

Submarine Cable Analysis for US Marine Renewable Energy Development

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




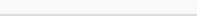
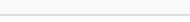
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1 Background

The submarine cable industry handles 95% of inter-continental internet, data and voice traffic (Communications Security, Reliability and Interoperability Council IV 2014), and is thus vital to the US and global economy. Repair and maintenance of cables traditionally involves grappling the cable and floating it to the surface, so allowance for drift of the repairing vessel and laying down of the additional splice of cable is dependent on bottom depth (Figure 1).

Table 1: Territories having submarine cables within the United States exclusive economic zone (EEZ) of 200 nm. Territory area (km²) and length of submarine cables (km) are reported with horizontal indicator bars proportional to values in rest of column (with italics headers). Remaining columns indicate whether energy resources (tidal, wave or wind) are characterized for the territory. The Pacific Island territories (Guam, Johnston Atoll, N. Mariana Islands, Palmyra Atoll, Wake Island) have submarine cables but no energy resource characterization, whereas the Atlantic Island territories (Puerto Rico, US Virgin Islands) have tidal and wind.

Territory	<i>Territory (km²)</i>	<i>Cable (km)</i>	Tidal	Wave	Wind
Alaska	 3,682,912	 15,782	✓	✓	
Atlantic Islands	 211,232	 4,241	✓	✓	
East	 932,351	 28,526	✓	✓	✓
Gulf of Mexico	 1,553,288	 1,909	✓	✓	✓
Hawaii	 2,474,715	 21,496		✓	✓
Pacific Islands	 2,174,943	 4,908			
West	 824,679	 20,459	✓	✓	✓
ALL	 11,854,120	 97,321	✓	✓	✓

Communications Security, Reliability and Interoperability Council IV. (2014). *Protection of Submarine Cables*

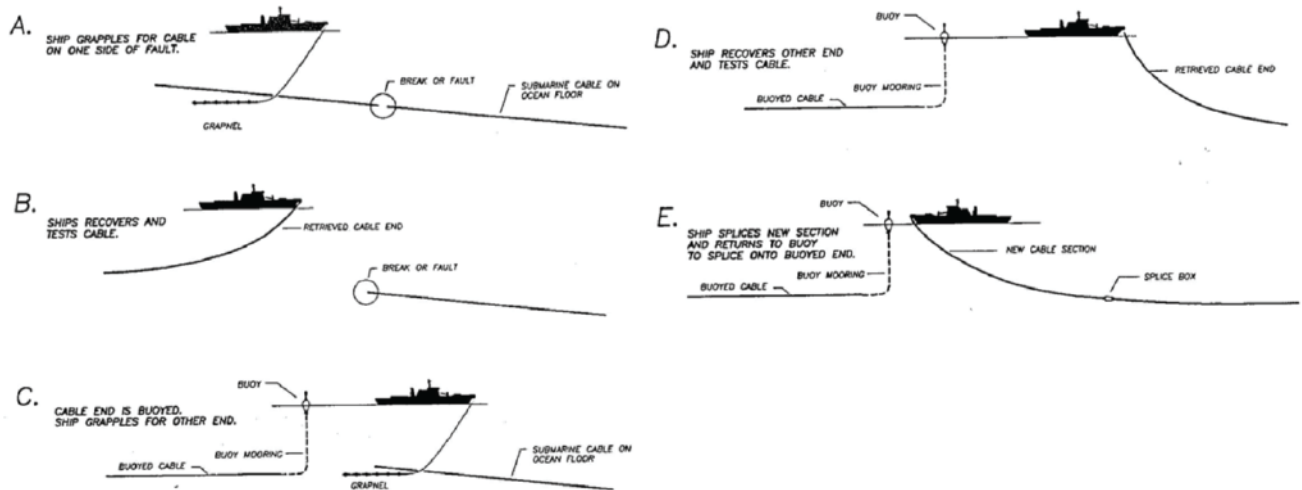


Figure 1: Ship operations for submarine cable repair. The ship runs a grapnel along the seafloor to catch the cable before the break, recovers and buoys one end of the cable, grapples and recovers the other, and splices a new section of repaired cable before laying it back onto the seafloor. Source: Tyco Electronics Subsea Communications, LLC

Through Spatial Separation. http://transition.fcc.gov/pshs/advisory/csric4/CSRIC_IV_WG8_Report1_3Dec2014.pdf