



CASE STUDY

Victorian Desalination Plant - RO Rack Installation

RO racks – The “heartbeat” of a desalination plant

The Victorian Desalination Plant is located on the Bass Coast near Wonthaggi. A major initiative under the Victorian Government's Our Water, Our Future plan, the project is aimed at securing the State's future water supplies in the face of increasing population and reduced reliability of traditional sources. Using Reverse Osmosis (RO) technology, the seawater desalination plant provides an alternative source of potable water fed right into the State's existing water system.

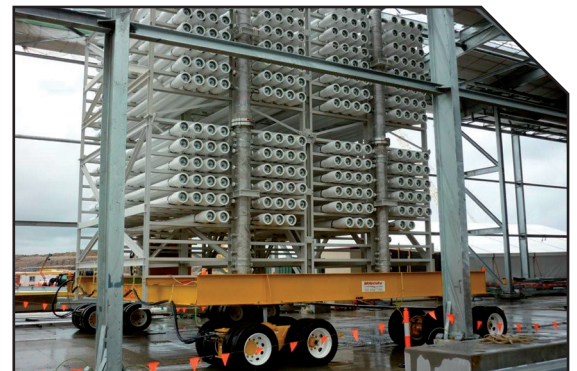
At the heart of the desalination plant are the RO racks, which house 55,000 membranes driven by over 6,100 pressure vessels actively converting seawater to potable water. Constructing a project that utilises a delicate membrane filtration process operating in high pressure, it comes as no surprise that significant care is required when handling the RO racks.

Recognising the unique challenge, the project's builder Thiess Degrémont JV approached Tutt Bryant Heavy Lift & Shift seeking suitable methods to move and install the RO racks. As a specialist heavy lift & shift provider, Tutt Bryant has the requisite experience and a range of conventional and alternative means to help Thiess Degrémont JV meet this challenge. The qualities Tutt Bryant offers were immediately put to the test when it was realised that due to the complex operational environment, conventional methods of installation including jacking and skating were a near impossibility.

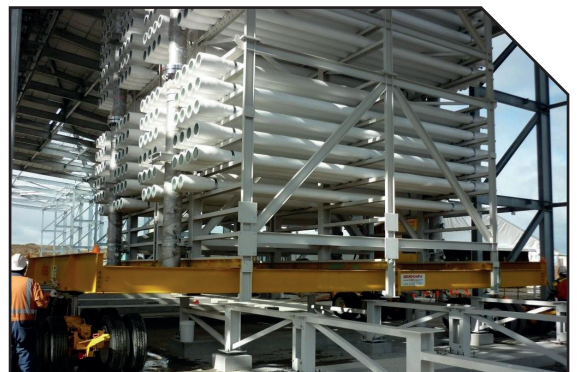
Working closely with Thiess Degrémont JV, Tutt Bryant was able to devise an alternative installation method using equipment not previously available in Australia along with current resources to have the RO racks placed safely and efficiently within the given timeframe.



Above - The Power Dollies feature power steering and free-wheel hydraulic drive on the 2 power dollies for improved manoeuvrability.



Above - The RO racks are loaded onto the Power Dollies and carefully transported to their individual table supports.



Above - The Power Dollies added manoeuvrability and jacking ability enabled precision alignment of the RO racks over the situated supports.



Thinking outside of the square

The client's brief might be simple – install 51 pipe rack modules within a nine month period – but it was never going to be the case when it was part of a much larger and complex project with multiple work scopes occurring concurrently. Logistical hurdles had to be overcome when dealing with oversized modules and equipment within confined spaces.

Each of the larger RO racks measured in at nine metres high by nine metres wide and weighed 80 tonnes. They were to be installed within six rows of the building at a maximum length of 120 metres and positioned on a concrete plinth with a pedestal attached. The biggest challenge Tutt Bryant faced was the limited space available within the plant's structure to manoeuvre the RO racks.

The lack of space ruled out the use of conventional installation methods, and required an innovative solution not immediately apparent. Michael Griffith – Tutt Bryant Heavy Lift & Shift Special Projects Manager recalls the turning point "Whilst in discussion with the client and a lot of head scratching, my mind drifted back to an article in a US publication that I had read some weeks prior. Even though not yet tested in Australia, I was sure that the concept is feasible and it was worked on with further research and discussions with the client. A final flight to the US to meet with the equipment supplier ended with Tutt Bryant acquiring a set of Power Dollies, the only units in Australia to date."

In comes the cavalry

The Power Dollies proved to be a resounding success. Operating in a similar manner to Self Propelled Modular Transporters (SPMTs), the Power Dollies have the added advantage of increased level of manoeuvrability and flexibility (due to the placement of the wheel and axle groups) and an inbuilt jacking and steering system.

The system also provided a more cost effective and importantly, time efficient solution for the project. Initial feasibility studies allowed at least 3-4 days for the installation of each RO rack which would have been too lengthy given the additional work involved and scheduling around other work scopes. The Power Dollies managed to significantly reduce the time required for installation to just one day and in some cases, only three hours. A typical installation process involved the manufacturer erecting the four sub frame components on a temporary foundation upon which a transport frame was bolted together to allow the Power Dollies to be positioned, after which Tutt Bryant carefully jacked, moved and steered the Power Dollies to place each RO rack onto its final designated location.

The use of such innovative equipment has helped deliver the large-scale and complex Victorian Desalination Project. To address the unique challenges of this landmark project, Tutt Bryant has demonstrated yet again its forward-thinking mentality by proposing and utilising an alternative lift & shift system not seen before in the Australian market.

Key Equipment - Power Dollies

The first and only of its kind in Australia, the Power Dolly system is a highly mobile device perfectly suited to the on-site movement of oversized loads in confined spaces. Comprising a power unit driving a set of power dollies and coaster dollies, the system through radio remote controls can move and jack loads of over 240 tonnes. Some of the key features are:

- 99 HP power unit with a hydrostatic pump drive to drive, steer and jack up to 6 dollies
- Hand held radio remote control over all functions with failsafe shutdown
- 4 coaster dollies and 2 power dollies configured for a total capacity of 240 tonne (option to increase capacity where required)
- Cylinders on each dolly extends the steel dolly cap (beam pad) by up to 400mm
- Highly mobile with power steering on all dollies and free-wheel hydraulic drive on the 2 power dollies
- Minimum set up time



Above - The Power Dolly system.