IHO HYDROGRAPHIC SERVICES AND STANDARDS COMMITTEE

Input report from HSSC11 to IRCC

Cape Town, South Africa (6-9 May 2019)

Introduction

HSSC work is guided by the IHO Work Programme 2 "Hydrographic Services and Standards" and by the Council key priorities

- **Meetings since IRCC-10:**
  - Cape Town, South Africa (6-10 May 2019)
- **Next Meeting:**
  - HSSC-12 Bristol, UK (11-15 May 2020)

HSSC-11 Key Priorities

- **Operational/strategic level**
  - Final remarks of the Resolution 2/2007 as amended
  - Revised Strategic Plan
  - S-100 Implementation Strategy
  - Future of Paper charts
- **Technical level**
  - Demonstration showcase of S-100 based products
  - Development of the S-1xx Product Specifications and operationalization of S-1xx framework
  - Priorities of IHO 2019 Work Plan 2
  - Hydrographic Dictionary S-32

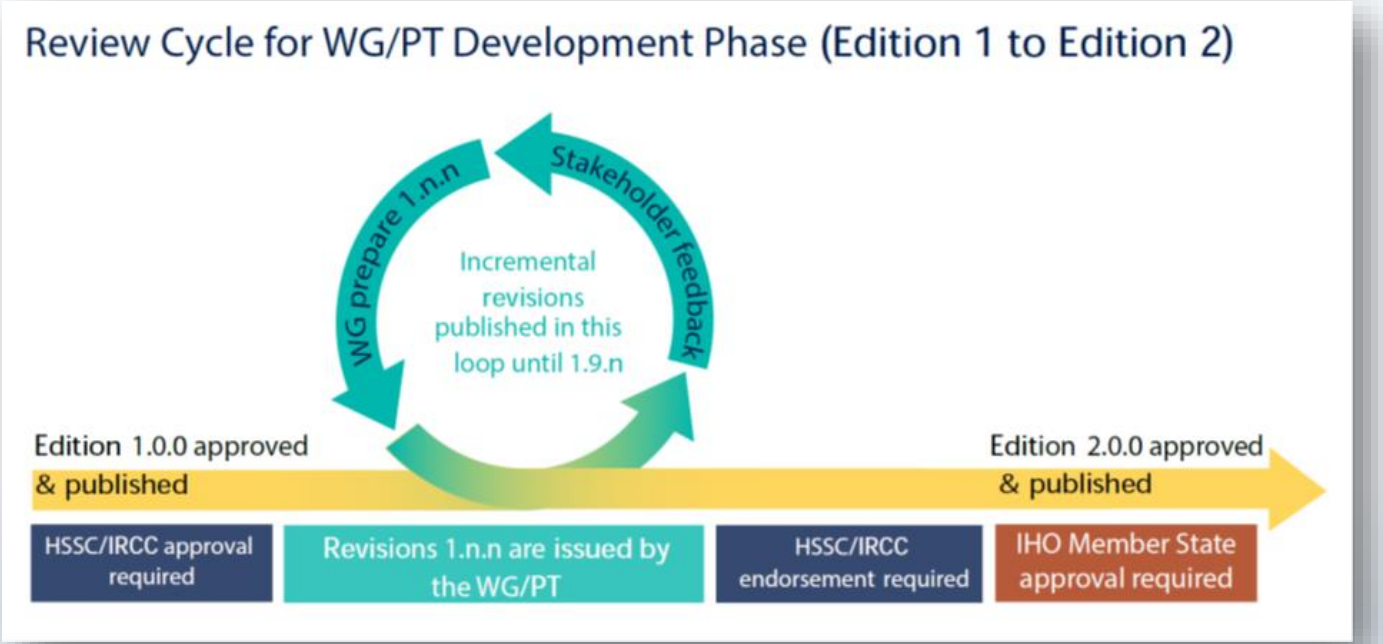
Analysis/Discussion – **Resolution 2/2007**

- HSSC endorsed IHO Resolution 2/2007 as amended
- Resolution 2/2007 applicable also to IRCC publications
- HSSC request IRCC-11 endorsement
- IHO Secretariat will send out a CL to the MSs seeking for the approval

Analysis/Discussion – **Resolution 2/2007**

The Resolution 2/2007 as amended is structured as follows:

1. Main doc: updated review cycle for WGs/PTs for the development of PSs and standards
2. Appendix 1 and 2: lists of IHO standards that must be maintained in conformance with the IHO Resolution 2/2007 as amended
3. Appendix 3: guidance for conducting stakeholders impact study



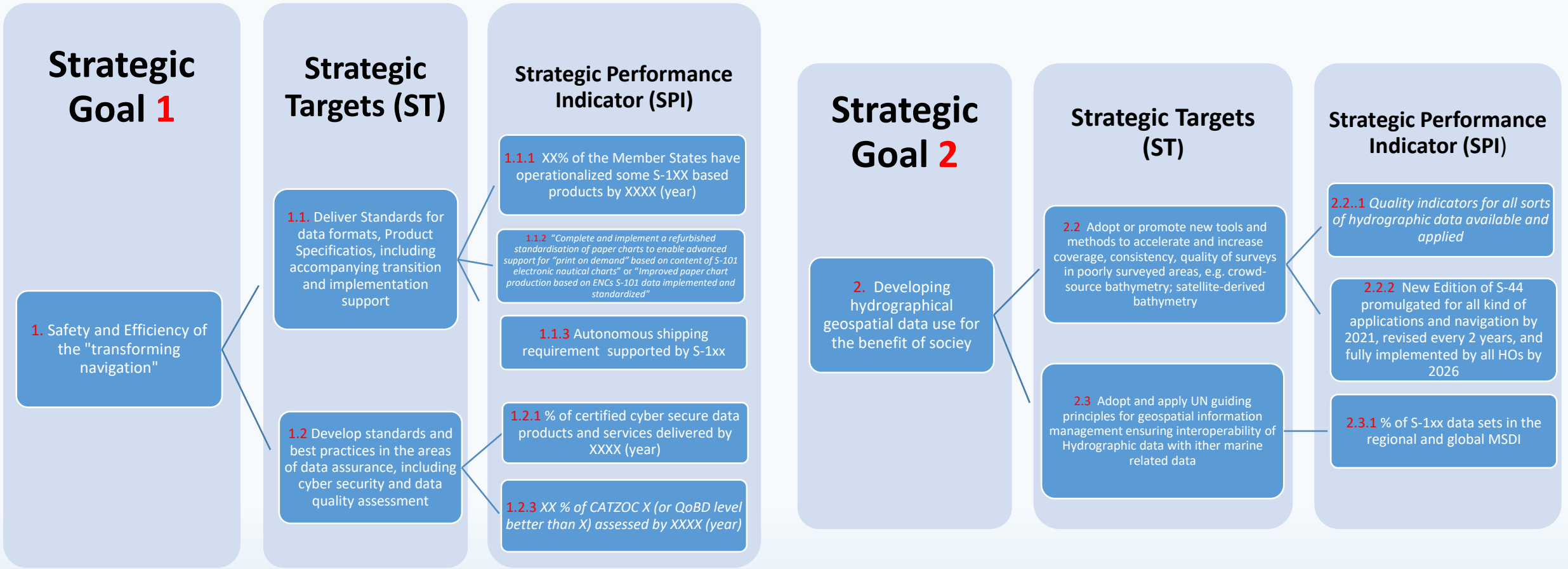
Analysis/Discussion – IHO Strategic Plan

- SPRWG provided a "Draft IHO Strategic Plan" (17th March 2019) where are defined:
  - Strategic Goals
  - Strategic Targets (ST)
  - Strategic Performance Indicators (SPI)

- **HSSC relevant elements** of the Future IHO Strategic Plan to be considered

- **HSSC Chair provided comments** on ST and SPI to SPRWG Chair info IRCC Chair (***HSSC CL 2/2019 dated 31 March 2019***)

Analysis/Discussion – IHO Strategic Plan



Analysis/Discussion – Implemetation Strategy

- C-2 tasked IHO SG, COUNCIL, HSSC and IRCC Chairs to prepare the "*S-100 implementation strategy*" (action C2/31)
- In March IHO provided a "Draft Skeleton"
- Document composed by four main contributions:
  - IHO
  - HSSC (Technical)
  - COUNCIL
  - IRCC
- WGs Chairs have been asked to provide their contribution

Analysis/Discussion –Implemetation Strategy

- What should be in the plan from the HSSC point of view

  Where does HSSC responsibility ends?

- Provide Answers
  - Why the S-100
  - Why a strategy
  - Who will implement the strategy (actors)
  - How the strategy will be implemented
  - When it will be implemented
  - Which are the phases of the implementation
- Easy document
- Nr. 5 S-100 Readiness Level (SRL)

Analysis/Discussion –**Implemetation Strategy – HSSC contribution**

Implementation levels definition	Transition phases, milestones, timeline	HSSC Chair, S-100 WG
	Technical Readiness Levels	S-100 WG
Provision of standards	PS structure	S-100 WG
	Interoperability aspects (S-98 development) and responsibility	S-100 WG, NIPWG
	Harmonization and responsibility	DQWG, S-100 WG, NIPWG
	Data management issue	ENC WG
Synchronization of standards and products	Design / Provision of synchronised products	NIPWG, S-100 WG
	Industry level of readiness	NIPWG, S-100WG,
Operationalization of the data	Guidance for data producers / WENS?	IRCC (WEND WG)
	Data protection	ENC WG
	Service distribution (cloud service)	S-100WG, IRCC (RENCs + HOs)

Note: IRCC contribution

Analysis/Discussion – S-100 Readiness Level

Required product specification component	Level 1 v1.0.0	Level 2 v1-2.0.0	Level 3 >v2.0.0	Level 4 >v2.0.0	Level 5 >v2.0.0
Main Document	X	X	X	X	X
A Default Encoding	X	X	X	X	X
S-100 Compliant Feature Catalogue	X	X	X	X	X
DCEG	X	X	X	X	X
S-100 Compliant Portrayal Catalogue		X	X	X	X
Data Quality Checks		X	X	X	X
Test Data Sets		X	X	X	X
Data Validation (and test datasets)		*X*	*X*	*X*	*X*
Exchange Catalogue		X	X	X	X
Encryption / Digital Signatures			X	X	X
Interoperability				X	X[1]
Alerts and Indications				X	X[1]
Operationalization					X

Analysis/Discussion – **Future of Paper Charts**

- Sales and use of paper nautical charts is declining
- NCWG drafted a document about PC's Future
- Preliminary comments received from HOs
- CL to be issued seaking for MS contribution
- Document to be approved in 2020

- Common needs:
  - Reallocate the resources currently dedicated to traditional paper
  - Ultimate goal is to fully automate the creation of paper products from fully populated ENC vector databases

Analysis/Discussion – Future of Paper Charts

PROPOSALS	CAN+UK	GER	AU	FR	US	NCWG
Full automating process from ENC to paper charts	X	X	X	X	X	X
Radical revision/Freezing of S4	X	X (ENCWG)		X (No NCWG)		Only Revision
Limit investment on paper charts	X				X	X
Freezing of INT1		X				
IMO involvement			X		X	X
Task an HSSC WG to develop a WP to the "Future of paper charts"				X (NCWG)	X (ENCWG or NCWG)	X

Analysis/Discussion –Showcase of S-100 based products

- C-2 tasked the HSSC (see action C2/29) :

  "Consider the possibility to organize a demonstration showcase of S-100 based products and test beds as an embedded session at C-3 in October 2019"

- HSSC-11 discussed showcase structure
- MSs/WGs volunteered to provide expertise, test data and examples
- S-100 WG Chair coordination

Analysis/Discussion – Showcase of S-100 based products

- Showcase characteristics:
  - "Educational narrative"
  - Help the HOs to support and follow S-1xx framework concept development towards its operational phase
  - Highlighting front-of-bridge/back-of-bridge requirements

    (topic to be reported to C-3 for IHO Secretariat involvement with IMO)

- General need to **work in connection with IRCC**, especially concerning the dissemination of S-1xx PS and the role of RENCs

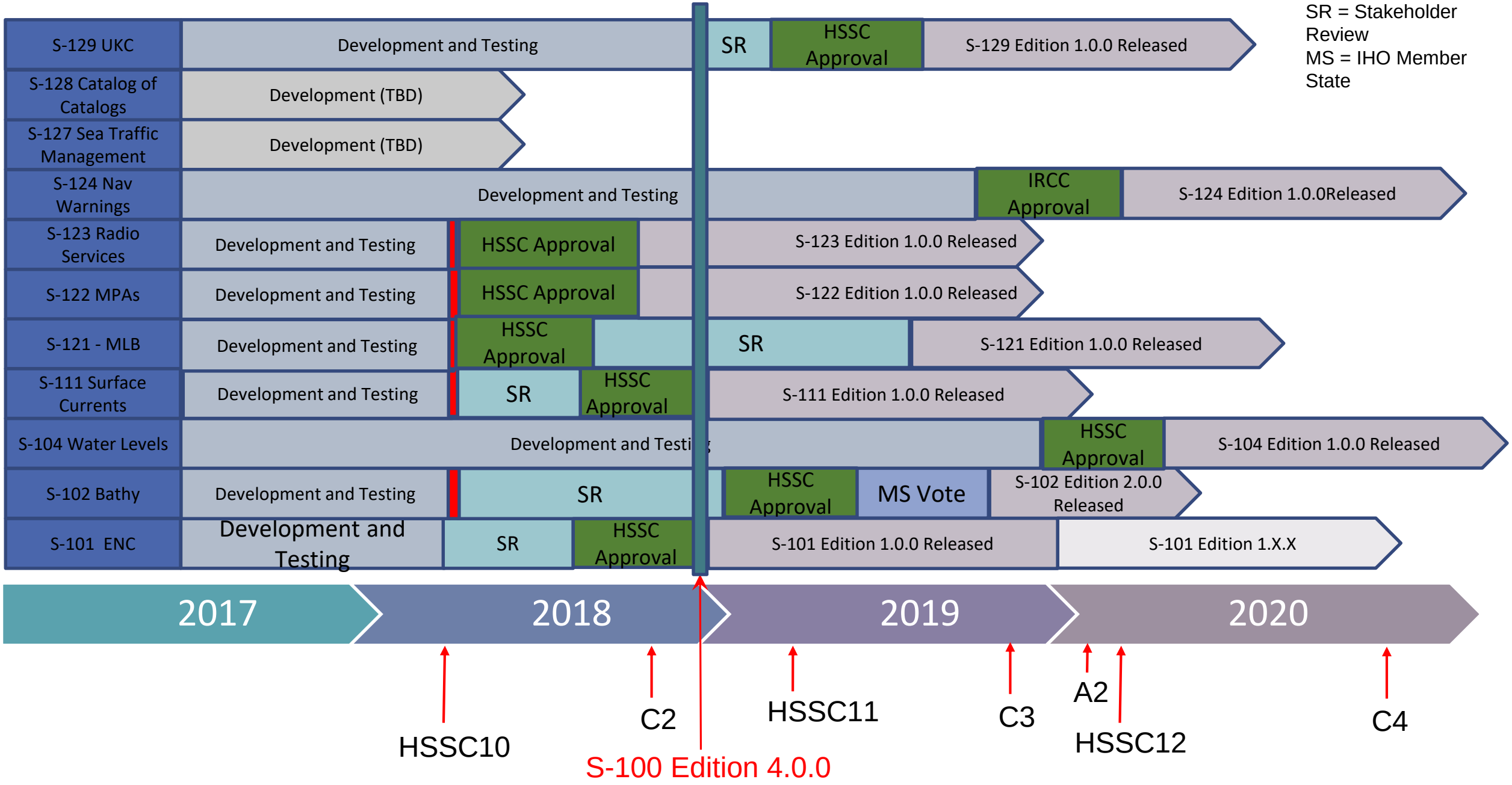
- HSSC intention to reach a larger audience at the Assembly

  (topic to be addressed to C-3)

Analysis/Discussion –Showcase of S-100 based products

	Duration	Topic	Speaker
1	15/20’	Point of situation of the new PSs and S-100 implementation strategy	HSSC Chair/IHO Secretariat (HSSC Report to C-3)
2	15’	S-101 with examples of conversion from S-57	S100WG/S101PT representative
3	15’ each PS	Examples of PSs at semi-operative stage (S-102, S-111, etc)	PTs/HOs
4	15’ each	Examples from the HOs/RENCs S-100 Service distribution	HOs, RENCs

Duration 2 hrs (including Q&A)


C=Council
A = Assembly
SR = Stakeholder Review
MS = IHO Member State
S-129 UKC
Development and Testing
SR
HSSC Approval
S-129 Edition 1.0.0 Released
S-128 Catalog of Catalogs
Development (TBD)
S-127 Sea Traffic Management
Development (TBD)
S-124 Nav Warnings
Development and Testing
IRCC Approval
S-124 Edition 1.0.0Released
S-123 Radio Services
Development and Testing
HSSC Approval
S-123 Edition 1.0.0 Released
S-122 MPAs
Development and Testing
HSSC Approval
S-122 Edition 1.0.0 Released
S-121 - MLB
Development and Testing
HSSC Approval
SR
S-121 Edition 1.0.0 Released
S-111 Surface Currents
Development and Testing
SR
HSSC Approval
S-111 Edition 1.0.0 Released
S-104 Water Levels
Development and Testi
HSSC Approval
S-104 Edition 1.0.0 Released
S-102 Bathy
Development and Testing
SR
HSSC Approval
MS Vote
S-102 Edition 2.0.0 Released
S-101 ENC
Development and Testing
SR
HSSC Approval
S-101 Edition 1.0.0 Released
S-101 Edition 1.X.X
2017
2018
2019
2020
HSSC10
C2
S-100 Edition 4.0.0
HSSC11
C3
A2
HSSC12
C4

Analysis/Discussion – HSSC Actions of interest

- HSSC endorsed S-102 Ed. 2.0.0 – *Bathymetric surface*
- HSSC approved Ed. 1.0.0 of S-97 – *Guidance for PS developers*
- HSSC approved Ed.1.0.0 of S-127 – *Marine Traffic Management*
- HSSC approved Edition 1.0.0 of S-129 – *Under Keel Clearance Management Information*

- S-100 Ed. 5.0.0 shifted to 2021
- S-98 to be submitted for endorsement in 2020/2021

Analysis/Discussion – HSSC Actions of interest

- HSSC to seek the agreement of IRCC for a survey for the production of the following data sets (NIPWG coordination):
  - S-122 - Marine Protected Area
  - S-123 - Marine Radio Services

- IRCC to evaluate to extend WENDWG scope to S-101 ENCs and other S-100 based products

- Proposal of “Cloud distribution” of S-100 based products (Canada):
  - To be investigated by IRCC

Analysis/Discussion – HSSC Actions of interest

- **S-100 data protection scheme**
  - RENCs to support HSSC WGs developing S-100 based products test data
  - RENC/IHO Sec. to act as S-100 Protection scheme administrator
  - RENC/IHO Sec. to prepare an implementation procedure

- **Test bed platform**
  - HOs to provide KHOA with S-100 based products test data sets
  - New test bed platform operative
  - IRCC to support this initiative among RHCs

Analysis/Discussion – Priorities of IHO 2019 Work Plan 2

- **Develop an S-100 interoperability specification**
  - Ed. 1.0.0. of S-98 final approval is part of S-100 Implementation Strategy
  - Ed. 1.0.0 of S-98 to be submitted for endorsement in 2020/2021
  - HSSC-11 agreed to organize a S-100 Test Strategy Meeting (TSM) in liaison with IEC

- **Develop S-121 Product Spec for Maritime Limits and Boundaries**
  - HSSC encouraged the S-121PT to pursue the development of Ed. 1.0.0
  - HSSC encouraged the IHO Member States to participate in the S-100 WG review process of S-121

Analysis/Discussion – Priorities of IHO 2019 Work Plan 2

- **Develop all the components needed to make S-101 a reality**:

- Ed. 1.1.0 of S-101 to be expected in December 2020
- Ed. 2.0.0 to be expected in December 2022
- S-101 components for Encryption, Alerts and Indications to be fully developed

Components	Edition 1.0.0 (2018)	Edition 1.X.X(2019)	Edition 2.0.0 (2022)
Main Documentation	✓	✓	✓
Feature Catalogue	✓	✓	✓
Portrayal Catalogue	Partial	✓	✓
Validation	Partial	✓	✓
Data Classification and Encoding Guide	✓	✓	✓
Encoding Format	✓	✓	✓
Encryption		✓	✓
Alerts and Indications		✓	✓
Full Test Data Sets for Type approval		Partial	✓
Notes	Portrayal will be limited to S-52 rules translated to LUA (SRL =1)	Edition 1.X.X refines all the additional rules (SRL =2-3)	**Operational Edition (SRL =4)**

Analysis/Discussion – Priorities of IHO 2019 Work Plan 2

- **Consolidation and clarification of standards in relation to ECDIS/ENC**:
  - ENCWG liaised with CIRM and IEC for updating S-63 for improved security for investigations and risk assessment
  - HSSC tasked ENCWG to develop a draft proposal for mitigation measures for cyber security and to make an impact assessment
  - HOs to review the current ENC production process and make changes where necessary to encode meaningful values of CATZOC

Analysis/Discussion – Priorities of IHO 2019 Work Plan 2

- **Prepare Ed. 6.0.0 of S-44:**

- May/June 2019 - HSPT: draft of the 6th Edition (v1.7.0) for review and comments by MSs and stakeholders
- March 2020: S-44 6th Edition (v2.0.0) delivered to HSSC for endorsement
- End 2020: Approval of the S-44 6th Edition

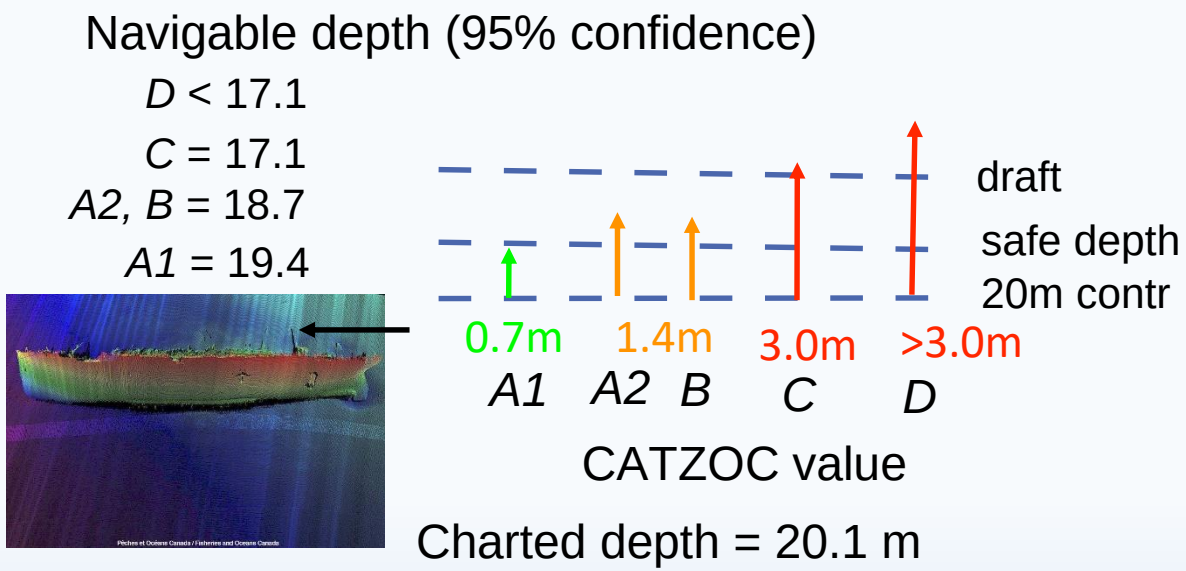
Contest for designing the cover page of Edition 6 of S-44 to be advertised among MSs

Analysis/Discussion – Priorities of IHO 2019 Work Plan 2

- **Consider data quality aspects in harmonized way for all S-100 based PSs:**

Visualization methodology of Quality of Bathymetric Data

- Method to depict the quality of the bathymetry and isolated features hazardous to the safety of navigation (wrecks, rocks, obstructions)
- Also supportive for decision making and autonomous shipping
- IRCC be aware of importance of QoBD



Analysis/Discussion – Priorities of IHO 2019 Work Plan 2

"Good Data Quality does not mean that the quality of the data has to be good….
It means that the end user is well informed how good the Quality of the Data is"

(by DQWG)

Recommendations for HOs:

- Provide meaningful values to Quality of Bathymetric Data (S-101)

  (1, 2, 3, 4, 5 or Oceanic. Unassessed should not be used)
- Provide horizontal/vertical uncertainty for isolated features

  (UWTROC, WRECKS, OBSTRN, SOUNDG) hazardous to navigation
- Assign DEPCNTs with *QUAPOS*=3 (inadequately surveyed) or *QUAPOS*=4 (approximate) in areas with *CATZOC=D (all depths)* or *C (<30m depth*)
- Be aware of vertical uncertainty when generating High-Density ENCs in areas of Quality of Bathymetric Data = 4 or 5 (*CATZOC = C or D*)

Analysis/Discussion – Priorities of IHO 2019 Work Plan 2

- HSSC supported “conditional visualization methodology” concept to be further developed
- HSSC encourage DQWG to involve other WGs and stakeholders

- Raise IRCC awareness about:
  - Existence of the methodology of visualization of the QoBD
  - Correct compilation of S-101 QoBD
  - Correct CATZOC attribution

❑ HSSC amended DQWG ToRs → DQWG to support IRCC WGs and sub-commitees on request (MSDI, CSBWG, S-124 PT)

Analysis/Discussion – Priorities of IHO 2019 Work Plan 2

- An **Initial Guidance** on definition and harmonization of "*Maritime Services in context of e-navigation*" was produced:
    - WWNWS-SC → No. 5 - Maritime Safety Information Service (MSI);
    - NCWG, ENCWG → No. 11 - Nautical Chart Service;
    - NIPWG → No. 12 - Nautical Publications Service;
    - TWCWG →No. 15 - Real-time hydrographic and environmental information Service.

- Need to maintain the Guidance up-to-dated under the IMO indications

- IRCC/WWNWS-SC is invited to contribute

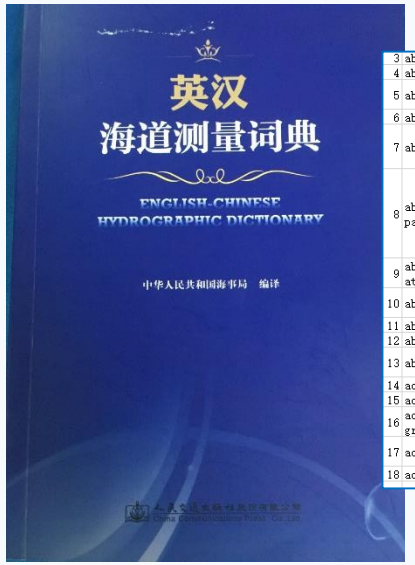
Analysis/Discussion – Hydrographic Dictionary (HD)

- HSSC11 noted the work done in the development of S-32 IHO HD

- Achievements:
  - The HD and the IHO GI Registry will share the same management system, use the same metadata and will be enriched and maintained by using the same procedure
  - Language improvements (New HDs)

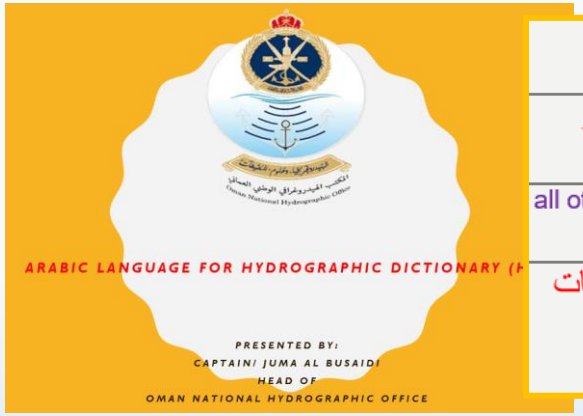
- HDWG template to be used by WGs when submitting new terms

Analysis/Discussion – Hydrographic Dictionary (HD)



3	abrasion	磨损，磨蚀，冲	The wearing away or rounding of surfaces by friction.	通过摩擦使表面磨损或光滑。	Desg
4	abscissa	横坐标	See COORDINATES: PLANE RECTANGULAR.	见plane rectangular coordinates（平面直角坐标）。	Ver (
5	absolute accuracy	绝对精度	See ACCURACY: ABSOLUTE.	确定单要素或大地基准及大地坐标系中点的位置时，对所有误差的估算值。	Evalu posi
6	absolute error	绝对误差	See ERROR.	相对于真值的绝对偏差（无需表示正负）。	Ver
7	absolute orientation	绝对方位	See ORIENTATION.	在摄影测量学中，确定立体模型或模型组的比例、置平，并根据地面控制点（在摄影测量仪器内）进行定向的过程。	En F la R o gr
8	absolute stereoscopic parallax	绝对立体视差	See PARAL-LAX.	在摄影测量学中，一对具有相同主距的航摄像片至其相应像底点距离的代数差。在水平面上平行于航摄基线测得，也称作水平视差（horizontal parallax）、线性视差（linear parallax）或左右视差（x-parallax）。	En F dist dos plan hori para
9	absorption: atmospheric	大气吸收	Transformation of RADIANT ENERGY into thermal, mechanical, electrical, etc. energy, by interaction with atmospheric constituents.	辐射能与大气成分相互作用转换成热能、机械能、电能等的现象。	Tran elé
10	abyssal	深海的，海底深处的，深渊	Belonging to the lowest DEPTHS of the OCEAN, generally below 3,700 METRES (2,000 FATHOMS).	海洋最深处，一般而言深度大于3700米（2000英寻）。	Relat 3700
11	abyssal gap	深海裂隙，深海	A gap in a sill, ridge, or rise that lies between two abyssal plains.	在两个深海平原之间的海槛、海脊或海隆中的峡谷。	Garg
12	abyssal hills	深海丘陵	A tract of small elevations on the deep-sea floor.	一种位于深海海底处的小高地。	Conj
13	abyssal plain	深海平原	An extensive, flat, gently sloping or nearly level region at abyssal depths.	深海中的广阔、平坦的、缓慢倾斜或近似水平的区域。	Regi en p
14	acceleration	加速度	The rate of change of VELOCITY.	速度的变化率。	Vari
15	acceleration: angular	角加速度	The rate of change of ANGULAR VELOCITY.	角速度的变化率。	Vari
16	acceleration of gravity	重力加速度	The ACCELERATION of a freely falling body caused by the force of GRAVITY.	自由落体在重力作用下产生的加速度。	ACEL GRAV
17	accidental error	偶然误差	See ERROR.	一种遵循随机定律的误差。也叫随机误差（random error ）。	ERRO azar
18	acclivity	上斜，向上斜坡	An upward SLOPE of GROUND; as opposed to DECLIVITY.	地面向上的斜坡；反之为下斜坡（declivity）。	PEND

Chinese HD is now available on the IHO website



alarm	In ECDIS a device or system which alerts by audible means, or audible and visual means, a condition requiring attention.
جرس إنذار	في نظام عرض الخرائط اللإلكترونية (أكدس) هو جهاز أو نظام تحذيري مسموع أو مسموع ومرئي، حالة تستدعي الإنتباه.
all other information	In ECDIS used to describe information additional to the STANDARD DISPLAY. Also called "ON-DEMAND INFORMATION".
جميع المعلومات الأخرى	في نظام عرض الخرائط اللإلكترونية (أكدس) تستعمل لوصف معلومات إضافية إلى تلك المعلومات القياسية المعروضة، وأيضا يدعى « معلومات تحت الطلب»

Arabic HD in progress

Analysis/Discussion – Hydrographic Dictionary (HD)

- MS are invited to develop their National variants that will be made available on the IHO Website

- HD members have been invited to act as HDWG (and GI Registry) ambassadors in RHCs

  →RHCs to support the HD

- HDWG Spanish and Russian representatives needed

Language branch	Speakers
English	371 to 1.39 bn
Chinese 中文	900 to 1.16 bn
Spanish	477 to 661 m
Arabic العربية	290 to 442 m
Russian ру́сский язы́к	171 to 267 m
Indonesian	204 to 281 m
French	80 to 285 m
Portuguese	218 to 240 m

Action requested of IRCC

The IRCC is invited to (1):

- Note the report
- Endorse Resolution 2/2007 as amended
- Note the HSSC CL 2/2019
- Coordinate with HSSC to draft “S-100 Implementation Strategy”
- Support the production S-100 showcase (RENC/RHCs)
- Contribute to S-122 and S-123 data set
- Encourage MSs to participate in PSs development (eg. S-121)
- Extend WENDWG scope to S-101 ENCs and other S-100 based products
- Evaluate “Cloud distribution” concept

Action requested of IRCC

The IRCC is invited to (2):

- Support the S-100 products test bed platform
- Encourage the encoding of meaningful values of CATZOC
- Note that DQWG can support IRCC WGs
- Note the existence of the “conditional visualization methodology” of QoBD
- Be aware importance of definition of QoBD for the conditional visualization
- Contribute to up-to-date the “Maritime Services” Guidance
- Encourage RHCs to support HDs development

- Take any other action deemed necessary