MULTI-YEAR MOBILE WATER SERVICE DELIVERS £100K ANNUAL SAVINGS FOR CCGT POWER STATION

CASE STUDY I Power I Mobile Water Services

| The client's needs

The site utilises river water as its primary source, processing it through a comprehensive water treatment system including clarification, demineralisation via ion exchange, and mobile reverse osmosis to meet the demanding water quality requirements for power generation.

The power station faced mounting pressure to reduce operational costs whilst maintaining high plant availability and water quality standards. Specifically, the client needed to achieve annual savings of approximately £100,000 on their total process water treatment costs.

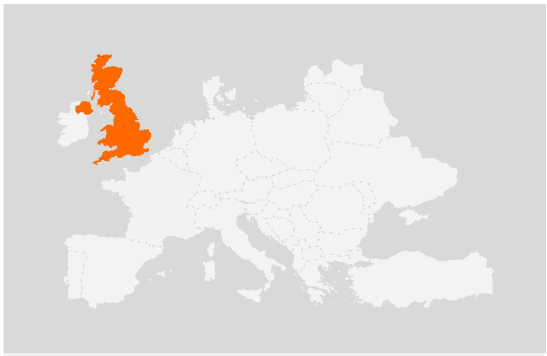
The existing water treatment approach relied heavily on chemical regeneration of ion exchange resins, resulting in substantial consumption of sulphuric acid and sodium hydroxide, frequent resin replacements, and associated disposal costs.

Additionally, the client sought to reduce on-site labour requirements whilst improving overall system reliability and availability. The challenge was to deliver these cost savings without compromising water quality or operational performance, and to identify a solution that would provide long-term cost certainty and protection against commodity price inflation.

| The solution

A comprehensive value assessment process was undertaken to identify opportunities across multiple operational areas including water usage, chemical consumption, energy efficiency, and waste reduction.

The assessment revealed that installing ultrafiltration and reverse osmosis (UF-RO) as pre-treatment upstream of the existing demineralisation plant would dramatically improve feedwater quality to the ion exchangers.



| The client

United Kingdom – The company operates a combined cycle gas turbine (CCGT) power station, featuring three combined cycle units with a total capacity of 1.3 MW.

The site operates with a lean team including operational staff and a dedicated boiler chemist to maintain water quality.

Key Figures

Duration: 10 years

Type: Multi-Year Mobile Water Service

90%
Reduction in regeneration chemistry consumption

>95%
Demin plant availability increase achieved

£104K
Annual operational cost savings achieved

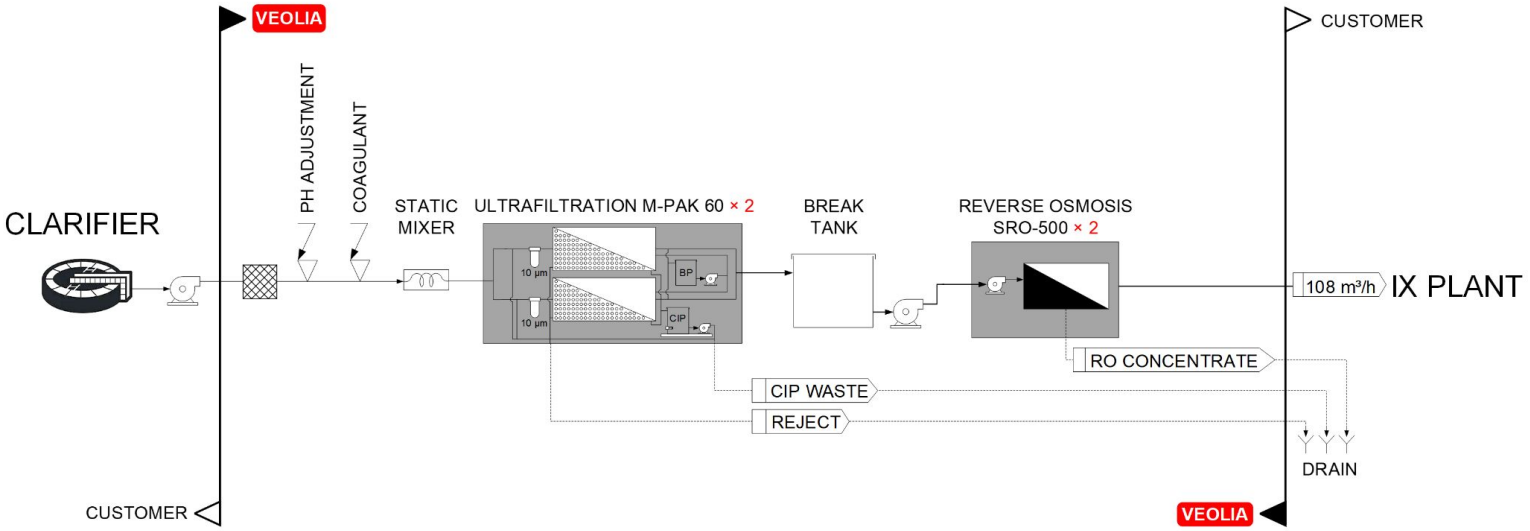
800 tonnes
Annual reduction in chemical and salt discharge to environment

This solution was selected because it would reduce regeneration frequency by 90%, thereby slashing chemical consumption, extending resin life, and improving plant availability.

The solution was delivered through a 10-year contract, combining mobile water assets with existing operational support and expert guidance services. This integrated approach provided the client with a single-source solution whilst transferring asset ownership and maintenance, refurbishment and technical upgrades responsibility to Veolia.

The contract structure also incorporated remote monitoring and performance reporting capabilities through Veolia's digital platforms, enabling more efficient operations with reduced on-site presence.

By consolidating all water treatment services under one comprehensive agreement, the client gained operational simplicity, cost predictability through price escalation clauses, and protection from volatile chemical commodity markets.



| Process trains

The technical solution centres on two mobile UF-RO units operating in a duty-standby configuration, each rated at 65 m³/hr feed flow capacity.

River water first passes through the existing Densadeg clarification system before entering the new mobile ultrafiltration units. Pressurised UF membranes provide robust pre-filtration, removing suspended solids, colloids, and microbiological contaminants to produce high-quality feedwater for the downstream reverse osmosis stage. The mobile Super RO units then remove dissolved salts and ionic contaminants, producing permeate water with significantly lower total dissolved solids compared to clarified river water alone. This pre-treated water then feeds the existing ion exchange demineralisation plant, which polishes the water to the ultra-pure quality required for boiler feedwater in power generation applications.

The maximum demineralisation demand of 108 m³/hr is comfortably met by the system configuration. The dramatically improved feedwater quality to the ion exchangers means the resin beds require regeneration far less frequently — achieving a 90% reduction in regeneration cycles. This translates directly into proportional reductions in sulphuric acid and sodium hydroxide consumption, as well as extended resin service life before replacement is required.

The mobile nature of the assets provides operational flexibility, whilst the multi-year mobile water services contract ensures professional membrane management including scheduled replacements after five years of service. Remote monitoring through digital platforms enables proactive maintenance and optimisation without requiring constant on-site technical presence.

| Results

The implementation of the integrated water treatment solution has transformed operations at the facility. The UF-RO pre-treatment system has consistently delivered the guaranteed 95% reduction in regeneration chemistry, with sulphuric acid consumption dropping from 53 tonnes to just 5 tonnes annually, and caustic soda usage falling from 171 tonnes to 17 tonnes per year. This dramatic reduction in chemical handling has improved site safety whilst simultaneously reducing the environmental footprint through lower salt discharge to the environment.

The enhanced feedwater quality has extended ion exchange resin life significantly, reducing replacement frequency and associated disposal costs. Plant availability has exceeded the >95% target, enabling the facility to achieve greater self-sufficiency in raw water abstraction from the local river. The 10-year contract structure has provided long-term cost certainty with built-in protection against commodity price inflation through the integrated service model.

Value assessment: Demineralisation pretreatment with UF-RO

Cost item (All costs in 2017 £)	Previous contract model		Veolia mobile water service agreement	
	Annual cost [£]	Cost [£ / m³]	Annual cost [£]	Cost [£ / m³]
H_2SO_4 96%	53,000	0.19	5,000	0.02
NaOH 50%	171,000	0.63	17,000	0.06
Resin replacement	42,000	0.15	19,000	0.07
Resin disposal	13,000	0.05	7,000	0.02
RO membranes	22,000	0.08	Included within Veolia service scope	
Mobile RO unit	92,000	0.34		
Veolia fixed service fee	232,000	0.85	474,000	1.74
Annual OPEX cost	**626,000**	**2.29**	**522,000**	**1.91**

This project demonstrates the power of collaborative problem-solving with our customers.

Rather than simply responding to a cost reduction request, we conducted a comprehensive value assessment that identified how mobile water assets could fundamentally improve the process efficiency.

By integrating our multi-year mobile water services model with existing operational support and remote monitoring through our digital platform, we've created a solution that delivers sustained financial and environmental benefits whilst extending our partnership for the long term.

It's a blueprint for how mobile water services can add strategic value beyond traditional equipment rental.

Lewis Taylor, Sales Director Mobile Water Services, Europe

| Benefits

- Guaranteed 95% reduction in regeneration chemistry consumption with protection from commodity price inflation
- Significant extension of ion exchange resin service life, reducing replacement and disposal frequency
- Enhanced plant availability enabling greater operational self-sufficiency for raw water supply
- Substantial reduction in environmental impact through lower chemical handling and salt discharge (460 tonnes annually)
- Integrated 10-year contract providing long-term cost certainty and single-point accountability
- Remote monitoring capability through Insight platform improving operational visibility and response times
- Reduced site manning requirements whilst maintaining operational excellence through expert guidance model

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