HSSC10-05.3C

Paper for consideration by HSSC10

HSSC WG input paper to amend IHO resolution 2/2007

Submitted by:	NIPWG on behalf of all HSSC technical WG
Executive Summary:	Provision of a draft Annex to IHO Res 2/2007 which describes the conduction of an Impact study
Related Documents:	HO Publication M-3-Resolutions of the IHO-2nd Edition-2010 - Updated to June 2017 Assembly 1, Report of Proceedings
Related Projects:	NIL

Introduction / Background

The resolutions of the IHO are collated and published in IHO Miscellaneous Publication M-3. They provide inter alia guidance and recommendations on which information should be provided in nautical publications. Having the entitlement to reflect the current standard of hydrographic technologies, the resolutions experience regular updates.

The current 2nd edition is dated 2010 and is updated to June 2017. Appropriate entries provide reference information on which International Hydrographic Conference or Assembly decision the amendments/ deletions/ additions are based on.

Assembly-1 Decision 12, which requests the integration of elements from PRO6 – to improve the test and validation procedure of making changes to specifications based on S-100 and Council-1 action item 5 on Standards approval/amendment procedures by the HSSC and the Council have been considered by HSSC as being relevant for the Committee work.

Action item HSSC 9/27 proposed the Resolution 2/2007 revision as a two phase procedure. The first phase is the creation of "guidance for impact assessment" and has to be conducted by the affected HSSC WG by HSSC10. The second phase is on the IHO Secretariat to develop the endorsement/approval procedure of the relevant standards by HSSC11, taking into account the role of the Council in the approval process. Although HSSC 9/27 did not explicitly define a working order, it is assumed that the work will be done successively and not in parallel.

Bearing in mind that the development of test bed has been assigned to the S100WG (see HSSC9/17 and HSSC9/18), this paper has been commonly developed by all HSSC WG based on an initial input submitted by the S100WG and NIPWG at HSSC9.

This paper provides further inputs to the intended revision of the said Resolution 2/2007.

Analysis/Discussion

The Resolution 2/2007 is the mandatory resolution when making changes to IHO technical standards, however, as more technical standards are developed and maintained, it has been noted that there are several shortcomings in Resolution 2/2007. PRO 6 at Assembly 1 addressed one of these shortcomings. While the spirit of Resolution 2/2007 is to provide a framework for the development and maintenance of IHO technical standards there are certain deficiencies:

- The lack of clarity on what is needed to conduct an impact study,
- Both "revisions" and "new editions" of IHO Technical Standards have to undergo the same lengthy approval process,
- Resolution 2/2007 was modelled around legacy paper standards and first generation digital standards,
- The standards approval process should reflect the ability for S-100 based IHO technical standards to be agile and responsive to emerging technology.

In addition to providing more guidance on conducting an impact study and documentation of testbed activities, it is also proposed to revise 2/2007 and split the concept of "revision" into two categories – "major" and "minor". By subdividing the "revision" process it allows for minor revisions to IHO technical standards to quicker through the IHO approval cycle and adopts a more agile approach to standards development.

The annex in this paper addresses the incorporation of PRO 6 at Assembly 1, the concept of a "major/minor" revision and the need for a standardized process for conducting impact studies.

Justification and Impacts
The proposed Resolution 2/2007 Annex provides guidance and will harmonise the impact study procedure. The harmonisation makes impact study results comparable. No significant impact on resources has been expected. Rather, it can be assumed that the preparation time and efforts of impact studies according to IHO Resolution 2/2007 will reduced.

Recommendations
The proposed input draft paper is a starting point to satisfy the request of the Assembly-1 decision.

Action required of HSSC
The HSSC10 is invited to:

a. note this paper,
b. act as considered appropriate.

Commented [AP1]: It is agree that there should be a more rigorous testing procedure, but implementing "minor/major" revisions adds another level of complication that is not necessary.
JW: Agree with Tony.
One of the issues that I have with 2/2007 as it is currently written is "who makes the decision as to the level of the change?". I have seen situations where a WG will deliberately characterise a new version of a Standard as a "clarification" version, when it is actually a revision, simply to get around the approval process for a Revision. Adding new levels of change will actually further complicate this.

ANNEX

PRINCIPLES AND PROCEDURES FOR MAKING CHANGES TO IHO TECHNICAL STANDARDS AND SPECIFICATIONS	**TBD**	**TBD**	**TBD**

1. Scope

1.1 These principles and procedures are intended to be applied to all proposals for changes to IHO technical standards and for new work items that will require significant resources to resolve or will potentially impact on those who need to apply the standards. They are not intended for IHO publications, catalogues or supporting documentation of ~~a~~ guidance, general or non-technical nature.

1.2 Any reference~~s~~ to "standards" in these principles and procedures follow~~s~~ the ISO/IEC definitions for *standard* and *guide* and may therefore also include some IHO "specifications" and "guidelines" as appropriate[1]. IHO Product Specifications are considered to be standards. A list of IHO technical standards that should follow the processes described in this Resolution is provided as Appendix 1 to this Resolution.

2. Principles

2.1 Improvements to technical standards can only occur by change. However, significant change can lead to problems such as 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 circumstances.

2.1.1 Before approval is granted, any proposed changes to existing standards should be assessed from a technical and commercial perspective, also taking into account any other relevant factors.

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

2.1.3 As far as practicable, any change to standards or systems should be "backwards compatible", or the existing version must be supported for a specified time.

2.1.4 If changes are required for the basis of product enhancement rather than for safety of navigation, then the previously approved system must be allowed to continue to be used at sea for a sufficient time to allow changes to be implemented on board.

2.1.5 If not already specified by an external or higher IHO authority, the timeline for making changes should be defined, where appropriate.

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.

2.1.7 The principles of a recognized project management system should be followed.

2.1.8 All interested parties should be encouraged to continuously improve IHO technical standards. Constructive feedback should therefore be provided for all rejected proposals.

3. Procedures - General

Commented [JS-F2]: Guidance is always singular

Commented [TS3]: Who decides this? Is there a list that categorizes all the current IHO publications?

Commented [TS4]: This to me is one of the biggest problems with this resolution. This is a large range of factors, not all of which apply to all IHO Standards. Trying to implement a "one size fits all" solution where the consequence/impact of change differs widely through the list of IHO technical Standards enforces sometimes unnecessary restrictions on the ability to get the work done quickly and efficiently. There is also the level of "complexity" and actual impact on digital systems/technology to take into account. A good example of the disparity is S-11 Part A as compared to S-101.

Commented [TS5]: What about safety of navigation and protection of the marine environment?

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

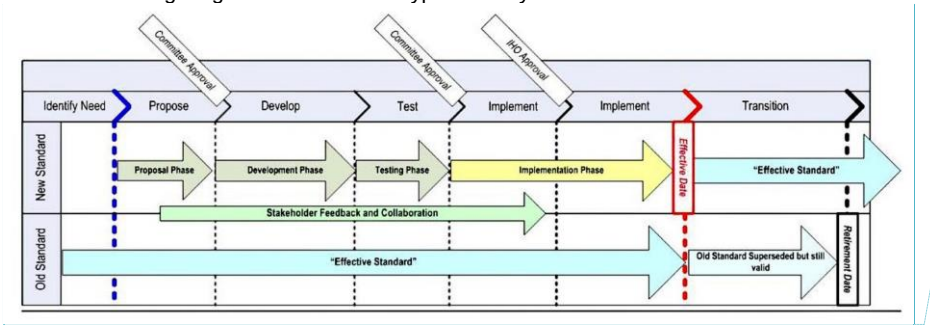
> *… a document, established by consensus and approved by a recognized body, that provides for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context.*

The ISO defines a guide as

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

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

3.2 The following diagram illustrates the typical life cycle of an IHO standard:



3.2.1 Changes to IHO standards are classified at one of four different levels: *new edition*, *major revision*, *minor* revision or *clarification* (see paragraph. 5.1). In each case, the development, consultation and approval process will be slightly different, ranging from a very comprehensive regime for *new editions* and *major revision*, to approval at the level of a subordinate body for *minor revisions* and *clarifications*. *New editions* and *major revisions* are considered to be "significant changes" for the purposes of review, consultation and approval. *Minor revisions* and *clarifications* are considered to be changes that can be implemented under the guidance of the relevant committee (HSSC or IRCC) and decision of the subordinate body.

3.2.2 The relevant Committee (HSSC or IRCC) should consider all proposals to develop *new editions* and *major revisions* to standards before work begins.

- The Committee should consider the impact on relevant *stakeholders* when assessing a proposal and planning any subsequent work, and consider the impact on other IHO standards or guidance, especially for interoperability and portrayal. Annex 1 provides details how to conduct an impact study. This assessment should systematically include a risk and feasibility analysis, and an estimate of the resources needed for the implementation of a new or revised standard or its development, including within Member States Hydrographic Services.
- If rejected, feedback should be provided to the proposal originator giving the reasons for rejection.

3.2.3 After the Committee has endorsed proposals and established a work priority, the ~~IHB~~ IHO Secretariat will incorporate tasks into the relevant work programmes.

3.2.4 Relevant stakeholders should be notified by the ~~IHB~~ IHO Secretariat of the timetable for new work items and be invited to comment and participate as appropriate. The notification should include a summary forecast of:

- the potential changes,
- the documents affected,
- the likely action list for relevant stakeholders,
- the timetable for implementation, and
- the proposed effective date of the new or revised standard.

3.2.5 The ~~IHB~~ IHO Secretariat should maintain an on-line register of IHO stakeholders. The register should be used to inform and seek input from stakeholders concerning any proposed changes to IHO standards.

3.2.6 The relevant subordinate bodies should provide the Committee with progress reports on a regular basis and after each milestone during the development and testing phases. These should be made available to stakeholders by the ~~IHB~~ IHO Secretariat.

Commented [TS6]: Another problem I have with this resolution. While this lifestyle diagram is OK for systems-based Standards, is does not work for other Standards such as S-4, S-11 Part A, UOC. For Specifications such as these, there is essentially no "testing" or "implementation" phase, and very rarely a "transition" phase.

Commented [Abri7]: Do not agree with 2 levels of revision.

Commented [LS8]: the approval for a Minor Revision is at level of Committee, not subordinate body

Comment by JW: I would think this would depend on the impact on systems. An example would be a "minor revision" of S-4, where there is no immediate direct impact on digital systems, therefore this could be approved at the WG level. However, who makes this decision as to what is "major" or "minor"?

Commented [JS-F9]: if that is a common understanding than several adjustments should be made in paragraphs below

Commented [Abri10]: They will only make recommendations

Commented [TS11]: The way I read this, New Editions and Major Revisions need to be approved by the Assembly, and only Minor Revisions and Clarifications be the relevant Committee. Is this the intention?

Commented [TS12]: This seems at odds with 3.2.1 – see my previous comment.

Commented [JS-F13]: Ref to the impact study conduction description

Commented [TS14]: For a Specification such as S-4, isn't this "everybody"? Is there just a single list, or a list for each technical Standard?

3.2.7 If required, a test bed may be established to test and validate the changes to S-100 based specifications and the results shared on the IHO website. If a test bed has been established then the following should be considered:

- Composition and tasks of the organization for running the test bed,
- Items and criteria of test phases,
- Guidelines on inter-operability between specifications,
- Any other specification set forth by other technical Committees.

3.2.8 At the successful completion of the development and testing phases for new standards and proposed changes to existing standards, the Committee should review the work done in terms of its impact on relevant stakeholders and whether the appropriate non-IHO stakeholder consultation process has been achieved.

3.2.9 After endorsement by the Committee, 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*". It is the prerogative of the HSSC and IRCC Chairs to appreciate and determine the need to obtain the approval of the Council for recommendations of possible strategic importance before submitting the new or changed standard to Member States for approval.

3.2.10 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.

3.2.11 A "*superseded*" standard may be "*retired*" as an available standard when it is no longer appropriate for use, subject to the approval of the Member States.

3.2.12 Subordinate bodies may assess and authorise ~~minor revisions and~~ *clarifications* to standards and associated references, subject to seeking input from relevant stakeholders.

3.2.13 The subordinate body chairman ~~shall have~~ has the authority to make a determination of what constitutes a *major* or *minor revision*. Minor revisions shall be utilized as an effective tool for revising and maintaining standards. The subordinate body chairman may seek input from subordinate body members or expert contributors in the determination of what is a *major* or *minor revision*.

4. Urgent Revisions

4.1 The introduction of revisions to existing standards is intentionally a thorough process in order to allow for appropriate levels of development, testing and consultation. 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 and implementation process may be needed. This should only occur in exceptional circumstances and in consultation with Member States. Any such fast-tracked revisions still require the approval of Member States before they can enter into force.

5. Procedures - Specific

5.1 New Editions, Major Revisions, Minor Revisions and Clarifications

5.1.1 *New Edition*

New Editions of standards introduce significant changes. *New Editions* enable new concepts, such as the ability to support new functions or applications, 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. 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.

5.1.2 *Major Revision*

A Major Revision~~s~~ is defined as substantive semantic changes to a standard. A *major revision* may add a new specification within an existing section, or contain such extensive

Commented [AP15]: Don't agree that testbeds should be part of the process to approve standards. Testbeds should be a tool for the appropriate WG / PT to ensure that the standard is implementable.

Comment JW: Agree.

Commented [Abri16]: Agree with HSSC Chair.

Commented [LS17]: Probably here there should be a statement about the decision making process by the HSSC/IRCC chair in submitting the new or changed standard to the Council for endorsement.

Commented [TS18]: Again, relevant for system or software based Standards only.

Commented [JS-F19]: Should It be defined what a "subordinate body" is?

Commented [LS20]: the approval for a Minor Revision is at level of Committee, not subordinate body.
In General, I believe that we can get rid of all the para 3.2.12, having a full description of procedures at Para 5.

Commented [JS-F21]: This deletion reflects the comment made further above

Commented [Abri22]: Disagree. Recommend remove this paragraph in total. I would prefer that recommendations be made on what constitute a revision or clarification

Commented [TS23]: The risk here is that the decision will always be that it is a minor revision, in order to simplify the process. Refer to my earlier comments.

Commented [TS24]: Does this mean that everything is a minor revision? Can't see the point of this sentence.

Commented [LS25]: The definition of Consensus is well internationally recognized and it means full 100% agreement. If there is no Consensus on a specific topic, it is already possible for a chair to call for a vote in accordance with existing TORs.

Commented [Abri26]: Another class of revision?! No need for this paragraph. When we do an assessment of the requirement for a revision the timeline will be decided depending on the urgency.

Commented [JS-F27]: What does that mean in practice? Is the "fast track" procedure described somewhere?

changes throughout the standard or appendices that the Chair determines this effort is a *major revision*. *Major* r*evisions* 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. Proposed changes to a standard should be evaluated and tested wherever practicable. The approval of Member States is required before any *major revisions* to a standard can enter into force. All cumulative *clarifications* must be included with the release of approved *major* ~~corrections~~ *revisions*.

5.1.3 Minor Revision

Minor revisions are also defined as substantive semantic changes to a standard. However, typically, *minor revisions* change existing specifications to correct factual errors; or introduce necessary changes that have become evident as a result of practical experience, testing or changing circumstances. *Minor* r*evisions* could have an impact on either existing users or future users of a revised standard. Proposed changes to a standard should be evaluated and tested wherever practicable. The approval of the relevant Committee (HSSC or IRCC) is required before any *minor revisions* to a standard can enter into force. All cumulative *clarifications* must be included with the release of approved *minor revisions*.

5.1.4 Clarification

Clarifications are non-substantive changes to a standard. Typically, *clarifications* remove ambiguity; correct grammatical and spelling errors; amend or update cross references, and insert improved graphics. A *clarification* must not cause any substantive semantic change to a standard. *Clarifications* are the responsibility of the relevant subordinate body and may be delegated to the responsible editor.

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

New Editions denoted as *n*.0.0

Major or *Minor* *Revisions* denoted as n.*n*.0

Clarifications denoted as n.n.*n*

Commented [TS28]: It appears that the only difference between a major and minor revision is the consultative process with stakeholders (not mentioned for a minor revision). I would think that where such a minor revision is made due to changing circumstances there should be a consultative process (at least for systems based Standards)?

Commented [JS-F29]: This reflects the comment made further above

5.3 The following diagram illustrates the development, consultation and approval processes for IHO standards:

Diagram – Changes to IHO Standards – General Case **((((Change according to HSSC's document provided underneath the following diagram))))**

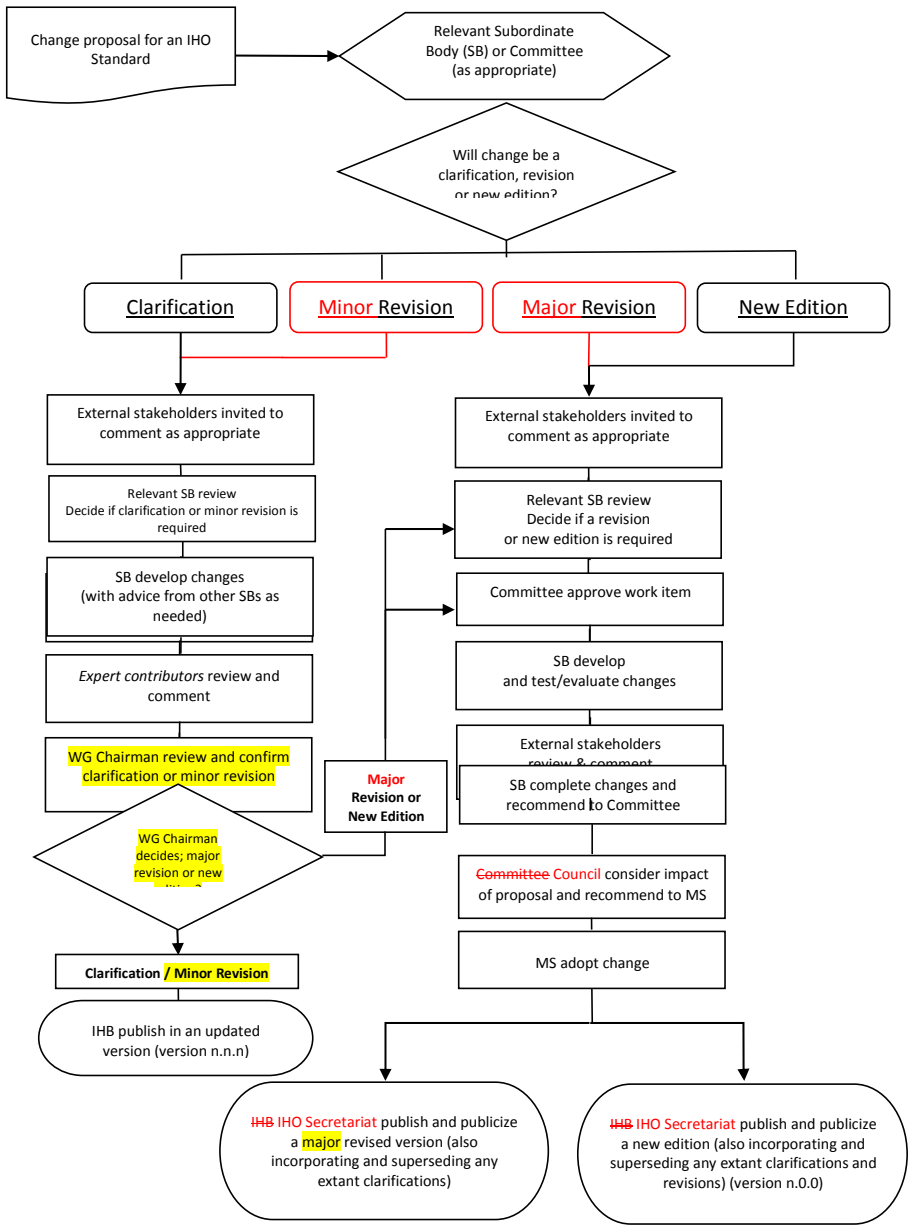
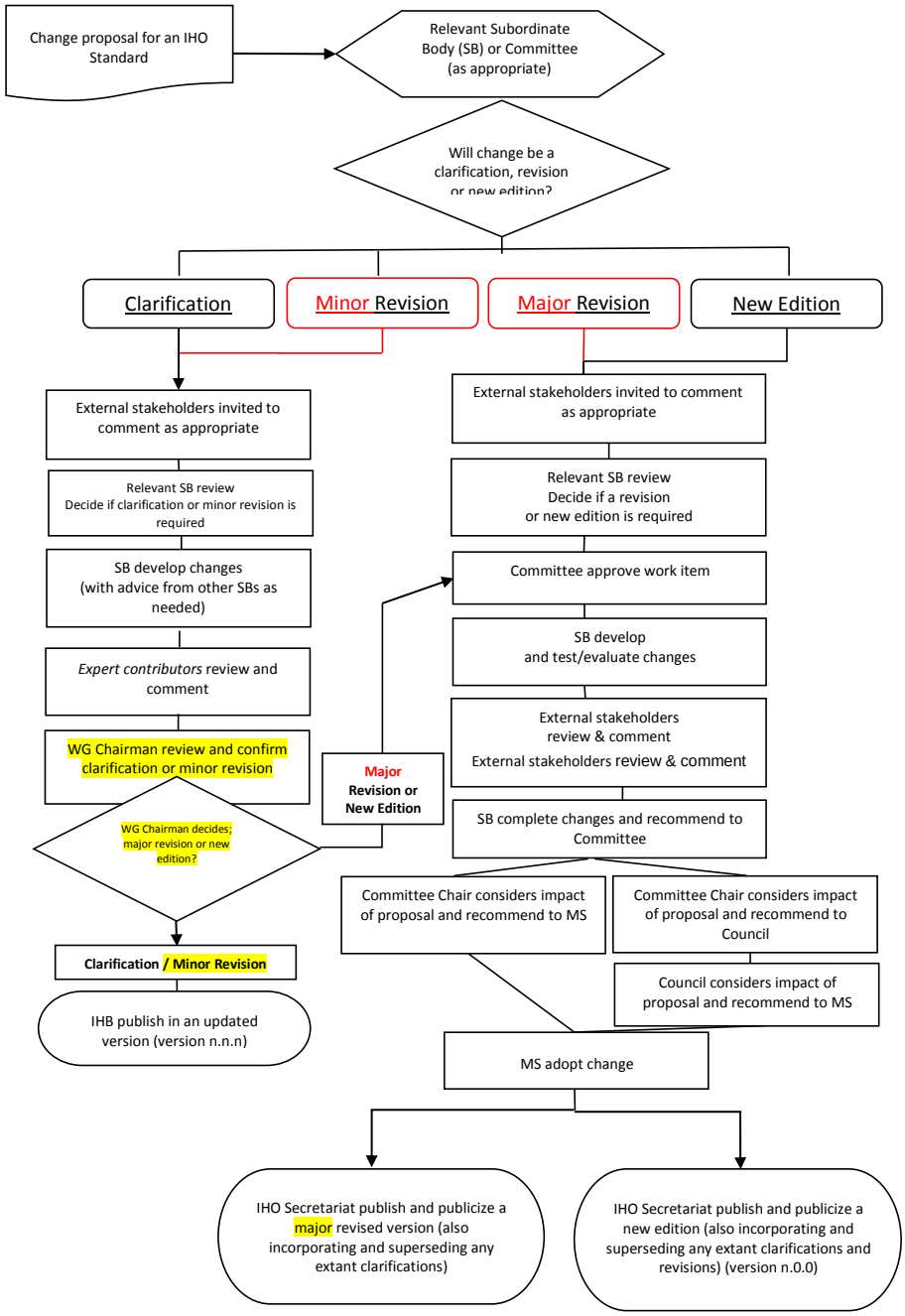


Diagram – Changes to IHO Standards – General Case (((((Revision according to HSSC Chair)))))



APPENDIX 1

IHO technical standards that should be subject to the terms of Resolution TBD

Number	Name	Relevant maintenance body
B-6	Standardization of Undersea Feature Names (Guidelines Proposal Form Terminology)	SCUFN
S-4	Regulations for INT Charts and IHO Chart Specifications	~~CSPCWG~~ NCWG
S-5	Standards of Competence for Hydrographic Surveyors	IBSC
S-8	Standards of Competence for Nautical Cartographers	IBSC
S-11 Part A	Guidance for the Preparation and Maintenance of INT Chart schemes	~~CSPCWG~~ NCWG
S-12	Standardization of List of Lights and Fog Signals	~~HSSCWG~~ NIPWG ~~when/~~ if required
S-23	Limits of Oceans and Seas	WG ~~when/~~if required
S-32	Hydrographic Dictionary	HDWG
S-32 Appendix 1	Glossary of ECDIS-Related Terms	HDWG
S-44	IHO Standards for Hydrographic Surveys	HSSCWG when/ if required
S-49	Standardization of Mariners' Routeing Guides	~~CSPCWG~~ NIPWG
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 ~~when/~~if required
S-53	Joint IMO/IHO/WMO Manual on Maritime Safety Information	WWNWS
S-57	IHO Transfer Standard for Digital Hydrographic Data	~~TSMAD~~ENCWG
S-57 Appendix B.1	ENC Product Specification	~~TSMAD~~ENCWG
S-57 Appendix B.1 Annex A	Use of the Object Catalogue for ENC	~~TSMAD~~ENCWG
S-57 Supplementary Information N°3	Supplementary Information for the encoding of S-57 Edition 3.1 ENC Data	~~TSMAD~~ENCWG

Commented [JS-F30]: Are these "subordinate bodies"

Commented [JS-F31]: ?????

Commented [JS-F32]: ????

Commented [JS-F33]: ?????

Number	Name	Relevant maintenance body
S-58	Recommended ENC Validation Checks	~~TSMAD~~ENCWG
S-60	Users Handbook on Datum Transformations involving WGS 84	WG ~~when/~~if required
S-61	Product Specifications for Raster Navigational Charts (RNC)	WG ~~when/~~if required
S-63	IHO Data Protection Scheme	DPSWG
S-64	Test Data Sets for ECDIS	~~TSMAD~~S-100 WG
S-65	ENC Production Guidance	ENCWG~~TSMAD~~
S-66	Facts about Electronic ~~Charting~~ Charts and Carriage Requirements	~~HSSCWG when / if required~~ ENCWG
S-99	Operational Procedures for the Organization and Management of the S-100 IHO Geospatial Information Registry	~~TSMAD~~S-100 WG
S-100	IHO Universal Hydrographic Data Model ~~Section 9 and other Portrayal related elements of S-100~~ ~~Quality related elements of S-100~~	~~TSMAD~~S-100 WG
S-102	Bathymetric Surface Product Specification	~~TSMAD-102 PT~~ ~~TSMAD~~S-100 WG
S-1*nn* (when adopted)	S-100 based Product Specifications	~~WG~~PT when/if required
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

Commented [JS-F30]: Are these “subordinate bodies”

Commented [LS34]: The principle is that WGs are responsible for the standards. PTs belong to WGs.

Commented [JS-F35]: I disagree, The assinement of work to a PT belongs to the responsible WG

Comment AP:
This should be WG – taking into account above.

Proposed ANNEX to Resolution 2/2007

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?
- 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 endorsement before the survey will be 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

Commented [TS36]: How is this going to work for a Specification such as S-4 or S-11 Part A?

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 has to 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 and 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 a 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. That 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.