

# CARNEGIE CLEAN ENERGY BUOYANT WAVE ACTUATOR

### Design and Supply

Carnegie Wave Energy Ltd (Carnegie) engaged ICON Engineering Pty Ltd (ICON) to design and supply a commercial scale prototype buoyant actuator for its wave energy conversion project.

The scale prototype consisted of a stand-alone wave energy buoy and a separate subsea hydraulic control module with the primary aim of the project to determine energy output of the unit.

The buoyant actuator is a partially submerged buoy designed to produce focused mechanical energy derived from wave energy. The buoy comprised of an outer structural steel shell encompassing hydraulic and pneumatic components.

- Preliminary design of the specialised mechanical components
- Management of 3<sup>rd</sup> party vendors in the fabrication of the buoyant actuator
- Plan and co-ordinate integration testing upon completion of the unit

#### **Integration Testing of the Buoyant Actuator**

ICON performed an integration test of the buoyant actuator at the Australian Marine Complex in Henderson, to test:

- Dry weight verification
- Ballast testing
- Freeboard verification
- Buoyancy verification



The Buoyant Actuator on location

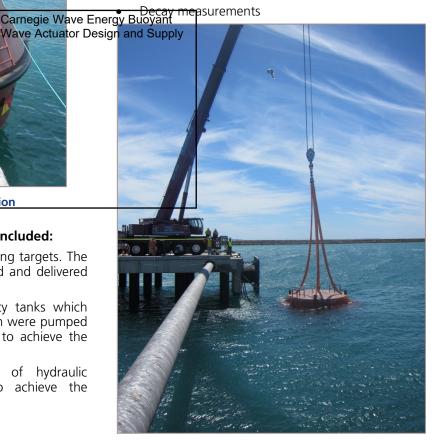
#### Key features of the Bouyant Actuator included:

- A fast-tracked schedule with challenging targets. The buoy was designed, fabricated, tested and delivered within 6 months
- The unit contained internal buoyancy tanks which were flooded for installation, and then were pumped full of air once anchored to seabed to achieve the positive buoyancy required
- Detailed design and procurement of hydraulic cylinder and accumulator bank to achieve the required tension variations
- Hydraulic hook up and commissioning

## **Detailed Design and Fabrication of the Buoyant Actuator**

The Scope of work for the detailed design and fabrication of the buoyant actuator included:

Detailed design of the structural components of the buoy



**Installing the Buoyant Actuator**