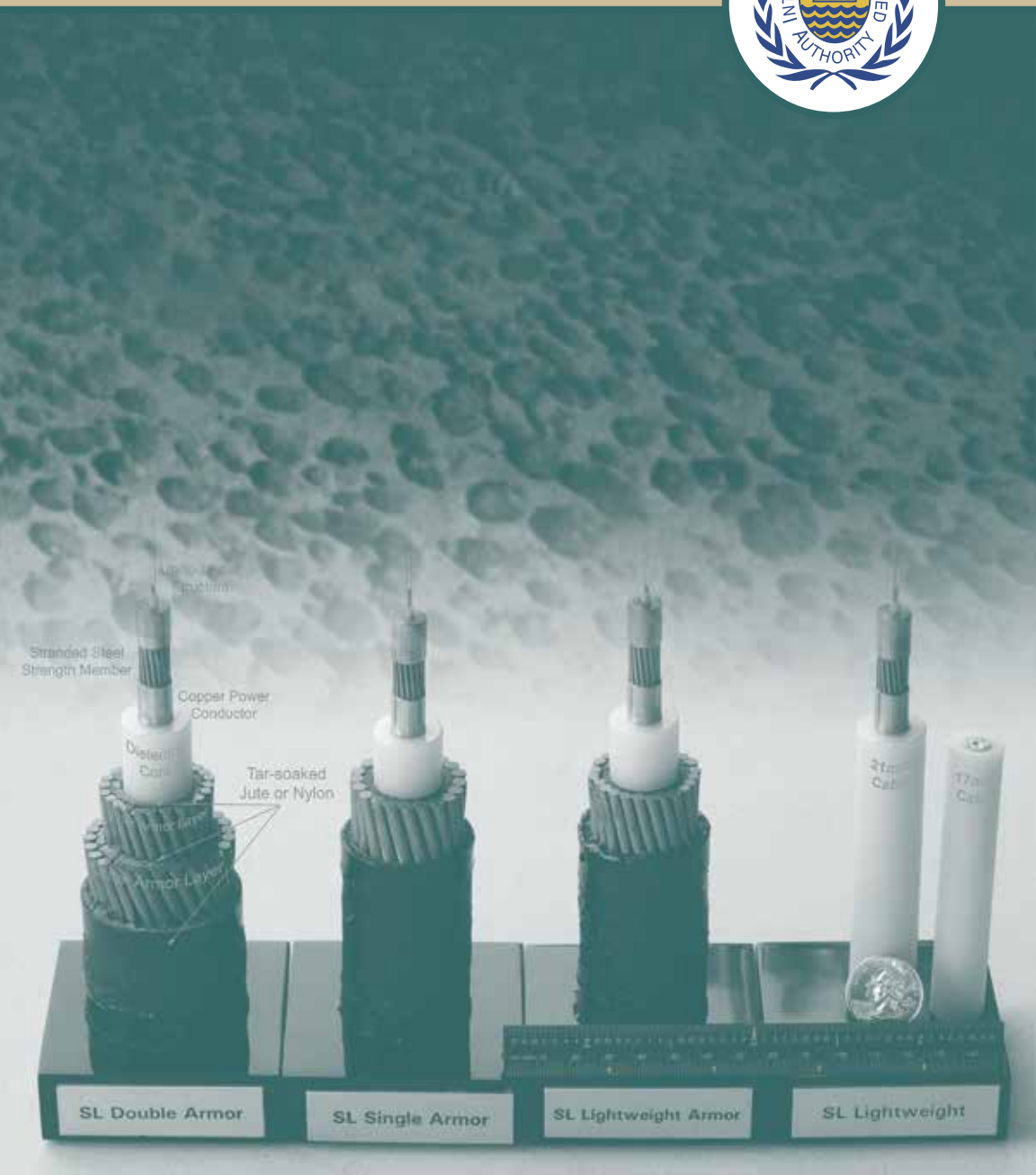
Submarine Cables and Deep Seabed Mining

Advancing Common Interests and Addressing UNCLOS "Due Regard" Obligations

Technical Study: No. 14



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WORKSHOP REPORT

10-11 March 2015

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Table of Contents

I. Executive Summary

I. EXECUTIVE SUMMARY

1. On 10-11 March 2015, the International Cable Protection Committee (ICPC)[1] and the International Seabed Authority (ISA)[2] held a first-of-its-kind workshop on ***"Submarine Cables and Deep Seabed Mining – Advancing Common Interest and Addressing UNCLOS 'Due Regard' Obligations"*** in the New York office of the law firm Squire Patton Boggs (US) LLP.[3] This was the first workshop held to address the combined issues of submarine cables on the high seas and deep seabed exploration in the Area. It brought together representatives from the submarine cable industry, a Contractor with the ISA, as well as delegates from the ICPC, ISA, United Nations and several governments in a non-representative capacity.

2. In view of the **growing risk of interferences** between submarine cables and deep seabed activities, the Workshop aimed at finding practical solutions for the peaceful coexistence of both uses in areas beyond national jurisdiction. The starting point was the United Nations Convention on the Law of the Sea (UNCLOS) of 1982. UNCLOS expressly authorizes both activities which are only limited by their mutual duty to exercise "*due regard*" for each other and other users.[4]

3. In the absence of precise provisions in UNCLOS on the resolution of disputes between cable owners and Contractors with the ISA, the participants discussed how best to avoid such disputes. They considered the technical and the legal aspects of the question, and came up with innovative ideas. The Workshop fostered **mutual understanding** between the ICPC and the submarine cable industry, and the ISA and its Contractors. It emphasized the need to continue the cooperation.

4. The participants reached **general consensus** on several key points:

   a. Under UNCLOS, the (i) laying and maintaining of submarine cables on the bed of the high seas beyond the continental shelf and (ii) the conduct of deep seabed mining activities in the Area are expressly authorized. Both entities – cable owners and Contractors – are required to exercise due regard for each other.

   b. In the absence of a provision of UNCLOS on the resolution of conflicts between cable owners and Contractors with ISA, the best strategy is to avoid disputes and to adopt practical procedures to reduce risks.

   c. While not defined in UNCLOS, "due regard" requires first notice, which can be actual or constructive, and then consultation between the cable owners and the Contractors engaged in competing activities in the international seabed Area.

   d. Charting of the contract areas awarded by ISA, and submarine cables present in the high seas and the Area, by the appropriate authorities would help the exchange of notice and the consultation.

   e. Cable owners and Contractors need to consider practical ways to avoid mutual interferences in crossing areas. The development of more precise techniques is one such method.

   f. Cable owners and Contractors need to assess their mutual liabilities in the event of a fault to a submarine cable or damage to Contractors' infrastructure on the seabed to facilitate the resolution of potential disputes.

1 For more information on the ICPC, please refer to https://www.iscpc.org/.

2 For more information on the ISA, please refer to http://www.isa.org.jm/.

3 For more information of Squire Patton Boggs, please refer to http://www.squirepattonboggs.com/.

4 *See* UNCLOS, art. 87, 112, 147 (1) and (3).

g. The ICPC and the ISA play important roles in the exchange of information to help their respective members to advance common interests and address "due regard" obligations.

5. Several **recommended actions** were also agreed upon.

a. The ICPC and the ISA should facilitate the cooperation between the owners of the submarine cables and the Contractors involved in the two crossings in the Pacific and Indian Oceans by helping them to identify possible crossing solutions, should exploitation occur in the future.

b. The ICPC and the ISA should exchange points of contact and information, such as the location of exploration areas under contract and proposed exploration areas at the stage of application. This would facilitate communication among cable owners, applicants and Contractors involved in potential crossings.

c. The ICPC and the ISA should invite each other to their respective annual meetings, which would take place in April 2015 in Hong Kong (ICPC) and in July 2015 in Jamaica (ISA).

d. The International Hydrographic Organization (IHO)[5] should be approached to discuss with the ISA the interest and feasibility of charting exploration areas under contract in the international seabed Area, in order to show the eventual presence of submarine cables.[6]

e. Techniques of risk-reduction should be reviewed by engineers from both sectors.

f. The ICPC and the ISA should consider a joint code of conduct with practical recommendations for cable owners and Contractors with the ISA. Alternatively, the ICPC should consider an ICPC Recommendation[7] to address the laying and maintenance of cables in ISA-designated exploration areas. The ISA could also consider appropriate guidance of its Contractors with respect to the conduct of operations in the vicinity of submarine cables. Drafts should be circulated among the Workshop participants for practical feedback before any external distribution.

g. The ICPC and the ISA should organize a follow-up workshop, or meeting, in 2016 to review mutual progress. The date for the workshop is to be fixed through a phone-conference in August 2015.

Group picture of participants in the workshop

5 For more information on the IHO, please refer to http://www.iho.int/.

6 Article B-443 of the Chart Specifications of the IHO address submarine cables well, but only apply to charting authorities (*i.e.* UKHO, SHOM, NOAA/DMA) in waters of 2,000 meters or less. Deep seabed activities take place in considerably deeper waters.

7 ICPC Recommendations are available to the public. Each Recommendation represents the learned consensus of cable owners, cable ship operators and others involved in addressing a particular engineering, safety, or procedure commonly faced with submarine cables in the ocean environment. Recommendations are non-binding, but effectively represent the custom and practice in the cable industry and are widely followed.

II. Introduction

II. INTRODUCTION

1. The **seabed of the high seas** has long been unexplored, although it covers approximately 40 per cent of the earth. Since the 19th century, the main human activity conducted in the seabed has been the laying of submarine cables. Today, modern techniques permit the exploration of the mineral resources of the seabed and activities are developing which are likely to interfere with submarine cables.

2. The issue is of particular interest to two organizations:

   a. The **International Cable Protection Committee** (ICPC) is not an intergovernmental organization with the regulatory competence of imposing binding decisions on its members. It is a non-profit organization that protects all types of submarine cables, including fibre optic cables that provide 98 per cent of the worldwide telecommunications, as well as power cables, scientific cables, and military cables. It was created in 1958 as the Cable Protection Committee, and renamed ICPC in 1967 to better reflect its vision statement *"to be the international submarine cable authority providing leadership and guidance on issues related to submarine cable security and reliability".*

   Today, the ICPC comprises **153 members** from 64 countries, including major cable owners, cable maintenance authorities, cable system manufacturers, cable ship operators, cable route survey companies and governments.[8] The ICPC recently opened associate membership to interested organizations. About 97 per cent of cable kilometres laid by the 265, or so, international submarine cable systems and all of the operators of the cable ships that lay and maintain them are ICPC members.

   b. The **International Seabed Authority** (ISA) is an international organization established by the United Nations Convention of the Law of Sea (UNCLOS) in 1982 to "*organize and control activities in the Area, particularly with a view to administering the resources of the Area*".[9] The Area is "*the seabed and ocean floor and subsoil thereof, beyond the limits of natural jurisdictions*".[10] Its resources are all solid, liquid or gaseous minerals that can be recovered. The 167 parties to UNCLOS (166 States and the European Union)[11] are automatically members of the ISA, and they finance its activities in proportion to their contribution to the United Nations.

   Since the adoption of the Implementation Agreement on Part XI of UNCLOS in 1994, the ISA has exercised the functions of regulating and monitoring deep seabed activities, protecting the marine environment and promoting and encouraging marine scientific research. Activities in the Area means exploration for and exploitation of all ***in situ*** solid, liquid or gaseous mineral resources at or beneath the seabed such as polymetallic nodules, polymetallic sulphides and cobalt-rich ferromanganese crusts. The ISA has already approved 26 **exploration contracts** in various oceans.[12] **Those contracts provide for security of tenure and confer exclusive rights upon Contractors.** So far, only exploration activities are carried out under contract, but the ISA recently issued a draft framework for the regulation of future exploitation activities.[13] This resulted, ***inter alia,*** from submissions

8 For a list of ICPC members, please refer to https://www.iscpc.org/about-the-icpc/member-list/. States include the United Kingdom, Australia, New Zealand, Malta, and Singapore.

9 ***See*** UNCLOS, art. 157.

10 ***See*** UNCLOS, art. 1.

11 As of 31 May 2015. For a list of States parties to UNCLOS, please refer to http://www.un.org/depts/los/reference_files/chronological_lists_of_ratifications.htm.

12 For more information on the Contractors, please refer to http://www.isa.org.jm/deep-seabed-minerals-Contractors.

13 ***See*** ISA Report, ***Developing a Regulatory Framework for Mineral Exploitation of the Area*** (March 2015), http://www.isa.org.jm/files/documents/EN/Survey/Report-2015.pdf.

to a public stakeholders' survey which involved several members of the ICPC and the ICPC itself.

3. On 25 February 2010, the ISA and the ICPC signed a **Memorandum of Understanding (MOU)** reflecting their "*strong interest in the protection of the marine environment from harmful effects arising from their respective activities*", and their objective "*to avoid potential conflicts between the laying and maintaining of submarine cables and current and future activities in the Area*".[14]

4. As part of their cooperation, the ICPC and the ISA exchanged the coordinates of the submarine cables and exploration areas. Recently, they discovered that two of the exploration areas, under contract with the ISA, were crossed by preexisting submarine cables:

   a. In the **Indian Ocean**, the 13.669 km cable SAFE (built in 2002, co-owned by France Telecom, Tata Communications and Telekom SA) links Mauritius, South Africa, India, Malaysia and Reunion and crosses an area assigned to the Republic of Korea for the exploration of Polymetallic Massive Sulphides under a contract starting on 24 June 2014;[15]

   b. In the **Pacific Ocean**, the 4,634 km cable HONOTUA (built in 2009, owned by OPT French Polynesia) links Hawaii with French Polynesia and crosses an exploration area reserved by the ISA for the exploration of Polymetallic Manganese Nodules by developing countries or natural or juridical persons having their nationality or being under their effective control and sponsored by them.[16]

5. On 10 and 11 March 2015, the ICPC and the ISA held an **Inaugural Workshop** in the New York office of the law firm Squire Patton Boggs (US) LLP. It was entitled "*Submarine Cables and Deep Seabed Mining – Advancing Common Interest and Addressing UNCLOS 'Due Regard' Obligations*". The Workshop was based on the premise that the UNCLOS expressly authorizes both activities in areas beyond national jurisdiction, provided that users have "due regard" for each other.[17] The objective was to exchange information on how cable owners and exploration Contractors can practically fulfill the "due regard" provisions of the UNCLOS.

6. The Workshop brought together **16 participants** with various specializations.[18] The ICPC and the ISA invited a limited number of cable owners, an ISA Contractor, scientists, international lawyers, and ocean policy makers to reflect different interests at stake. Delegates from the Division for Ocean Affairs and the Law of the Sea (DOALOS) of the United Nations[19] and diplomats from the governments of Mexico and Singapore attended the Workshop in a non-representative capacity.

7. It was the first Workshop to address the growing risk of interference between **submarine cables and deep seabed activities** in the Area. High-level presentations generated intense debates which were held under the Chatham house rule. The Report reflects the main technical and legal issues discussed, the points of general agreement, the points for further discussion, and the recommended actions to foster the cooperation between the submarine cables owners and the deep seabed Contractors.

14 **See** Memorandum of Understanding between the ICPC and the ISA, Annex A.

15 For a map of the crossing area in the Indian Ocean, please refer to Annex B.

16 For a map of the crossing area in the Eastern Pacific Ocean, please refer to Annex C.

17 **See** UNCLOS, art. 87, 147.

18 For a list of participants, please refer to Annex D.

19 For more information on DOALOS, please refer to http://www.un.org/depts/los/index.htm.

III. Workshop Structure

III. WORKSHOP STRUCTURE

1. The Inaugural Workshop started with welcome statements from **Keith Schofield**, General Manager of the ICPC, **Neil Rondorf**, ICPC Chairman and **Michael W. Lodge**, Deputy to the Secretary General and Legal Counsel at the ISA. The two days were then divided into four main sessions, consisting of presentations, interspersed with discussions.[20]

2. The first session introduced the issues and the different organizations involved:

    a. The Dilemma of Competing Uses: Submarine Telecommunication Cables and ISA Mining Concessions by Douglas Burnett, International Cable Legal Advisor of the ICPC, Partner at Squire Patton Boggs;

    b. The Role of the United Nations by Shawn Stanley, Geographic Information Systems (GIS) Officer at the DOALOS of the United Nations;

    c. Processing applications for exclusive rights with the ISA and taking account of cables by Gwénaëlle Le Gurun, Legal Officer at the ISA; and

    d. The Role of the ICPC by Neil Rondorf, Chairman of the ICPC.

3. The second session presented the technical framework of submarine cables and deep seabed exploration for mineral resources:

    a. Deepsea Activities in the Area: Technical Framework by **Sandor Mulsow**, Head of the Office of Resource and Environmental Monitoring of the ISA;

    b. UK Seabed Resources Ltd – Sustainably Developing Deep Sea Minerals by **Ralph Spickermann**, Chief Engineer at UK Seabed Resources Ltd (UKSLR);

    c. How Industry Undertakes Submarine Cables Development Activity by **Ronald J. Rapp**, Director of Industry and Marine Liaison at TE Subcom,[21] Member of the Executive Committee of the ICPC.

4. The third session featured the legal framework of submarine cables and deep seabed activities in the Area:

    a. Deep Seabed Activities in the Area: Regulatory Framework by **Michael W. Lodge**, Deputy to the Secretary General and Legal Counsel at the ISA; and

    b. Cable System Planning by **Ronald J. Rapp**, Director of Industry and Marine Liaison at TE Subcom, Member of the Executive Committee of the ICPC.

5. The fourth session was an open discussion on how and what the ICPC and the ISA can communicate on the basis of the technical and legal issues raised in the previous sessions.

20 For a detailed agenda, please refer to Annex E.

21 For more information on TE Subcom, please refer to http://www.subcom.com/.

IV. Key Issues Discussed During the Workshop

IV. KEY ISSUES DISCUSSED DURING THE WORKSHOP

A. TECHNICAL FRAMEWORK

Important Facts on Submarine Cables

1. Representatives from the cable industry presented submarine cables as the **backbone of the global economy**. Today, 98 per cent of international telecommunications are carried by submarine cables. They have a lower latency and cost and a higher scalability than satellites. Submarine cables are particularly essential to financial transactions, shipping, air transportation and international logistics which affect the global economy. Major cable failures can effectively isolate a country's economy as well as the other countries relying upon its goods and services.

2. Submarine cables are not regulated by any organization on the high seas. Submarine cables do not have State sponsors. The impressive and effective submarine cable systems that are critical international infrastructure upon which the world depends are almost exclusively privately funded and the result of competitive private enterprise and the ingenuity of the engineers, commercial leaders, and mariners that plan and execute the manufacture and installation of submarine cable systems. A key component of the success of the world's international submarine cables is the long recognized **freedom to lay and maintain cables** in the world's oceans. This freedom allows market-based and efficient communications to flourish without the need for massive public investments or regulation.

3. It was explained that submarine cables are organized into **many independent systems**, rather than a single global network. There are about 265 cable systems in the oceans worldwide, reaching a total combined length of 1,576,481 km. Most systems are owned by a consortium of four to 30 private companies, except for some systems that are owned by a single company or a government. Not only are the cable systems shared, but also the cost and use of the cable ships used to repair cables and restore telecommunication services. This organization, by regional maintenance agreements among cable systems and cable ship operators, maximizes the resilience of cables because of a more efficient use of cable ships that are available at lower rates to carry out repairs. Repairs are important because with modern fibre optic cables, other cable systems are used as back-up during the repairs. This dynamic mesh of competing cable systems enables telecommunication companies to provide fast and reliable high speed voice, data, video, and internet services.

4. Representatives from the cable industry underlined that submarine cables remain **extremely costly to repair**, especially in high seas. The creation of a transatlantic cable system costs approximately half a billion US dollars. Repair operations can cost on average an extra-cost of US$1 to US$3 million. Cables are thus designed for an average service life of 25 years, and they are laid very carefully to minimize the risk of faults during this expected lifespan. In the high seas, cable repairs are particularly lengthy and technical, but they are also less frequent. Indeed, the great water depths protect cables from most human threats. However, submarine cables remain subject to natural threats, such as earthquakes, landslides and deep currents.

5. In this context, the **reduced carbon footprint** of submarine cables was emphasized. Several peer-reviewed papers and reports, such as the report prepared jointly by the ICPC and the United Nations Environment Programme (UNEP),[22] confirm that their environmental impact is "*minor if not negligible*." It was also the conclusion of a joint workshop held by the ICPC and the Sargasso Sea Commission on "*Legal and Environmental Issues in Areas Beyond National Jurisdiction*" on 23 October 2014.[23] The Sargasso Sea is an ecologically significant area surrounding the Bermuda EEZ in the deep North Atlantic Ocean. Cable owners discussed with scientists the impact of cables in such deep waters, and all participants agreed that it was minimal.[24] Indeed, cables are simply laid on the bed of the high seas without burial, after the conduct of a hydrographic survey to determine a cable route that avoids seamounts, smokers, thermal vents, and other geographic features with steep gradients. Evidence of cables recovered from deep water demonstrates that it rests benignly on the seabed and suffers no degradation.

6. Representatives from the cable industry elaborated on the different phases of cable development:

    a. During the **planning and surveying** phase, private owners or consortiums of telecommunication companies determine the route of the new system. First, they develop a general business case based on telecommunication traffic and route analysis. The objective is to follow great circle routes to minimize cable length, latency and cost. Cable owners then undertake a Desktop Study (DTS) to refine the landing sites and cable route, identify risks and mitigations, define permits needed, and establish budgetary costs. No permit is required in the high seas, which are beyond the national jurisdiction of any State.

        Cable projects may still be challenged by competitive users. In such circumstances, the cable owners contact them to organize the peaceful coexistence of their activities. For instance, cable owners routinely discuss safe crossing conditions with oil and gas companies, so that numerous cables are successfully laid over pipelines and other cables each year. ICPC Recommendation No. 3 provides criteria for the safe crossing of submarine cables and pipelines.[25]

        The DTS results in the production of a preliminary route position list (RPL), which provides the exact coordinates of the route intended for the new cable. Cable owners then charter a specialized vessel to conduct a marine cable route survey. The objective is to analyse the condition of the seabed along the route, to localize precisely the obstacles identified in the DTS, and to verify the absence of remaining obstacles. For this purpose, marine survey vessels use sophisticated tools such as single and multi-beam echo-sounders, side-scan sonars, sub-bottom profilers and magnetometers. The cable route survey is used solely to determine the optimal cable route and is incidental to the freedom to lay cables. The data obtained is proprietary to the cable owners and is not shared with third parties. For these reasons the cable route survey is not Marine Scientific Research (MSR) under UNCLOS.[26]

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22 **See** Lionel Carter et al., ***Submarine Cables and the Oceans – Connecting the World***, UNEP-WCMC/ICPC Biodiversities Series No. 31 (2009), http://www.unep-wcmc.org/system/dataset_file_fields/files/000/000/118/original/ICPC_UNEP_Cables.pdf?1398680911; **See** Burnett, Beckman, Davenport, Submarine Cables, ***The Handbook of Law and Policy***, Martinus Nijhoff Publishers (2014), Chapter 7, "Relationship Between Submarine Cables and the Marine Environment" at 179-212.

23 **See** Burnett, Freestone & Davenport, ICPC & Sargasso Sea Commission Workshop Report, ***Submarine Cables in the Sargasso Sea: Legal and Environmental Issues in Areas Beyond National Jurisdiction*** (Oct. 23, 2015), http://www.sargassoalliance.org/storage/documents/Submarine_Cables_in_the_Sargasso_Sea_Final_Workshop_Report_dated_16_January_2015.pdf.

24 A Summary of the Interactions Between Submarine Telecommunications Cables and the Marine Environment is in Annex F.

25 Available from the ICPC on request.

26 **See** UNCLOS, part XIII.

In the high seas, surveyors mostly use the echo-sounders for hydrographic application, because the main obstacles are seamounts and other geographic seabed reliefs. In shallow waters, cable owners need more precise data to assess the necessity and feasibility of cable burial. Some Coastal States may also require an environmental impact assessment (EIA) in areas within their national jurisdiction. After having identified all the obstacles, cable owners undertake a pre-lay grapnel run (PLGR) to clear the route prior to burial. These operations and an EIA are not necessary[27] or required in the high seas where cables are laid on the seabed without burial.

b. During the **manufacturing and installation** phase, cable owners proceed to the actual laying of the new cable. First, the factory supplies the appropriate length and type of cable and repeaters (optical amplifier) to match the RPL refined on the basis of the marine cable route survey. For depths greater than 2,500 metres, the cables are lightweight, with polyethylene cover but no protective armours. They are similar in diameter to a garden hose or a beer bottle cap, 17 to 20 millimeters. The system is loaded at the factory into specialized cable ships, which then lay the cable along the final RPL.

   In the high seas, laying operations are conducted at a typical speed of six knots or less. Transit speeds for cable ships when not laying cable, such as proceeding to a repair location, are generally 10 to 12 knots. Cable ships proceed slowly during laying and use precise location tools, such as GPS and sensors, to follow the route as closely as possible and to avoid cable slack when laid by following the seabed contour. Cables are not buried in the high seas and the extreme water depths of the Area.

c. During the **post-installation and maintenance** phase, cable owners intervene to prevent and repair damages. In the event of a fault, repair is urgently done to ensure the reliability of telecommunication services, because each cable acts as the backup for other cables. Cable ships are, thus, normally contractually required to sail within 24 hours of notice. In the case of repairs on the high seas, long transit times from the cable ship's base port are expected. Once the vessel has reached the location of the fault, repairs last four to seven days, but weather and seamanship skills are all factors in the speed of repair. Techniques have not changed significantly since the 19th century, except for safety improvements. This is especially true on the high seas.

   Cable ships first drag a grapnel to cut the cable close the fault location. After that, they pick up each end, cut out any damaged cable, and leave the clear end on a buoy. Cable ships then add a piece of spare cable long enough to reach between the two ends. If much length is added, they may need to install an extra repeater (optical amplifier). When the final splice is completed, cable ships carefully lay it on the seabed. In deep waters, cable operations normally plan a safety margin of twice the water depth on either side of the cable to run the grapnel without inadvertently damaging a cable and to give room for the final bight after the repair is complete.

   Repair operations are highly technical. They require an experienced crew as well as sophisticated tools and techniques. Cable ships must be able to endure harsh conditions for long periods of time. There are approximately 43 vessels meeting these conditions in the world. They are also designed to conduct laying operations. These specialized vessels have high charter rates. To maximize cost-efficiency, most cable owners enter into cable maintenance agreements, under which they share the cost of

27 For further information on the environmental impact of submarine cables, see Annex F.

maintaining cable ships on standby for either a specific zone or a private maintenance agreement for a specific cable system. They also enter spare cable storage agreements to share repair depot facilities at select base ports.

Cable owners take many precautions to avoid cable faults. Once a new cable is laid, they provide its "as laid" RPL to national hydrographic offices (***i.e.*** UKHO, SHOM, NOAA/DMA), which show the cable on their marine charts with a wavy magenta line, and issue notices to mariners to alert the other seabed users. There are no charts of the high seas or waters over 2,000 metres depth with enough depth accuracy to show submarine cables. Other means of communication remain available. Cable owners in coastal waters issue cable awareness charts to inform fishermen and other users on the precise location of their cables in certain areas of intense activity. These free charts are available in electronic format to facilitate use by vessels with electronic navigation equipment. For instance, the website KIS-ORCA provides an updated database of cable awareness charts in the European Union and North-East Atlantic region.[28]

In addition, cable owners monitor maritime trends and high-risk activities. They issue flyers with practical recommendations targeted at specific users engaged in activities that could damage cables. A good example is provided by the ICPC Fishing Booklet.[29] It is available in English, French and Spanish on the ICPC website, and distributed in many fisheries around the world. As a result, faults caused by fishing vessels are minimized. In deep waters, fishing vessels are particularly dangerous when they are bottom trawlers, which are likely to break unburied cables.

Cables are normally left in place at the end of their service life because their removal after 25 years in the marine environment can create more disruption than leaving them in place. Some cables are reused and relaid for new communication connections, especially for developing countries and islands. Others are donated for reuse as scientific cables. Still others are recovered for use as artificial reefs. Finally, in some cases, contract salvage of submarine cables by specialists takes place. ICPC Recommendation No. 1 reflects the custom and practice of the cable industry on the management of redundant and out-of-service cables.[30]

Important Facts on Deep Seabed Activities in the Area

7. Representatives involved in deep seabed activities highlighted some general similarities between submarine cables and deep seabed activities.

    a. Both activities take place on the **seabed of the high seas**, in the deepest waters of the oceans worldwide. They cover wide zones in the case of mineral exploration and long distances in the case of cables. Together, the exploration areas approved by the ISA exceed the size of Mexico. Each area consists of one or more contiguous or non-contiguous zone(s). The total exploration area varies according to the mineral resource in question: 75,000 square kilometres in the case of exploration for polymetallic nodules; 10,000 square kilometres in the case of exploration for polymetallic sulphides; and 3,000 square kilometres in the case of exploration for cobalt-rich ferromanganese crusts.

28 ***See*** http://www.kis-orca.eu/.

29 ***See*** Stephen Drew & Alan Hopper, ***Fishing and Submarine Cables - Working Together***, ICPC (2009), https://www.iscpc.org/publications/.

30 Available from the ICPC on request. ***See*** Burnett, Beckman, Davenport, ***Submarine Cables***, The Handbook of Law and Policy, Martinus Nijhoff Publishers (2014), Chapter 8, "Out-of-Service Submarine Cables at 213-222.

b. Deep seabed exploration and mining, like laying cables, rely on **highly sophisticated tools**, such as multi-beam echo-sounders to analyse the relief of the deep seabed, and grapnels and sampling tools to extract items and samples from the seabed. These tools are constantly monitored and improved by engineers, to increase their maneuverability and capacity. For instance, a mixed hydraulic/mechanic collecting system was recently designed by an ISA Contractor, but it has not yet been tested.

c. Contractors engaged in exploration share the **environmental concern** of cable owners. Pursuant to ISA regulations, they establish detailed environmental baselines to assess the biodiversity of exploration areas, and carry out monitoring programmes to evaluate the impact of their activities on the environment. These activities reflect the industry's return to mining and collection activities.

d. Another common feature of both activities is their **essential societal value**. Minerals are used to power electric devices, produce goods, and develop pharmaceutical products. Moreover, Contractors' activities in the Area play a significant role in the collection of data on the ecosystem and the biodiversity. Cables facilitate human interaction, science and international business, as well as providing greater access to the internet.

e. Like the installation and maintenance of cable systems, deep seabed exploration and exploitation require significant **up-front investments**, creating the same strong incentive to avoid risk.

8. Beyond these similarities, exploration and exploitation of mineral resources have specific characteristics that are connected to ISA regulations applicable to the type of minerals collected:

a. Contractors are now primarily interested in **Polymetallic Manganese Nodules**. These minerals result from the slow precipitation of Mn and Fe oxyhydroxides. Their size ranges from a few millimetres to more than 10 centimetres. They can be found in both open and enclosed waters, at depths from 800 to 6,000 metres. Their concentration varies from a few kilograms to more than 20 kilograms pro quadrat metre. So far, there are 16 exploration areas: 15 in the Clarion-Clipperton Fracture Zone (CCZ) of the Pacific Ocean, and one in the Indian Ocean.

b. Other minerals in the Area for which ISA Contractors have an interest are **Polymetallic Massive Sulphides**. They result from the heating of seawater through volcanic activity, which dissolves metal compounds, forming black smokers. Their size may exceed 10 metres. They are mostly found at depths of 1,000 to 4,000 metres, especially on mid-ocean ridges, island and volcanic arcs. There are six exploration areas: two in the MAR, three in the Central Indian Ocean, and one in the South-West Indian Ocean.

c. The third type of mineral subject to deep seabed exploration is **Cobalt Ferromanganese Crusts**. They result from the precipitation of manganese oxides and iron hydroxides associated with the oxygen minimum zone of the water column. This process occurs between depths of 500 and 2,000 metres, leading to various sizes of minerals. There are four exploration areas: two in the Western Pacific Ocean, one in the Magellan Mountains of the Pacific Ocean and one in the Rio Grande Rise in the South Atlantic Ocean.

9. The deep seabed Contractors have been described as more heterogeneous than those in the submarine cables industry . Each contract is unique, with a strategy adapted to the area and its resources. The **diversity of techniques** is also connected to the recent development of deep seabed exploration and exploitation. To collect minerals, Contractors can use active or passive systems, which can be dragged or proceed by themselves, relying on hydraulic or mechanical forces. It is too early to identify common practices.

10. All projects are still at the exploration phase, which precedes the exploitation phase:

    a. During the **exploration** phase, Contractors prepare the exploitation of the minerals present in a certain area. They collect, *inter alia,* geologic data on the seabed to localize and classify the minerals of interest. For this purpose, marine survey vessels are equipped with trappers of sediment, video cameras, grabs, box and multi-core samples. They use autonomous underwater vehicles (AUV) and human occupied vehicles (HOV) to explore water depths of 6,000 to 7,000 metres.

    Based on the results of the marine survey, Contractors assess the feasibility of future mining as well as its potential impact on the environment. They make an EIA prior to each mining test. They apply a precautionary approach, and establish a detailed environmental baseline as required by ISA regulations. The objective is to prepare for the next stage, the development of an exploitation plan of work, which defines the mineable area and its resources, as well as the mining schedule. In addition, Contractors develop a remediation plan of work, which defines specific measures to mitigate the environmental impact of their activities. These plans of work are necessary to start exploration and exploitation. So far, only exploration contracts have been granted. Contractors have 15 years to explore the area and implement the plan of work. Exploration contracts can be extended for up to five additional years in exceptional circumstances.

    b. During the **exploitation** phase, future mining Contractors will proceed to the actual collection of resources according to the plans of work. No project has reached this phase yet, so that exploitation techniques cannot be described. It is likely that Contractors engaged in exploitation will use tools similar to those used for exploration, but more intensely. They will need to conduct regular EIAs during the 20 to 30 years of exploitation.

Preliminary Risk Assessment

11. After comparing both activities, the participants analysed the risks of **mutual interferences**. They agreed that a submarine cable laid in a Contractor's area was at risk of damage at some stage of the exploration or exploitation. In such circumstances, both the cable owner and the Contractor would incur significant losses and damages.

12. The participants discussed the question of a **reasonable safety distance** between the operations of Contractors' and submarine cable operators in the Area. Representatives from the Contractor guaranteed the accuracy of their tools, which is necessary because of the irregular location of mineral resources on the seabed. Despite this accuracy, they explained that submarine cables would be hard to detect on the surface of the seabed. The metaphor of a murky "soup" of sediments was used to describe the lack of visibility. Therefore, it was recognized that knowledge or notice of the cable's position was integral to establishing safety margins. The cable industry said that if the mining Contractor used a magnetometer or an AUV to pinpoint the location

of the cable with precision, then a safety margin of 500 metres on each side of the cable would be acceptable. If no close determination was made by an AUV or other tool, then the safety margin of twice the water depth on either side of the cable would be the minimum acceptable safety margin. This approach opens the possibility of indirectly creating "cable corridors" in ISA mining areas.

13. Although representatives from the cable industry strongly supported the idea of "cable corridors", they cautioned that their delimitation could not be based on their "as laid" RPLs, which were not as precise in the Area as they were in shallow waters. They explained that cables were subject to deep currents during and after laying operations, and that, so far, nothing had justified the cost of developing techniques to localize cables more precisely in the Area. It was observed that Contractors could **pinpoint submarine cables** with their AUVs and HOVs during the exploration phase, although the cost would also need to be justified. In return, to avoid accidental damage to cables and for planning operations, cable owners could share the results of their marine survey on the exploration area, which could be of interest to Contractors.

14. However, it was stressed that the idea of "cable corridors" would significantly reduce mining possibilities by removing a section of Contractors' area for exploration or exploitation. It was recalled that contracts provided security of tenure and conferred on Contractors **exclusive rights**. The ISA was responsible for ensuring compliance with these terms. Therefore, the idea of creating "cable corridors" and restricting the exercise of exclusive rights of Contractors, in general, was not consensual. It was emphasized that most of the approved exploration areas were already non-contiguous, and that the future exploitation areas would, necessarily, be more reduced. The bottom line was that such an arrangement would need to be a private agreement worked out between the cable owner and ISA Contractor.

15. The participants thus agreed on the need to further develop **practical risk-avoidance strategies**, which may imply the improvement of the tools used by both industries to increase their precision. It was observed that the companies already involved in crossings would have a strong incentive to design efficient techniques in the Pacific and Indian Oceans. The ICPC and the ISA agreed to approach them and monitor the development of the situation.

(L-R: Sandor Mulsow (ISA), Gwenaëlle Le Gurun (ISA), and Keith Schofield (ICPC)

B. LEGAL FRAMEWORK

Submarine Cables under UNCLOS

1. It was explained that the submarine cables were subject to **several international treaties** applicable to areas beyond national jurisdiction: the 1884 Convention for the Protection of Submarine Telegraph Cables; the 1958 Convention on the High Seas; the 1972 Convention for the Prevention of Collisions at Sea; and the 1982 UNCLOS. The most comprehensive and widely implemented is UNCLOS, which sets out the legal framework within which all activities in the oceans and seas must be carried out. The 1884 Convention remains in force, as amended by the 1886 Declaration on the Protection of Submarine Cables and the 1887 Protocol on the Protection of Submarine Cables. It contains some provisions such as safety distances from cable ships and repair buoys not found in UNCLOS.

2. The Preamble of **UNCLOS** recognizes "*the desirability of establishing through this Convention, with due regard to the sovereignty of all States, a legal order for the seas and oceans which will facilitate international communication*". More precisely, as provided under UNCLOS, it is noted that "*beyond the outer limits of the 12NM territorial sea, the coastal State may not (and should not) impede the laying or maintenance of cables, even though the delineation of the course for laying of pipelines* [not cables] *on the continental shelf is subject to its consent*".[31]

3. Several provisions define the rules applicable to submarine cables on the bed of the high seas beyond the continental shelf:

   a. Article 87 recognizes "*the freedom to lay submarine cables*" as a **freedom of the high seas**. As such, it "*shall be exercised by all States with due regard for the interests of other States in their exercise of the freedom of the high seas, and also with due regard for the rights under this Convention with respect to activities in the Area*". It was explained that the freedom to lay submarine cables covers all types of cable operations, including cable route surveys and cable repair. Indeed, article 87 refers to article 79, which specifies that "*possibilities of repairing existing cables or pipelines shall not be prejudiced*".

   b. Article 113 establishes **criminal and civil liability** for damaging submarine cables in the high seas. It requires all States to criminalize the "*breaking or injury of a submarine cable*", whether the offence was "*done willfully or through culpable negligence*", and whether or not it resulted in an actual interruption of "*telegraphic or telephonic communications*". The only admissible defense for a vessel or master is to have "*acted merely with the legitimate object of saving their lives or their ships, after having taken all necessary precautions to avoid such break or injury*".

   c. Article 114 introduces the **"first laid" rule**. Cable owners who damaged another cable or pipeline while "*laying or repairing*" their own cable must "*bear the cost of the repairs*", and thus indemnify the owners of the "first laid" cable or pipeline.

   d. Article 115 encourages vessels to **sacrifice an anchor or fishing gear to protect a cable**. Cable owners must indemnify the cost of sacrifice of "*an anchor, a net or any other fishing gear, in order to avoid damaging a submarine cable*". The only condition is that "*the owner of the ship has taken all reasonable precautionary measures*

31 **See** UN FAQ on ***Maritime Space: Maritime Zones and Maritime Delimitation***, "Q7: What regime applies to the cables and pipelines?", at http://www.un.org/depts/los/LEGISLATIONANDTREATIES/frequently_asked_questions.htm.

beforehand". The indemnity does not extend to consequential damages or, in the case of a pipeline, to its contents.

4. Under UNCLOS, submarine cables enjoy extensive freedoms that are only limited by the obligation to exercise "due regard" for other users of the high seas. Although the expression appears in several provisions of UNCLOS, there is no clear definition of "*due regard*". It is generally understood that "*'due regard' requires all States, in exercising their high seas freedoms, to be aware of and consider the interests of other States in using the high seas, and to refrain from activities that interfere with the exercise by other States of the freedom of the high seas.*"[32] In practical terms, due regard requires both notice and consultation.

5. However, the space in which the laying and maintaining of submarine cables had been considered a freedom of the high seas is reduced as a result of the delineation of the continental shelf beyond 200 nautical miles. The coverage of the Area is similarly affected.

6. Information was provided on the recommendations that had been submitted by its Working Group to the General Assembly relating to the development of an international, legally-binding instrument under the Convention on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction. Several developments in other General Assembly bodies dealing with ocean issues were also highlighted. These included: the sixteenth meeting of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea in April 2015, which focused its attention on oceans and sustainable development; integration of the three dimensions of sustainable development, namely, environmental, social and economic; and a workshop of the General Assembly will address, in 2016, the impacts of bottom fishing on vulnerable marine ecosystems and the long-term sustainability of deep sea fish stock.

7. In reply, representatives from the cable industry emphasized that submarine cables had much less impact on the environment and were also threatened by bottom fishing. A lack of communication was identified, as well as a **lack of representation of the cable industry at the United Nations**. It was suggested that the ICPC could be invited to the 2016 workshop on sustainable fisheries or to other meetings of interest.

8. Significantly, the recent report on Oceans and Law of the Sea by the Secretary-General of the United Nations and Resolutions on Oceans and the Law of the Sea of the United Nations General Assembly have recognized the importance of submarine cables as critical international infrastructure, their benign environmental impact, and their value to enhanced socio-economic development and effectiveness as a tool to combat climate change.[33]

Deep Seabed Mining under UNCLOS

9. Deep seabed mining is governed by **UNCLOS exclusively**,[34] because the activity did not exist at the time of drafting the previous treaties on the law of the sea. The development of deep seabed mining actually fostered the adoption of UNCLOS, which tried to reach a compromise between the various interests at stake.

10. The UNCLOS creates the Area, and defines the general principles applicable to deep seabed exploration and exploitation in the Area:

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32 **See** Nordquist et al., ***United Nations Convention on the Law of the Sea 1982 - A Commentary***, Volume III (1995), p. 264.

33 Oceans and the Law of the Sea, Seventieth Session, ***Report of the Secretary-General***, March 2015, at paragraphs 53-55 [Laying of Submarine Cables]. For the latest resolution on the oceans and the law of the sea, see A/RES/69/245, paragraphs 151-154.

34 Later modified by the 1994 Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea.

a. Article 136 recognizes "*the Area and its resources*" as "*the* ***common heritage of mankind***".

b. Article 137 precludes States from claiming or exercising "*sovereignty or sovereign rights over any part of the Area or its resources*", because "*all the* ***rights in the resources of the Area*** *are vested in mankind as a whole, on whose behalf the Authority [ISA] shall act*". It creates an exception for "*the minerals recovered from the Area*", which "*may only be alienated in accordance with this Part and the rules, regulations and procedures of the Authority*."

c. Article 140 requires activities to "*be carried out for the benefit of mankind as a whole*" in the Area. It missions the ISA to "*provide for the* ***equitable sharing*** *of financial and other economic benefits derived from activities in the Area through any appropriate mechanism, on a non-discriminatory basis*".

d. Article 141 opens the Area "*to use exclusively for* ***peaceful purposes*** *by all States*".

e. Article 147 requires activities in the Area to be "*carried out with* ***reasonable regard*** *for other activities and the marine environment*" in the Area and requires that "*Other activities in the marine environment shall be conducted with* ***reasonable regard*** *for activities in the Area*". This is elaborated in the Regulations on Prospecting and Exploration adopted by the ISA. More specifically, it provides that in the process of considering an application for approval of a plan of work, the Legal and Technical Commission must determine whether the proposed plan will "ensure that installations are not established where interference may be caused to the use of *recognized sea lanes essential to international navigation or in areas of intense fishing activity*". It was emphasized that the original wording precluded interferences "*with the use of recognized sea lanes essential to international navigation or other established maritime activities in the area*". This wording would have included submarine cables. But, as noted previously, Article 87(2) imposes a due regard obligation in the exercise of all of the freedoms listed in that article, including navigation and laying of cables and pipelines.

f. Article 153 requires activities to be carried out "*in association with the Authority by States Parties, or state enterprises or national or juridical persons which possess the nationality of States Parties or are effectively controlled by them or their nationals, when* ***sponsored by such States***". It means that each ISA Contractor must have a sponsoring State.

11. The UNCLOS also creates the ISA, and defines the role of each of its organs in the regulation of deep seabed mining:

a. Article 160 institutes the **Assembly** as "*the supreme organ*" of the ISA with "*the power to establish general policies*" on any issue arising in the Area. Its members are the 166 States parties to UNCLOS as well as the European Union.

b. Article 162 institutes the **Council** as "*the executive organ*" of the ISA with two main powers: to "*approve plans of work*" with the help of the Legal and Technical Commission, and to "*make recommendations to the Assembly*" with the help of its Economic Planning Commission. The 36 members of the Council are elected through a complex mechanism detailed in the previous article. It aims at representing various interests: consumer States, investing States, exporting States, developing States, and other States for an equitable geographic representation.

c. Article 170 institutes the **Enterprise** as "*the organ of the Authority which shall carry out activities in the Area directly*". So far, its functions have been performed by the Secretariat of the ISA.

12. As a result, deep seabed activities are more regulated than the essentially unregulated submarine cables in the Area. All deep seabed projects are subject to the same permitting process, and all contracts include some standard terms imposed by the Regulations of the ISA.[35] It was underscored that Contractors carry out their activities in the area under contract in respect of a mineral resource with exclusive rights. It was also emphasized that the ISA had no jurisdiction over cable owners, because they simply laid their cables on the deep seabed without exploring, exploiting or otherwise affecting its resources. Both Contractors and cable owners are subject to a similar obligation of **"*due*" or "*reasonable regard*"** in the Area.

Preliminary Liability Assessment

13. The participants agreed that both activities (cables and mining) were expressly authorized under UNCLOS, but that they had to be carried out with "due regard" for each other. They also agreed that UNCLOS did not provide how to resolve conflicts between cable owners and ISA Contractors. In this context, they noted the critical importance of due regard, not only to prevent disputes, but also to assess liabilities in the event of a dispute.

14. The participants understood due regard as requiring both notice and consultation. Main consideration was given to notice, and how it could and should be given by cable owners and ISA Contractors in the Area. The ISA and the ICPC agreed to do their utmost to facilitate the exchange of notice, whether actual or constructive:

    a. Cable owners and mining Contractors can give **actual notice** of their operations, through direct contact, on a voluntary basis. On the one hand, the ICPC agreed to inform cable owners who are ICPC members on the location of ISA Contract areas, when such information was released to the public by the ISA, so that cable owners could notify the ISA Contractors impacted by their activities. On the other hand, the ISA agreed to ask applicants to inquire about the presence of submarine cables in their area of interest, so that they could notify the cable owners affected by their project. Representatives from the ISA explained that to give effect to article 147 of the Convention, it was common practice that applicants were asked whether there were cables in the proposed area for exploration but the problem is how applicants can know if this information is not publicly available. This practice, which had been developed in the course of processing applications for approval of plans of work was well received by applicants. For instance, China Minmetals Corporation, which submitted an application for approval of a plan of work for polymetallic nodules on 8 August 2014, provided the following reply to a written question of the Legal and Technical Commission in February 2015:

    "*The applicant also informed the Commission that it had considered the issue of possible existence of submarine cables or pipelines in the area under application. The applicant stated that it attaches great importance to mutual accommodation of activities in the area and in the marine environment as stipulated in article 147 of the Convention and relevant provisions of the regulations. In accordance with the relevant international law, the applicant declares that it will take all necessary measures to ensure the proper*

35 **See** "Mining Code", http://www.isa.org.jm/mining-code.

protection of submarine cables or pipelines. It also indicated its willingness to cooperate actively and fully with the Authority and the owners and operators of submarine cables or pipelines."[36]

It was recalled that UNCLOS did not expressly preclude overlaps between mining areas and submarine cables. It was suggested that the ISA could amend its Regulations and Recommendations on Prospecting and Exploration to mention submarine cables, and that it could take cables into account in a due regard context in the current development of the regulatory framework for mineral exploitation of the Area. Some expressed concern for the preservation of the exclusive rights of ISA Contractors.

An idea was brought forward to subject submarine cables to the same procedure as for historical discoveries. When ISA Contractors make historical discoveries in their exploration area, they must inform the ISA, which contacts the United Nations Educational, Scientific and Cultural Organization (UNESCO). ISA Contractors are then required to protect the historical discoveries. Similarly, ISA Contractors could be required to notify the discovery of submarine cables to the ISA, which would inform the cable owners with the help of the ICPC. Both users would be left to pursue their due regard obligations under UNCLOS.

The ICPC pointed out that submarine cables were largely exempt from most requirements in the 2001 Convention on the Protection of the Underwater Cultural Heritage.[37] The decision of the drafters was based on the long experience of cable laying, which whenever possible, avoided shipwrecks or other items that attracted human activities that might threaten a cable.

b. Cable owners and ISA Contractors can also give **constructive notice** of their operations, through indirect contact. In this respect, the useful example of charting cables in depths less than 2,000 metres as recommended by the IHO was described. Under this well-established practice, when a submarine cable system is laid, the owner submits the "as laid" RPL that provides the latitude and longitude of its estimated position on the seabed to charting authorities (UKHO, SHOM, NOAA/DMA, and local coastal authorities). Upon receipt of the RPL, the charting authorities have the discretion to issue nautical charts and notices to mariners that mark the cable using the standard symbol of a wavy magenta line. Nautical charts are used by mariners worldwide to navigate safely and avoid submarine cables. ICPC Recommendation No. 5 fosters compliance with this procedure in the cable industry.

   So far, the IHO has not recommended charting cables in depths greater than 2,000 meters and therefore there is no IHO chart showing ISA contract areas. The participants discussed the utility of asking the IHO to consider issuing charting recommendations for zones of ISA contract areas. On these high seas charts, the "as laid" RPL of any submarine cable could be shown. This would allow mariners and other users to be aware of each other's activities and infrastructures. Such constructive notice would then allow the competing users of the seabed to contact each other and work out practical arrangements to reduce risks to all concerned.

   Regarding the coordinates of contract areas, the ISA already makes them publicly available once a contract has been awarded. Contractors can therefore encourage

36 ISBA/21/C/2, Report and recommendations of the Legal and Technical Commission to the Council of the International Seabed Authority relating to an application for the approval of a plan of work for exploration for polymetallic nodules by China Minmetals Corporation, paragraph 17.

37 2 November 2001, 41 *I.L.M.* 337 (2002) (entered into force 2 January 2009).

the publication of high seas charts to protect their activities once published by the ISA. Nevertheless, these charts could only show the exploration and exploitation areas already approved by the ISA, and not those under review since at that time coordinates are confidential. For competition reasons, the ISA can only communicate the delimitation of broad application zones, and not the detailed coordinates of projects.

Representatives from the cable industry raised two objections against the publication of the coordinates of submarine cables. First, the accuracy of "as laid" RPLs is not as precise in the high seas as it is in shallow waters because of the great depths involved, the currents, and the long catenary required for a deep ocean lay operation. Cables are laid thousands of metres behind the cable ship, in waters impacted by deep currents. Second, "as laid" RPLs are proprietary to cable owners, who keep them confidential for security and competition reasons. Cable owners only share them with governments to obtain permits, and with other users to determine safe crossing conditions. It was emphasized that the risk of terrorism is limited in the high seas, and that the risk of interference with deep seabed activities creates a strong incentive to disclose the general route of cables to ISA Contractors. The users affected by eventual crossings could enter confidentiality agreements to share more detailed information on their respective infrastructures and operations.

The participants thus agreed to approach the IHO to determine the interest and feasibility of high seas charts where the ISA had awarded contracts. If published, cable owners could provide RPL data that would be shown in these areas under contracts. It should be emphasized that this initiative would be limited to ISA contracts in the Area and not the high seas beyond the contract's area. The ICPC underlined that IHO representatives would attend its plenary meeting in Hong Kong in April 2015, and offered to approach them on this occasion about the prospects and procedures for such an effort by the IHO. Information received would then be shared with the ISA. It was also suggested that the ISA and/or ICPC could present a copy of this report to the IHO for its consideration and feedback.

15. The participants considered two scenarios of possible disputes between cable owners and ISA Contractors:

    a. The first scenario corresponds to the allocation of a **new contract area over a submarine cable already laid** on the seabed. The Contractor can explore and/or exploit the area, and legally come close to the cable so long as the cable is not damaged or the possibility of its repair threatened. It is highly recommended that due regard by the Contractor involves contacting the cable owner to exchange information and work out practical measures to reduce the risk of damage and not jeopardize the possibility of repair. If the Contractor or its vessels had been notified of the location of the cable and negligently or willfully damaged it in the course of their operations, the Contractor and any vessels it used would be subject to admiralty claims by the cable owner for the cost of repair of the cable and restoration of communication services.

    b. The second scenario corresponds to the laying of a **new cable system through a contract area already granted** by the ISA. This situation is more hypothetical because there are few new cable projects, whereas deep seabed mining is just starting to consider exploitation. Nonetheless, it is highly recommended that due regard by the cable owner involves contacting the ISA Contractor concerned to

exchange information, through the regulators, and work out practical measures to reduce the risk of damage to Contractor's operations and/or damage to the cable or the vessel that laid it. These measures may include: (a) voluntarily avoiding the contract area in its entirety; (b) laying the cable in an area designated as determined by ISA regulations; (c) laying the cable in a contract area where activities are unlikely due to economic considerations; and (d) establishing mutually acceptable practical protocols with the Contractor taking into account laying and repair of the cable and operations under the contract.

16. In both scenarios, a premium was placed on the **individuals** affected - cable owners and ISA Contractors - to work out practical measures for the peaceful sharing of the international seabed Area.

17. It was suggested that the ICPC and the ISA could draft a joint **code of conduct** to help cable owners and ISA Contractors to coexist successfully in the Area. It was agreed that engineers of both sectors would collaborate to develop the technical content.

18. There were debates on the legal status of such a document:

    a. The **ICPC** could transpose it into a Recommendation, which is a non-binding instrument "*intended as a guide to aid cable owners and other seabed users in promoting the highest goals of reliability and safety in the submarine cable environment*". The ICPC had already issued 15 Recommendations on multiple aspects of cable operations that were widely followed in the cable industry.[38] They were updated every two to three years. They reflect the custom and practices of the cable industry. Two of them were distributed to the participants as examples: Recommendation No. 1 on the Management of Redundant and Out-of-Service Cables, and Recommendation No. 15 on the Procedure to be Followed Whilst Marine Aggregate Extraction, Dredging or Mining is Undertaken in the Vicinity of Active Submarine Cable Systems.[39] ICPC Recommendations are available to the public upon request.[40]

    b. The **ISA** could transpose it into a Recommendation, a Regulation or an ad-hoc non-binding document. It was emphasized that a Recommendation would be easier to adopt than a Regulation, because it would only require approval of the Legal and Technical Commission. However, there was the objection that an ISA recommendation would be binding on all Contractors whereas an ICPC recommendation would not be binding on cable owners. In addition, objections were made that this way would "*perpetrate the imbalance of power from the organizations to the companies*". Dialogue and exchange of information was the way forward which was preferred over recommendations and regulations.

L-R: Ronald J. Rapp (ICPC), Keith Schofield (ICPC), Alice Leonard de Juvigny (Squire Patton Boggs (US) LLP), Sandor Mulsow (ISA), Jennifer Warren (UKSRL) and Ralph Spickermann (UKSRL)

38 For a list of the ICPC Recommendations, please refer to https://www.iscpc.org/publications/recommendations/.

39 Available from the ICPC on request.

40 www.iscpc.org, address the request by email to the Managing Director, ICPC.

V. Conclusions and Way Forward

V. CONCLUSIONS AND WAY FORWARD

1. At the end of the Workshop, there was **general consensus** on several key points:
    a. Under UNCLOS, both submarine cables and deep seabed activities are expressly authorized, and required to exercise due regard for each other.
    b. In the absence of a provision of UNCLOS on the resolution of conflicts between cable owners and ISA Contractors, the best strategy is to avoid disputes and reduce risks with practical solutions by privileging dialogue and exchange of information in compliance with the due regard obligation and to adopt practical procedures to reduce risks.
    c. While not defined in UNCLOS, due regard requires first notice, which can be actual or constructive, and then consultation between the cable owners and the Contractors engaged in competing activities in the international seabed Area.
    d. Charting the submarine cables in exploration areas under contract and the ISA publicly designated exploration areas present in the international seabed Area would help the exchange of notice and the consultation.
    e. Cable owners and ISA Contractors need to elaborate practical ways to avoid mutual interferences in crossing areas, such as the development of more precise location and avoidance techniques.
    f. Cable owners and ISA Contractors need to assess their mutual liabilities in the event of a fault to a submarine cable or damage to a Contractor's infrastructure on the seabed to facilitate the resolution of disputes.
    g. The ICPC and the ISA can play an important role in the exchange of information, to help their respective members advance common interest and address "due regard" obligations.
2. The participants agreed on several **recommended actions**:
    a. The ICPC and the ISA should contact the owners of the submarine cables and the exploration Contractors involved in the two crossings that they identified in the Pacific and Indian Oceans, and help them to cooperate in finding efficient crossing solutions should exploitation occur in the future.
    b. The ICPC and the ISA should exchange points of contact and public information, such as the location of areas under contract, and facilitate the communication between cable owners and Contractors involved in potential crossings.
    c. The ICPC and the ISA should invite each other to their respective annual meetings, which will take place in April 2015 in Hong Kong (ICPC) and in July 2015 in Jamaica (ISA).
    d. The IHO should be approached to discuss the interest and feasibility of charting ISA exploration areas in the Area, to show the eventual presence of submarine cables in them.
    e. Techniques of risk-reduction should be reviewed by engineers of both industries.
    f. The ICPC and the ISA could consider a draft joint code of conduct with practical recommendations to cable owners and Contractors. Alternatively, the ICPC could consider an ICPC Recommendation to address the laying and maintenance of cables

in ISA exploration areas under contract. The ISA could also consider providing appropriate guidance to its Contractors on the conduct of activities in the vicinity of submarine cables. Drafts of these documents should be circulated among the Workshop participants for practical feedback before any external distribution.

g. The ICPC and the ISA should organize a follow-up meeting or workshop in 2016 to review mutual progress. The date of the workshop is to be fixed through a phone-conference in August 2015.

3. The Workshop was concluded with an enthusiastic closing statement by Neil Rondorf, Chairman of the ICPC: "*We are pleased to have connected members of ISA and ICPC to learn more about one another and to have shared important information that benefit both organizations in regard to building a relationship between seabed users in the subsea mining and subsea cable sectors.*" Michael W. Lodge, Deputy to the Secretary General and Legal Counsel of the ISA, agreed: "*The inaugural and joint workshop was an excellent starting point to help foster the collaboration between the ISA and ICPC that originated from our bilateral Memorandum of Understanding. We look forward to future conversations.*"

Michael W. Lodge (ISA)

VI. Annexes

Annex A

MEMORANDUM OF UNDERSTANDING BETWEEN THE ICPC AND THE ISA

MEMORANDUM OF UNDERSTANDING BETWEEN THE INTERNATIONAL CABLE PROTECTION COMMITIEE AND THE INTERNATIONAL SEABED AUTHORITY

The purpose of this Memorandum of Understanding is to specify the scope of co-operation between the International Cable Protection Committee Ltd (hereinafter referred to as "the ICPC") and the International Seabed Authority (hereinafter referred to as "the Authority").

WHEREAS:

The ICPC is an organization representing the submarine cable industry that has been established to promote the security and safeguarding of submarine cables against man-made and natural hazards;

Submarine cables provide critical infrastructure and the laying of submarine cables is one of the freedoms of the high seas under articles 87 and 112 to 115 of the United Nations Convention on the Law of the Sea of 10 December 1982 ("the Convention"), which freedoms shall be exercised by all States with due regard for the interests of other States and for the rights under the Convention with respect to activities in the Area, defined in article 1(1) of the Convention as the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction;

The Authority is the organization through which States Parties to the Convention shall, in accordance with Part XI of the Convention and the Agreement relating to the Implementation of Part XI of the Convention adopted on 28 July 1994 by the United Nations General Assembly, Resolution 48/263 ("the Agreement"), organize and control activities in the Area, particularly with a view to administering the mineral resources of the Area;

Both the ICPC and the Authority have a strong interest in the protection of the marine environment from harmful effects arising from their respective activities;

Increased co-operation between the ICPC and the Authority would help to avoid potential conflicts between the laying and maintaining of submarine cables and current and future activities in the Area;

THE ICPC AND THE AUTHORITY THEREFORE AGREE:

1. To consult, where appropriate and practical, on issues of mutual interest with a view to promoting or enhancing a better understanding of their respective activities;
2. To invite each other's representatives to attend and participate in the meetings of their respective governing bodies as observers in accordance with the rules of procedures of such bodies;
3. To exchange where practicable or to facilitate by direct liaison with the owners of international cable systems information on cable routings and prospecting and exploration areas, subject to confidentiality provisions;
4. To co-operate, where appropriate and practical, in the collection of environmental data and information and, where possible, to exchange standardized data and information;
5. To conduct, where appropriate, co-operative studies and seminars;

6. To invite each other's representatives to participate in relevant meetings of experts and workshops;

7. That this Memorandum of Understanding is without prejudice to agreements concluded by either party with other organizations and programmes;

8. That the co-operation between the two organizations referred to herein is subject to the requirements of confidentiality of data and information imposed upon the Authority by the Convention, the Agreement and the relevant rules, regulations and procedures of the Authority in respect of data and information submitted to it by applicants and Contractors for exploration and exploitation in the Area and upon the ICPC in accordance with its rules, articles and member approval as provided therein;

9. That this Memorandum of Understanding will come into effect upon its signature by the Chairman of the ICPC and the Secretary-General of the Authority. It may be terminated by any of the parties by giving to the other a written notice six months prior to the proposed date of termination;

IN WITNESS WHEREOF the undersigned have signed the present Memorandum of Understanding in duplicate.

The Chairman of the
International Cable Protection Committee
Date: (written) 25 February 2010

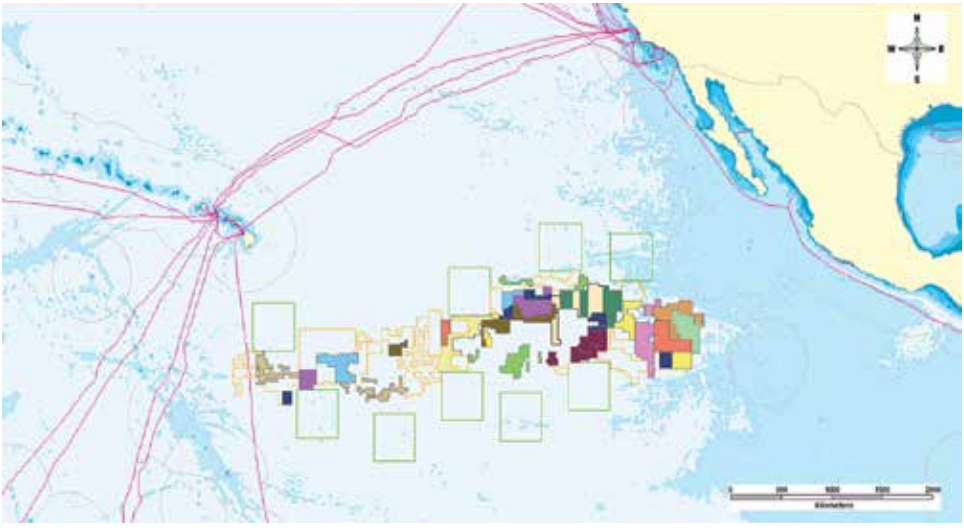
The Secretary-General of the
International Seabed Authority
Date: 15 December 2009

Annex B

MAP OF THE CROSSING BETWEEN CABLE SAFE AND THE POLYMETALLIC SULPHIDES EXPLORATION AREA IN THE INDIAN OCEAN

Annex C

MAP OF THE CROSSING BETWEEN CABLE HONOTUA AND THE POLYMETALLIC MANGANESE NODULES EXPLORATION AREA IN THE PACIFIC OCEAN



Annex D

LIST OF WORKSHOP PARTICIPANTS

Mexico

Galo Carrera, Vice-Chairman, Commission on the Limits of the Continental Shelf

Alejandro Sousa Bravo, Legal Counsellor, Permanent Mission of Mexico

Permanent Mission of Singapore

Seema Parkash, First Secretary

Borg Tsien Tham, Counsellor

Squire Patton Boggs (US) LLP

Alice Leonard de Juvigny, Law Clerk

UN-DOALOS

Shawn Stanley, GIS Officer

ICPC

Douglas R. Burnett, International Cable Legal Adviser

Ronald J. Rapp, Executive Committee

Neil E. Rondorf, Chairman

Christine Schinella, Secretariat

Keith Schofield, General Manager

UK Seabed Resources Ltd

Ralph Spickermann, Chief Engineer

Jennifer Warren, Vice President, Technology Policy and Regulation, Government and Regulatory Affairs

ISA

Michael W. Lodge, Deputy to the Secretary-General and Legal Counsel

Gwenaëlle Le Gurun, Legal Officer

Sandor Mulsow, Head, Office of Resource and Environmental Monitoring

Annex E

WORKSHOP AGENDA

DAY ONE (Tuesday 10 March 2015)

Time	Session Summary	Presentation Title
2:00-2:15pm	Introduction, Welcome, Opening Statements from ISA and ICPC	**ICPC**: Keith Schofield, General Manager & Neil Rondorf, Chairman ISA: Michael W. Lodge, Deputy to the Secretary-General and Legal Counsel
2:15-3:15pm	**ISA and ICPC:** How UNCLOS applies to mining and cable activity, ISA concession approval process	**ICPC:** Douglas Burnett, International Cable Legal Adviser: *The dilemma of competing uses: submarine telecommunication cables and ISA mining concessions* **ISA**: Gwenaëlle Le Gurun, Legal Officer: *Processing applications for exclusive rights with the ISA and taking account of cables* **UN/DOALOS:** Shawn Stanley: GIS Officer *Submarine cables: the role of the United Nations*
3:15-3:30pm	**Break**	
3:30-4:30pm	**ISA and ICPC:** The respective roles of the ISA and the ICPC	**ICPC**: Keith Schofield, General Manager & Neil Rondorf, Chairman *The role of the ICPC* **ISA**: Sandor Muslow, Head, Office of Resource and Environmental Monitoring: *The role of the ISA*
4:30-5:30pm	**ISA**: How deep sea mining exploration is carried out, Previous and current concession applications to ISA	**UK Seabed Resources Ltd. (UKSRL):** Ralph Spickermann **ISA**: Sandor Muslow, Head, Office of Resource and Environmental Monitoring: *Deep Sea Mining in the Area: Technical framework*
5:30-5:45pm	**Break**	
5:45-6:45pm	**ICPC:** How industry undertakes submarine cable development activity	**ICPC:** Ronald J. Rapp, Executive Committee Video and Presentation: *How industry undertakes submarine cable development activity*
6:45-7:00pm	**All:** Feedback and achievements from Day 1. (All) (Keith Schofield with Michael W. Lodge).	**Day One of Workshop:** *Feedback and achievements*

DAY TWO (Wednesday 11 March 2015)

Time	Session	Presentation Title
10:00-10:15	Review of objectives for day 2 (Keith Schofield with Michael W. Lodge).	**Welcome to Day Two:** *Review of objectives* **ICPC:** Keith Schofield, General Manager
10:15-11:15	**ISA:** ISA regulatory process	**ISA:** Michael W. Lodge, Deputy to the Secretary-General and Legal Counsel
11:15-11:30	**Break**	
11:30-12:30	**ICPC:** Cable system planning and permitting	**ICPC:** Ronald J. Rapp, Executive Committee *Cable system planning and permitting*
12:30-1:30	**In-House/Working Lunch**	
1:30-2:30	**ICPC and ISA:** What we need to communicate now	*What and how ICPC and ISA will communicate* **ICPC:** Keith Schofield, General Manager **ISA:** Sandor Muslow, Head, Office of Resource and Environmental Monitoring
2:30-3:30	**ICPC and ISA:** How we will communicate from now	*What and how ICPC and ISA will communicate* **ICPC:** Keith Schofield, General Manager **ISA:** Michael W. Lodge, Deputy to the Secretary-General and Legal Counsel
3:30-3:45	**Break**	
3:45-4:45	**All:** Feedback and Workshop Recommendations (Keith Schofield with Michael W. Lodge).	**Day Two from Workshop:** *Feedback and recommendations*
5:00	**End of Workshop**	

Annex F

ENVIRONMENTAL IMPACTS OF SUBMARINE CABLES

By Lionel Carter, ICPC Marine Environmental Advisor, Professor, Marine Geology, Antarctic Research Centre, Victoria University of Wellington, New Zealand

Environmental Impacts

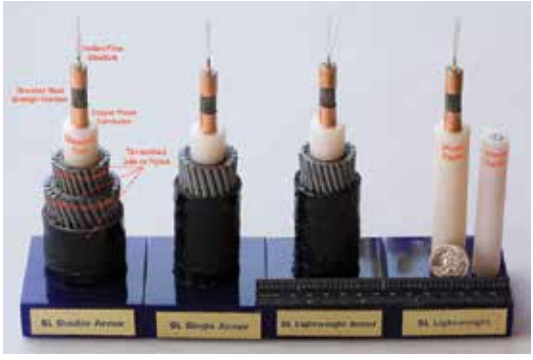
A substantial peer-reviewed literature shows conclusively that submarine telecommunications cables have nil to minimal impact on the marine benthic environment. e.g. [12], [13] Reviews and analyses of that literature can be found in Burnett et al. (2014)[14] and UNEP/ICPC (2010).[15] Here we present a synopsis of the main findings:

Operations

- For water depths deeper than about 1,500m, cables are laid directly on the seabed. There is no requirement for protective burial, hence seabed disturbance is minimal.[14, 15]
- Laying is planned to be an one-off operation in the 20-25 year design life of a cable, but faults may occur mainly via human-related and natural hazards.[16, 17]
- When repairs are needed, grapnels are used for cable recovery and these can disturb the seabed along a metre-wide path. The recovered cable is repaired and lowered to the seabed to minimize further disturbance.[18] Again, a repair is planned to be a one-off-operation in a cable's remaining design life.
- Cables on the continental shelf where water depths are typically less than 200m, may be buried for protection against bottom trawl fishing and ships' anchoring - the main causes of cable faults. Burial by plough or water jet will disturb the seabed along a narrow corridor of ~2-8m wide depending on the plough size. Disturbed seabed recovers especially in the presence of ocean currents and waves with no long lasting impact on the biota. [19, 20] Burial is generally a non-repetitive activity unless a cable requires repair.

Telecommunication Cables

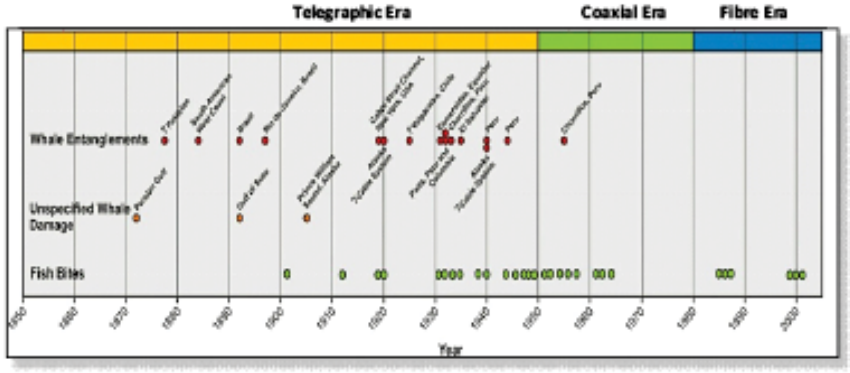
- The size of a cable in water depths greater than 1,500m is 17-21mm diameter hence its physical footprint is small.[21, 22] Such depths account for over 85 per cent of the world's oceans. On the continental shelf, cable dimensions can increase to up to 50mm diameter due to the addition of galvanized wire armour.[21]
- Cables are protected by a substantial sheath of marine-grade polyethylene, which is inert in the ocean. [23, 24]



- A deep water sample of a fibre-optic cable, partly exposed to show the internal components, which include (from inside to out) glass fibres, copper conductor, steel wire strength member, polyethylene sheath (white) bite protection (silver) and black polyethylene external sheath.
- New armoured cables may leech zinc from the galvanized wire, but laboratory tests performed in closed tanks show the amounts emitted are typically less than 10 parts per million. These concentrations decline over three months in the laboratory and reduce markedly in the ocean due to dilution. Finally, zinc is an essential element needed for marine organisms.[25]

Interaction with Marine Biota

- Research into cables and benthic organisms show there is no statistical difference in the abundance and diversity for organisms living near and away from a cable. [19, 20, 26]
- Whale entanglements with cables ceased with the transition from telegraph to coaxial cables in the early 1960s and fibre-optic systems in the late 1980s.[27] This change reflected improved cable design, laying techniques and seabed mapping.
- Fish bites, including those of sharks, have damaged cables, but faults have reduced due to improved bite protection. Bite-related faults have not been reported since 2006.[17, 27, 28]



Record of whale entanglements (red dots) that ceased in the 1950s with the introduction of improved cable design and deployment. The number of fish bites has declined with time due to improved bite protection. No cables have failed due to bites since 2006.

Natural Hazards

- Worldwide, natural hazards account for less than 10 per cent of all cable faults. As a seismically stable region, Australia can expect a low incidence of submarine landslides and turbidity currents, [cf 29] which are a prime cause of cable faults.
- Sediment movement on the continental shelf may result in cable abrasion and fatigue but related faults are few, attesting to the effectiveness of cable armouring and/or burial. A detailed review of worldwide fault statistics by the International Cable Protection Committee, shows no faults in Australia's territorial seas and EEZ from 2008-2014. This reflects a low-risk environment and Australia's modern and effective cable protection legislation that discourages conduct by vessels and third parties likely to cause damage to its cables that Australia regards as critical national infrastructure. Climate change is strengthening ocean currents and the intensity/frequency of storms are likely to enhance

sediment transport on the continental shelf, [30, 31] but burial and/or adequate cable armour will meet that challenge. Sea level rise and its amplification by storms may also pose a risk to coastal infrastructure.[32] The industry is well aware of these potential threats and has the expertise to adapt to change.

Submarine Power Cables

Much of the aforementioned summary applies directly to submarine power cables[25] while noting that power cables are larger (150mm diameter in the case of Basslink interconnector) than their telecommunications counterpart. In essence, power cables have a low environmental impact but questions have been raised concerning the impacts of electro-magnetic fields on the marine fauna. Reviews [e.g.33] have not found conclusive evidence that EMF affects the behaviour of swimming or sessile organisms in the open ocean. One of the most intensively studied cable systems is ***Basslink*** that connects the power grids of Victoria and Tasmania. An independent board concluded from the observational and modelling studies[34, 35] that:

- Magnetic fields associated with the cable are similar to those predicted from theory with effects dropping rapidly with distance from the cable. Beyond 20m distance, the field is indistinguishable from background fields;
- The Basslink cable was trenched by jetting and after one year there was no evidence of the trench at over one-third of observation sites. Elsewhere, trench remnants were infilling with sediment that provided a habitat for a usually sparse benthic flora and fauna; and
- Where the cable system crosses rocky reefs, the steel pipe protecting the cable was encrusted with a biota that was indistinguishable from that of the natural reef.

Other Environmental Considerations

Submarine cables also play a role through the provision of data and knowledge on the marine environment – a benefit realized through collaboration with the science community.

1. Recovered cables yield biological samples for museum and university collections.[36]
2. Cables underpin the communications and data transfer for major ocean science observatories including Ocean Networks Canada and the Ocean Observatories Initiative.[37, 38]
3. Cables act as sentinels of the deep ocean providing information on processes that shape the ocean floor such submarine landslides and turbidity currents.[39]
4. Discussions are underway between the industry, academia and the International Telecommunications Union regarding the feasibility of equipping cables with environmental sensors to monitor ocean change and hazards. [40]
5. Cables provide a communications service that markedly reduces greenhouse gas emissions.[41] For a two-day teleconference between Stockholm and New York lasting eight hours/day, 5.7kg of CO_2 would be released compared to 1,920kg emitted for the face-to-face meeting, which involved 16,000 km of air travel. This study highlights the modest carbon footprint of submarine telecommunications and their contribution to reducing greenhouse gas emissions.

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