

PROJECT PROFILE SERIES #11

High Purity Boiler Make-up Water for Esso Thailand



The Facility

The Esso refinery is located in Sriracha, Thailand approximately 50 miles south of Bangkok. Due to increased refinery demands, Esso embarked on a facility expansion to more than double the refinery's production capacity.

The Problem

The expansion plan required additional high purity water to be used for boiler make-up. With the existing desalination units in disrepair, Esso required new units which would provide a reliable source of high purity water.

Specifically, their problems were centered on a need for a turndown of the system. Esso also had past experience with vertical tube units and once-through multi-stage flash plants which experienced extensive corrosion. They had a limited amount of space in which to construct the new system and required it to be compact. Delivery demands were urgent.

The Solution

Aqua-Chem ICD engineers quickly recognized how a packaged Multiple Effect Thermocompression Desalination (MED-TC) plant would handle the bulk of these problems easily and at a lower cost than other thermal processes. MED-TC offers the advantages of turndown and a conservative use of steam. The Esso MED-TC plant is designed to run on an extraordinarily low steam pressure of 13 psig. In addition, heat transfer is more effective than with other processes, and the low temperature design lessens the potential for scaling and improves plant life. MED consumes half the electrical energy of most other systems due to less seawater required and therefore smaller pumps. These plants are physically smaller designs than other processes and fit the available space criteria.

Aqua-Chem ICD engineers analyzed the process requirements to ensure Esso was offered the most reliable unit in terms of performance and on-line availability. The correct choice of materials ensures a long equipment life.

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The Results

Esso Thailand was extremely pleased with the results of their system which performed beyond expectations. The desalination plant met the 60 ton/hour capacity criteria and actually surpassed this production by 10%, while still meeting the guaranteed product purity of less than 5 ppm.

Installed at the refinery in August 1993, this system met the water requirements for Phase I of the expansion activities. Since the expansion was not yet complete, water needs were lower than design capacity. Esso took advantage of the turndown

capability of the plant, to produce only 70% of total design capacity. The system can operate effectively at even lower turndown rates, if desired.

After commissioning of their new plant, Esso purchased a second MED-TC unit for Phase II of the expansion project.

