

Desalination Plant #526



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1. Executive Summary

1.1 Plant Capacity

- Six (6) units available, each unit 2,880 M³/day of sea water

1.2 Plant History

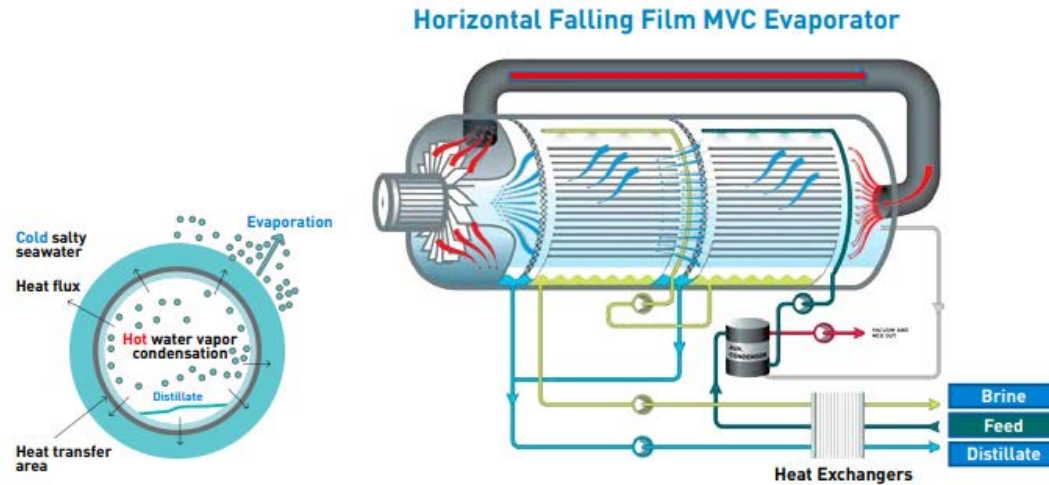
- Built in 2000
- Shut down in 2018

2. Process Description

The units use thermal desalination process with Mechanical Vapor Compression (MVC) technology for seawater. MVC unit is a reliable, cost-effective desalination solution for power plants, refineries, process industries. Dozens of power plant with critical need for stable and reliable sources of process water have MVC desalination units as an affordable, low-maintenance, workhorse desalination solution.

- The MVC process is a compressor driven, low pressure, desalination process, in which seawater flows into the unit through a set of heat exchanger where it is heated by exchanging residual heat from the product and brine, which is rejected from the unit.
- After the heat exchangers, the sea water flows into auxiliary condenser where it is deaerated prior to entering the MVC evaporator-condenser.
- In the evaporator-condenser, the seawater is sprayed as a falling film on the upper surface of the horizontal heat exchanger bundles, and exchanges heat with the water vapor that flows in the tubes.
- This heat exchange causes part of the seawater to evaporate, while the water vapor in the tubes is condensed to permeate.
- The seawater that is not evaporated is circulated and sprayed again on the upper surface of the heat transfer tubes until it reaches the target salinity. It is then rejected from the MVC unit as brine.
- The generated water vapor is evacuated from the evaporator-condenser through mist eliminators using a mechanical compressor, which is the heart of the MVC process.
- The role of the compressor is to drive the process by continually evaluating the generated water vapor, compressing it to a higher pressure and temperature, and extracting it into the heat transfer tubes.
- The MVC process can be implemented in a single stage or multi-stage arrangement, in which a water vapor that is generated in one effect flows into the heat transfer tubes of the next effect to generate additional water.

MVC Desalination solution



3. Major Equipment

- Product and Brine heat Exchanger
 - Design Pressure (6 BARG) / Design Temperature (70° Celsius)
 - MOC for Heat transfer bundles – Special Aluminum Alloy (Al.502-H34) and Titanium
- MEVC Compressor
 - 6000 V / 900 kW / 3000 Giri / SIEMENS mod. 1LA1502-2K F60-Z
- Product Pump / Brine Pump / Circulation Pump/ Liquid Ring Vacuum Pump
- Brine and Circulation Filter
- MEVC Vessel
 - Design Pressure (1.5 BARG) / Design Temperature (70° Celsius)
- Separation Tank
- Direct Contact Condenser