

2017 Submarine Cable Replacement Project

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During routine maintenance of 1977 OPALCO cable, divers descend down 90' (as deep as they could safely go) and discover significant damage to submarine cable.



Bathymetric scans create 3D mapping of seafloor to identify best crossing for laying new cable protecting it from rocks, tidal action, etc.

OPALCO shares mapping with CenturyLink to help them repair their failed cable.

CenturyLink flies Remote Operating Vehicle (ROV) over cable; OPALCO documents CenturyLink trespass into OPALCO easement.

OPALCO prepares project bids in cooperation with other regional utilities to share expertise, costs and resources.

OPALCO signs contract with Sumitomo USA for manufacture of 2017 cable.

Contractor, Trenchless Construction Services LLC, uses innovative technique to bore two 350' channels under the shoreline and eel grass to protect sensitive areas. Two channels built concurrently to meet long-range planning goals.

Vault built and installation complete for two 350' runs of 20" conduit from vault on shore to 50' past sensitive eelgrass beds.

Aggressive outreach to CenturyLink to ensure construction deadlines are met.

OPALCO prepares San Juan shoreline for new cable installation. Monitors CenturyLink work to ensure adherence to safety and timeline.

Barge transports cable from Japan (August); 1977 cable removed and 2017 cable installed (September).

Land connections complete and OPALCO fiber commissioned.

2011

2012

2013

2014

2015

2016

2017

2018

Budgeting begins in 2013-2016 Construction Work Plan for cable design, replacement and permitting.

Design and permitting begin. OPALCO ROV flyover provides evidence of cable deterioration, identifying challenges for cable removal and installation.

Manufacture of sea portion of the cable begins. Decommission 1977 cable and start mineral oil removal (air injection system) from the old cable to prepare for its removal. Receive and install 1,500' of land cable from the submarine cable terminal on Lopez to the vault at the shoreline. OPALCO verifies cable manufacturing and quality testing in Japan.

Test equipment. Obtain all regulatory approvals and energize new cable. Complete restoration of all construction areas.



FUN FACTS

- Location: Lopez to San Juan island crossing
- Length: approx. 13,596' in one continuous piece (2.6 miles)
- Ocean depth: down to approx. 280' (Cable rated to depth of 390')
- Boring length under eel grass and sensitive archeological areas: approx. 350' with 20" diameter conduit
- One of two submarine cables in this crossing for redundancy
- Cable includes three phases of electrical conductor and 144 strands of fiber optic cable to meet members' energy and communications needs for next 50+ years
- Each cable can independently carry the entire electric load of San Juan Island and associated islands (Brown, Pearl, Henry, Spieden)
- Load capacity: 50 MW continuous load, 60 MW peak load
- Rated AC Voltage between Phases 120,000 Volts (120 kV)
- Cable weight in air 33 lb/ft.; total weight before installation (on spool) is 400 metric tons
- Submarine Cable replacement is estimated to cost \$15M
- 20 years of 2017 cable will yield enough power to pay for itself 2x over (calc based on 72K volts — average 200 amps on a 24/7 basis — cost of power flat)