IHO and where it’s going

- Background and History
- Current Structure
- Programmes
- Key Technical Initiatives
- Capacity Building and Cooperation Effort
Background and History
International Hydrographic Bureau

1899 International cooperation in the field of hydrography began with a Conference held in Washington.

1908 International Congress of Navigation, St Petersburg

1912 International Maritime Conference, St Petersburg

1919 International Hydrographic Conference, London

1921 The IHB was established by 24 nations and tasked to support Safety of Navigation and the Protection of the Marine Environment.

At the invitation of HSH Prince Albert 1st, a noted marine scientist, it was headquartered in Monaco where it remains today.
What is the International Hydrographic Organization?

... intergovernmental consultative and technical organization
... established in 1921
... to support safety of navigation and the protection of the marine environment

The Mission of the IHO is;
... to facilitate the provision of adequate and timely hydrographic information
... for world-wide marine navigation and other purposes
... through the co-ordination of the endeavors of national hydrographic offices
IHO – The Objectives of the IHO are:

(a) To promote the use of hydrography and to raise global awareness of its importance;

(b) To improve global coverage;

(c) To improve global hydrographic capability and capacity:

(d) To establish international standards and to achieve uniformity in the use of these standards;
UN Articles and Resolutions

- SOLAS Chapter V, Regulations 2 and 9
- UNCLOS Annex II, Article 3, Paragraph 2
- UNCLOS Article 75: Charts and lists of geographical coordinates
- UN GA Resolution A/55/7 (2001)
- UN GA Resolution A/56/12 (2001)
- UN GA Resolution A/58/240 (2004)
The Provision of Hydrographic Services

... is an International Obligation under Treaty Law

... affecting ALL SOLAS contracting governments.
Governmental Obligations

SOLAS V/9 – Requires each State to ensure:

- the provision of Maritime Safety Information (MSI)
- surveying and data collection
- the production of charts and nautical publications
- chart maintenance and updating services
Current Structure
International Hydrographic Organization

1970 – An International Convention changed the name and legal status.

The IHO comprises an International Hydrographic Conference and the International Hydrographic Bureau.
International Hydrographic Organization

2005 Protocol of Amendments to the IHO Convention

2014 ... awaiting majority of Member States’ approval to amendments
International Hydrographic Bureau
International Hydrographic Bureau

IHO Secretariat:
19 Personnel
   – 3 Directors
   – 5 Assistant Directors
   – 3 Translators
   – 8 Supporting Staff
(Conference) Assembly
All Member States
Frequency of meetings: 3 years

(IHB) Secretariat
Secretary General
2 Directors
5 Assistant Directors

(New) Council
30 MS (or 25% if greater)
regional & interest representation.
Frequency of meetings: annual

Inter-Regional Coordination Committee
meeting at least annually

Finance Committee
Frequency of meetings: 3 yrs

Hydrographic Services & Standards Committee
meeting at least annually

Working Groups:
Chart Standardization
Transfer Standard
Digital Information Portrayal
Marine Spatial Data Infrastructure
Tides and Water Level
...

Accredited Non-Governmental International Organizations

(RHC)

ABLOS
Programmes
Uraga strait - the entrance to Tokyo Bay

Eastern Approaches to Muscat
Uraga strait - Tokyo Bay

Chesapeake Bay approaches
- **tide tables**
- **sailing directions**
- **lists of lights and radio signals**
Maritime Boundaries
Regional Coordination – IHO DCDB

IHO Data Center for Digital Bathymetry

(http://www.ngdc.noaa.gov/mgg/bathymetry/iao.html)
Crowd-sourced data

Data uploaded at mariners’ convenience

Near real-time update and view

(new or revised chart)

Normal chart updating cycle

DCDB viewer and data download
Key Technical Initiatives
Technical Work Programme – Working Groups

Base Standards and Services (Building Blocks)
- S-100 – Geospatial Framework
- IHO Registry

Product Specifications
S-101 – ENC
S-102 – Bathy Surface
S-10x – Marine Protected Areas
S-10x – Radio Signals
S-10x – Tidal Information
S-10x – Surface Currents
S-20x – Inland ENC
S-20x – Marine Boundaries
Others …..

Other non-IHO Product Specifications

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- S-100 – Geospatial Framework
- IHO Registry

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S-20x – Marine Boundaries
Others …..

Other non-IHO Product Specifications
S-100
IHO Universal Hydrographic Data Model
S-100 IHO Universal Hydrographic Data Model
S-57 Limitations

- No longer a contemporary GIS standard (30+ years old)
- Inflexible maintenance regime ("freezing" of editions)
- Difficult to accommodate emerging requirements
  - ASL’s, emergency wreck marking buoy, PSSA’s, ...
- Cannot easily support contemporary requirements
  - gridded bathymetry, imagery, time-varying information, mixed data sets, etc
Why S-100

- broad, contemporary geospatial framework standard
  » Not specific to ECDIS or charting
  » Enables use of hydro data in other products and services
- Based on ISO 19100 series of geographic standards
  » interoperable with other ISO data profiles
- Standards are never “frozen”
- “Plug and play” updating
S-100: based on ISO 19100 series
S-100 Current Status

Standard published January 2010 but further development is on-going – revision possible in the 2014.

Portrayal section - almost completed.

Completion of Portrayal will enable an S-101/S-100 test phase to begin.

Wider use of S-100 is likely to continue and grow as e-navigation evolves.
S-100 Product Specifications - Components

Product Specification – main document – defines the rules to which the product must conform

Feature Catalogue (XML) – Application schema, Features and Attributes

Portrayal Catalogue (XML) - (optional) – Display rules and symbols

Encoding – e.g. GML, ISO-8211, netCDF, GeoTIFF

Capture guide (optional) – Guidance on how to capture a product data.
PRELIMINARY LIST OF S-100 BASED PRODUCT SPECIFICATIONS

- IHO: S-101 to S-199
  - IHO S-101 ENC
  - IHO S-102 Bathymetric Surface
  - IHO S-103 Sub-surface Navigation
  - IHO S-111 Surface currents
  - IHO S-121 Maritime limits and boundaries
  - IHO S-122 Marine Protected Areas;
  - IHO S-123 Radio Services
  - IHO S-124 Navigational warnings
  - IHO S-125 Navigational services
  - IHO S-126 Physical Environment
  - IHO S-127 Traffic Management
  - IHO S-1xx Marine Services
  - IHO S-1xx Digital Mariner Routeing Guide
  - IHO S-1xx Harbour Infrastructure
  - IHO S-1xx (Social/Political)

- IALA: S-201 to S-299
  - IALA S-201 Aid to Navigation Information
  - IALA S-20x Inter-VTS Exchange Format
  - IALA S-20x Application Specific Messages
  - IALA S-20x (Maritime Safety Information)

- IOC: S-301 to S-399
  - Various: S-401 to …
  - IEHG S-401 Inland ENC
  - JCOMM S-411 Sea ice
  - JCOMM S-412 Met-ocean forecasts
S100 – Relationship with other Organization

IMO

IALA

S-100 Standards Development

IHO

Stakeholder Community

Other Standards Organizations
Capacity Building and Cooperation Effort
Regional Hydrographic Commissions

Governed by Statutes - NOT IHO regulations
What has the IHO found?

- New jetties and port installations, utilised by high risk vessels (LNG carriers; large passenger vessels), where surveys have not been conducted and information has not been passed to HOs for charting.
Less than 10 percent of the world’s seas and oceans are surveyed to modern standards. There are higher resolution maps of the Moon and Mars than most of the world’s sea and ocean areas.

There is no indication of any significant improvement, in the last three decades the numbers of surveying vessels has declined by 34% for offshore vessels and 35% for coastal vessels.

This reduction has not been matched by an increase in capacity through the use of more efficient technology or through governments opting to use commercial surveying contractors.
Stages of Development of Hydrographic Surveying and Nautical charting capability

PHASE ONE

Builds on current capability by:

The collection and circulation of nautical information necessary to maintain existing charts and publications up to date
PHASE ONE

National Activity:

- Form National Maritime Safety Committee
- Create or improve current infrastructure to collect and circulate information
- Strengthen links with charting authorities to enable the updating of existing charts and publications
- Minimal training required
PHASE TWO

Enhances current capability by:

The creation of a surveying capability to conduct coastal and offshore surveys
Stages of Development of Hydrographic Surveying and Nautical Charting Capability

PHASE TWO

National Activity:

- Establish capacity to enable surveys of ports and port approaches
- Maintain adequate aids to navigation
- Build capacity to enable surveys in coastal and offshore areas
- Requires funding for training and equipment or for contract survey work
PHASE THREE

Develops independent national capability by:

The independent production of charts and publications
Stages of Development of Hydrographic Surveying and Nautical Charting Capability

PHASE THREE

National Activity:

• Consider carefully if this phase is required
• Consider bi-lateral arrangements for the production of nationally recognised charts and publications
• An independent national structure requires long-term sustained funding
Regional Coordination – Capacity Building

Objectives:

... assess the status of hydrographic surveying, nautical charting ... in developing regions ...

... establish close relationships with national agencies and international organizations, to identify funding and technical assistance ...

... cooperate with Regional Hydrographic Commissions ...

Fund supports:

Proposals submitted via Regional Hydrographic Commissions
International Hydrographic Organization

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Thank You