



Protection of submarine cables and pipelines as a regional maritime security issue: A comparative perspective of Estonian and Finland's arrangements

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Abstract

Submersible infrastructure, such as telecommunications cables and energy pipelines, plays a strategic role in modern maritime activities and regional energy security, especially in semi-enclosed seas such as the Baltic Sea. The increasing level of vulnerability of underwater installations raises legal concerns regarding the adequacy of regulation in the current international and national legal regimes. This research aims to examine the international legal framework governing the protection of subsea infrastructure and examine its application in the Estonian and Finnish national legal systems. This research utilises a normative legal research method with a statutory and conceptual approach, focusing on relevant international legal instruments, in particular the 1982 United Nations Convention on the Law of the Sea (UNCLOS), as well as maritime regulations and national criminal law. A comparative approach was used to explore the similarities and differences in the regulatory patterns applied by the two countries. The findings show that while international law provides a general normative framework for the protection of submarine cables and pipelines, its effective enforcement is highly dependent on national-level arrangements. Estonia and Finland both adopt international obligations into domestic law, but have different regulatory foci, particularly in the aspects of deterrence and criminal liability. These variations in approach have the potential to affect the level of infrastructure protection in transboundary maritime areas. This research concludes that it is not enough to rely on international norms for the protection of underwater infrastructure but requires harmonised national implementation and strengthened bilateral cooperation to ensure legal certainty and regional maritime security.

Keywords: Underwater Infrastructure, international maritime law, UNCLOS 1982, national arrangements, Baltic Sea

Introduction

The resilience and sustainability of subsea infrastructure is an issue that is receiving increasing attention in the study of international positive law of the sea today. Submerged installations, including telecommunications cables and energy pipelines, are not merely technical means, but have become pillars of economic function and global connectivity. This is why the international law of the sea regime, particularly the 1982 United Nations Convention on the Law of the Sea (UNCLOS), is seen as the primary normative framework that structures states' rights and obligations over the utilisation of maritime space, while also providing the basis for cooperative mechanisms to address issues arising from the use of such infrastructure. The Convention accommodates various marine zoning regimes ranging from the territorial sea to the exclusive economic zone to the continental shelf and affirms the obligations of coastal states and other states to respect legitimate underwater installations, maintain safety of navigation, and fulfil broader environmental and marine security obligations [1].

UNCLOS 1982 implicitly recognises the complexity of interstate relations in the context of the use of maritime space, which is increasingly crowded with activities. The Convention's provisions, such as the right to lay submarine cables and pipelines and the obligation to settle disputes peacefully through various methods, reflect international law's efforts to provide a comprehensive and adaptive normative foundation [2]. This is important given the frequency and impact of incidents that threaten the stability of undersea communications and energy lines, which can have

far-reaching implications for the international economy and security. Furthermore, while conventional norms such as UNCLOS provide general principles, national practices often must be adapted to concrete conditions, including the need for operational technical standards, as well as more specific mechanisms of coordination and cooperation among interested states.

The integration of international legal principles in national policies is key in addressing these challenges. Several countries have placed underwater infrastructure protection regimes as a strategic priority. This is inseparable from the character of certain marine zones that have geographical dynamics, density of maritime activities and inter-state connectivity, requiring a synergistic legal approach between international norms and more operational technical instruments [3]. In this context, the theory and practice of international law of the sea must be understood as a dynamic process, combining conventional provisions with mechanisms of multilateralism cooperation and the application of technical standards that support the protective effect of the law.

At the same time, contemporary legal literature asserts that the regulation of underwater infrastructure cannot be viewed as a static set of substantive norms, but rather as a mechanism that continues to evolve across national borders and legal regimes [4]. In this perspective, the further study outlined in the next section critically examines the content of the 1982 UNCLOS provisions on underwater infrastructure, how they are implemented in national law, and the role of international cooperation and ancillary instruments such as technical recommendations in ensuring effective legal protection for these strategic installations.

Methodology

This research was prepared using a normative legal research approach that places the law as a norm that applies in society. The legal materials used consist of primary, secondary, and tertiary legal materials. Primary legal materials include relevant international legal instruments, particularly the 1982 United Nations Convention on the Law of the Sea (UNCLOS), as well as national laws and regulations relating to the protection of underwater infrastructure in Estonia and Finland, including maritime and criminal law regulations. Secondary legal materials include scholarly literature in the form of legal textbooks, journal articles, official reports, and policy documents that discuss international law of the sea, protection of submarine cables and pipelines, and state practice in implementing international obligations. Tertiary legal materials are used on a limited basis as aids to clarify certain legal terms and concepts, such as legal dictionaries and legal encyclopaedias.

The method of collecting legal materials was carried out through library research by tracing relevant legal sources and having academic authority. The analysis of legal materials was conducted qualitatively using a statutory approach and conceptual approach to understand the structure of norms, legal principles and the purpose of regulating the protection of underwater infrastructure. In addition, this research applies a comparative law approach to examine the similarities and differences in legal arrangements and policies applied by Estonia and Finland in the context of subsea infrastructure protection. This approach is used to assess the extent to which international legal norms are adopted and operationalised in each country's national legal system. The results of the analysis are then presented descriptively analytically by drawing conclusions based on systematic and logical legal reasoning, to provide a comprehensive picture of the relationship between the international legal regime and national implementation in the protection of underwater infrastructure.

Discussion

International Legal Framework for the Protection of Undersea Infrastructure

The international legal framework for the protection of undersea infrastructure has essentially evolved from a combination of conventional norms, general international law principles, and state practices that continue to adapt to the increasing global dependence on undersea installations. While these arrangements have provided a normative basis for the rights, obligations and responsibilities of states in the utilisation of marine space, their implementation in the context of strategic infrastructure protection still shows a variety of approaches, whether through sectoral arrangements, cooperation mechanisms or the adoption of non-binding technical standards^[5]. Therefore, to understand the effectiveness of the international legal framework more comprehensively, further discussion is needed on the main legal instruments referred to, the concrete forms of regulation applied, and the role of international and national actors in ensuring the security and sustainability of underwater infrastructure.

The main substance of the Convention for the Protection of Submarine Telegraph Cables 1884 basically focuses on protecting submarine communication cables, but the norms

contained therein have legal consequences that can be extended to regulate the installation and security of subsea pipelines. The Convention is seen as an early foothold in the establishment of an international legal regime relating to the protection of vital infrastructure in seabed areas^[6]. Through its articles, state parties are obliged to provide legal protection to submarine cables lawfully installed beyond the territorial sea. The operational security dimension is further regulated through Article V and Article VI, which stipulate safety distance provisions for other vessels to cable installation or repair activities. These provisions require other vessels to maintain a minimum distance of one nautical mile from the activity site and keep fishing gear or nets away to prevent potential damage. Such arrangements are of high relevance to transboundary energy pipeline projects, given the similar nature of protection needs during the installation phase^[7].

The provisions of the 1884 Convention can be seen as a normative foundation that has been further developed in modern legal instruments, such as the 1982 United Nations Convention on the Law of the Sea (UNCLOS). Article 79 of UNCLOS confirms that coastal states do not have the authority to prevent the installation of subsea pipelines on the continental shelf but still have the right to regulate the installation route and set provisions related to environmental protection and security aspects^[8]. Thus, the arrangements in the 1884 Convention show continuity with the modern law of the sea regime, although initially its scope was limited to telegraph cables.

Although the 1884 Convention does not explicitly regulate submarine pipelines, the legal principles it contains have been the initial foundation for the establishment of an international legal regime to protect and regulate various forms of submarine infrastructure, including transboundary communications cables and energy pipelines.

Regulation of Submarine Pipelines Under the International Cables Protection Committee (ICPC) 1958

The principles developed by the International Cable Protection Committee (ICPC) show a close relationship with the international law of the sea regime, particularly as set out in the 1982 United Nations Convention on the Law of the Sea (UNCLOS). Although the ICPC operates as a soft law mechanism that does not produce binding norms, the technical recommendations it issues substantially complement the general provisions of UNCLOS, particularly in regulating the protection of submarine cables and pipelines outside the territorial sea^[9]. UNCLOS itself establishes the right to install submarine cables and pipelines and the obligation of states to respect legitimate installations but does not specify the operational technical standards required to ensure the safety and reliability of such infrastructure. It is in this context that the ICPC recommendations serve as a complementary instrument that bridges the regulatory gap between international legal norms and technical practices on the ground.

The integration of UNCLOS and ICPC principles is reflected in the national legal approaches of coastal states in the Baltic Sea region, including Estonia and Finland. Both countries have adopted international obligations under UNCLOS into their domestic legal frameworks, whether through maritime regulations, environmental law or criminal law, paying particular attention to the protection of strategic underwater infrastructure. In practice, the technical

standards and precautionary principles recommended by the ICPC such as coordination among seabed users, safety distancing, infrastructure route mapping and environmental risk mitigation are often used as operational references by national authorities and industry players^[10]. Thus, although not binding, the ICPC's recommendations contribute significantly to shaping national law implementation patterns in line with the objectives of UNCLOS.

For Estonia and Finland, the integration of ICPC principles into national practice is also of particular significance given the Baltic Sea's character as a semi-enclosed sea with high levels of maritime activity density and transboundary energy dependence. Early coordination of infrastructure deployment, transparency of information through mapping, as well as safe distance arrangements are important instruments to prevent jurisdictional conflicts and minimise the risk of damage to subsea infrastructure. Therefore, the relationship between UNCLOS, ICPC recommendations, and Estonian Finnish national law can be understood as a complementary normative and operational unity in establishing an effective subsea infrastructure protection regime at the regional level^[11].

Regulation of subsea pipelines is a fundamental element of the international law of the sea regime as formulated in the 1982 United Nations Convention on the Law of the Sea. These provisions serve as the legal basis for coastal states and other states in the utilisation of the seabed area, including the installation and protection of subsea pipelines in various maritime zones^[12]. Through UNCLOS, a balance is sought between two main legal interests, namely the sovereign rights of coastal states over underwater resources and the freedom of other countries to conduct transboundary communication and energy activities.

Article 79 of UNCLOS explicitly states that 'All States are entitled to lay submarine cables and pipelines on the continental shelf, in accordance with the provisions of this article.' The provision is further clarified through the next paragraph which authorises coastal states to determine the route and technical requirements of installation for reasons of safety and security, while ensuring that the freedom of other states to lay pipelines is not inhibited if the prescribed procedures are complied with^[13]. This provision shows that UNCLOS in principle does not give exclusive authority to coastal states to prohibit the installation of subsea pipelines by foreign parties, although coastal states still play an important role in regulating routes and protecting the marine environment in their jurisdiction. In practice, coastal states may designate certain corridors or restricted areas based on national security interests, safety of navigation, or protection of the marine environment.

In the context of Estonia and Finland, the Estlink-2 subsea pipeline damage incident in the Baltic Sea region in 2024 is a concrete illustration of the high vulnerability of transboundary energy infrastructure. The incident had serious implications for regional energy security and emphasised the importance of interstate coordination in the protection of subsea pipelines. The incident highlights the urgency of effectively implementing UNCLOS provisions, particularly Article 58 and Article 79, which require technical and legal cooperation to maintain maritime stability and security^[14]. Normatively, the UNCLOS regime not only regulates the rights and obligations of coastal states and other states but also provides a basic framework for international cooperation in handling disputes and incidents

related to subsea infrastructure. It serves as a global legal umbrella that balances the sovereign interests of coastal states with the shared interests of the international community in ensuring the sustainability of transboundary energy connectivity.

Finland National Law on the Protection of Undersea Pipelines

Finland as one of the coastal states in the Baltic Sea region shows significant legal attention to the protection of undersea infrastructure, including gas pipelines and energy cables. Such attention is influenced not only by Finland's strategic geographical position as a regional energy hub, but also by the country's degree of dependence on transboundary infrastructure to ensure energy supply and communication systems. Within its national legal framework, Finland regulates the protection of subsea pipelines through various legal instruments covering criminal, administrative and technical aspects. One of the main instruments underpinning the legal protection of strategic infrastructure is the Criminal Code of Finland (Rikoslaki). The criminal provisions serve as the basis for action against those who damage or impede the function of subsea pipelines, either through direct or indirect actions^[15]. The Finland legal system builds comprehensive protection of subsea pipelines through three main instruments: criminal law, administrative law and international law. Criminal provisions serve as the basis for prosecuting perpetrators of sabotage or destruction, administrative provisions provide prevention mechanisms and technical supervision, while international provisions provide legitimacy and a framework for cooperation between countries. From an academic perspective, this reflects how a country can integrate energy security principles with environmental protection principles in an integrated national legal system.

Finland's approach is also relevant for comparative study with other coastal states, including Indonesia. As an archipelagic country with an extensive network of undersea pipelines and cables, Indonesia can learn from the Finnish legal model that simultaneously emphasises aspects of national security and environmental sustainability. Regulations on sabotage, the establishment of underwater security zones, and strengthening international coordination are important elements that can be adapted in national policy development. In the long run, such a regulatory model has the potential to strengthen Indonesia's legal position in protecting its vital infrastructure from the threat of technical damage and non-traditional forms of threats.

Overall, Finnish national law reflects a systematic structure of protection for subsea pipelines. The framework is not only geared towards preventing and prosecuting crimes directly but also anticipates environmental impacts and regulates the state's responsibility in maintaining national energy stability. The integration of the Criminal Code, Water Act, Maritime Act and international legal norms demonstrates a legal design that is mature, adaptive and in tune with contemporary maritime security dynamics.

The protection of submarine pipelines by two coastal states in the Baltic Sea region, Estonia and Finland, is structured through national legal frameworks that combine criminal law instruments, marine administrative regimes and commitments to international law of the sea provisions. In Estonia, the criminal regime includes norms on damage to property and interference with public utilities as set out in

the Karistusseadustik (Penal Code), including provisions that criminalise damage to property, interference with public utilities, as well as norms that may qualify as sabotage of strategic infrastructure (Articles 203, 206 and 235, among others), while administrative and technical arrangements rely on the Water Act and marine regulations that require environmental impact assessments, licensing of marine space utilisation, establishment of safety zones around subsea installations, and supervision by the competent technical authorities; In contrast, in Finland, similar protections are formulated more explicitly in the Rikoslaki (Criminal Code) through provisions on sabotage of vital infrastructure (e.g. Chapter 34 Section 1) and environmental offences (Chapter 48 Section 1), complemented by administrative regimes in the Vesilaki (Water Act) and Merilaki (Maritime Act) that require the establishment of safety zones, technical inspections and incident reporting mechanisms^[16].

Both countries internalise UNCLOS provisions in national practice by recognising the rights and obligations of coastal states in regulating pipelines on the continental shelf and exclusive economic zone and applying the polluter pays principle in the event of marine pollution, although in practice there are differences in emphasis, with Finland tending to place energy infrastructure sabotage provisions expressly in its criminal law with clear threats of sanctions for acts that threaten national security, whereas Estonia relies on a combination of property damage norms, interference with public facilities and sabotage provisions to achieve effectiveness, While in the administrative realm they both impose EIA, security zone and reporting obligations with differences in the institutional structure of oversight and nomenclature of authorised agencies, and the experience of regional incidents such as the Balticconnector/Estlink breakdown prompted both countries to tighten their security policies, confirming that subsea pipeline protection at the practical level is a synergy between preventive and repressive criminal norms and technical-administrative arrangements. The synergy between the two regulatory regimes serves to ensure the sustainability of energy supply, minimise the risk of damage to the marine environment, and maintain the overall security of the maritime region.

Conclusion

The protection of submarine infrastructure has, in principle, found a regulatory basis in both the international legal regime and the Estonian and Finnish national legal systems, albeit designed through normative approaches that are not entirely uniform. At the international level, particularly through UNCLOS, a general framework is if sets out the rights and obligations of states in safeguarding and protecting submarine cables and pipelines, but these norms are still skeletal and require further regulation at the domestic level. In contrast, Estonia and Finland have internalised these international provisions into their national laws through a combination of criminal, administrative and technical instruments geared towards ensuring the security, safety and sustainability of subsea infrastructure. The variety of arrangements developed between these countries shows that the design of subsea infrastructure protection is strongly influenced by national interests, the characteristics of the legal system, and the empirical experience of each country. Therefore, the effectiveness of protection is not

solely determined by the existence of legal norms, but also by the level of harmonisation between international and national laws and the intensity of cooperation between countries in its implementation.

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