Submarine Cables the Hidden Asset

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Before I Start

Agenda

- A Little bit about me
- The Submarine Cable Network
  - History
  - The position today
  - The dangers
  - The areas of concern and interest
- Cable Systems
  - Legal Jurisdictions
  - Cable & Amplifiers
  - System Design
  - System Processes
  - Marine Repairs
  - Ongoing Preventative Maintenance

A little bit about me

Started with submarine cables in 1985, worked in the terminals on UK-Belgium No 5.

Worked in a variety of companies ranging from manufacturers, installers, consultancies through to developers and owners.

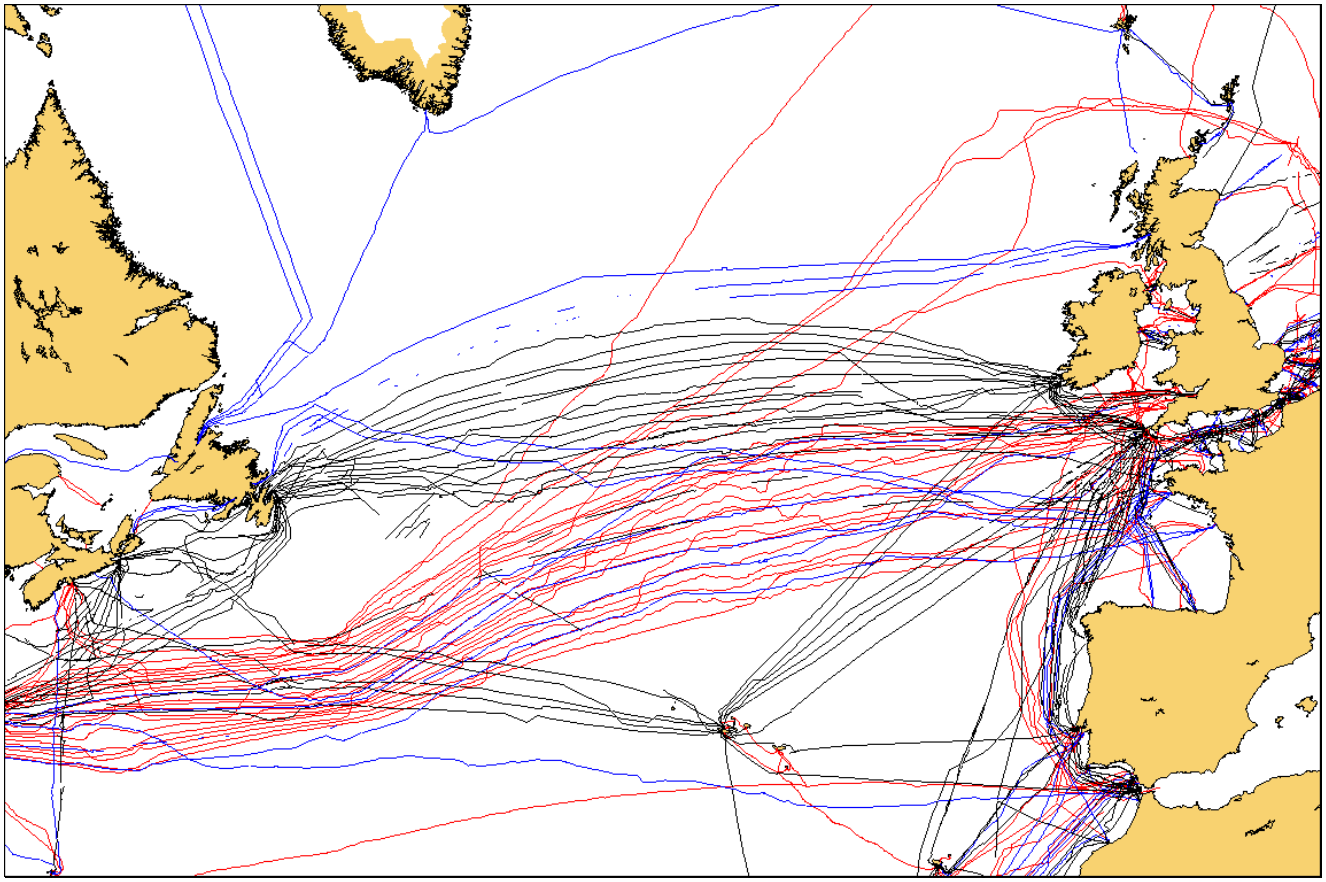
Been involved with the following, System Design, Installation and Commissioning of systems on land and at sea, system maintenance etc.

Have a keen interest in the history of cables

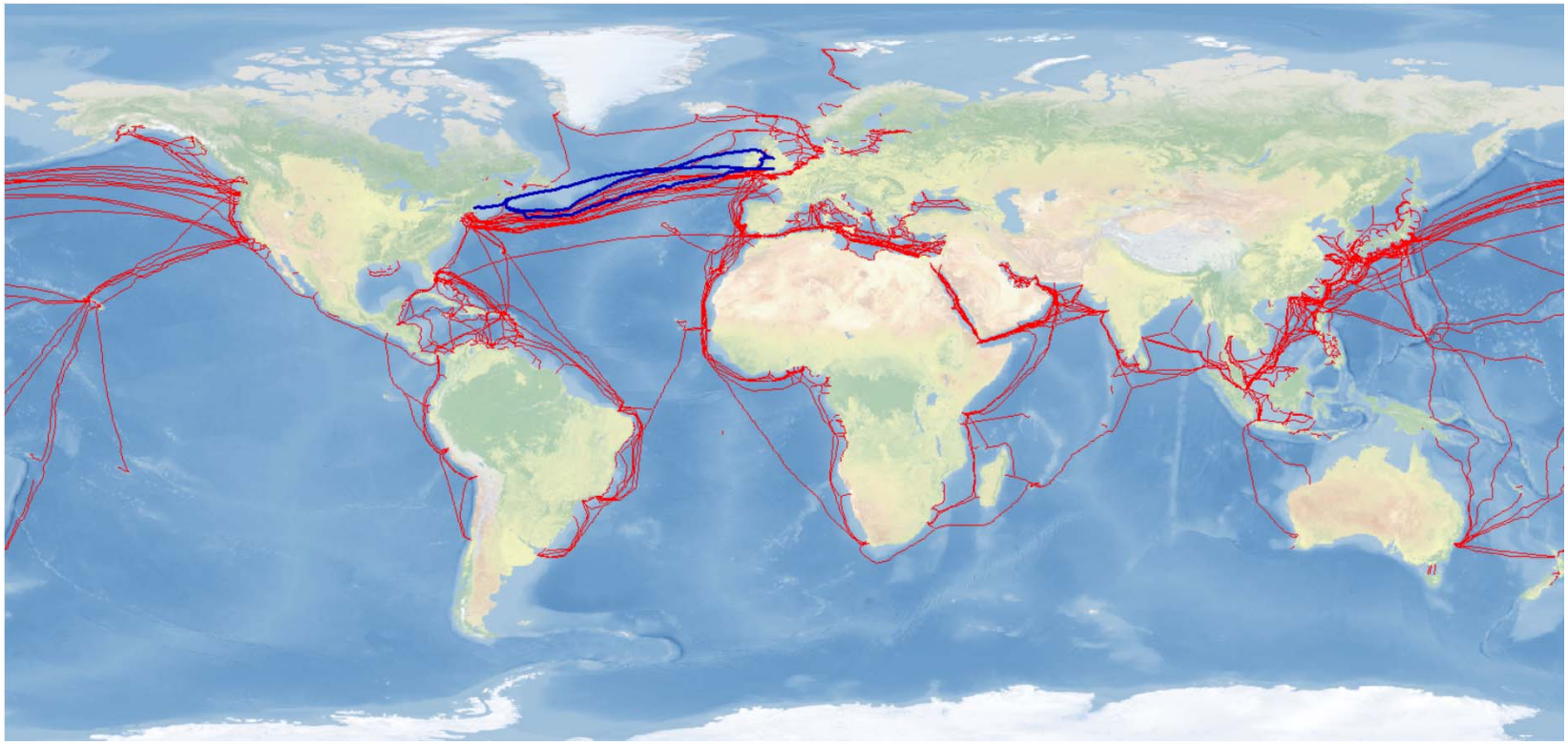
History of Cables

- 1850 First cross channel telegraph cable
- 1858 First transatlantic telegraph cable (failed)
- 1865 First working transatlantic cable
- 1939 First polyethylene coaxial cable
- 1976 Highest capacity coaxial cable system in the world installed (ANZCAN)
- 1980 First optical repeater installed (Loch Fylde, Scotland, BT experimental system)
- 1986 First international optical system (UK - Belgium 5)
- 1997 First optically amplified system installed

Evolution in the Atlantic 1850 - 2010

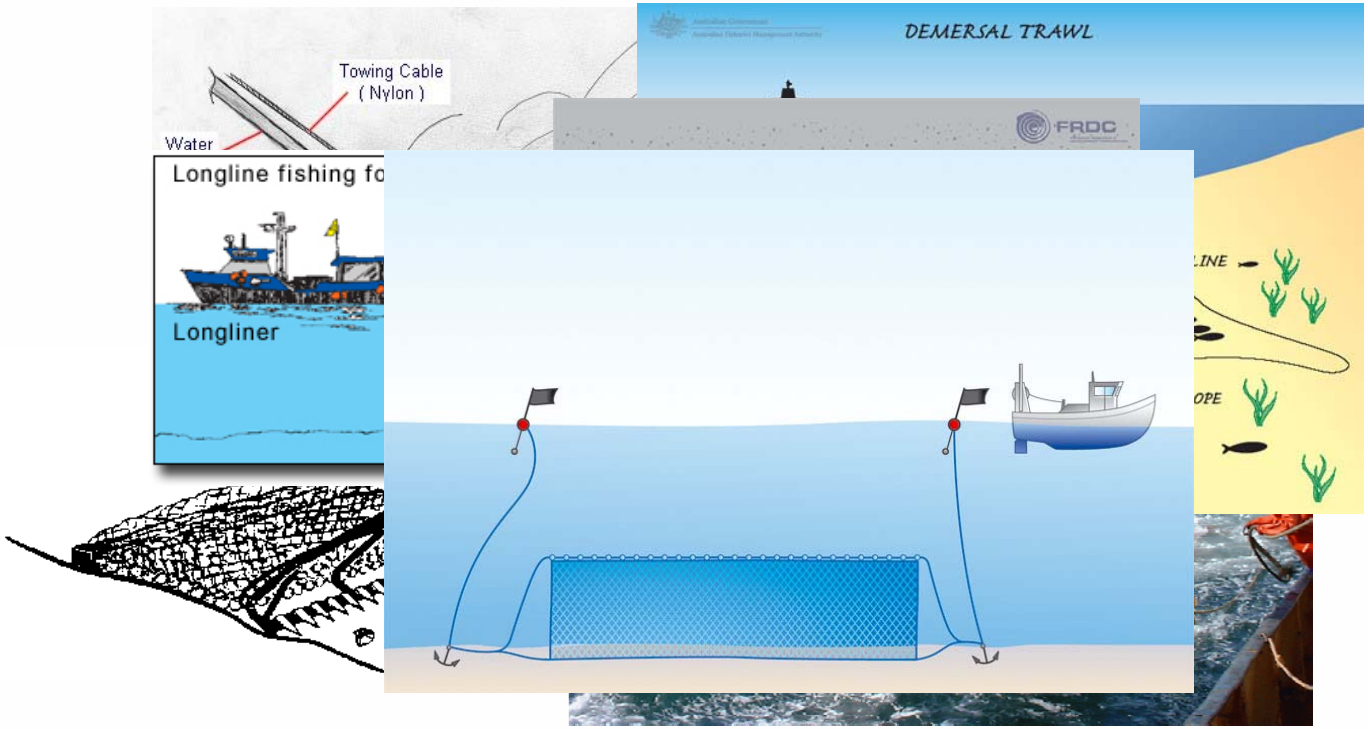


Telecommunications Cables in Service 2014



The Dangers to Cables (1)

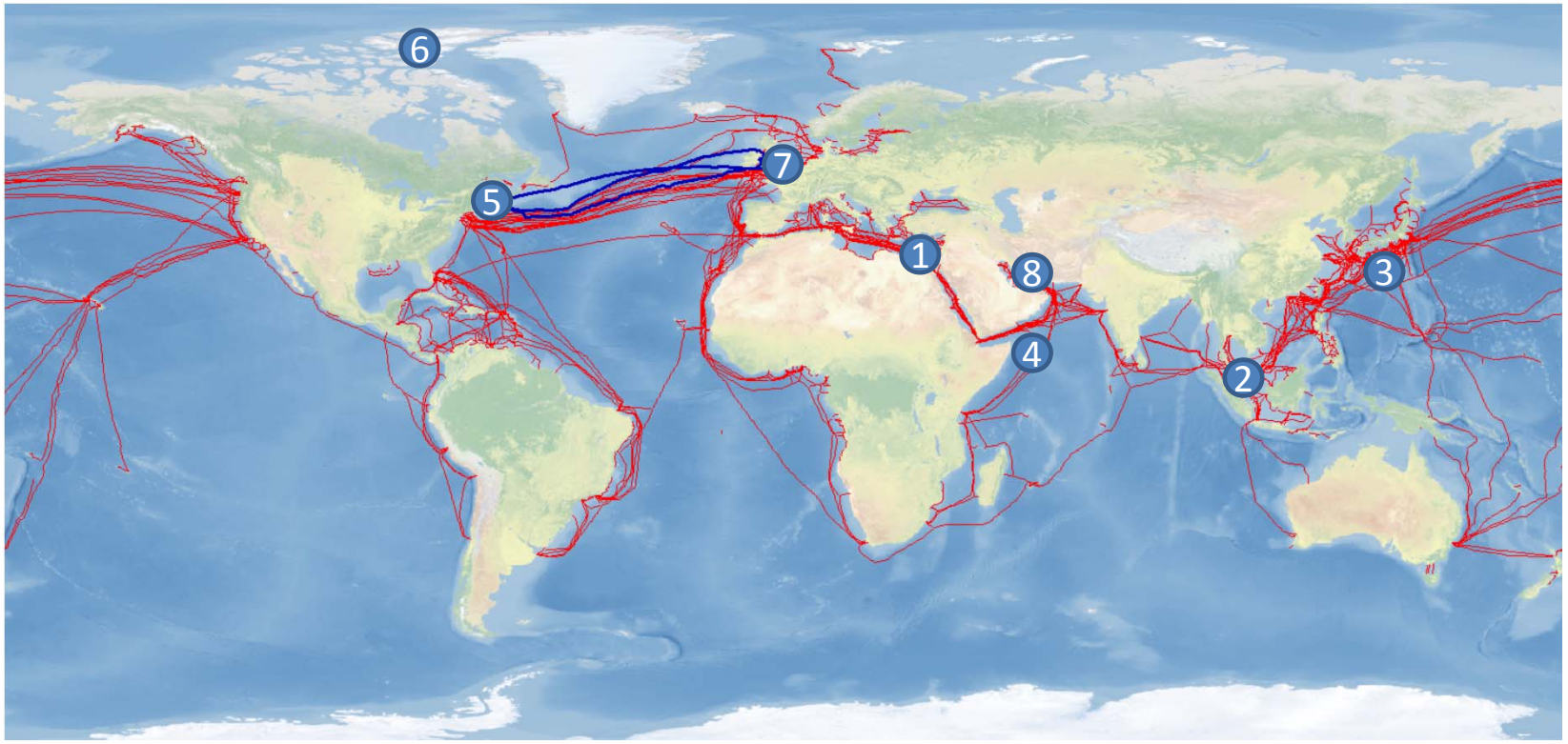
- Fishing
  - Bottom Fishing
    - Trawling
      - Beam
      - Otter (doors)
    - Scallop Dredging
    - Clam Dredging
  - Stow nets
  - Longlines
  - Bottom Gillnets



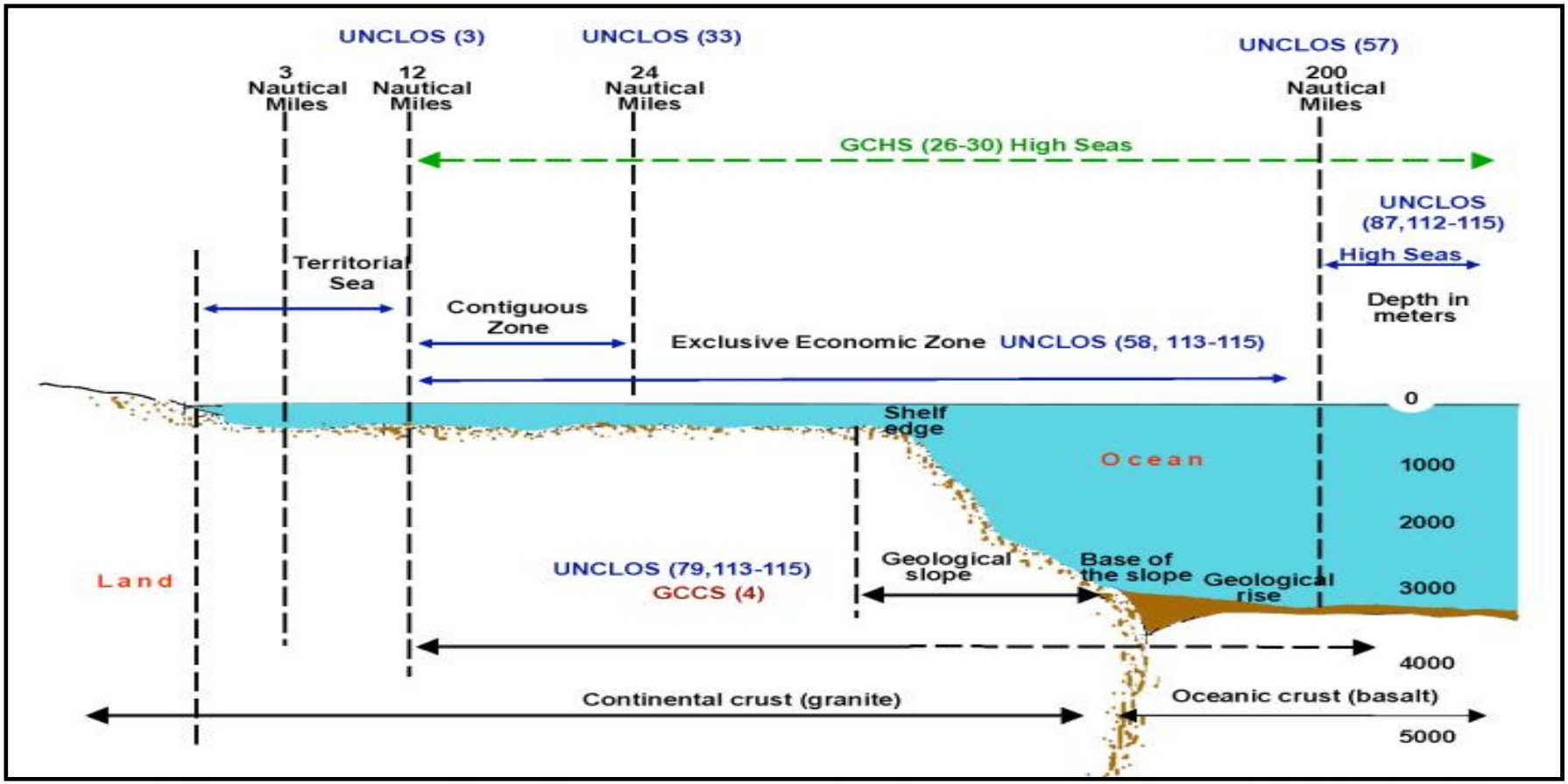
The Dangers to Cables (2)

- Ships
  - Anchors
  - Piracy
- Natural Phenomena
  - Earthquakes
  - Turbidity Currents
- An Increasingly Crowded Seabed
  - Oil & Gas Exploration
  - Offshore Energy
  - Fish Farms
  - Deep Sea Mining

Areas of Concern and Interest

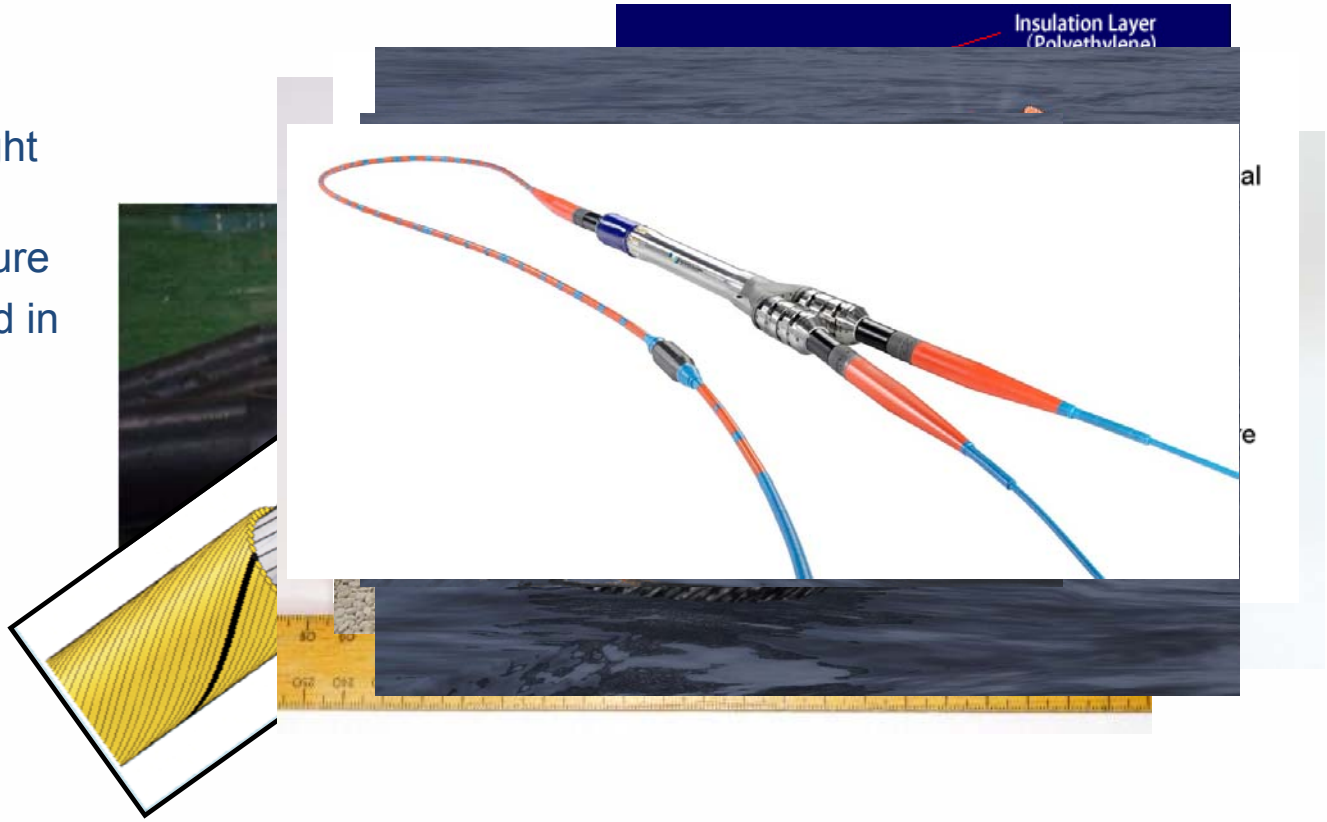


Legal Jurisdictions

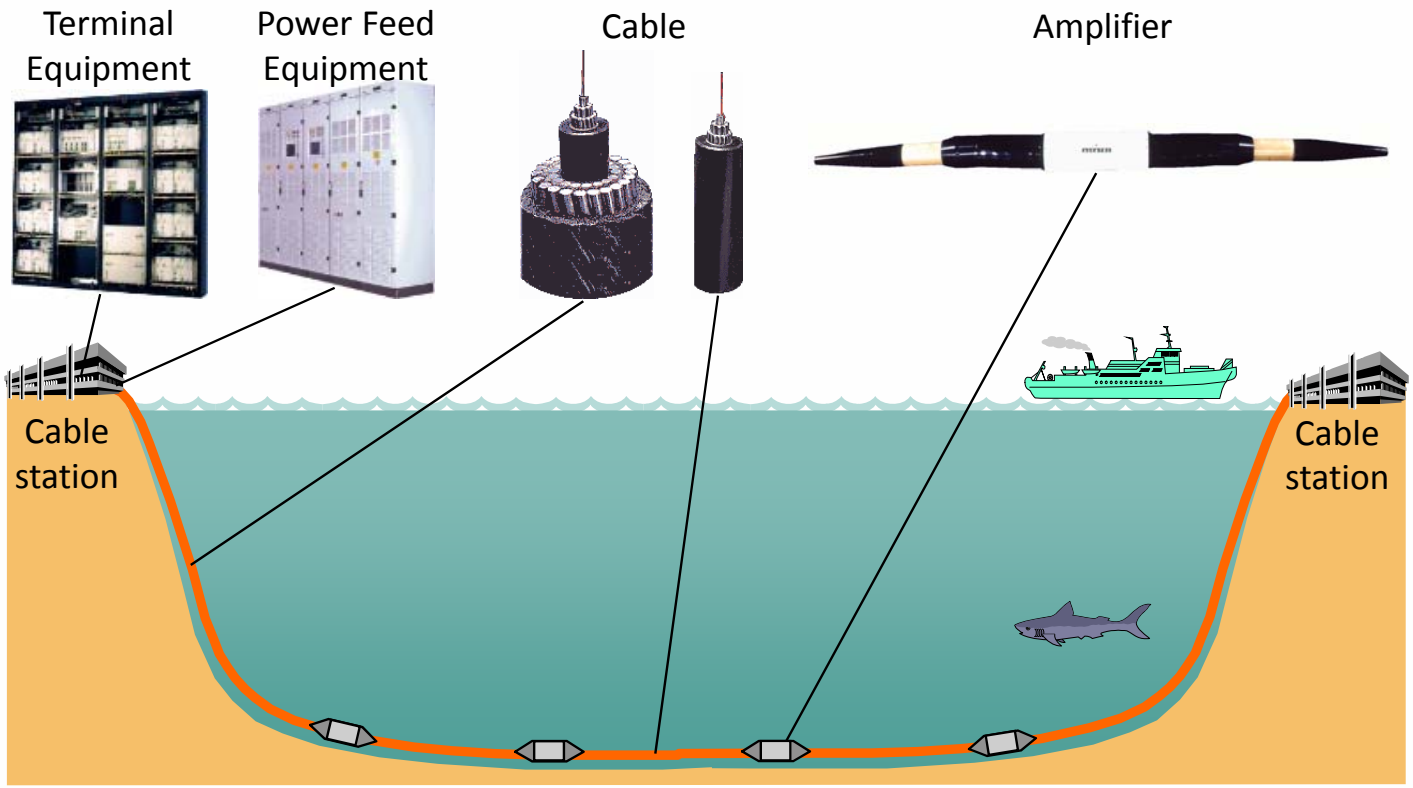


Cable & Amplifiers

- Telecoms
  - Basic cable structure lightweight cable
  - Double armoured cable structure
  - Range of cables normally used in telecoms system
  - Un-repeatered cable
  - Amplifiers
  - Branching Unit
- Power Cables
  - AC
  - DC

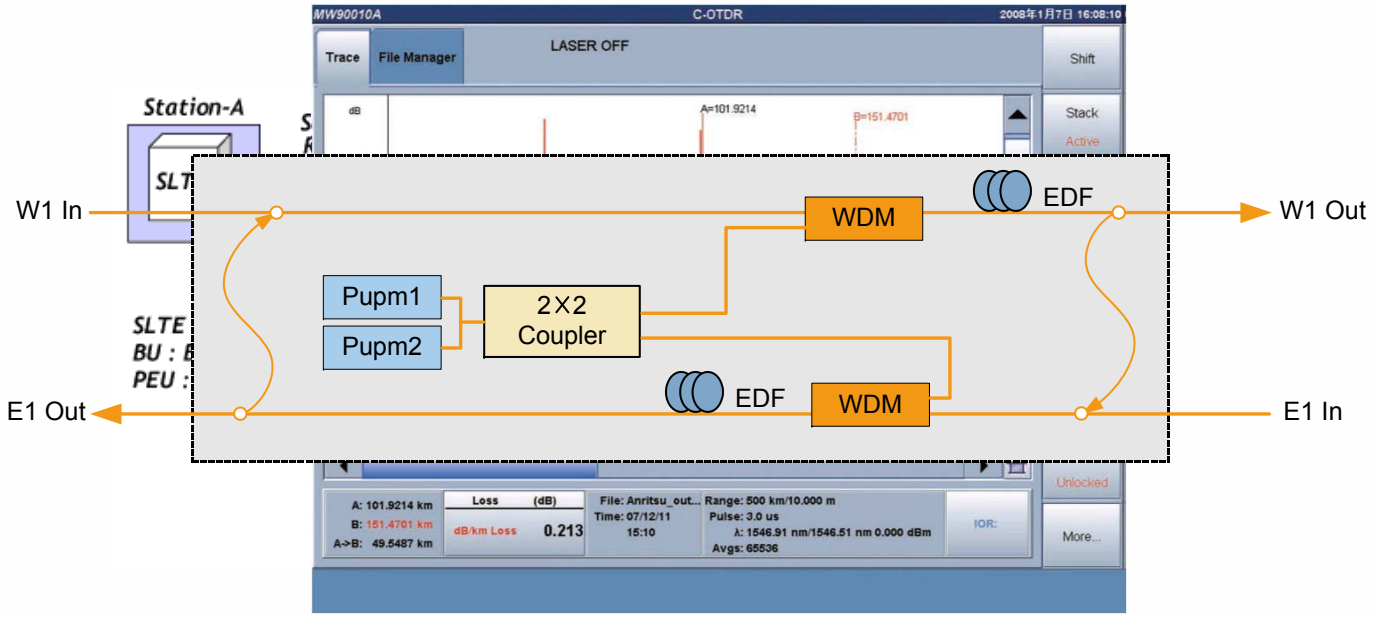


System Design (1)



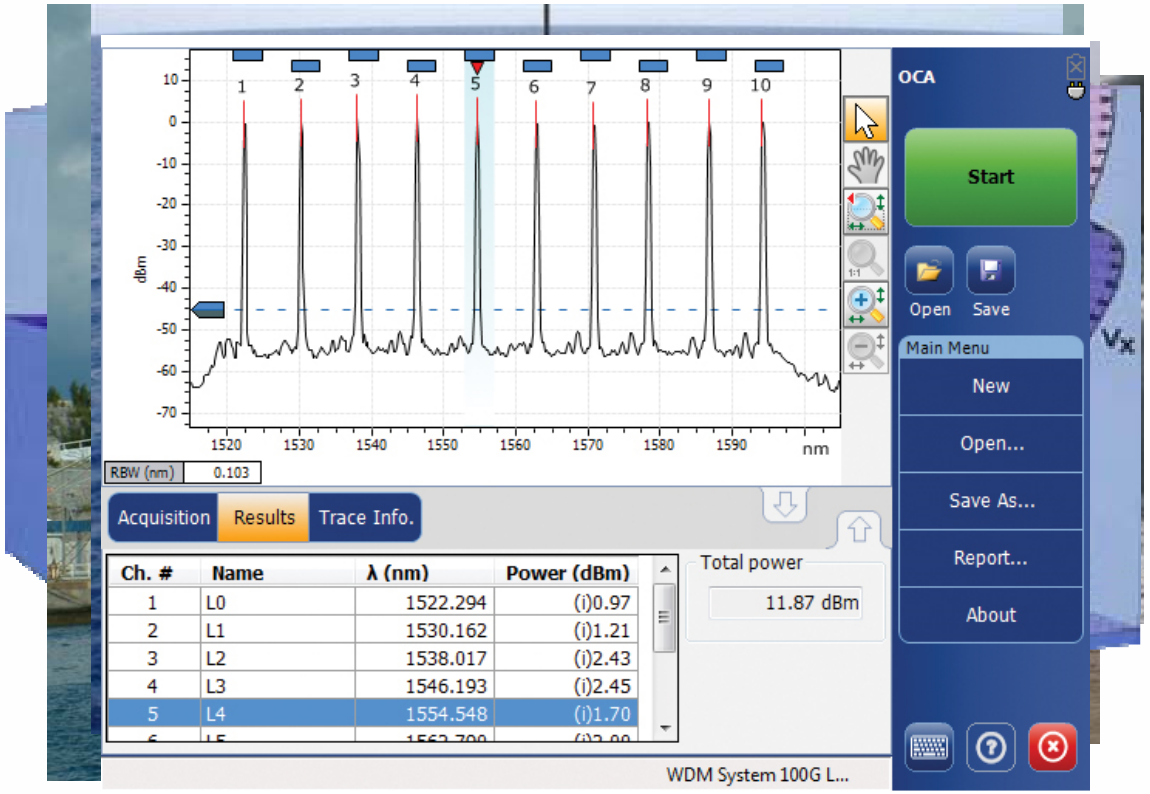
System Design (2)

- Amplified System
  - Amplifier internals
  - C-OTDR
- SLTE
  - WDM Multiplexer & Demultiplexer
  - Transponders
  - Network Management System

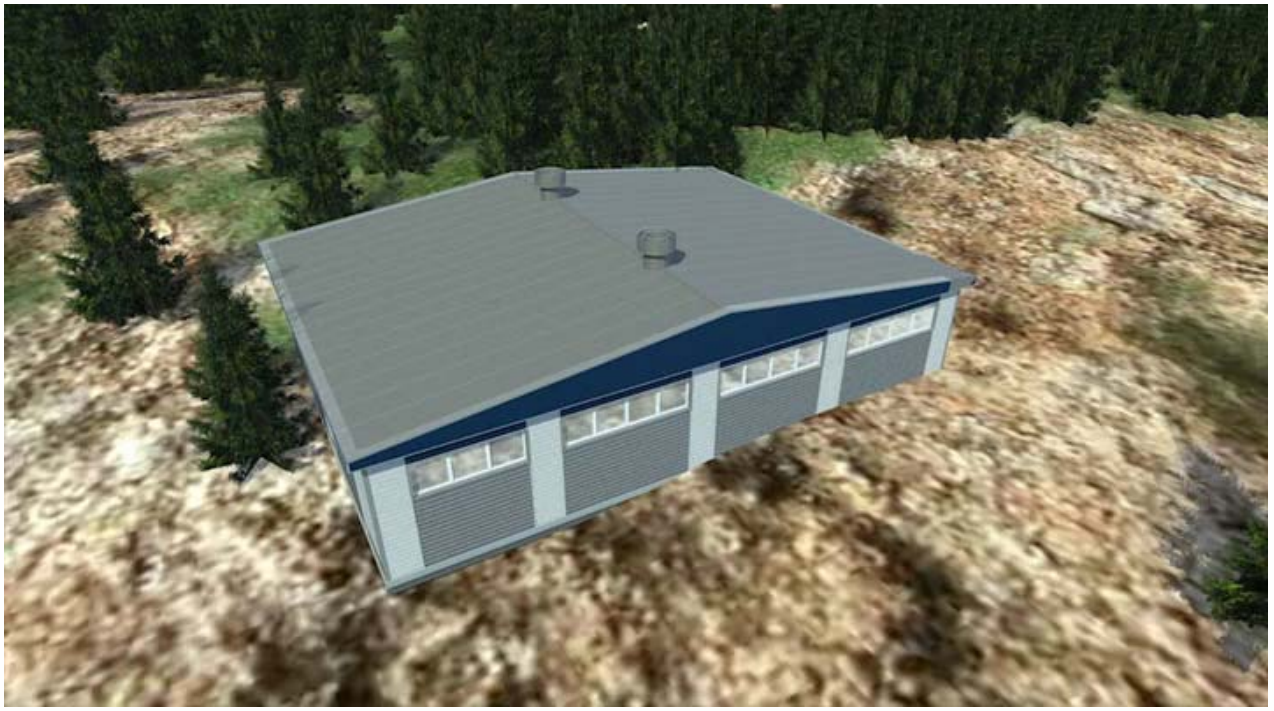


System Processes

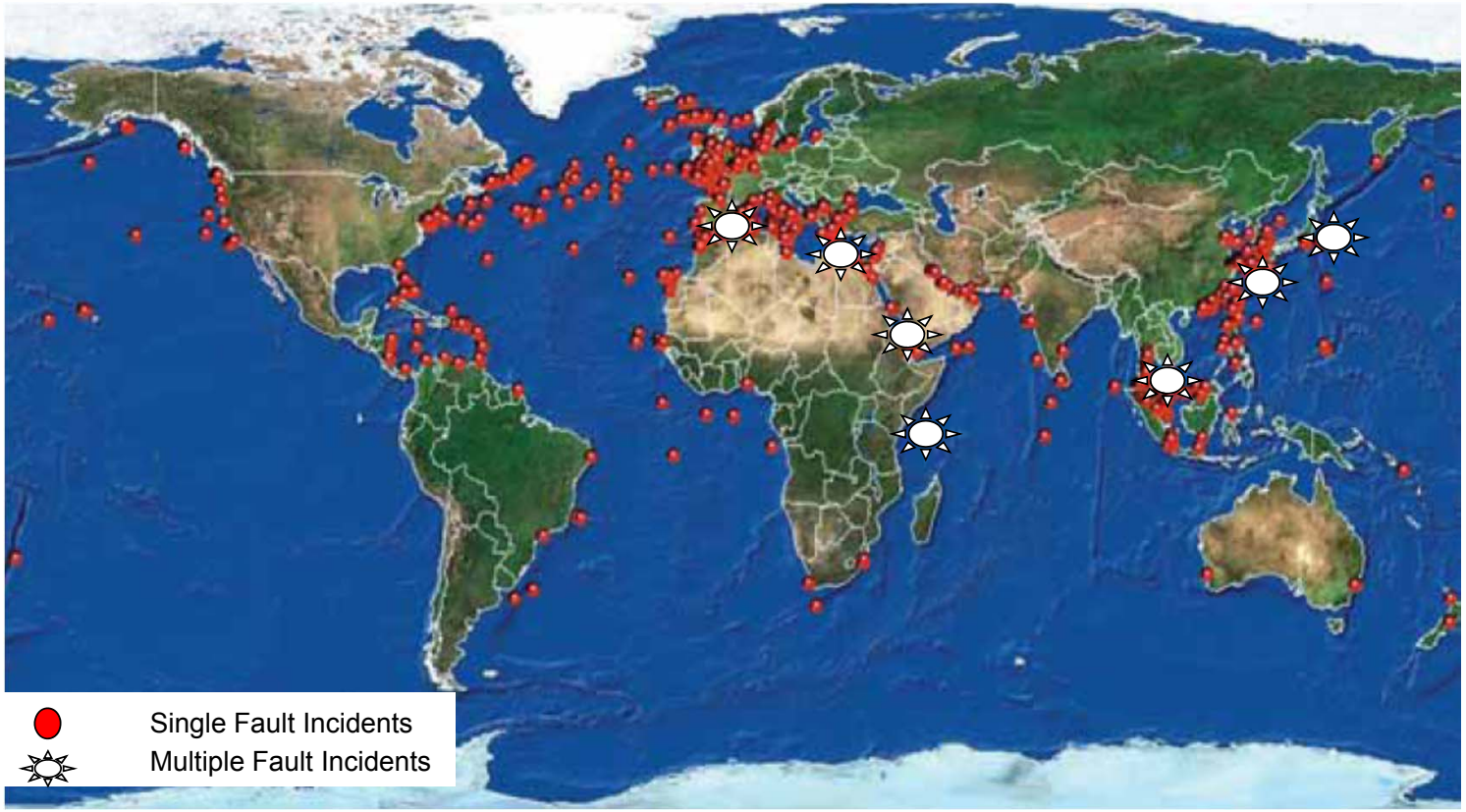
- Desk Top Study
- Survey
- Manufacture
- Installation
  - Shore End
  - Shallow Water
  - Deep Water
  - Post Lay Burial & Inspection
- Commissioning



System Installation

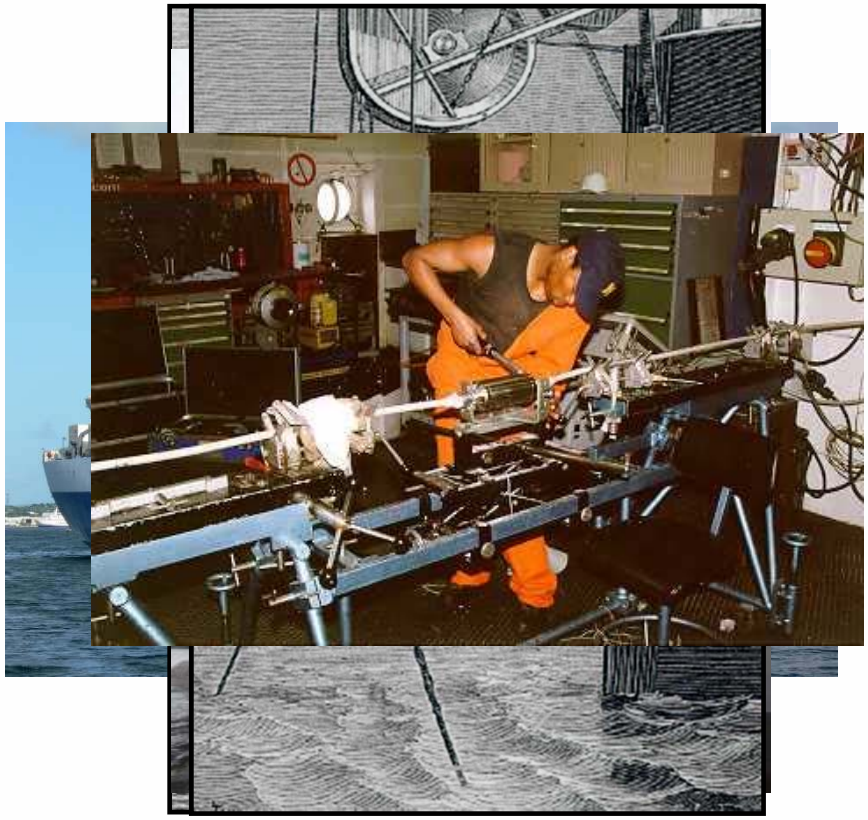


Marine Repairs (1)



Marine Repairs (2)

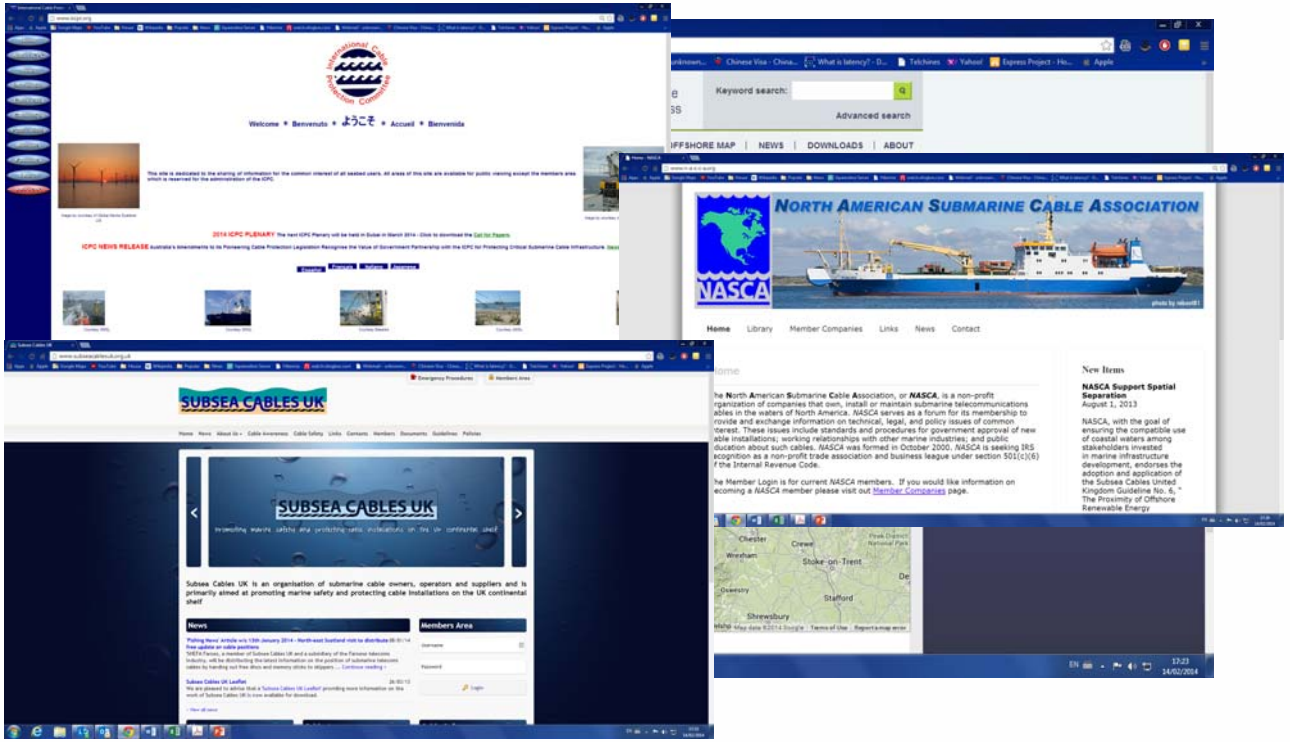
- Repair
  - Transit to cable grounds
  - Find Fault
  - Grapple for cable or use ROV
  - Pick up
  - Joint
  - Put Back



Marine Repairs (3)

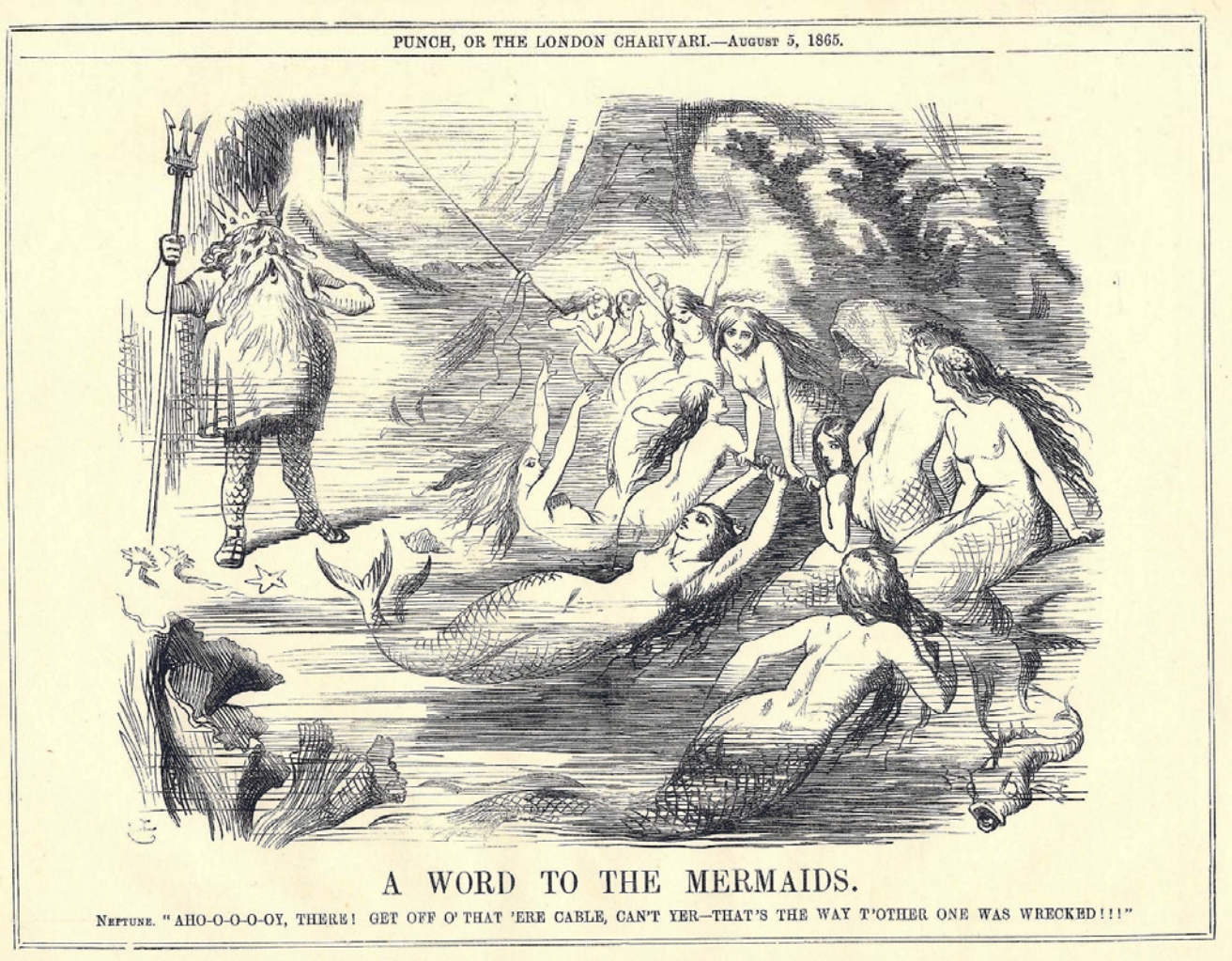
Ongoing Preventative Maintenance

- Cable monitoring using AIS
  - www.marinetraffic.com
- Cable Awareness Programs
  - www.kisorca.eu
- Cable Protection Associations
  - Raise awareness with Governments, NGOs, and other industries
  - Provide a repository for information
  - Provide Guidelines or Recommendations for best practice in the industry
- Fisheries Liaison



With thanks to

- Global Marine Systems
- TeSubcom
- Alcatel Lucent Submarine Networks
- Nexans
- Norddeutsche Seekabelwerke
- Ericsson
- Kokusai Cable Ship Company
- Huawei Marine Networks
- International Cable Protection Committee
- SubseaCables UK
- Seafish
- NEC Corporation
- Makai Ocean Engineering
- Mitsubishi Engineering
- Soil Machine Dynamics
- Orange Marine
- Anritsu Corporation
- EXFO
- And many others……


PUNCH, OR THE LONDON CHARIVARI.—August 5, 1865.
A WORD TO THE MERMAIDS.
Neptune. "AHO-O-O-O-OY, THERE! GET OFF O' THAT 'ERE CABLE, CAN'T YER—THAT'S THE WAY T'OTHER ONE WAS WRECKED!!!"

For further information please contact

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