



ICPC Recommendation

Recommendation No. 6

Recommended Actions for Effective Cable Protection (Post Installation)

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1. INTRODUCTION

This recommendation concerns post-installation measures to mitigate the risk of cable faults caused by human activities such as fishing and vessel anchoring. Such measures are often referred to as marine liaison, offshore liaison, or cable awareness. This document is not intended to cover physical protection such as burial and other measures that may be taken during installation or remediation.

The activities and risks that affect cables vary a great deal from one area to another. For example, in some areas the greatest risks are caused by trawlers on the continental shelf. In other areas, static fishing gear carrying anchors or weights may cause major risks, or the greatest risks may be from the anchors of merchant ships, offshore dredging or mining. In some areas, the risks are spread over a broad continental shelf used by many different vessels, and in others only a short length of cable may be at risk on a narrow shelf or slope. Consequently, very different measures may be appropriate in different areas, even when a single cable system is involved.

One of the first steps in any marine liaison program should be a study to identify the particular risks likely to affect a cable in the different areas it traverses. Specific measures may then be developed that are appropriate for a particular cable and local conditions. Such measures must also take into account the characteristics of the different mariners active in each area, such as fishermen, merchant mariners, pilots, port authorities, military officers, marine traffic control officials, operators of resource extraction vessels, etc. These conditions and risks may change over time.

The measures described below have been used as components of effective cable risk mitigation programs. It is up to each Maintenance Authority to determine the risks to its cables and determine the nature and extent of information dissemination to be done. Based on the studies mentioned above, a combination of measures may be developed for each area to provide appropriate and cost effective mitigation for risks caused by human activities.

2. DISSEMINATION OF CABLE ROUTE INFORMATION

2.1. Hydrographic Offices

It is essential that the location of International cables be notified to the major charting organisations such as United Kingdom Hydrographic Office (Admiralty charts), National Oceanic and Atmospheric Administration (NOAA) and Service Hydrographique et Océanographique de la Marine (SHOM). In addition local or national Hydrographic Offices should also be informed of new cable installations and the status of existing cables for the purpose of updating navigation charts.

2.2. Military Authorities

Relevant Military Authorities must be kept informed about submarine cable areas for various reasons:

- a) To ensure that their vessels do not damage the cables by anchoring.
- b) To ensure that potentially dangerous submarine activities, such as submarine explosions / firing etc. are not undertaken in the vicinity of submarine cable.

- c) To ensure those authorities responsible for Maritime Domain Awareness and Coastal Surveillance are aware of the presence of cables and the role of cable repair ships that may have to operate in a territorial sea.
- d) To request, whenever appropriate, their immediate intervention to clear from the cable area any ship violating the local restrictions (e.g. trawling in a prohibited area or causing difficulties to a repair operation), and to enforce any applicable International/Domestic cable laws.
- e) To ensure that new telecommunications cable systems do not impact on existing or planned military cables.

2.3. Commercial & Scientific Organisations

Commercial & Scientific organisations, such as Offshore Operators, Oil and Gas Pipeline Owners, Marine Construction, Wind/Wave farms, Sand/Aggregate Dredging, Underwater Observatory Operators etc. must be informed about submarine cables so that appropriate ICPC recommendations can be followed when planning their seabed activities or structures.

This is an issue of mutual interest because Maintenance Authorities must also take into account any existing or planned seabed structures when planning new cable routes.

2.4. Port Authorities

Liaison with Port Authorities is essential in the light of increasing instances of cable faults as a result of damage from ship anchors.

Port Authorities regulate anchoring areas, maritime traffic corridors and ship standby areas, which must not coincide with cable corridors. The same applies to harbour development projects, either industrial or recreational (marinas). They must therefore be kept informed about the location of submarine cables and where possible overlay cable routes on port radars.

2.5. Maintenance Authorities

It is essential to ensure regular exchange of information among all Maintenance Authorities within each area. This is required to ensure that installation and repair operations do not constitute a threat to existing cables and that the guidance provided in ICPC Recommendation No. 2 is observed.

2.6. Local Authorities

Relevant local governmental / administrative authorities shall be kept informed on the routes of land cables and on the location of beach infrastructures in order to protect such cables and infrastructure against potential damage caused by future road / housing / industrial construction works.

It is very important to obtain a formal assurance from those authorities that no works will be authorised in the vicinity of land cable routes without confirmation of their position by the Maintenance Authority and that, whenever necessary, the procedures for the execution of the works be co-ordinated and agreed with the Maintenance Authority. The implementation of cable easements (wayleaves) may be necessary to achieve this level of protection.

2.7. Environmental Authorities

Relevant environmental authorities must be notified prior to cable repair activity if required by law or permit. They may also be informed regularly on the land cable infrastructures, as they will necessarily be involved in approving any construction project in the area and may thus help to avoid additional risks to the existing cables.

3. STAKEHOLDER LIAISON & EDUCATION

3.1. Fishing Industry

3.1.1. Free distribution of cable warning charts

Cable Warning Charts show very clearly the position of submarine cables and the boundaries of Cable Protection Areas (where existing). They should also provide some information on how to contact the Maintenance Authorities for any clarification or additional information, for example a 24 x 7 phone number should be displayed on the chart. Refer to ICPC Recommendation #5 – Standardisation of Cable Awareness Charts

It is essential that updated copies of Cable Warning Charts are provided to the Fishing Authorities and to the Owners / Captains of the most powerful fishing vessels (in particular trawlers) operating in the area, in order to ensure that they are aware of the cables' positions and of any Cable Protection Areas or fishing / anchoring restricted areas. This awareness reduces the likelihood of a cable being fouled by a fishing vessel and, in case that still occurs, may be a decisive factor when subsequently trying to obtain compensation for any damage to the cable.

A prerequisite to this objective is the availability of updated Cable Warning Charts. These charts may be produced by the local Hydrographic or Oceanographic Institutes or by commercial organisations. The first tasks of the Maintenance Authorities are to:

- a) Provide such organisations with detailed, updated Route Position Lists (RPLs) of each cable.
- b) Request (and, if necessary, fund) the publication of updated charts whenever new cables are installed or existing cables are re-laid with a significantly different route due to maintenance / repair operations.

3.1.2. Electronic information for navigation/plotting instruments

In many areas fishermen rely more on electronic plotters and computers (instead of paper charts) for navigation, planning and conduct of fishing operations. Cable route information may be provided in electronic formats compatible with the equipment and software used locally. A Maintenance Authority may choose to have its cable routes in electronic format distributed on disc to fishermen, programmed into fishing vessel electronics (with the captain's permission) by a contractor, or available for download on the internet.

3.1.3. Free distribution of ICPC fishing booklet

The fishing booklet produced by the ICPC, called *"Fishing and Submarine Cables - Working Together"*, is intended to explain to the fishing community the importance of submarine cables and the hazards which may be caused by the fishing gear used.

It is therefore equally important to provide copies of this booklet to the Fishing Authorities, and to the Owners / Captains of at least the major fishing vessels.

This booklet is available for download from the ICPC Website at www.iscpc.org

3.1.4. Free distribution of ICPC educational material

The ICPC has produced a video called *"Fishing and Submarine Cables - Sharing the Seabed"* which highlights the problems and dangers caused by the presence of submarine cables in fishing grounds and the importance of working together to minimise the risks and hazards to both parties. Copies of this video should be provided to fishing authorities, fishing schools, and to the owners/captains of at least the major fishing vessels.

Other videos with a similar theme may be available from individual submarine cable operators.

A slideshow called *"About Submarine Telecommunications Cables"* and two videos called *"ICPC Submarine Cables"* and *"Ocean Currents"* have also been produced to explain the role of submarine telecommunications and power cables in the modern world.

Both the video and slideshow are available for download on the ICPC's website at www.iscpc.org together with other useful information.

3.1.5. Participation in fishing exhibitions

Fishing exhibitions usually attract representatives of all official and commercial fishing entities, as well as many fishing captains, vessel owners and mariners. These exhibitions present an excellent opportunity to:

- a) Advise them of any new cables being installed
- b) Reinforce the importance of submarine cables and the need to protect them.
- c) Distribute the material referred to above.
- d) Establish and develop personal contacts with fishing entities and answer to any questions they may have.

It is therefore recommended that Maintenance Authorities be represented, if possible with attractive stands, in the main fishing exhibitions.

3.1.6. Teaching future fishermen about submarine cables

Many fishermen probably start their careers with little understanding of the role of submarine cables in the modern world and the serious consequences of damaging them.

A practical way to create awareness is to introduce a tutorial module about submarine cables into the programme of the fishing schools and other relevant training establishments.

Such a module should address both the importance of submarine cables and the hazards that may be caused by fishing or other marine activity and how to avoid them. As a very minimum, this would require one full day or preferably two or more sessions.

It is therefore recommended that Maintenance Authorities contact the relevant training establishments in their country in order to establish such a module in their programmes. This may require that, at least in the first years, the instructor and the teaching material are provided directly by the Maintenance Authorities.

The ICPC's promotional materials and relevant Hydrographic charts that identify the location of submarine cables should be made freely available to the training establishments.

3.1.7. Direct contact with fishermen and fishing authorities

In addition to maintaining a presence at relevant events such as fishing exhibitions, personal contacts should be developed with fishermen and fishing authorities to keep them informed about submarine cables.

This task could for example be delegated to Cable Station Managers, who are usually located close to the local fishing communities and should therefore have the best possible relationship with them.

3.2. Other Stakeholders

Education of other stakeholders that have contact or relationships with vessels that traverse cable areas should also be considered. These stakeholders could include Port Agents, Maritime schools/academies, Port Pilots etc. Educational programmes would need to be agreed with the stakeholder and customised for the target audience, but the key goal is to raise awareness of submarine cables as infrastructure that is critically important to the economic success and social wellbeing of all nations.

4. MONITORING SECURITY OF CABLE ROUTES & CORRIDORS

4.1. Electronic Monitoring

4.1.1. Radar

In areas where a cable station has a clear view of the landing and is in close proximity to the submerged portion of the cable, electronic monitoring of fishing vessels is an effective method of cable protection.

In this case a radar mast may be erected at the cable station. Through co-ordination with the radar manufacturer and the installer of the submarine cable, the location of the submarine cable can be plotted on the display of the radar. When a vessel ventures to within a buffer zone around the plotted position of the cable, the radar may be programmed to sound an audible alarm. Cable station personnel who are familiar with

identifying the various types of fishing vessels should investigate via binoculars or spotting scope to determine if the vessel in question is a threat to the submarine cable. The vessel may be hailed on VHF radio and informed of the location of the cable and its proximity to it. Any suggested or required actions or warnings (dependent upon local laws) may be relayed to the vessel as well. In the event that the vessel does not heed warnings, a log shall be kept in the event that the cable is broken so that proof of notification can be provided.

A Port Authority may also have radar that covers a portion of the cable route and so a Maintenance Authority should arrange to have cable route locations overlaid on the Port Authority's Radar.

4.1.2. Vessel Monitoring Systems (VMS)

Local laws may specify the minimum vessel size for the fitting of a VMS, which may therefore not cover all fishing vessels. However, an increasing number of governments are requiring fishing vessels to be fitted with a VMS to ensure that fishing quotas are observed. Such VMS systems interface with the fishing vessel's onboard GPS system and regularly relay its position to the fishing authority's central monitoring computer. Maintenance Authorities may be able to obtain this information, via a court order, if a particular fishing vessel is suspected of damaging a submarine cable system.

4.1.3. Automatic Identification System (AIS)

The installation of an AIS receiver can be used to provide proactive protection against ships that are dragging at anchor. AIS can also be used as a reactive tool, in the event of a ship is dragging its anchor whilst underway.

At cable landing points where a cable station has a clear view of the landing and of the route of the cable to approximately 50 kilometres (28 nautical miles) offshore it is possible to install an AIS receiver in a suitable place with an aerial on the roof. When connected to the internet, the system will allow the interrogation of ships' details (course, speed, call sign etc.) if over 300 gross registered tonnes.

By use of additional commercially available software, the exact cable route can be plotted and guard zones can be overlaid on the cable route with alarms that activate at predetermined levels. When a zone is intersected, emails or SMS text messages can be sent automatically to Marine Liaison Officers and/or Cable Owners. The offending ship can then be contacted via the local Coast Guard to advise them of the proximity of cables.

4.2. Air Patrol

Though rarely used, air patrol may be a cost effective means of cable protection in certain areas and seasons because it highlights the existence of submarine cable(s) in an area where there may be a lot of marine activity. In addition, emergency callout of an air patrol in the event of a cable break can catch the responsible parties, thus sending a strong signal to the seafaring community that cable breaks will not be tolerated.

Air patrols may be flown throughout the year. However, in areas where fishing vessels are concentrated over cable grounds during a certain season, the flights may be concentrated

within that season. Randomising the day of the week and time of the day of the flights is recommended. In this manner fishermen are unable to predict when an air patrol may fly overhead. Potentially offending vessels spotted by the air patrol are called on VHF radio and informed that they are in the vicinity of a submarine cable. Additionally, leaflets indicating the location of the cable can be dropped. Identifying numbers and names can be cross referenced later to determine if the fishing vessels have been contacted during port visits or sent cable protection charts or if additional notification might be required.

Contracts can be established to ensure that air patrols will be available on a 24-hour call-out basis in the event of a cable break and modern night vision and image-stabilising devices can enable identification of vessels at any time of day or night. Success in collecting damages from a vessel sends a very strong message throughout the seafaring community.

4.3. Sea Patrol

Sea patrol is an effective means of cable protection as it allows the direct notification to potentially offending vessels of the location of the submarine cable. In addition, emergency callout of a sea patrol vessel in the event of a cable break can catch the responsible parties, thus sending a strong signal to the seafaring community that cable breaks will not be tolerated.

Sea patrols may be undertaken throughout the year. However, in areas where fishing vessels are concentrated over cable grounds during a certain season, the patrols may be concentrated into that season. Randomising the day of the week and time of the day of the sea patrols is recommended. In this manner the fishermen are unable to predict when the sea patrol will occur. Potentially offending vessels identified by the sea patrol are called on VHF radio and informed of that they are in the vicinity of a submarine cable. Additionally, cable warning charts may be passed to the fishing vessel to give a clear indication of the location of the cable. Identifying numbers and names can be cross- referenced later to determine if the fishing vessels have been contacted during port visits or sent cable protection charts or if additional notification might be required.

Sea patrols may be available on a 24-hour call out basis in the event of a cable break and modern night vision and image stabilising devices can enable identification of vessels at any time of day or night. Success in collecting damages from a vessel sends a very strong message throughout the seafaring community.

4.4. Terrestrial Patrol

All actions for the protection of the submerged plant referred to above need be complemented with an effective monitoring of the land cable (front haul) route in order to ensure that the land cable suffers no aggression. The land cable may contain the fibre optic cable, high voltage power conductor and earth cable in the same duct or separate sub-ducts.

For this purpose, Cable Station Managers should establish a routine, preferably daily, consisting of a visual observation of the entire land cable route to confirm that no construction work is being undertaken in the vicinity of the cable. Sometimes, this can be accomplished simply by delegating a member of the Cable Station staff to follow the land cable route when driving to/from the Station. This will enable the land cable route to be carefully monitored and any potentially dangerous activity reported.

Whenever any work is authorised in the vicinity of the cable, the only way to minimise an accidental aggression to the cable is for the responsible Maintenance Authority to have a representative familiar with the cable location permanently present on the work site to advise / remind workers on the cable position. If possible, the representative should have power to order stopping the works, however this obviously requires previous agreement with the local Authorities who authorised the works.

Additionally a “dial-before-you-dig” service should be established with the local authorities. If an existing service is already in place covering other underground assets, then Maintenance Authorities should provide location information and a 24/7 contact phone number to ensure that cable location information is available to the general public.

5. LEGAL

5.1. Compensation for Lost Gear

National and international legislation may require Maintenance Authorities to compensate fishermen for fishing gear sacrificed in order to avoid damaging a submarine cable and thereby guaranteeing its integrity.

Under article 115, United Nations Law of the Sea Convention (UNCLOS), State parties are to establish in domestic law a means by which a vessel that through no fault of its own fouls a cable and has sacrificed its anchor or fishing gear to avoid injury to a submarine cable can be indemnified for the sacrifice. Article 7 of the 1884 International Convention for the Protection of Submarine Cables provides specific procedures for indemnification. The vessel owner must immediately or within 24 hours of arriving in a port of entry notify the cable owner or coast guard of the sacrifice in a statement supported by the sworn testimony of the crew and other evidence. The cable owner upon receipt of the notice and evidence may make an investigation of the sacrifice. If the sacrifice is proper under international law, the cable owner is obligated to indemnify the vessel owner for the sacrificed anchor or gear. By law the indemnification does not include lost profits or catch.

Although few States have enacted domestic legislation, the cable industry complies with international law on sacrifices as a matter of custom and practice. Many cable owners have established toll free telephone numbers on a 24/7 basis where masters can call if they believe a cable has been fouled. Additionally, many cable owners have forms for mariners to complete to facilitate a prompt investigation of a sacrifice claim and indemnification where warranted.

5.2. Development of National Legislation on Cable Protection

Legislation could help to reduce the risk of cable damage by:

- a) Establishing a corridor in which other marine activities may be restricted.
- b) Setting a legal framework that entitles the Maintenance Authorities to claim compensation in the case of cable damage.
- c) Establishing fines or penalties for damage to cables arising from wilful misconduct and/or culpable negligence. These contribute to an important deterrent impact of conduct that increases risks to cables.

Individual ICPC members can assist by providing examples of any National regulations which have been introduced to enhance the level of cable protection. It is important to ensure that all National laws are consistent with UNCLOS.

In the absence of legislation, legal action against vessels that wilfully or through culpable negligence damage submarine cables are actionable under the general maritime law in national courts with admiralty jurisdiction.

5.3. Establishment of Cable Protection Areas

Cable Protection Areas are typically offshore sectors or corridors, covering part of the route of one or more submarine cables, where some fishing and anchoring restrictions apply. This protects the cables by minimising the variety and intensity of human activities that are potentially aggressive to the cable.

However, it must be stressed that a Cable Protection Area exists only where the relevant Maintenance Authority has (i) taken the initiative of requesting it, and (ii) been successful in such application. This normally requires a long and complex negotiation process with the local Authorities and those seabed users who may be affected by its establishment.

Cable Protection Areas should be marked on Cable Warning Charts and in all navigation charts. It is sometimes required by the Authorities to deploy visual markers to identify Cable Protection Area boundaries.

5.4. Recovery of Damages

In the event a vessel is suspected of damaging a cable, the Maintenance Authority should carefully consider civil litigation to recover damages. In addition to civil actions and depending on national law, the cable owner should consider approaching the relevant government authority to pursue a criminal prosecution. Such actions serve as a deterrent to discourage future misconduct.

6. REFERENCES

Document Number	Title
ICPC Recommendation #2	Recommended Routing and Reporting Criteria for Cables in Proximity to Others
ICPC Recommendation #5	Standardization of Cable Awareness Charts
ISBN: 978-0-9563387-2-3	Submarine Cables and the oceans: Connecting the world. UNEP/WCMC ICPC Publication
Submarine Cables: The Handbook of Law and Policy Publishers: Martinus Hijoff (2014)	Chapter 3: <i>Overview of the International Legal Regime Governing Submarine Cables</i> Chapter 11: <i>Protecting Submarine Cables from Competing Uses</i>
International Convention for Protection of Submarine Cables (1884)	Article VII

7. DEFINITIONS

The following words, acronyms and abbreviations are referred to in this document.

Term	Definition
Maintenance Authority (MA):	The organisation responsible for the operation and maintenance of a particular submarine cable system.
RPL:	Route Position List

8. ACKNOWLEDGEMENTS

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