



**Capability  
For  
Hydrographic  
Capacity Building:  
Industry Partnering**

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IHO SWPHC  
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**IIC Technologies**  
is a  
Global Provider Of Geospatial Solutions And Services

**[www.iictechnologies.com](http://www.iictechnologies.com)**

## Capacity Building (CB) - Concept

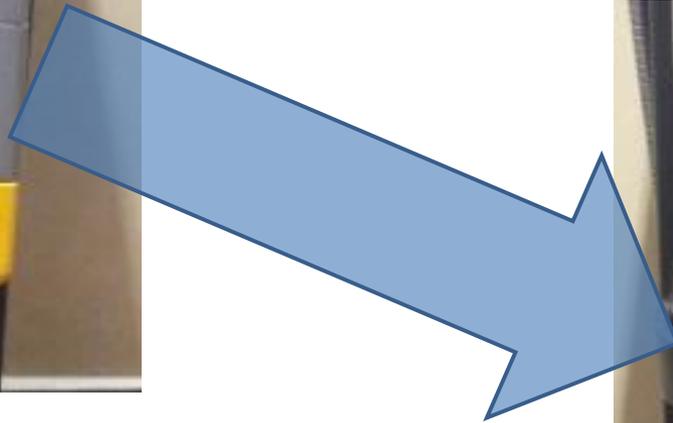
CB is defined as the process by which the IHO assesses and assists in sustainable development and improvement of the States, to meet the objectives of the IHO and the obligations and recommendations related to hydrography, charting and maritime safety as described in SOLAS Chapter V, UNCLOS and other international instruments.

Training is not capacity building but an activity that is a component of a capacity building strategy...

# Capacity has many variations...



*Did this company have the capacity to jump to cell phones?*



*“Sometimes the Capacity Builders do not have the Capacity”*

# Hydrographic Value Chain



## Data Value Chain

### Data Acquisition

- Hydrographic
- Geophysical
- Oceanographic
- Airborne Lidar
- Satellite

### Survey Data Processing

- Bathymetry Data Cleaning
- Surface Modeling
- Image processing
- Deconfliction

### Marine Products

- ENC's / IENC's
- Military Overlays
- Paper Charts
- Geophysical Products

### Verification & Validation

- Spatial Accuracy
- Feature Verification
- Logical Consistency
- 3rd Party Checks
- Vertical/Horizontal Consistency

### Updating & Maintenance

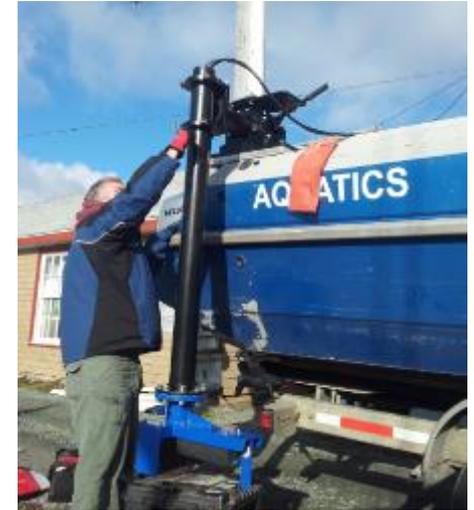
- Database maintenance
- Data Assessment
- Data critical updates
- Data management
- Data warehousing

## Education & Training

# Data Acquisition...



Canada



Satellite Derived Bathymetry / Airborne Bathy Lidar / Multibeam Surveys



NEW APP



**MV Mariner (54m length)**

- MBES / SBES
- Survey on ellipsoid
- Survey on chart datum
- Bottom sampling
- MBES Imagery
- DF SBES sub-bottom
- QC QC data processing
- Observe conspicuous o
- Measure water currents
- Measure Sound Velocity
- L&R 9m survey launch
- Report of Survey



**Bathy Lidar Survey**

- Airplane
- Hawkeye lidar
- Initial post processing
- Initial QA/QC processing
- Sub-Report of Survey



**Processing Centre**

- MBES / SBES / Lidar
- Cleaning
- Field sheet generation
- Data management
- Sub-Report of Survey

**Survey Launch (9m length)**

- MBES hydrographic
- Survey on ellipsoid
- Survey on chart datum
- Shoal & wreck exam
- Bathy Lidar gaps
- MBES Imagery



**Project Support**

- Ship supplies, water , fuel
- Licensing, visas, clearances
- Land transport, hotel
- Aircraft logistical support
- GCS client liason

**Support Vessel**

- Secchi disc
- People transfer
- Grab sampling
- Data transfer
- Medical transfer
- Establish 2m x 2m cube
- MBES hydrographic
- Survey on ellipsoid
- Survey on chart datum
- Shoal & wreck exam
- Bathy Lidar gaps
- MBES Imagery



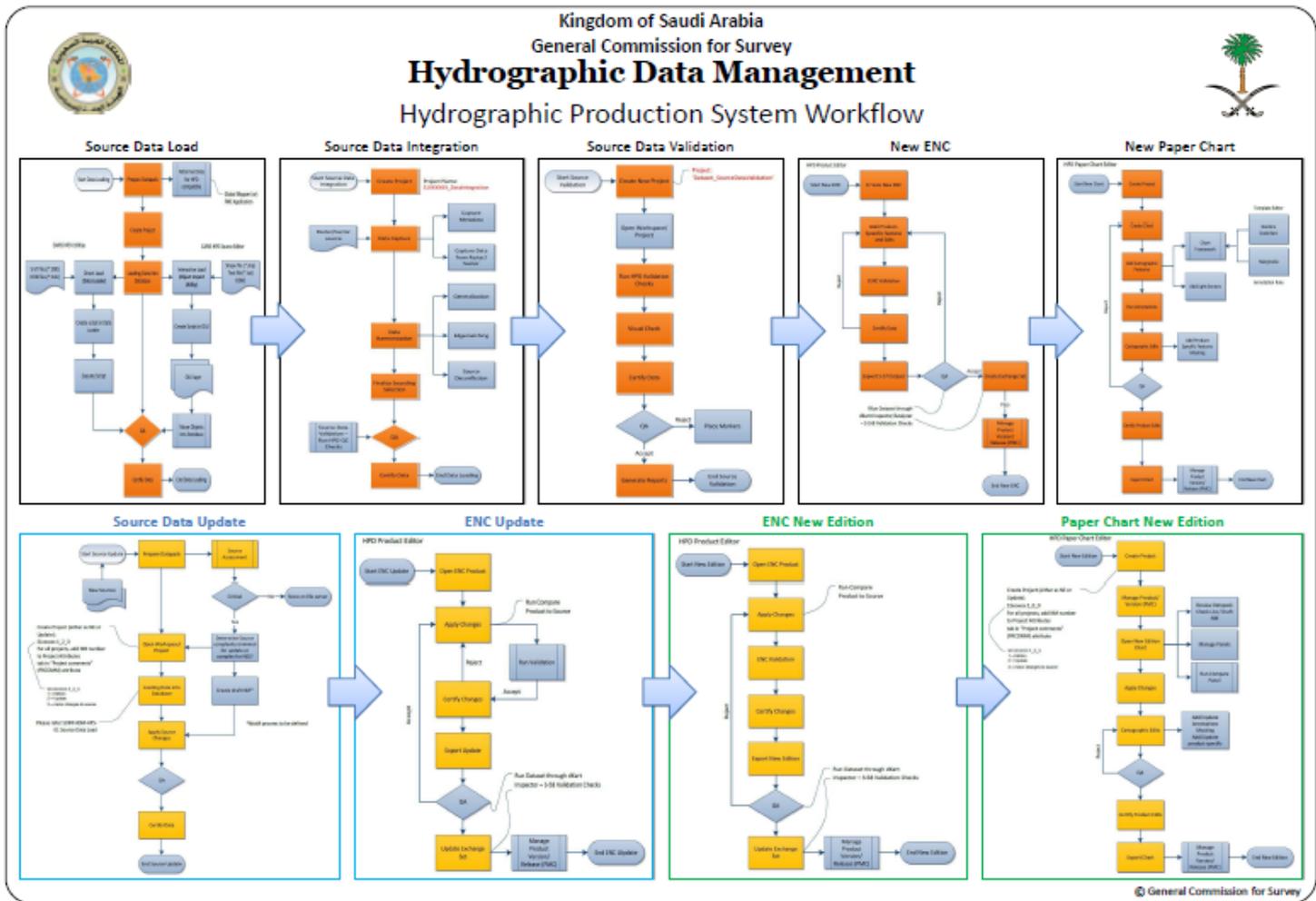
**Establish Tide Gauges**

- survey, install benchmarks
- Survey geodetic coordinates

**Establish Base stations**

- Survey geodetic coordinates
- Establish GPS RTK stations







# Commonwealth Marine Economies Programme

Enabling Safe and Sustainable Marine Economies across Commonwealth Small Island Developing States



Funded by UK Government

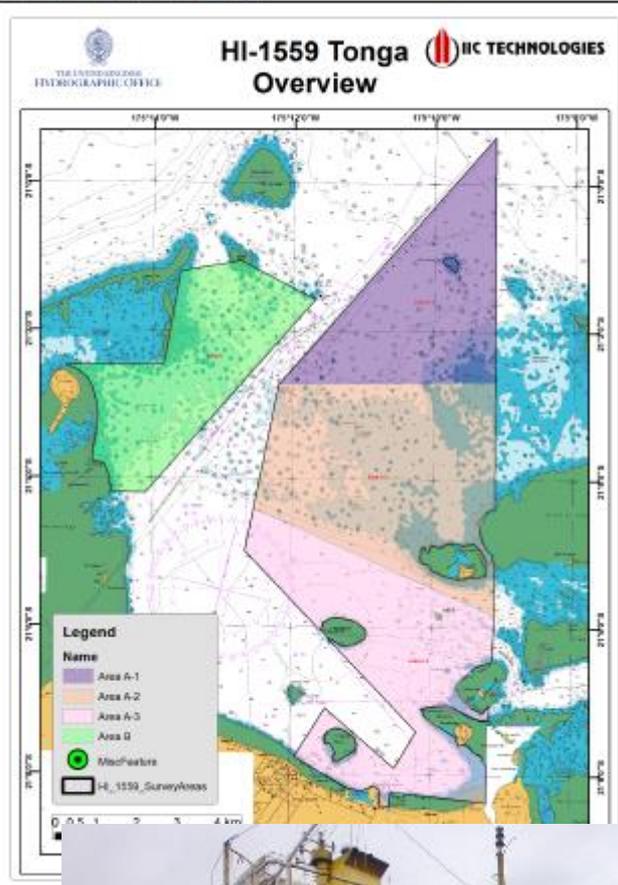
## Hydrographic Instruction 1557 North Atlantic Ocean – Guyana – Approach to Demerara River

14th August 2017

Demerara River



Figure 2- Close-up of Areas with Priorities [BA 0527] (Depth in Fathoms / Feet)



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## Education & Training

# Data Production / Data Management...



16 cartographers embedded in NOAA charting division



Hydrographic Data Base (HDB) using Citrix technology



Hydrographic Data Base (HDB) using Citrix technology



HPD Paper Chart Master creation and loading & production of charts for Samoa, Cook Islands, Nuie, and Tonga



Production of approx. 84 charts from source over 4 years



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## Education & Training



## Category B

S5 (Hydrographic Operations)

*Deliverable at IIC Academy, India*

S8 (Nautical Cartography)

*Portable: Deliverable at customer site*

S8 (Nautical Cartography)

*Deliverable at IIC Academy, India*



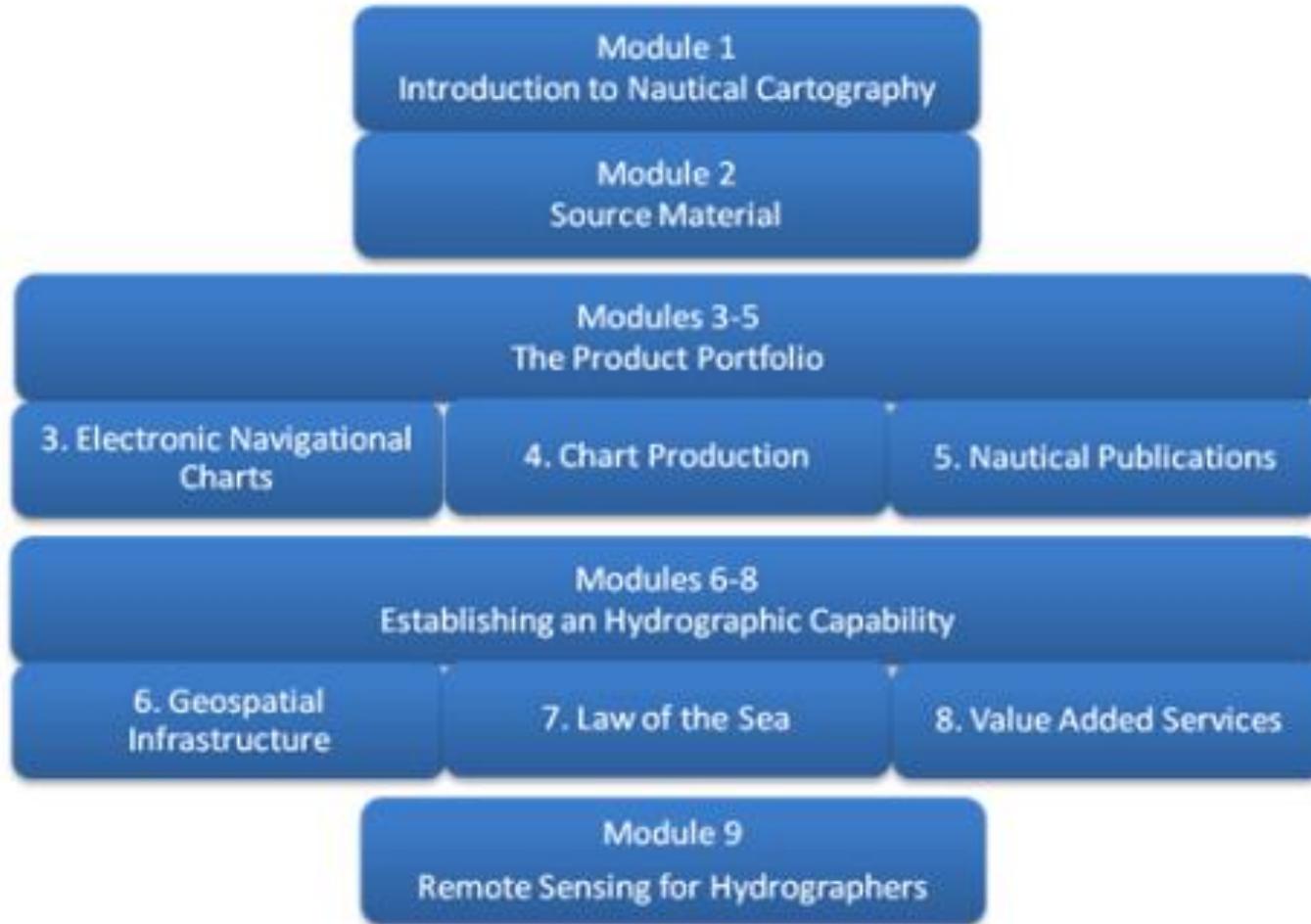


Figure 2. The modular design of IIC's S8 nautical cartography course.

# Training experiences....



Oman Hydrographic Office  
IHO Cat B S8



IHO Cat B S8 Portable



NGA.mil  
NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

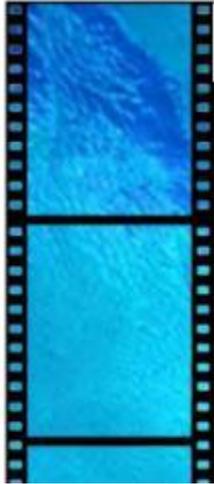


Data Production &  
Database Management

Multi-Disciplinary Hydrographer (MDH) training



# Korea Cat B S5 & S8 Programs....



## Notes

### SUCCESSFUL DELIVERY OF THE CAT.B MARINE GEOSPATIAL INFORMATION PROGRAMME By the Korea Hydrographic and Oceanographic Agency (KHOA)

The Phase 3 of the Category "B" Marine Geospatial Information Programme was successfully delivered from 3 to 28 July 2017 at the Korea Hydrographic and Oceanographic Agency (KHOA), Busan, Republic of Korea. The programme was run by the Capacity Building Fund of the International Hydrographic Organization (IHO) sponsored by the RoK from 2015 to 2017. It was recognized as Category "B" by the FIG/IHO/ICA International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC) in April 2014.



**Cat B S5**



**Cat B S8**

Capacity Building activities can take on many forms with the overall objective of assisting the hydrographic organization to reach their goals and achieve their obligations.

Training, hydrographic surveying, chart production and database management through the provision of technical solutions and services are activities that IIC Technologies undertakes as part of the capacity building strategy.

## **Mutual Recognition Agreement**

**Agreement of Labour Mobility**

**For Hydrographic and Offshore Surveyors**

**Worldwide**

**Between**

**The Association of Canada Lands Surveyors, and**

**The Australian Surveying & Spatial Sciences Institute, and**

**The New Zealand Institute of Surveyors**

### **Purpose**

We, the undersigned, enter into the Mutual Recognition Agreement (MRA) in order to enhance the career opportunities for Hydrographic and Offshore Surveyors worldwide. The purpose of this MRA is to establish the conditions under which a Hydrographic or Offshore Surveyor who has been certified by either the Canadian Hydrographer Certification Panel (CHCP) or the Australasian Hydrographic Surveyor Certification Panel (AHSCP), will have his/her certification recognized by the other.

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