

Teller to Brevig Mission Intertie Project

Story and photos by Sean Robbins.

Roughly 70 miles to the northwest of Nome, Alaska lie the coastal Inupiaq villages of Brevig Mission and Teller. Located next to the natural harbor of Port Clarence, and the protected bay of Port Clarence, the region offers plentiful subsistence resources, and awe-inspiring vistas. Alaska Village Electric Cooperative (AVEC) supplies power to both villages, via individual diesel-fired power plants.

As part of a system-modernization program, funded by the Denali Commission and the U.S. Department of Agriculture's Rural Utility Service, last year a modern power plant and tank farm were completed in Brevig Mission, sized to also power the nearby village of Teller (six and-a-half miles away). See the September 2010 issue of Ruralite for additional information about that project.

Electrically connecting these two villages proved to be a challenge! Several design concepts were pursued, over an eight-year period. The first design was entirely overhead and featured tall towers to span a 1,600-foot-wide channel between Port Clarence and Grantley Harbor. Residents of both communities were concerned that the power line would interfere with the subsistence uses of the land, so AVEC went back to the drawing board.

A second design called for installing a six-mile submerged cable across Port

Clarence. However, installing such a cable would require the use of a very specialized cable-installation barge—which is not commonly found in Alaska, let alone the far reaches of western Alaska. The cost to mobilize one of these specialized barges from western Canada or the Lower 48 (or even eastern Asia) greatly exceeded the project's budget.

Furthermore, the March 2011 Japanese earthquake damaged many submarine power and communications cables, increasing region-wide demand for these vessels equipped to lay and repair cables—the same types of vessels we would have to use.

While this “out-of-sight” option was popular with the area residents, the excess cost would have placed a large financial burden on AVEC's other consumers, and therefore was not an option.

However, a third option emerged as the most acceptable. Area residents wanted something out-of-sight, so AVEC's intertie engineer came up with a buried design



Starting to backfill the primary trench in Teller.

for most of the overland portion. The hybrid, underground-overhead-underwater intertie project was created. The sticking point, however, was how to cross the 1,600-foot-wide channel, without having to mobilize in an expensive cable-laying barge from thousands of miles away.

AVEC challenged its submarine cable contractor to come up with an innovative way to install a cable in this area, using only locally-available equipment. The solution was to float the cable with buoys, and then use the excavating equipment to pull the cable from one shore to the other, towing the cable into position. Then divers would cut the floatation buoys off to sink the cable in place.

To further protect the cable from sea ice scouring, storm erosion, and anchor damage, AVEC elected to also bury and armor the cable near the shoreline. From the recently constructed power plant in Brevig Mission, the intertie line goes:

- Underground for half a mile as it passes under a portion of the village's airport,
- Overhead for a mile and a half as it follows the road between the village center and the village dump,
- Underground for three and a half miles as it crosses Native allotments, village Native corporation, and private land, through soils ranging from permafrost tundra to sandy beach gravel,
- Underwater for a little over a quarter mile,
- And underground for three quarters of a mile on the Teller side, before connecting to an existing pole line in Teller.

To the best of our knowledge, this is the northernmost submerged utility cable in North America. Construction started in September 2011, and the intertie is expected to be operational by the end of 2011. AVEC looks forward to providing Teller residents with lower-cost power from the newer and much-more fuel-efficient Brevig Mission plant as soon as possible.



Buoys attached to the cable every 10 feet kept the cable afloat during the pull. Sacks of concrete mix were attached every 20 feet to keep the cable submerged after the floatation buoys were removed.



The Brevig Mission trench at the start of the cable pull.



An excavator carefully pulled the tow line and cable into the Teller trench.



The cable reached the Teller beach after slowly being pulled across the channel.



Protective armor covers the cables near the shoreline. The trench was filled.