Challenge

Economic challenges facing the energy industry have forced operators to seek more cost-effective solutions for facility upgrades or new installations for offshore water injection methods to extract more oil from a reservoir, extend field life, and increase revenue. These goals must also be met without sacrificing efficiency and safety.

Technical Solution

Water Standard (WS) offers and delivers cost-effective and efficient water treatment solutions to the energy industry using innovative technologies.

WS’s Membrane Deaeration (MDA™) technology reduces dissolved oxygen content in injection water to mitigate corrosion and prevent biological issues in injection infrastructure, down hole and pipelines.

MDA™ is a direct replacement for vacuum towers, which are commonly used for this application. Furthermore, vacuum towers are heavy, and demand a large footprint and structural steel module. Vacuum towers cannot achieve typical outlet oxygen specifications, therefore require continuous oxygen scavenger dosing downstream of the tower.

MDA™ Advantages

- **Compact**, saves footprint and weight, compared to vacuum towers.
- **Modular**, offers construction advantage and enabling future expansion.
- **Cost-effective**, due to its compact and streamlined design and no chemicals.
- **Reliable**, MDA™ can achieve outlet oxygen results of less than 10 ppb without continuous dosing of oxygen scavenger chemicals.
- **Operationally efficient**, simplifying transportation and storage logistics and minimizing oversight by reducing chemical demand.
Product Line Expansion

WS has expanded upon its MDA™ design to add value for operators by eliminating the need for rotating equipment through its MDA Torrnado™. It is advantageous in applications where a liquid or gas stream is available for use as motive fluid.

MDA Torrnado™ Advantages

- Complete removal of the vacuum pump skid, further reducing overall size and weight.
- Capital cost savings due to use of a less expensive vacuum system and reduced module size.
- Removal of rotating equipment, improving plant reliability and decreasing maintenance requirements.
- Minimal power consumption required for entire deaeration system.

Case Study Results

WS compared the designs of a conventional vacuum tower, MDA™ and MDA Torrnado™ for a 125,000 bpd test case.

These designs included equipment skids, complete structural steel, connecting pipework, chemical dosing and storage skids, and electrical equipment.

Results indicate that the volumes were reduced by:

- 61% with MDA™
- 74% with MDA Torrnado™

The dry and operating weights were reduced by:

- 65% with the MDA™ complete system
- 77% with MDA Torrnado™

Water Standard’s MDA™ and MDA Torrnado™ solutions translate to significant capital cost savings compared to vacuum towers.

For further reading, see SPE 74935-MS Offshore Membrane Deaeration as a Replacement for Vacuum Tower Deaeration - A Comparative Study, Water Standard, Stephen Van Pelt and Holly Churman, Water Standard, 2015 or contact one of our Sales Engineers at sales@waterstandard.com.