

**DAMAGE TO
SUBMARINE CABLES
FROM
INDISCRIMINATE ANCHORING
IN SOUTHEAST ASIA**

15 December 2009

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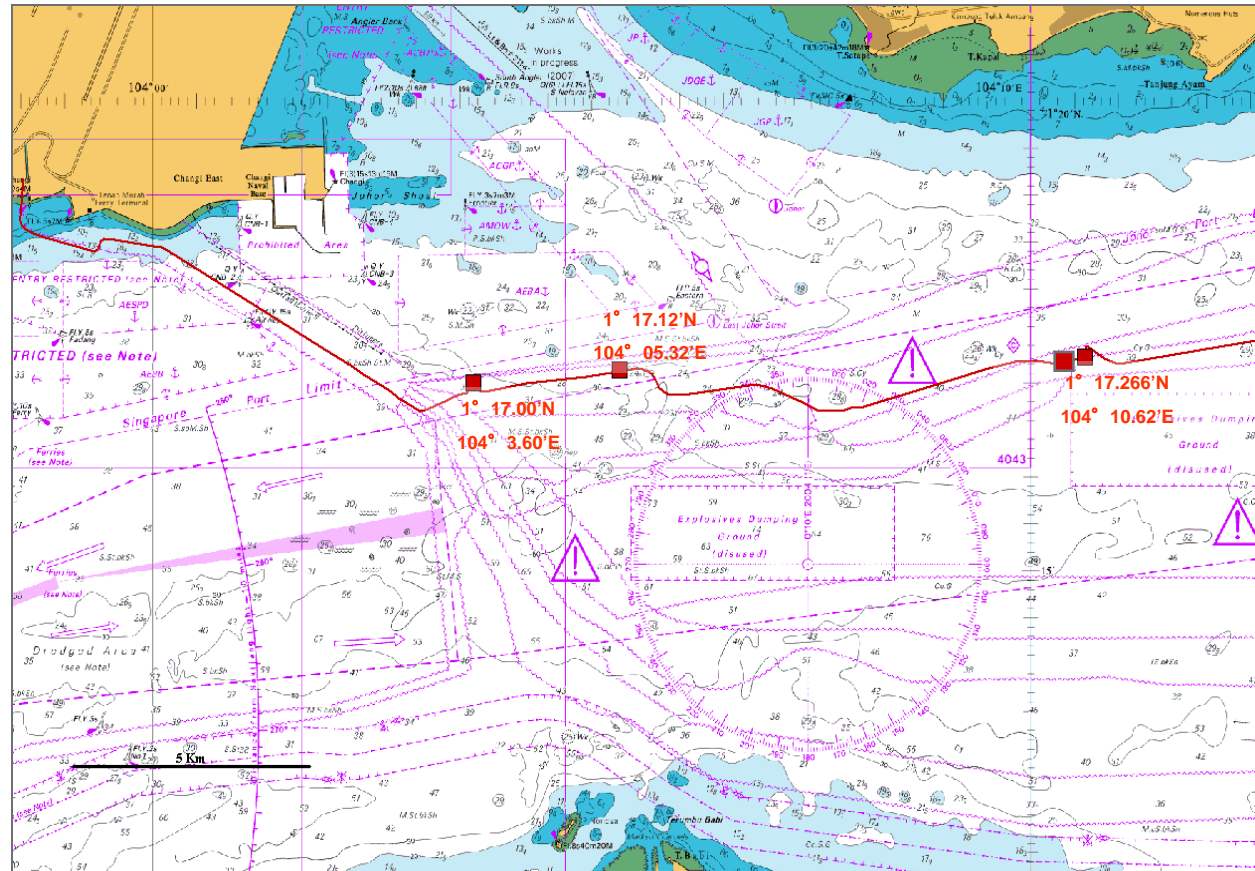
Issues faced by the Submarine cable industry due to illegal anchoring

- Frequent cable shunt faults and fiber cuts
- Huge repair charges which increases the annual O&M expenditures by cables owners
- Required increases to the base cost of services and products to customers
- Significant interruption of international connectivity affecting Global Commerce
- Traffic loss and impact on Enterprise Business.
- Revenue Loss to cable owners
- Customer dissatisfaction due to frequent interruptions of service



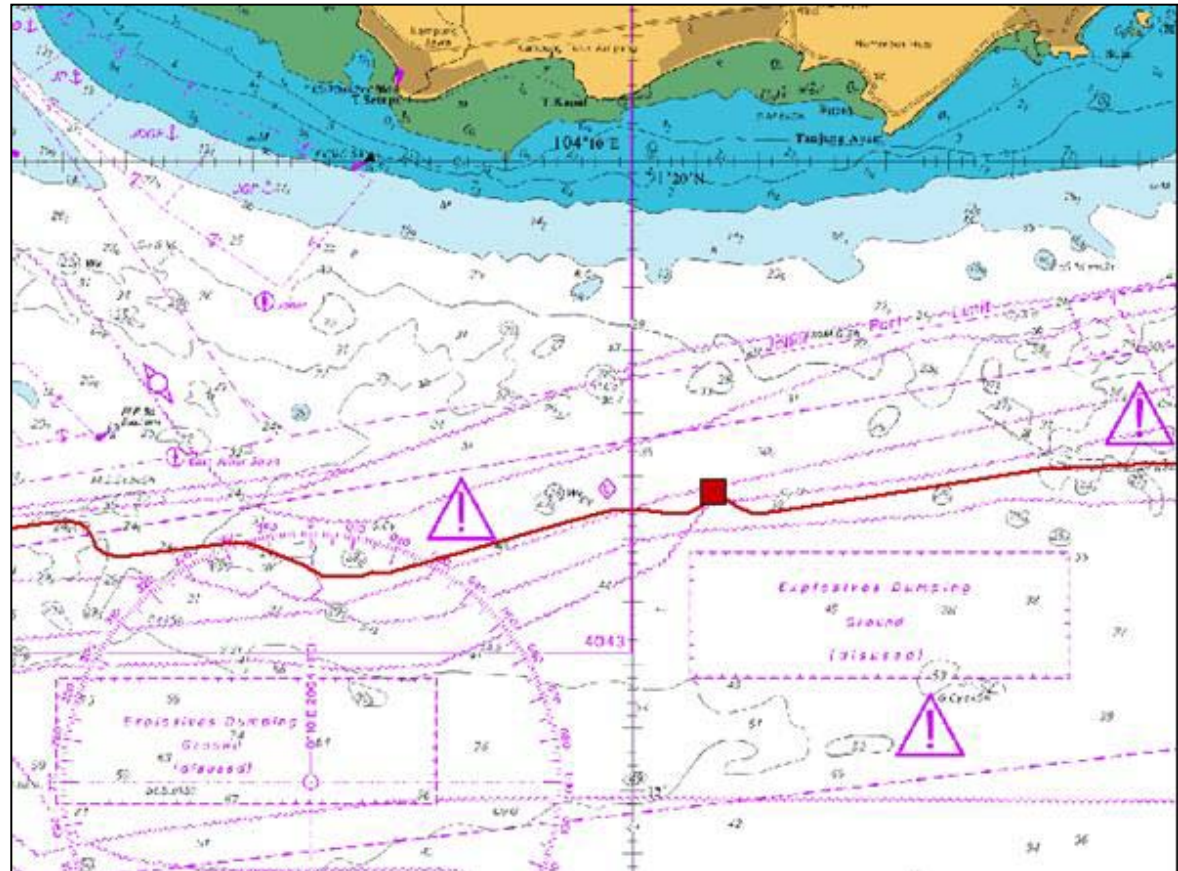
TGN-IA Cable System

- System in service March 2009
- Initial Capacity of 650Gbps and Design Capacity of 3.84Tbps
- Connecting Singapore to Japan and US
- 4 repairs between Mar and Nov-2009, in Singapore Straits - one before service and three while in service



Fault during June-2009

- Fault location, $1^{\circ} 17.27'N$ and $104^{\circ} 10.62'E$, close to prior to service fault
- Within Westbound Lane Of TSS
- Ship departs for Repair Grounds, June 15th, 13:17
- Time to get to Repair Ground, 7 days. Total Time of Repair 6 days & 10 hours
- Approximately US\$500k to repair



Fault during June-2009



Large Anchor (1.6 Tons) hooked the cable and dragged cable until mooring line of anchor parted or was cut. The Anchor and cable came up to the Aft Deck of the repair ship with submarine cable entangled.



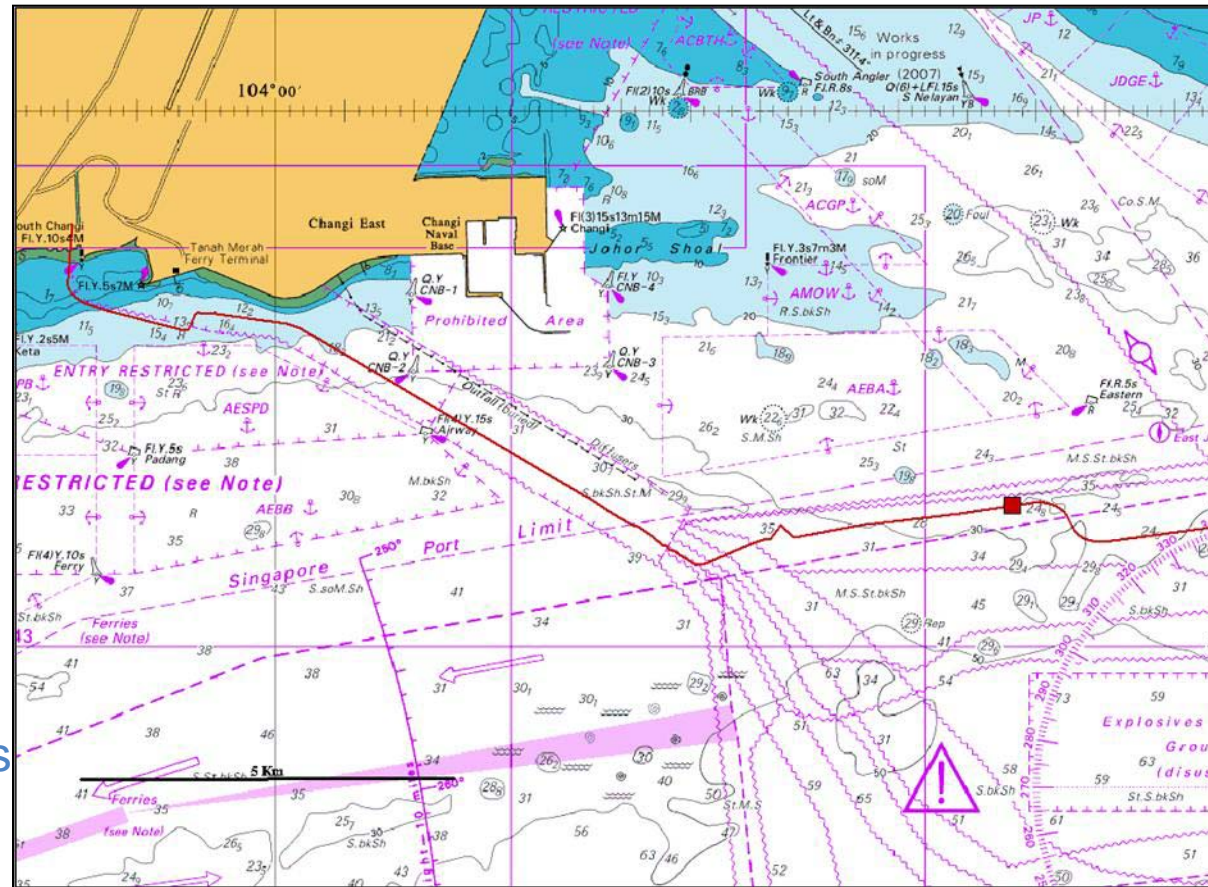
Large Anchor with cable wrapped around

Submarine Cable entangled with Anchor



Fault during September-2009

- Shunt Fault
- Fault location, $1^{\circ} 17.12N$ and $104^{\circ} 05.32E$
- Within Westbound Lane Of TSS
- Ship departs for Repair Grounds, October 15th, 22:30
- Time to get to Repair Ground, 2 hours. Total Time of Repair 15 days & 11 hours
- Approximately US\$ 1M to repair, with Reroute



Fault during September-2009



Cable was out of position by approximately 400 meter to the North of the as-laid route. The cable showed signs of external aggression and appeared that the armor wire was embedded into the polyethylene jacket causing the shunt fault.

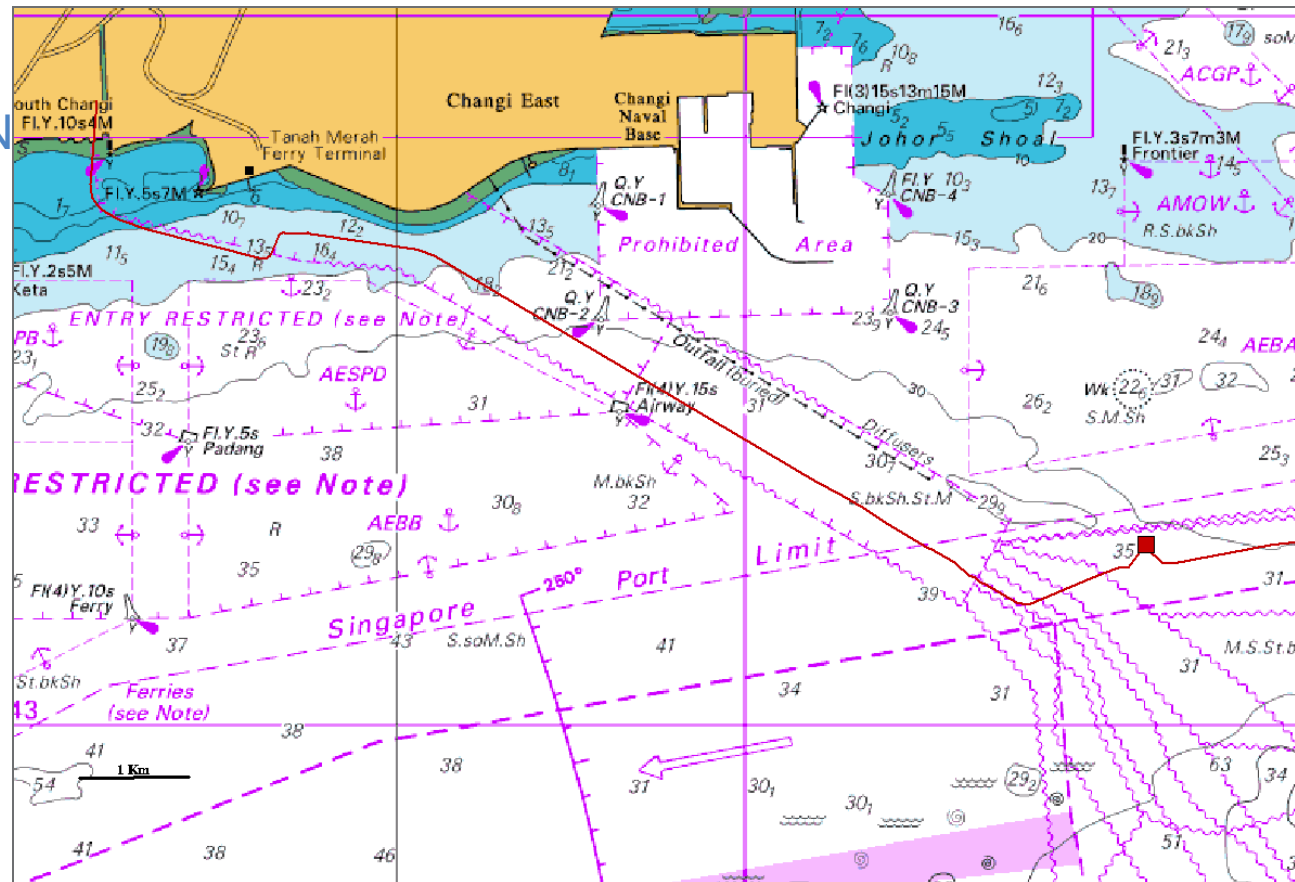


Exposed armor wire and stress,
possible fault location



Fault during October 2009

- Shunt Fault
- Fault location, $1^{\circ} 17.0'N$ and $104^{\circ} 3.60'E$
- Within Westbound Lane Of TSS
- Ship departs for Repair Grounds, November 11th, 21:54
- Time to get to Repair Ground, 2 hours 48 min. Total Time of Repair 7 days & 14 hours
- Approximately US\$300k to repair





Using ROV the cable was found to be pulled north of it's original as-laid position. Severe severing damage was found as the ROV approached the break. There were large quantities of debris nearby and over the cable including an anchor.

Clean cut of armored cable



Greatest Threat to Submarine Cables in the Singapore Straits



Vessel illegally anchoring near fault location of June repair

Anchor recovered during June fault with cable wrapped around



What Can be Done ?

1. Stricter Enforcement of rules within designated waterways
2. Enhanced Charting and education on the consequences of illegal anchoring
3. Better Cable Awareness within the Global Commercial Fleets
4. Move Anchorage Zone Further from Cable Areas
5. Proactive prevention of illegal anchoring by regional governments



Thank you

CORPORATE