PRINCIPLES AND PROCEDURES FOR MAKING CHANGES TO IHO TECHNICAL STANDARDS AND SPECIFICATIONS	**2/2007 as amended**	**IHO A-1 & 46/2019**	**A1.21**

1. Scope

1.1 These principles and procedures are intended to be applied to all proposals for development of and changes to IHO technical standards and for new technical standardization work items that will require significant resources to resolve or will potentially impact on those who need to apply these standards. The principles and procedures set in place by means of this resolution for IHO technical standards are not intended be applied for IHO GIS services, publications, catalogues or supporting documentation of general or non-technical nature which form a separate group.

1.2 Any reference to "standards" in these principles and procedures follows the ISO/IEC definitions for *standard* and *guide* and may therefore also include some IHO "specifications" and "guidelines" as appropriate[2]. IHO Product Specifications, including test data sets for validation checks, are considered

[2] ISO/IEC Directives, Part 2 - Rules for the Structure and Drafting of International Standards defines a standard as

> *... a document, established by consensus and approved by a recognized body, that provides for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context.*

The ISO defines a guide as

> *... a document giving orientation, advice or recommendations on non-normative matters relating to international standardization.*

to be standards. The list of IHO standards that must follow the principles and procedures described in this resolution is provided in the Appendixes.

a. The list of those IHO standards that must be developed and maintained with the provision of an impact study, endorsement of the relevant Committee and endorsement by the Council if deemed appropriate by the Committee[3], and the approval of Member States, is provided in *Appendix 1.*

b. The list of those IHO standards that must be developed and maintained with endorsement of the relevant Committee and the approval of Member States, without the compulsory requirement for conduction of an impact study and not subject to the Council's endorsement, is provided in *Appendix 2*.

2. Principles

2.1 Improvements to standards can only occur by change. However, significant change can lead to problems such as implementation issues by hydrographic offices, incompatibility between systems, high updating costs, market monopoly, dissatisfied users, or increased risks to safety of navigation. The following guiding principles have been developed to avoid these effects.

2.1.1 Before formal approval is granted when required, normally through Member States vote, any proposed changes to existing standards should be assessed from a technical, commercial and institutional perspective by the widest range of stakeholders, not limited to Member States, also taking into account any other relevant factors.

2.1.2 Where possible, assessment of the proposed changes should involve all stakeholders, not only IHO Member States, but all relevant parties such as international organisations, maritime administrations, equipment manufacturers, data distributors, industry, users and other professional organisations.

2.1.3 As far as practicable, any change to standards or systems should be "backwards compatible", or the previous edition must enjoy continued support for a specified transition time.

2.1.4 If standard changes are required for functional improvement rather than initiated by a compelling and urgent need to maintain safety of navigation, then the previously approved edition must be allowed to continue to be used for a transition phase, taking the limited accessibility of seaborne equipment into account where applicable.

2.1.5 If not already specified by an external or higher IHO authority, the transition timeline should be defined as part of the standard change approval process by the proposer.

2.1.6 In exceptional cases (for example, those affecting safety of navigation), it may be necessary to make recommendations for immediate change to standards and systems to the relevant authorities. This may be achieved through shortening the normal time frames for submission and consideration of proposals for changes, including endorsement and approval. However, such a procedure should be understood as the last resort in urgent cases.

2.1.7 The principles of a recognized project management system for all procedural steps of a conducted standard change should be agreed between interested parties beforehand.

2.1.8 All interested parties should be encouraged to continuously improve IHO standards. Constructive feedback should therefore be provided for all proposals – even in cases of rejection.

3. Procedures - General

3.1 Standardised procedures help to ensure that any proposed changes to IHO standards are properly developed, assessed, endorsed, approved and implemented. These procedures should remain simple to encourage their use.

3.1.1 Changes to IHO standards are classified at one of three different categories: *new edition*, *revision*, or *clarification* (see paragraph. 4.1). The development, assessment, approval and implementation process differs for each category, ranging from a very comprehensive regime for *new editions*, to

[3] See HSSC and IRCC Terms of Reference and Rules of Procedure.

approval at the level of a subordinate body for *clarifications*. *New editions* and *revisions* are considered to be "significant changes" for the purposes of assessment, approval and implementation.

3.1.2 The relevant IHO Committee or delegated Working Group should consider all proposals to develop *new editions* and *revisions* to standards before work commences.

- For those standards listed in Appendix 1, the Committee should always consider the impact on relevant stakeholders when assessing a proposal and planning any subsequent work on standard changes; likewise, the Committee should assess the impact on other IHO standards or guidance, especially for interoperability, data/product quality and portrayal. Appendix 3 of this Resolution provides details on the impact study conduction. This assessment should systematically include a risk and feasibility analysis, and an estimate of the resources required for the development and the implementation of a new or revised standard, including but not limited to Member States Hydrographic Services.

- If a proposed standard change is rejected by the Committee, detailed feedback should be provided to the proposal originator giving the reasons for rejection.

3.1.3 After the Committee has endorsed a proposal for standard change and established a work priority, the IHO Secretariat will incorporate the respective task into the relevant work programmes.

3.1.4 Relevant stakeholders should be notified by the appropriate IHO committees, working groups and project teams and/or the IHO Secretariat of the timetable for new standardization work items and be invited to comment and participate as appropriate. The notification should include a summary forecast of:

- the rational of the standard change,

- the potential scope of changes of the standards,

- the standard documentation affected,

- the anticipated effects and the likely resulting actions for relevant stakeholders,

- the planned timetable for implementation, and

- the proposed effective date of the new or revised standard.

3.1.5 The IHO Secretariat should maintain an online register of IHO stakeholders. The register should be used to inform and seek input from stakeholders concerning any proposed changes to IHO standards.

3.1.6 The relevant subordinate bodies should provide the Committee with progress reports on a regular basis in accordance with their management plan and after each milestone during the development and testing phases. These should be made available to stakeholders by the IHO Secretariat (and/or relevant working groups and project teams if agreed). The Committees have the authority to approve the Edition 1.0.0 of all new standards requiring a subsequent development phase before implementation (see paragraph 4.1) and to endorse the following Editions before they are submitted for the approval of Member States.

3.1.7 After endorsement by the Committee or the Council, if applicable, the new or changed standard should be submitted to Member States by the IHO Secretariat for approval of the content, and confirmation of the "*effective date*". This is not applicable for new standards in the development (implementation and testing) phase (see paragraph 4.1).

3.1.8 At the "*effective date*", the new or changed standard becomes the effective standard. A "*superseded*" standard should normally remain available concurrently with the revised standard for a suitable transition period.

3.1.9 Subject to endorsement by the Committee, and the Council if applicable[2], followed by the approval of the Member States, a superseded standard must be withdrawn from the list of standards in force after the transition period.

3.1.10 Subordinate bodies may assess and request the IHO Secretariat to publish *clarifications* to standards and associated references, subject to seeking input from relevant stakeholders if appropriate. These clarifications are reported to the relevant committees at their annual meeting.

4. Procedures - Specific

4.1 First Editions, New Editions, Revisions and Clarifications

First Edition (WG/PT Development Phase)

A Working Group must make a submission to the Committee if the standard was developed by a subordinate Project Team – if the Project Team (PT) was established directly under the Committee then the PT would submit directly to the Committee – for approval of Edition 1.0.0 to be released and published for initial implementation, testing and evaluation and further stakeholder review. Such Edition 1.0.0 is not designed for regular use in approved arrangements or for provision of operational services by purpose.

The first Edition aiming to be released and published for the implementation phase of operational services is Edition 2.0.0 (See paragraph 4.3). For the maturation process from Edition 1.0.0 to Edition 2.0.0 the Working Group (WG) has the authority to issue iterative Edition(s) 1.n.n[4] – for clarifications and revisions that may have arisen during the initial implementation, testing and evaluation phase. The changes should be traceable either via a formal comment procedure or through an official proposal mechanism.

When the WG/PT has completed an impact assessment and obtained stakeholder feedback and considers that the standard is mature to become an Edition 2.0.0, it must submit the standard to the Committee for endorsement. The Committee may submit the standard to the Council for endorsement, if applicable[2], before the New Edition is submitted to Member States by the IHO Secretariat for approval of the content, and confirmation of the "*effective date*" of implementation.

New Edition

New Editions of standards introduce significant changes. *New Editions* enable new concepts, such as the ability to support new functions or applications, or the introduction of new constructs or data types, to be introduced. *New Editions* are likely to have a significant impact on either existing users or future users of the revised standard. It follows that a full consultative process that provides an opportunity for input from as many stakeholders as possible is required for standards listed in Appendix 1, optional for those listed in Appendix 2. Proposed changes to a standard should be evaluated and tested wherever practicable. The approval of Member States is required before any *New Edition* of a standard can enter into force. All cumulative *clarifications* and *revisions* must be included with the release of an approved *New Edition* of a standard.

Revision

Revisions are defined as substantive changes to a standard. Typically, *revisions* change existing specifications to correct factual errors; introduce necessary changes that have become evident as a result of practical experience or changing circumstances; or add new specifications within an existing section. *Revisions* could have an impact on either existing users or future users of a revised standard. It follows that a full consultative process that provides an opportunity for input from as many stakeholders as possible is required for standards listed in Appendix 1, optional for those listed in Appendix 2. Proposed changes to a standard should be evaluated and tested wherever practicable. The approval of Member States is required before any *revisions* to a standard can enter into force. All cumulative *clarifications* must be included with the release of approved corrections revisions.

However, there may be instances where more urgent action is required, especially where there are serious implications to safety of navigation. In such cases, a "fast-track" approval by correspondence and rapid implementation process may be needed. This should only occur in exceptional circumstances, but any such fast-tracked *revisions* will still require the approval of Member States before they can enter into force.

A *revision* shall not be classified as a *clarification* in order to bypass the appropriate consultation processes.

Clarification

Clarifications are non-substantive changes to a standard. Typically, *clarifications*: remove ambiguity; correct grammatical and spelling errors; amend or update cross references; insert improved graphics in spelling, punctuation and grammar. A clarification must not cause any substantive semantic change

[4]"n » is not limited to 9.

to a standard. *Clarifications* are the responsibility of the relevant subordinate body and may be delegated to the responsible editor.

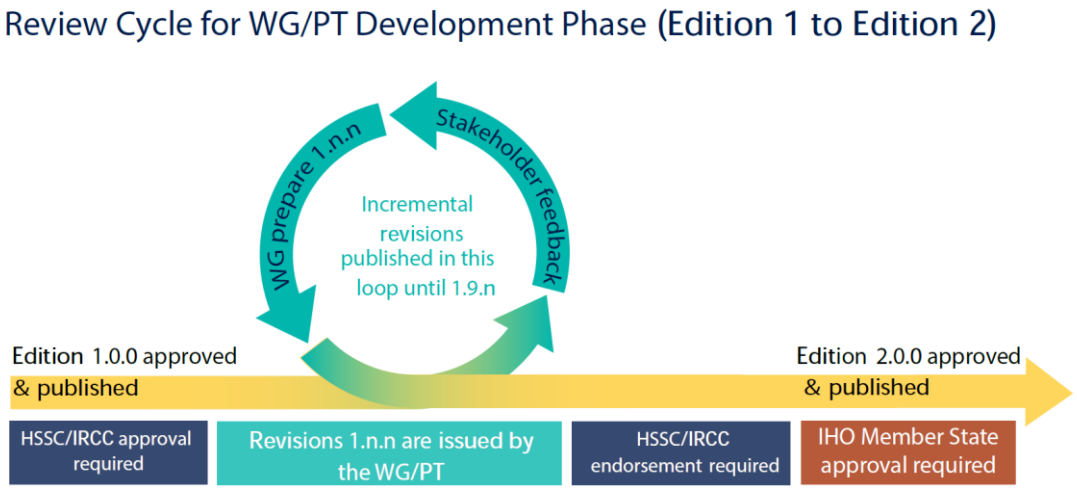
4.2 The associated version control numbering to identify changes (n) to all IHO standards should be as follows:

New Editions denoted as *n*.0.0

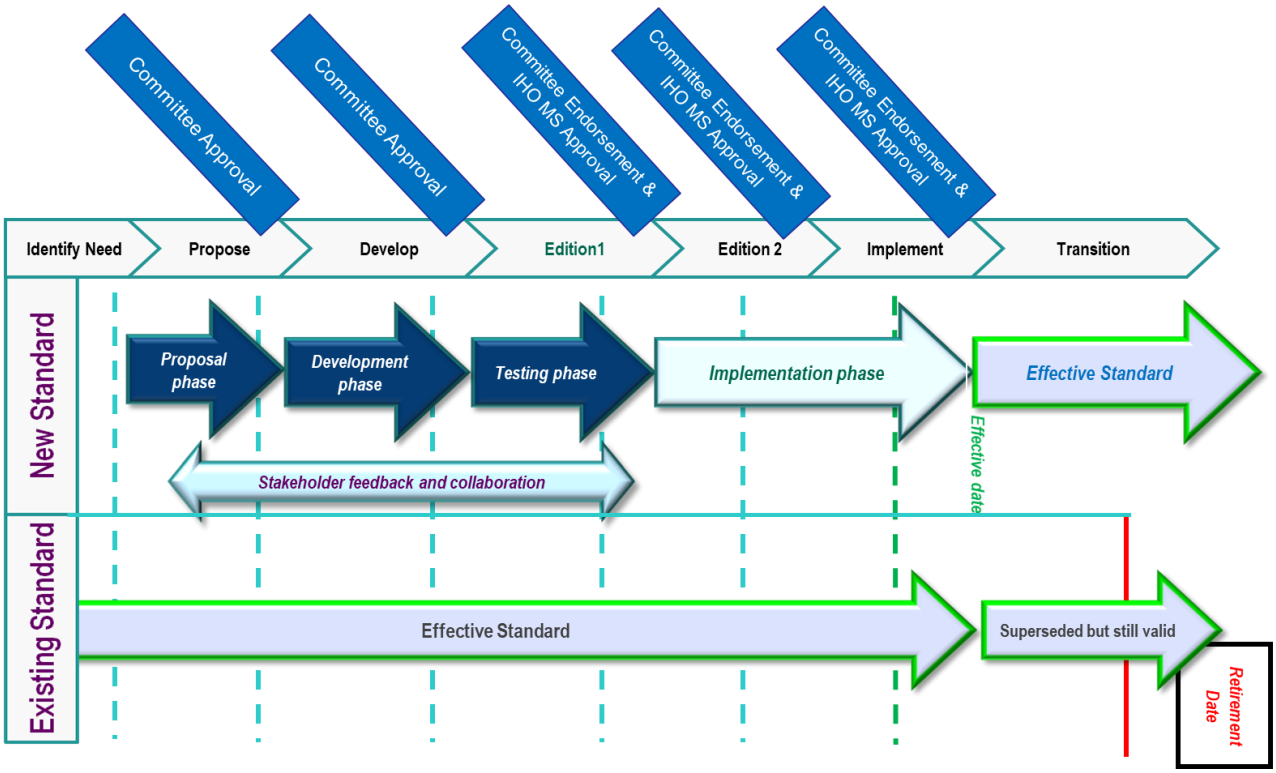
Revisions denoted as n.*n*.0

Clarifications denoted as n.n.*n*

4.3 The following diagrams illustrate the development, consultation and approval processes for IHO standards:

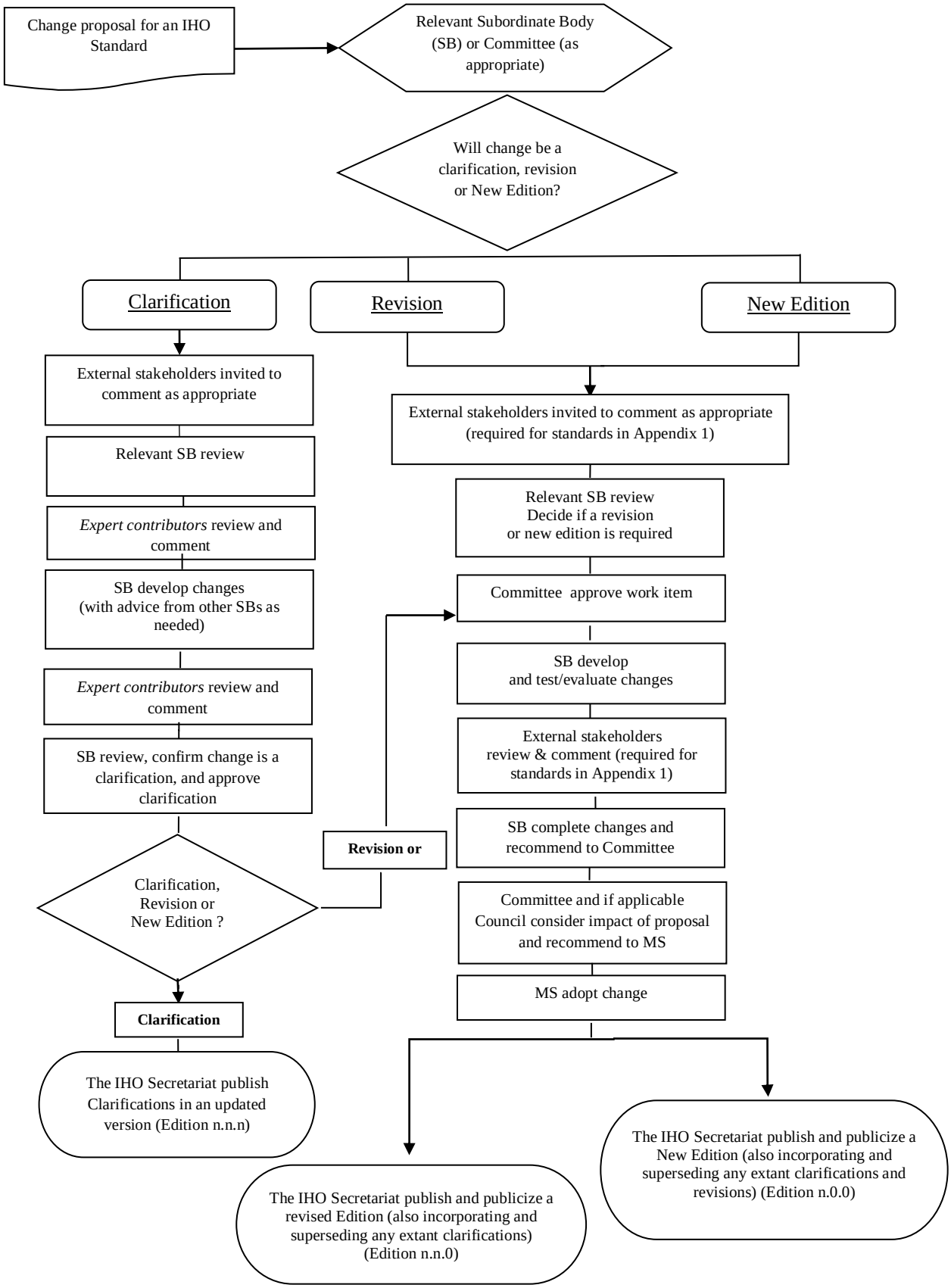


The typical life cycle of an IHO standard incorporating a Development Phase:



IHO Programme 2 "Hydrographic Services and Standards"
2.1 – General

Diagram – Changes to IHO Standards – General Case



IHO Programme 2 "Hydrographic Services and Standards"
2.1 - General

APPENDIX 1

IHO standards that are subject to the approval process as described in paragraph 1.2.a.

Number	Name	Relevant maintenance body
~~**B-12**~~	~~Guidance on Crowdsourced Bathymetry~~	~~CSBWG~~
S-5A	Standards of Competence for Category "A" Hydrographic Surveyors	IBSC
S-5B	Standards of Competence for Category "B" Hydrographic Surveyors	IBSC
S-8A	Standards of Competence for Category "A" Nautical Cartographers	IBSC
S-8B	Standards of Competence for Category "B" Nautical Cartographers	IBSC
S-23	Limits of Oceans and Seas	Informal Consultation when/if required
S-44	IHO Standards for Hydrographic Surveys	WG/PT when/if required
S-52	Specifications for Chart Content and Display Aspects of ECDIS	ENCWG
S-52 Annex A	IHO ECDIS Presentation Library	ENCWG
S-52 Appendix 1	Guidance on Updating the ENC	WG/PT when/if required
S-57	IHO Transfer Standard for Digital Hydrographic Data	ENCWG
S-57 Appendix B.1	ENC Product Specification	ENCWG
S-57 Appendix B.1 Annex A	Use of the Object Catalogue for ENC	ENCWG
S-57 Supplementary Information N°3	Supplementary Information for the encoding of S-57 Edition 3.1 ENC Data	ENCWG
S-58	Recommended ENC Validation Checks	ENCWG
~~**S-61**~~	~~Product Specifications for Raster Navigational Charts (RNC)~~	~~ENCWG~~
S-63	IHO Data Protection Scheme	ENCWG/S-100WG
S-98	Interoperability Specification for Navigation Systems	S-100WG
S-99	Operational Procedures for the Organization and Management of the S-100 IHO Geospatial Information Registry	S-100WG
S-1*nn* (when adopted)	S-100 based IHO Product Specifications	Ad hoc WGs and PTs

IHO Programme 2 "Hydrographic Services and Standards"
2.1 - General

APPENDIX 2

IHO standards that are subject to the approval process as described in paragraph 1.2.b.

Number	Name	Relevant maintenance body
B-6	Standardization of Undersea Feature Names (Guidelines Proposal Form Terminology)	SCUFN
B-12	Guidance on Crowdsourced Bathymetry	CSBWG
S-4	Regulations for INT Charts and IHO Chart Specifications	NCWG
S-11 Part A	Guidance for the Preparation and Maintenance of INT Chart and ENC schemes	NCWG
S-12	Standardization of List of Lights and Fog Signals	NIPWG
S-32 **	Hydrographic Dictionary	HDWG
S-32 Appendix 1	Glossary of ECDIS-Related Terms	HDWG
~~**S-44**~~	~~IHO Standards for Hydrographic Surveys~~	~~WG/PT when/if required~~
S-49	Standardization of Mariners' Routeing Guides	NIPWG
S-60	Users Handbook on Datum Transformations involving WGS 84	WG when/if required
S-61	Product Specifications for Raster Navigational Charts (RNC)	ENCWG
S-62 **	List of Data Producer Codes	ENCWG
S-66	Facts about Electronic Charting and Carriage Requirements	ENCWG
S-67	Mariners' Guide to Accuracy of Depth Information in Electronic Navigational Charts (ENC)	DQWG
S-97	Product Specification Guide Book	S-100WG
S-100	IHO Universal Hydrographic Data Model	S-100
C-17	Spatial Data Infrastructures: "The Marine Dimension" - Guidance For Hydrographic Offices	MSDIWG
C-51	A Manual on Technical Aspects of The United Nations Convention on the Law of The Sea - 1982	ABLOS

** Follows IHO GI Registry for updating

APPENDIX 3

Guidance on Conduction of an Impact Study

Description of the purpose of the study (testable hypotheses)

An impact study plan should include the general description of the impact assessment and a plan to conduct the study. The general description should specify a set of hypotheses about the outcomes and impacts of the study. The impact should consider all the outcomes, also the updating process of existing data.

There are three distinct levels of potential impact that a change to the standard might have:

- Does the new version of a standard impact on the market and business procedures?
- Does the new version of a standard impact on producing offices/agencies/institutions?
- Does the new version of a standard impact on the stakeholders?

Specification of the result assessment methods

The intended assessment method should be proposed by the WG for HSSC/IRCC endorsement before the survey is initiated. This ensures that the assessed results are transparent and that misinterpretations will be prevented.

Identification of a minimum of measurable indicators

Measurable indicators should be defined that can be used to determine potential impacts to the community. The results of the survey questionnaire will populate the indicators. The impact study shall take into consideration the following minimum set of subject items:

- Impact on software development;
- Impact on equipment development;
- Impact on data distributors;
- Cost/effectiveness of the implementation;
- Readiness of implementation.

Suitability of impact study questions

The success of a survey depends on the questions asked. Thus, the set of the survey questions has to be checked to determine whether they are useful for this purpose. This check should be conducted by professional survey experts.

Identification of potential stakeholders

An impact study should be done in two parts. The first part should be the feasibility study and conducted before the development starts. This study should address the feasibility of the intended Product Specification. The second part is an impact study should be initiated before the release and should address the potential users. The audience of both studies can be different. The first study should approach the interested parties, whereas the latter should approach software developers, OEMs and Member States.

A list of potential stakeholders is being maintained by the IHO Secretariat and should be available. The initiator of the impact study should select those stakeholders on which the intended new Standard has significant impact. It is recommended to approach the following stakeholders:

- IHO Member States,
- International organizations,

- Software developers,
- Equipment manufacturers,
- RENCs,
- Product/data distributers,
- End users (hydrographic community),
- End users (marine community)

Identification of appropriate survey tools and methods

Professional online tools should be used for the survey. Stakeholders should be approached by e-mail. The survey should be conducted under the supervision of the initiating Organisation or IHO Working Group. To assist stakeholders who are uncertain about specific survey questions, the initiating Organisation should provide point of contact information for the survey duration.

Specification of the survey duration

The survey time should be limited to 3 months as the maximum duration.

Specification of requested actions and dissemination of the findings

The findings of the impact study should be summarized and the findings should be made public on the IHO website. The in-depth analyses should be conducted by the initiating Organisation and be supervised by the IHO Secretariat. This ensures that the analytic capacity is available and that the results will be compiled correctly. The raw data should be stored for backward research and for transparency in a repository hosted by the IHO Secretariat. The cleaned data should be provided in tables, diagrams or other appropriate formats. The final report and the outcome of the study should be forwarded to the IHO Secretariat and should be publicly available on the IHO website at an appropriate place. This will ensure the further use of the study results.

UNIT OF MEASUREMENT	1/1919 as amended	11/2009	A2.1

1 It is strongly recommended that all countries, as soon as convenient, adopt the metric system for their nautical publications.

2 It is resolved that, on charts of countries which do not use the metric system, a table or scale shall be inserted for converting into metres the depths given.

3 It is recommended that when non-metric units are used in Sailing Directions, Lists of Lights and Notices to Mariners, the equivalent measurement in the metric system be also given in brackets.

INTERNATIONAL NAUTICAL MILE	2/1919 as amended	IHC 10	A2.2

It is resolved that the length represented by 1852 metres shall be the international nautical mile.

SYMBOLS AND ABBREVIATIONS	3/1962 as amended	11/2009	A2.3

1 It is resolved that the following international symbols and abbreviations shall be used for the most common units:

Hour	h
Minute of time	min or m (The use of m is not recommended; it is acceptable when there is no possible confusion with metre.)
Second of time	s or sec
Metre	m
Decimetre	dm
Centimetre	cm
Millimetre	mm
Square metre	m^2
Cubic metre	m^3
Kilometre	km
Inch	in
Foot	ft or f^t
Yard	yd or y^d
Fathom	fm or f^m
Nautical mile	M
Knot	kn
Ton, Tonne, tonnage	t (use for measurement of vessel volume or weight; the context should make clear which is intended)
Candela (new candle)	cd
Degree	*x*°
Minute of arc	*y*'
Second of arc	*z*''

2 It is recommended that the above international symbols and abbreviations be used on charts instead of the entire words, as these symbols can be understood by navigators of any nationality.

HYDROGRAPHIC OFFICE ARRANGEMENTS FOR THE EXCHANGE AND REPRODUCTION OF NAUTICAL PRODUCTS	7/1919 as amended	IHO A-1	A3.4

Note: "Products" within the context of this Resolution includes nautical charts and documents in analogue or digital format.

1 Noting that:

a) Hydrographic Offices have a need to exchange products in the interest of safety and efficiency of navigation;

b) Member States have rights to the products of their Hydrographic Offices under national and international law;

c) Hydrographic Offices should cooperate to meet the needs of their customers by ensuring appropriate availability of adequate and up-to-date products;

d) Hydrographic Offices should avoid creating products where another Hydrographic Office has charting responsibility for the waters concerned and already offers up-to-date products adequate for customers' requirements; and

e) Originating and reproducing Hydrographic Offices should seek to maintain good liaison, including the use of bilateral arrangements where appropriate.

The following procedures are recommended:

2 Hydrographic Offices should make use of internationally standardized products such as International (INT) Charts and Electronic Navigational Charts (ENC) of other Hydrographic Offices where these products meet their customers' needs and are kept up-to-date. INT charts should be adopted in accordance with the 'Regulations of the IHO International (INT) Charts'. The use of ENC should be governed by the principles of the Worldwide Electronic Navigational Chart Data Base (WEND).

3 If no internationally standardized product is available, and national products are agreed to be adequate for national and international navigation, these should be used.

4 Where internationally standardized products are not available, and where national products do not meet the requirements of its customers, any Hydrographic Office may compile new products to satisfy those needs, provided that it obtains the agreement and cooperation of all Hydrographic Offices whose agreement is required.

5 Hydrographic Offices may establish bilateral arrangements covering the exchange and reproduction of products, and other issues of mutual interest. These bilateral arrangements should meet the legal requirements regarding the reproduction of works and may include technical, financial or other terms and conditions including acknowledgement, in the published products, of all Hydrographic Offices whose material has been utilized in those products.

6 Until bilateral arrangements are in place, or where it is mutually agreed that the procedures above are not appropriate or economical, Hydrographic Offices may operate according to other procedures mutually agreed between them.

7 In order to facilitate the negotiation of bilateral arrangements, the parties may agree to seek the assistance of the IHO Secretariat.

8 In circumstances where differences arise between Member States concerning bilateral arrangements, it is recommended that they consider agreeing to the use of alternative dispute resolution procedures in order to attempt to resolve those differences.

See also 1/1982 (A1.18)

UNIFORM POLICY FOR HANDLING GEOGRAPHICAL NAMES	8/1919 as amended	8/1974	A4.1

1 With the purpose of obtaining approximate uniformity in the geographical names appearing on the nautical documents of maritime countries, it is recommended that each national Hydrographic Office:

a) On its charts and other nautical documents of its own coasts, show names that are in exact agreement with the forms prescribed by the most authoritative source. Each country will thus provide complete and authoritative name coverage in its own official script, whether Roman or non-Roman, for the use of all other national Hydrographic Offices that issue charts on various scales, and other nautical documents, for the same area.

b) On its charts and other nautical documents of foreign coasts where the Roman alphabet is officially used by the sovereign country, show names that are in exact agreement with the most authoritative usage of the country having sovereignty. These names should be obtained directly from new and revised editions of the nautical charts and other documents of the country having sovereignty or confirmed by correspondence with that country. Where such names as officially written use accents or diacritical signs, these should be retained, even, and indeed particularly, when names are printed in capital letters.

c) On its charts and other nautical documents of foreign coasts where the script of the sovereign country is other than the Roman alphabet, show names that are obtained by applying the various international systems for romanization approved by the United Nations to the names appearing on the most authoritative sources of the country having sovereignty or confirmed by correspondence with that country.

Note: *Among countries where the Roman alphabet is official, international uniformity in transcription systems would be advantageous to the various national governments. It is accordingly recommended that national Hydrographic Offices place before their governments the desirability of obtaining uniformity and urge the continuation of efforts for effective agreements through the United Nations.* *See also 2/1937(C1.2).*

d) On its charts and other nautical documents of all foreign coasts, use for the generic part of complex geographical names the word (in its Roman-alphabet form) used by the country having sovereignty. e.g. Falsterborev. By following this practice, the geographical generic term will not be translated but will appear, in its Roman-alphabet form, on the charts of all nations.

e) On all its charts and other nautical documents, apply its conventional national usage to names of countries, major territorial divisions and boundary features, and to the oceans and international subdivisions thereof. The names used internationally may also be shown but in a subordinate manner. This system will be applied until an international convention by the United Nations on standardization of internationally recognized names has been adopted.

INTERNATIONAL STANDARDIZATION OF GEOGRAPHICAL NAMES	1/1972 as amended	IHO A-1	A4.2

1 It is resolved that the IHO Secretariat should maintain continuous contact with the United Nations Organization and specifically with the United Nations Group of Experts on Geographical Names, for all studies or actions relating to geographical names involving or affecting hydrographic publications. The IHO Secretariat should insure that actions previously taken on hydrographic matters, with respect to names, within the IHO are brought to the attention of appropriate United Nations Conferences or working groups. The IHO Secretariat should also promulgate to Member States information on all significant developments on this subject as they occur.

2 It is recommended that, since national standardization of geographical names is an essential preliminary to international standardization, Hydrographic Offices encourage and support the establishment of national names authorities, following the principles and procedures recommended by the resolutions on this subject adopted by the United Nations Conferences on Geographical Names.

3 It is recommended that the IHO Secretariat co-operate with the United Nations Group of Experts on Geographical Names with the object of achieving international standardization of names of maritime and undersea features.

4 It is further recommended that co-operation should, in particular, be extended in the under-mentioned activities of the United Nations Group of Experts:

a) Study of existing national and international practices concerning the delineation and naming of oceans and seas, including their integral subdivisions, beyond the limits of national jurisdiction, with a view to recommending improvements in current nomenclatural practices and procedures.

b) Drawing up a system for naming undersea features beyond a single sovereignty and proposing it as a basis for preparing an international convention on the subject.

c) Standardizing the definitions of undersea feature "terms and definitions" in order to promote their acceptance and use by names authorities.

d) Developing procedures for international standardization of naming new undersea features as they are discovered, defined and identified in the future.

5 It is recommended that when Hydrographic Offices produce gazetteers or geographical dictionaries, these publications be standardized as far as possible in accordance with resolutions on the subject adopted by the United Nations.

6 It is recommended that where two or more countries share a given geographical feature (such as, for example, a bay, strait, channel or archipelago) under a different name form, they should endeavour to reach agreement on fixing a single name for the feature concerned. If they have different official languages and cannot agree on a common name form, it is recommended that the name forms of each of the languages in question should be accepted for charts and publications unless technical reasons prevent this practice on small scale charts. e.g. English Channel/La Manche.

NAMING OF UNDERSEA FEATURES	2/1987 as amended	IHO A-1	A4.3

1 It is agreed that Member States should strongly encourage marine scientists and other persons in their country wishing to name undersea features to:

a) check their proposals with published Gazetteers of Undersea Feature Names, including the IHO/IOC publication B-8, "Gazetteer of Geographical Names of Undersea Features" shown on (or which might be added) the GEBCO and on the IHO

small scale International Chart Series and its supplements of Geographical Names included on larger scale Regional International Bathymetric Chart Series;

b) take into account the guidelines contained in the IHO/IOC publication B-6 "Standardization of Undersea Feature Names", including the use of the Undersea Feature Name Proposal Form contained therein;

c) submit all proposed new names for clearance either to their appropriate national authority or, where no such national authority exists, to the IHO Secretariat or IOC for consideration by the GEBCO Sub-Committee on Undersea Feature Names, which may advise on any potential confusing duplication of names.

2 It is agreed that Member States invite publishers of ocean maps and editors of scientific journals in their country to require compilers and authors to provide written evidence of such clearance before accepting for publication any maps or scientific articles containing new names for undersea features.

STANDARD GEOGRAPHICAL SEQUENCE	**8/1937 as amended**	**61/2009**	**H1.1**

1 Although a standard geographical sequence does not appear to be indispensable in editing miscellaneous nautical documents, it is nevertheless recommended that those which are of general interest and cover a vast area of the world, or are subject to frequent revisions by Hydrographic Offices, be drawn up as far as possible according to a predetermined geographical arrangement. It is recommended that this geographical sequence be that which is adopted for Sailing Instructions and that it also be extended to the other nautical documents.

2 It is recommended that the same geographical sequence be adopted in the classification of Notices to Mariners.

See also 13/1919 (C2.1)

HISTORICAL ACCOUNTS OF HYDROGRAPHIC OFFICES	**30/1919 as amended**	**IHO A-1**	**H1.2**

In order that the IHO Secretariat may hold a record of the historical background of its Member States, it is recommended that each country should forward to the IHO Secretariat library, whenever they are published or become otherwise available, a copy of any historical account of its hydrographic activities.

MARINE SPATIAL DATA INFRASTRUCTURE (MSDI) POLICY	**5/2009 as amended**	**IHO A-1**	**K4.7**

1 The IHO will support Member States in the identification, development and implementation of an appropriate role in national Spatial Data Infrastructure (SDI) and MSDI initiatives. This will be achieved through:

a) The development and maintenance of an IHO Publication that will provide a definitive procedural guide to establishing the role of the national hydrographic authority in MSDI.

b) Developing an MSDI capacity building plan comprising knowledge transfer and training to Member States.

c) Developing and managing a web-based facility to encourage knowledge transfer, best practice and provision of online guidance and training material.

d) Formalising relations between IHO and other SDI stakeholder groups and through actively participating in these groups to strengthen understanding and knowledge of the role of hydrography in MSDI.

2 IHO Regional Hydrographic Commissions are encouraged to monitor and report progress in Member States' MSDI engagement and development as a means of benchmarking the role of the national hydrographic authority in MSDI.

COLLECTING OCEANIC SOUNDINGS	3/1932 as amended	85/2008	A5.1

1 It is strongly recommended that Hydrographic Offices include in their programmes regular and systematic surveys of ocean areas beyond the continental shelves.

2 It is recommended that when Hydrographic Offices plan oceanic surveys they attach sufficient importance to obtaining data which will be useful not only for navigation purposes but also for promoting knowledge of the morphology of the sea floor.

3 It is recommended that Hydrographic Offices interested in the same oceanic areas arrive at an understanding among themselves regarding a suitable division of their zones of activity and priorities.

4 It is recommended that, as concerns oceanic soundings, Hydrographic Offices work in close cooperation with the oceanographic bodies of their respective countries and use a standard procedure for recording data.

5 It is recommended that ships fitted with MBES or SBES be requested to collect bathymetric soundings and communicate the results of such soundings to the Hydrographic Offices of their respective countries with all information required to enable their accuracy to be estimated. The use of sound velocity calibration in accordance with the guidance set out in the IHO Manual on Hydrography (C-13) is recommended.

6 It is recommended that newly-discovered topographic undersea features should be properly mapped and named following the "Standardization of Undersea Feature Names" IHO-IOC Publication B-6.

METADATA FOR OCEANIC SOUNDINGS	4/1932 as amended	85/2008	A5.2

It is resolved that oceanic soundings, together with the metadata and potential additional supplementary information, shall be collected and exchanged mainly in digital form.

Metadata should comprise at least information on:

a) the survey in general as e.g. date, area, equipment used, name of survey platform;
b) the geodetic reference system used, i.e. horizontal and vertical datum; including ties to WGS 84 if a local datum is used;
c) calibration procedures and results;
d) sound velocity;
e) positioning information e.g. GPS, RT-DGPS, GLONASS, GALILEO;
f) tidal datum and reduction (if applicable); and
g) accuracies achieved and the respective confidence levels.

CENTRALIZATION OF OCEANIC SOUNDINGS	3/1929 as amended	IHO A-1	A5.3

1 Full details of the information required to accompany data, and the criteria for its quality control, are contained in the GEBCO Cook Book (IHO Publication B-11).

2 Data Storage and exchange of data.

a) Member States are requested to remind institutions and organizations within their own country of the desirability of collecting bathymetric data, whenever possible, in the course of oceanographic missions.

b) It is recommended that Member States inform the IHO Secretariat of any details concerning recent bathymetric data collected by themselves or by other national institutions and organizations, about which they may have been notified. The standard format below should be used for this purpose:

i) Country of origin;

ii) Institution or authority responsible for the mission;

iii) Name of vessel which carried out the soundings;

iv) Date (month and year);

v) Location (general sea area or significant points along track); and

vi) Terms under which data may be obtained (address for requests, method of ordering, price, or whether free on a mutual data exchange basis, etc.).

The IHO Secretariat will issue an annual CL requesting such information.

3 All bathymetric data collected should be forwarded by HOs to the IHO Data Centre for Digital Bathymetry (DCDB). Any format convenient to the individual HO may be used; but the data must be accompanied by comprehensive format documentation and metadata. The IHO DCDB should be notified of digital data that have been found to be in error; if possible, a corrected version should be submitted as well.

4 Information concerning Recent Bathymetric Data IHO Publication B-4

At the beginning of each calendar year, the IHO Secretariat shall make available an updated version of the online publication B-4 showing all bathymetric data received during the preceding year. These data will be available for download from the IHO DCDB in several digital formats, which include MGD 77, HYD 93 and delimited xyz ASCII.

IHO Programme 2 “Hydrographic Services and Standards”
2.2 - Tides and Water Levels

TITLE	Reference	Last amendment (CL or IHC)	1st Edition Reference
DATUMS AND BENCH MARKS	**3/1919 as amended**	**10/2017**	**A2.5**

1 It is resolved that the datum of tide/water level observations and predictions for mariners shall be the same as chart datum (datum for sounding reduction).

2 It is resolved that chart datum and other tidal/water level datums used should be clearly stated on charts and all other navigational products.

3 It is resolved that chart datums (datums for sounding reduction), the datums of tide/water level prediction and other tidal/water level datums shall always be connected with the general land survey datum, and, in addition, with a prominent and permanent fixed mark in the neighbourhood of the tide gauge, station, observatory etc.

4 It is resolved that ellipsoidal height determinations of the vertical reference marks used for tidal/water level observations should be made, in order to support the production of seamless data sets; i.e. to allow the translation between data sets with differing vertical datums. It is further resolved that such observations should relate to a geocentric reference system, preferably the International Terrestrial Reference System (ITRS), the World Geodetic System 1984 (WGS 84), or other geodetic reference systems coincident with ITRS.

In oceanic tidal areas

5 It is resolved that heights on shore, including elevations of lights, should be referred to a Highest Water (HW) datum.

6 It is resolved that the Lowest Astronomical Tide (LAT*), or a datum as closely equivalent to this level as is practical and acceptable to Hydrographic Offices, be adopted as chart datum. Alternatively, another, similar datum may be used if low water levels in a specific area frequently deviate from LAT, or a different datum has been established by national policy.

7 It is resolved that Highest Astronomical Tide (HAT*), or a datum as closely equivalent to this level as is practical and acceptable to Hydrographic Offices, be adopted as the datum for vertical clearances. Alternatively, another, similar datum may be used if high water levels in a specific area frequently deviate from HAT, or a different datum has been established by national policy.

8 It is recommended that LAT and HAT be calculated either over a minimum period of 19 years using harmonic constants derived from a minimum of one year's observations or by other proven methods known to give reliable results. Tide levels should, if possible, reflect the estimated uncertainty values obtained during the determination of these levels.

In mixed waters *(where water level variability is due to both tidal and regionally specific forcing mechanisms)* ***and inland waters***

9 It is resolved that depths, and all other navigational information should be referred to an appropriate level that is practical and acceptable to Hydrographic Offices (such as lowest water (LW) as a reference level for depths and HW for vertical clearances). The selection of which one of the alternatives to be used is a difficult issue which can only be determined locally and which will be largely dependent on seasonal hydrological conditions. LW and HW are defined preferably as the mean of lowest/highest water levels, or as a suitable percentile of lowest/highest water levels, observed over a long time period from a minimum of one year's observations of free water level.

In geographical areas where the tidal range is negligible *(for example less than 0.30m)* ***and in non-tidal areas***

10 It is resolved that depths, and all other navigational information should be referred to Mean Sea Level (MSL) or other level as closely equivalent to this as is practical and acceptable to Hydrographic Offices.

> *Note: The adopted level may be a well-defined geodetic datum as used for heights in land survey applications or an observed local Mean Sea Level (MSL) based on long series of water level observations.*

11 In order to support other non-navigational applications and also to indicate the characteristics in the area, it is recommended to adopt the mean of yearly lowest/highest water levels, or a suitable percentile of lowest/highest water levels, observed over a long time period from a minimum of one year's observations.

** Note: LAT (HAT) is defined as the lowest (highest) tide level which can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions.*

USE OF TERMS "TIDE", "TIDAL STREAM" AND "TIDAL CURRENT"	**4/1919 as amended**	**18/1955**	**A2.8**

It is resolved that the term "tide" or its equivalent in another language shall be used for designating the periodical vertical movement of the water, and the terms "tidal stream", "tidal current", or their equivalents for designating the periodical horizontal movement of the water.

DESCRIPTION OF CURRENTS AND TIDAL STREAMS	**5/1919 as amended**	**19/2008**	**A2.9**

1 It is resolved that a current shall be described by the direction towards which it is running.

2 It is resolved that tidal streams shall be defined by the direction towards which they flow.

a) If desired, the terms "flood stream" and "ebb stream" may be used for designating the horizontal movement of the water when the tide is respectively rising or falling, but to avoid any ambiguity, in the case of streams which do not turn at about the time of local high or low water, an indication shall be given of the direction towards which the stream flows.

3 It is resolved that information relating to tidal streams shall be referred to the time of high or low water at a port for which tidal predictions are given in the Tide Tables.

4 It is strongly recommended that the port selected for reference be preferably a port for which daily predictions are given in Tide Tables (standard ports) and where the tides have similar characteristics to those of the currents under consideration.

5 The rules of the above paragraphs 3 and 4 would not be applicable for those countries which publish Current Tables giving daily information relating to tidal streams with reference to the hours of the day. In such instances, it is recommended that the reference be made to the time of slack or maximum current at a place for which daily tidal stream predictions are given in such Tables.

6 It is resolved that velocities shall be given in knots to 1 decimal place.

7 It is recommended that the effect of prevailing winds or long-continued weather conditions on local currents be recorded in Sailing Directions.

EXCHANGE OF TIDAL INFORMATION	9/1919 as amended	42/2000	A6.1

It is resolved that published tidal information shall be freely exchanged. The exchange of tide and tidal current observations and predictions shall be made as far as possible in a form directly usable in electronic computers.

ADVANCE SUPPLY OF TIDAL PREDICTIONS	10/1919 as amended	75/2006	A6.2

1 It is resolved that advance copies of tidal predictions shall be supplied on request to those Member States who require them for inclusion in their own published tables.

2 It is strongly recommended that these advance copies be supplied in sufficient time to be in the hands of the publishing authority not later than twelve months before 1 January of the year of predictions.

3 It is recommended that when tidal constituents or values of harmonic constants are changed from those used for tidal predictions for the previous year, the tidal constituents should also be supplied to the producer nation upon request together with the national tidal predictions.

4 It is recommended that tidal predictions supplied to other countries be in the form of the times and heights of high and low waters, unless these values are not normally predicted or are requested in another form.

ISSUING AUTHORITIES FOR TIDAL PREDICTIONS	2/1947 as amended	IHC 10	A6.3

In the general interests of navigation it is resolved that tidal predictions to be used for any important commercial port or approach areas within a country's territorial waters shall be those established by the appropriate authority in which the port or the approach area is situated or is being maintained. It may be necessary to establish the authority for predictions if such predictions are made on a regional co-operative basis where several narrow stretches of water separate States. In this connection, it is strongly recommended that Member States extend their tidal observations to those areas, and prepare and publish their predictions.

EXTENSION OF WORLD NETWORK OF TIDAL OBSERVATIONS	5/1932 as amended	IHO A-1	A6.4

1 It is recommended that the world network of tide stations be extended, that some well-distributed stations operate continuously, and that special efforts be directed towards the establishment of stations on the outer sea coast of the continents and oceanic islands.

2 It is recommended that governments which do not possess departments organized for this purpose be advised by the IHO Secretariat as to the desirability and means of undertaking the installation of tide gauges, the analysis of the resulting records and the preparation of Tide Tables. This work, carried out for selected stations, is of importance both in the interests of navigation and of science. It is possible that such work might be financed by commercial corporations or by other institutions if they were brought to appreciate its utility.

3 Concerning the extension of the world network of tidal stations with a view to improving co-tidal line charts, it is recommended that Hydrographic Offices give increased attention to the need for additional observations of tides and tidal streams in many areas not now adequately examined. It is noted that in certain regions observations extending over 29 days of tides and tidal streams are sufficient.

STUDY OF MEAN SEA LEVEL	6/1932 as amended	IHO A-1	A6.5

1 It is recommended that the IHO Secretariat encourage Member States to carry out systematic, long-term tidal observations, records of typically 40 years or longer, in view of the importance of monthly and secular variations of mean sea level in connection with tidal prediction.

2 It is recommended that Member States make such data available for publication by the Permanent Service for Mean Sea Level of the International Council of Scientific Unions, since that service publishes regular monthly and annual values of mean sea level for tidal stations throughout the world.

GEOGRAPHICAL POSITIONS OF TIDE STATIONS	1/1967		A6.6

It is recommended that when giving tidal information about stations whose identification on the chart is not obvious, the approximate geographical positions of such stations be indicated.

COLLECTION AND PUBLICATION OF TIDAL DATA	1/1977 as amended	44/2014	A6.7

1 It is recommended that Member States gather tidal data from as many locations as feasible and maintain sets of harmonic constants in National Tidal Constituent Data Banks.

2 It is recommended that Member States make public, using their web site or other suitable means, tidal and tidal stream predictions and a list of locations included in their own Tidal Constituent Data Banks.

NATIONAL TIDAL CONSTITUENT BANKS	2/1977 as amended	44/2014	A6.8

It is resolved that the National Tidal Constituent Banks should store the following information for each location:

a) Location identification by number, name, country, body of water, and geographic coordinates;

b) Source, date, time zone, and duration of data used in analysis;

c) Identification of geodetic levelling datum, and date of reference to this datum, elevation of mean sea level and, where applicable, the connection to and identification of the appropriate bench mark(s); and

d) Listing of values for tidal constituents giving amplitudes in metres and Greenwich phase lags in degrees and designation of organization responsible for analysis. (Tidal constituents used should form part of those in the Standard List prepared by the TWLWG and published on the IHO website.)

See also 9/1919 (A 6.1) and 10/1919 (A 6.2).

RELEASE OF TIDAL DATA TO COMMERCIAL ORGANIZATIONS	1/1994 as amended	22/2001	A6.9

1 Recommendations for a Strategy concerning the Release of Tidal Data to Commercial Organizations

a) Definition of a Commercial Organization

A "commercial organization" is an organization which sells or distributes products. This definition does not refer to national authorities when they sell or distribute products in the context of their duties as a public service.

b) Definition of Tidal Data

The term "tidal data" for this document includes any data leading to and including tidal and tidal stream predictions.

c) General considerations

i) In the interest of safe navigation, effective oil and hazardous material spill response, efficient search and rescue and improved environmental management, the following statements are intended as a framework for Hydrographic Offices to make arrangements with commercial organizations.

ii) As the development of quality-assured tidal predictions is a complicated matter, comprehensive knowledge and experience of tidal theory and practice are absolute prerequisites.

iii) Computer technology can provide valuable support in presenting tidal predictions to users in convenient forms. However, the methods to present such information must be applied in an appropriate manner or data quality may suffer. Some Hydrographic Offices may find it unnecessary to develop all the products which are desired by all users; some development may be left to commercial organizations.

d) Recommendations

i) The Hydrographic Offices should NOT be responsible for the correctness of any predictions developed and distributed by commercial organizations.

ii) Official tidal predictions should be released by Hydrographic Offices only. Hydrographic Offices may, however, authorize recognized institutions to calculate and/or distribute these official predictions. Hydrographic Offices or these institutions authorized by them may release their own harmonic constituents, but not those of other Member States, as may be deemed appropriate.

iii) Any product of a commercial organization should only be supplementary to obligatory official information required in terms of international conventions.

iv) Authorized tidal differences or harmonic constituents should be supplied by the Hydrographic Offices for secondary stations.

v) In addition to the products outlined above, Hydrographic Offices should have the right to produce, market and distribute any tide related products.

vi) Where applicable, commercial organizations should be allowed to distribute official tide related products with the permission of the producing Hydrographic Office.

2 Recommendations for Standards to be applied in connection with the Release of Tidal Data

a) Predictions used for primary stations should only be those provided by the Hydrographic Offices, unless a specific agreement is made between an HO and some other body.

b) For secondary stations, predictions based either on tidal differences or on harmonic constituents may be published, in all cases including the method, source, date of analysis and the relevant primary station. This applies to numerical as well as graphical representation.

c) If a Hydrographic Office believes that, by using information obtained from a commercial product, a danger to life, property or the environment may result, the Hydrographic Office should take such action as it may deem appropriate to fulfil its responsibilities in the field of maritime safety. This should not be construed, however, to mean that Hydrographic Offices have responsibilities for inspecting the products of commercial organizations *(see Section 3 below).*

d) Legal matters, matters of copyright and of charges to be paid are different in each country and are very complex. They are left to the discretion of each Member State.

e) Commercial organizations developing products *should* be required to state clearly on their products the following:

i) That the information being presented does not replace obligatory navigation material.

ii) That where the original data were provided by a Hydrographic Office, a disclaimer should appear that, as the Hydrographic Office has no control over the product, it cannot accept any responsibility for it, except for those parts of the product which are a complete and true reproduction of official predictions issued by the Hydrographic Office.

iii) A sample product may be required to be made available to the Hydrographic Offices responsible and/or to each donating authority prior to distribution, to ensure the imposed conditions are honoured. The Hydrographic Offices concerned should respond within a mutually acceptable time scale.

iv) The data remain the property of the donating agencies.

3 Recommendations for Standards to be applied in connection with the inspection of the products of Commercial Organizations

a) Inspection of commercial products by Hydrographic Offices *is not recommended* as examination may imply approval with its attendant responsibilities and liabilities.

IHO Programme 2 "Hydrographic Services and Standards"
2.2 - Tides and Water Levels

TITLE	Reference	Last amendment (CL or IHC)	1st Edition Reference
DIGITAL TIDE AND TIDAL CURRENT TABLES	**01/2019**	**04/2020**	

1. It is resolved that member Hydrographic Organizations (HO) may choose to publish their tide and tidal current tables in either paper format or digitally. If digitally, they can be distributed either through the HO's web site, or representative complement or via portable media such as a DVD.

General Guidelines for Digital Tide and Tidal Current Tables

2. It is resolved that digital tide and tidal current tables should adhere to all the same requirements as existing paper tide and tidal current tables as specified in IHO publication M-3 (*IHO Programme 2 "Hydrographic Services and Standards" Section 2.2 – Tides and Water Levels).*

3. It is resolved that the issuing office should provide documentation on how to install or read the electronic tables, minimum computer specifications how to obtain product support and general information on the Digital Tide and Tidal Current Tables. This information should be provided in either hardcopy written form (for example, on a separate sheet of paper or on the cover of the disk or other media), or electronically in a plain ASCII text 'readme.txt' type of file. This file should also include user license and/or condition of use information.

4. It is resolved that the issuing office should provide its formal name, mailing address, web url and point of contact information on the cover of the media. It should also provide information on the production of the tables (including both address and website), information on how to obtain annual updates, and how to obtain interim updates or errata information.

5. It is resolved that the digital tide and tidal current tables should include a statement concerning the standing of the digital tables as meeting the applicable maritime regulations, either SOLAS and/or local country carriage requirements.

Formats for Digital Tide and Tidal Current Tables

6. It is resolved that there shall be two allowable formats for digital tide and tidal current tables.

A. Scanned images of the paper tide tables with the attributes described below in section 7 (*Detailed Specifications for Digital Tide Tables – Scanned Images of Tide Tables*).

B. Electronically generated Tide and Tidal Current Predictions: This format consists of software and a user interface that calculates tide and tidal current predictions from stored harmonic constituents or time and range offsets.

Detailed Specifications for Digital Tide Tables – Scanned Images of Tide Tables:

7. It is resolved that Scanned Images of Tide Tables should follow the following specifications.

a. Should be a faithful reproduction of all the pages of printed tide tables;

b. The images should be formatted in a widely available, common format. Examples formats include, but not limited to, PDF, tiff, Jpeg, Gif, png. If PDF files are provided, then information on how to download Adobe© Reader must be provided;

c. If multiple books are published, then each book should be located within its own folder and clearly identified;

d. No modification of the scanned images is permitted by users.

IHO Programme 2 "Hydrographic Services and Standards"
2.2 - Tides and Water Levels

Detailed Specifications for Digital Tide Tables – Electronically Generated Tide Predictions

8. It is resolved that Electronically Generated Tide Predictions should follow the following specifications:

a. Station Selection: It is recommended that station selections can either be map based or list based, and should be organized by water body;

b. Station Information: It is recommended that the following information be available for each station:

Station Name and Number (or ID) as appropriate;

Body of Water Descriptor (if appropriate);

Latitude and Longitude (following ISO 6709 convention, stated in degrees and 6 decimals);

Horizontal and Vertical Datum convention;

Location Map with nearby prediction stations identified;

URL to station or data portal.

c. It is recommended that Earth-Moon-Sun Astronomical Calendar Information (Tabular and/or integrated with graphical data output) be provided;

d. It is recommended that Sunrise/Sunset Calendar Information (Tabular and/or integrated with graphical data output) be provided;

e. It is recommended that the default reference datum is the Chart Datum used by the Country furthermore, it is recommended that the user have the ability to reference predictions to other tidal datums supported by the HO (such as LAT, HAT, MHW, MSL) and user identified datums such as a national geodetic or ellipsoidal datum or other coastal engineering or threshold datums that are pertinent;

f. It is recommended that data displays and tables can be toggled to both in Metric or English units, with default depending upon country;

g. It is recommended that the time displayed is the legal local time as default, with user selected option for UTC/GMT, daylight savings time, etc. Legal time includes daylight savings time if applicable. Furthermore, when time zone information is displayed it should follow the convention that negative time zone offsets are used for east longitude and positive offsets for west longitude;

h. It is recommended that the following tide prediction source metadata information be provided:

Harmonic Constituents or Time and Range Correction to Reference Station;

Dates of Harmonic Analyses time series used to create the set of Harmonic Constituents used in the prediction;

Dates of the observations used to create time and height corrections (for non-harmonic based predictions) to a reference Station;

Links to the list of the Harmonic Constituents used in the Prediction. Furthermore, the display of the Harmonic Constituents should adhere to the IHO publication M-3 (*IHO National Tidal Constituent Banks Resolution 2/1977 as amended 44/2014 A6:8)*;

The name of the Harmonic Analysis program used to generate the harmonic constituents.

i. It is recommended that the HO provide and display tidal sea level amplitude prediction with a minimum of either centimetre (for metric systems) or tenths of foot (for imperial systems) precision;

j. It is recommended that users have the ability to obtain output in common formats such as PDF, TXT, XML, CSV;

k. It is recommended that additional information be provide special warning explaining areas of anomalous tidal conditions, special datums, or tidal based hazards to navigations (dual high or low waters, tidal bores, river flow dependencies and river datums, frequent non-tidal conditions, etc..);

l. It is recommended, when applicable, that estimates of uncertainty in the predicted times and heights of high and low waters be provided to users.

Detailed Specifications for Graphical Display of Electronic Tide Predictions

9. It is resolved that the predictions have the ability to obtain graphical and tabular output for desired time period (either historical and into the future) and should contain the following attributes with the objective not to prescribe a specific graphical view but rather to identify common elements that transcend all types of graphs:

a. It is recommend that the predictions can be displayed as discrete points or a continuous curve using a curve fit routine to times and heights of high and low waters or to the time series values;

b. It is recommended that all axes should be clearly labelled;

c. It is recommended that time series data should have 1- hour or shorter increments;

d. It is recommended that times and heights of predicted high and low tides should be provided;

e. It is recommended that the default datum should be the same as chart datum for the location of the prediction;

f. It is recommended that the tidal height units default should be the same as the HO's printed tables;

g. It is recommended that the display should include station information (as defined above);

h. It is recommended that the display include the name and/or the insignia of the source authority organization;

i. It is recommended that the display should have the option to view the tide prediction numerical values used to create the graphic;

j. It is recommended that the display of the graphical data should be able to be adjusted to suit daytime, twilight, and night time viewing.

Detailed Specifications for Digital Tidal Current Tables

10. It is resolved that Digital Tidal Current Tables can be in the same two formats as Digital Tide Tables and the same requirements that apply to digital tide tables pertain to tidal current tables.

11. It is resolved that electronically generated Tidal Current Predictions do have additional specifications as identified:

a. It is recommended that the depth of prediction be included in the metadata and include a the descriptor that the depth is either from the surface down or from the bottom up;

b. It is recommended, if applicable, flood and ebb current direction (referenced to True North) be presented;

c. It is recommended that for graphical display of tidal currents the default speed units should be knots;

d. It is recommended that for graphical display of tidal currents the default direction units should be degrees (referenced to true north).

Examples of Digital Tide Tables

USA - NOAA Example - Scanned Tide Table

Albany, New York, 2015

Times and Heights of High and Low Waters

January

	Time	Height		Time	Height
	h m	ft cm		h m	ft cm
1 Th	0048	5.1 155	16 F	0026	4.2 128
	0741	−0.3 −9		0705	0.4 12
	1317	5.5 168		1241	5.0 152
	2026	−0.4 −12		2006	0.4 12
2 F	0142	5.1 155	17 Sa	0121	4.3 131
	0833	−0.3 −9		0803	0.3 9
	1407	5.5 168		1331	5.2 158
	2120	−0.4 −12		2043	0.2 6
3 Sa	0233	5.1 155	18 Su	0211	4.4 134
	0922	−0.3 −9		0858	0.1 3
	1454	5.6 171		1417	5.4 165
	2210	−0.5 −15		2153	0.0 0
4 Su	0321	5.1 155	19 M	0257	4.6 140
	1009	−0.2 −6		0952	−0.1 −3
	1538	5.5 168		1503	5.6 171
○	2256	−0.4 −12		2243	−0.2 −6
5 M	0408	5.0 152	20 Tu	0343	4.8 146
	1054	−0.1 −3		1044	−0.2 −6
	1621	5.4 165		1549	5.7 174
	2341	−0.3 −9	●	2331	−0.4 −12
6 Tu	0454	4.9 149	21 W	0430	4.9 149
	1136	0.1 3		1196	−0.4 −12
	1702	5.3 162		1639	5.7 174
7 W	0022	−0.2 −6	22 Th	0018	−0.5 −15
	0540	4.8 146		0520	5.0 152
	1216	0.2 6		1227	−0.4 −12
	1742	5.1 155		1733	5.7 174
8 Th	0103	0.0 0	23 F	0106	−0.5 −15
	0625	4.7 143		0612	5.1 155
	1255	0.4 12		1320	−0.4 −12
	1822	5.0 152		1830	5.6 171
9 F	0141	0.1 3	24 Sa	0154	−0.5 −15
	0710	4.6 140		0708	5.2 158
	1334	0.5 15		1414	−0.4 −12
	1901	4.9 149		1931	5.5 168
10 Sa	0219	0.2 6	25 Su	0244	−0.4 −12
	0755	4.6 140		0806	5.2 158
	1416	0.6 18		1511	−0.3 −9
	1940	4.8 146		2032	5.4 165
11 Su	0256	0.3 9	26 M	0336	−0.3 −9
	0839	4.6 140		0904	5.3 162
	1503	0.7 21		1610	−0.2 −6
	2021	4.6 140	◐	2132	5.2 158
12 M	0334	0.4 12	27 Tu	0429	−0.3 −9
	0922	4.7 143		1002	5.3 162
	1559	0.8 24		1710	−0.1 −3
	2115	4.4 134		2231	5.1 155
13 Tu	0416	0.4 12	28 W	0524	−0.2 −6
	1006	4.7 143		1101	5.3 162
	1701	0.8 24		1810	−0.1 −3
◑	2220	4.3 131		2330	5.0 152
14 W	0507	0.5 15	29 Th	0620	−0.1 −3
	1055	4.8 146		1159	5.3 162
	1806	0.8 24		1908	−0.1 −3
	2325	4.2 128			
15 Th	0605	0.5 15	30 F	0028	5.0 152
	1148	4.9 149		0715	−0.1 −3
	1908	0.7 21		1255	5.3 162
				2004	−0.2 −6
			31 Sa	0123	5.1 155
				0808	−0.1 −3
				1347	5.4 165
				2057	−0.3 −9

February

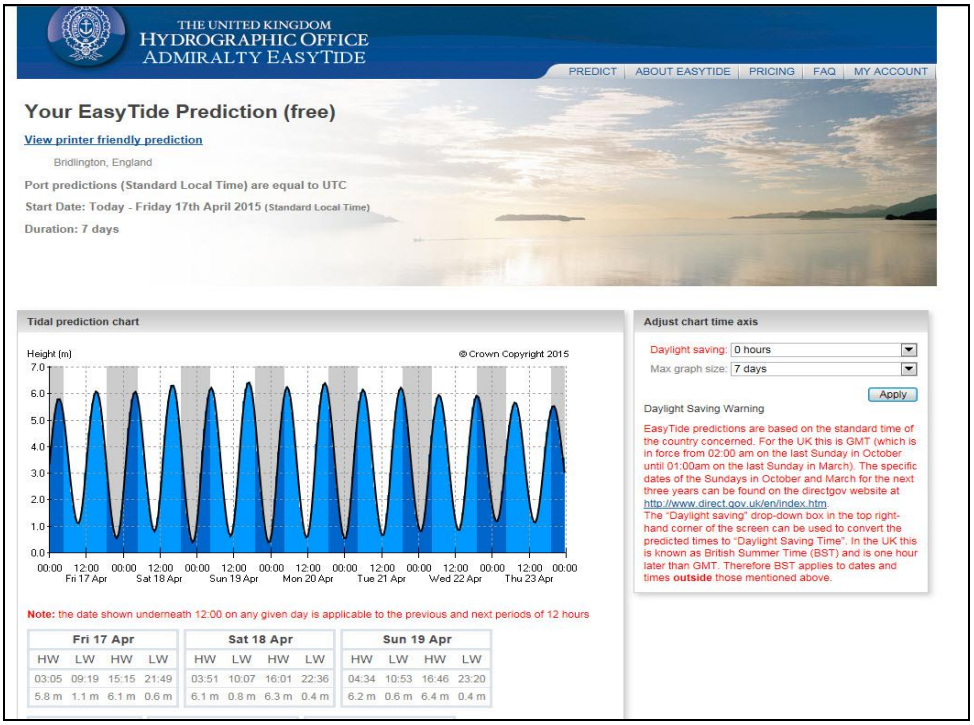
	Time	Height		Time	Height
	h m	ft cm		h m	ft cm
1 Su	0214	5.2 158	16 M	0144	4.8 146
	0859	−0.1 −3		0836	0.3 9
	1435	5.4 165		1353	5.6 171
	2145	−0.3 −9		2127	0.1 3
2 M	0302	5.2 158	17 Tu	0234	5.0 152
	0946	−0.1 −3		0933	0.1 3
	1519	5.4 165		1445	5.7 174
	2230	−0.3 −9		2217	−0.1 −3
3 Tu	0348	5.2 158	18 W	0322	5.3 162
	1030	0.0 0		1027	−0.2 −6
	1600	5.4 165		1535	5.9 180
○	2313	−0.2 −6	●	2306	−0.2 −6
4 W	0431	5.1 155	19 Th	0409	5.4 165
	1112	0.1 3		1119	−0.3 −9
	1640	5.3 162		1626	5.9 180
	2352	−0.1 −3		2353	−0.3 −9
5 Th	0513	5.1 155	20 F	0458	5.6 171
	1152	0.2 6		1211	−0.4 −12
	1718	5.2 158		1719	5.9 180
6 F	0029	0.0 0	21 Sa	0040	−0.3 −9
	0553	5.0 152		0549	5.6 171
	1231	0.3 9		1303	−0.3 −9
	1754	5.1 155		1815	5.8 177
7 Sa	0104	0.2 6	22 Su	0128	−0.2 −6
	0632	5.0 152		0642	5.6 171
	1310	0.5 15		1356	−0.2 −6
	1826	5.0 152		1913	5.6 171
8 Su	0137	0.3 9	23 M	0216	−0.1 −3
	0706	5.0 152		0739	5.6 171
	1350	0.6 18		1452	−0.1 −3
	1851	4.9 149		2012	5.5 168
9 M	0208	0.4 12	24 Tu	0307	0.1 3
	0730	5.0 152		0837	5.6 171
	1434	0.7 21		1549	0.1 3
	1924	4.8 146		2111	5.4 165
10 Tu	0240	0.5 15	25 W	0400	0.2 6
	0752	5.1 155		0935	5.5 168
	1526	0.8 24		1647	0.2 6
	2009	4.6 140	◐	2210	5.3 162
11 W	0320	0.5 15	26 Th	0455	0.4 12
	0832	5.2 158		1034	5.4 165
	1627	0.9 27		1746	0.3 9
◑	2109	4.5 137		2309	5.2 158
12 Th	0413	0.7 21	27 F	0552	0.5 15
	0923	5.2 158		1133	5.4 165
	1733	0.9 27		1843	0.3 9
	2234	4.4 134			
13 F	0520	0.7 21	28 Sa	0007	5.3 162
	1028	5.2 158		0648	0.5 15
	1837	0.8 24		1231	5.4 165
	2348	4.4 134		1938	0.2 6
14 Sa	0631	0.7 21			
	1149	5.2 158			
	1938	0.6 18			
15 Su	0050	4.5 137			
	0736	0.5 15			
	1256	5.4 165			
	2034	0.4 12			

March

	Time	Height		Time	Height
	h m	ft cm		h m	ft cm
1 Su	0102	5.4 165	16 M	0023	5.1 155
	0743	0.5 15		0715	0.9 27
	1324	5.5 168		1230	5.7 174
	2029	0.1 3		2006	0.7 21
2 M	0153	5.5 168	17 Tu	0120	5.4 165
	0834	0.4 12		0817	0.6 18
	1413	5.6 171		1333	5.9 180
	2117	0.1 3		2059	0.5 15
3 Tu	0241	5.6 171	18 W	0212	5.7 174
	0922	0.4 12		0915	0.3 9
	1457	5.6 171		1428	6.0 183
	2201	0.1 3		2150	0.3 9
4 W	0325	5.7 174	19 Th	0300	6.0 183
	1006	0.4 12		1009	0.1 3
	1538	5.6 171		1519	6.2 189
	2241	0.1 3		2239	0.1 3
5 Th	0406	5.7 174	20 F	0347	6.2 189
	1049	0.4 12		1102	−0.1 −3
	1617	5.5 168		1610	6.2 189
○	2319	0.3 9	●	2326	0.1 3
6 F	0444	5.6 171	21 Sa	0435	6.3 192
	1130	0.4 12		1154	−0.1 −3
	1654	5.4 165		1702	6.1 186
	2354	0.4 12			
7 Sa	0520	5.6 171	22 Su	0013	0.2 6
	1209	0.5 15		0523	6.3 192
	1728	5.3 162		1245	0.0 0
				1756	6.0 183
8 Su	0027	0.5 15	23 M	0100	0.3 9
	0550	5.6 171		0615	6.2 189
	1249	0.6 18		1337	0.1 3
	1757	5.2 158		1853	5.8 177
9 M	0058	0.6 18	24 Tu	0148	0.5 15
	0607	5.7 174		0710	6.1 186
	1330	0.7 21		1431	0.3 9
	1821	5.2 158		1951	5.7 174
10 Tu	0129	0.7 21	25 W	0238	0.7 21
	0627	5.8 177		0807	5.9 180
	1414	0.8 24		1526	0.5 15
	1855	5.1 155		2049	5.6 171
11 W	0202	0.8 24	26 Th	0331	0.9 27
	0704	5.8 177		0906	5.8 177
	1504	1.0 30		1622	0.6 18
	1942	5.0 152		2147	5.5 168
12 Th	0245	0.9 27	27 F	0426	1.0 30
	0751	5.8 177		1055	5.6 171
	1602	1.1 34		1718	0.7 21
	2041	4.9 149	◐	2245	5.5 168
13 F	0341	1.0 30	28 Sa	0522	1.1 34
	0844	5.8 177		1104	5.6 171
	1705	1.1 34		1814	0.8 24
◑	2201	4.9 149		2342	5.6 171
14 Sa	0453	1.1 34	29 Su	0619	1.2 37
	0947	5.6 171		1202	5.6 171
	1808	1.1 34		1907	0.7 21
	2318	4.9 149			
15 Su	0607	1.1 34	30 M	0037	5.7 174
	1110	5.6 171		0714	1.1 34
	1909	0.9 27		1256	5.6 171
				1957	0.6 18
			31 Tu	0128	5.9 180
				0806	1.0 30
				1346	5.7 174
				2043	0.6 18

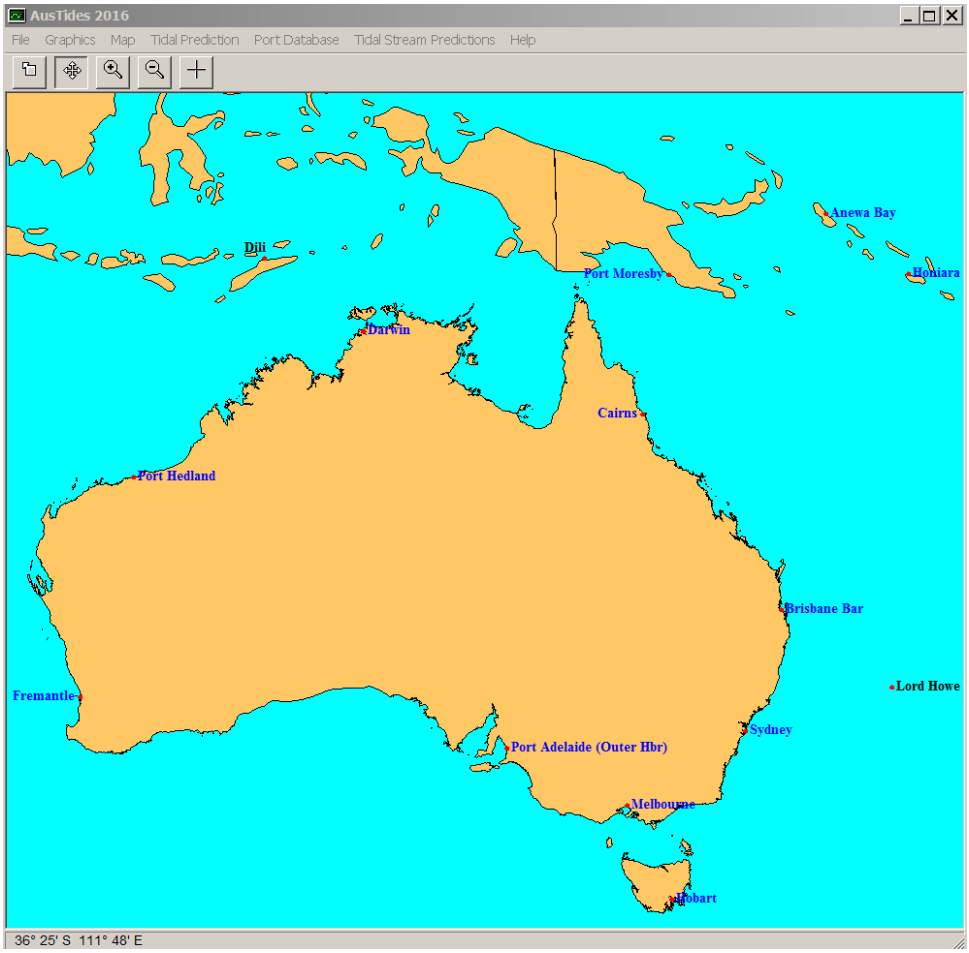
Time meridian 75° W. 0000 is midnight. 1200 is noon. Times are not adjusted for Daylight Saving Time.
Heights are referred to mean low water during lowest river stages which is the chart datum of soundings.

UKHO Example



IHO Programme 2 “Hydrographic Services and Standards”
2.2 - Tides and Water Levels

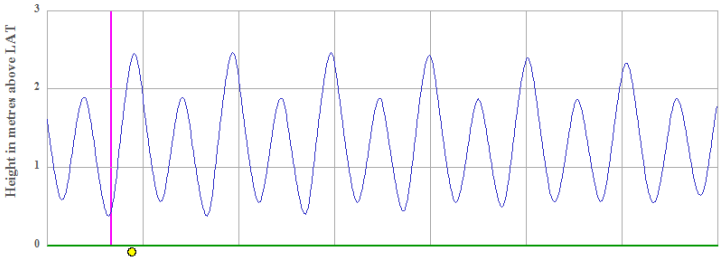
Australian Example



BRISBANE BAR

Local Standard Time Zone: -10:00 U.T. | **27° 22' S 153° 10' E** | **Year 2016**

PREDICTION DATUM below MSL: 1.31 (m) | **Port 59980**



16:00 0.4m

Jun 20 Mo		21 Tu		22 We		23 Th		24 Fr		25 Sa		26 Su	
Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m
0343	0.6	0423	0.6	0503	0.5	0543	0.5	0624	0.5	0024	2.4	0109	2.3
0911	1.9	0951	1.9	1032	1.9	1115	1.9	1200	1.9	0707	0.5	0755	0.5
1520	0.4	1557	0.4	1635	0.4	1713	0.4	1755	0.5	1250	1.9	1347	1.9
2150	2.4	2227	2.5	2304	2.5	2343	2.4			1843	0.6	1939	0.6

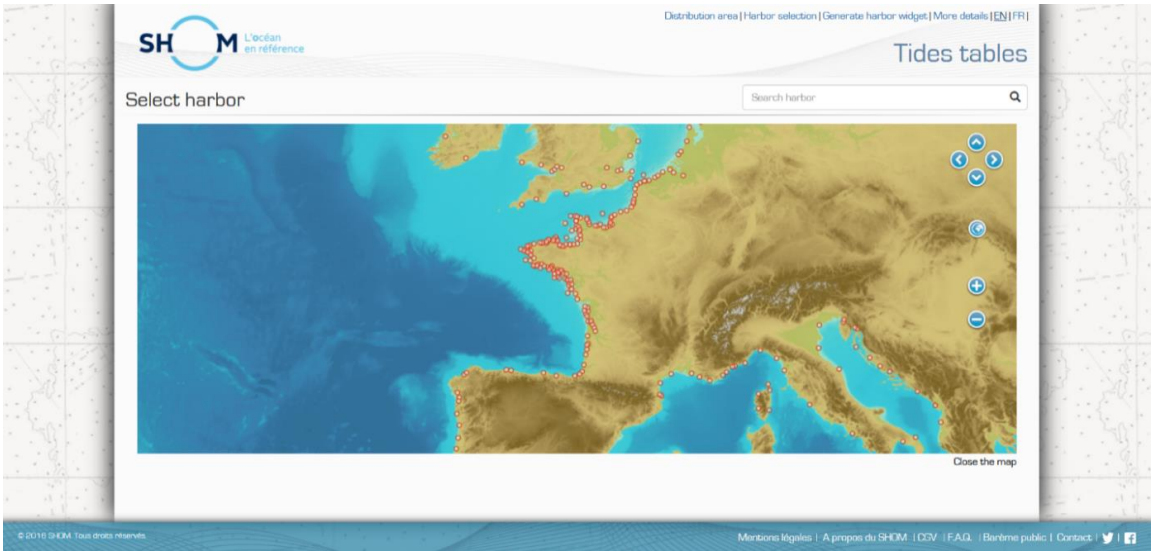
Moon phases supplied by Sydney Observatory

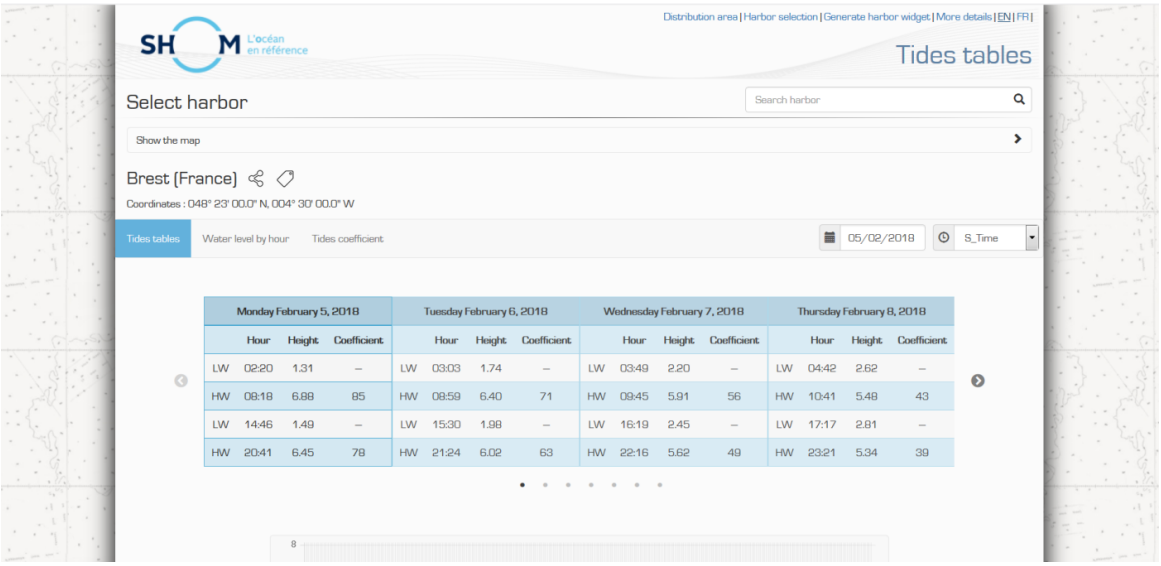
No account is taken of Daylight Saving Time

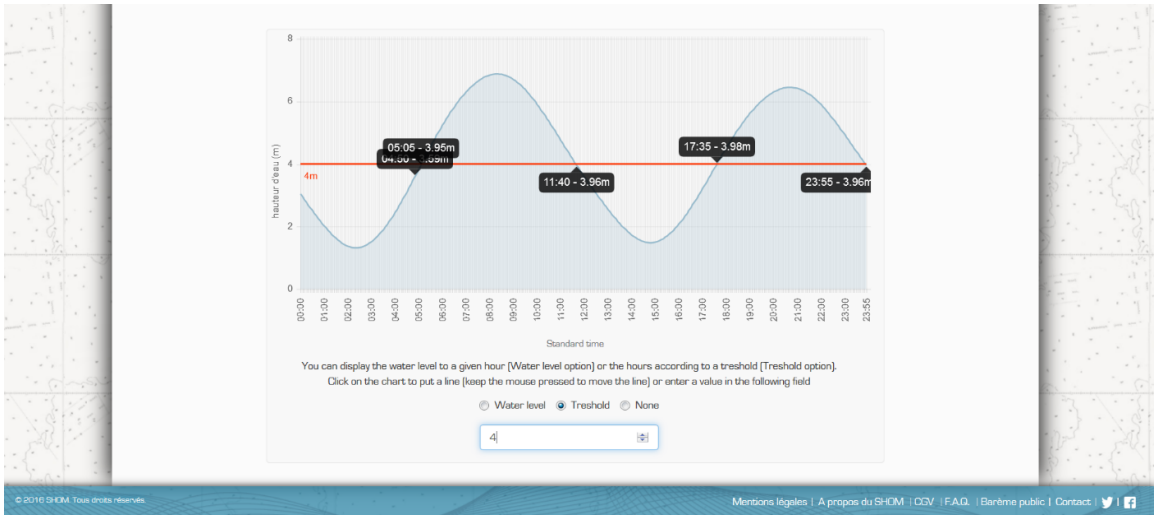
These predictions are identical to those published in ANTT and can thus be used as an official navigational publication.
Prediction Datum is LAT, which may not be Chart Datum. Correction to Chart Datum can be found at:
Level / To Chart Datum Corrections and Zero of Predictions Window.

IHO Programme 2 "Hydrographic Services and Standards"
2.2 - Tides and Water Levels

Example from SHOM (France)







IHO Programme 2 "Hydrographic Services and Standards"
2.3 – Charts / 2.3.1 – General

Deletion from charts of doubtful hydrographic data

Reporting and Publication of Dangers to Navigation

Naming Convention for the Vertical Datum of Charts

Canals for inland navigation

Soundings taken from foreign charts

TITLE	Reference	Last amendment (CL or IHC)	1st Edition Reference
DELETION FROM CHARTS OF DOUBTFUL HYDROGRAPHIC DATA	**1/1947 as amended**	**29/2009**	**A1.11**

It is strongly recommended that, whenever possible, Member States devote part of their annual hydrographic activities to systematic investigations undertaken for the purpose of eliminating from nautical charts the reports now appearing thereon as PA, PD and ED.

REPORTING AND PUBLICATION OF DANGERS TO NAVIGATION	**1/2006**		**A1.20**

The following is a list of the actions that should be considered by the relevant authorities. Not every action will be appropriate in every case. Whilst the actions below are set out in a logical sequence it is likely that some of these steps will take place simultaneously or in a different order.

a) Local / National Authority (e.g. harbourmaster, lighthouse authority, hydrographic office etc.) receives message indicating the presence of a new danger to navigation.

b) Receiving authority ensures local and/or coastal warnings are issued to all ships in the vicinity, if appropriate.

c) Authority informs National co-ordinator (see S-53 for definition) and national charting authority. NB. The national charting authority may be the national HO or a foreign HO to which chart production for the area has been delegated.

d) National co-ordinator informs: Navarea co-ordinator or Sub-area co-ordinator, if one exists, (see S-53 for definitions); national charting authority (if not already informed at 3 above); and authority responsible for marking dangers to navigation.

e) Co-ordinators at 4 above issue navigational warnings via national and international services.

f) The Charting HO issues NtM / ER for affected chart(s). This also serves to inform other interested authorities e.g. HOs producing world-wide chart coverage. After suitable time has elapsed for effective NtM / ER distribution, authorities may cancel relevant navigational warnings.

g) HO / MSA / Port Authority, if it is considered necessary, organises hydrographic survey or includes the requirement for survey in its prioritised future survey schedule.

h) HO issues updated NtM / ER based on results of survey (or cancels NtM if danger was temporary and has now been removed).

i) HO considers need for new edition / new chart.

NAMING CONVENTION FOR THE VERTICAL DATUM OF CHARTS	**1/2008**		**A2.16**

1 It is resolved that the vertical datum used on navigational charts, Chart Datum (CD), be defined without ambiguity in order to enable subsequent bathymetric data comparisons to be conducted in an efficient and reliable manner and for the accurate combination of datasets using different vertical datums.

2 It is recommended that a designated epoch for example CD (2006) or LAT-UK (2000) be used. The decision as to when a change in CD for a given area is necessary and the name given to that specific definition of CD remains a matter for each Member State based on their national requirements.

CANALS FOR INLAND NAVIGATION	**4/1929**		**B2.18**

It is resolved that a brief note shall be inserted in a suitable position on the appropriate charts, or in the Sailing Directions, calling attention to the official publications in which the necessary nautical information concerning canals for inland navigation is to be found.

SOUNDINGS TAKEN FROM FOREIGN CHARTS	**3/1947**		**B2.28**

It is resolved that, when soundings taken from original foreign charts are accepted unchanged, a note shall be given in the title of the chart stating the datum for sounding reduction used for each constituent area; alternatively the information may be conveyed in the table of tidal information on the chart.

IHO Programme 2 "Hydrographic Services and Standards"
2.3 – Charts / 2.3.2 – INT

IHO Transfer Standard for Digital Hydrographic Data

ENC/SENC distribution option

IHO Data Protection Scheme S-63

ENC Distribution and Use of the Term ENC

Principles of the Worldwide Electronic Navigational Chart Database (WEND)

The importance of resolving issues related to the functioning of the "ECDIS-ENC system"

Reaffirmation of the IHO's commitment to full ENC coverage (PRO WENDWG-1)

Elimination of overlapping ENC data in areas of demonstrable risk to the safety of navigation

TITLE	Reference	Last amendment (CL or IHC)	1st Edition Reference
IHO TRANSFER STANDARD FOR DIGITAL HYDROGRAPHIC DATA	**1/1987 as amended**	**IHO A-1**	**A3.7**

1 It is resolved that the IHO Transfer Standard described in S-57 shall be adopted by the IHO for the exchange of digital hydrographic and cartographic data.

2 It is further resolved that the IHO Secretariat, through the HSSC (Hydrographic Services and Standards Committee), keep the contents of the Standard under review in response to changing requirements and practical experience. Changes to the Standard are coordinated on behalf of the HSSC by an ENC Standards Maintenance Working Group (ENCWG). National Hydrographic Offices which wish to propose changes to the Standard should address their comments to the IHO Secretariat. Other users of the Standard, for example equipment manufacturers, should be advised to address their comments to their national Hydrographic Office.

ENC/SENC DISTRIBUTION OPTION	**4/2002 as amended**	**43/2003**	**A3.11**

It is resolved that SENC distribution can be accepted as an option, in addition to direct ENC distribution, providing that the following principles be adhered to:

a) The HO should ensure that the IHO data (ENC) is always available to any user in the S-57 ENC format.
b) As an option Hydrographic Offices may allow the distribution of their HO data (ENC) in a SENC format.
c) Distributors who are to supply the SENC service must operate under the regulations of the issuing authority. The onshore ENC to SENC conversion must be performed using type approved software.
d) The SENC update mechanism should not be inferior to the ENC - ECDIS update mechanism.
e) The distributor of SENC data should maintain a registry of its users.
f) The copyright of the ENC data should be maintained.

IHO DATA PROTECTION SCHEME S-63	**1/2007 as amended**	**IHO A-1**	**A3.12**

1 It is resolved that the IHO Data Protection Scheme, as described in Publication S-63, is the IHO recommended security scheme for ENCs.

2 It is further resolved that the IHO Secretariat will act as Scheme Administrator for S-63.

ENC DISTRIBUTION AND USE OF THE TERM ENC	**3/2007**		**A3.13**

1 The distribution of ENC must have a suitable method of authentication to confirm its source and integrity.

2 The governmental responsibility for ENC is the same as that applicable to other navigational products and services issued by or on the authority of the respective issuing government.

3 ENC must be made universally available in an IHO recognized non-proprietary format.

4 The term ENC must not be qualified in any way to refer to any product that is not government authorized.

PRINCIPLES OF THE WORLDWIDE ELECTRONIC NAVIGATIONAL CHART DATABASE (WEND) & ITS ANNEX (Guidance for Establishment of ENC Production Boundaries)	**1/1997 as amended**	**IHC 18 & 40/2014[5] & 36 Rev1/2017[6]**	**K2.19**

1. The purpose of WEND is to ensure a world-wide consistent level of high-quality, updated official ENCs through integrated services that support chart carriage requirements of SOLAS Chapter V, and the requirements of the IMO Performance Standards for ECDIS.

2. Service Provision

a) Member States will strive to ensure that mariners, anywhere in the world, can obtain fully updated ENCs for all shipping routes and ports across the world.

b) Member States will strive to ensure that their ENC data are available to users through integrated service[7], each accessible to any ECDIS user (i.e., providing data in S-57 form), in addition to any national distribution or system-specific SENC delivery.

c) Member States are encouraged to distribute their ENCs through a RENC[8] in order to share in common experience and reduce expenditure, and to ensure the greatest possible standardization, consistency, reliability and availability of ENCs.

d) Member States should strive for harmonization between RENCs in respect of data standards and service practices in order to ensure the provision of integrated ENC services to users.

e) Methods to be adopted should ensure that data bear a stamp or seal of approval of the issuing HO.

f) When an encryption mechanism is employed to protect data, a failure of contractual obligations by the user should not result in a complete termination of the service. This is to assure that the safety of the vessel is not compromised.

g) Member States are to strive for the greatest possible user –friendliness of their ENC services and to facilitate integrated services to the mariner in order to maximise the use of ENCs.

3. Rights and Responsibilities

a) SOLAS Chapter V, Regulation 9, requires Contracting Governments to ensure that hydrographic data are available in a suitable manner in order to satisfy the needs of safe navigation. The introduction from 2012 of an IMO mandatory carriage requirement for ECDIS imposes a requirement on Contracting Governments to ensure that such data are available in a form suitable for use in ECDIS.

[5] Amendment reference valid for the annex only: Guidance for the Establishment……

[6] In paragraph 4 a) (Standards and Quality Management), the reference year for ISO 9001 has been removed.

[7] Integrated services are a variety of end-user services where each service is selling all its ENC data, regardless of source, to the end user within a single service proposition embracing format, data protection scheme and updating mechanism, packaged in a single exchange set.

[8] RENCs are organisational entities where IHO members have established co-operation amongst each other to guarantee a world-wide consistent level of high quality data, and for bringing about coordinated services with official ENCs and updates to them.

b) It is expected that Member States will have mature arrangements in place for the issue of ENCs and their subsequent updating for waters of national jurisdiction in order to support the IMO requirement for the mandatory carriage of ECDIS.

c) By the dates established by IMO[9], Member States will strive to either:

   a. Provide the necessary ENC coverage, or
   b. Agree with other States to produce the necessary ENC coverage on their behalf.

   IHO will address overall coverage on a regional basis through Regional Hydrographic Commissions. Guidelines on the implementation of the WEND Principles are published separately. These should be employed to facilitate the provision of appropriate ENC coverage within a suitable timeframe.

d) The INT chart system is a useful basis for initial area selection for producing ENCs.

e) Member States are encouraged to work together on data capture and data management.

f) Responsibilities for providing digital data outside areas of national jurisdictions must be established (see guidance in Annex).

g) Technically and economically effective solutions for updating are to be established conforming to the relevant IHO standards. The updating of ENCs should be at least as frequent as that provided by the nation for correction of paper charting.

h) The Member State responsible for originating the data is also responsible for its validation in terms of content, conformance to standards and consistency across cell boundaries.

i) A Member State responsible for any subsequent integration of a country's data into a wider service is responsible for validating the results of that integration.

j) National HOs providing source data are responsible for advising the issuing HO of update information in a timely manner.

k) Member States should work together so that the IHO Data Protection Scheme (S-63) is used for ENC distribution to end users, to ensure data integrity, to safeguard national copyright in ENC data, to protect the mariner from falsified products, and to ensure traceability.

l) In producing ENCs, Member States are to take due account of the rights of the owners of source data and if paper chart coverage has been published by another Member State, the rights of that State.

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[9] The IMO Sub-Committee on Safety of Navigation, at its 51st Session (NAV 51):

- Agreed to recommend to the IMO Maritime Safety Committee the mandatory carriage requirement of ECDIS for High Speed Craft (HSC) by 1 July 2008.
- Did not decide on a mandatory carriage requirement for other types of ship; this will be considered in conjunction with a Formal Safety Assessment (FSA) to be conducted into the use of ECDIS in ships other than HSC and large passenger ships.

Maritime Safety Committee, at its 82nd Session (MSC 82), adopted revisions to the High Speed Craft Codes, making the carriage of ECDIS compulsory for new build craft from 1 July 2008 and for existing craft from 1 July 2010. At the 86th Session (MSC 86 in June 2009), this was extended to a wide range of vessels (including all vessels over 10,000GT) in a programme commencing from July 2012 and running until July 2018.

m) Member States should recognize their potential exposure to legal liability for ENCs.

4. Standards and Quality Management

a) A Quality Management System should be considered to assure high quality of ENC services. When implemented, this should be certified by a relevant body as conforming to a suitable recognised standard; typically this will be ISO 9001:2008 (as amended).

b) There must be conformance with all relevant IHO and IMO standards.

5. Assistance and Training

a) Member States' HOs are strongly recommended to provide, upon request, training and advice to HOs that require it to develop their own national ENC provision.

Annex to 1/1997 as amended (K2.19)

Guidance for the Establishment of ENC Production Boundaries

1 ENC duplication should be avoided. A single ENC producing country should exist in any given area.

2 A country is normally the ENC producing country for waters within its national jurisdiction.

3 Responsibility for the production of ENC can be delegated in whole or in part by a country to another country, which then becomes the producing country in the considered area.

4 When the limits of waters of national jurisdiction between two neighbouring countries are not established, or it is more convenient to establish boundaries other than established national boundaries, producing countries are to define the cartographic boundaries for ENC production within a technical arrangement.

5 A cartographic boundary is defined as an agreed limit to clip overlapping nautical charts or related data between two or more neighbouring countries, or between two adjacent charting Regions. The boundary is established for cartographic convenience and technical purposes only and shall not be construed as having any significance, legal effect or status regarding political or other jurisdictional boundary. It should be as simple as possible (for example: a succession of straight segments and turning points corresponding preferably to meridians and parallels) so as to provide data compilers with clarity as to the limits of their charting responsibilities and data users with the most coherent service possible.

6 In international waters, the paper INT chart producer nation is assumed to be the producer of the corresponding ENC. Where the offshore limits of waters under national jurisdiction have not yet been established, or where paper INT charts overlap, paragraph '4'should apply.

7 In areas where the paper INT charts overlap, neighbouring producer nations should agree on a cartographic boundary for ENC production. Where different producer nations are responsible for INT coverage of the same area at different scales, those nations should agree on a suitable set of cartographic boundaries for ENC production.

8 In areas of national jurisdiction for which there is no recognized ENC producer nation, the Regional Hydrographic Commission (or similar body) should determine the ENC producer nation. ENCs produced under such arrangements should be offered for transfer to the Coastal State in the event that the Coastal State subsequently develops the capacity to maintain the ENCs. Such transfer should respect the moral rights of the Coastal State and the commercial rights of the producer nation.

9 When the production limits are the official limits for national jurisdiction waters, commercial rights shall belong to the ENC producing country.

10 When the production limits are cartographic boundaries as opposed to national boundaries, the commercial rights shall normally belong to the ENC producing country but may possibly be encumbered by the payment of royalties to the relevant country through a technical arrangement (see paragraph '4').

THE IMPORTANCE OF RESOLVING ISSUES RELATED TO THE FUNCTIONING OF THE "ECDIS-ENC SYSTEM"	**1/2012 as amended**	**IHO A-1**	**-**

- Recognizing the IHO's role in the development of ECDIS and its active support to IMO in the endorsement of a carriage requirement for ECDIS that starts in 2012.

- Furthermore recognizing the issues with regard to the anomalous behaviour of some ECDIS systems that have come to light through increasing operational experience and the actions already taken by the IHO Member States and the IHO Secretariat to assist in facilitating their resolution.

- The IHO is encouraged to continue to take a leading role within the ECDIS stakeholder community to ensure that issues identified in regard to the anomalous operation of ECDIS are collated, analysed, communicated and resolved as speedily as possible to maintain the safety of navigation and to assist the smooth transition from paper to digital navigation.

REAFFIRMATION OF THE IHO'S COMMITMENT TO FULL ENC COVERAGE (PRO WENDWG-1)	**2/2012**	**-**	**-**

The International Hydrographic Conference agreed that the Member States of the International Hydrographic Organization should commit to:

- continuing through best international collaborative efforts and technological innovation to complete the outstanding requirement established for adequate ENC coverage as outlined at IMO NAV54;

- working with IMO Member States to promote the need for improved hydrographic survey and nautical charting services as required by SOLAS Chap. V, Reg. 9 and to provide support through the respective IHO and IMO capacity building programmes;

- encouraging bilateral and multilateral cooperation within and across RHCs to improve consistency and harmonization of ENC cells (including the removal of any overlapping data) and services;

- establishing a systematic methodology, through the IRCC and the WEND-WG and in conjunction with the RHCs and RENCs, for monitoring evolving ENC coverage requirements, agreeing production priorities and for supporting the provision of integrated ENC services;

- informing mariners, through such things as IMO Safety of Navigation circulars and other national and international navigational warning mechanisms, the areas of national waters where the use of electronic navigation systems is not possible due to the limited quality or absence of source hydrographic data reflected in the nautical charts.

IHO Programme 2 "Hydrographic Services and Standards"
2.3 – Charts / 2.3.2 – INT

ELIMINATION OF OVERLAPPING ENC DATA IN AREAS OF DEMONSTRABLE RISK TO THE SAFETY OF NAVIGATION	**1/2018**	**19/2018**	

1. It has been reported that overlapping ENC data, when used in ECDIS equipment, may lead to unpredictable behaviour in at least the following cases:

   - overlapping data occurring in the same usage band (Navigational Purpose);

   - overlapping data occurring in ENC cells in different usage bands (Navigational Purposes) but using the same compilation scale.

2. Hydrographic Offices, ENC Producers, and Regional Hydrographic Commissions should take appropriate measures to eliminate all overlapping ENC data, particularly in areas of demonstrable risk to the safety of navigation.

3. While RENCs and End-User Service Providers may develop certain distribution policies to help prevent such overlapping data from passing through the ENC distribution chain, the safety of mariners at sea should not rely on these mechanisms alone, as if they were the primary solution.

4. In addition to the existing procedures related to overlapping ENC data described in:

   - IHO Resolution 1/1997 as amended (*WEND Principles*) and its Annex (*Guidance for the Establishment of ENC Production Boundaries*);

   - The *Guidelines for the Implementation of the WEND Principles*, as endorsed by the 11th WEND Committee Meeting in 2008 and amended in 2014;

   - S-11 Ed. 3.1.0 - *Guidance for the Preparation and Maintenance of International (INT) Chart and ENC Schemes and Catalogues of INT Charts and ENCs*; and

   - S-57 - *IHO Transfer Standard for Digital Hydrographic Data* -, Appendix B.1, Annex A - *Use of the Object Catalogue for ENC* (Ed. 4.1.0, January 2018) - clause 2.1.8;

   Hydrographic Offices, ENC Producers, and Regional Hydrographic Commissions should seek to:

   - Identify overlapping ENC data in all areas of significance to navigational safety within their areas of production or control;

   - Prevent the increase of any such cases; and

   - Resolve all of those cases where a demonstrable risk to the safety of navigation exists, through discussion and negotiation between the relevant ENC producers, as soon as possible, and at least within one year of any such overlapping ENC data being reported or identified.

5. Notwithstanding the responsibilities of the ENC Producer Member States involved, to take early action to notify the mariner of possible risks to the safety of navigation, in any case where the elimination of overlapping ENC data cannot be resolved and its continued existence presents a demonstrable risk to the safety of navigation, the procedures described in section 1.7 of the *Guidelines for the Implementation of the WEND Principles* should be applied. The timescale to resolve should be within one year of the matter coming to the attention of the ENC Producer Member States involved. Section 1.7 states:

   "*1.7. The S-57 Standard allows minimal overlap of ENC data within usage bands. ECDIS systems will operate unpredictably in areas where significant overlapping ENC coverage is present, raising a potential navigational risk to end-users. Where overlapping coverage exists the Producer Member States should recognize their*

responsibility and take the necessary steps to resolve the situation. To ensure that overlapping ENC data coverage is resolved to the satisfaction of the Regional Hydrographic Commission (RHC), the following procedures should be undertaken in sequence until there is satisfactory resolution:

1.7.1 The RHC will identify and assess ENC coverage within their area of responsibility and highlight those areas where there are navigationally significant differences between the overlapping ENCs. The assessment of what may be navigationally significant should be guided by the best practices in this regard, acknowledged and approved by the IRCC. The RHC may seek the assistance of a Regional ENC Coordination Centre (RENC) to assist in development of this assessment and should take a proactive approach with the ENC Producer Member States, to resolve overlap issues within the region.

1.7.2 The RHC will keep the IRCC Chair and the IHO Secretariat informed, through the annual reporting process, about overlaps in ENC coverage, their associated risks and related action(s) taken by the coastal States and/or the Producer Member State. Appropriate action by the IHO Secretariat should be initiated to inform the International Maritime Organization of the situation with details of the desired actions to be taken by the Government(s) of the involved coastal State(s) and the risks associated with inaction.

1.7.3 Where urgent action is required to alert mariners to navigationally significant overlap issues then the RHC, through the concerned Producer Member States, should initiate promulgation of appropriate warnings directly with the regional NAVAREA coordinator and other local navigational warning protocols, while keeping the IRCC Chair and IHO Secretariat informed."

IHO Programme 2 “Hydrographic Services and Standards”
2.3 – Charts / 2.3.3 – INT

Regulations of the IHO for international (INT) charts and chart specifications of the IHO

TITLE	Reference	Last amendment (CL or IHC)	1st Edition Reference
REGULATIONS OF THE IHO FOR INTERNATIONAL (INT) CHARTS AND CHART SPECIFICATIONS OF THE IHO	**11/2002 as amended**	**IHO A-1**	**B5.6**

1 Regulations of the IHO for International (INT) Charts, Chart Specifications of the IHO for Medium- and Large-scale National and International (INT) Charts (Scales larger than 1:2 000 000), and Chart Specifications of the IHO for Small-scale International (INT) Charts (Scales 1:2 000 000 and smaller) are adopted and published as Part A, Part B and Part C, respectively, of publication S-4 "Regulations of the IHO for International (INT) Charts and Chart Specifications of the IHO".

2 It is resolved that Member States adhere to the "Regulations of the IHO for International (INT) Charts", when acting either as producers or printers of INT Charts. Particular attention should be given to the establishment of bilateral arrangements between producers and printers, which should define both the technical and the financial terms to be applied.

3 It is resolved that the IHO Hydrographic Services and Standards Committee (HSSC) , through the appropriate working group keep publication S-4 under review in order to advise the IHO on their updating. Member States having proposals to update S-4 should forward them to the working group through the IHO Secretariat.

IHO Programme 2 "Hydrographic Services and Standards"
2.4 – Publications / 2.4.1 – General

Temporary Notices

Use of ISO codes for the codification of country names

Duplicate material in publications

Updating of nautical publications

Notification of periodicity of certain nautical handbooks

List of nautical publications

Printed and digital nautical publications

Nautical publications and the SOLAS Convention

Time Reference

TITLE	Reference	Last amendment (CL or IHC)	1st Edition Reference
TEMPORARY NOTICES	**2/2010 as amended**	**49/2010**	**Formerly F3.7 Para. 2**

It is resolved that in basic nautical publications such as Sailing Directions, Lists of Lights, etc., a note shall be inserted stating whether or not temporary Notices to Mariners are embodied in the publication concerned.

USE OF ISO CODES FOR THE CODIFICATION OF COUNTRY NAMES	**1/1995 as amended**	**11/2009**	**A1.19**

With the purpose of obtaining uniformity in the coding of country names, the IHO has agreed to use the two-letter (alpha-2) codes of the International Organization for Standardization (ISO 3166) as published in IHO S-62.

DUPLICATE MATERIAL IN PUBLICATIONS	**2/1929**		**A2.10**

It is resolved that, when it is necessary to overlap or duplicate material in nautical publications of the same kind, evidence of this shall be clearly indicated in each of the publications concerned, in order to ensure that such overlap shall be taken into account when making corrections.

UPDATING OF NAUTICAL PUBLICATIONS	**1/1952 as amended**	**IHC 16**	**A2.11**

1 It is recommended that in each basic nautical publication the rules concerning its updating should be inserted.

2 It is recommended that Hydrographic Offices apply such a system for keeping up to date nautical publications so as to simplify and speed up the task of navigators in charge of carrying out updating, as well as to ensure the full accuracy and clearness of all updates.

3 It is also recommended that the system of writing and erasing updates by hand be avoided as much as possible.

NOTIFICATION OF PERIODICITY OF CERTAIN NAUTICAL PUBLICATIONS	**2/1932**		**A2.12**

It is recommended that whenever the periodicity of any nautical publication: Catalogues, Lists of Lights, Magnetic Charts, etc., is definitely fixed, this periodicity be inscribed in the publication concerned or mentioned in any other publication placed in the hands of mariners.

LIST OF NAUTICAL PUBLICATIONS	**1/2002**		**A2.13**

It is resolved that nautical publications shall include, but not necessarily be limited to the following publications:

Distance Tables
List of Buoys and Beacons
List of Lights
List of Radio Signals
List of Symbols, Abbreviations and Terms used on Charts
Mariners' Handbooks
Notices to Mariners
Routeing Guides
Sailing Directions
Tidal Stream Atlases
Tide Tables

PRINTED AND DIGITAL NAUTICAL PUBLICATIONS	**2/2002 as amended**	**11/2009**	**A2.14**

It is resolved that nautical publications may be published in printed and/or digital form. When a publication is produced in both printed and digital forms, it is not mandatory that both versions be facsimiles or replicas; nevertheless the information published in the two forms shall be consistent and non-conflicting.

NAUTICAL PUBLICATIONS AND THE SOLAS CONVENTION	**3/2002 as amended**	**11/2009**	**A2.15**

It is resolved that nautical publications produced in compliance with these Technical Resolutions and Recommendations shall be deemed to satisfy the relevant carriage requirements for nautical charts and nautical publications in accordance with the International Safety of Life at Sea (SOLAS) Convention Chapter V, particularly regulations 2.2 and 9.

TIME REFERENCE	**7/2009 as amended**	**40/2019**	**A2.17**

Time in nautical publications, Tide Tables excluded (See M-3, section 2.4.7, IHO Resolution 27/1919 as amended), should be expressed as Universal Time Co-ordinated (UTC):
Example 1321Z

Alternative time references may be used, as follows:

1. Local time with offset: Example 13:21 (UTC + 3)
2. Unspecified local time: Example 13:21 (Local Time) if time zone reference is provided within the publication.

IHO Programme 2 "Hydrographic Services and Standards"
2.4 – Publications / 2.4.2 – Digital

Content and general arrangement

Data formats

Presentation and information

Cross-referencing of information

Updating

Data security

TITLE	Reference	Last amendment (CL or IHC)	1st Edition Reference
CONTENT AND GENERAL ARRANGEMENT	**5/2002**		**A7.1**

1 Digital Nautical Publications may be produced in two arrangements, firstly as a stand-alone product based on existing paper publications, and secondly in the form of a compiled database intended primarily to work within an ECDIS.

2 For the sake of clarity, Nautical Publications shall be defined by the following:

a) NP1 – Printed paper publications

b) NP2 – Digital publications based upon existing paper publications

c) NP3 – Digital dataset(s) fully compatible with ECDIS that serve the purpose otherwise provided by NP1 or NP2.

Note: Data Specifications for NP3 have yet to be finalised and therefore are not specifically referred to in this document.

3 It is resolved that Digital Nautical Publications (NP2 and NP3) shall at least fulfil the functions of corresponding printed nautical publications (NP1).

4. Digital Nautical Publications (NP2 and NP3) need not slavishly follow the requirements of presentation and organisation laid down for printed publications (NP1). However, the relevant resolutions and recommendations for printed publications (NP1) shall serve as guidance regarding content and purpose.

See also 2/2002 (A2.14), 6/2002 (A7.2), 7/2002 (A7.3), 8/2002 (A7.4) and IHO Publication S-12.

DATA FORMATS	6/2002		A7.2

It is strongly recommended that NP2 digital nautical publications that are based directly on existing printed nautical publications (in other words, digital facsimiles, re-compilations, or others) utilise open-systems or widely accessible digital publishing techniques and formats. This provides HO's with maximum flexibility in how they undertake digital publication but at the same time ensures compatibility and ease of integration with the widest range of computer based applications likely to be used to access the information.

PRESENTATION OF INFORMATION	7/2002		A7.3

For digital nautical publications, it is not recommended or required that the presentation of information is standardised as to order or geographical sequence other than to be in agreement with any indexes devised to direct the user to the relevant parts of a digital publication. It is however, recommended that information presented in a digital nautical publication conforms to the relevant IHO textual presentation and symbology standards.

CROSS-REFERENCING OF INFORMATION	8/2002 as amended	11/2009	A7.4

1 It is recommended that insofar as is possible an auto cross-referencing system shall be incorporated to connect all related / relevant material in a digital nautical publication.

2 It is recommended that digital nautical publications make the fullest use of such things as search engines, web-based browsers, hypertext links and keywords.

3 It is recommended that the cross-referencing system be suitable to provide links to associate information in a digital nautical publication with information in ENCs (and RNCs where possible) and with visual index diagrams.

4 It is recommended that insofar as is possible:

a) links shall be available to associate sketch plans, aerial oblique photographs or other illustrations and photographs with the relevant digital nautical publications text and with the relevant parts of ENCs (and RNCs where possible).

b) digital nautical publications providing, for example, meteorological or oceanographic information shall contain a linked database capable of supporting modelling solutions.

UPDATING	9/2002		A7.5

It is recommended that a regular system of updating for digital nautical publications be maintained using an appropriate combination of:

a) Digital Notices to Mariners

b) Cumulative updating files

c) Replacement files

See also 1/1952 (A2.11) and 2/1932 (A2.12).

DATA SECURITY	10/2002		A7.6

It is recommended that digital nautical publications incorporate data authentication processes to ensure that information contained in digital nautical publications can be verified by consumers before use.

IHO Programme 2 "Hydrographic Services and Standards"
2.4 – Publications / 2.4.3 – IHO Publications

List of Publications of the IHO

Free distribution and sale of IHO publications

Translation of IHO publications

Documentation

Limits of Oceans and Seas (S-23)

Hydrographic Dictionary (S-32)

Status of Hydrographic Surveying and Nautical Charting World Wide

Yearbook of the IHO

Report of Assembly Sessions and Council Meetings

International Hydrographic Review

Repertory of resolutions

Convention on the International Hydrographic Organization

Basic documents of the IHO

IHO Programme 2 "Hydrographic Services and Standards"
2.4 – Publications / 2.4.3 – IHO Publications

TITLE	Reference	Last amendment (CL or IHC)	1st Edition Reference
LIST OF PUBLICATIONS OF THE IHO	**3/1957 as amended**	**39/2009**	**Q1.1**

1 The IHO List of Publications shall be made available on the IHO website and kept updated. IHO Publications will be classified as follows:

B	Bathymetric Publications	Mainly those related to GEBCO.
C	Capacity Building Publications	Publications that relate or contribute to the IHO capacity building programme.
M	Miscellaneous – Basic Regulatory Publications	Publications of a general nature including general regulations and resolutions.
P	Periodic Publications	Publications that refer to periodic events or require periodic editions according to content.
S	Standards and Specifications	Publications that refer to standards and specifications, including guidelines.

2 IHO publications shall be provided mainly through the IHO website free of charge, except in special cases, as indicated in the List of Publications.

FREE DISTRIBUTION AND SALE OF IHO PUBLICATIONS	**10/1937 as amended**	**IHO A-1**	**R4.1**

1 Publications in printed format:

The free supply of the few IHO publications in printed format shall be limited as follows:

a) Up to 3 copies to each of the Hydrographic Offices of Member States;

b) Prospective IHO Member States may be provided ONE copy of certain IHO publications during the period when they are actively seeking IHO membership; and

c) One copy to former Presidents, Secretaries-General and Directors, if requested.

2 A print-on-demand service will not automatically be available, as publications can be printed locally from CD-ROM or from an Internet download. Nevertheless, the IHO Secretariat may offer a print-on-demand service in exceptional cases, which will be considered on a case by case basis by the Secretary-General, but this shall not be considered as a standard service. Pricing will be determined on a case by case basis, if applicable.

3 Publications in digital format

a) Publications are available from the IHO web site:

b) Publications are available on CD-ROM, exclusively upon request; and

c) On the rare occasions where a Member State may require publications on a CD-ROM, the IHO Secretariat will provide this service at no cost. If such a requirement comes from a non Member State or other organization or individual, subject to the discretion of the Secretary-General, 50 Euros will be charged for each CD-ROM, regardless of the number of publications included on the CD-ROM

TRANSLATION OF IHO PUBLICATIONS	2/2008 as amended	IHO A-1	R4.2

1 General

In agreeing to the translation of IHO publications by third parties, the following general principles should be observed:

a) The IHO as the copyright owner of the source material should be acknowledged in all translations;

b) The IHO should not be responsible for the translation or any misuse or misunderstanding of a translation. All translations should be marked as such;

c) The accuracy of a translation lies with the translator. All translations should be marked as such;

d) Where appropriate, the IHO should benefit from any exploitation of a translation of its material; and

e) Translations should always contain the following statement prominently at the front of the publication unless IHO authorizes otherwise:

"This document/publication is a translation of IHO document/publication [Name]. The IHO has not checked this translation and therefore takes no responsibility for its accuracy. In case of doubt the source version of [Name] in [Language] should be consulted"

2 Translations for internal and private use

a) HOs and other users (for example, academia, companies and individuals) may translate IHO Publications for their internal needs and requirements on the understanding that such translations are not intended for sale or reward of any kind.

b) It is encouraged that any translations in languages other than the official languages of the IHO be provided to the IHO Secretariat in order that, without assuming any responsibility, they may be posted on the IHO web site for the benefit of IHO Member States and other parties of the international hydrographic community.

3 Translations for commercial sales and purposes

a) Any organizations (including HOs), entities or individuals wishing to translate IHO publications for commercial sale or reward of any kind must obtain prior agreement from the IHO Secretariat in order that the rights and benefits of the IHO and its Member States are safeguarded.

b) In the first instance, prospective applicants should contact their respective national HO, who in turn may advise the IHO Secretariat on any opinion that they have on an application. The IHO Secretariat, on behalf of the IHO, may then grant permission in the form of an Agreement on a case by case basis, taking into account any general guidance that may be established by the IHO from time to time.

DOCUMENTATION	12/1962 as amended	IHO A-1	T1.5

It is resolved that the IHO Secretariat shall publish its reports and publicationsin either bilingual (English/French) or in separate English and French versions. In addition, the IHO Secretariat should (without increasing for this reason the present number of Locally Recruited Members of Staff) publish at least its Annual Report (Parts 1 and 2) and the periodic I.H. Bulletin in Spanish.

The language(s) of other IHO reference documents, guidelines and standards shall be at least one of the official languages decided on a case by case basis in the IHO Work Programme, taking into account the intended use of the document, the resources of the IHO Secretariat and the assistance offered by Member States.

LIMITS OF OCEANS AND SEAS (S-23)	32/1919 as amended	IHC 11	K3.2

1 It is agreed that it is desirable that the limits of enclosed seas should be laid down, and that it might be stated to what sea or ocean a strait connecting two of them should be reckoned.

2 It is recommended that all copies of any publication of this nature finally authorized by the IHB be plainly labelled: "Delimitations shown on this diagram and described in the accompanying text are made solely for the convenience of national Hydrographic Offices and are not to be regarded as representing the result of full geographic study".

3 It is resolved that S-23 shall be transferred from the group of current publications to the group of publications of lasting value.

4 It is resolved (*XIth Conference*) that in view of the increasing use being made by cartographers, national institutions and commercial agencies of S-23 "Limits of Oceans and Seas", the IHB shall undertake a revision of this publication in order to update its content.

a) To accomplish this task the IHB should solicit representatives for an ad hoc Working Group to carry out a review of this publication and to provide guidelines for its updating and revision.

HYDROGRAPHIC DICTIONARY (S-32)	7/1929 as amended	IHO A-1	K3.3

1 It is resolved that the IHO Secretariat publish a hydrographic dictionary, in English, French and Spanish serving the following main purposes:

a) as an explanatory reference for the field of hydrography and related disciplines;

b) as a means of standardizing terms used in hydrography; and

c) as a comparative dictionary for translation into other languages.

2 The dictionary is kept up-to-date continuously by the Hydrographic Dictionary Working Group (HDWG) reporting to the Hydrographic Services and Standards Committee (HSSC).

3 All IHO bodies developing publications containing glossaries and definitions should make reference to S-32 as much as possible and nominate one member of their WG to liaise with the WG on the Hydrographic Dictionary.

4 Any Member State or IHO subsidiary body wishing to add or amend definitions to the dictionary may make proposals directly to the WG. Such proposals should include justification for the addition / change and provide a draft definition approved, where appropriate, by the submitting

subsidiary body. Following consideration of the proposals, the HDWG will submit recommendations to the HSSC for endorsement and subsequent submission to IHO Member States for approval.

STATUS OF HYDROGRAPHIC SURVEYING AND NAUTICAL CHARTING WORLD WIDE	**1/2010 as amended**	**IHO A-1**	**A1.22**

It is resolved that the IHO Secretariat, based on information provided by Member States and the Regional Hydrographic Commissions, maintains and promulgates the status of hydrographic surveying and nautical charting worldwide, aimed at highlighting those areas where further surveying and charting activity is required in order to satisfy the requirements of international navigation on one hand (publication C-55) and other hydrographic applications on the other.
See also 2/1972 (K4.1), 3/1977 (K4.2) and 4/1977 (K4.3).

YEARBOOK OF THE IHO	**8/1929 as amended**	**72/2009**	**Q2.3**

The Year book is intended for general purpose use. It contains general information on Hydrographic Offices of Member States, as well as some information on Hydrographic Offices of Non-Member States, plus Appendices with information on Reported Tonnages for IHO Member States; Tables of Shares, Contributions and Votes; List of Governments that have participated in the work of the Organization since its creation, and Non-Governmental International Organizations (NGIO) accredited as Observers to the IHO. The Year book is distributed through the IHO Website and is continuously updated.

REPORTS OF PROCEEDINGS OF ASSEMBLY SESSIONS AND COUNCIL MEETINGS	**9/1929 as amended**	**IHO A-1**	**Q2.4**

The Proceedings of Assembly sessions and Council meetings will be prepared by the IHO Secretariat and shall comprise summary records of all meetings. It will be made available in digital form after each meeting. The IHO Secretariat will prepare a limited number of printed copies for the IHO Secretariat Library.

INTERNATIONAL HYDROGRAPHIC REVIEW	**6/2009 as amended**	**IHO A-1 & 07/2019**	**Q2.5**

1 Background

The International Hydrographic Review (IHR) is an international journal publishing peer-reviewed papers on all aspects of hydrography and associated subjects, ranging from the latest technical developments to history. It was first published in 1921 and since then has been published regularly with two or three issues per year. In September 2000 the IHR, which had until then been compiled and published internally by the International Hydrographic Bureau (IHB) (now IHO Secretariat), was transferred to a private publisher aiming at improving the scope and quality of the IHR, to widen the circulation and to reduce costs. In October 2007 the Directing Committee was informed by the publisher that they were no longer prepared to renew the contract due to financial circumstances. After a detailed study, the Directing Committee concluded that there were no realistic possibilities for the IHO to continue the publication of the IHR in its traditional form without a significant increase in costs and expenditure and proposed to the Member States to go digital. The decision adopted by the Member States was to publish the IHR as a web-based publication, with peer-reviewed articles, with two editions a year and an annual printed copy consisting of a compilation of the articles, initially for IHO Member States only. Member States also agreed to have the Editor as a "part time" collaborator, in accordance with terms of reference agreed with the IHO Secretariat.

2 The Digital International Hydrographic Review

A digital version of the publication was introduced in 2009 with the editions placed on the IHO web site twice a year, in May and November. Access open to all and free of charge. As with the previous hard copy version, strict standards of review and editing are maintained. Once a year a hard copy compendium will be produced that will be available to Member States only and will provide an ongoing historical record. Member States – particularly their staff and cooperating industries - are strongly urged to contribute to the Review as an important means of sharing information on their activities and developments within the hydrographic community. Individuals and organisations working in the field, but outside the Member States' Hydrographic Offices, are also urged to contribute.

Given the multi-lingual nature of the community, potential contributors should not be intimidated by concerns over language as any linguistic problems may be handled by the Editor and the Editorial Board during the editing process. Likewise the work of developing hydrographic offices is as important as that of the developed, well equipped offices, in the overall discussions on progress in the profession. It is hoped that contributions will be received from all sectors of the community. Material should be sent to the Editor in accordance with paragraph 4.

3 The IHR Format

The IHR is composed of four parts: Editorial, Articles, Notes and General Information:

a) Editorial:
This part will be written by the IHR Editor and will be a maximum of one-page highlighting the content of the edition, motivating the reader to get into the subjects content. This page will include a photo of the IHR Editor. The IHR Editor might wish to liaise with any Regional Hydrographic Commission Chairs or the Secretary-General for the purpose of including relevant messages or concepts associated to the content of the IHR. The Editorial shall be approved by the Secretary-General/ relevant Director.

b) Articles:
It is expected that articles will be between 4,000 and 6,000 words long, although longer articles may be considered. Articles will concern hydrography and associated subjects. Unpublished articles that have not yet been submitted for publication elsewhere will be given priority. All articles will be peer-reviewed.

c) Notes:
Notes are expected to be between 1,500 and 2,500 words long. Notes are brief records of testimony of an event, a meeting, a conference, an action, a speech or a particular circumstance. Notes will not be refereed but will be subject to editorial comment and amendments.

d) General Information:
Falling under this part will be contributions on matters providing general information to the community. These may include, as examples: a book review, a calendar of forthcoming events, letters to the Editor and the corresponding reply if pertinent, and any Obituaries.

4 The IHR online

The IHR will be accessible from the IHO website.The web page will provide details for contacting the Editor, information and instructions for contributors and access to the IHR online editions.

IHR online editions: the reader will access the different IHR Editions. The content may be on the IHO website or in a repository elsewhere.

5 The IHR Editorial Board

The IHR will have an Editorial Board to help the IHR Editor in keeping a good standard of the Review. The Editorial Board will be comprised of representatives of all Regional Hydrographic Commissions, who are expected to encourage the following activities at a regional level:

a) Motivate Member States in his/her region to submit Articles, Notes and General Information suitable for the IHR;

b) Contribute with relevant Notes after holding RHC's Meetings or other IHO-related events;

c) Search and identify suitable and available experts in their region who could volunteer to peer-review the Articles, to ensure the peer-review process; and

d) Provide the Editor with key information to be highlighted in the Editorial of the IHR.

REPERTORY OF RESOLUTIONS	**13/1932 as amended**	**IHO A-1**	**Q3.1**

1 All resolutions adopted by Assembly or by correspondence shall be compiled in one volume.

2 It is resolved that the IHO Secretariat shall keep the Repertory of Resolutions up to date by periodically submitting, through circular letters to Member States, amendments to existing resolutions and new resolutions on any subject, provided that they do not concern matters which would be more appropriately handled by the Assembly through the Council. These amendments or new resolutions may be proposed either by a Member State or by the Council or by the Secretary-General.

3 It is strongly recommended that the IHO Hydrographic Dictionary be used to standardize terminology of the Resolutions.

CONVENTION ON THE INTERNATIONAL HYDROGRAPHIC ORGANIZATION	**7/1947 as amended**	**72/2009**	**Q3.2**

1 On 22 June 1970 the IHO Convention had been accepted by two thirds (28) of the States that were Members in 1967 and consequently the Convention entered into force three months after that date, i.e. on 22 September 1970.

2 The proposed amendments adopted during the XIIIth and XVth Conferences have not entered into force and according to the Protocol of Amendments to the Convention of the IHO approved at the 3rd Extraordinary International Hydrographic Conference in 2005, they shall not hereafter enter into force.

3 The 1970 IHO Convention shall be amended by the Protocol of 2005 which shall enter into force for all Contracting Parties three months after notification of approval by two-thirds of the Member States (48) have been received by the Government of Monaco (Depositary of the Convention)[10].

[10] The Protocol of 2005 entered into force on 8 November 2016 (see IHO CL 41/2016).

BASIC DOCUMENTS OF THE IHO	5/1977 as amended	IHO A-1	Q3.5

1. Subsequently to the approval of a Protocol of amendments to the Convention on the IHO in 2005, the 17th International Hydrographic Conference in 2007 approved the text of a revised set of rules, comprising the General and Financial Regulations and the Rules of Procedure, that contained a number of detailed provisions intended to supplement the provisions of the Convention as amended by the Protocol.

2. These rules are kept updated through review and revision by Member States and the IHO Secretariat , through the Council and published as a single document (IHO Publication M-1) containing the Convention, the General and Financial Regulations, the Rules of Procedure and the Host Agreement between the Organization and the Government of the Principality of Monaco.

Distance Tables

IHO Programme 2 "Hydrographic Services and Standards"
2.4 – Publications / 2.4.4 – Distance Tables

TITLE	Reference	Last amendment (CL or IHC)	1st Edition Reference
DISTANCE TABLES	**31/1919 as amended**	**61/2009**	**H2.1**

It is recommended that those countries which do not already publish Distance Tables for their own coast do so and include therein the connecting points listed below, which are already used by several countries.

1. Nordkapp (30 NM N)
2. North Foreland
3. Skagen
4. Kiel (Holtenau)
5. German Bight (GB Light Buoy)
6. Dover Strait (51° 00'N 001° 30'E)
7. Pentland Skerries
8. Cape Wrath
9. Barra Head
10. Inishtrahull
11. Inishtearaght Light
12. Off Fastnet Rock TSS (5 NM S of Fastnet Rock)
13. Off Tuskar Rock TSS (6 NM SE of Tuskar Rock)
14. Bishop Rock
15. Off Ouessant TSS (30 NM NW of Île d'Ouessant)
16. Finisterre (30 NM W)
17. Gibraltar (6 NM S of Europa Point)
18. Bonifacio Strait
19. Stretto di Messina
20. Dioryga Korinthou
21. Istanbul
22. Port Said
23. Las Palmas (Canary)
24. Cape of Good Hope (30 NM SW)
25. Bab el Mandeb (3 NM SW of Balfe Point)
26. Strait of Hormuz (6.5 NM N of Didamar)
27. Sri Lanka (Dondra Head)
28. Singapore (Raffles Lighthouse)
29. Hong Kong
30. Tsugaru Kaikyo, Japan
31. Kanmon Kaikyo, Japan
32. Selat Sunda
33. Selat Lombok
34. Torres Strait (Goods Island (10° 34'S 142° 09'E))
35. Cape Leeuwin (Australia)
36. Pedra Branca (Tasmania)
37. Wilson Promontory, (Rodondo Island (39°14'S 146°23'E))
38. Southwest Cape (NZ)
39. Adele Island
40. Bougainville Strait
41. Honolulu, Hawaii
42. Unimak Pass, Alaska (5 NM N of Ugamak Island)
43. In the Strait of Juan de Fuca and its Approaches TSS (J Light Buoy)
44. San Francisco (SF Light Buoy)
45. Panama
46. Cabo de Hornos
47. Cabo Pilar (Magellan Strait)
48. Punta Dungeness (Magellan Strait)
49. 30 NM NE of Cabo Calcanhar
50. Colon
51. 80 NM E of Cabo Catoche, Yucatan Channel
52. Key West
53. Cape Hatteras (Diamond Shoal Light Buoy)
54. Nantucket Shoals, Great South Channel (N Light Buoy)
55. St. Lawrence River (Reporting Point 5, Les Escoumins)

SECTION 2.4.5 – PUBLICATIONS – RADIO SIGNALS

TITLE	Reference	Last amendment (CL or IHC)	1st Edition Reference
ARRANGEMENT OF STATIONS	**7/1932 as amended**	**IHC 9**	**E2.1**

1 It is resolved that each category of radio stations shall form the subject of a special chapter, the stations in each chapter to be listed by country in the recognized standard geographical sequence, as laid down in Resolution 8/1932 (E2.2).

2 Nations which publish lists for the whole world shall enumerate, in each of the chapters, first the stations of their own country and then those of other countries in the recognized standard geographical sequence.

GEOGRAPHICAL SEQUENCE OF STATIONS	8/1932 as amended	IHC 9	E2.2

It is recommended that the geographical sequence shown below be followed for the enumeration of the stations in the Lists of Radio Signals. The sequence has been drawn up in such a way that the list may begin with either the American or the European stations.

Greenland (E coast), Iceland, Jan Mayen I., Bear I., Spitsbergen, Franz-Joseph Land.

Norway (W and N coasts, from Bergen), Russia (N coast, as far as Novaya Zemlya).

Norway (W coast, from Bergen, and S coast), Sweden.

Belgium, Netherlands, Germany, Denmark, Poland, Russia (Baltic Sea coast), Finland.

Faroe Is., Ireland and Great Britain (coasts in order of British Sailing Directions), France (N and W coasts), Spain (N and W coasts), Portugal, Spain (S-W and S-E coasts), Balearic Is., France (S coast and Corsica), Italy (W coast), Sardinia, Sicily, Malta, Italy (S and E coasts), Yugoslavia, Albania, Greece, Greek Archipelago, Dodecanese, Turkey (Anatolia), Cyprus, Syria, Lebanon, Israel.

Morocco (N coast), Algeria, Tunisia, Libya, Egypt (N coast).

Turkey (Marmara and Black Sea coasts), Bulgaria, Romania, Russia (Black Sea, Azov Sea and Caspian Sea coasts).

Azores Is., Madeira I., Canary Is., Cape Verde Is., Morocco (W coast), Rio de Oro, Mauritania, Senegal, Gambia, Guinea-Bissau, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Dahomey, Nigeria, Cameroon, Equatorial Guinea, Fernando Po I., St. Thomas I., Gabon, Congo-Brazzaville, Zaire, Angola, South Africa, Ascension I., St. Helena I., Tristan da Cunha I., Bouvet I.

Mozambique, Madagascar, Comoro Is., Kerguelen I., Crozet I., St. Paul I., Amsterdam I., Réunion I., Mauritius I., Amirante Is., Seychelles Is., Tanzania, Kenya, Somalia, Socotra, Ethiopia, Sudan, Egypt (Red Sea coasts), Arabia, Iraq, Iran, India (W coast), Laccadive Is., Maldive Is., Chagos Is., Sri Lanka, India (E coast), Burma, Andaman Is., Nicobar Is., Cocos Is., Malaysia, Indonesia, Timor, Borneo, Philippine Is., Thailand, Cambodia, Viet-Nam, China, Korea, Russian Littoral Province, Siberia (E and N coasts as far as Novaya Zemlya).

Japan, Formosa I., Mariana Is., Caroline Is., Marshall Is.

Australia (N, W and S coasts), Tasmania, Australia (E coast), New Zealand, Kermadec Is., Chatham Is., Auckland I.

New Guinea, Admiralty Is., New Ireland, New Britain, Solomon Is., New Caledonia, Loyalty Is., New Hebrides, Banks Is., Santa Cruz I., Fiji Is., Tonga Is., Samoa Is., Ellice Is., Gilbert Is., Phœnix Is., Tokelau (Union) Is., Cook Is., Tubai Is., Society Is., Tuamotu Is., Marquesas Is., Pitcairn Is., Malden I., Christmas I., Fanning I., Washington I., Palmyra I.

Greenland (W coast), Arctic Archipelago, Baffin Land, Hudson Bay, Labrador, Newfoundland, Canada (E coast), U.S.A. (E and S coasts), Mexico (E coast).

Bermuda Is., Bahama Is., Cuba, Jamaica, Hispaniola, Puerto Rico, Lesser Antilles, Trinidad, Tobago.

Honduras, Central America (E coast), Colombia (N coast), Venezuela, the Guianas, Brazil, Uruguay, Argentina, Falkland Is., South Georgia I., Sandwich Is., South Orkney Is., South Shetland Is., Chile, Juan Fernandez I., S. Ambrosio I., Easter Is., Peru, Ecuador, Galapagos Is., Colombia (W coast), Central America (W coast), Mexico (W coast), U.S.A. (W coast), British Columbia, Alaska, Hawaii Is.

NUMBERING OF TYPES OF STATIONS	**5/1937**		**E2.3**

It is recommended that for purposes of quick reference each station be assigned an index number corresponding to the nature of the services it carries out and ensuring connection between the various chapters in which the same station appears.

The following system is recommended:

	Index
Coastal W/T Station	0 (optional)
Direction finding station	1
Radiobeacon	2
Wireless time signals	3
Meteorological bulletins; Storm warning signals	4
Navigational warnings; Ice reports	5
Distress notices	6
Medical and quarantine advice	7
Coastal wireless telephone station	8 (Optional)

UNIFORM SEQUENCE OF INFORMATION	**9/1932 as amended**	**IHC 4 & 46/2018**	**E2.4**

It is resolved that the various particulars for each category of station shall be listed in the following uniform sequence:

a) Serial (or index) number.

b) Name of the station (call signal).

c) Geographical position: latitude and longitude (taken from the largest-scale original coastal chart). If necessary, the positions of the transmitter and the receiver shall be given.

d) Wave (or waves: call, bearing, transmission), type, power.

e) Operational Hours

f) Nature of service.

g) Sectors of utilization and, possibly, range.

h) Call station (if necessary).

i) Characteristics of signal or of message (sources of data, codes utilized, areas concerned, clear weather transmission, etc.).

j) Procedure: preparatory signal, form of message, repetitions, errors.

k) Auxiliary or supplementary signals.

l) Control stations, combined stations, relay stations, synchronization.

m) Remarks, changes, etc.

IHO Programme 2 "Hydrographic Services and Standards"
2.4 – Publications / 2.4.6 – Sailing Directions

Transliteration in Roman characters of geographical names

Alphabetical indexes of geographical names

Use of information published by other countries

Advance notification of the publication of Sailing Directions and their supplements

Correction of Sailing Directions

Geographical arrangement and division into volumes

General arrangement and division of Sailing Directions information

Standardization of Sailing Directions

Index charts in Sailing Directions

Indication of geographical positions

Instructions for through traffic in difficult waters

Arrangement of information

Dimensions of ships admitted into harbours

Date of certain essential information

Unverified information

Dredged channels or areas

Swept areas

Clearance under bridges and aerial cables

Submarine cables

Tidal information to be given in Sailing Directions

Meteorological information

Oceanographic information

Recommended traffic separation schemes in congested areas

Landfall descriptions

Extent of information

Illustrations and sketches in Sailing Directions

Laws and regulations

TITLE	Reference	Last amendment (CL or IHC)	1st Edition Reference
TRANSLITERATION IN ROMAN CHARACTERS OF GEOGRAPHICAL NAMES	**2/1937 as amended**	**18/1955**	**C1.2**

1 It is recommended, with a view to facilitating as far as possible the transcription of geographical names that those countries which do not use Roman characters insert, in the alphabetical indexes of their Sailing Directions, a transliteration in Roman characters of those geographical names which refer to their own coasts.

2 The transliteration should be made in accordance with the official system of the country concerned. A brief description of the system used should be given.

See also 11/1919 (C1.3).

ALPHABETICAL INDEXES OF GEOGRAPHICAL NAMES	**11/1919 as amended**	**18/1955**	**C1.3**

It is recommended that all countries include alphabetical indexes of geographical names in their Sailing Directions. These names should be written according to the official orthography.

Note: For those countries which use a non-Roman alphabet see 2/1937 (C1.2).

USE OF INFORMATION PUBLISHED BY OTHER COUNTRIES	**1/1926 as amended**	**18/1955**	**C1.4**

1 It is recommended that, when compiling Sailing Directions which include information concerning foreign coasts, Hydrographic Offices use the Sailing Directions of the country which is being described or those of its administrating authority, if such are available.

2 It is recommended that, in the case of information taken from foreign publications, the title and date of issue of such publications should be clearly stated in the preface.

ADVANCE NOTIFICATION OF THE PUBLICATION OF SAILING DIRECTIONS	**12/1919 as amended**	**42/2009**	**C1.8**

It is resolved that, when any Hydrographic Office decides on the issue of a new volume / edition of Sailing Directions or a supplement, it shall publish advance notification in its Notices to Mariners.

CORRECTION OF SAILING DIRECTIONS	**3/1982**		**C1.9**

1 It is strongly recommended that a regular system of correction be maintained using only one of the following three systems:

a) i) The issue periodically of supplementary statements containing information and corrections necessary for the amendment of the Directions, such supplements to

be arranged in the same geographical sequence as the volumes affected, the latest supplement in all cases cancelling all earlier ones;

ii) In any supplement issued, new or altered material should be clearly indicated by some form of readily perceived identification, preferably side-lining; or

b) Revised editions up-dated by automated means; or

c) Change pages for loose-leaf books.

2 It is recommended that the interval between successive supplements/revised editions/change pages should not exceed two years and need not be more frequent than 12 months.

3 It is recommended that Notices to Mariners be used for urgent corrections, but these should be incorporated into the next supplement/revised edition/change pages and should be regarded as a separate system of correction for important matters only between supplements/revised editions/issues of change pages.

See also 1/1952 (A2.11) and 2/1932 (A2.12).

GEOGRAPHICAL ARRANGEMENT AND DIVISION INTO VOLUMES	**13/1919 as amended**	**IHC 16**	**C2.1**

1 It is resolved that nations publishing non-original Sailing Directions shall indicate in the preface of every volume the title and the geographical limits of the source Sailing Directions referred to in the volume or in some of its chapters. *See also 1/1926 (C1.4).*

2 It is recommended that, insofar as possible, the divisions of the volumes and of the chapters be in agreement with the index showing the arrangement in the source Sailing Directions.

3 It is recommended that the order adopted for the description of coasts be that of the source Sailing Directions, and that in intricate waters a sketch index shows, by means of arrows, with numbers of paragraph or pages as far as is necessary, the sequence followed in the description.

4 It is resolved that the limits of oceans and seas described in IHO Special Publication S-23 shall be adopted, as far as possible, for the titles of volumes, chapters and paragraphs of Sailing Directions and Lists of Lights.

See also 32/1919 (K3.2).

GENERAL ARRANGEMENT AND DIVISION OF SAILING DIRECTIONS INFORMATION	**14/1919 as amended**	**IHC 16**	**C2.2**

It is recommended that the following paragraphs be used as a general guide for the arrangement of the contents of Sailing Directions.

a) The general arrangement of a volume should be as follows:

i) Preliminary pages. *See paragraph c below;*

ii) General navigation and regulations. *See paragraph d below;*

iii) Environmental conditions. *See paragraph e below;*

iv) Offshore and through-routeing information. *See paragraph f below;*

v) Coastal routes and geographical areas. *See paragraph g below;*

vi) Appendices for detailed regulations etc. *See paragraph h below;*

vii) Illustrations. *See paragraph i below; and*

viii) Alphabetical index. *See paragraph j below.*

b) Separate volume for general information:

When several volumes of Sailing Directions cover a major sea area, or a landlocked sea, it may be more expedient for some of the general information *(see a above),* the environmental information *(see a above)* and the through-routeing to form a separate volume covering the whole of the major sea area.

c) Preliminary pages comprising:

i) Title page showing date of issue, latest Notice to Mariners used, short statement on method of correction;

ii) Preface with bibliography of source material *(See 1/1926 (C1.4) and 13/1919 (C2.1);*

iii) List of contents and diagrams, etc;

iv) Explanatory Notes on terms and conventions used;

v) List of abbreviations used;

vi) Glossary of foreign and special words found on charts and in the text. A transliteration alphabet and/or notes on the system used when this is necessary; and

vii) Index chartlet *See 15/1919 (C2.4).*

d) First chapter or section should contain the following information:

i) Charts and charting. Remarks on the general quality of the charts (paper and digital) available for the area, use of charts other than those of own nationality; remarks on important differences of geographical or tidal datum between charts;

ii) Buoys and beacons. Descriptions of systems in use if differing from IALA Regions A or B;

iii) Navigation. General remarks on navigation in coral waters; notes on the existence of large amounts of kelp; ice navigation and ice-breaker service available where these are applicable to the area; any other notes applicable to navigation throughout the area covered by the book, such as fishing and other maritime activities;

iv) Regulations. Extracts of national regulations concerning navigation, pollution, quarantine, cables, pipelines and any other special regulations that should be known to mariners before arrival in national waters. The territorial sea and economic zones claimed should be given in general terms;

v) Radio services. General remarks on the availability and reliability of radio position fixing systems, radio beacons, navigational warnings, and weather forecasts. This section

should not duplicate the details of times of operation and the frequencies if these are given in separate radio publications;

vi) Pilotage. General remarks on pilotage services in the areas, national regulations regarding pilotage. Where there are standard regulations for pilots applicable to all parts of the area, these can be given to avoid repetition elsewhere in the book. Special regulations applicable only to individual ports are best given at the port concerned rather than in the first chapter;

vii) Visual signals. Systems of signals in use in the area for storm, weather, dredging, traffic and other special maritime activities should be described. These should not include well-known international signals; special signals only applicable to an individual port are best given with the main description of the port;

viii) Distress and rescue. Brief description of the sea/air rescue organisations that may be in operation for the area covered by the book;

ix) Countries. Brief information about the countries in the area of interest to the mariner;

x) Principal ports and anchorages. A list of ports and anchorages in the area giving position, principal purpose, brief statement on limiting conditions such as depth of water, or size of vessel that can use the port, whether it is a port of entry, cross-reference to other parts of the book or other publications where further information can be obtained; and

xi) Port services. A list of places should be given where fuel, fresh water, repairs, docking, fumigation, and diplomatic representatives are available;

e) Second chapter or section should contain:

Environmental conditions. General information concerning bottom topography, if relevant, seismic activity, currents, tidal streams, oceanography, ice conditions with diagrams, sea and swell, surface meteorological information with seasonal diagrams and climatic tables for selected places on the coast.

See also 7/1962 (C3.12) and 8/1962 (C3.13).

f) Third chapter or section should deal with the following:

i) Through routes and traffic separation;

ii) Landfall aids and landmarks;

iii) Offshore activities and hazards affecting navigation offshore and for passing through the area;

iv) In complex geographical areas it may be necessary to have other local through-routeing chapters or sections.

See also 16/1919 (C2.7).

g) Subsequent chapters or sections.

i) After the main through-route chapter, the book should be subdivided into chapters or sections as necessary using the "waterway" principle *(see below);*

ii) The contents of chapters or sections should be determined by the needs of navigation to form logical geographical units.

See also 4/1982a (C2.8a).

iii) The "waterway" principle means that it is the channel or coastal route that is being described and not the coast. For example:

Strait of Gibraltar - Through route
Strait of Gibraltar - North side
Strait of Gibraltar - South side
rather than
Spain - South coast
Morocco - North coast

iv) A large island having a passage either side of it should not be described as a whole, but in the form of a passage along one side and then a passage along the other side.

h) Appendices.

These may be inserted after the main text and should be used to contain lengthy regulations, or extensive lists of restricted areas, coastal distance tables and other matter that might be inconvenient with the main text.

i) Illustrations should whenever possible be included within the text.

See also 6/1982 (C3.20).

j) Index.

A comprehensive index (primarily of place names) should be included. *See also 11/1919 (C1.3).* The index may also contain latitudes and longitudes as well as paragraph or page references for the text.

STANDARDIZATION OF SAILING DIRECTIONS	1/1957 as amended	IHC 16	C2.3

It is recommended to standardize as far as is reasonable, the general structure and arrangement of books of Sailing Directions published by Member States, but not to the extent of constraining all thought and innovation for improvement.

INDEX CHARTS IN SAILING DIRECTIONS	15/1919 as amended	IHC 16	C2.4

1 It is strongly recommended that each country publish an index chart showing that portion of the world covered by its volumes of Sailing Directions.

2 It is strongly recommended that each volume contain an index chart or charts showing the following:

a) Coastal outline and border with latitude and longitude graduation;

b) Limits of area covered by the volume;

c) Title and number of the adjacent volumes;

d) Limits and numbers of the charts for the area;

e) Names of principal ports, bays, channels sea areas, headlands, islands and countries, as far as this is consistent with clarity; and

f) Limits of chapters or sections to show the area covered and the direction in which the text proceeds.

See also 13/1919 (C2.1) and 14/1919c (C2.2c).

INDICATION OF GEOGRAPHICAL POSITIONS	3/1937 as amended	IHC 16	C2.6

It is resolved that geographical positions (latitude and longitude) should be quoted as precisely as possible to enhance the utility of positional information when used in electronic systems.

INSTRUCTIONS FOR THROUGH TRAFFIC IN DIFFICULT WATERS	16/1919 as amended	IHC 16	C2.7

1 It is recommended that general information on through routes, reporting points, traffic separation schemes, the general track followed by shipping, should be described if known. In some areas there may be very little to describe, in others the recommended through-routes may be complex and it may be necessary to have a separate chapter.

See also 14/1919b (C2.2b).

2 It is recommended that when a channel is referred to in several parts of the same volume, the complete instructions for this channel be given in a separate chapter, or that such instructions be linked by adequate page references.

3 It is recommended that general information on the following subjects that affect ships passing through the area should be given; for example, exercise areas, fishing, exploration and exploitation of the seabed, and ice-breaking services.

See also 14/1919 (C2.2) and 5/1967(C3.16).

ARRANGEMENT OF INFORMATION	4/1982 as amended	IHC 16 & 46/2018	C2.8

It is recommended that in printed publications the information in chapters or sections be arranged as follows. The style may be in the form of a notebook with bullet point side headings containing single sentence statements. Information that properly rests in another publication shall be omitted or reference only made to that publication.

a) Waterways and coast

i) Chapters or sections should begin with introductory paragraphs dealing with general information applicable to the whole area of the chapter or section, *see below:*

- General aspect and remarks about the waterway and shores;
- Water level peculiarities and irregularities *See 17/1919 (C3.11);*

- Currents and tidal streams;
- Local meteorological conditions;
- Local ice conditions;
- Fishing activity;
- Offshore or coastal activities dangerous to shipping such as drilling platforms, military exercises, dumping grounds;
- Magnetic anomalies;
- Regulations;
- Pilotage; and
- Submarine cables and pipelines of a general nature *See 4/1967 (C3.10).*

ii) After the introductory paragraphs, each significant portion of the waterway or coastal route should contain the following information of a more local nature:

- Route - general description;
- Controlling depth or least charted depth in the fairway;
- Regulations for traffic separation, movement reporting, prohibited areas *See 5/1967 (C3.16);*
- Local pilotage;
- Currents, tidal streams, overfalls;
- Local winds and fogs, etc;
- Principal marks and navigation aids *See 10/1962 (C3.17);*
- Directions for the waterway or coastal passage;
- Directions for approaches to harbours and anchorages;
- Anchorages and harbours;
- Minor side channels for small craft (less than 2m draught, or 12m in length); and
- Small craft anchorages, harbours and marinas not falling within larger harbours.

b) Port information:

- Name and position of port or harbour;
- Limits of port;
- General remarks on type of port, main function, and amount of traffic handled;

- Port authority;
- Limiting conditions due to draught, size of vessel *See 2/1967 (C3.3) and 5/1962 C3.4);*
- Water level and mean tidal range;
- Ice;
- Local meteorological conditions;
- Arrival information required and notice for ETA;
- Port information service, signal stations ;
- Pilotage and tugs;
- Regulations;
- Outer anchorages and sea berths;
- Tidal streams;
- Entrance channel or fairway;
- Traffic signals;
- Directions for entering;
- Berths, basins and depths of water *See 5/1962 (C3.4);*
- Port facilities in brief for cargo handling, ro-ro, containers, lighters, cranes, etc;
- Repair facilities, dry docking, and slipways; and
- Supplies of fuel, water, etc

DIMENSIONS OF SHIPS ADMITTED INTO HARBOURS	**2/1967 as amended**	**IHC 16**	**C3.3**

It is strongly recommended that the maximum dimensions of ships normally admitted into harbours, as fixed by the harbour authorities, be given in Sailing Directions.

DATE OF CERTAIN ESSENTIAL INFORMATION	**5/1962 as amended**	**IHC 16**	**C3.4**

It is recommended that critical types of information contained in Sailing Directions, such as instructions for entering harbours, depths of water, channels, etc., be followed by the date, in brackets, when the data were last checked.

UNCONFIRMED INFORMATION	**6/1962 as amended**	**IHC 16**	**C3.5**

It is recommended that unconfirmed items of information should not appear in the Sailing Directions unless there is a potential hazard.

DREDGED CHANNELS OR AREAS	**2/1926 as amended**	**IHC 16**	**C3.6**

It is resolved that the following information concerning dredged channels or areas shall be inserted in Sailing Directions only when it is not shown on the chart:

a) Depth to which the channel or area has been dredged; and
b) Year of the last dredging.

SWEPT AREAS	**3/1967 as amended**	**IHC 16**	**C3.7**

It is recommended that for areas where the nature of the bottom is such that depths tend to vary and the changes have practical significance to surface navigation, the latest date on which they were swept be indicated in Sailing Directions, but only when it is not shown on the chart.

CLEARANCES UNDER BRIDGES AND AERIAL CABLES	**2/1952 as amended**	**IHC 16**	**C3.8**

1 It is resolved that minimum vertical clearance shall always be given in Sailing Directions in respect of bridges, viaducts, overhead transporters, aerial cable-ways, power transmission cables and telegraphic and telephonic cables crossing navigable waters; even when this information is shown on the chart.

2 It is recommended that, in the case of overhead transporters and aerial cable-ways, the clearance of the bridge or the cable itself, as well as that of the cars when in motion, be indicated; even when this information is shown on the chart.

3 It is resolved that the navigable width shall always be given for bridges and viaducts crossing navigable waters.

SUBMARINE CABLES	**4/1967 as amended**	**IHO A-1**	**C3.10**

Considering the provisions of the International Convention for the Protection of Submarine Telegraph Cables as amended, Hydrographic Offices should use the following text as the basis upon which to provide mariners with appropriate information in publications such as Mariners' Handbooks or annual Notice to Mariners:

Certain submarine cables are used for telecommunications functions while others are used for power transmission. All power cables and most telecommunications cables carry dangerous high voltages. 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.

In view of the serious consequences resulting from damage to submarine cables, vessel operators should take special care when anchoring, fishing, mining, dredging, or engaging in underwater operations near areas where these cables may exist or have been reported to exist. In order to minimize the risk of such damage as much as possible, vessels should avoid any such activity at a minimum distance of 0.25-nautical mile[1] on either side of submarine cables.

Mariners are also warned that the seafloor where cables were originally buried may have changed and cables become exposed; therefore particular caution should be taken when operating vessels in areas where submarine cables exist especially where the depth of water means that there is a limited under-keel clearance.

Vessels fouling a submarine cable should not attempt to clear or raise the cable due to the high possibility of damaging the cable. No attempt should be made to cut a cable and anchors or gear that cannot be cleared should be slipped. Before any attempt to slip or cut gear from the cable is made, the cable should first be lowered to the seafloor. Note that there is a risk of capsizing smaller vessels (primarily fishing vessels) if they attempt to bring a cable to the surface. Following an incident of fouling a cable, a vessel should immediately notify the local responsible authority of the position, type, and amount of gear remaining on the seafloor. In inland areas or along the coast, warning signs or marker beacons are often erected to warn the mariner of the existence of submarine cables.

Incidents involving the fouling of submarine cables should be reported at the shortest possible notice to the responsible authorities[2] who should be advised as to the nature of the problem and the position of the vessel.

Notes :

1. Each responsible authority can set this distance to a value that they feel is appropriate.
2. The responsible authorities can be listed here, as well as contact methods (telephone, facsimile, VHF, e-mail, internet, etc.) and required information.

TIDAL INFORMATION TO BE GIVEN IN SAILING DIRECTIONS	**17/1919 as amended**	**IHC 16**	**C3.11**

1 It is recommended that in Sailing Directions information regarding tides already given on harts and in Tide Tables should not be included. However, peculiarities and irregularities should be fully described.

2 It is recommended that information be given showing, for the year, seasons or months at a certain place or area, adequate data concerning the deviations of water level, in relation to chart datum, resulting from meteorological and other random or seasonal influences. This information may have to be mentioned in three ways, namely:

a) General information for the area in the first chapter *See 14/1919 (C2.2);*

b) Coastal information where it occurs geographically in the text *See 4/1982 (C2.8); and*

c) For a specific port *See 4/1982 (C2.8).*

3 It is recommended that when the above information appears in Sailing Directions a reference to this effect be inserted on the charts concerned.

See also 5/1919 (A2.9).

METEOROLOGICAL INFORMATION	7/1962 as amended	IHC 16	C3.12

It is recommended that a chapter at the beginning of each volume of Sailing Directions give all general meteorological and ice information concerning the region covered by the volume. Local meteorological and ice information (e.g. prevailing winds in a port) could also be added in the chapters or sections.

See also 14/1919e (C2.2e).

OCEANOGRAPHIC INFORMATION	8/1962 as amended	IHC 16	C3.13

1 It is recommended that the introductory part of Sailing Directions includes oceanographic information concerning general currents and a brief account of the main characteristics (temperature, salinity, density) of surface water.

2 It is recommended that a reference be made to the relevant oceanographic and tidal atlases, whenever possible.

See also 14/1919e (C2.2e).

RECOMMENDED TRAFFIC SEPARATION SCHEMES IN CONGESTED AREAS	5/1967 as amended	IHC 16	C3.16

It is strongly recommended that details of traffic separation schemes should always be given in Sailing Directions.

See also 16/1919 (C2.7), 4/1982 (C2.8) and 1/1980 (A1.17).

LANDFALL DESCRIPTIONS	10/1962 as amended	IHC 16	C3.17

1 It is recommended that landfalls be described before giving a detailed description of the coast for the use of a navigator sailing along it.

2 It is recommended that, for a landfall from offshore, the description be given in the order in which features become visible to the navigator approaching from the most usual direction. The description will give, first, offshore islands, then mountains, then visible landmarks, etc. Then at the end of the section will be given all information known about ports and anchorages, unless this appears as part of the usual description of the coast, in which case an appropriate reference will be inserted.

3 It is recommended that, in the case of arrival at an estuary, a description (lateral marks, beaconage, alignments, etc.) of the entire length of the various channels, one after the other, in decreasing order of importance, be given, followed possibly by a description of the banks and dangers situated between these entrance channels, as well as of landmarks of secondary importance.

See also 4/1982 (C2.8).

EXTENT OF INFORMATION	5/1982 as amended	IHC 16	C3.19

It is strongly recommended that:

a) Nautical publications should only contain such information as is useful for mariners;

b) Information should be presented clearly and distinctly so as to facilitate scanning of the publication and to avoid time-consuming reading of extensive text;

c) Information given in other nautical documents should not be repeated except as necessary to give a clear description;

d) It is not the function of the Sailing Directions to give a written description of the chart;

Information should be selected on the following basis:

The general layout of the passage or channel routeing and regulations, pilotage, environmental conditions, etc;

Features that are useful navigationally as landmarks or seamarks;

Features that are applicable to navigation that may be used as leads, or have to be avoided, or passed or otherwise are relevant to vessels likely to use the waterway; and

Features relevant to anchorages and berths.

e) Those features that are selected for mention in Sailing Directions should be described as follows:

If full details can be seen on the charts, then the feature need not be mentioned unless visual identification is problematic; and

If there is more information than is shown on the charts and the absence of such additional information is potentially dangerous navigationally, then this should be given in the text of the Sailing Directions.

ILLUSTRATIONS AND SKETCHES IN SAILING DIRECTIONS	6/1982 as amended	IHC 16	C3.20

It is recommended that sketch plans, aerial oblique photographs or other illustrations and photographs be used where possible to improve the descriptions given in the text. Sketch plans should not duplicate that which can be clearly appreciated from the charts.

LAWS AND REGULATIONS	7/1982 as amended	IHC 16	C3.21

It is recommended that Sailing Directions include the important portions of laws and regulations appertaining to navigation which should be known by mariners before arrival at an anchorage or port. In many cases it will suffice to paraphrase the important portions, but if the regulations are complex then the full (translated) text may need to be given in addition as an Appendix.

TITLE	Reference	Last amendment (CL or IHC)	1st Edition Reference
MEAN SEA LEVEL SYMBOLS	**7/1937 as amended**	**IHC 7**	**G1.1**

It is resolved that the following symbols shall be used in nautical publications to denote:

Zoo : The best practical figure which can be obtained for the height of mean sea level referred to the datum in general use;

Zo : Height of mean sea level, as obtained from any individual analysis, above chart datum;

So : Height of mean sea level, as obtained from any individual analysis, above the zero of observations; or

Ao : Height of mean sea level as obtained from any individual analysis above an arbitrary datum different from chart datum or the zero of observations.

TIME TO BE USED	**27/1919 as amended**	**44/2014**	**G1.2**

1 It is recommended that the time system employed in printed Tide Tables shall be Standard Time as observed at the port.

2 It is recommended that daylight saving time shall not be used in the predictions in the printed Tide Tables but that a notice or caution relative to its use and the period of its application shall be included therein.

It is strongly recommended that the time system employed in Digital Tide Tables (DTT) published in web sites shall be Standard Time as observed at the port, without daylight saving time application. A notice or caution relative to its use and the period of its application shall be included therein. Additionally, DTT can offer to the user the possibility to set automatically another time system.

TRANSLATION OF HEADINGS ETC.	**7/1926 as amended**	**34/2005**	**G2.1**

It is recommended, principally for those Tide Tables which are not published in Roman characters, that the headings of divisions and columns include a translation in English, French or Spanish, in order to increase the international usefulness of the publication.

INFORMATION TO BE GIVEN IN TABLES	**28/1919 as amended**	**IHC 8**	**G3.1**

It is resolved that Tide Tables shall include:

a) Detailed predictions for the ports chosen as standard ports ; these predictions may consist of either the time and height of high and low water or the hourly heights of the tide; and

b) Special tables giving data required for calculating, from the predictions for the standard ports, the corresponding predictions for the secondary ports.

MEAN SEA LEVEL	**29/1919 as amended**	**IHC 4**	**G3.2**

It is resolved that the height of mean sea level above chart datum (Zo) shall be stated clearly in Tide Tables and in a concise manner on charts.

See also 7/1937 (G1.1).

MENTION OF ORIGIN OF TIDAL PREDICTIONS	**6/1947**		**G3.3**

It is recommended that the Hydrographic Offices which publish predictions supplied by other countries give the origin of such predictions in their Tide Tables.

IHO Programme 3 “Inter Regional Coordination and Support”
3.1 – Regional Hydrographic Commissions

Establishment of Regional Hydrographic Commissions (RHC)

IHO Response to Disasters

Hydrography and Cartography of Navigable Inland Waters

IHO Programme 3 "Inter Regional Coordination and Support"
3.1 – Regional Hydrographic Commissions

TITLE	Reference	Last amendment (CL or IHC)	1st Edition Reference
ESTABLISHMENT OF REGIONAL HYDROGRAPHIC COMMISSIONS (RHC)	**2/1997 as amended**	**IHO A-2**	**T1.3**

GENERAL

1 The mission of the IHO is to create a global environment in which States provide adequate and timely hydrographic data, products and services and ensure their widest possible use. To accomplish this mission, Member States are to pursue, on an intergovernmental basis, their cooperation on hydrographic activities on a regional basis.

2 IHO Member States have established regional coordination as an essential factor to support enhancements in the exchange of information and foster training and technical assistance between all nations. To effectively implement this, Regional Hydrographic Commissions (RHCs) are recognized by the Assembly as the primary organs to bring together coastal States within a region to progress the work of the IHO and extract the highest societal value of Member States' effort for the benefit of the nation, region and wider global marine geospatial community.

3 The IHO has established an Inter-Regional Coordination Committee (IRCC) with the aim to establish, coordinate and enhance cooperation in hydrographic activities amongst States on a regional basis, and between regions, especially on matters associated with Capacity Building; the World-Wide Navigational Warning Service; General Bathymetry and Ocean Mapping; Marine Spatial Data Infrastructures; Education and Training and the implementation of the WEND suitable for the need of international shipping. The IRCC is the IHO Committee tasked to coordinate and engage directly with RHCs on regional activities.

ESTABLISHMENT OF REGIONAL HYDROGRAPHIC COMMISSIONS

4 It is resolved that the IHO Secretariat and the relevant IHO subordinate bodies shall encourage IHO Member States having common regional interests in data collecting or nautical charting to form RHCs to cooperate in the undertaking of surveys and other projects. Recognized by the Assembly, the RHCs shall complement the work of the Organization, establish common regional approaches, and balance regional issues with global geospatial needs.

5 RHCs should provide, in pursuance of the resolutions and recommendations of the IHO, regional coordination with regard to nautical information, hydrographic surveys, production of nautical charts and documents, technical cooperation, capacity building (CB) projects and marine spatial data infrastructure (MSDI) projects, related to the work of the IHO. RHCs, led by IHO Member States, should enable the exchange of information and consultation among the hydrographic services of all coastal States concerned in the region. Geographically adjacent RHCs should liaise with each other to coordinate the provision of hydrographic services. Cooperation among all RHCs, including among those not adjacent, is encouraged. RHCs should be aware of the technical maturity level and fiscal challenges that may influence state involvement. The processes and management of the RHC meetings should be designed to accommodate the broad participation of nations within the region.

6 RHCs should assess regularly the status of nautical information, navigational warnings, hydrographic surveying, nautical charting, hydrographic capacity and requirements within their region and provide reports to the work of the relevant IHO subordinate bodies and inputs to relevant IHO publications.

7 RHCs should be properly constituted, follow standard processes where possible, and have activities in line with the objectives of the IHO as described in Article II of the Convention on the IHO, and Article 8 of the IHO General Regulations. Regional activities should align with and support the intent and objectives of the approved IHO Work Programme. RHCs should take into account the actions, recommendations and outcomes of the IRCC.

8 Geographical areas of the RHCs will normally coincide with INT chart regions, modified as appropriate to meet regional requirements and special circumstances. There are special provisions for Region M (Antarctica) because of its special status.

9 The working languages used by the RHCs should be agreed upon by their members and designated to ensure the best communication between participants. The reports and IHO documents relating to RHC activities shall be in at least one of the official languages of the IHO. For correspondence with the IHO Secretariat, one of the official languages shall be used.

10 The IHO Secretariat shall be invited to attend the meetings of RHCs as Permanent Observer.

MEMBERSHIP

11 RHC membership may include full Members and Associate Members willing to contribute to the objectives of the IHO in the fields of hydrography, nautical charting, nautical information or navigational warnings, marine spatial data infrastructure (MSDI) and related fields in the region concerned. The roles of full members, associated members and observers should be defined by each RHC, in line with the IHO General Regulations. The invitation procedures for membership should be established by each RHC, following approaches that are open, inclusive and supportive of a regional coordination role.

12 Full membership is reserved for IHO Member States within the region who sign the statutes of the RHC. Associate membership is available to other IHO Members States or other nations who are non-IHO members and being signatories of the statutes of the RHC. International Organizations, Non-Governmental Organizations, Industry and Academia stakeholders, active in the region concerned may be invited by the RHC to participate as Observer or Subject Matter Expert.

LEADERSHIP

13 Leadership of the RHC should be documented within the Commission Statutes, and establish the position of Chair, Vice-Chair, and Secretary, with associated selection process, and term of duties. Duties of the Commission Leadership are encouraged to be in line with this Resolution and the IRCC document titled *Roles and Responsibilities of Regional Hydrographic Commission Chairs.*

14 The Chair of the RHC will provide the secretariat support for the RHC meetings and the intersessional coordination within the region. The IRCC shall maintain a list of responsibilities of the Chairs to enable the work of the RHCs in the IRCC document titled *Roles and Responsibilities of Regional Hydrographic Commission Chairs.*

PROVISION OF HYDROGRAPHIC SERVICES

15 RHCs are recognized by the IHO to coordinate the breadth of regional activities needed to fulfil the provisioning of hydrographic services for international treaty or other regulatory requirements, and general marine geospatial information needs. RHCs will identify and assess INT Charts and ENC coverage within the region, highlighting those areas of significant navigational risk to the producer nations, and work to resolve the issues in a timely manner. As new marine geospatial products and services are developed within the S-100 Universal Hydrographic Data Model, RHCs should engage with data owners, product and service providers, and other stakeholders as appropriate to ensure a coordinated and cohesive regional approach is considered.

CAPACITY BUILDING

16 Where CB is required, RHCs are recommended to establish an internal body to deal with CB matters. All RHCs are encouraged to appoint a CB Coordinator to ensure that regional capacity building activities are aligned and coordinated in accordance with the IHO CB Strategy and with CB procedures and practices developed by the Capacity Building Sub-Committee (CBSC). Such appointment should be reflected in the RHC Statutes to define the role of the CB Coordinator. This part-time allocation to assist RHCs should come primarily and ideally from Hydrographic Offices

(HOs) within the region. If that is not possible then the RHC might agree to request support from another RHC or an HO that might wish to take that responsibility.

17 The CB Coordinators should be nominated having in mind the importance of continuity; should be in regular contact with the corresponding RHC Chair as well as with the CBSC Chair, the IHO Secretariat and the relevant NAVAREA Coordinators. Ideally CB Coordinator should be a CBSC member with access to RHC meetings. However, RHCs may nominate a CBSC member different from the CB Coordinator.

OTHER ACTIVITIES

18 RHCs are also encouraged to establish other committees and working groups, as appropriate, to pursue regional priorities including those that align with IHO global strategic objectives. These include efforts to establish regional charting schemes, elimination of ENC overlaps and gaps, marine spatial data projects, among others. The procedures for establishing such groups, their leadership and duration should be determined internally as RHCs see fit.

REPORTING

19 Chairs of RHCs shall report to the IHO Assembly on RHC activities, the findings of the assessments made in accordance with paragraph 6, future plans and the agreed key targets that support RHC tasks detailed in the IHO Work Programme. The Chairs of RHCs shall also submit reports to the IRCC meetings and an annual report to the IHO Secretariat indicating progress made against the agreed key targets in the IHO Work Programme. Between sessions of the IHO Assembly, reports of studies or other activities, which may be considered of general interest to all IHO Member States, shall be sent by Chairs of RHCs to the IHO Secretariat for general dissemination.

20 The following structure is recommended for National Reports made to RHCs. These reports are intended to streamline information to be considered by the RHC Conferences and to be used by the IHO Secretariat to update the Country Information System (CIS):

Structure for National Reports to Regional Hydrographic Commissions

Executive summary

1. Hydrographic Office / Service:	General, including updates for the IHO Yearbook e.g. reorganization. Note: use the available template for updates to the Yearbook or the online system. Use separate sections if more than one national HO works within region for a single Member State.
2. Surveys:	Coverage of new surveys. New technologies and /or equipment New ships Crowdsourced and satellite-derived bathymetry - national policy Challenges and achievements
3. New charts & updates:	ENC coverage, gaps and overlaps ENC distribution method RNCs

	INT charts
	National paper charts
	Other charts, e.g. for pleasure craft
	Challenges and achievements
4. New publications & updates:	New Publications
	Updated publications
	Means of delivery, e.g. paper, digital
	Challenges and achievements
5. MSI:	Existing infrastructure for MSI dissemination
	Statistics on work of the National Coordinator
	New infrastructure in accordance with GMDSS Master Plan
	Challenges and achievements
	Note: use the WWNWS template for this section
6. C-55:	Latest update
	Note: use the available template to update C-55 or the online system.
7. Capacity Building:	Offer of and/or demand for Capacity Building
	Training received, needed, offered
	Status of national, bilateral, multilateral or regional development projects with hydrographic component (In progress, planned, under evaluation or study)
	Definition of proposals and requests to the IHO CBSC
8. Oceanographic activities:	General
	GEBCO/IBC's activities, GEBCO Seabed 2030 activities
	Tide gauge network
	New equipment
	Challenges and achievements
9. Spatial data infrastructures:	Status of MSDI
	Relationship with the NSDI
	Involvement in regional or global MSDI efforts
	National implementation of the Shared Data Principles – including any national data policy and impact on marine data.
	MSDI national portal
	Best practices and lessons learned
	Challenges and achievements

10. Innovation:	Use of new technologies
	Risk assessment
	Policy matters
11. Other activities:	Participation in IHO meetings
	Meteorological data collection
	Geospatial studies
	Preparation for responses to disasters
	Environmental protection
	Engagement with the Maritime Administration
	Aids to Navigation matters
	Magnetic and gravity surveys
	International engagements
	Etc.
12. Conclusions:	

21 The IHO Secretariat will keep templates for the National Reports and its presentations to RHC meetings. The templates will be in a format compatible with the IHO databases.

IHO RESPONSE TO DISASTERS	1/2005 as amended	IHO A-2	K4.5

1 Introduction

In recent years, huge earthquakes, tsunamis, hurricanes and other natural disasters occurred all over the world and not only severely affected local communities through the widespread loss of life and the extensive destruction of most facilities, but also severely affected safety of navigation through the destruction of port facilities and the creation of new navigational obstacles. A huge number of refugees were created and immediately suffered from shortages of food, water and fuel. In such circumstances support by sea transport was vital and depended on the immediate restoration of appropriate hydrographic and charting services.

It should be noted that "the Sendai Framework for Disaster Risk Reduction 2015-2030" was adopted at the 3rd UN World Conference on Disaster Risk Reduction (WCDRR3), where international organizations are expected to implement activities to understand and manage disaster risks.

Various data and information obtained from hydrographic and charting activities are beneficial for sharing information right after a disaster, the development of restoration plans for damaged coastal areas and for strategies for disaster risk reduction. It would be important to provide hydrographic information effectively in the process from the occurrence of the disaster to the recovery.

The International Hydrographic Organization (IHO), its Member States and the Regional Hydrographic Commissions (RHCs) should ensure adequate preparedness so as to enable an immediate and appropriate response to any future disaster affecting coastal areas of the world.

Hydrographic Offices should therefore be part of the National Plan developed beforehand to respond immediately after the occurrence of such severe disasters and participate in and cooperate in the development and implementation of the restoration plans for the damaged coastal areas and the strategies for disaster risk reduction within their area of responsibility, which may vary from Member State to Member State. As such following activities can be identified with the overarching framework of the Convention on the IHO and General Regulations of the IHO.

2 Activities

a) By coastal States:

All coastal States are encouraged to develop contingency plans in advance in order to be prepared in case a disaster occurs. The specific roles and tasks of the Hydrographic Offices within these coastal States depend on the individual national governance structures.

Contingency plans may contain the following key elements as appropriate:

i) Immediately upon the occurrence of a disaster, including tsunami, promulgate appropriate navigational warnings and necessary information and advice to shipping through existing channels (e.g. NAVTEX, SafetyNET, etc.) using appropriate ways, such as graphical information on maps. In addition, and following further monitoring and assessment, promulgate updated warnings, information and advice in accordance with the development of the event.

ii) Cooperate with the NAVAREA Coordinator and other national coordinators so that warnings, information and advice can be made available to mariners beyond the area of national jurisdiction as soon as is practicable.

iii) Assess the extent of damage to the coastal area particularly to ports, harbours, straits, approaches, and other restricted areas.

iv) Assess, in cooperation with other national agencies, for example, lighthouse and port authorities, the extent of damage to navigational aids.

v) Prioritize actions and allocate resources in order to identify requirements and undertake preliminary re-surveys starting with the most critical areas for navigation, aiming at ensuring the passage of support and supplies through maritime channels and ports, and the marking of new dangers where necessary.

vi) Assess the specific effects on shipping of the existence of obstacles and any changes to the seafloor that can hinder navigation, taking full account of the effects of drifting obstacles which may also hinder preliminary survey results.

vii) Take the following action to assess and define new hydrographic or cartographic requirements, including:

1. Conducting hydrographic surveys in harbours and approaches as soon as practicable wherever the depth is likely to have changed due to geomorphic change, obstacles, or accumulation of sediment. Surveys should be progressed incrementally in support of progress in reconstruction of port facilities.

2. Checking and confirming relevant benchmarks. Re-defining chart datum, if necessary.

3. Providing nautical information as soon as practicable. Providing chart correction information or new editions of charts incrementally according to priorities and available resources. Indicating newly surveyed areas in chart correction information or on new editions of charts in order to highlight areas of more reliable information in areas where significant changes of depth have taken place.

4. Noting that, in case of earthquake, the ground level may continue to change for many years due to post-seismic crustal deformation, which may accumulate and affect charted depths significantly.

Also, actions to be taken in ordinary period may contain the following key elements as appropriate:

1) Prepare equipment and information and conduct exercises to implement the contingency plan effectively.

2) Share information about disaster response with the Chair of the RHC and the IHO Secretariat at appropriate. This includes support requests for the immediate disaster response as well as the recovery response, for instance enabling entry survey or subsequent updating of nautical charts.

It is also very important for coastal States to collect relevant coastal and bathymetric data in their areas of responsibility and to make this available to the appropriate organizations to support the establishment and improvement of tsunami early warning systems, protection of coastal areas and relevant simulation studies. In particular, coastal States should cooperate and support the IOC Tsunami Warning Programme (www.ioc-tsunami.org) in setting up sea-level and tide gauges networks, procedures and systems for the exchange and transmission of near real time sea-level data[11]. One to five minute transmission of sea-level data, properly sampled (~1 min rather than 15 min or 1 h) is recommended for specific gauges likely to provide early warnings of tsunamis and storm surges. Any necessary regional cooperation for the collection of data can be coordinated through the Regional Hydrographic Commission with other States in the Region and regional bodies of other International Organizations as appropriate, such as the IOC.

[11] See also "Manual on Sea Level: Measurement and Interpretation Volume IV" https://www.psmsl.org/train_and_info/training/manuals/

b) By Regional Hydrographic Commissions:

i) Regional Hydrographic Commissions (RHC) should include disaster preparedness and response into Agenda item on RHC meetings as appropriate.
ii) The Chair of a RHC may act as a broker for hydrographic demand (from the affected countries) and supply (by countries offering assets).
iii) RHC should consider the implementation of capacity building for disaster preparedness and response as appropriate.

c) By the IHO Secretariat:

i) The IHO Secretariat should promote actions by Member States and RHCs above as appropriate.
ii) The IHO Secretariat should promote sharing best practices regarding disaster preparedness and response provided by Member States for the world resilience.

3 Diplomatic clearance

Effective disaster response predicates on diplomatic clearance to actually deploy the offered hydrographic assets in theatre. It is the responsibility of affected coastal States to institute procedures to progress 'hydrographic' requests timely through their Nations' Diplomatic channels. As it is the national responsibility of the Member States offering such support, to use those channels. The IHO Secretariat and Chairs of the RHCs have no means to absorb these national responsibilities.

HYDROGRAPHY AND CARTOGRAPHY OF NAVIGABLE INLAND WATERS	4/2009 as amended	IHO A-1	K4.6

Relevant Regional Hydrographic Commissions (RHC), through appropriate liaison bodies, are invited to:

a) encourage the consistent use of hydrographic and nautical cartographic standards and mutual cooperation for the enhancement of navigation safety in navigable inland waters within and between regions.

b) encourage the identification of needs for developing additional regional extensions to IHO specifications to cater for navigable inland waters and foster these developments together with other relevant organizations.

c) encourage liaison with relevant IHO bodies (IHO Secretariat, Hydrographic Services & Standards Committee (HSSC)) to ensure that any extensions to IHO specifications for navigable inland waters are consistent with IHO specifications and are as far as possible harmonised between other regional extensions.

d) encourage liaison, when appropriate, with other bodies working with inland hydrographic and nautical specifications, especially with the Inland Electronic Navigational Chart Harmonization Group (IEHG), to ensure consistency and harmonisation as far as feasible with their specifications.

e) encourage cooperation and mutual assistance between relevant authorities, even from different regions but with common interests, particularly for the safety of navigation in navigable inland waters, with the purpose of mutual support and the establishment of instructions and guidance for hydrographic survey and the production of nautical charts; *See also 7/1919 (A3.4)*

f) Monitor the development and use of hydrographic and cartographic standards on navigable inland waters, and report as necessary to the Inter-Regional Coordination Committee (IRCC).

Where the responsibility for hydrography and nautical cartography of maritime and navigable inland waters is divided among different organizations, Member States are encouraged to ensure that these organizations' activities are properly coordinated."

IHO Programme 3 “Inter Regional Coordination and Support”
3.2 – Capacity Building

Technical Assistance and Cooperation in the field of hydrography

Hydrography in developing countries

Training and Technical Assistance to developing countries

Technical Aspects of the Law of the Sea

The Capacity Building Fund

Purpose of the Capacity Building Fund

Uses of the Capacity Building Fund

Procedures for the Capacity Building Fund

IHO Programme 3 "Inter Regional Coordination and Support"
3.2 – Capacity Building

TITLE	Reference	Last amendment (CL or IHC)	1st Edition Reference
TECHNICAL ASSISTANCE AND COOPERATION IN THE FIELD OF HYDROGRAPHY	**2/1972 as amended**	**IHO A-1**	**K4.1**

1 It is resolved that, in accordance with Article II(c) of the Convention on the International Hydrographic Organization, the IHO Secretariat should take every opportunity to remain in the forefront of organizations acting as the source of technical advice and as a co-ordinating body for the promotion of measures aimed at establishing and/or strengthening the hydrographic capabilities of developing countries through co-operative programmes and other appropriate means, upon request by the recipient countries.

2 It is further resolved that the IHO Secretariat shall actively assist developing countries in establishing or strengthening their hydrographic capabilities in a suitable manner, including the following:

a) by notifying countries and appropriate international organizations that it serves as a primary source of technical advice in hydrography;

b) by arranging for experts from the IHO Secretariat or Member States to visit developing countries, upon request, in order to:

   i) assess the existing facilities and needs;

   ii) advise on measures that can be taken to establish or strengthen hydrographic capabilities including the identification of the most appropriate national structure.

c) by maintaining an inventory of all training courses on hydrography by updating S-47 periodically;

d) by providing guidance on the method of establishing a hydrographic service, including cartographic facilities;

e) by investigating the availability of funding from international organizations and providing advice to developing countries on the formulation of projects; and

f) by encouraging and subsequently following the development of bilateral arrangements between countries having well established Hydrographic Offices and those desiring to establish hydrographic capabilities.

3 The Secretary-General is invited to report annually to Member States through the Council on measures taken regarding the above-mentioned actions.

HYDROGRAPHY IN DEVELOPING COUNTRIES	**3/1977 as amended**	**17/2008**	**K4.2**

The IHO should take all possible measures to strongly encourage those States that do not yet have an adequate hydrographic and/or cartographic capability to meet SOLAS requirements including surveying, Maritime Safety Information (MSI) services and ENC production, to give urgent consideration to developing or expanding their hydrographic capabilities. If necessary, States should apply, through their respective Governments, for assistance which is available from relevant international organizations (for example European Union, UNDP and World Bank), or enter into bilateral Arrangements with States that have a more developed hydrographic capability.

IHO Programme 3 "Inter Regional Coordination and Support"
3.2 – Capacity Building

TRAINING AND TECHNICAL ASSISTANCE TO DEVELOPING COUNTRIES	4/1977 as amended	IHO A-1	K4.3

Member States with developed hydrographic and/or cartographic capabilities are urged to give favourable consideration to requests for training and technical assistance from developing countries. Those Member States offering scholarships, technical assistance and training programmes are invited to forward the details of such scholarships and programmes to the IHO Secretariat. The IHO Secretariat shall maintain a repository of current specific information on hydrographic and/or cartographic training and technical assistance programmes available from Member States for dissemination to all Members and other inquiring nations.

TECHNICAL ASPECTS OF THE LAW OF THE SEA	2/1992 as amended	IHO A-1	K4.4

The IHO,

RECOGNIZING the importance of the delimitation and delineation of coastal States' maritime zones and in particular the delineation of the continental shelf, in accordance with the UNCLOS and the technical difficulties in the application of the relevant provisions of the UNCLOS,

FURTHER RECOGNIZING the contribution of the IHO-IAG Advisory Board on the Law of the Sea (ABLOS),

REQUESTS the IHO Secretariat to:

1 Maintain a register of experts who may be called upon to provide Member States with Technical Assistance related to the delimitation and delineation of maritime zones and the continental shelf and other matters concerning technical aspects of delimitation and delineation;

2 Encourage the development of specialized courses in matters of Law of the Sea of concern to hydrographers and marine cartographers,

3 Support the preparation and the publication of manuals and other literature, which will be of assistance to Hydrographic Offices and others in the understanding of the technical aspects of the Law of the Sea.

THE CAPACITY BUILDING FUND	5/2004 as amended	IHO A-1	R6.2

1 The Capacity Building Fund will be integrated by:

a) An annual contribution from the IHO Budget approved by Member States; and

b) Donations made by governments, other international organizations, funding agencies, public or private institutions, associations or private individuals in support of IHO Capacity Building initiatives.

c) Contributions earmarked for a specific capacity building initiative may also be received.

2 The IHO Secretariat shall open a special internal account for the sole purpose of facilitating the management and control of the funds received to support capacity building initiatives, either coming from the normal IHO budget and/or extraordinary external contributions received.

PURPOSE OF THE CAPACITY BUILDING FUND	4/2004 as amended	17/2005	R6.1

1 The Capacity Building Fund (CBF) is defined as a mechanism to support the Capacity Building Work Programme (CBWP) developed by the Capacity Building Committee (CBC) and approved by Member States.

2 The resources of the CBF shall be used to go in support of the main capacity building activities, as for example:

a) technical assistance;

b) training and education;

c) financial assistance for participation in IHO events; and

d) start-up funding for hydrographic elements of projects

all with the sole objective to assist developing countries in building human and institutional capacities for the effective development of hydrographic surveying and nautical charting capabilities needed to comply with the IHO objectives and related requirements defined in SOLAS and in other international regulations.

3 The CBF will be a vital tool alongside a costed CB Management Plan and CB Work Programme. It will enable the IHOCBC to assess proposals submitted by the RHCs and to recommend an annual Capacity Building Work Programme to Member States.

USES OF THE CAPACITY BUILDING FUND	6/2004 as amended	17/2005	R6.3

The Capacity Building Fund is to be used in the following four main streams:

a) **Technical Assistance**

Concept: These funds will support technical visits to Member States to assess hydrographic surveying, nautical charting and nautical information status; provide guidelines for the development of local hydrographic capabilities and/or to discuss and advise on technical matters pertaining to hydrographic projects. The technical visits to Non Member States are also considered under this concept. In brief, the resources under this topic are to be used to implement visits and related capacity building activities consistent with the IHO Work Programme**.**

b) **Training and Education**

Concept: These funds will support the implementation of hydrographic, nautical cartography and other related training and education initiatives consistent with the IHO Work Programme.

c) **Financial Assistance**

Concept: These funds will support Member States' representatives to attend courses and/or technical meetings as necessary in the interest of the Organization, consistent with the IHO Work Programme.

d) **Start-up Projects**

Concept: These funds will support the very first steps of the implementation of high priority hydro-cartographic projects consistent with the IHO objectives.

IHO Programme 3 "Inter Regional Coordination and Support"
3.2 – Capacity Building

PROCEDURES OF THE CAPACITY BUILDING FUND	7/2004 as amended	IHO A-1	R6.4

1 IHO Member States, preferably through the RHC Chairs, shall report to the Chair of the Capacity Building Sub-Committee (CBSC) via the IHO Secretariat, no later than April each year, on the main capacity building initiatives needing financial support. The needs shall be clearly identified as well as the regional priority assigned.

2 The CBSC at its annual meeting, May/June, shall analyze all requirements received from the RHCs and, considering the IHO WP & Budget approved by the Assembly, shall agree on a prioritized CB Work Programme & Budget for the following year to be submitted to Member States for approval through the IHO Secretariat.

3 The IHO Secretariat shall include the CB Work Programme & Budget in the IHO WP & Budget proposal requesting Member States' approval, following the existing procedure.

4 The IHO Secretariat shall report annually within the existing accountability system full details of income and expenditures associated to these resources. Expenditures will be executed according to the CB Work Programme and Budget proposed by the IHO Capacity Building Sub-Committee for Member States' approval, as part of the normal IHO WP & Budget approval process. The Annual Report, Part 2, Finances should consider an Annex containing a detailed report on the management of the Capacity Building Fund.

5 Funds not used within the calendar year shall remain in the Capacity Building Fund to be used in support of future Capacity Building activities identified in the IHO Work Programme.

IHO Programme 3 "Inter Regional Coordination and Support"
3.3 – Coordination of Global Surveying and Mapping

Improving the Availability of Bathymetric Data Worldwide

IHO Programme 3 "Inter Regional Coordination and Support"
3.3 – Coordination of Global Surveying and Mapping

TITLE	Reference	Last amendment (CL or IHC)	1st Edition Reference
IMPROVING THE AVAILABILITY OF BATHYMETRIC DATA WORLDWIDE	**1/2017**	**IHO A-1-**	**-**

Noting that the depth of a significant percentage of the world's seas, oceans and waterways has yet to be measured directly;

Noting that bathymetric knowledge underpins the safe, sustainable, cost effective execution of almost every human activity in, on or under the sea;

Recognizing the relevance of bathymetry in the maritime aspects of the UN's 2030 Agenda for Sustainable Development Goals, the Paris Agreement under the United Nations Framework Convention on Climate Change and the Sendai Framework for Disaster Risk Reduction 2015-2030;

Noting that significant amounts of bathymetric data is collected by the scientific and commercial sector for purposes other than chart improvement, but is not easily made discoverable or available for secondary purposes;

Noting that in the absence of any data, bathymetric data that may not support precise navigation may nevertheless still be useful for many potential users of the world's seas, oceans and waterways;

1. Member States **resolve** that, in addition to fulfilling their international obligations to provide hydrographic information in support of safety of navigation, they should also consider implementing mechanisms that encourage the widest possible availability of all hydrographic and particularly bathymetric data, so as to support the sustainable development, management and governance of the marine environment. This may be achieved in several ways, including:

   a. active participation in and contribution to the marine element of national Spatial Data Infrastructures (MSDI);

   b. continued support for the IHO-IOC GEBCO project and the IHO Data Centre for Digital Bathymetry;

   c. encouraging the scientific and the commercial sector to identify and wherever possible make available for secondary use, data collected or being collected for a specific scientific or commercial purpose;

   d. supporting systems and infrastructures, such as MSDI and the IHO DCDB, that facilitate data discovery, thereby avoiding unnecessary duplication in bathymetric data collection;

   e. encouraging supplementary methods for collecting bathymetric data, including, but not limited to:

      (1) Crowd-Sourced Bathymetry,

      (2) Satellite Derived Bathymetry,

      (3) The use of autonomous vehicles for the collection of environmental data including bathymetry.