Problems faced by Industry in the repair of damaged submarine telecommunications cables inside maritime jurisdictional claims

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Primary Causes of Cable Faults

Fishing gear types that contacts the sea bed are a primary cause of cable faults

Recent developments in AIS and vessel tracking have shown that ship anchors are a more significant cause of cable faults than previously thought

Dredging operations; seismic activity; catastrophic weather; theft; abrasion from cable movement due to hard sea bed and strong undersea currents

source: NASA

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Consequences of Cable Faults

Cable faults disrupt communications including data, voice, fax and internet as well as financial transfers, and have costly commercial consequences

In some cases, communications can be restored immediately but sometimes there are insufficient alternate transmission pathways to absorb the added traffic

Faults are very expensive to repair

Time is critical to restoring communications and reducing risk of multiple disruptions

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Cable Fault Event

About 100 faults per year occur globally, with about half of these occurring in the Asia-Pacific region

When a fault occurs, alarms on shore notify cable station technicians immediately. Instruments on shore are used to determine the *estimated* fault location

Proximity of repair ship to fault location is critical to repair time

Maintenance agreements and ship teaming agreements help distribute and coordinate assets in the most efficient regional arrays

If Permits are required, they are obtained before the ship leaves port to minimize the risk and high cost of vessel standby

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The Type of Damage Affects Fault Localization

A shunt (electrical) fault involves damaged insulation so that the electrical current for repeaters shunts to the sea water. Optical fibres may remain intact.

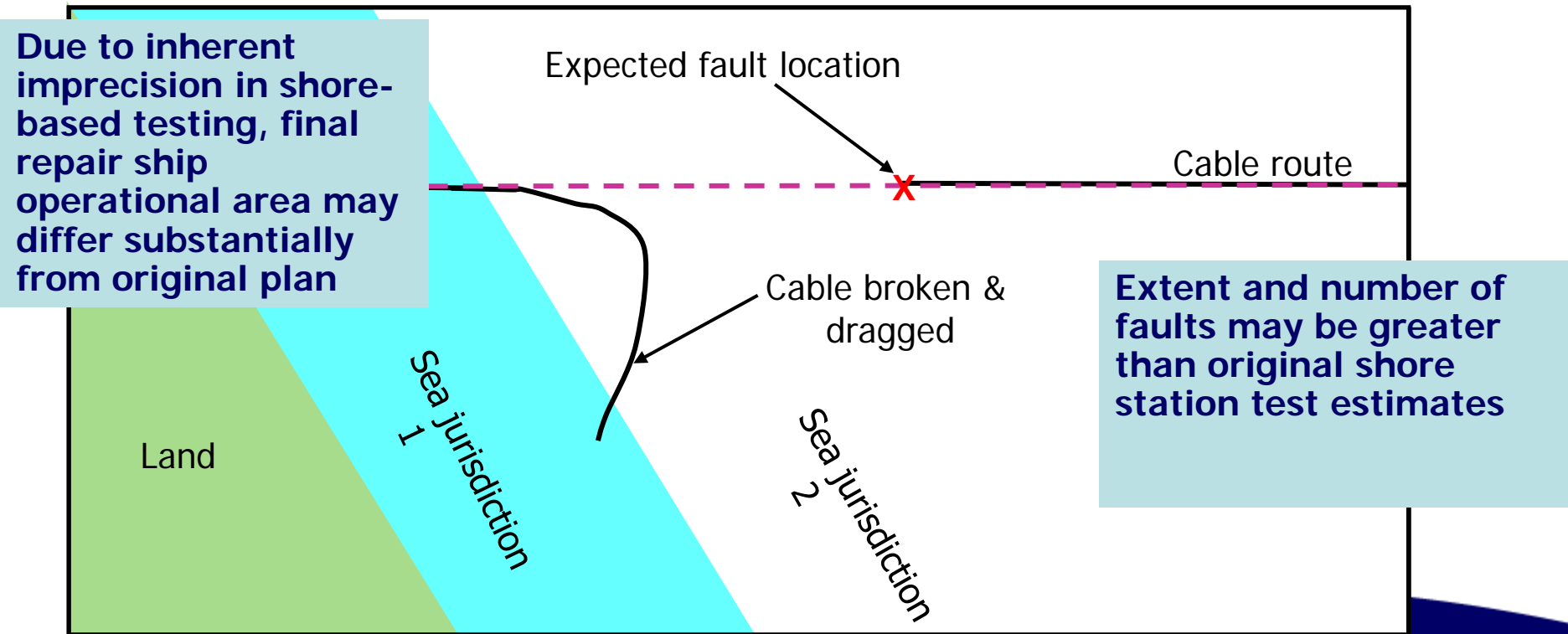Shunt faults are more challenging to locate than optical faults or full breaks

Shunt fault before & after armour removal

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Challenges and Uncertainties in Fault Localization

Actual fault position may be in different jurisdictional area

Cable Ships carry instruments to refine fault positions estimated from shore

Due to inherent imprecision in shore-based testing, final repair ship operational area may differ substantially from original plan

Expected fault location

Cable route

Cable broken & dragged

Extent and number of faults may be greater than original shore station test estimates

Land

Sea jurisdiction 1

Sea jurisdiction 2

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Cable Operations Involve Restricted Mobility

A typical repair may take 3-5 days with ship on site, possibly much longer for bad weather or other factors

During cable operations a ship has limited ability to maneuver, with cables or ROV umbilical in the water

During operations the ships, cables and equipment are vulnerable to damage by other vessels and fishing gear

Deck operations

ROV burial

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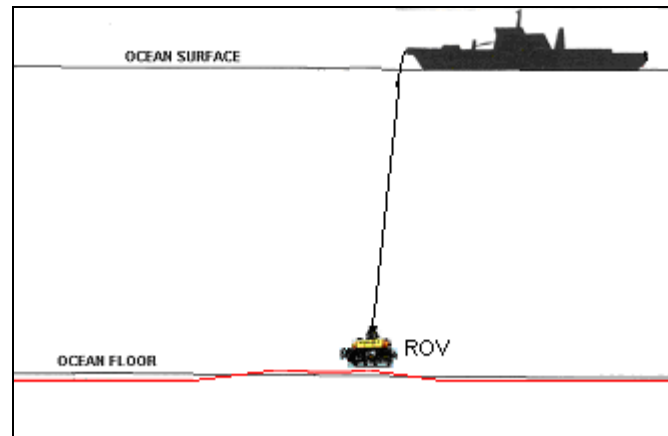
Permitting Delays

Repairs are not always addressed in original installation Permits

Requirement to obtain Permits for cable repairs may not be clear

When required before repair operations are allowed to start, Permit procedures often pose significant delays

Delay increases risk of multiple cable failure

Multiple cable failure can cause major disruption to the telecommunications services in the region

We seek a way to streamline and unify the Permit process, perhaps through prequalification linked to the original installation permits

Having a unified international process can help when maritime jurisdiction is uncertain or in dispute

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Cable Repairs: *Governments Can Help!*

Eliminate Permit requirements for repairs to international cables beyond territorial seas jurisdictional claims

Expedite the permitting process inside territorial seas to an agreed-upon regional or international protocol

Accord cable repair ships innocent passage status for the purpose of undertaking repairs in territorial seas & flexibility in operational area after repair has begun

Educate fishermen and mariners to avoid interference during cable operations and to comply with international law requiring 1-mile clearance from working cable ships

Ensure that laws and regulations protecting cable security are enforced

Facilitate repair of international cables in a spirit of cooperation for the mutual benefit of all nations and users of communication infrastructure

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We Thank You

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