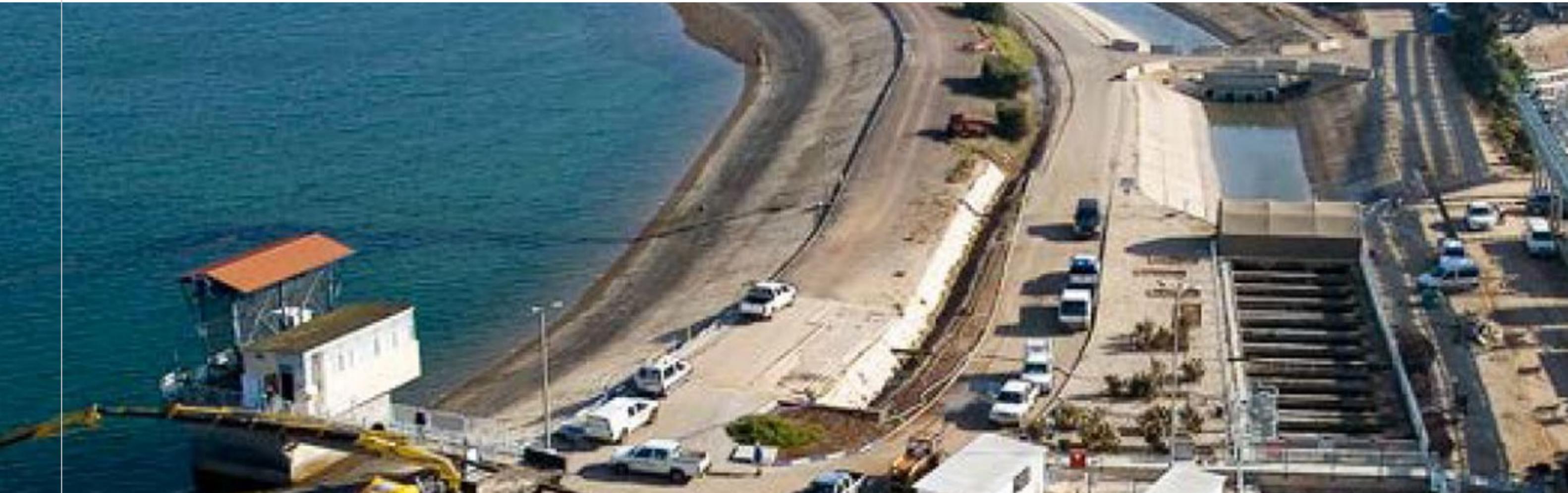




# Mekorot: High Availability, Connected Control Solution Virtually Eliminates Downtime



# Challenge

Mekorot, Israel's National Water Company, provides 70% of all water, and 80% of the drinking water for the country. Mekorot sought to reduce production costs through improved energy efficiency and tighter process control.

By leveraging GE Digital's software and GE's hardware automation solutions, Mekorot is now using real-time data to automatically monitor and control devices from a single control room. This has created a connected environment in which minimal intervention by operational staff is required. Full redundancy was also employed to virtually eliminate downtime and to simplify controller backup.

# Background

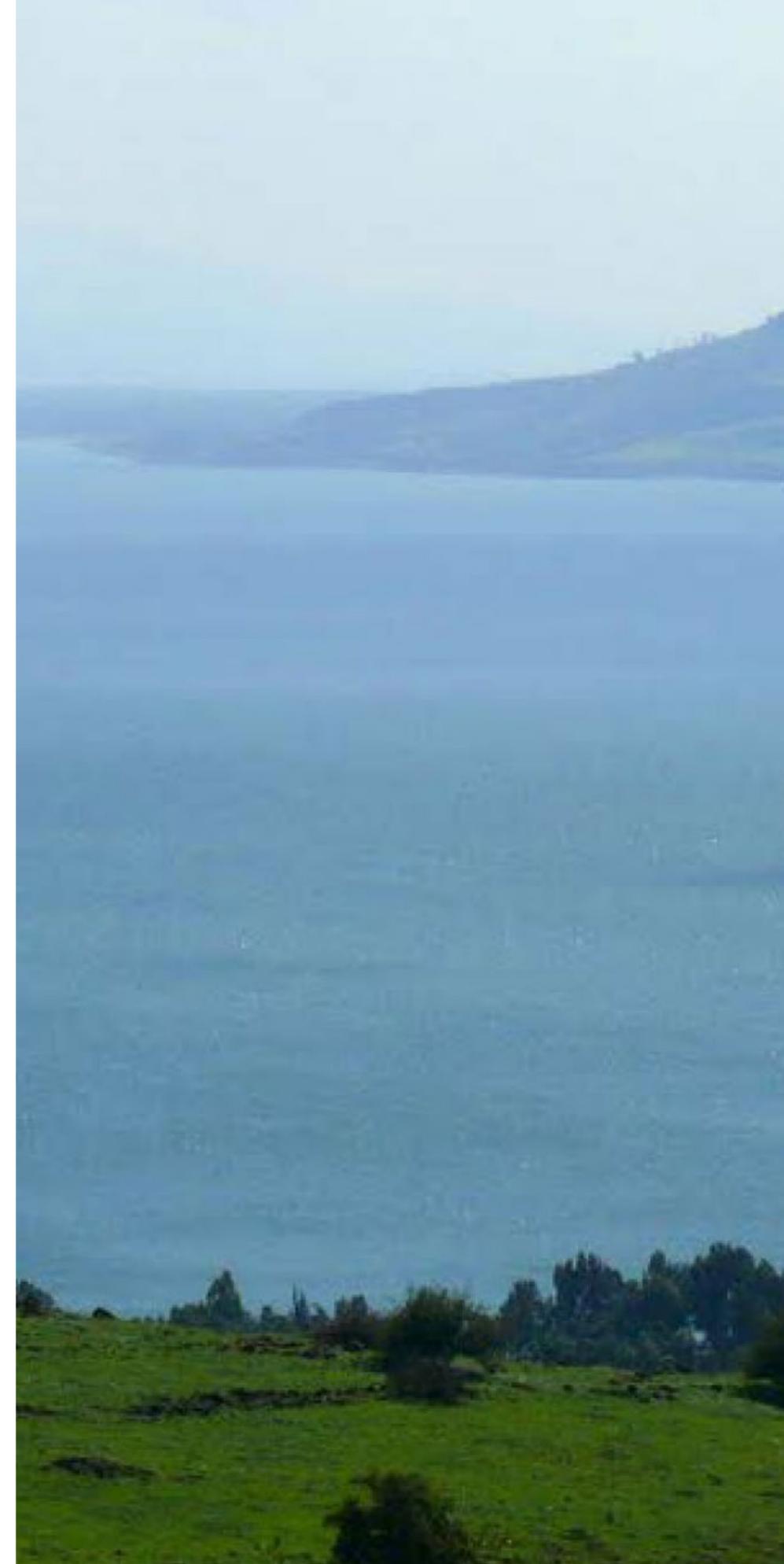
In an arid climate such as Israel, water is an especially valuable commodity. Frequent droughts and a dramatic increase in demand have made securing a reliable source of high-quality water a national priority.

Lake Kinneret, also known as the Sea of Galilee, is a key source of water for the Mekorot system. To improve the quality of the water pumped from Lake Kinneret and address Israel's decades-long water shortage, Mekorot built a state-of-the-art filtration plant controlled by GE Digital's state-of-the-art high-performance automation solutions. The Central Filtration Center at Eshkol in Northern Israel is currently the only one of its kind in Israel, and one of the largest in the world.

Lake Kinneret is 212 meters (695 feet) below sea level, so most of the water filtered at the Eshkol plant is pumped 152 meters (498 feet) above sea level, and then flows through pipes and open canals to the Eshkol Site. At the plant, it is treated and filtered before being distributed to urban, industrial, and agricultural customers.

*"We aim to achieve high energy efficiency and process efficiency, so that we can facilitate cost reduction in the production of water. To achieve this, we have to leverage operations support systems and programming tools, which enable real-time decision-making. The GE control system at the plant performs automatic monitoring and control of the devices from a single control center."*

**Nuriel Meraro, Command & Control Engineering Manager of Mekorot's Jordan Valley Division**





# Solution

During the filtration center's planning and construction, Mekorot worked with GE's channel partner General Engineers, which specified and provided GE solutions to control and monitor the plant.

Mekorot chose GE's process control products for their ability to meet three critical customer needs:

1. Efficient, connected operation with fewer shifts and personnel
2. High availability
3. High and proven reliability

## Simplifying operations

GE Digital's automation solutions monitor and manage the Eshkol plant from a single control center. Dozens of monitors visualize and track the plant's systems with minimal intervention from operational staff, dramatically increasing operational efficiency and minimizing costs.

## Securing water

As a critical system, the Eshkol filtration plant operates 24/7, except once a year, when water flow is stopped for maintenance and upgrades that can't be performed when water is flowing. Otherwise, GE's control system allows upgrades to the system while in process, allowing Mekorot to maintain a steady flow of water to its customers.

The control system installed at the Eshkol Filtration Center features the PACSystems High Availability solution, which provides true redundancy and enables full backup of the controller. The GE control and monitoring system has identical modules which work independently, and have full backup to help ensure the continuous and reliable operation that is of critical importance to Mekorot. Operations support system and programming tools enable real-time decision-making.

The system features 7 pairs of PACSystems RX3i controllers, controlling 6,000 I/O points with redundant architecture at all control layers—I/O to end devices, controllers, and HMI system. It is wired with fiber optic cables to ensure the fastest failover communication.

GE Digital's CIMPLICITY HMI/SCADA software monitors the control system. The software was customized to the requirements of Mekorot, enabling optimal control of all facets of the filtration processes.

*"PACSystems controllers along with [GE Digital] CIMPLICITY HMI/SCADA system provide the highest flexibility in their implementation, as well as cost reduction for the end customers."*

**Hertzel Perry, Technical Manager for Control and Communication Systems of General Engineers**



# Benefits

With GE's hardware controls and GE Digital's software solutions, Israel National Water Company met its goals for the Central Filtration Center:



### High availability

The plant runs 24/7, even during system upgrades



### Increased efficiency

The connected plant can run with fewer shifts and personnel than similar-sized operations



### Reduced cost

Less unplanned downtime and greater operational efficiency has reduced operational expenses



### High reliability

True system redundancy enables continuous operation

Building on the success of the GE controls at the Eshkol Filtration Center, soon additional screens will control and monitor the plant's sludge treatment process. This process cycles sludge created by the filtration process back through the system, saving water, enhancing the overall efficiency of the water filtration process, and reducing costs.

*"Mekorot faced challenging targets in the last seven decades of the Israeli water market. We feel proud to be part of turning these challenges into reality with our advanced solutions and our engineering expertise."*

**Zachi Stromza, Automation and SW Solution Division Manager of General Engineers**





## About GE

GE (NYSE: GE) is the world's Digital Industrial Company, transforming industry with software-defined machines and solutions that are connected, responsive, and predictive. GE is organized around a global exchange of knowledge, the "GE Store," through which each business shares and accesses the same technology, markets, structure, and intellect. Each invention further fuels innovation and application across our industrial sectors. With people, services, technology, and scale, GE delivers better outcomes for customers by speaking the language of industry.

## Contact Information

Americas: 1-800-322-3616 or 1-434-978-5100

Global regional phone numbers are available on our web site.

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