Compact Deoxygenation (CDX)

Deoxygenation methods

In addition to vacuum and gas strip deaeration technologies, Cameron offers a compact, proprietary technology called CDX™. This process allows for significant cost savings and process improvements to the industry as exploration and production frontiers move to deeper waters.

What is CDX?

CDX is Cameron’s proprietary compact and lightweight seawater deoxygenation technology for application in offshore seawater injection systems. Hydrogen is injected into the feed and then reacts with the oxygen in seawater over a catalyst to produce water.

\[ 2H_2 + O_2 \rightarrow 2H_2O \]

Advantages of CDX

CDX has the following advantages compared with traditional deaeration tower technology:

Cost Savings
- Capital cost savings when compared to standard technology
- Reduces engineering hours, due to ability to be bid as a fully engineered package
- Elimination of support equipment and materials
  - Support steelwork
  - Interconnecting pipework
  - Miscellaneous platforms and ladders
  - Booster pumps and isolation valves
  - Vacuum pump and booster pump cabling
  - Chemical storage tanks and dosing equipment
  - Additional craneage and installation costs on site

Pressurized Operation
- Insensitive to motion
- No sump level to control
- Stable performance regardless of pitch, roll or heave
- Eliminates downstream booster pumps
- Eliminates vacuum system and subsequent oxygen ingress

Comparison: Traditional Vacuum (left) versus Cameron’s CDX (right)
Weight and Center of Gravity

- Compact height 10-12 feet (3-4 m) allows for installation between decks
- Flooded weight 10-25% of comparable vacuum system (complete with supporting steelwork)
- Low center of gravity
- Big savings in support steelwork on FPSOs

The CDX Pilot

The CDX pilot is a small demonstration unit for the CDX technology. It includes a full scale hydrogen generator, a small scale pilot ultra filtration (UF) seawater preconditioning system, and a small scale pilot CDX reactor system. Please refer to separate data sheet for plant details and site requirements.

Fully-commercial CDX Plant

It is expected that the trials will demonstrate the robustness of the process:

- Demonstration of commercial size H₂ generator (specified suitable for typical 50,000 BPD capacity)
- Demonstration of UF pre-treatment to ensure that the resin bed experiences negligible fouling
- Outlet oxygen levels usually undetectable

The commercial CDX unit will be directly scaled up from the pilot plant and will be available within the next 12 months.