ASEAN Submarine Cable International Connectivity (Protection and Risk Mitigation)

DIR. PHILIP A. VARILLA
National ICT Governance Group
DOST-ICTO, Philippines
Outline

• International Connectivity
• Submarine Cable Connectivity Risks and Assessments
• Submarine Cable Protection Regime
  – Regulations
  – Best Practices
  – Capacity Building
ASEAN International Connectivity

In 2012, ASEAN is served by 24 key submarine cable systems with a Total Lit Capacity of 4.08 Tbps and Potential Capacity of 41.24 Tbps.
AP SUBMARINE CABLE SYSTEMS

• APCN2 (Cable length – 19,000km)
• APG (Cable length – 10,400km)
• AAG (Cable length – 20,000km)
• ASE (Cable length – 7,500km)
• FEA (Cable length – 28,000km)
• SEAJC (Cable length – 8,300km)
• SEAMEWE3 (Cable length – 39,000km)
• SEAMEWE4 (Cable length – 20,000km)
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
New Resilience

STRATEGIC, MULTI-LEVER, ADAPTIVE APPROACH

- Preventive - concentrate on what causes the majority of problems
- Regulatory approach
- Generate awareness or problems
- Resilient networks (system view & response)
- Collaborative industry & Govt and university
- Strategic maintenance approach
Risk Assessment Factor

**Capacity Risk**
Bandwidth capacity is not sufficient to meet the bandwidth demand by the country.

**Concentration Risk**
Overreliance on a set of submarine cable amongst all the available submarine cable system.

**Route Risk**
No diversity route to address its bandwidth demand in the event of disaster and disruption.

**Architecture Risk**
Vulnerable when there is no adequate built-in redundancy given the inherent physical network design of a submarine cable system.
Substantial efforts should be made to reduce the risk. Risk reduction measures should be implemented urgently within a define time period.

Consideration should be as to whether the risks can be lowered to a tolerable level and preferably to an acceptable level but the costs of additional risk reduction measures should be taken into account.

No additional controls are required. Actions for further reduce these risks are assigned very low.
## Risk Assessment Summary

<table>
<thead>
<tr>
<th>YEAR</th>
<th>CAPACITY RISK</th>
<th>ROUTE RISK</th>
<th>CONCENTRATION RISK</th>
<th>ARCHITECTURE RISK</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>Low</td>
<td>Low</td>
<td>Moderate</td>
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<tr>
<td>2009</td>
<td>Low</td>
<td>Low</td>
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<td>Moderate</td>
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<tr>
<td>2010</td>
<td>Low</td>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
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<tr>
<td>2011</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
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<tr>
<td>2012</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
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<tr>
<td>2013 and beyond</td>
<td>Moderate</td>
<td>Low</td>
<td>Low</td>
<td>Moderate</td>
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Risk Reduction Framework

- Planning and survey tools
- Burial depth based on soil conditions
- Deep water data

- Preventive inspections/warnings
- Permits during installation and repair
- Customizes maintenance based on local environment

- Information to fishing industry/mariners
- Cable route published charts, maps on board
- Exact cable positions, or areas where fishing/anchoring is restricted
- Information campaign

- International cable laws
- Cable protection corridors, forbidden zones
- Civil recovery of damages under general maritime law
- Special permits
• Identifying seismically active areas of the Pacific plate and historical analysis
Risk Mitigation Method

Risk Impact/Probability Chart
Government/Regulators - 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.
Correct information about cable route (cable record) must be collected and stored by the cable operator.

Information about all submarine power cables must be given to the institute (or similar) responsible for updating charts.

Updated charts must be present on vessels.

Marine officers and pilots must be familiar with local conditions and know who to contact in emergency situations.

Fishermen must have updated charts on board their vessels and know the location of submarine cables.

Fishermen must know if it is forbidden to use bottom trawl in a zone.

Fishermen must act correctly when it comes to forbidden zones.

Fishermen must know who to contact if they hit a submarine cable.

The cable operator must know how to act when a submarine cable has been hit by an anchor or fishing gear.
Due to “Ring of Fire” zones and patterns, submarine cables of Asia Pacific regions is at risk of large scale cable faults

Up to 10 international submarine cables could be affected:
- Traffic
- Revenue Loss
- Outage duration

• Resilient Network
• Immediate restoration

• Prepare early warning mechanism
• Information and education
Cable awareness education for maritime communities is imperative, our "catch fish not cables" phrase is central to this campaign.
Best Practices (Denmark)

Government Participate in Regular Meetings
MAS provide 24/7 Surveillance of the Area
Engage Proactively in Cable Protection Measures

The Executive Order on Cables (No 939 of 27th November 1992): Act No 54, 15th February 1895, last revised 1972 Protection Zone 200 Metres either side of Submarine Cable
Entitlement to Compensation for Loss of Sacrificed Gear Violations shall be Fined

No Permit Required for Repair Operations
Convention on the International Regulation for Preventing Collisions at Sea, 1972 apply to all Vessels

Jurisdiction of the Danish Maritime Authority (Søfartsstyrelsen) Requirement for Re-burial of Repairs since 1991

Requirement to Remove Out-of-Service Cables within 12 Miles
Best Practices (Australia)

LEGISLATIVE SOLUTION

• Implement national legislation to protect subsea cables
• Creation of protection zones or corridors around cables
• Restrict and prohibit activities in the zones
• Introduce significant criminal penalties in accordance with UNCLOS
• Educate seabed users
## Capacity Building for ASEAN

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<th>AIM 2015</th>
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<tbody>
<tr>
<td>Strengthen ASEAN analysis planning, implementation and preventive measures</td>
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<td>Foster information exchange</td>
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<td>Share and promote Best practices</td>
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<tr>
<td>Raise awareness</td>
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<td>Communicate lessons learned</td>
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<td>Network disaster response drills among ASEAN</td>
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Thank You...