

Undersea Cables in the East China Sea

A presentation to CIMA and COLP by the
International Cable Protection Committee

Robert Wargo - AT&T
ICPC Vice Chairman

Contents

- Introduction to the ICPC
- Brief History of Submarine Cables
- Cables in the China Sea
- Cable Protection
- Recent events, 2005-2009
- Permitting

International Cable Protection Committee (ICPC)

- Formed in 1958 with 8 members as the Cable Damage Committee
- The ICPC's 92 members include all major communications and cable companies from 47 countries
- Non – profit corporation registered in the UK.
- Representatives from submarine telecommunications and power cable owners and maintenance authorities.

International Cable Protection Committee (ICPC)

- The ICPC has a mandate to provide leadership and guidance on issues related to submarine cable planning, installation, operation, maintenance, protection and retirement
 - We monitor the evolution of international treaties and national legislation and help to ensure that submarine cables are fully protected
 - We promote awareness of how a large proportion of the global economy is now totally dependent upon the security of the submarine cable network

Typical Submarine Cable System

Network Management System



Terminal Equipment



Cable Station



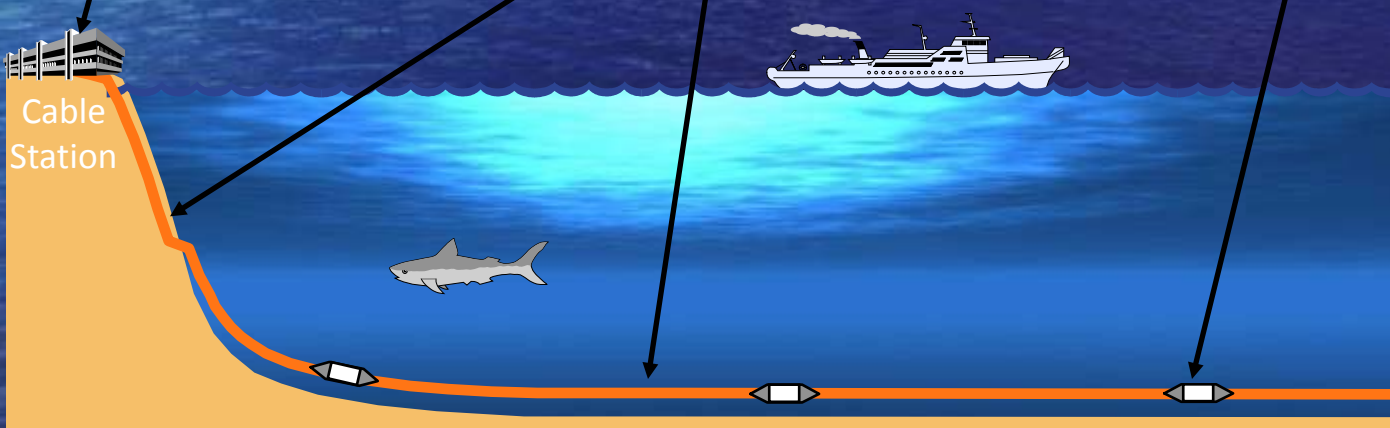
Armoured Cable



Lightweight Cable



Amplifier

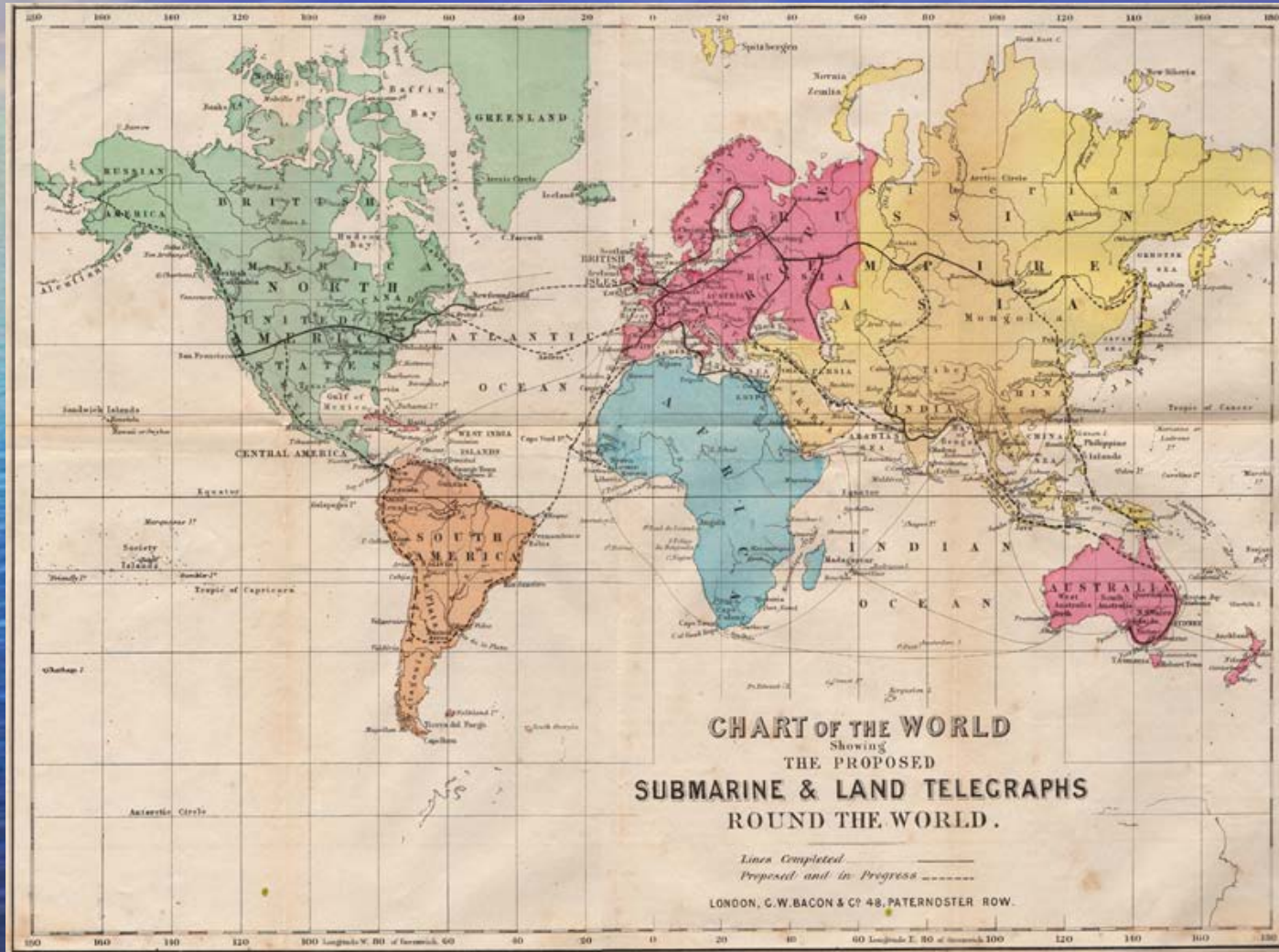


Source: U.K. Cable Protection Committee & Alcatel-Lucent Submarine Networks

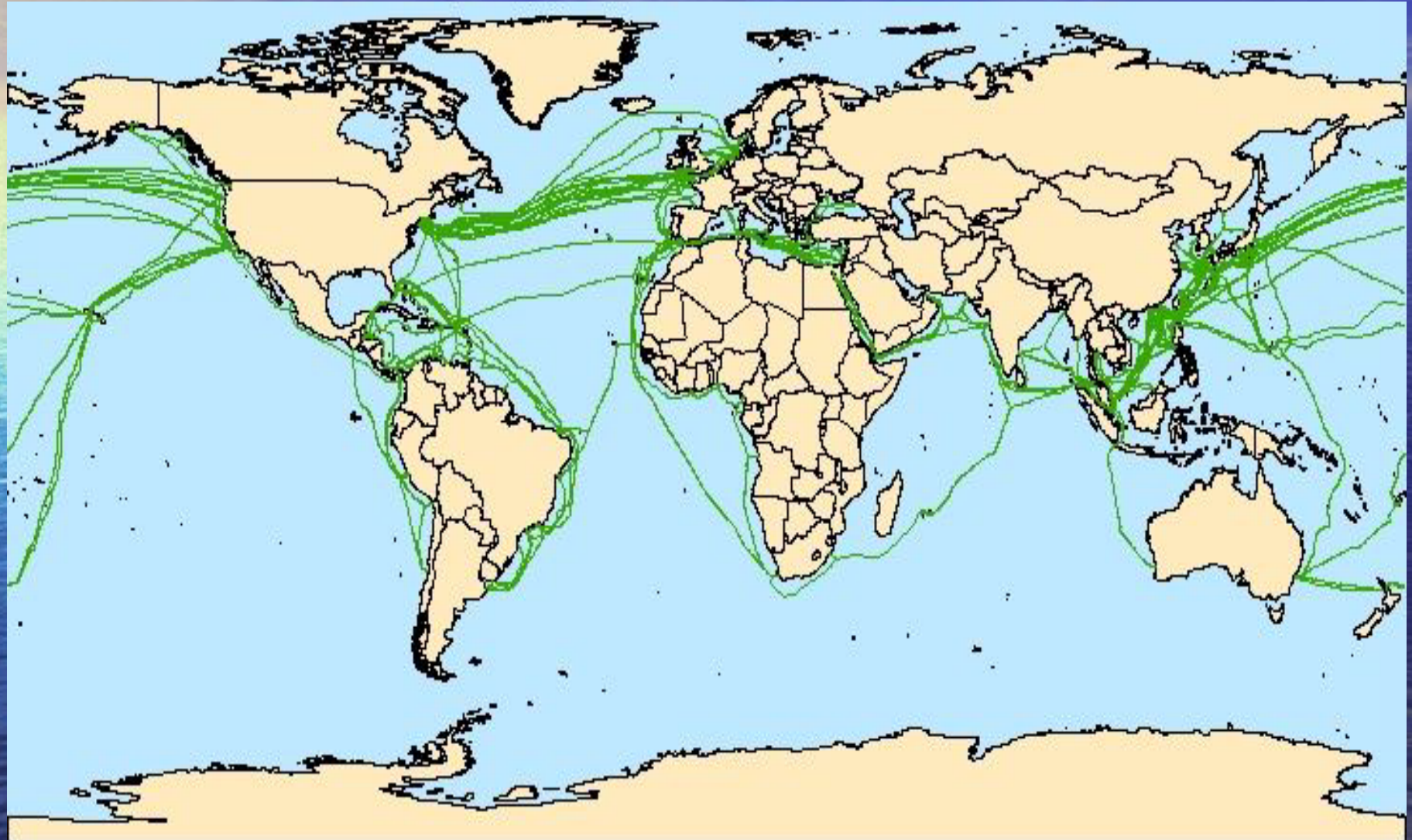
Shanghai to Hong Kong - 1870



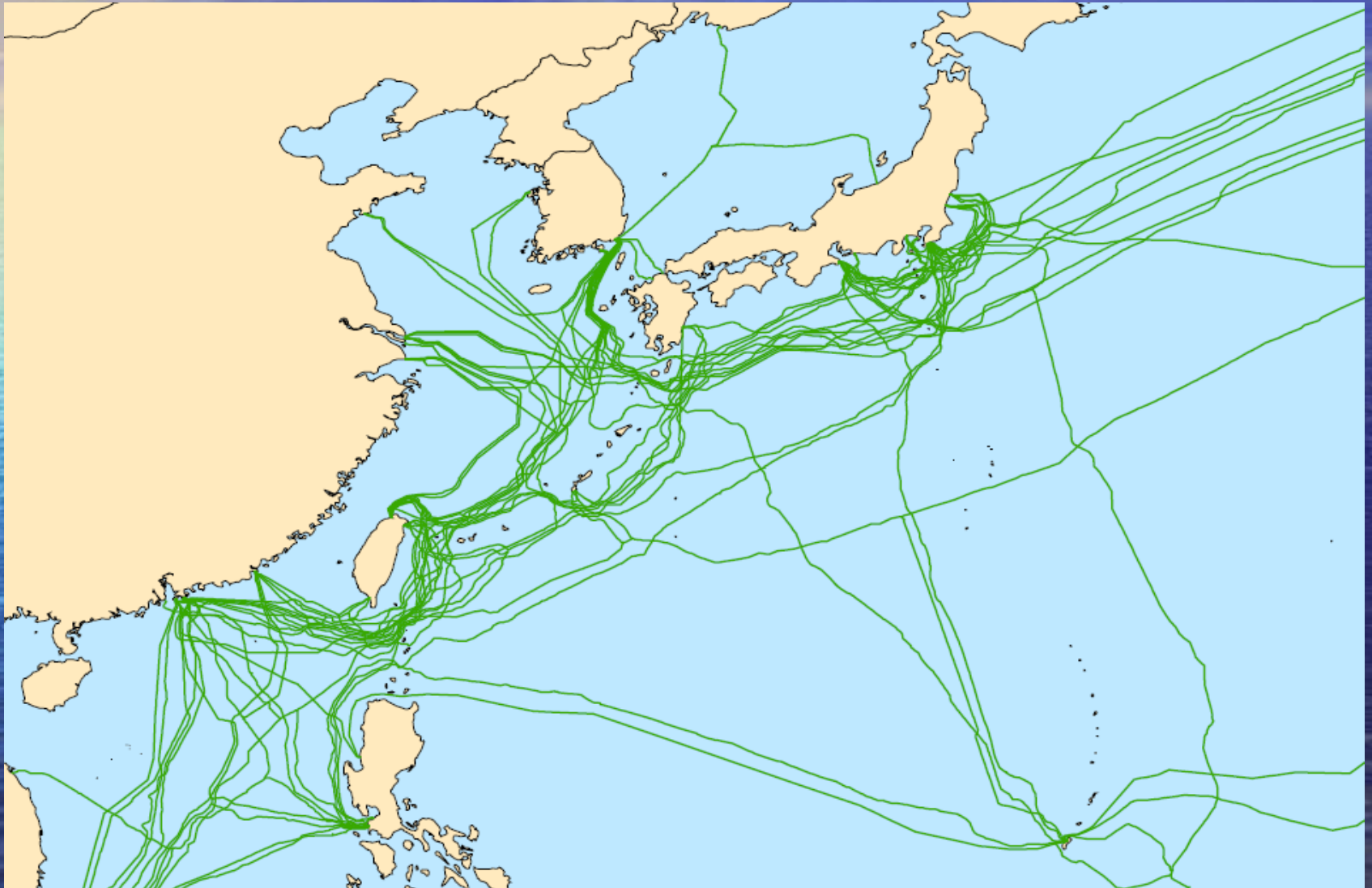
International Submarine Cable Network - 1865



International Submarine Cable Network



Cables in the China Sea region



Cable Protection

- The cable is protected by various means
 - Prior to installation a detailed route survey is done to find the safest route
 - During installation via plow and Remotely Operated Vehicle burial
 - Once installed through liaison with other marine industries to inform them of the location of the cable and penalties if they are caught breaking them.
 - Cable owners often recover the cost of the cable repairs when the cable breaker is caught.

Facilities Protection

- Carriers protect their traffic by using
 - Separate cables to carry traffic
 - Ring networks
 - Restoration paths to protect traffic in the event of a failure
- Provides for the ability to route traffic around cable faults
- Because of the interdependence between all of the cables in the network, when one is damaged the network is compromised and in the event of another failure locations can be isolated.

Cable Breaks

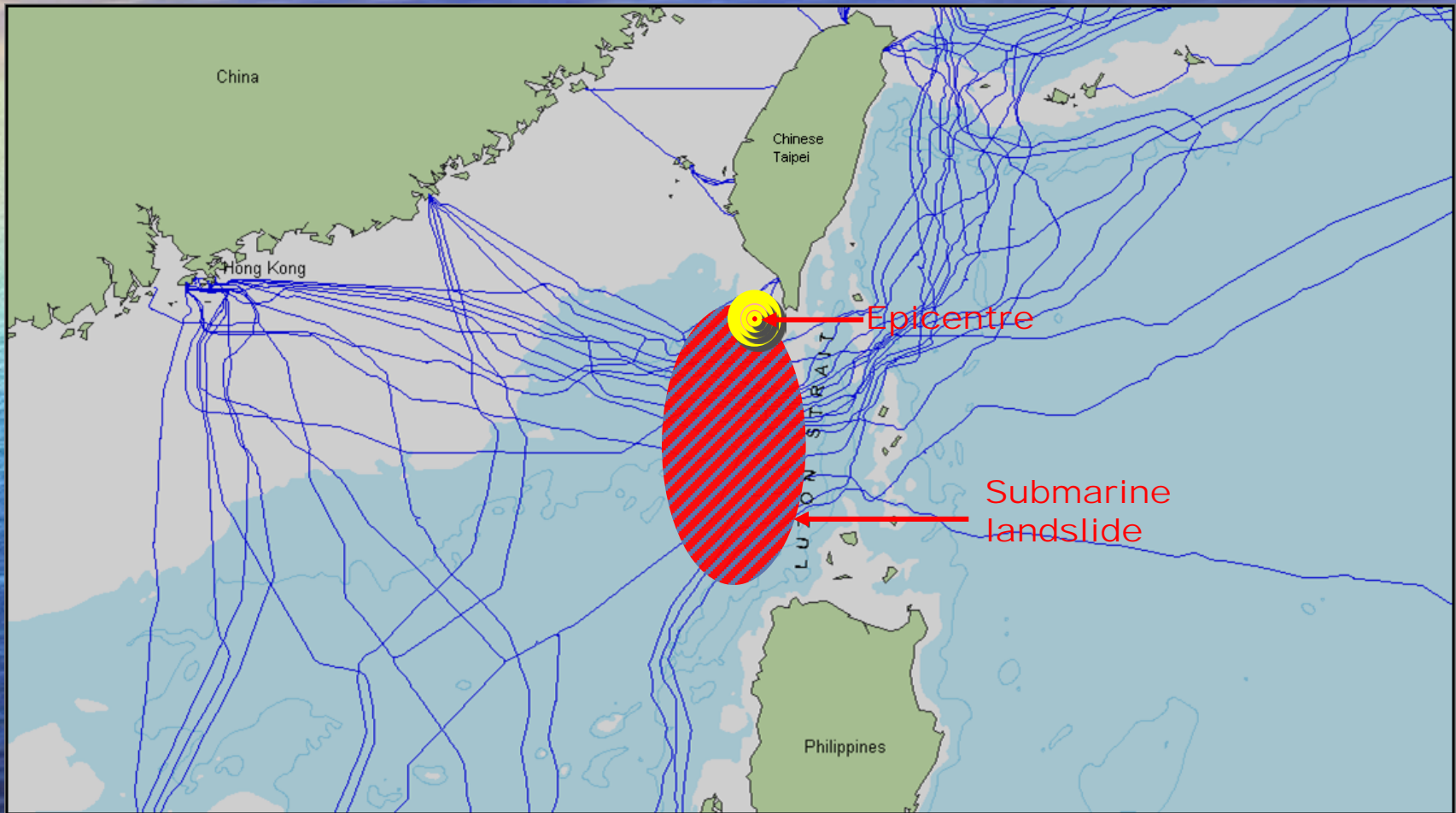
- Despite our best efforts, cables do get broken by various means
 - Fishing
 - Dragging while underway
 - Illegal anchoring
 - Sand dredging
 - Natural means
 - Earthquakes and underwater landslides

Cable Breaks - Theft

- Off Vietnam local fishers recovered not only out-of-service cables but in-service cables as well.



Cable Breaks – Earthquake



Cable Faults 2005 - Present

- Since 2005 there have been 234 faults in cables that service SE Asia (an average of roughly 1 per week)
 - 2005 – 41
 - 2006 – 61
 - 2007 – 58
 - 2008 – 55
 - 2009 – 19

Cable Repairs

- Whenever a cable breaks it is in the owners (and their customers) best interest to have the cable repaired as soon as possible.
- To facilitate this cable owners go through numerous means to ensure a rapid response in the event of a cable break.

Cable Repairs

- Special purpose cable repair vessels are positioned in key areas around the world.
- Cable owners enter into agreements with the cable ship providers that require.
 - Leaving port within 24 hours of being notified
 - Numerous other performance requirements to ensure speed and quality of the repair.
- Any item that slows down the repair process affects all users of the cable.

Cable Repair Delays

- Various items can affect the timely repair of a cable
 - Weather and sea conditions
 - Type and extent of cable damage
 - Crowded sea areas
 - Shipping lanes
 - Fishing areas
 - Permit requirements
 - Port clearances
 - Operational permits

Cable Repair Delays

- Weather, sea conditions or the number of vessels in an area are beyond the control of the maintenance authority or the cable ship operator
- Delays associated with permitting may be beyond the control of the maintenance authority or cable ship operator however they are not beyond the control of the regulatory authority requiring the permit.

Permitting Delays

- In most countries repairs and maintenance in territorial waters are approved with only a notification to the permitting authorities.
- In most countries permits are not required to install or maintain a cable outside the limits of the countries territorial waters (beyond 12 nautical miles).
- In areas claimed by multiple countries the permitting landscape is even more complicated

Repairs in areas claimed by more than one country

- The cable owners understand that multiple countries may have legitimate claims to an ocean area, however....
 - We just want to fix our cable!
 - By fixing the cable we are not taking sides on the issue and supporting one country over another.
 - If the cable lands in the countries that lay claim to the area where the cable needs to be repaired all parties benefit by a timely repair – everyone benefits!

Permitting delays

- China has required permits for repairs outside its territorial waters (beyond 12 nautical miles).
- These permits have required as much as 2 weeks for the ship operator or local maintenance authority to acquire.

Permitting delays, Chinese Waters

System	Failure Date	Permit Required	Days to Obtain
CABLE A Seg. S	4/6/2005	Yes	7 days
CABLE B Seg. P	4/27/2005	Yes	> 7 Days
CABLE C Seg. N	4/30/2005	Yes	12 Days
CABLE C Seg. N	10/22/2005	Yes	7-14 Days
CABLE A Seg. S	1/17/2006	Yes	7-14 Days
CABLE C Seg. W	3/28/2006	Yes	3 Days
CABLE D Seg 1	3/28/2006	Yes	< 7 Days
CABLE B Seg. P	3/29/2006	Yes	7-14 Days
CABLE B Seg. P	8/4/2006	No Mention	No Mention
CABLE C Seg. N	11/23/2006	Yes	3 Days
CABLE C Seg. N	2/1/2007	Yes	5 Days
CABLE D Seg 1	3/20/2007	Yes	5 Days
CABLE C Seg. N	3/4/2008	Yes	2-3 Days
CABLE C Seg. N	3/4/2008	Yes	2-3 Days
CABLE C Seg N	1/12/2009	Yes	5 Days
CABLE C Seg N	1/13/2009	Yes – included with above	5 Days
CABLE C Seg N	1/26/2009	No – continuation of above	
CABLE D Seg 1	2/9/2009	Yes	5-10 Days
CABLE B Seg. P	4/19/2009	Yes	10-14 Days

Submarine Cable Repairs Beyond China's Territorial Sea January 2005 - April 2009

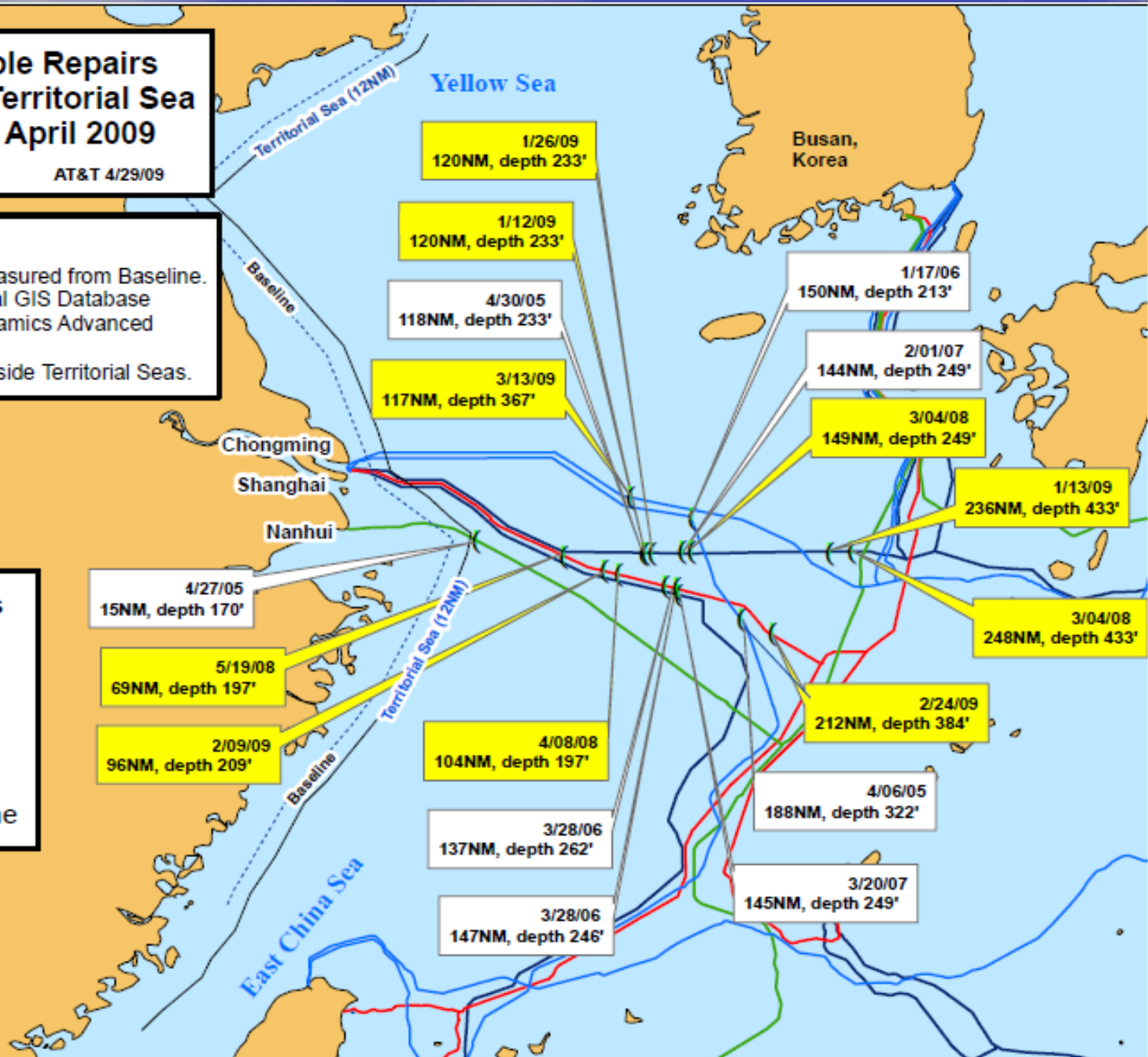
AT&T 4/29/09

Notes:

- 1) Distances shown are measured from Baseline.
- 2) Baseline data from Global GIS Database maintained by General Dynamics Advanced Information Systems.
- 3) All repairs shown are outside Territorial Seas.

Submarine Cables

- Cable A
- Cable B
- Cable C
- Cable D
- china_baseline



Cable Owner's view of Permit Delays

- The cable owner wants the cable repaired as soon as possible.
- Any delay puts the system at risk due to the possibility of other links failing.
- Restoration on other cables is costly.
- Longer restoration routes create greater latency, which our customers do not like.
- Costs of delays are ultimately borne by customers

Cable Owner's view of Permit Delays

- The cable repair process is obvious
 - Small number of vessels capable of repairing cables, they display distinctive day-shapes and lights while working, their general form is unique and their home ports are well known.
 - Governmental notification can be, and often is provided, when a repair is begun and once complete.
 - Can be tracked by Automated Information System (AIS) on the vessels.

A broken cable benefits nobody!

- In the current global economy >90% of the world's commerce and communication takes place over submarine cables. A timely repair benefits....
 - The cable owners
 - The countries in which the cable lands
 - The citizens and businesses in the countries the cable lands
- There should be a way to balance the needs encompassed by the permits and the need to repair the cable quickly!

Possible solutions

- Repair pre-approval when a cable is installed that would provide for
 - Notification prior to repair commencing
 - Reporting after repair is complete
- Working with local telecom operators to inform sea bed users of the importance of cables
- Others??
 - We are open to discuss all options



Sharing the seabed in harmony