

Grands Vaux Reservoir Pumping Station

extensive refurbishment and the introduction of new motor control centre and generator installation

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The Island of Jersey is situated in the English Channel, 161km south of the English coast. Jersey Water produces the Island's potable drinking water, supplying over 90% of the Island's population of 100,000. Jersey Water operates six major reservoirs, one of which is Grands Vaux Reservoir. Originally built in 1951, it is situated in St Saviour, a parish central to the island. As the largest catchment for Jersey Water, Grands Vaux spans an area of 9.09km², with its reservoir being the 3rd largest on the island with a capacity of 229.57 ML. 2019 sees Jersey Water investing in a new MCC and generator installation at Grands Vaux Reservoir; but why?



Grands Vaux dam - Courtesy of Jersey Water (M Smith)

Project need

As a site, Grand Vaux is a key resource for Jersey Water and is one of the last few reservoirs to be without an alternate mains power source. As a station it serves key functions, enabling Jersey Water to pump directly to Queens Valley Reservoir to maintain acceptable water quality levels and blending regimes, whilst also offering the facility to supply the Augres WTW, constructed in 1964 and located in the parish of Trinity, with a maximum daily capacity of 20 ML.

The current pumping station's control switchgear is nearing the end of its useful life having been in service for in excess of 20 years. The

project for 2019 sees Jersey Water teaming up with mechanical and electrical contractors to replace the existing motor control centre and install a standby generator set to provide a backup power supply for the current station.

Project conception

The project conception started in 2016 when Jersey Water faced challenging times managing the pesticide 'Oxadixyl', and resulted in Val De La Mare Reservoir, the island's second largest at 938.42 ML (which represents 35% of the island's water storage capacity), being taken out of service for a period of 5 months.

Supply Chain	Company
Client	Jersey Water
Principal contractor	Clayton Penistone Group
Generator supplier	Power Electrics Generators Ltd
Variable speed drive supplier	Danfoss Ltd

This left the company in a vulnerable position and started the drive to ensure all remaining key reservoir pumping stations incorporated generator backed power supplies.

Contracts

The works commenced in 2018 with a project proposal going out to tender for an 8 week period. Following the evaluation of all tenders the principal contractor was awarded the works with an installation date scheduled to commence September 2019.

Variable speed drives

The project sees the removal and replacement of the existing site's motor control centre, with a revised design to optimise pumping demands and site functionality by installing 4 (No.) standalone variable speed drives (offering energy savings in the region of 40% over that of fixed speed drives). The works scope includes the installation of 4 (No.) Danfoss VLT Aqua drives FC202, three sized at 315 kW and one at 110 kW to supply the current weir between bearing centrifugal pumps.

All will be controlled via a programmable logic controller, hardcoded to interlock the pumping system so as to avoid overloading the stations 1000Amp 3-phase electrical supply.

Variable speed drives are not the only efficiencies with Jersey Water specifying the latest power monitoring instrumentation to manage maximum demands and optimise flow control where possible.

Generator set

The generator set selected for the purpose is to be a free standing FJ Wilson set incorporating a Perkins diesel designed to automatically take over supply in the event of electrical phase failure. With a set sized at 600kVA its purpose is to maintain the operation of any one pump. This system is hardwired interlocked utilising air circuit breakers integral to the motor control centre and maintain the raw water supplies for treatment at this key island water source.

Telemetry

Utilising remote telemetry provides Jersey Water and their latest SCADA system with complete control of all pumps and actuated suction and delivery valves enabling for an autonomous pump station significantly reducing the demand on its operational staff.

Provisional cabling

Mitigation of risks will see provisional cabling to the pumping station's smaller 110kW pump set whilst the main installation works are undertaken, thus enabling Jersey Water to utilise existing mobile generator power should the need materialise to transfer water.

Project status (June 2019)

The works are scheduled to start in September 2019, with the site shut down for 6-8 weeks. This places Grands Vaux out of action, therefore it will be down to the careful management of Jersey Water's operational water supply team to manage sources in the run up to this period so as to ensure the island's water storage capacity remains at optimum levels and does not impact on the water available for use.

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Inside Grands Vaux Pumping Station - Courtesy of Jersey Water



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