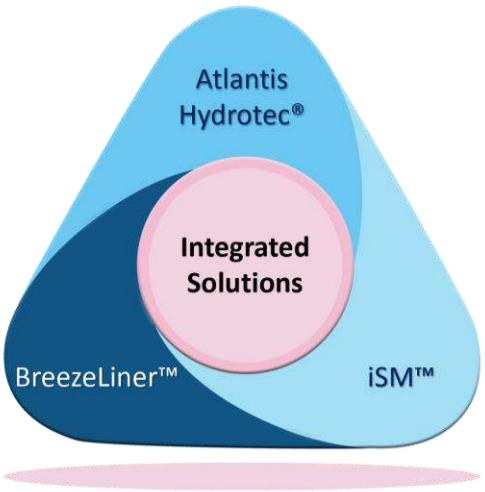
CRALEY Group
Innovators in
Smart Infrastructure

Case Study - Atlantis Hydrotec®

SnoPUD - Washington State

June 2018 v1.0



CRALEY Group's suite of integrated solutions provide a clear, logical and compelling mix which have the ability to make smart water networks happen.

We provide the products that create a platform to deliver hard-wired ultra-fast comms between all sensors and actuators within a water network; regardless of location, including rural reservoirs, treatment works and water towers.

Our solutions are capable of providing fibre optic communications by utilising the existing in-ground pipe infrastructure as ready-made conduits, which already link all of the assets where reliable high-speed communications are required.

In addition to providing in-pipe communication solutions, we have a trenchless pipe relining and rehabilitation product with the ability to provide simultaneous fibre optic connectivity if required

Atlantis Hydrotec®
For in-pipe fibre communications in potable water pipes

BreezeLiner™
Pipe rehabilitation and communications

iSM™
For in-pipe Event Monitoring and Asset Protection

CASE STUDY

The Client:

Snohomish County Public Utility District No. 1 (SnoPUD) is the second largest publicly owned utility in Washington with a service territory exceeding 2,200 square miles and providing more than 348,000 customers with electricity from its Hydro Power facility.

The Problem:

SnoPUD already had an established microwave communications link between the Jackson Hydro Power Station and the Culmback Dam. While this microwave link had provided good service, like with any radio link, they experienced periods of unreliability, particularly during periods of adverse weather. It was during these periods of adverse weather, when they typically experienced signal fade due to heavy rain or snow, or high wind and ice-loading causing dish mis-alignment, and this at the time the communications link is most important; particularly as the dam provided drinking water to a population of more than 600,000 and electricity to more than 348,000.

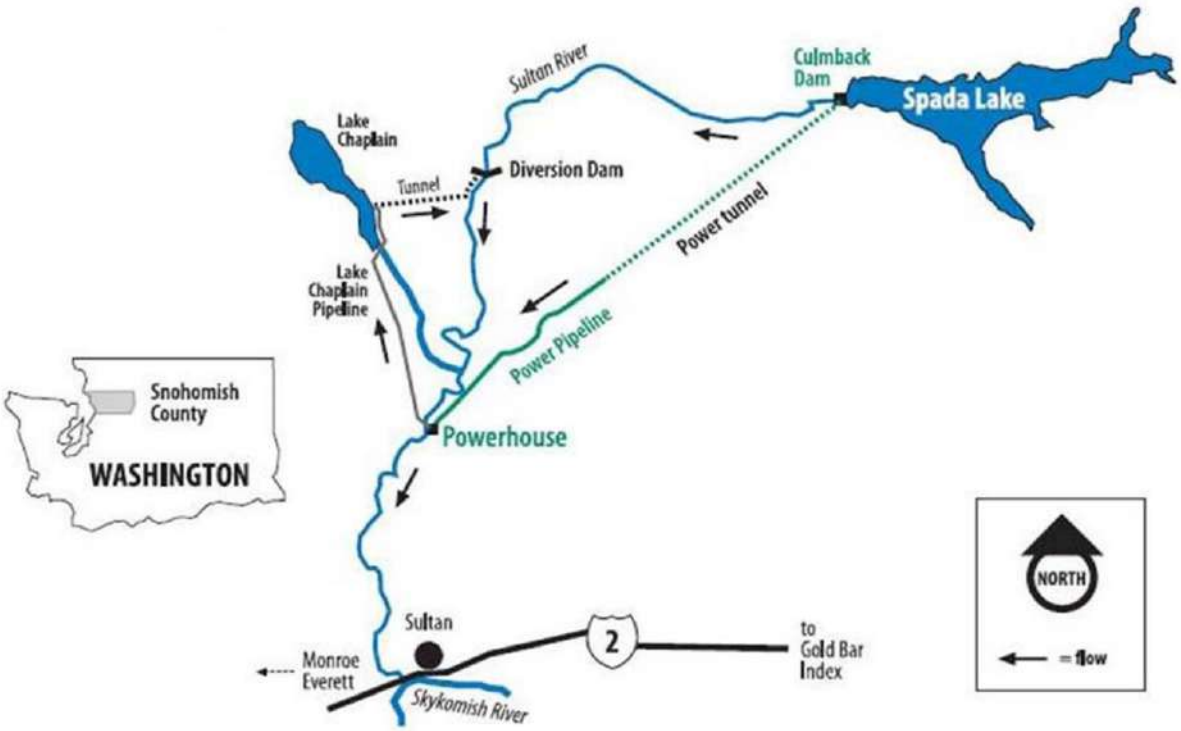
The challenge was that SnoPUD required a hard-wired fibre optic link to provide reliable 24/7 365 communications between the hydro plant and the dam and to provide ultra-fast next generation service.

The location of both the hydro plant and the dam are highly remote and the terrain is very challenging, like most dam and hydro facilities around the world.

To provide a fibre-optic link would require the trenching of over 12 miles (20km) of track, in solid granite rock.

Initial enquiries revealed the cost to install a fibre optic link using traditional techniques would be in excess of $2 million and take up to 12 months to complete.

SnoPUD therefore needed a better, faster and less expensive way to achieve the fibre optic link.



The Solution:

Water is provided to the Jackson Hydro Plant via a 4.35 mile long (7km) and 13ft diameter (4m) tunnel, bored through the solid granite mountain from the Culmback Dam to the Hydro Plant.

The visionary engineering team at SnoPUD contacted CRALEY Group to ascertain whether they were able to design a solution using their innovative Atlantis Hydrotec® pipe-in-pipe technology.

Atlantis Hydrotec® is a patented solution which facilitates the deployment of fibre optic cables within existing pipeline infrastructure by installing a small-bore 'Messenger Pipe' within the existing pipeline in which a fibre optic cable could be installed without any adverse effect and crucially, without the fibre cable ever coming into contact with the water.

Working closely with SnoPUD, the design team at CRALEY Group immediately set to work in designing special purpose fittings for the entry and exit points and designing an appropriate messenger pipe to provide the secure, in-tunnel communication link capable of withstanding the rugged entry and exit zones, high flow-velocities and high pressures. All Atlantis Hydrotec® Messenger Pipes are internationally approved and certified as safe to use in potable water pipelines.

The final solution included a single continuous length of Atlantis Hydrotec® potable water approved and certified messenger pipe, with a 48-core fibre optic cable. The messenger pipe entered and exited through two individually designed PFM pressure fittings and was secured to the walls along the length of the tunnel at regular intervals.

Whilst the timeline for traditional techniques was 12-months, the installation of the Atlantis Hydrotec® solution would need to be completed during a 2-week scheduled maintenance shutdown of the pipeline.

The Results:

SnoPUD scheduled a 14-day shutdown of the tunnel to carry out the Messenger Pipe and fibre optic installation as well as some required tunnel maintenance, and the contracting parties of CRALEY Group, IMCO Construction and SnoPUD carefully planned the installation to ensure that it could be achieved within the 14-day time-frame.

The contractors set to work, and the messenger pipe installation was achieved at the astonishing rate of 1 mile per day (1.6km) which, including the installation of the specially designed PFM entry and exit fittings, meant that the entire project was completed in just one week; way ahead of schedule.

A 4.35 mile, 48-fibre communications link has been successfully deployed in a 14ft underground river in just one week, within schedule and under budget.

"SnoPUD relied on our current microwave system for control, monitoring and telemetry but we needed a more reliable much higher speed Next Generation solution. Atlantis Hydrotec® from CRALEY Group provided the ideal solution for us in a time-frame that fitted within our requirements."

Brad Spangler, SnoPUD Senior Generation Manager

Summary of Benefits

A water company's pipe infrastructure, by design, goes exactly where people, buildings and assets are, providing inter-connectivity for the delivery of water and providing the ideal pre-existing and highly protected routing for fibre-optics. The hydro-tunnels inter-connecting dams and power generation facilities provide a perfect example of this technique.

The Jackson Hydro Power Plant to Culmback Dam project was completed in just seven days, in comparison to an estimated 12 months for traditional trenching, and at a fraction of the overall project cost.

"We found CRALEY Group to be a great company to work with, highly responsive, creative and flexible to accommodate our requirements. The end result being the successful implementation of a complicated and challenging project ahead of schedule and within budget"

Scott Spahr, SnoPUD Generation Engineering Manager

Where such facilities are already connected by micro-wave or radio link, then fibre-optics delivers ultra-high capacity Next Generation data-speeds for enhanced services, while allowing the existing micro-wave/radio link to become a redundant fault-tolerance circuit (where previously there was no back-up link available).

Hydro Electric plants, and reservoirs, are almost always in highly-rural, and often geographically challenging regions; where existing communications are very poor and traditional civils-based installation techniques are slow, problematical and cost prohibitive. But, it is in these very circumstances that Atlantis Hydrotec® provides the maximum benefit.

CRALEY Group is already involved in many projects around the world, from the Americas to the Far East, providing rapid and cost-effective communication links within pipeline infrastructures. Hydro tunnels and large underground rivers or aqueducts are an ideal example of this.

The new fibre-optic link provides the primary data feed inter-linking the facilities, for enhanced and Next Generation telemetry, control and CCTV 'home-land' security feeds. The link will also find application to provide enhanced local mobile coverage in this remote location.

Fiber-optic communications provides such large data bandwidths that this represents a completely future-proofed data link system.

"This is an excellent example of the true flexibility and benefits of the Atlantis Hydrotec® solution. I am very pleased that, despite severe weather conditions and just a 14-day tunnel shut-down window, that the install was completed within budget in just 7 days. My thanks and recognition go out to each member of the excellent SnoPUD, IMCO and CRALEY Group team, who delivered this project on time, and on budget"

Andy Harris, CEO CRALEY Group

For further information, or to schedule a 'live demonstration' Webinar, please contact us via the website www.craley.com or email office@craley.com

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