ADMM Cybersecurity and Information Centre of Excellence

UPDATE ON
THE
INFORMATION DOMAIN
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Vulnerabilities of Subsea Cables and its Potential to Disrupt Information Flow

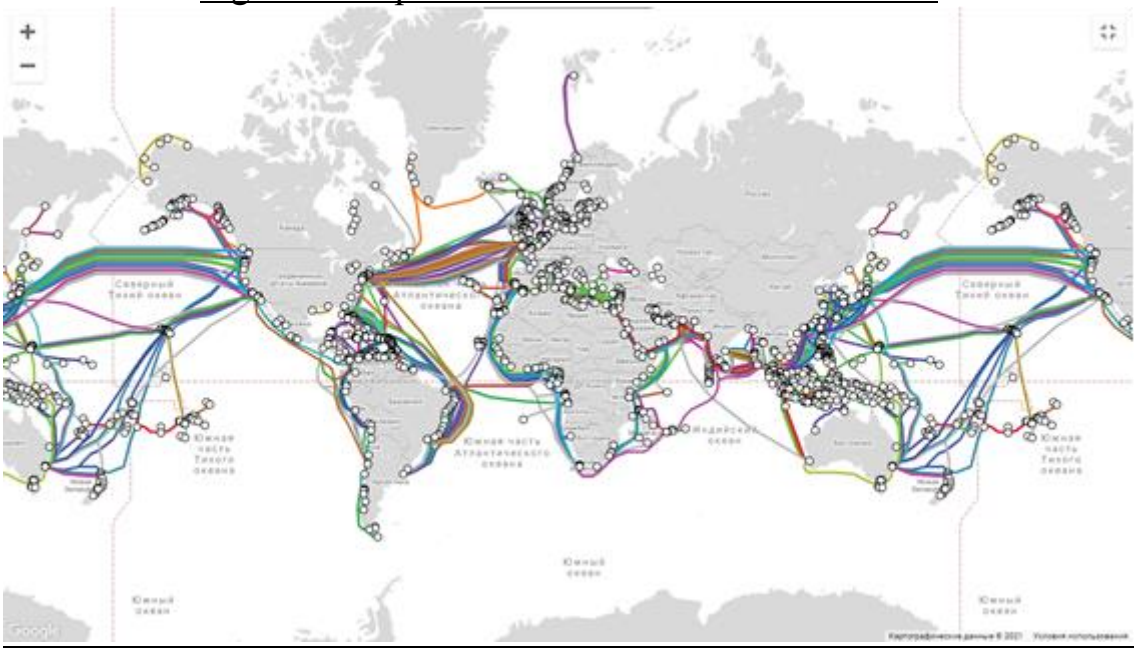
Introduction

1. Subsea Cables form the backbone of global digital communications, carrying vast amount of data and enabling internet connectivity across continents, supporting email exchanges, cloud computing and real-time video streaming. The increasing global demand for real-time data and high-speed internet connectivity makes their reliability critically important. Deep-sea pressures, potential damage from natural disasters, marine life or human activities, and the complexity of repairs makes it challenging to keep these systems working. Protecting subsea cables from accidents, sabotage and attacks is essential for sustaining global connectivity and ensuring the continuous flow of information, as any disruptions may have potential consequences on global information flow, including economic, security, and strategic implications.

2. Subsea cables are predominantly concentrated in certain regions due to historical, economic, and geopolitical factors. According to Precedence Research, the Asia-Pacific region leads in undersea cable systems, driven by rapid industrialisation, 5G rollout, and increasing demand for broadband services. Europe on the other hand is the fastest-growing market for subsea cables systems, with major investments in intra-regional cables. Meta's 2Africa subsea cable is currently the longest in the world, at approximately 45,000 kilometres. As reported by Business Insider, "the deep-sea cable

project will connect 32 other African countries and directly support economic development in Africa, fostering further growth of 4G and 5G applications, and increasing broadband penetration to millions of people and businesses across the African continent".

Figure 1: Map of the World's Underwater Cables



Source: Map by TeleGeography

3. Disruptions of subsea cables connections through cable cutting, would disrupt global communications and the transfer of data. The uninterrupted flow of information is necessary for communications. In today's interconnected world, the vulnerabilities of subsea cables to disruptions poses serious security concerns. Ensuring their integrity is critical for maintaining uninterrupted global communications. This underscores the importance of implementing protective measures to prevent hacking.

Impact of Disruptions on Information Flow

4. When a subsea cable is disrupted, the interruption of primary communication routes can delay official responses or counter-narratives. While alternative systems such as satellites or radio exist, they often lack the bandwidth or scalability needed for timely public messaging, making subsea cables the dominant channel for reliable and high-volume communication.

5. In 2024, several undersea communications cables in the Red Sea were cut, affecting 25% of data traffic flowing between Asia and Europe. This incident not only disrupted global communications but also highlighted the vulnerabilities of subsea cables to the risk of sabotage. As reported by the Observer Research Foundation, such disruptions pose a real challenge to global telecom infrastructure and exposes the risks due to a lack of global security infrastructure and laws surrounding subsea cables.

6. According to Reuters, the Houthis had denied allegations that they had targeted subsea cables in the Red Sea, attributing the damage to US and British military actions without providing concrete evidence. Such ambiguities create fertile ground for misinformation campaigns, as different parties may promote narratives that suit their own interests, further complicating the public's understanding of the truth. This emphasises the importance of having strong security measures and resilient infrastructure to protect against both physical disruptions and the information campaigns that might accompany them.

Figure 2: Increased reliance on seabed infrastructure and the various ways in which it can be reached.

Source: Naval News

Role of Misinformation and Disinformation

7. Cutting of subsea cables can quickly become the subject of speculations or false narratives. In October 2022, two independent faults appeared on the SHEFA-2 cable near Shetland. A news article published by The Record reported that the damage to the submarine cable to the remote Shetland Islands north of Scotland is believed to have been accidentally caused by a fishing vessel and not sabotage. The Scottish Government and the Maritime and Coastguard Agency, were also aware that the damage was caused by a fishing vessel registered in the United Kingdom. Despite this, there was a lack of official communications from the Scottish Government as well as the Maritime and Coastguard Agency, leading to speculation in some media outlets about possible sabotage.

Conclusion

8. The challenges of subsea cable protection, together with their importance in global communication, create significant risks for global information flow. Disruptions in subsea cables, which form the backbone of international communication, can have far-reaching effects on information availability.

9. New solutions based on Artificial Intelligence (AI) and machine learning are being developed to monitor subsea cable integrity in real-time. These developments allow for earlier detection of possible threats, resulting in quicker responses and reduce the window of vulnerability. These technologies can considerably increase the resilience of subsea cables by improving the ability to identify and address maintenance issues ahead of time, strengthening the integrity of global communication channels.

10. As reported by the Observer Research Foundation, the red sea cable disruptions in 2024 have served as a wake-up call for governments and the telecommunications industry to focus on increased international cooperation on monitoring, protection, and diversification of subsea cable systems. Recognising these cables as critical infrastructure and establishing clear legal frameworks for their

security are crucial steps to build a more resilient future for the global digital economy.

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CONTACT DETAILS

All reports can be retrieved from our website at www.acice-asean.org/resource/.

For any queries and/or clarifications, please contact ACICE at ACICE@defence.gov.sg.

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