CASE STUDY

PROJECT ULTRA-PURE WATER FOR NUCLEAR POWERED SUBMARINES
PRODUCT BWRO, MAKPAK
INDUSTRY Defence
LOCATION Garden Island, Western Australia

BACKGROUND

A defence contractor required the reliable generation of military specification ultra-pure water to support nuclear powered submarines while berthed. Submarines were required to move offshore to generate demineralised water, resulting in significant operational inefficiencies. These offshore movements were time consuming and costly, increased logistical complexity, and reduced shore leave opportunities for military personnel. The client sought a secure, compliant water treatment solution that would allow submarines to remain alongside for maintenance while still meeting stringent water quality requirements.

SOLUTION

MAK Water worked closely with the defence contractor to design and deliver a containerised, mobile water treatment solution to military and naval specifications. A Brackish Water Reverse Osmosis (BWRO) plant was engineered to treat scheme water with less than 3,000 mg/L of total dissolved solids (TDS). The solution was designed, built and assembled in Malaga, Western Australia by security cleared personnel and constructed to meet rigorous NAVSEA, United States Navy and Australian defence standards. This collaborative approach ensured the final system delivered reliable ultra-pure water production while meeting operational, security and compliance requirements.

MAK WATER KEY SOLUTIONS

- BWRO 030 system integrated with MAKPAK deionisation using military specification resin to achieve ultra-pure water quality.
- 9,240 litre 316 stainless steel storage tank for secure and corrosion resistant water storage.
- Upgraded pipework constructed entirely from 316 stainless steel tri clover fittings to meet hygiene, durability and defence standards.

BWRO 030 system integrated with MAKPAK deionisation

9,240 litre 316 stainless steel storage tank

RESULTS AND BENEFITS

- **Operational flexibility.** Rapidly deployable, modular and transportable system that supports changing defence operational requirements.
- **Cost and time savings.** Enables submarines to berth for maintenance while generating demineralised water onsite, eliminating the need to return to sea.
- **Operational efficiency.** Avoids costly and time-consuming submarine movements, improving asset availability and maintenance scheduling.
- **Personnel wellbeing.** Reduces offshore movements, allowing increased shore leave for military personnel.