Hadera desalination plant two years of operation

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ABSTRACT
In May 2010, IDE Technologies Ltd. completed the Hadera plant, one of the world’s largest operating seawater reverse osmosis desalination facilities. This was a milestone event for the desalination industry clearly confirming IDE’s clear leadership of the mega-sized desalination market. IDE’s design for the Hadera plant utilizes the three center design (pumping, membrane, and energy recovery centers), cascade boron treatment, and other technologies to decrease energy requirements and increase overall efficiency. These technologies have enabled Hadera to achieve one of the lowest ever costs for high-quality desalinated water. One of the main challenges met in the design of the plant was the minimization of the energy cost by utilizing the different electricity tariffs over a 24-h period, as well as a variable operation production regime. Moreover, the specific energy cost was further reduced by taking advantage of the common pressure center design during the peak electricity periods. Hourly variations in production from 100 to 40% are typical figures in day-to-day plant operation. The brackish reverse osmosis system patented cascade design demonstrates the system’s ability to produce water with low boron content, minimum operational risks, and at the highest recovery ratios. The posttreatment system design is optimized to produce high-quality potable water in terms of the required alkalinity, hardness, pH and langeliers saturation index through intensive rehardening, while still optimizing capital and operational costs. Recently the plant completed its second year of operation. This article describes the current plant operation section-by-section.

Keywords: Optimization; Energy cost; Energy consumption; Variable production regime; Electricity tariff

1. Introduction
The Hadera desalination plant, located in the Orot Rabin Power Station in Hadera, Israel, started its commercial operation in January 2010.
It is one of the biggest seawater desalination plants along the Mediterranean Sea and is a build, operate, and transfer project for 25 years, with share-holders IDE Technologies Ltd. (50%) and H&C (50%).

Although its original capacity was 100 Mm$^3$/year, the plant was expanded to 127 Mm$^3$ annually, from its first year of commercial operation.
During January 2012, the plant production was increased further, to 146 Mm$^3$/year, in order to meet the needs for potable water in the area.

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