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## VANCOUVER WWTP GETS LARGER, MORE EFFICIENT PUMPING SYSTEM

**M**etro Vancouver Regional District's Annacis Island Wastewater Treatment Plant in Delta, British Columbia, presently serves about 1.3 million people living in 14 municipalities.

The pumping facility at the Annacis Island plant uses three 1,200 horsepower influent pumps and four 684 horsepower trickling filter pumps. The influent pumps regulate the level of raw sewage in the wet well, conveying it into the treatment plant. Should these fail during high flow situations, there are overflow gates, but these bypass raw sewage into the Fraser River, which would lead to significant fines and penalties due to the environmental impact. The trickling filter pumps send partially treated wastewater over trickling filters for secondary treatment.

When the time came to upgrade the facility, it was essential that replacing the pump drives, power distribution, and control equipment be done without taking the facility offline. It also required a complex pumping system with efficient performance that could meet the challenge of rising energy costs.

3 Phase Power Systems was retained to create a detailed project plan and bid

response that would consider the environmental and economical challenges.

### MAXIMIZING SPACE AND PROTECTING EQUIPMENT

The available footprint restriction was challenging to the point that installing traditional power distribution and control equipment would be difficult. Selected enclosures had to contain all the critical equipment in a small area, while keeping the components environmentally safe and secure. The proposed layout for the project needed to be readily understandable and demonstrate how the specifications could be met within the available space.

### CRUCIAL TIMING AND ENVIRONMENTAL CONCERNS

Pump drive replacement had to occur during the summer months, when water levels were low due to lack of precipitation. Per Canada's Wastewater Systems Effluent Regulations, companies are required to monitor and record effluent quality.

By failing to meet these regulations, Metro Vancouver would be at risk for fines and legal action. As such, this project had to be done within a tight timeframe,

or it would have to be put off for a full year until the water table was low enough again.

### TIMELY DELIVERY AND INNOVATIVE SOLUTIONS

The third challenge was being able to reliably ensure that the required materials would be available within the tight timeline. To accomplish this, the project partners had to have the infrastructure in place to seamlessly deliver the project. It required access to innovative solutions and methods for power systems and wiring.

By working with Rittal and EPLAN, the 3 Phase Power project team was able to meet the required footprint and include the proposed panels in a 3D drawing, as a visual. At the time of the bid, they submitted 3D drawings, and bills of materials of the enclosure, ratings, and manuals. This level of detail served to help assure the low environmental risk of the project, as well as the competency of the company.

Each part of the project had to be timed precisely because of the narrow window for installation. "They tracked and met critical dates and timelines," said 3 Phase Power's Dwayne Donaldson. However, the most critical part was the installation itself. Watching for the right conditions and maintaining a water level low enough to stop the pumps for installation were imperative, as issues could create critical wastewater scenarios.

To fit the power distribution product into the space of the enclosure, Rittal's busbar system was used instead of traditional cabling. Paired with 3 Phase Power's Danfoss-VACON variable frequency drives (VFDs) for load sharing, the ampacities of the busbar provided the necessary power, along with the brackets and busbar support which bolted into the enclosures. As a result, the equipment not only fit into a much smaller space, but also provided the essential and documented CSA approvals.

The Danfoss-VACON incorporates the latest in VFD technology and has actively developed benchmark applications tailored for water and wastewater handling. These applications include pump control, hose filling, pump supervision, and multiple pump control applications. ■

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