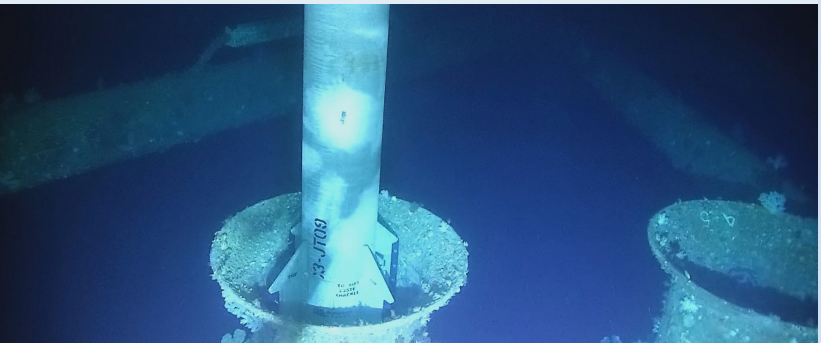


Managing well positioning and alignment

Given the depth of water and the use of a semi-submersible drilling rig, **maintaining well position and conductor verticality was a key consideration** during the pre-drilling campaign.

Aquaterra Energy **worked alongside the wider project team to help develop strategies** that would support the future tieback operation, including the use of template centralisation solutions, designed to **minimise movement and improve positional control** during well construction.

As the project progressed, **detailed engineering studies examined the relationship between the wells, template, jacket and topsides,** helping to ensure the tiebacks could be installed as intended once all project elements were in place.



Using engineering data to optimise tieback installation

Following installation of the jacket and topsides, **laser-based LiDAR surveys** were used to measure the position of wellheads and structural reference points. This created a **detailed three-dimensional picture** of the completed installation, allowing **tieback lengths, alignment requirements and installation strategies** to be refined before execution offshore.

The team also considered factors such as **jacket movement, installation tolerances and settlement** following installation. This information was used to support **riser length selection, target-box planning and tieback configuration decisions,** helping reduce uncertainty ahead of offshore operations.

Supplying equipment and offshore support

Alongside its engineering scope, Aquaterra Energy **supplied cement top-up systems, template centralisers and external centralisers** for all five wells. Our team also provided **offshore installation support and ongoing engineering guidance throughout the tieback phase,** helping support the deployment of equipment offshore.

Results

The completed campaign **successfully tied back all five wells to the Crux platform,** marking the culmination of years of planning, engineering and execution. From early project development through to final delivery, **Aquaterra Energy provided continuity of engineering knowledge throughout the development.**

The campaign achieved several notable milestones:

- **First platform tieback of its kind in Australia,** connecting pre-drilled subsea wells to a fixed platform using a Hydraulic Workover Unit (HWU).
- The **deepest tieback completed in the Eastern Hemisphere.**
- **All tiebacks installed within tolerance,** with every centraliser successfully landing within its guide, **achieving right-first-time installation across every well.**
- **Over 50 centralisers supplied** to support the five-well tieback campaign.
- **Five years of engineering support** spanning feasibility, concept selection, pre-drilling planning and tieback execution.

By **supporting the project from its earliest stages, Aquaterra Energy's involvement provided contunity between** decisions made during concept development, well construction and tieback planning aligned with the requirements of the final offshore campaign. Detailed engineering assessments, alignment studies and installation planning **supported the connection of the wells to the platform and the delivery of a complex deepwater tieback project.**





Tieback engineering, intelligently engineered

Successful tiebacks start long before installation begins. Discover how Aquaterra Energy's engineering, analysis and operational expertise helps operators build confidence in critical development decisions, reduce project risk and maintain a clear route to first production.