

HYPERBARIC TESTING OF SUBSEA WORKOVER PLUG

CLIENT

Global provider of engineered services and products for subsea industry

TEST LOCATION

Matrix Composites & Engineering, Henderson WA

CHAMBER

The Meg, Matrix Subsea Test Centre

TIME PERIOD

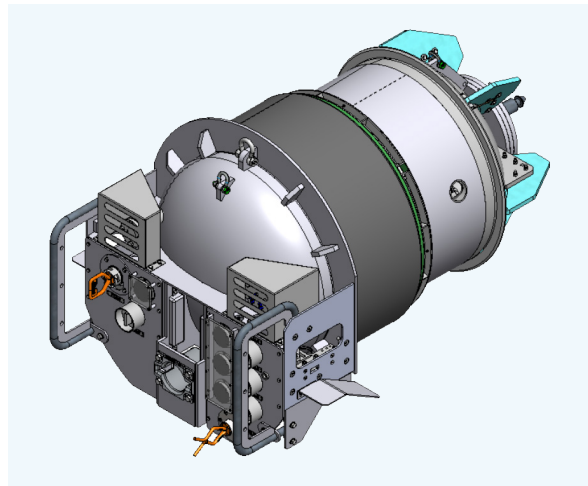
September 2022

VALUE DELIVERED TO CLIENT

- Risk Mitigation
- Safety Assurance
- Exclusive Service
- Functional Testing Capability

BACKGROUND

A leading global provider of engineered services and products for the offshore energy industry required hyperbaric testing for their Subsea Workover (SW) plug assembly. This ROV-installable tool is critical for sealing discharge pipes in various subsea oil and gas installations, preventing seawater ingress or fluid loss from sealed section ensuring safe workover operations. Given the safety-critical nature of this application, validating the plug's performance under simulated subsea conditions was essential to mitigate operational risks.



3D representation of Subsea Workover (SW) assembly tested in the Meg hyperbaric test chamber.

THE OBJECTIVE

The primary goal was to assess the SW plug's performance under simulated subsea pressure conditions. The hyperbaric tests were conducted to ensure the plug's external integrity and functionality, ensuring it could reliably isolate the discharge pipe and maintain system safety in operational scenarios.

THE CHALLENGE

As the only facility in Australia equipped for this type of testing, Matrix Composites & Engineering's Deepwater Hyperbaric Test Facility provided an irreplaceable service. Without this testing, the client would have had to deploy the SW plug without confirmation of its reliability, potentially facing significant operational risks, including seawater ingress and unsafe workover conditions.

The ability to verify the plug's performance pre-deployment was crucial for reducing risk and enhancing safety.

THE SOLUTION

The testing was conducted at the **Matrix Subsea Test Centre** in September 2022. Using the facility's largest hyperbaric chamber, "Meg", two tests were performed to validate the SW-2 plug assembly's functionality.

Test details:

- **Component tested:** SW plug
- **Chamber used:** Meg, 1.6 m diameter, 520 bar rating
- **Working depth simulated:** 30 msw (meters of seawater)
- **Test medium:** Water with glycol
- **Pressure hold period :** 15min for Test 1 and 60 min for Test 2
- **Chamber penetrations used:** two hydraulic penetrations

Test 1: Focused on testing the external integrity of the plug assembly under hyperbaric pressure. This ensured that the system could withstand the subsea conditions without any visible damage or leakage.

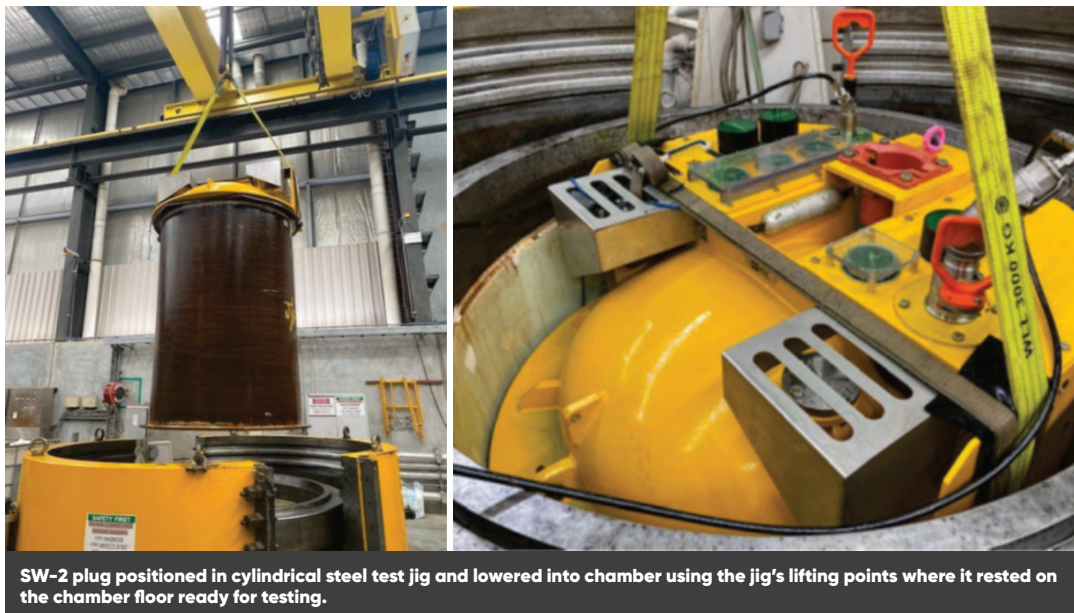
Test 2: Evaluated the functional performance of the SW plug. This involved assessing its hydraulic actuation and sealing capability under hyperbaric pressure, ensuring it could reliably isolate the discharge pipe from seawater ingress during operations.

THE RESULT

Both tests were completed successfully within the parameters defined by the client. After testing, the SW plug showed no signs of external damage or performance issues. The successful completion of these tests provided the client with the assurance that the plug would perform reliably during real-world operations, significantly reducing the risk of equipment failure and ensuring safe workover operations in the subsea installation.

VALUE DELIVERED

- **Risk mitigation:** Validated plug performance pre-deployment, preventing potential failures during real-world operations.
- **Safety assurance:** Provided client with confidence in deploying the plug, reducing operational risk and ensuring safety during workover operations.
- **Exclusive service:** Delivered access to the largest hyperbaric test facility in the Southern Hemisphere, offering unmatched capabilities of ensuring the reliability of subsea equipment.
- **Functional testing capability:** Enabled comprehensive functional testing, including hydraulic actuation through chamber penetrations, providing clients with deeper insights into equipment performance under simulated subsea conditions.



SW-2 plug positioned in cylindrical steel test jig and lowered into chamber using the jig's lifting points where it rested on the chamber floor ready for testing.