



Case Study

Emergency Response in Record Time:
200 m³/h of **Demineralized Water**
Through a **Modular Solution**

Abu Dhabi, **United Arab Emirates**

fluenceTM

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Industry:

Aluminum Smelter

Location:

Abu Dhabi, United Arab Emirates

Technology used:

Cartridge filtration and continuous electrodeionization (CEDI), with in-line instrumentation and control by PLC/HMI.

Solution: A mobile, containerized demineralized water production system with an initial capacity of 50 m³/h was deployed for emergency response and later expanded with three additional units, bringing the total nominal capacity to 200 m³/h.

Solution:

A mobile, containerized demineralized-water production system rated at 50 m³/h, developed as an emergency response and subsequently expanded with three additional units, reaching a combined nominal capacity of 200 m³/h.

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Challenge

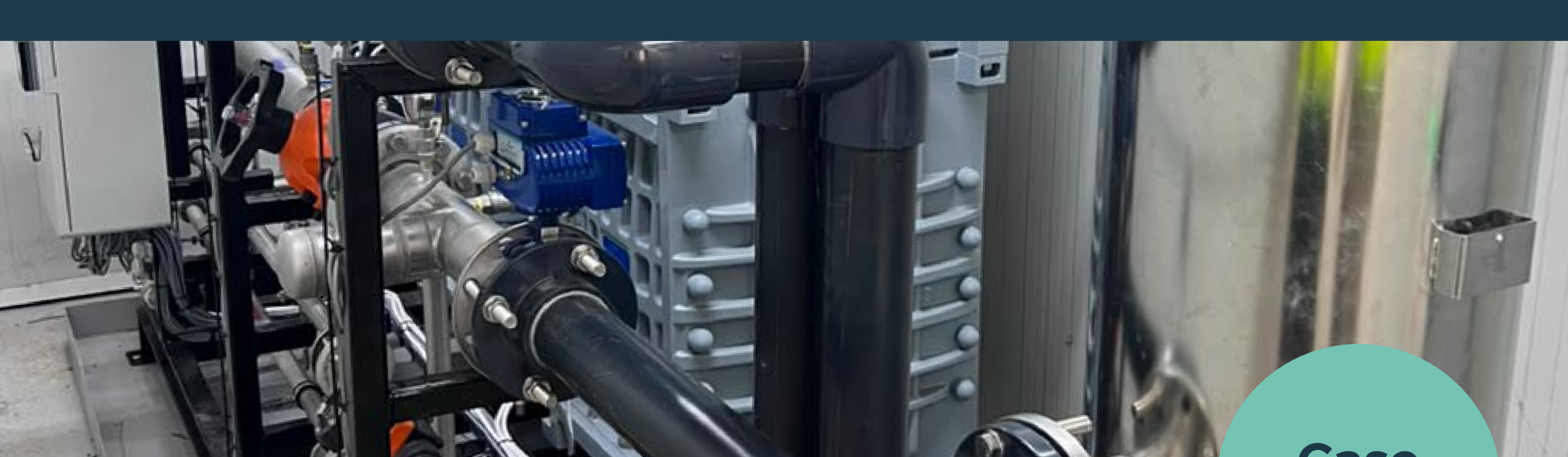
The customer's existing demineralized water production plant was unexpectedly taken offline, disrupting the supply of high-purity water needed for the factory's operations.

In this critical situation, identifying an alternative treatment technology was only the first step. The solution had to be engineered, manufactured, transported, installed and commissioned within an extremely short timeframe to minimize the impact on operations.

The system also needed to integrate with the site's existing infrastructure, using available reverse osmosis permeate as feed water and connecting to the complex's electrical power, water storage and brine disposal systems.

The emergency also presented significant logistical and safety challenges, including transporting the equipment to the site in Abu Dhabi, gaining access to the facility, lifting and connecting the equipment, and carrying out the work within an operating industrial plant.

In response to these challenges, Fluence developed a mobile, modular and containerized solution designed to accelerate deployment and rapidly restore the supply of demineralized water.



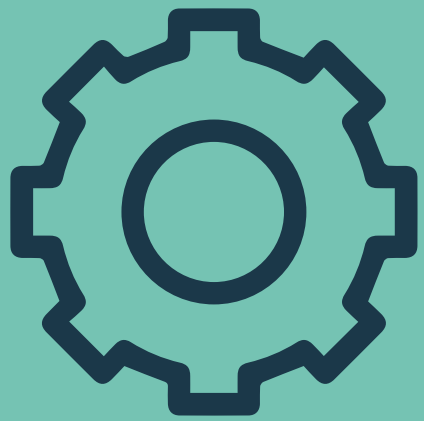
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Process Description

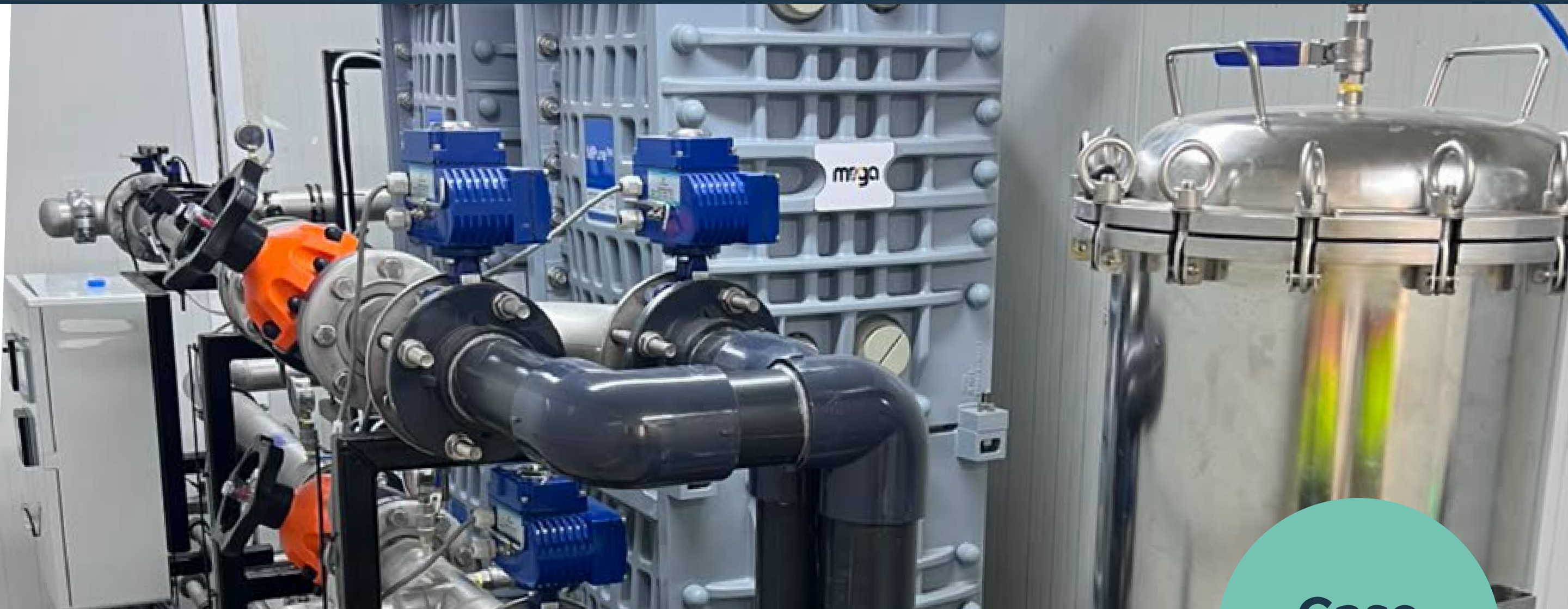
Fluence engineered, manufactured and supplied a containerized demineralized water production system with a nominal capacity of 50 m³/h, integrating the main treatment equipment, auxiliaries, instrumentation and control system into a single package.



The process begins with a **cartridge filtration stage** designed to protect the downstream treatment equipment. The water is then fed into the **continuous electrodeionization (CEDI) system**, which consists of four Ionpure VNX-Max-1 modules that remove the remaining ionic species and produce high-purity water.

The system was designed to treat reverse osmosis permeate with a TDS concentration of approximately 10–15 ppm or less, producing treated water with less than 0.5 ppm TDS.

The package incorporates SS316 stainless-steel piping, motorized valves, online monitoring instrumentation, and a Siemens PLC/HMI control system, enabling operators to monitor and control the main operating parameters.

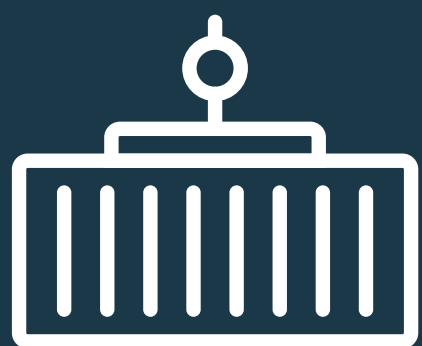


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One of the project's key differentiators was its **fast-track approach**. The package was prefabricated and factory-tested before being shipped to the United Arab Emirates, minimizing on-site activities and accelerating installation and commissioning.

Fluence provided on-site support throughout system integration, including installation, testing, commissioning and operator training. The work was completed in just 10 days with a team of two supervisors, helping ensure a smooth and efficient startup.



The first system began operating on April 28, 2026, just 14 days after the contract was awarded, meeting the client's emergency schedule.

Following the successful implementation of the initial unit, the system was expanded with **three additional 50 m³/h containers, adding 150 m³/h of nominal capacity**. The expanded system now consists of four identical units with a combined nominal capacity of **200 m³/h**. Each package can produce up to **55 m³/h**, with CEDI recovery ranging from **85% to 95%**.



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Results

The solution made it possible to quickly restore the demineralized water supply needed for the customer's operations, transforming an emergency situation into a reliable and subsequently scalable solution.

Key results include:

- **50 m³/h** nominal capacity in the initial unit
- Commissioning just **14 days after** the contract was awarded
- Product water quality of **less than 0.5 ppm TDS**
- CEDI recovery of **85%–95%**
- Expansion with **three additional 50 m³/h units**
- **200 m³/h combined nominal capacity** after expansion
- Modular, repeatable design that enabled capacity expansion without a complete system redesign
- Reduced installation time through prefabrication and factory testing
- Fluence-led commissioning and operator training
- Flexible solution suitable for future emergency situations, temporary replacement, bridging applications or capacity expansion



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From an Emergency Response to a Scalable Solution

The project demonstrated how a standardized, containerized solution can be deployed quickly in response to an unexpected system failure and easily expanded as water treatment needs grow.



The Abu Dhabi project helped validate a **fast-track service model for mobile demineralized water production, combining rapid engineering and modular manufacturing with delivery, commissioning, operator training and ongoing support.**

For **Fluence**, this project represents a new capability to accompany critical industries when the availability of high-purity water cannot wait.



Value from Water



Fluence Corporation