

## Demkolec ICGCC Power Plant

### Evaporator/Crystallizer meets stringent zero-discharge waste requirements

In 1989, Demkolec B.V. was founded by the Dutch Power Authority N.V., S.E.P., to execute the first integrated coal gasification combined cycle (ICGCC) power plant. For the gasification process, Demkolec selected Shell. The plant, the world's largest, is located next to the existing Maascentrale power station in Buggenum, municipality of Haalen the Netherlands. Its net electricity production rating is 259 MW.

### The Problem

Strict environmental standards are required for new generation power plants and coal gasification addresses them all. One of the features was zero-liquid discharge to preserve the environmental integrity of the adjacent Maas River. A plant was needed to treat the wastewater produced by the gas purification process.

### The Solution

Aqua-Chem, together with Degrémont-Holland, worked very closely with Demkolec and Shell to design a complete zero-discharge wastewater treatment plant. After several process design modifications and evaluation, Demkolec selected the Aqua-Chem/Degrémont-Holland team to provide the turnkey plant.

The pretreatment plant provided by Degrémont removes undesired dissolved chemicals (primarily fluoride and heavy metals) from the wastewater. The Aqua-Chem evaporator/crystallizer then



*The world's largest ICGCC power plant is located next to the existing Maascentrale power station in a municipality of the Netherlands.*

concentrates the wastewater to recover distilled water and salts. Strict guarantees were required for energy efficiency, chemical consumption, produced waste and reliability. A high degree of automation was also required, including automatic operation, start-up and shutdown of the evaporator/crystallizer plant.

### Technical Data: Partial Feed Chemistry and Performance

Na <sup>+</sup> .....	900-11,500 mg/l
Design Feed Rate (to Evaporator) .....	9 m <sup>3</sup> /hr (40 gpm)
Recovered Water Purity .....	< 30 mg/l TDS
Water Recovery .....	96% - 99%
Product Salt Rate .....	25- 250 kg/h (55-550 lb/h)

# PROJECT PROFILE SERIES # 3

EFFECT 1

EFFECT 2

EFFECT 3

