

**INTERNATIONAL HYDROGRAPHIC
BUREAU**

4b, quai Antoine 1er
B.P. 445
MC 98011 MONACO CEDEX
PRINCIPAUTE DE MONACO

**BUREAU HYDROGRAPHIQUE
INTERNATIONAL**

Tel : +377.93.10.81.00
Fax : +377.93.10.81.40
e-mail : info@iho.int
web : www.iho.int

Monaco, 24 April 2015

Pamela TANSEY
Senior Deputy Director
Technical Co-operation Division
International Maritime Organization
London, UK

Dear Pamela,

In continuation of the joint IMO-IHO technical cooperation for delivering Capacity Building currently part of the 2014-2015 ITCP, please find attached the documents related to the proposed 2016-2017 IMO/IHO Joint Training Program for the following regions: Africa (AFR), Arab States and Mediterranean Region (NIO) and Pacific Islands (SWP).

Annex A shows the evolution of the programme since 2008 with the basic courses provided in Maritime Safety Information (MSI), Hydrographic Surveying (HYD), Hydrography and Basic Cartography (H+C), Basic ENC and ENC Production (E+P), Multi-beam (MB) and Marine Spatial Data Infrastructure for ENC Production (MSDI). These courses were funded by the IMO and/or by the IHO.

Annex B presents the proposed programmes for the period 2016-2017 with training courses in English, French and Portuguese, as listed in Annex B. Annexes C to H contain the IMO/IHO Regional Training Courses proposed for the period that IMO is kindly invited to consider when developing the program. The IHO will give priority to the training teams being recruited from the region of delivery as much as possible. The selected regions are as far as possible coincident with the IMO and IHO geographic criteria.

Another lesson learned from the previous program was the need to be more flexible in the course content, in order to fit the needs and challenges in each of the target regions. Furthermore, there is an understanding that some regions may need to receive a combination of courses and seminars focusing other subjects necessary to further develop their hydrographic capabilities. Another factor to take into account is the different backgrounds of the attendees.

The syllabi provided in Annexes I, J and K were developed throughout the years and should provide the basis for delivering the training. However, the mentioned syllabi need to be flexible and might be adjusted to each region on a case by case scenario. In the case where adjustment is required, the IHO will stand ready to coordinate the relevant adjustment with the IMO.

Best regards,

Mustafa IPTES
Director
International Hydrographic Organization

Annexes:

- Annex A** IMO/IHO Joint Training Program evolution from 2008 to 2015.
- Annex B** IMO/IHO Joint Draft Training Course Program 2016/2017.
- Annex C** IMO/IHO Regional Training Course in Hydrographic Field Operator for Francophone Africa (PID 2016)
- Annex D** IMO/IHO Regional Training Course in Basic Hydrography and Hydrographic Governance for Lusophone Africa (PID 2017)
- Annex E** IMO/IHO Regional Training Course in Basic Hydrography and Hydrographic Governance for Southern Africa (PID 2016)
- Annex F** IMO/IHO Regional Training Course in Basic Hydrography and Hydrographic Governance for Red Sea and Gulf of Aden (PID 2017)
- Annex G** IMO/IHO Regional Training Course in Basic Hydrography and Hydrographic Governance for Pacific Islands (PID 2016)
- Annex H** IMO/IHO Regional Training Course in Hydrographic Survey and Introduction to Chart Production for Pacific Islands (PID 2017)
- Annex I** Syllabus for the Training Course in Hydrographic Field Operator
- Annex J** Syllabus for the Training Course in Basic Hydrography and Hydrographic Governance
- Annex K** Syllabus for the Training Course in Hydrographic Survey and Introduction to Chart Production

JOINT IMO/IHO CB PROGRAMME¹
AFRICA (AFR) – LATIN AMERICA AND THE CARIBBEAN (LAC) – ASIA & PACIFIC IS. (API) AND
NORTH INDIAN OCEAN (NIO) – EASTERN EUROPE AND CIS (EE+CIS) – ARAB STATES AND
MEDITERRANEAN REGION (ASM)

Region	2008	2009	2010	2011	2012	2013	2014	2015
AFR	HYD (English)	MSI (English)	MSI (English)	H+C (English) E+P (English)	H+C (French) HYD (English) MSI (English)	E+P (English) MSI (English)	HYD (English) MSI (French)	H+C (English) ⁴ MSI (English)
LAC	MB (English)	H+C (English) MB (English)	E+P (English)	MSI (English) H+C (English)	E+P (English) MSDI (English)	MSI (English ³)	HYD (Spanish)	MSI (English) MSDI (English)
API & NIO	HYD (English) MB (English)	MSI (English)	MSI (English) H+C (English)	E+P ² (English) MB (English)	H+C (English) MSDI (English)	E+P (English)	H+G (English) MSI (English) ³ MSDI (English)	HYD (English) ⁴ MSDI (English) MB (English)
EE+CIS							H+C (English)	
ASM							MSI (English)	MB (English)

Courses funded by IMO and IHO shown by the colors blue and green respectively.

Programmes provided during 2008 to 2015:

- MSI: Maritime Safety Information
- HYD: Hydrography
- H+C: Hydrography and Basic Cartography
- E+P: Basic ENC and ENC Production
- H+G: Basic Hydrography and Hydrographic Governance
- MB: Multi-beam training
- MSDI: Marine Spatial Data Infrastructure for ENC Production

Notes:

- the table only shows the courses directly related to MSI, hydrographic surveying and nautical cartography and does not account for other courses, workshops and technical visits
- in 2011 the H+C course in AFR had the participation of NIOHC (North Indian Ocean Hydrographic Commission)
- Four MSI courses provided in the region
- Planned for 2015

JOINT IMO/IHO CB PROGRAM 2016/2017
(version 20 April 2015)

Annex	Region	Subregion	Training Course Name	Delivery Date	Language	RHCs involved	Project leader
C	Africa	Francophone Africa	IMO/IHO Regional Training Course in Hydrographic Field Operator	Second semester 2016	French	EAtHC SAIHC	TBD
D	Africa	Lusophone Africa	IMO/IHO Regional Training Course in Basic Hydrography and Hydrographic Governance	First semester 2017	Portuguese	EAtHC SAIHC	TBD
F	Africa	Southern Africa	IMO/IHO Regional Training Course in Basic Hydrography and Hydrographic Governance	Second semester 2016	English	SAIHC	TBD
E	Arab States & Mediterranean Region	Red Sea and Gulf of Aden	IMO/IHO Regional Training Course in Basic Hydrography and Hydrographic Governance	First semester 2017	English	NIOHC	TBD
G	Asia and Pacific Islands Region	Pacific Islands	IMO/IHO Regional Training Course in Basic Hydrography and Hydrographic Governance	Second semester 2016	English	SWPHC	TBD
H	Asia and Pacific Islands Region	Pacific Islands	IMO/IHO Regional Training Course in Hydrographic Survey and Introduction to Chart Production	Second semester 2017	English	SWPHC	TBD

**ACTIVITY PROPOSAL FOR THE PREPARATION OF THE PID
ON THE GLOBAL PROGRAMME ON
SUPPORT TO SIDS AND LDCs FOR THEIR SPECIAL SHIPPING NEEDS
==== EAHC ====**

Title:	IMO/IHO REGIONAL TRAINING COURSE IN HYDROGRAPHIC FIELD OPERATOR		
Duration:	Two weeks	Time line:	Second Semester 2016
Region:	Africa	Subregion:	Francophone Africa
Donor:	IMO (TC Fund) + IHO (Technical Support)		
Host country:	TBD (a western-African francophone country)		
Subject matter:	Field operator in hydrography		
Discipline:	According to the Syllabus at Annex I.		
Recipient countries:	Benin, Cameroon, Comoros, Congo (Brazzaville), Congo (Democratic Republic of the), Equatorial Guinea, Gabon, Guinea, Ivory Coast, Madagascar, Mauritania, Senegal and Togo		
Brief description:	<p>The safety of navigation along the African coasts depends on the updating of nautical documents. The current survey activity in the subregion is not sufficient with regards to the increase of maritime activities and the obsolescence of the hydrographic knowledge, particularly in shallow water areas (coastal enlarging/erosion, detection of wrecks, development of harbor infrastructures).</p> <p>Despite of hydrographic capacity building initiatives, the systematic provision of long-lasting advanced training related to hydrographic survey and nautical charting answers only partially to the needs of the African coastal states. Indeed, they still report a lack of trained manpower to conduct survey field work. This course aims at providing short duration 'practice centric' training in hydrography to local personnel to assist hydrographic surveyors for field operations. This will increase the dissemination of maritime safety information from those African coastal States to their charting authority States and will contribute to significantly improve nautical documents in the subregion.</p>		
Inputs:	<ul style="list-style-type: none"> - Instructors Fee, travel and accommodation fees. The training team will have to be composed of at least one local trainer from this region. IHO will coordinate with the appropriate institution (SHOM) and/or consultants for the delivery of this course by their training expert team, - Group training travel and accommodation fees for only one participant from each country, up to a maximum of 10 students (to be adjusted according to vessel capacity used for the practical session), - Survey launch at disposal for the practical session (to be defined), - Deployable survey equipment to be shipped from France, if not available on site, - Classroom and educational equipment for the theoretical session. 		
Outputs:	A trained group of operators on the basic concepts and practical procedures associated to Hydrography, able to assist hydrographic surveyors/technicians on the field.		
Implementation Officer:	TBD		

DRAFT SCHEDULE OF ACTIVITIES (TBC)

Indicators	Milestones
Agreement of venue/dates and support by host State	January 2016
Agreement of support from IHO (instructors, travel and per-diem arrangements, hydro industry contribution support)	January 2016
Invitation applicants	February 2016
Deadline for application	April 2016
Selection applicants finalized	May 2016
Confirmation selected participants	May 2016
Travel/accommodation arrangements for participants.	July 2016
Course delivery	September 2016
Course Report submission	September 2016
Final finance arrangements	October 2016

Budget allocation (2016-2017)

APPROXIMATE VALUES

To be filled by IMO

	Plan 2016	Plan 2017
Experts fees:		
Consultant fees:		
Consultant DSA:		
Consultant fare:		
IMO staff DSA:		
IMO staff fare:		
Group training:		
Publications:		
Sundries:		

TOTAL

**ACTIVITY PROPOSAL FOR THE PREPARATION OF THE PID
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==== BHI ====

Title:	IMO/IHO REGIONAL TRAINING COURSE IN BASIC HYDROGRAPHY AND HYDROGRAPHIC GOVERNANCE		
Duration:	Two weeks	Time line:	First Semester 2017
Region:	Africa	Subregion:	Lusophone Africa
Donor:	IMO (TC Fund) + IHO (Technical Support)		
Host country:	TBD (an African Lusophone country or other country with an appropriate training facility)		
Subject matter:	Basic Hydrography and Hydrographic Governance		
Discipline:	According to the Syllabus at Annex J.		
Recipient countries:	Angola, Cape Verde, Equatorial Guinea, Guinea Bissau, Mozambique, and Sao Tome and Prince		
Brief description:	<p>The safety of navigation along the African coast depends on the provision of Hydrographic Services as defined in SOLAS V/4 and V/9. Training courses in Africa have been jointly delivered in English and French, spoken by a large number of States as the official or secondary languages.</p> <p>Portuguese is spoken in six countries either as an official or as a <i>lingua franca</i>. This training aims at providing these coastal States with training delivered by countries that maintain historical liaison through the common language (Brazil and Portugal).</p> <p>This regional training course in basic hydrography and hydrographic governance introduces the benefits of hydrography to coastal States, including national economic development and environmental management. It describes the need for national coordination of hydrographic functions and describes the roles of national hydrographic organizations within the framework of the IMO and the IHO.</p> <p>It develops a general understanding of cartographic practices used to represent hydrographic and safety of navigation information to users and develops skills in depicting information on nautical charts. The course will develop a basic knowledge of the fundamental principles of hydrographic surveys in coastal environments to enable trainees to specify basic survey requirements and understand the hydrographic equipment used to collect hydrographic information.</p> <p>The training also aims at strengthening the bonds amongst the trainees around the provision of hydrographic services for the benefit of the maritime community and the region.</p>		
Inputs:	<ul style="list-style-type: none"> - Instructors Fee, travel and accommodation fees. The training team will be composed of two experts and/or consultants from Brazil and/or Portugal. - Group training travel and accommodation fees for two participants from each country, up to a maximum of 12 students, to be jointly selected by the IMO and the IHO. - Classroom and educational equipment for the training. 		
Outputs:	A trained group of maritime, port and hydrographic personnel that will be able to: understand the basic concepts, techniques processes and equipment associated with hydrographic surveys and nautical cartography to IHO standards; raise awareness and understanding of the importance of hydrographic services; and appreciate how to meet national hydrographic obligations.		
Implementation Officer:	TBD		

DRAFT SCHEDULE OF ACTIVITIES (TBC)

Indicators	Milestones
Agreement of venue/dates and support by host State	July 2016
Agreement of support from IHO (instructors, travel and per-diem arrangements, hydro industry contribution support)	July 2016
Invitation applicants	August 2016
Deadline for application	October 2016
Selection applicants finalized	November 2016
Confirmation selected participants	December 2016
Travel/accommodation arrangements for participants.	February 2017
Course delivery	June 2017
Course Report submission	July 2017
Final finance arrangements	July 2017

Budget allocation (2016-2017)

APPROXIMATE VALUES

To be filled by IMO

	Plan 2016	Plan 2017
Experts fees:		
Consultant fees:		
Consultant DSA:		
Consultant fare:		
IMO staff DSA:		
IMO staff fare:		
Group training:		
Publications:		
Sundries:		

TOTAL

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==== SAIHC ====**

Title:	IMO/IHO REGIONAL TRAINING COURSE IN BASIC HYDROGRAPHY AND HYDROGRAPHIC GOVERNANCE		
Duration:	Two weeks	Time line:	Second Semester 2016
Region:	Africa	Subregion:	Southern Africa
Donor:	IMO (TC Fund) + IHO (Technical Support)		
Host country:	TBD		
Subject matter:	Basic Hydrography and Hydrographic Governance.		
Discipline:	According to the Syllabus at Annex J.		
Recipient countries:	Angola, Comoros, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, Tanzania		
Brief description:	Several recipient countries have followed a systematic provision of training related to hydrographic survey and nautical charting. This course is developed to professionals, managers and decision makers and focus on the basic concepts of Hydrographic Surveying, Nautical Cartography and Data Governance.		
Inputs:	Instructors Fee, travel and DSA. Group training travel and DSA for only one participant from each country, up to a maximum of 12 students. IHO will coordinate with the appropriate institution and/or consultants for the delivery of this course by their training expert team. The IHO will coordinate as well with the hydrographic industry to complement the training with suitable presentations on available hardware and software.		
Outputs:	A trained group of professionals on the basic concepts associated to e-Navigation and Hydrographic Awareness		
Implementation Officer:	TBD		

DRAFT SCHEDULE OF ACTIVITIES (TBC)

Indicators	Milestones
Agreement of venue/dates and support by host State	March 2016
Agreement of support from IHO (instructors, travel and per-diem arrangements, hydro industry contribution support)	April 2016
Invitation applicants	June 2016
Deadline for application	August 2016
Selection applicants finalized	August 2016
Confirmation selected participants	September 2016
Travel/accommodation arrangements for participants.	October 2016
Course delivery	November 2016
Course Report submission	January 2017
Final finance arrangements	February 2017

Budget allocation (2016-2017)

APPROXIMATE VALUES

To be filled by IMO

	Plan 2016	Plan 2017
Experts fees:		
Consultant fees:		
Consultant DSA:		
Consultant fare:		
IMO staff DSA:		
IMO staff fare:		
Group training:		
Publications:		
Sundries:		

TOTAL

**ACTIVITY PROPOSAL FOR THE PREPARATION OF THE PID
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==== NIOHC ====**

Title:	IMO/IHO REGIONAL TRAINING COURSE IN BASIC HYDROGRAPHY AND HYDROGRAPHIC GOVERNANCE		
Duration:	Two weeks	Time line:	First Semester 2017
Region:	Arab States & Mediterranean Region	Subregion:	Red Sea and Gulf of Aden
Donor:	IMO (TC Fund) + IHO (Technical Support)		
Host country:	Suggest Saudi Arabia (Jeddah), subject to the host confirmation		
Subject matter:	Basic Hydrography and Hydrographic Governance.		
Discipline:	According to the Syllabus at Annex J.		
Recipient countries:	Egypt, Eritrea, Jordan, Saudi Arabia, Somalia, Sudan, Yemen and Maldives (from outside the subregion)		
Brief description:	Several recipient countries have followed a systematic provision of training related to hydrographic survey and nautical charting. This course is developed to professionals, managers and decision makers and focus on the basic concepts of Hydrographic Surveying, Nautical Cartography and Data Governance.		
Inputs:	<ul style="list-style-type: none"> - Instructors Fee, travel and DSA. - Group training travel and DSA for only one participant from each country, up to a maximum of 12 students. - IHO will coordinate with the appropriate institution and/or consultants for the delivery of this course by their training expert team. The IHO will coordinate as well with the hydrographic industry to complement the training with suitable presentations on available hardware and software. 		
Outputs:	A trained group of professionals on the basic concepts associated to basic Hydrography, e-Navigation and Hydrographic Awareness		
Implementation Officer:	TBD		

DRAFT SCHEDULE OF ACTIVITIES (TBC)

Indicators	Milestones
Agreement of venue/dates and support by host State	July 2016
Agreement of support from IHO (instructors, travel and per-diem arrangements, hydro industry contribution support)	July 2016
Invitation applicants	August 2016
Deadline for application	October 2016
Selection applicants finalized	November 2016
Confirmation selected participants	November 2016
Travel/accommodation arrangements for participants.	January 2017
Course delivery	March 2017
Course Report submission	March 2017
Final finance arrangements	April 2017

Budget allocation (2016-2017)

APPROXIMATE VALUES

To be filled by IMO

	Plan 2016	Plan 2017
Experts fees:		
Consultant fees:		
Consultant DSA:		
Consultant fare:		
IMO staff DSA:		
IMO staff fare:		
Group training:		
Publications:		
Sundries:		

TOTAL

**ACTIVITY PROPOSAL FOR THE PREPARATION OF THE PID
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==== SWPHC ====**

Title:	IMO/IHO REGIONAL TRAINING COURSE IN BASIC HYDROGRAPHY AND HYDROGRAPHIC GOVERNANCE		
Duration:	Two weeks	Time line:	Second Semester 2016
Region:	Asia and Pacific Islands Region	Subregion:	Pacific Islands
Donor:	IMO (TC Fund) + IHO (Technical Support)		
Host country:	TBD		
Subject matter:	Basic Hydrography and Hydrographic Governance		
Discipline:	According to the Syllabus at Annex J.		
Recipient countries:	American Samoa, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Pitcairn Islands, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, and Wallis and Futuna		
Brief description:	Several recipient countries have followed a systematic provision of training related to hydrographic survey and nautical charting. This course has been developed for professionals, managers and decision makers and focus on the basic concepts of Hydrographic Surveying, Nautical Cartography and Governance, necessary to achieve IHO Phase 1 Capacity Building.		
Inputs:	Instructors, travel and DSA. Group training travel and DSA for only one participant from each country (TBD), up to a maximum of 12 students. IHO will coordinate with the LINZ/AHS/UKHO/SPC for the delivery of this course. The IHO will coordinate as well with the hydrographic industry to complement the training with suitable presentations on available hardware and software.		
Outputs:	<ol style="list-style-type: none"> 1. A trained group of professionals on the basic concepts associated with basic Hydrography and hydrographic governance. 2. SIDS are aware, engaged and have line-of-sight (a clear pathway and action plan) to achieve IHO Phase 1 Capacity Building, i.e. legislation for a national HO, NHCC, MSI position and bi-lateral with the relevant PCA 		
Implementation Officer:	TBD		

DRAFT SCHEDULE OF ACTIVITIES (TBC)

Indicators	Milestones
Agreement of venue/dates and support by host State	January 2016
Agreement of support from IHO (instructors, travel and per-diem arrangements, hydro industry contribution support)	January 2016
Invitation applicants	February 2016
Deadline for application	April 2016
Selection applicants finalized	May 2016
Confirmation selected participants	May 2016
Travel/accommodation arrangements for participants.	July 2016
Course delivery	September 2016
Course Report submission	September 2016
Final finance arrangements	October 2016

Budget allocation (2016-2017)

APPROXIMATE VALUES

To be filled by IMO

	Plan 2016	Plan 2017
Experts fees:		
Consultant fees:		
Consultant DSA:		
Consultant fare:		
IMO staff DSA:		
IMO staff fare:		
Group training:		
Publications:		
Sundries:		

TOTAL

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===== SWPHC =====**

Title:	IMO/IHO REGIONAL TRAINING COURSE IN HYDROGRAPHIC SURVEY AND INTRODUCTION TO CHART PRODUCTION		
Duration:	Two weeks	Time line:	Second Semester 2017
Region:	Asia and Pacific Islands Region	Subregion:	Pacific Islands
Donor:	IMO (TC Fund) + IHO (technical support)		
Host country:	TBD		
Subject matter:	Hydrographic Survey and Introduction to Nautical Chart Production		
Discipline:	According to the Syllabus at Annex K.		
Recipient countries:	American Samoa, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Pitcairn Islands, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, and Wallis and Futuna		
Brief description:	Some countries in the region have taken advantage of technical visits paid; seminar organized to raise awareness of the importance of hydrography, nautical cartography and marine safety information matters and have received practical training on MSI to those concerned with drafting Radio Navigational Warnings or with the issuance of Maritime Safety Information (MSI) for the high seas under the Global Maritime Distress And Safety System (GMDSS). This training on hydrographic survey and introduction to nautical chart production constitute the logic flow in order for these countries to progress in achieving SOLAS V/9.		
Inputs:	Instructors travel and DSA. Group training travel and DSA for only one participant from each country (TBD), up to a maximum of 12 students. IHO will coordinate with the LINZ/AHS/UKHO/SPC for the delivery of this course. The IHO will coordinate as well with the hydrographic industry to complement the training with suitable presentations on available hardware and software.		
Outputs:	<ol style="list-style-type: none"> 1. Capacity building established in hydrographic surveys and nautical chart production 2. SIDS can provide high quality products and services to fulfill the basic requirements for safety of navigation in the area as regulated by SOLAS 3. SIDS achieve IHO Phase 1 & 2 Capacity Building, i.e. establish national HO and conduct hydrographic surveys/basic charting 		
Implementation Officer:	TBD		

DRAFT SCHEDULE OF ACTIVITIES (TBC)

Indicators	Milestones
Agreement of venue/dates and support by host State	January 2017
Agreement of support from IHO (instructors, travel and per-diem arrangements, hydro industry contribution support)	January 2017
Invitation applicants	February 2017
Deadline for application	April 2017
Selection applicants finalized	May 2017
Confirmation selected participants	May 2017
Travel/accommodation arrangements for participants.	July 2017
Course delivery	September 2017
Course Report submission	September 2017
Final finance arrangements	October 2017

Budget allocation (2017-2018)

APPROXIMATE VALUES

To be filled by IMO

	Plan 2016	Plan 2017
Experts fees:		
Consultant fees:		
Consultant DSA:		
Consultant fare:		
IMO staff DSA:		
IMO staff fare:		
Group training:		
Publications:		
Sundries:		

TOTAL

Syllabus for the Training Course in Hydrographic Field Operator

Programme de Formation - Opérateur hydrographe

Durée du stage : 10 jours	Date : A définir	Lieu : A définir
<p>Objectifs du stage :</p> <ul style="list-style-type: none"> - Assister les hydrographes (Cat. B – OHI) lors des travaux hydrographiques, à terre et à la mer. - Réaliser des travaux hydrographiques, à terre et à la mer sous la responsabilité d'un hydrographe catégorie B – OHI. 		
<p>Programme détaillé :</p>		
Jour 1		
a.m.	<p style="text-align: center;">Présentation du Cours (suivant contexte)</p> <ul style="list-style-type: none"> · Missions, organisation, moyens <p>Définition de l'hydrographie</p> <ul style="list-style-type: none"> · Enjeux de l'hydrographie. Besoins · Utilisation des données hydrographie. Importance de la méthodologie en hydrographie. <p>Présentation des levés</p> <ul style="list-style-type: none"> · Généralités · Les différents types de levés · Le levé hydrographique 	
p.m.	<p>Introduction à la géodésie</p> <ul style="list-style-type: none"> · Brève histoire de la Géodésie · Activités et techniques de la géodésie · Surfaces de références en géodésie · Les systèmes de coordonnées · Les systèmes géodésiques · Transformations de coordonnées et changements de systèmes géodésiques · Généralités sur les projections · Les projections Mercator, UTM et Lambert · Pesanteur et altitude · Les systèmes d'altitude · Carte marine et navigation 	
Jour 2		
a.m.	<p>Positionnement à terre – Topographie</p> <ul style="list-style-type: none"> · Les observations topographiques · Rappel sur les systèmes d'unité · La mesure des angles et des distances · Les déterminations planimétriques <p>La station totale</p> <ul style="list-style-type: none"> · Présentation des stations totales et de quelques applications possibles · La mesure des dénivelées · Les déterminations altimétriques <p>Le niveau électronique</p> <ul style="list-style-type: none"> · Présentation des niveaux numériques et des techniques de nivellement 	
p.m.	<p>Positionnement – Les stations totales et le niveau numérique (pratique) La station totale</p> <ul style="list-style-type: none"> · Mise en œuvre des stations totales : Mesures des angles, des distances et des altitudes · Applications et calculs topographiques <p>Le niveau électronique</p> <ul style="list-style-type: none"> · Mise en œuvre des niveaux numériques : Mesure des dénivelées · Calculs des dénivelées et des altitudes. 	

Jour 3	
a.m.	<p>Le positionnement satellitaire</p> <ul style="list-style-type: none"> · Introduction aux GNSS <p>Le GPS</p> <ul style="list-style-type: none"> · Fonctionnement : principe et différents modes de mesure · Utilisation pratique du GPS
p.m.	<p>Positionnement satellitaire – Le GPS (pratique)</p> <ul style="list-style-type: none"> · Le GPS - Présentation du GPS LEICA 1200 · Mise en œuvre du GPS LEICA 1200
Jour 4	
a.m.	<p>Bathymétrie – sondeur vertical et sonar latéral</p> <ul style="list-style-type: none"> · Techniques de mesure de la profondeur <p>Bases d'acoustique sous-marine : Nature et propagation des ondes. Effets de la célérité du son</p> <ul style="list-style-type: none"> · Transducteurs. Fréquences et faisceaux · Les capteurs ou échosondeurs (vertical, multifaisceau et sonar latéral) <p>Le sondeur vertical</p> <ul style="list-style-type: none"> · Prise en compte de la célérité. Prise en compte de l'immersion de la base · Etalonnage des sondeurs verticaux. · Méthodes d'estimation de l'incertitude des données. · Méthodes d'enregistrement : Tenue du cahier de quart, traçabilité des étalonnages · Mesure de l'attitude. Compensation de la houle · Contrôle qualité <p>Présentation des sondeurs multifaisceaux (ne sera pas approfondi, <i>en option</i>)</p> <p>Le sonar latéral</p> <ul style="list-style-type: none"> · Le sonar latéral – Instrumentation - Principe de fonctionnement : Géométrie, couverture, performances, limitations · Sonar latéral et sondeur monofaisceau/multifaisceau : Complémentarité
p.m	<p>Océanographie</p> <ul style="list-style-type: none"> · Océanographie descriptive : structure, propriétés physiques de l'eau de mer et instruments de mesure <p>Marée et courants – niveaux de référence verticaux.</p> <ul style="list-style-type: none"> · Théorie de la marée · Les instruments, les mesures et le traitement de base. Utilisation d'une échelle de marée. Mise en œuvre des marégraphes · Réduction des sondages. Les niveaux de référence verticaux : zéro de réduction des sondages, zéro hydrographique, référence des altitudes · Notions sur la mesure des courants
Jour 5	

a.m.	Sédimentologie <ul style="list-style-type: none"> · Sédimentologie : Notions et mesures, les instruments de prélèvement Méthodologie des levés hydrographiques <ul style="list-style-type: none"> · Qualité des levés hydrographiques : La publication spéciale S44 de l'OHI · Classification des levés en fonction des objectifs · Différentes classes de systèmes acoustiques utilisées en hydrographie · Estimation de l'incertitude des sondages
p.m.	Conduite d'un levé hydrographique <ul style="list-style-type: none"> · Etude de la zone à sonder – Reconnaissance. Recherche des besoins locaux : contacts avec les pratiques · Planification des levés hydrographiques : évaluation de l'instrumentation disponible, choix de la méthodologie appropriée · Prise en compte de l'environnement : météo, état de mer · Préparation des minutes, échelle, définition des profils à suivre (orientation, écartement) · Acquisition des données hydrographiques · Travaux de reprise · Profils de compléments · Recherches · Topographie · Information nautique : principes d'acquisition et de diffusion
Jour 6	
a.m.	Pratique du levé et/ou mise en œuvre du SIREP SHOM <ul style="list-style-type: none"> · Installation et mise en œuvre du système de positionnement. · Installation et mise en œuvre du système de mesure des profondeurs · Etalonnage à la barre. Mesures d'immersion de la base. Mesures de célérité
p.m.	Mise en œuvre du SIREP SHOM
Jours 7 à 10.	
Mise en œuvre du SIREP SHOM	

Syllabus for the Training Course in Basic Hydrography and Hydrographic Governance

DAY 1: Monday	
Session 1 (09.00 – 10.30)	1-1-1 Introduction to Hydrography and Hydrographic Governance
10.30 – 11.00	Coffee break
Session 2 (11.00 – 12.30)	1-2-1 What is Hydrography?
	1-2-2 Economic Benefits of Hydrography
	1-2-3 International Obligations to Provide Hydrographic Services
	1-2-4 The International Hydrographic Organization (IHO)
12.30 – 13.30	Lunch break
Session 3 (13.30 – 15.00)	1-3-1 The International Maritime Organization (IMO)
	1-3-2 Other Related Authorities, Agencies and Bodies
15.00 – 15.30	Coffee break
Session 4 (15.30 – 7.00)	1-4-1 Understanding the Nautical Chart
	<i>Practical exercise on the nautical chart -</i>
DAY 2: Tuesday	
Session 1 (09.00 – 10.30)	2-1-1 Basic Elements of Hydrographic Surveys
	2-1-2 International Hydrographic Survey Standards
	2-1-3 Acoustic Theory for Hydrography
10.30 – 11.00	Coffee break
Session 2 (11.00 – 12.30)	2-2-1 Introduction to Hydrographic Systems and Equipment
12.30 – 13.30	Lunch break
Session 3 (13.30 – 15.00)	2-3-1 Introduction to Laser Airborne Depth Measurement -LIDAR
	2-3-2 SBES Principles and Errors
	2-3-3 SBES Calibration
15.00 – 15.30	Coffee break
Session 4 (15.30 – 17.00)	2-4-1 MBES Principles and Calibration
	2-4-2 SSS Principles and Operation
	<i>Individual Progress Assessment – Days 1 and 2</i>
DAY 3: Wednesday	
Session 1 (09.00 – 10.30)	3-1-1 Geodesy - The Shape of the Earth
	3-1-2 Projections and Grids
	3-1-3 Horizontal Control
	3-2-1 Horizontal Positioning - GNSS
	3-2-2 Theory of Tides
10.30 – 11.00	Coffee break
Session 2 (11.00 – 12.30)	3-2-3 Water Levels and Vertical Datum
12.30 – 13.30	Lunch break
Session 3 (13.30 – 15.00)	<i>Practical survey experience 1</i>
15.00 – 15.30	Coffee break
Session 4 (15.30 – 17.00)	<i>Practical survey experience 1</i>

DAY 4: Thursday	
Session 1 (09.00 – 10.30)	4-1-1 Theory of Errors in Measurement
	4-1-2 Sources of Errors in Hydrographic Surveys
	4-1-3 Hydrographic Survey Specifications
10.30 – 11.00	Coffee break
Session 2 (11.00 – 12.30)	4-2-1 Gridded Bathymetry
	4-2-2 Hydrographic Metadata and Transfer Formats
	4-2-3 Survey Planning
12.30 – 13.30	Lunch break
Session 3 (13.30 – 15.00)	<i>Exercise - Planning a hydrographic survey. Exercise - Contour and critique of practical survey data</i>
15.00 – 15.30	Coffee break
Session 4 (15.30 – 17.00)	<i>Exercise - Planning a hydrographic survey. Exercise - Contour and critique of practical survey data</i>
DAY 5: Friday	
Session 1 (09.00 – 10.30)	5-1-1 Cartographic Fundamentals
	5-1-2 The Nautical Chart
	5-1-3 Scales and Objectives
10.30 – 11.00	Coffee break
Session 2 (11.00 – 12.30)	5-2-1 IHO Charting Standards
12.30 – 13.30	Lunch break
Session 3 (13.30 – 15.00)	5-3-1 Cartographic Planning
15.00 – 15.30	Coffee break
Session 4 (15.30 – 17.00)	<i>5-4-1 Cartographic Revision Exercise - Cartographic Fundamentals The Nautical Chart Scales and Objectives IHO Charting Standards Cartographic Planning & Developing a Chart scheme Review of Practical exercise</i>
DAY 6: Saturday	
Session 1 (09.00 – 10.30)	6-1-1 Nautical Chart Production
	6-1-2 Chart Compilation Process
10.30 – 11.00	Coffee break
Session 2 (11.00 – 12.30)	6-2-1 Chart compilation Process (continued)
	6-2-2 Transition from Paper Chart to Digital chart
12.30 – 13.30	Lunch break
Session 3 (13.30 – 15.00)	6-3-1 Principles of ENC Production
	6-3-2 Nautical Chart Maintenance
15.00 – 15.30	Coffee break
Session 4 (15.30 – 17.00)	6-4-1 Nautical Chart Distribution
	6-4-2 Revision Exercise – Chart Production and Maintenance
	6-4-3 Individual Progress Assessment- days 5 and 6
DAY 7: Sunday – Rest day	
DAY 8: Monday	
Session 1 (09.00 – 10.30)	8-1-1a Global Maritime Distress Safety System (GMDSS)
	8-1-1b SafetyNET
	8-1-1c NAVTEX
	8-1-2a World-wide Navigational Warning Services

DAY 8: Monday (Cont.)	
10.30 – 11.00	Coffee break
Session 2 (11.00 – 12.30)	8-1-2b WWNWS Guidance Documents
	8-1-2c National Coordinator Duties & Responsibilities
	8-1-2d Regional SafetyNET & NAVTEX Coverage
	8-1-2e Joint IMO/IHO/WMO Manual on Maritime Safety Information
	8-1-2e S-53 Message Format- Examples
12.30 – 13.30	Lunch break
Session 3 (13.30 – 15.00)	8-2-1 MSI Practical Exercises Information Assessment for Promulgation
	<i>MSI - Practical Exercise – Information assessment for promulgation</i> <i>MSI – Review of Practical Exercise</i>
15.00 – 15.30	Coffee break
Session 4 (15.30 – 17.00)	8-4-1 Chart Updating and Liaison with Charting Authority (HO)
	8-4-2 Maritime safety review\
DAY 9 : Tuesday	
Session 1 (09.00 – 10.30)	<i>Practical MSI Experience</i>
10.30 – 11.00	Coffee break
Session 2 (11.00 – 12.30)	<i>Practical MSI Experience</i>
12.30 – 13.30	Lunch break
Session 3 (13.30 – 15.00)	9-3-1 Maritime Risk Assessment –Principles
15.00 – 15.30	Coffee break
Session 4 (15.30 – 17.00)	9-4-1 Maritime Risk Assessment -Vanuatu example <i>Individual Progress Assessment-</i>
DAY 10 : Wednesday	
Session 1 (09.00 – 10.30)	10-1-1 Regional Hydrographic Coordination and Cooperation
	10-1-2 Global Distribution of ENC - RENCs
10.30 – 11.00	Coffee break
Session 2 (11.00 – 12.30)	10-2-1 IMO Integrated Technical Cooperation Programme (ITCP)
12.30 – 13.30	Lunch break
DAY 10 : Wednesday	
Session 3 (13.30 – 15.00)	10-2-2 IALA – and the World-Wide Academy
	10-3-1 SPC Regional Hydrographic Capability
	10-3-2 Donor Agencies and Funding
	10-3-3 Introduction to e-Navigation
	10-3-4 Standards of Competence for Hydrographic Surveyors
15.00 – 15.30	Coffee break
Session 4 (15.30 – 17.00)	10-4-1 Introduction to Marine Spatial Data Infrastructures (MSDI)
	10-4-2-1 The Universal Hydrographic Data Model - S100
	10-4-2-2 IHO S-100
DAY 11 : Thursday	
Session 1 (09.00 – 10.30)	11-1-1 International Obligations to Provide Hydrographic Services
	11-1-2 Voluntary IMO Member State Audit Scheme
10.30 – 11.00	Coffee break

DAY 11 : Thursday (Cont.)	
Session 2 (11.00 – 12.30)	11-2-1 Meeting National Hydrographic Obligations
	11-2-2 Contracting Hydrographic Surveys
12.30 – 13.30	Lunch break
Session 3 (13.30 – 15.00)	11-3-1 Satellite Bathymetry
	11-3-2 Bilateral Agreements and Contracts for Charting Support
15.00 – 15.30	Coffee break
Session 4 (15.30 – 17.00)	11-4-1 Review of National Hydrographic Regulations
	<i>11-4-2 Exercise</i>
	<i>1. Review hydrographic arrangements for represented States,</i>
	<i>2. Develop national action plan for meeting hydrographic obligations (groups)</i>
	<i>11-4-3 Individual progress assessment- days 10 and 11</i>
DAY 12 : Friday	
Session 1 (09.00 – 10.30)	12-1-2 Considerations with ECDIS and ENC
	<i>Final Assessment - (questions taken from review questions from each presentation and progress assessments)</i>
10.30 – 11.00	Coffee break
Session 2 (11.00 – 12.30)	<i>Group Discussion - Experience of working in a Hydrographic Office Resource priorities, recruitment and training, retention, workflows, ict support systems, NTM maintenance</i>
12.30 – 13.30	Lunch break
Session 3 (13.30 – 15.00)	12-3-1 The Need for Hydrography
	Course Summary Discussion - Review of SOLAS Obligations and Economic Benefits of Hydrography (Refer to previous presentations as required – to clarify uncertainties)
15.00 – 15.30	Coffee break
Session 4 (15.30 – 17.00)	a- Completion and Submission of Course Evaluation Forms b- Course Evaluation Discussion c- Presentation of Certificates d- Closure of the Course

Notes:

- a) **Duration:** 11 training days (Monday through Saturday and Monday through Friday).
- b) **Evaluation:** Evaluation of the participants will be done by means of a theoretical examination (60%) and 40% from an evaluation of the practical hydrographic survey (from planning to report).
- c) **Instructors:** At least two instructors are required to implement the theoretical component of the programme.
- d) **Logistics:**
 - Premises for the classes;
 - Two computers and datashow.

Syllabus for the Training Course in Hydrographic Survey and Introduction to Chart Production

Unit	Content
1	Basic Concepts.
	a) General aspects (Day 1 half AM) <ol style="list-style-type: none"> a. Definition of hydrography b. Types of hydrographic surveys c. Nautical charting surveys d. Surveys in support of port management and environmental studies
	b) Positioning (Day 1 half AM and all PM plus Day 2 AM) <ol style="list-style-type: none"> a. Shape of the earth. Projections and scales b. System of Coordinates c. Horizontal and Vertical control. Datum. Angles and distance measurements. Leveling d. Methods and Instruments used to extend Hor. & Ver. Control e. Basic topographic and geodetic computations f. Positioning systems. Visual, electromagnetic, hybrid, GPS, DGPS g. Positioning fixing. Errors and quality control
	c) Bathymetry (Day 2 PM) <ol style="list-style-type: none"> a. Techniques used for depth determination b. Acoustic fundamentals c. Transducers. Frequencies and Beams. Echo sounders (SB, MB, SSS) d. Calibration and recording methods e. Quality control f. Hydrographic launches
	d) Water levels and Currents (Day 3 AM) <ol style="list-style-type: none"> a. Tidal and currents fundamentals b. Tidal and current instruments, measurements and basic processing c. Tidal prediction. Use of tide table
2	Methods of carrying out hydrographic surveys.
	a) Hydrographic Survey Specifications and operations (Day 3 PM) <ol style="list-style-type: none"> a. Hydrographic survey specifications (S-44) b. Operation of hydrographic instruments, equipment and systems
	b) Hydrographic Survey planning (Day 4) <ol style="list-style-type: none"> a. Study of the survey area. Recognisance b. Hydrographic survey planning. Evaluation of the available instrumentation Selection of applicable hydrographic methodology Fair sheet preparation, scale, lines separation and orientation c. Hydrographic data acquisition. Integrated systems and data logging
	c) Hydrographic Survey Practice (in groups) (Day 5 and Day 6 in the field) <ol style="list-style-type: none"> a) Conduct a basic horizontal control and leveling extension b) Install and operate position system c) Install and operate depth register d) Install and operate a tide gauge or tide scale e) Conduct a systematic survey or a pre selected area
	d) Hydrographic Data Management (Day 7 and Day 8) <ol style="list-style-type: none"> a) Apply relevant corrections and filters to data gathered (Tides, speed of sound, others) b) Obtain positions and depths of the lines surveyed c) Analyze data and results d) Manual and digital data presentation e) Plotting field sheet and prepare technical report
3	Basic Principles of Nautical Cartography
	a) Nautical Chart (Day 9) <ol style="list-style-type: none"> a. Characteristics b. Projections c. Scales and objectives d. Specifications e. Nautical Chart Reading exercise

	b) Nautical Charts planning (Day 10 AM) <ol style="list-style-type: none"> a. Principles b. National cartographic plan c. International cartographic scheme d. Practical scheming exercise
4	Basic Principles of Nautical Chart Production (Day 10 PM and Day 11 AM)
	a) Nautical Chart production flow
	b) Compilation process
	c) Paper Charts Production
	d) Transition from Paper Chart to Digital Chart
	e) Principles of ENC and introduction to ECDIS and AIS
	f) Nautical Chart maintenance
	g) Nautical Chart distribution
5	Evaluation and Closure of the Course (Day 11 PM)

Notes:

- e) **Hours:** 88 hours (52 lecture, 16 field, 16 processing and 4 hours evaluation) during 11 training days (Monday through Saturday and Monday through Friday).
- f) **Evaluation:** Evaluation of the participants will be done by means of a theoretical examination (60%) and 40% from an evaluation of the practical hydrographic survey (from planning to report).
- g) **Instructors:** At least two instructors are required to implement the theoretical component of the programme. It has to be added the support personnel for the practical survey (boat operator).
- h) **Logistics:**
- Premises for the classes;
 - Two computers for the theoretical and practical (field) exercises and its hydrographic software, including a plotter;
 - A survey boat for the field practical period.
 - An echo sounder, a tide gauge, level instrument,
 - A positioning system.
 - Transport to the place where the surveying exercise must be carried out.