

HYPERBARIC TESTING OF SUBSEA ROV 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

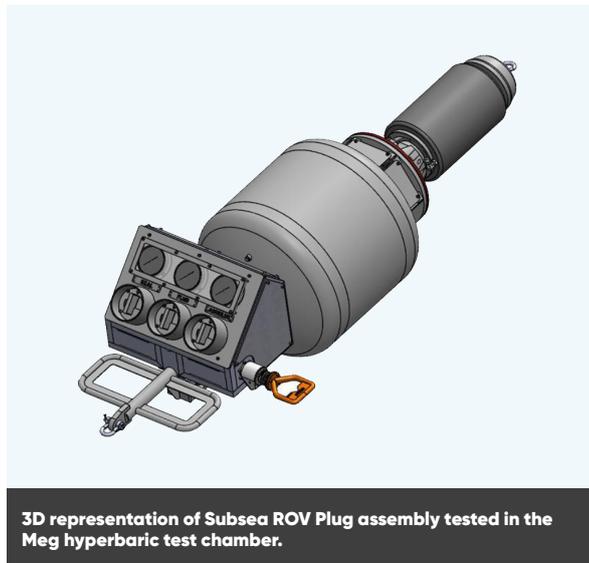
July & August 2022

VALUE DELIVERED TO CLIENT

- Preventing non-productive time
- Comprehensive functional testing
- Assured reliability.

BACKGROUND

A leading global provider of engineered services and products for the offshore energy industry required hyperbaric testing for their Subsea ROV installable plug. This ROV plug provides critical power transmission and data communication between the surface and the remotely operated underwater vehicle while protecting against harsh marine environments. The ROV plug featured a pressure balancing system, using a combination of mechanical and inflatable seals to equalise internal and external pressures. The plug's design allowed for consistent insertion and removal at depth, ensuring reliable functionality during subsea operations. Given its safety-critical role in maintaining watertight integrity and reliable subsea functionality, validating its performance under simulated conditions was essential.



THE OBJECTIVE

The primary goal was to assess the ROV plug's external integrity and functionality under simulated subsea pressure conditions. Two hydrostatic tests were conducted to verify that the plug could reliably maintain a watertight seal and perform as intended in operational scenarios.

THE CHALLENGE

Matrix Composites & Engineering's Subsea Test Centre is the only facility in Australia capable of this type of testing, making it essential for the client to validate the ROV plug's integrity before deployment. Without access to local testing capabilities, deploying the plug without proper validation would have posed significant risks, including potential leaks, operational failures, and costly downtime in high-stakes environments.

THE SOLUTION

The testing was conducted at the **Matrix Subsea Test Centre** in the months of July and August, 2022. Using the facility's largest hyperbaric chamber, "Meg," two distinct tests were performed to validate the ROV plug assembly.

Test details:

- **Component tested:** Subsea ROV Plug
- **Chamber used:** Meg, 1.6 m diameter, 520 bar rating
- **Working depth simulated:** 5 msw (meters of seawater)
- **Test medium:** Water with glycol
- **Pressure hold period :** 15 min for Test 1 and 60 min for Test 2
- **Chamber penetrations used:** three hydraulic penetrations for Test 2

Test 1: Focused on testing the external integrity of the plug assembly under 5 msw hyperbaric pressure. This ensured that the system could withstand the subsea conditions without any visible damage or leakage.

Test 2: Assessed the functional performance of the ROV plug by connecting hydraulic hoses through chamber lid penetrations. The test evaluated hydraulic actuation

and sealing capability of plug under hyperbaric pressure, ensuring it could reliably connect into plug and provide watertight sealing.

THE RESULT

Integrity and function tests were completed successfully within the parameters defined by the client. After testing, the ROV plug showed no signs of external damage or performance issues.

VALUE DELIVERED

- **Preventing non-productive time (NPT):** Verified equipment reliability pre-deployment, reducing potential for NPT and preventing costly downtime or intervention expenses associated with equipment failure.
- **Comprehensive functional testing:** Enabled detailed functional testing, including hydraulic actuation through chamber penetrations, providing deeper insights into equipment performance under simulated subsea conditions.
- **Assured reliability:** Matrix's local facility ensured the timely and thorough validation of equipment performance, reducing the risk of deploying untested equipment, especially given the lack of alternative local testing facilities.



Subsea ROV Plug positioned and lowered into chamber.

