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|  |  | International Cable Protection Committee |

**NCWG3-08.3A**

**3rd NCWG MEETING**

**ESRI HQ, Redlands, California, USA 16-19 May 2017**

**Paper for Consideration by NCWG**

**ACTION HSSC8/68 ICPC PROPOSAL TO NCWG FOR ADAPTING S-4 CHARTING SPECIFICATION (B443 & C408) FOR SUBMARINE CABLES TAKING INTO ACCOUNT DEEP SEA MINING**

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| ***Submitted by:*** | International Cable Protection Committee (ICPC) |
| ***Executive Summary:*** | ICPC are proposing some amendments to S-4 to enhance protection of submarine cables. |
| ***Related Documents:*** | S-4 B-443, C-408; NIPWG3-47.1; HSSC807.13A; HSSC8 Action 68; IHO A.1/G/02Rev1 PRO 12 |
| ***Related Projects:*** | None |

1. **Background**

Following ICPC participation at HSSC-7 in Busan, Korea, November 2015; the subsequent signing of the IHO-ICPC MoU in April 2016; and ICPC participation at HSSC-8 in Monaco, November 2016. The IHO-ICPC MoU states that while the IHO has a strong interest in achieving the greatest possible uniformity in nautical charting products such as nautical charts and in charting standards, safety at sea, and protection of the marine environment; the ICPC has a strong interest in the protection of submarine cable infrastructure and ensuring that submarine cable activities necessary to achieve that protection have minimal impact on the marine environment.

Furthermore the MoU encourages increased cooperation between the IHO and the ICPC with the overarching stated objective of helping to facilitate:

* The development of a uniform set of cable charting standards for submarine cables adopted globally by HOs;
* The development of compatible digital input formats for as-laid cable data that address charting requirements;
* Global consistency in the treatment of charting data for cables to facilitate data re-use by HOs around the world, and to allow data correlation without further manipulation;
* Optimization of resources to reduce lead times from data availability from the relevant cable operator to the publishing of updates to nautical charts;
* The development of a global approach to the issuance of Notices to Mariners for new cables;
* The development of standardized information in nautical publications drawing the mariners’ attention to the necessity to protect cables against damage caused by ship operations;
* The development of charting policies that address hazards to submarine cables from deep sea mining, oil and gas activities as well as renewable energy developments;
* The development of procedures to encourage and facilitate the provision of survey data, or metadata, collected as part of cable laying or maintenance activities, to the IHO Data Centre for Digital Bathymetry (DCDB).

These proposals are consistent with the objectives or the IHO-ICPC MoU; and the post MoU signing proposed amendments to the “Text Box” drafted by the NIPWG and submitted to the Assembly for consideration and adoption by Germany under Assembly Circular Letter No. 10 bis-3 15 December 2016

# Discussion

More than 98% of all international voice, data, video, and internet traffic is carried on submarine cables comprising ≈ 265 systems ≈ 1.6 million kilometres. Data shows that each day the Society for Worldwide Interbank Financial Telecommunications (SWIFT) transmits ≈ 15 million messages to more than 8300 banking organizations, securities intuitions, and corporate customers in 208 countries and that the United States Clearing House for Interbank Payment System (CHIPS) process over US$ 1 Trillion per day to more than 22 countries for all manner of commodity exchanges, investments, and securities. With a recent World Bank study indicating that a 10% increase in broadband penetration results in a 1.38% increase in GDP growth in low and middle income countries; the criticality of the global submarine telecommunications cable infrastructure to world finance, socio-economic development, defence, and the internet itself is inescapable.

Any damage to the submarine cable infrastructure can have serious consequences for the economy and national security of states connected to affected cables. In the event of damage, such states may be forced to rely on satellite capacity where alternative subsea cable restoration paths are unavailable. Satellite communication is more expensive, less secure, and of lesser quality than communications via submarine cables. Moreover, due to bandwidth constraints satellite capacity may be inadequate to fulfil the capacity needs of impacted states. Many communications and related economic activities would necessarily be curtailed until the cable was repaired, a process that could take weeks or months, depending on the nature of the damage, the location, the time of year (and type of weather), and other factors.

Cable protection and cable awareness is a fundamental objective of the ICPC

* Cable protection can be engineered through armoring and cable burial
* However, cables do remain vulnerable to third party actions particularly from anchors, fishing activity and increasingly from deep sea mining and renewable energy activities
* Cable awareness initiatives have been developed by regional Cable Protection Committees (CPCs) for example KIS-ORCA for UK/Europe
* Otherwise cable awareness relies on published navigational charts
* Cable awareness plays a critical role not only in the protection of the submarine cable infrastructure
* Cable awareness also plays a key role in Safety at Sea as not only power cables but also telecom cables can carry very high voltages.

Under the MoU, the ICPC short term objectives include:

* The development of standardized information in nautical publications drawing the mariners’ attention to the necessity to protect cables against damage caused by ship operations; ACL No. 10 addresses this objective.
* Development of a uniform set of cable charting standards for submarine cables adopted globally by HOs; and:
* Charting policies that address hazards to submarine cables from deep sea mining

IHO Chart Specifications S4 B443 and C408 address the charting of submarine cables; however, the ICPC proposes that there is a case for updating these sections of S4 to more clearly highlight the criticality and need for protection of the submarine cable infrastructure in line with ACL No. 10. Additionally, S443.8 should be deleted as this gives the false impression that deep buried submarine cables are adequately protected against threats from anchoring.

Specifically the ICPC proposals include:

* Development of a uniform set of cable charting standards for submarine cables adopted globally by HOs; and:
* Charting policies that address hazards to submarine cables from deep sea mining
* As a minimum S4 B-443 and S4 C-408.1 requirements for charting of cables to 2,000m should be uniformly applied by all HOs
* Where ISA deep sea mining tenements are demarcated cables should be charted to full ocean depth
* Charting standards should align with new ICPC Recommendation on Deep Sea Mining

1. **Conclusions**

The criticality of the submarine cable infrastructure is not adequately reflected in the current S4 Standards. While the current Standards reflected in S4-B443 and S4-C408.1 refer to submarine cables being charted to 2,000m, this standard is not adopted by all HOs and is inadequate for areas where deep sea mining is likely to take place as defined by ISA demarcated tenements blocks. S4-B443.8 requires deletion or revision to reflect that submarine cables even if deep buried remain at serious risk to threats from anchors or certain types of fishing methods. The current Standards defined under S4-B443 do not align with the proposed Text Box revisions shown in ACL 10 bis.3.

1. **Recommendations**

The ICPC respectfully recommends that S4-B443 and S4-C408.1 be revised to be consistent with the revised Text Box proposal submitted by Germany for review and adoption by the Assembly ACL 10 bis.3 as reflected in ICPC suggested text amendments to S4-B443 included as Annex A. The ICPC further respectfully recommends that S4-B443.8 be deleted or revised to highlight the fact that submarine cables even if deep buried remain at risk from anchoring and certain types of fishing activity as reflected in Annex A.

1. **Justification and Impacts**

The recommended actions proposed for amendments to S4 Standards as they pertain to submarine cables can be justified on the basis of the need for enhanced submarine cable awareness and protection to the criticality of this infrastructure to world finance, socio-economic development, defence, and the internet; and in particular the increasing risks to submarine cables in deep water from deep sea mining activities.

The ICPC will offer the necessary resources through its IHO Focus Group to work with the appropriate IHO Working Groups anticipated to include but not limited to NIPWG and NCWG with potential liaison with the IRCC.

The ICPC considers the proposed actions as high priority, but recognise adoption of any agreed recommendations may require inputs from more than one session from the working groups engaged in developing their implementation. The ICPC propose that HSSC-9 be set as a target to finalise a joint position whilst recognising the interrelationship of this action with Action HSSC8/70: *ICPC Focus Group to consider in liaison with the IHO Secretariat the development of a roadmap contributing to the implementation of the IHO-ICPC MoU.*

1. **Action Required by NCWG**

The ICPC invite the NCWG to endorse these proposals and to share with the ICPC any alternatives that will achieve the main objectives of these proposals, and subsequently take action for their adoption.

**Annex A to NCWG3-08.3A**

**ICPC suggested text amendments to S-4**

**B-443 SUBMARINE CABLES**

Submarine cables are used to carry power or telecommunications. All power cables and most telecommunication cables carry dangerous voltages. Submarine cables are potential hazards to both vessels and life, particularly to fishing vessels engaged in trawling the seabed. Where possible, submarine cables are now buried beneath the sea floor in water depths of less than 1000 metres; however there remains a large percentage unburied. Submarine cables are vulnerable to damage from anchoring, trawling or other seabed operations; even small craft anchors can penetrate a soft seabed sufficiently to foul a cable. Damaging or severing a submarine cable, whether a telecommunications cable or a power cable, may, in some circumstances be considered as a national disaster and very severe criminal penalties may apply. Electrocution, with injury or loss of life, could occur if any cables carrying high voltage are broached. Depending on whether the cable is primarily for power or telecommunications, damage may result in power cuts, loss of voice, data transfer or internet connectivity. In these circumstances cables are considered to be critical infrastructure.. Submarine cables, including disused cables, should be charted to indicate their presence to vessels engaged in anchoring, trawling or seabed activities in order to:

• Warn mariners of the potential hazard to their vessel, including electric shock to any vessel fouling or breaking the cable, possible capsize of a small vessel if its fishing gear or anchor is trapped under the cable, or loss of gear (trawls or anchor cables).

• Prevent damage to the cable and avoid disrupting the service the cable may be providing. Active cables should be charted to a minimum depth of 2000 metres (which is the deepest depth of water to which vessels may normally be endangered by fouling the cable). In areas gazetted for seabed mining activities, active cables should be charted to full ocean depth**.** In order to avoid the risk of damaging submarine cables as much as possible, a 0.25-mile wide protected area exists on either side of a submarine cable. Anchoring is prohibited within this area, even when there is no specific prohibition on the chart. The origin and destination names and/or name of a submarine cable may be inserted adjacent to the cable, in sloping magenta text, where these are not obvious or in order to associate a note, for example: *Valencia to Ibiza; F.O.G. cable (see Note).* For disused cables, see B-443.7. For buried cables, see B-443.8. For cables related to degaussing areas see B-448.

**B-443.1 The exact route of individual cables** must be charted where possible to give the chart user full information, using the symbol of a wavy magenta line (see B-142.2). **L30.1** Where several cables land at the same point, the symbols may be terminated before they reach the coast or inshore water on smaller scale paper charts, to avoid obscuring more important detail. In oil and gasfields, where pipelines and cables are often laid on the same route, the cable may be omitted.

**B-443.2 Power transmission cables** should be distinguished from telephone and telegraph cables, for the protection of the mariner. The magenta power ‘flash’ should break the cable symbol at intervals of about 50mm. **L31.1** In the case of power cables across narrow channels, where it is considered that notice boards give adequate warning of the danger, the ‘flash’ symbol may be omitted. In certain circumstances, high voltage power cables may cause a deviation in a ship’s magnetic compass; in these cases, where reports have been received, they should be treated as local magnetic anomalies (see B-274) and the legend ‘Magnetic Anomaly (see Note)’ should be added in magenta at appropriate points along the cable.

**B-443.3 Cable areas** should be charted where:

• cables (including disused cables) are so numerous in an area that it would be impossible to chart them individually without impairing the legibility of the chart, or

• a regulatory authority designates an area for the protection of a cable, or cables. The area must be delimited by the general symbol for the limits of restricted areas (N2.1), interspersed at intervals of about 30mm with short sections of the cable symbol. The cable symbol must be repeated sufficiently to characterize the line (see B-439.3). Individual cables within a cable area should not be shown. **L30.2 L31.2** The outer limits of a cable area must enclose the area in which anchoring and certain forms of fishing are prohibited or inadvisable (that is: the limits must lie a safe distance beyond the actual lines of the outermost cables). See B-443.4 referring to regulations prohibiting anchoring and certain forms of fishing.

**B-443.4 Regulations prohibiting anchoring** or certain forms of fishing near submarine cables differ in detail from country to country. Where such regulations exist, it may be indicated by use of the symbol and/or in magenta (N20, 21) within a cable area (see B-439.4), or by reference to a note.

**B-443.5 Cable beacons, notice boards, or lights,** marking cable landings must be shown in black on the largest scale charts, for example: **Q123 B-443.6 Buoys marking cables.** Cables are sometimes marked by buoys, which should be charted,for example: *Cable Y* **Q55**

**B-443.7 Disused submarine cables.** Where disused cables traverse possible anchorages or where there is known seabed activity, for example trawling grounds, they should be charted on the largest scale charts (including the largest scale INT chart – see B-402.3e), provided they do not obscure more important information. Disused cables must be shown by the same wavy line as active cables, but broken by omitting every fourth complete sinusoid. **L32** Few disused cables are recovered and so to chart them all would lead to clutter on some charts. Also, accurate records of their positions are likely to be incomplete (some cables having been cut or dragged out of position), so there is a case for charting them very selectively, for example stopping them at 20m, which is likely to be the depth of water to which small vessels may be endangered by anchoring and fouling the cable.

**B-443.8 Cables, buried** so deep that they are not vulnerable to damage from anchoring, should not be charted (so that mariners are not unnecessarily inhibited from anchoring or fishing). In marginal cases they may be charted in magenta with a note stating the nominal depth to which they are buried, as L42.1, but with a cable symbol. *Buried 1.6m* If they are partly laid in a tunnel, the entrance, if required to be shown, must be charted as L42.2, but with a cable symbol. For details, see B-444.5.

**ICPC Comment – B-443.8 is misleading and we would prefer to have this deleted or modified to reflect that there are in fact very few submarine cables buried so deep that they could not be damaged from anchoring or certain fishing methods such as stow net fishing.**

**C-408 SUBMARINE CABLES**

**C-408.1** Submarine cables are vulnerable to damage from anchoring, trawling or other seabed operations. Their inclusion on charts assists in protecting the cables (and the service they provide) from damage, in addition to warning mariners of the potential hazard presented to their vessel by the existence of submarine cables. Active cables should be charted to a depth of not less than 2000 metres (which is the deepest depth of water to which vessels may normally be endangered by fouling the cable In areas gazetted for seabed mining activities, active cables should be charted to full ocean depth**.**), using symbol L30.1 or L31.1 as appropriate. They are not normally shown on the 1:10 000 000 series. Guidance is provided in B-443. Where the chart is the largest scale, or in areas where it is likely to be used for navigation, submarine cables should be shown if at all possible. However, depiction of the cables may be terminated before they reach the coast, or inshore water, to avoid obscuring other important detail. In these cases, a suitable legend should be inserted on the chart in the vicinity and a note included, in magenta, preferably under the main title block, along the following lines:

NOTE. Submarine cables have been omitted from part of this chart. For details of these, the larger-scale charts should be consulted

The following annexes are available as separate PDF documents:

Annex B: Assembly Circular Letter No.10 bis-3 (15 December 2016)

Annex C: Memorandum of Understanding between the IHO and the ICPC