



CIL-NUS CONFERENCE
CONFERENCE ON INTERNATIONAL LAW AND THE PROTECTION OF
SUBMARINE CABLES
AND PIPELINES : MULTI-DIMENSIONAL PERSPECTIVES

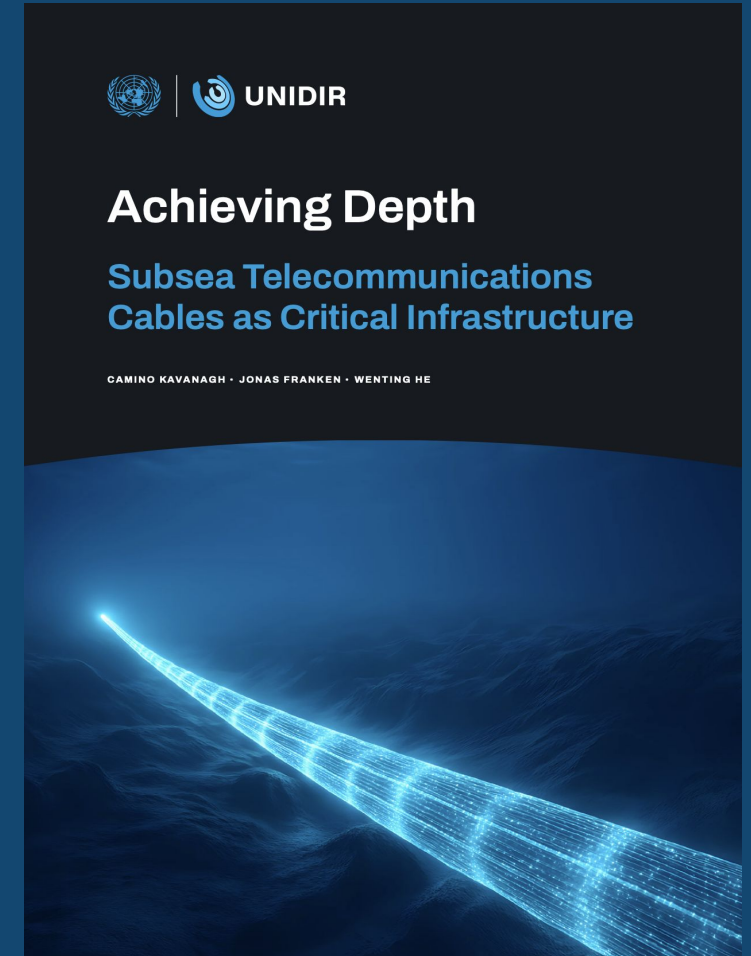
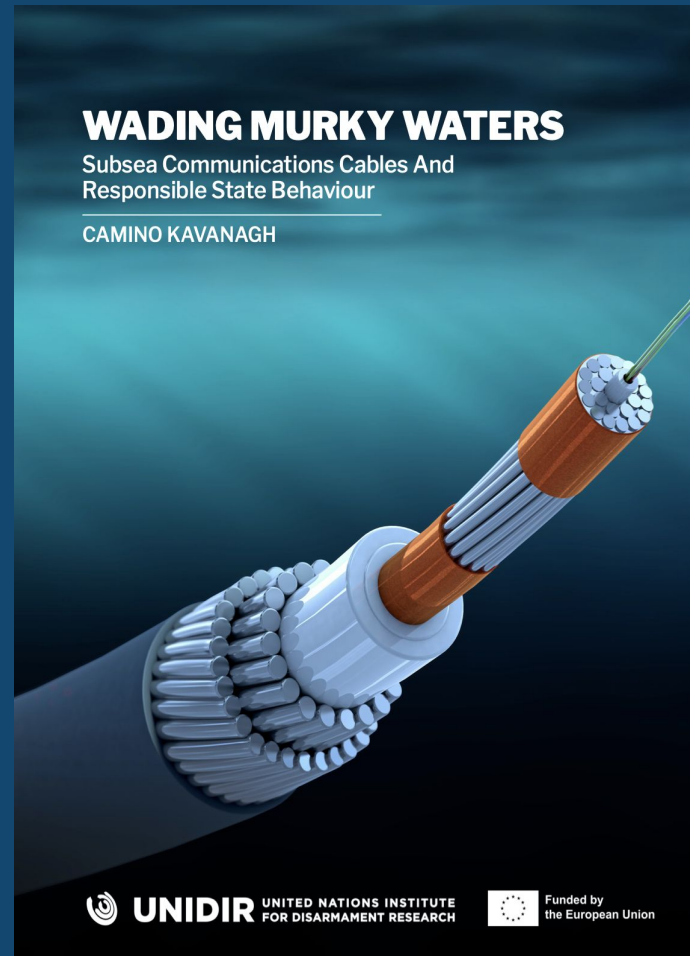
SUBSEA CABLES AS CRITICAL INFRASTRUCTURE

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POLICY + PRACTICE

Achieving Depth: Subsea Cables as Critical Infrastructure, Kavanagh, Camino, Franken, Jonas and He, Wenting, UNIDIR, 2025.

Murky Waters: Subsea Cables and Responsible State Behaviour, Kavanagh, Camino, UNIDIR (2023).



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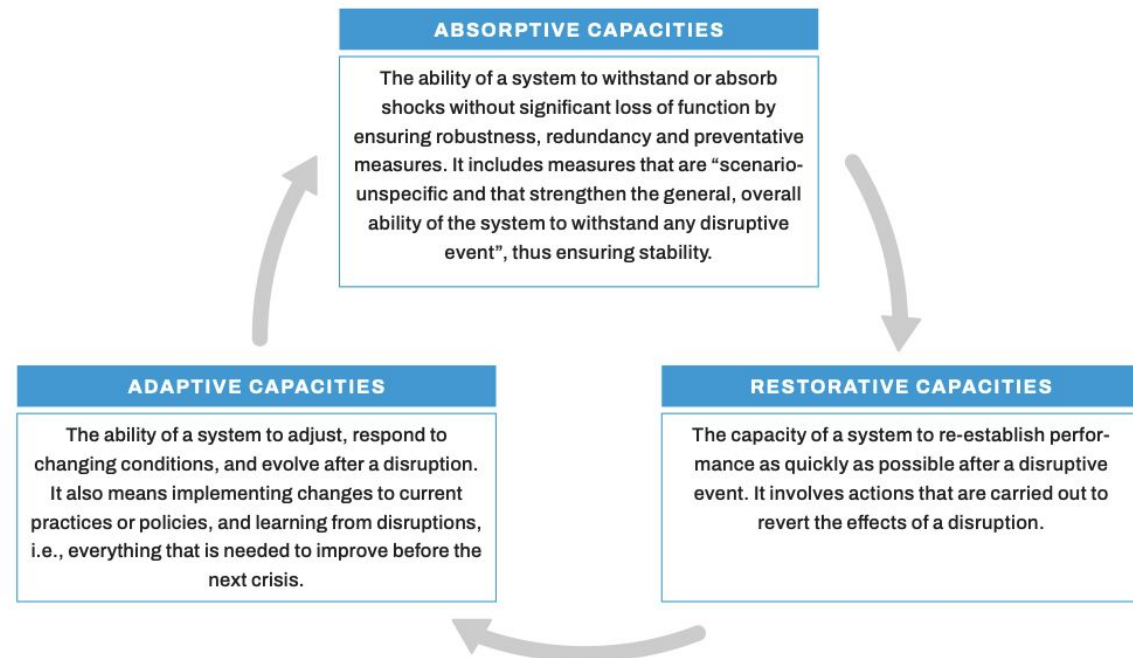
RESILIENCE CAPACITIES:

“THE CAPACITIES A SYSTEM REQUIRES TO ANTICIPATE, RESIST, ABSORB, RESPOND TO, AND RECOVER FROM NEGATIVE IMPACTS, CARRY OUT ITS ORIGINAL FUNCTIONS, AND ADAPT IN RESPONSE TO LESSONS LEARNED FROM PAST EXPERIENCE OR CHANGED CIRCUMSTANCES” (p.12)*

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FIGURE 2.

Core Resilience Capacities: A Cycle



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SAMPLE SECURITY & RESILIENCE FRAMEWORK

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SUBSEA CABLE SECURITY & RESILIENCE: A SAMPLE FRAMEWORK FOR GOVERNMENTS

CROSS-CUTTING ISSUES

International law and norms: Charter of the United Nations, United Nations Convention on the Law of the Sea (UNCLOS), Geneva Conventions, customary international law, United Nations SC Resolutions + United Nations GA resolutions (Oceans), agreed norms of responsible State behaviour (cyber)

Critical infrastructure consideration/designation: national policy/law

Public-private engagement: policy, regulatory, operational

Principles: predictability, reliability, transparency, accountability, security and safety.

Equities management: public-private engagement; security vs. resilience; security vs. privacy; transparency vs. confidentiality; national sovereignty vs. international cooperation; competing policy areas (environmental/biodiversity protection, energy, fisheries, deep-sea mining, cultural/heritage protection)

ABSORPTIVE CAPACITIES

The ability of a system to withstand or absorb shocks without significant loss of function by ensuring robustness, redundancy and preventative measures. It includes measures that are "scenario-unspecific and that strengthen the general, overall ability of the system to withstand any disruptive event", thus ensuring stability.

- Domestic law and regulations streamlined and in place
 - Permitting and licensing for installation and maintenance/repair
 - Spatial separation
 - Cable charting
 - Cable damage
 - Cybersecurity
 - Supply chain security
- National preparedness/crisis management plans, structures, personnel and capabilities in place
 - Roles and responsibilities (authorities/Rules of Engagement) clarified
 - Point of Contacts appointed at policy, regulatory, operational levels
 - Protocols and procedures established and regularly exercised at all levels (information-gathering/data-sharing (intra- and inter-government; government-industry); incident/outage reporting; system monitoring; law enforcement/military patrols)
 - Cable, route diversity and alternative redundancy options identified
 - System security priorities, authorities and operational protocols identified (physical/cyber of front haul, Cable Landing Station, backhaul, data centres, points of presence, network operations centres and management systems, maintenance/repair fleet, personnel, supplies, supply depots, supply chains)
 - National capability needs identified and addressed

RESTORATIVE CAPACITIES

The capacity of a system to re-establish performance as quickly as possible after a disruptive event. It involves actions that are carried out to revert the effects of a disruption.

- Personnel needs identified and addressed
- International cooperation
 - diplomatic processes/tools identified
 - transparency/cooperative/stability mechanisms established
- Regulation and guidance (measures for expediting access to cable ships for repair; physical/cybersecurity of repair vessels and operations + spares depots, supply chain requirements)
- Engagement with industry on maintenance/repair needs
- Procurement/investment gaps for maintenance/repair capabilities, spares and supply chains identified and addressed
- Incident/crisis response plans, protocols and procedures ready to be activated
- Capabilities ready to be deployed
- Diplomatic tools ready to be activated

ADAPTIVE CAPACITIES

The ability of a system to adjust, respond to changing conditions, and evolve after a disruption. It also means implementing changes to current practices or policies, and learning from disruptions, i.e., everything that is needed to improve before the next crisis.

- Learning from incidents and exercises and cross-sectoral collaborations; and application of post-review recommendations
- Regular reviews of policy, law, regulation, standards
- Regular risk management reviews
- Diplomacy/international cooperation (long-term engagement):
 - Subsea cable diplomacy toolbox developed
 - Subsea cable security and resilience integrated into foreign policy engagement and diplomatic training
 - Development/fine-tuning of transparency/cooperative/stability mechanisms
 - Pathways for resolving existing challenges (e.g., vessel/anchor safety standards) identified
 - Pathways for addressing gaps and emerging issues in international law identified
 - Awareness-raising/capacity-building on regulatory best practices
 - Awareness-raising/capacity-building on international law
 - Financing for connectivity (beyond just the cable landing)

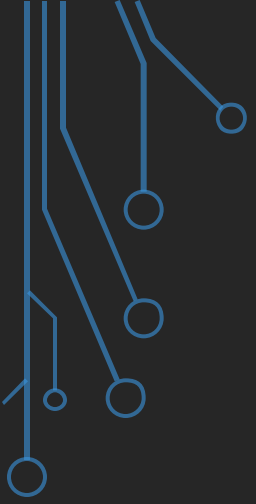


SECURITY & RESILIENCE FRAMEWORK: CROSS-CUTTING ISSUES

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- International law/ norms: Charter of the United Nations, UNCLOS, Geneva Conventions, customary international law, UN SC Resolutions + UN General Assembly resolutions, agreed norms of responsible State behaviour (cyber)
- Critical infrastructure consideration/designation: national policy/law + Ros/ specialised orgs
- Public–private engagement: policy, regulatory, operational
- Principles: predictability, reliability, transparency, accountability, security and safety

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HOW STATES CAN CONTRIBUTE TO
STRENGTHENING A SYSTEMS'

ABSORPTIVE CAPACITIES

(THE SCAFFOLDING)

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- Domestic law and regulations adopted and streamlined
 - Permitting and licensing for installation/maintenance
 - Spatial separation
 - Cable charting
 - Cable damage
 - Cybersecurity of relevant system elements
 - Supply chain security
- National preparedness/crisis management plans in place (lessons from EE, FI, EE, IE, NO, UK)
 - Roles and responsibilities clarified
 - Points of contact appointed at relevant levels (policy/ operational)
 - Risk assessment and info sharing protocols and procedures in place
 - Incident response protocols and procedures regularly exercised
 - Cable route diversity and alternative redundancy options identified, procured and in place
 - System security priorities, authorities and operational protocols identified (physical/cyber of front haul, cable landing stations, backhaul, data centres, points of presence, network operations centres and management systems, maintenance/repair fleet, personnel, supplies, supply depots, supply chains)
 - National capability needs identified and addressed (vessels and tech x MDA +)
 - Personnel needs identified and addressed
- International cooperation
 - Diplomatic processes/tools identified
 - Transparency/cooperative/stability mechanisms established

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HOW STATES CAN CONTRIBUTE
TO STRENGTHENING A SYSTEMS'

RESTORATIVE CAPACITIES

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- Regulation and guidance in place (e.g., measures for expediting access to cable ships for repair (e.g., NL, UK, SA – pre-notification for repair; SG-commitment to expediting repair permits)
- Procurement/investment gaps for maintenance/repair capabilities, spares and supply chains identified and addressed (market studies/ mapping exercises etc.)
- Engagement with industry on maintenance/repair needs

In the event of an incident:

- Incident/crisis response plans, protocols and procedures ready to be activated (lessons from Baltic and North Sea incidents: esp. gov and gov-industry info sharing + coordination/ strategic communications)
- Naval/ coastguard capabilities on stand-by/ ready to be deployed
- Diplomatic tools ready to be activated

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HOW STATES CAN
CONTRIBUTE TO
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SYSTEMS'

ADAPTIVE CAPACITIES

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- Learning from incidents and exercises and cross-sectoral collaborations
- Regular reviews of policy, law, regulation, standards
- Regular risk management reviews and application of post-review recommendations
- Diplomacy/international cooperation (long-term engagement):
 - Subsea cable diplomacy toolbox developed
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 - Development/fine-tuning of transparency/cooperative/stability mechanisms
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FINAL OBSERVATIONS

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- Report recommendations
 - Develop and finetune national security resilience frameworks (neither concepts are static).
 - Promote better understanding of faults and related effects, including how redundancy works to keep data flowing.
 - Strengthen responses to cable damage at sea (law and regs should reflect criticality of the systems).
 - Identify pathways for managing anchor-related issues.
 - Engage in exchanges of national views - including on gaps/ lacunae in IL, on national preparedness, on thresholds for incident and outage reporting and approaches to subsea cable incident classification ...
 - Innovation and investment in cable repair
 - Policy one-stop shop

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