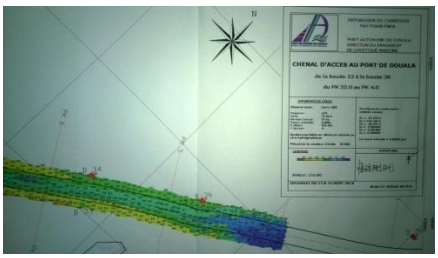
IHO Capacity Building Programme
TECHNICAL VISIT AND
VISIT TO TRAINING CENTRES
IN CAMEROON
13-16 February 2019
REPORT



Ministry of Transport **Port Authority of Douala** **The University of Douala**

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Abbreviations

CBSC	*Capacity Building Sub-Committee*
CBWP	*Capacity Building Work Programme*
EAtHC CHAtO	*Eastern Atlantic Hydrographic Commission* Commission Hydrographique de l'Atlantique oriental
ENC	*Electronic Navigational Chart* Cartes électronique de navigation
GMDSS SMDSM	*Global Maritime Distress and Safety System* Système mondial de détresse et de sécurité en mer
IALA AISM	*International Association of Marine Aids to Navigation and Lighthouse Authorities* Association Internationale de Signalisation Maritime
IOC COI	*Intergovernmental Oceanographic Commission* Commission Océanographique Intergouvernementale
IHO OHI	*International Hydrographic Organization* Organisation Hydrographique Internationale
IMO OMI	*International Maritime Organization* Organisation Maritime Internationale
MBES	*Multi-Beam Echo Sounder* Sondeur multifaisceau
MSI RSM	*Maritime Safety Information* Renseignement de Sécurité Maritime
MOWCA OMAOC	*Maritime Organization of West and Central Africa* Organisation Maritime de l'Afrique de l'Ouest et Centrale
MSDI	*Maritime Spatial Data Infrastructure*
NC	Nautical Charts Carte marine
NHS	*National Hydrographic Service*
NHC CNH	*National Hydrographic Committee* Comité National Hydrographique
NtMs	Notice to Mariners Avis aux navigateurs
PAD	Port Autonome de Douala
PAK	Port Autonome de Kribi
PCA	*Primary Charting Authority* Autorité cartographique principale
PMAWCA AGPAOC	*Port Management Association of West and Central Africa* Association de Gestion des Ports de l'Afrique de l'Ouest et du Centre
RHC CHR	*Regional Hydrographic Commission (EAtHC)* Commission Hydrographique Régionale (CHAtO)
SAR	*Search And Rescue*
SBES	*Single Beam Echo Sounder* Sondeur mono-faisceau
Shom	Service hydrographique et océanographique de la marine (France) *French Hydrographic and Oceanographic Office*
SOLAS	*[United Nations] Convention for the Safety of Life at Sea*
WACA	*West Africa Coastal Areas Management program* Programme de gestion du littoral ouest Africain
WWNWS SMAN	*Word-Wide Navigational Warning Service* Service Mondial d'Avertissements de Navigation

FOLLOW-UP ACTIONS - RECOMMENDATIONS

Table of the main "short-term" actions (other actions are identified in the report)

§	Object	Ongoing - Done	Following actions
3	IHO contact references (P5-Yearbook)	Updated: Annex E-1	• IHO/Secretariat (website)
3	EAtHC contact references	Updated: Annex E-2	• IHO/Secretariat (website)
3	Administrative Arrangement (AA) with the current chart producer: France (Shom) (SOLAS Obligation)	Draft AA provided to PAD	• Cameroon: additions • France (Shom): exchanges • France (ambassador) and Cameroon: signatures
5	Next EAtHC of 2020 in Lisbon (Portugal)		• Cameroon - participate (initiative: PAD)
5	Next IHO-IALA seminar in Rabat (Morocco) in October 2019		• Cameroon - participate (initiative: PAD)
17	National Hydrographic Coordination Committee (NHC)	A model constitutive text has been provided (*)	• Cameroon - create (initiative: PAD)
18	Transmit coastal «MSI»(Maritime Safety Information) using the NAVAREA II (Shom) coordinator	See Annex F (Shom/NAVAREA II Offer)	• Cameroon (initiative: PAD)
22	Basic training in hydrography	Link to list of accredited programs provided	• Cameroon : ○ Enroll in CAT B approved schools ○ Practical training in port performing dredging operations
22	Basic training in port charting		• Cameroon : ○ Acquire specific software ○ (+ associated training)
23	Continuous training courses Managerial training	List of IHO seminars provided Douala University sensitized	• Cameroon

(*)https://www.iho.int/mtg_docs/CB/CBA/Modele_decret_creation_committee.pdf

See also the IHO M-2 publication and its additional documents:

- https://www.iho.int/iho_pubs/IHO_Download.htm
- https://www.iho.int/iho_pubs/misc/M-2_3.0.7_F_06142018.pdf

PRIMARY ONGOING ACTION

The main ports (Douala, Kribi, Limbé) must first of all maintain permanent relations with the NAVAREA II coordinator, who is also the current producer of nautical charts (France/Shom) so that MSI (Maritime Safety Information) are distributed in time to mariners (e.g. on SafetyNet in emergencies) and nautical documents (e.g. nautical charts) updated at an appropriate frequency (e. g. notices to mariners, new map editions).

MSI transmission :
coord.navarea2@shom.fr or coord.navarea2@gmail.com (emergency email address)
Tel: +33 2 56 31 24 24 24 (D7 - H24) Fax: +33 2 98 22 22 16 65

Non-urgent nautical information:

Hydrographic surveys, harbour plans: bri@shom.fr + copies na-etr@shom.fr and dmi-rex-d@shom.fr

Other nautical information: na-etr@shom.fr + copies: bri@shom.fr and dmi-rex-d@shom.fr
Postal address: "
Département "Informations et Ouvrages Nautiques"
Service hydrographique et océanographique de la marine (Shom)
CS 92803 - 29228 BREST CEDEX 2

INTRODUCTION

1 Introduction - Programming

The visit was planned as part of the IHO capacity building activity programme for the year 2018 (postponed to 2019):

- CBWP 2018: A-01;
- Training Center Visits (PART 2 Gabon - Cameroon).

This visit is a follow-up to similar visits made:

- in Ivory Coast in September 2015 (in particular at ARSTM: Académie Régionale des Sciences et Techniques de la Mer - Regional Academy of Science and Technology of the Sea of Abidjan);
- in Ghana in March 2016 (particularly in the RMU: Regional Maritime University of Accra);
- in Nigeria in March 2017 (particularly at the NNHS: Nigeria Navy Hydrographic School);
- in Gabon in February 2019 (in particular at the Omar Bongo University in Libreville: 10-13 February 2019).

IHO's Capacity Building Programme aims to coordinate the development of hydrographic surveys and marine charting for its members. It was thus decided:

- promote regional cooperation in capacity building in West and Central Africa (CHAtO: Commission Hydrographique de l'Atlantique Oriental de l'OHI – EAtHC: Eastern Atlantic Hydrographic Commission of IHO);
- to identify the potential of national and regional training centres;
- to explore the possibilities of organizing regional seminars.

The trip was used to:

- lead the visit to the University of Douala as part of a "training-employment" forum of the regional Master's degree (Gabon - Cameroon) "integrated management of coastal and marine environments" (GIELM: « gestion intégrée des environnements littoraux et marins);
- conduct a technical visit in addition.

The preparations were conducted in connection with:

- for the "technical visit" part: the dredging and maritime logistics department of the PAD;
- for the "visit of training centres":
    - IRD (Institut de recherche pour le développement France),
    - The University of Douala (regional master's degree in integrated management of coastal and marine environments: GIELM).

Terms of Reference: Annex A.

2 Composition of the team

The visiting team was composed of:

Name	Role
Henri DOLOU	Head for Shom (France for IHO)

The preparation of the visit has closely involved:

- Mr Vincent LAMARRE, Head of the Shom's "External Relations" Division;
- Mr Georges MENYE (Director of Dredging and Maritime Logistics of the PAD) and one of his deputies Mr Idriss BEYE (Head of the Dredging Department of the PAD on which the Hydrographic Service depends);
- Mr Raphaël ONGUENE from the University of Douala (in charge of the GIELM master's degree).

PART A - OVERALL ASSESSMENT OF THE SITUATION IN THE REGION

3 Effectiveness of the Technical Visit

This effectiveness must be measured in relation to the objectives of the mission and the achievement of immediate actions that can be launched.

Participations

- The main stakeholders concerned in Douala were met apart from the Navy (telephone and e-mail exchanges partially compensated for this absence).
- As the trip was limited to Douala, it should be noted that the central administrations (ministries in Yaoundé) and the existing structures of other major seaports (Kribi, Limbé) were not met. It was nevertheless agreed that PAD would bring up the topics discussed.

Findings: it is probably necessary to speak of a "rethinking" of relations between Cameroon and IHO (secretariat, other IHO members, associate members and observers of EAtHC):

- it is already a question of updating the references of Cameroonian correspondents
- it's then a question of:
    - to maintain renewed relationships:
        - with France, which has special responsibilities in the EAtHC area within the IHO (NAVAREA II coordinator, cartographic coordinator, capacity building coordinator)
        - with other European countries (Cameroon is part of the Commonwealth) and especially with other African countries with which it is desirable to develop exchanges and cooperation
    - start again to carry out actions together (see the following chapters)

Findings	Actions
The relational network is to be reconstituted	• Update the P5 publication (Yearbook: https://www.iho.int/iho_pubs/periodical/P5YEARBOOK_ANNUAIRE.pdf) : elements in Annex E-1 • Update the list of contacts of EAtHC Member States (https://www.iho.int/mtg_docs/rhc/EAtHC/EAtHC_Misc/EAtHC-CHAtO_Contacts.pdf) : elements in Annex E-2
Cameroon little participates in the work, meetings and seminars organized by IHO The relational network must work	• Check the IHO website for news and planned events (especially those of EAtHC)
Cameroon is not meeting all its international commitments (SOLAS)	• Establish an Administrative Arrangement (AA, a project was submitted to the PAD during the visit) with France (Shom) in order to formalize the role of charting authority for Cameroon ("de facto" role ensured). This type of AA remains a transitional solution pending Cameroon's establishment of the necessary hydrographic services to establish and disseminate the nautical information necessary for safe navigation in its waters. • Ministries concerned: transport, external relations, defence

It should be noted that the technical exchanges covered the obligations of the SOLAS Convention (Chapter V) as well as the expected economic benefits. As such, hydrographic investments can generate financial savings, particularly through optimization:

- dredging operations
- ship loading

The visits made it possible to identify real areas for improvement in training and education. They are not limited to enrolments in training courses outside Africa.

4 Cooperation - Defence

a. [International and Regional Organizations]

IHO/OHI Status	Regional Hydrographic Commission	IMO/OMI	IALA/AISM	OMAOC/MOWCA
Member	CHAtO/EAtHC Member	Member	Member	Member

b. [Defence and security arrangements]

The Cameroonian Navy is naturally involved in the coordination of search and rescue (SAR) operations.

It has naval resources and a Marine Operations Centre (Centre Opérationnel de la Marine : COM) which also acts as a "*Centre de Coordination et de Sauvetage en Mer* " CCSM (SRCC: Search and Rescue Coordination Center).

These "national" activities are prescribed in Decree No. 2007/290/CAB/PR of 1 November 2007 on the organization and conduct of State action at sea and on inland waterways.

The action of the State at sea and on inland waterways covers in particular public service missions at sea:

- search and rescue at sea of persons and property;
- environmental protection and pollution control at sea;
- safety of navigation and assistance to ships in distress.

Its naval resources, its personnel qualified for maritime matters, make the Navy important for the development in addition to the activities of autonomous ports (Port Authority) , of hydrographic activities which by nature have a national vocation.

As in most countries, its national vocation is therefore to become a central actor in the proposed National Hydrographic Coordination Committee (NHC).

It is proposed that the Ministry of Defence (Navy) should already approach the Ministry of Transport (supervision of the PAD) to initiate the creation of the CNH. It will be possible to rely on:

- Commander Grégoire FOTSO TOGA (Commander of the Naval Officers Application and Development School) already appointed for the 15th EAtHC Conference (Lagos, October 2018), that the author of the report was able to meet and with whom he can continue the exchanges;
- the French naval officer, technical adviser to the Cameroonian Navy (Defence Cooperation Mission in Cameroon).

PART B - CAMEROON - EVALUATION

5 Involvement in the Regional Hydrographic Commission (EAtHC)

Findings	Actions
Although a member of IHO and EAtHC, the PAD, which officially represents Cameroon, participates little in the work and conferences of the Commission (last participation in 2012)	• Attend the next EAtHC conference in 2020 in Lisbon (Portugal): https://www.iho.int/mtg_docs/rhc/EAtHC/EAtHC16/EAtHC16_Docs.html
	• In particular, participate in the IHO-IALA seminar to be held in Rabat (Morocco) in October 2019 (supported through the IHO Capacity Building Programme)

6 Preliminary contacts

The visit was prepared by Henri DOLOU (Shom) in close collaboration with Mr Georges MENYE (Director of Dredging and Maritime Logistics of the PAD) and one of his deputies Mr Idriss BEYE (Head of the Dredging and Hydrography Department of the PAD).

The IHO questionnaire was used and proved to be very useful. He was informed by Mr. Idriss BEYE.

7 Contact points

The contact points are listed in Annex B.
The names of the IHO correspondents (P5- Yearbook) and more specifically those of the EAtHC have been updated and are specified in Annex E.

DESCRIPTION OF MARITIME ACTIVITIES

8 National Maritime Affairs

The duration of the visit and the fact that it took place only in Douala (the capital Yaoundé, where the ministries are located, was not visited) did not allow all the organizations involved to be visited.
Nevertheless, they were met:

- the regional transport delegation (Ministry of Transport): river and lake maritime district;
- the PAD.

The main ministry concerned is the Ministry of Transport, which is responsible for:

- the Directorate of Maritime Affairs and Waterways (Headquarters);
- the National Port Authority (Autorité Portuaire Nationale : APN);
- regional transport delegations: river and lake district of Douala.

Other stakeholders :

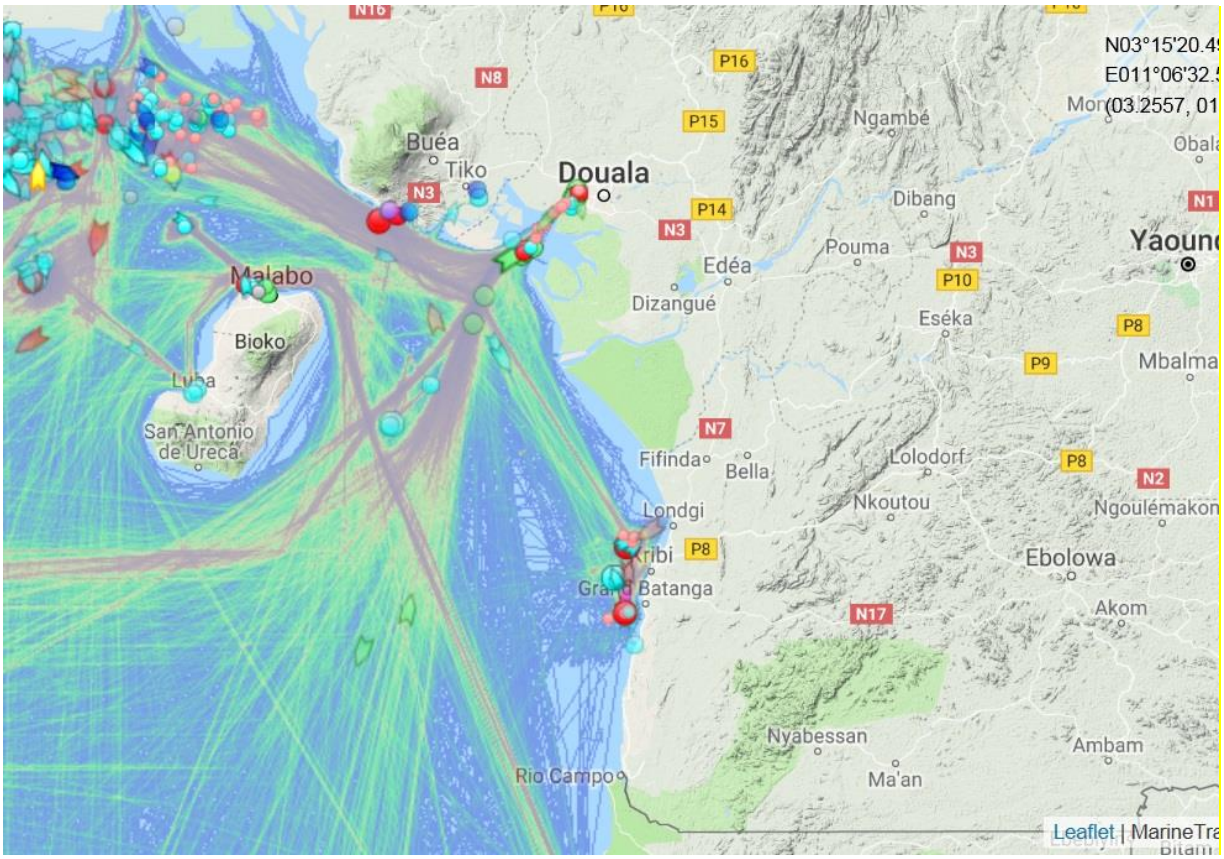
- the Ministry of Defense;
- the Ministry of Domains, Cadastre and Land Affairs;
- the Ministry of Water and Energy;
- the Ministry of Economy, Planning and Spatial Planning;
- the Ministry of Livestock, Fisheries and Animal Industries;
- the Ministry of Higher Education;

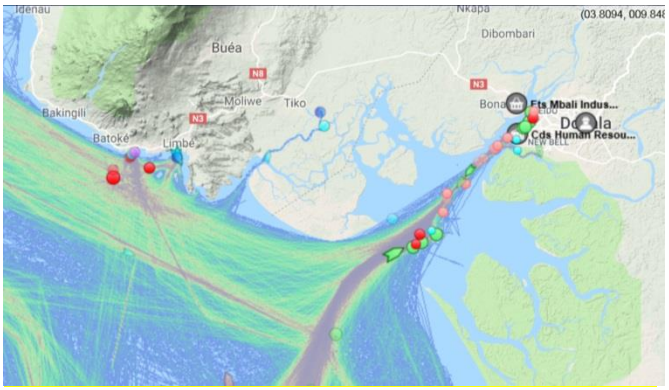
- the Ministry of the Environment, Nature Protection and Sustainable Development;
- the Ministry of Mines, Industry and Technological Development;
- the Ministry of Scientific Research and Innovation;
- the Ministry of Foreign Affairs.

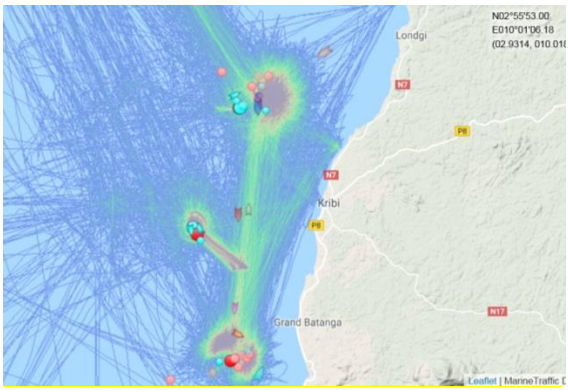
The list of these ministries allows to identify the stakeholders of a national hydrographic (oceanographic) coordination committee.

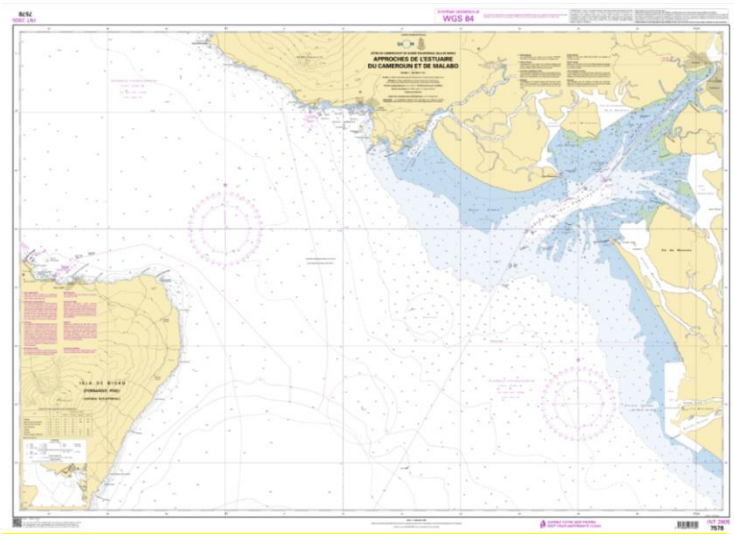
9 Maritime trade and traffic

https://www.marinetraffic.com (AIS data)

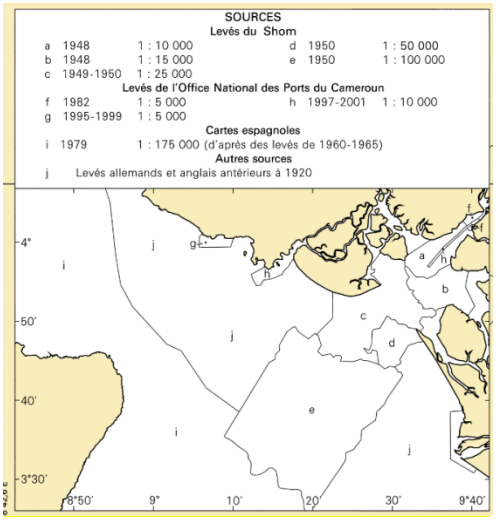




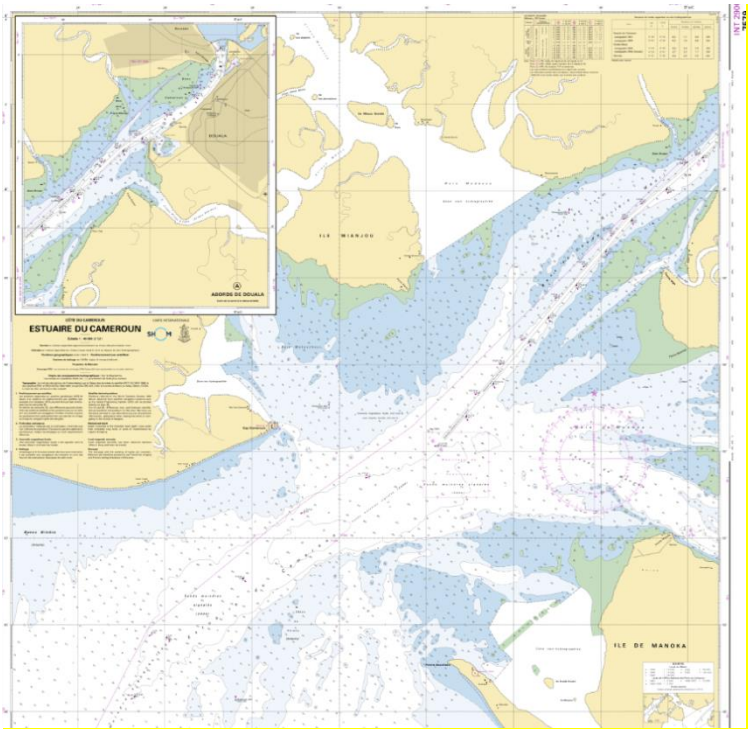




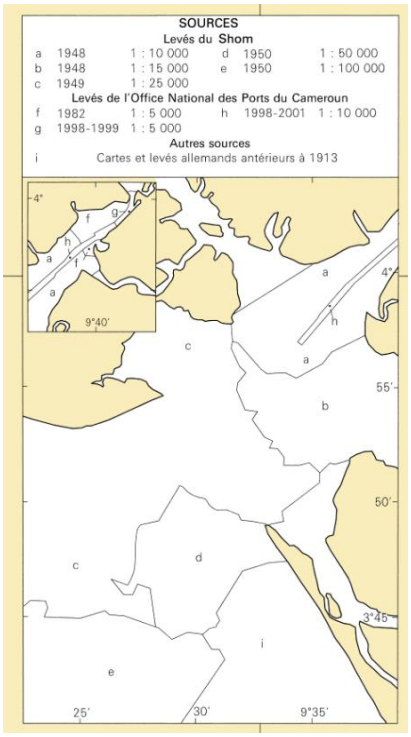
Chart



Origin of sources



Chart



Origin of sources

Findings	Actions
Although there are marine charts, the data used to produce them are often very old, apart from direct access to the main ports of Cameroon (Douala, Kribi, Limbé)	• Check if there are no other data (bathymetric surveys, harbour plans, etc.) that could be compiled in nautical documentation (marine charts in particular). Information to be transmitted to the Shom for exploitation • Verify that the current shipping routes are properly hydrographically designed with regard to the characteristics of the vessels and the foreseeable evolution of traffic (increase in tonnages and draughts)

	• Beyond that, quantify the economic gains made possible by efficient hydrographic services (precise bathymetric surveys, tide forecasting / observation) in terms of load optimization (pilot foot of ships adjusted to the right need. Common interest with the optimization of dredging operations • Verify how the routes of the cabotage (coastal) lines envisaged (Limbé, Douala, Kribi) could be optimised (transit times, minimisation of risks) according to a renewed hydrographic knowledge

Note: the actions mentioned above could usefully be discussed at the Rabat seminar scheduled for October 2019. This will present (workshops) risk analysis methods (navigation and hydrography/OHI and buoyage/AISM).

10 Responsibility for the safety of navigation

The Directorate for Maritime Affairs and Inland Waterways (Central Administration of the Ministry of Transport) is responsible for this at national level.
Reports to this Directorate: the Sub-Directorate for Navigation, Safety and Protection of the Maritime Environment and Waterways (police, maritime search and rescue operations, environmental protection, organisation and facilitation of maritime traffic, safety and security).

11 Responsibilities of the Defence Forces

See Chapter 4

12 Coastal zone management and environmental protection

Responsible Ministry: Ministry of the Environment, Nature Protection and Sustainable Development (Ministère de l'Environnement, de la Protection de la Nature et Développement Durable MINEPDED).

This department has not been met. However, according to the evidence gathered, the main concerns are related to forests.

Autonomous ports operate in their areas of responsibility (which therefore do not cover the entire coastline).

The University of Douala is mainly involved in subjects related to the coast and the sea. It is important to highlight not only the capacities of the current GIELM Master's teams but also those of the entire network of graduates and qualified experts (foreign and Cameroon) that has been built around the GIELM.

It seems highly desirable that all stakeholders involved in the maritime field should consult and join forces to promote the development of science and technology in the maritime field.

The creation of a national inter-ministerial structure (not only academic to promote operational and economic issues) could be one of the first topics for discussion by the National Hydrographic (Oceanographic) Coordination Committee, whose establishment is strongly recommended. It certainly depends on better listening to international donors.

While the national organization deserves to be strengthened, it is nevertheless equally important to develop regional cooperation as already exists with Gabon within the framework of the GIELM.

It is already suggested that Cameroon should be part of regional projects such as the WACA (West Africa Coastal Areas) project on coastal zone management (including erosion). Such a project (supported by the World Bank and France for Senegal, Togo and Benin) already makes it possible to set up reference databases (old and current) for multiple uses: marine charts, aerial photographs, hydrographic and topographical surveys, tidal measurements, etc.

The initiative must come from Cameroon.

OUTLINE C55- ANALYSIS

13 Status of hydrographic surveys in the national maritime area

The following table summarizes the status of the surveys as it was established by Shom as the charting manager at the last EAtHC conference (Lagos 2018).
Reference: https://www.iho.int/mtg_docs/rhc/EAtHC/EAtHC15/EAtHC15-04B-National_Report-France.pdf

		Surface ref < 200m	A Net	B Net	C Net	Surface ref > 200M	A Net	B Net	C Net
CAMEROUN	(en km2)	11960	327,31	356,72	11275,97	2687,9	77,632	0	2610,268
		100%	2,7%	3,0%	94,3%	100%	2,9%	0,0%	97,1%

With :

- A: Correctly hydrographied
- B: Requiring new surveys
- C: Never systematically hydrographied

Note:

- these indicators are based solely on the data available to the Shom (there must be surveys carried out by private companies, in particular for the benefit of oil companies, which are not known to the Shom)
- they clearly show the weakness of hydrographic knowledge as already pointed out in § 9 Trade and maritime traffic

14 Collection and circulation of nautical information

It is the responsibility of the ports to provide data to Shom in order to update nautical publications, in particular by notices to mariners.
The information flow must include:

- marine charts (e.g. new bollards, new docks, new buoys, removed wrecks, underwater cables, etc.);
- sailing instructions;
- list of lights
- tides (harmonic constants used for predictions to be made more reliable and accurate using continuous observations made at different locations in the locations).

Improvements in these information flows are discussed in Chapter 18.

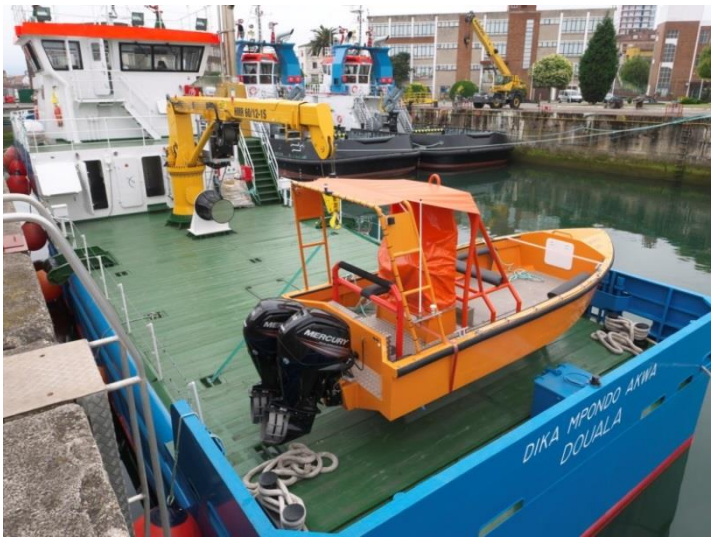
15 Hydrographic survey capacity of the Port Authority of Douala

2005 hydrographic launch:

- Length 17.95m - Width 4.65m - Draught 1.40m
- Propulsion 2*360 hp
- Hydro Equipment
  - GPS Trimble dual-frequency 5700
  - Atlas Deso 17 dual-frequency single-beam sonar
  - Wave compensator HS 50
  - Atlas SVC 300 Celerimeter
  - Gyrocompass

New multi-purpose vessel of 2017: DIKA MPONDO AKWA

- Length 32 m - Width 8m - Draught 2.2m
- Propulsion
- Hydro Equipment
  - GPS Vector VS 330 GNSS Receiver
  - Kongsberg M3 Multi Beam Echo Sounder
  - ODOM CV100 Single Beam Echo Sounder
  - Inertial unit MRU3
  - AML Base -X sound velocity profiler

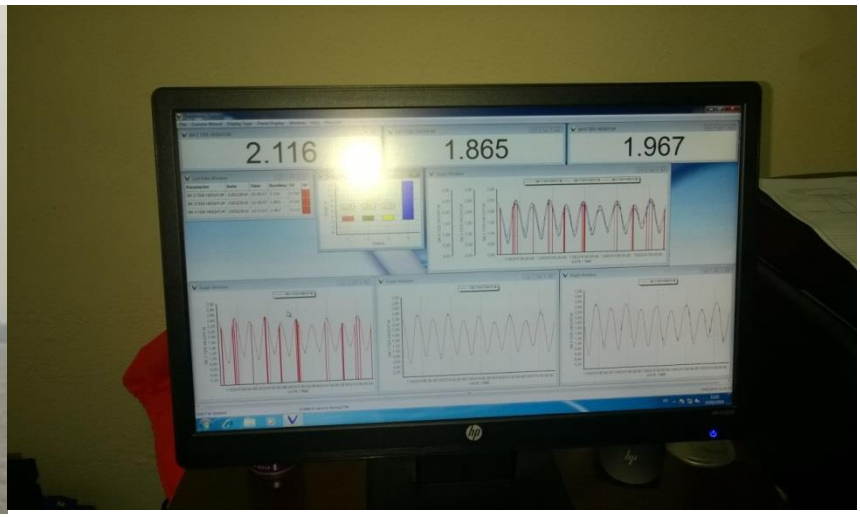


Treatment systems : Hypack, Autocad, Surfer software for bathymetric plane production

Tide measurements

- 3 operational tide gauge stations in the estuary (SM2, SM3, SM4)
- the 3 stations are equipped with Valeport digital tide gauges with a radar sensor
- tidal transmission system of the three stations every 05 mn (real time) via a UHF link (Trimble)
- tidal data collection centre
- analog tide gauge R16 with float

Tide gauge



Real-time data display

Staff

The service is managed by an experienced hydrographer Mr André MBONGO ELLONG with in his team:

- an engineer Engineer-industrial engineer
- an oceanographer Master 2
- a Master 1 geologist
- a degree in Biochemistry & level 2 Earth Sciences
- a level 2 geologist
- an agent

16 Independent chart production capacity

There is no capacity to produce charts, update and distribute them.

See Chapter 20.

Note: the production of bathymetry fairsheets is done under Hypack.

PROPOSAL FOR COORDINATION AND CAPACITY BUILDING

17 National Hydrographic Coordination Committee

The interest of such a coordination committee (interdepartmental, inter-agency) was explained (SOLAS, investment efficiency, data sharing which can have multiple applications...) based on the publication M2 (https://www.iho.int/iho_pubs/misc/M-2_3.0.7_E_06142018.pdf), extracts of which were provided.

The example of the IHO Institutional Agreement was also provided.

This committee will be responsible:

- to develop a national charting scheme (not just ports), to monitor its execution and updating;
- coordinate and plan the hydrographic surveys necessary for the development of this charting scheme;

- identify and recommend the necessary actions in terms of staff training and the purchase of equipment for the execution of the programme;
- to coordinate the development of national maritime security;
- to submit an annual report to the supervisory authorities.

Note 1: Data collection and sharing has been widely advocated (one data = several applications). This raises the problem of data archiving and dissemination at the national level. Techniques and tools are increasingly well mastered with databases and communication and download portals.

Note 2: The committee must be formally recognized by the government as part of its response to national responsibilities under IMO instruments such as the SOLAS Convention or the GMDSS organization.

Findings	Actions
Such a committee does not exist	• set up a National Hydrographic Coordination Committee which will be extended to activities relating to the environment of coastal areas based on the IHO model: https://www.iho.int/mtg_docs/CB/CBA/Model_decret_creation_committee.pdf

18 Phase 1 Hydrographic Capacities: MSI and GMDSS

Introduction:
Maritime Safety Information (MSI), as defined in International Maritime Organization Resolution A.705(17) and detailed in the joint IHO/IMO/WMO Manual on MSI (IHO Special Publication S-53), consists of the collection and dissemination of navigation and meteorological warnings, search and rescue information and other urgent safety information, including nautical information relating to nautical documentation.
The dissemination of these MSIs is based on the Global Maritime Distress and Safety System (GMDSS), an international system that uses telecommunications for maritime search and rescue and accident prevention.
In addition, MSIs in their broadest sense include the updating of navigation charts and other nautical publications (list of lights, radio signal, etc.).
MSIs need an organisation (procedures for collecting, transcribing and transmitting information, equipment maintained, personnel trained) with a national MSI coordinator in relation to navigators, the charting authority (France /Shom) and NAVAREA II (France / Shom).

a. MSI (Maritime Safety Information). At now, there does not seem to be a real MSI organization. Services to seafarers could be offered on SafetyNET through the NAVAREA II coordinator (France / Shom) although it was noted that no contributions had been received for a long time.

   NAVTEX should be the optimal solution for ships sailing in Cameroonian waters and approaching its main ports. There is no such thing. As long as this situation persists, SafetyNET (NAVAREA II, France / Shom) may be used for coastal warnings (see Annex F).

   The MSIs must be made available to **NAVAREA II:**
   Département "Informations et Ouvrages Nautiques"
   Service hydrographique et océanographique de la marine (Shom)
   CS 92803 - 29228 BREST CEDEX 2
   Tel: +33 2 56 31 24 24 (Duty Officer, H24)
   +33 6 24 80 08 92 (Duty Officer, spare)

Fax: +33 2 56 31 25 84
Email: coord.navarea2@shom.fr (H24),
coord.navarea2@gmail.com (spare)
Website: http://diffusion.shom.fr/navarea-en-vigueur

b. Nautical information on ports and their accesses. The Shom publishes notices to mariners and maintains nautical publications (list of light book, sailing directions, etc.)

This subject was not discussed in detail, the following table was provided based on the information received

Master Plan	A1 Area	A2 Area	A3 Area	NAVTEX	SafetyNET	Notes
No (1)	VHF	No	No	No	No	

(1) Information on facilities dedicated to terrestrial and satellite communications (latest version: GMDSS.1/Circ.12 on 30 April 2010)

Findings	Actions
The NAVAREA II Zone Coordinator does not receive any MSI from Cameroon. The Shom, which produces and distributes official nautical documents (marine charts in particular) of waters under Cameroon's jurisdiction, does not systematically receive the information needed to update them: in addition to not being in conformity with international commitments (SOLAS), these gaps can be a source of mistrust for navigators in the region.	• Pending the establishment of a national MSI organisation, the various port authorities must systematically transmit MSIs to the NAVAREA II coordinator (France - Shom) within an appropriate time frame • The PAD: requests the assistance of the NAVARAEA II coordinator to transmit coastal notices via SafetyNet on a transitional basis pending the establishment of NAVTEX transmission capacity (see Annex F)

Note : transmission of non-emergency nautical information:
Hydrographic surveys, harbour plans: bri@shom.fr + copies na-etr@shom.fr and dmi-rex-d@shom.fr
Other nautical information: na-etr@shom.fr + copies: bri@shom.fr and dmi-rex-d@shom.fr

Postal address:
Département "Informations et Ouvrages Nautiques"
Service hydrographique et océanographique de la marine (Shom)
CS 92803 - 29228 BREST CEDEX 2

19 Phase 2 Hydrographic Capabilities: Surveys

The PAD has (and has just been equipped, see § 15) capacities that make it possible to carry out port and estuarine (access channel) and even coastal surveys with the new multi-function ship DIKA MPONDO AKWA (aluminium hull).

20 Phase 3 Hydrographic Capabilities: Production of nautical charts

Cameroon does not yet have the capacity to produce official national marine charts. France (via the Shom) is *de facto* the charting authority for waters under Cameroon's jurisdiction. To be in line with the SOLAS Convention, relations between Cameroon and France should be formalized (Shom)
The co-production of maps is a development step to be considered with the current cartographic coordinator (France/Shom).

Findings	Actions
The Shom can continue this task in order to ensure that nautical information is regularly disseminated to all mariners. It cannot do so without the active support of Cameroon (at least with information from Cameroon's main ports).	• Systematically forward to the Shom the information that will allow the nautical documents to be updated. Use emergency procedures appropriately
	• To be in accordance with the SOLAS Convention, relations between Cameroon and France (Shom) must be formalized by finalizing the draft administrative arrangement (AA) provided

21 Table 1: Summary of the National Hydrographic Capacity Assessment

IHO	EAtHC	NHC	Phase 1 Capacity	Phase 2 Capacity	Phase 3 Capacity	Notes
Member	Member	NO	Partial	Partial	NO	

TRAINING

22 Basic training of hydrographic technicians

Formation of hydrographers

The PAD must have a sufficient number of qualified hydrographic technicians.
The recommended training is offered by schools whose programmes are accredited by the FIG/OHI/ACI (International Federation of Surveyors, International Hydrographic Organization/International Cartographic Association) Category B (CAT B).
The practical training that complements the theoretical training of the schools will be carried out in a port operating dredging operations and having a hydrography department.

CAT B hydrographers will be able to train the hydrographic assistants the country needs ("CAT C") upon their return.

The priority is not to have CAT A hydrographers. This may be considered once the decision to develop national capacity (to cover all the country's waters) has been taken.

Given the number of staff to be trained (limited turnover rate) it is not appropriate to institute recurrent training of category B hydrographers on site in Cameroon. The absence of qualified trainers on site does not facilitate the organization of highly specialized training. Until approved regional training (West and Central Africa) is in place, there is currently no alternative but to enrol officers for training in hydrography schools outside the African continent. They may be French or English-speaking. The contacts that IHO has had so far in West and Central Africa have not really made it possible to identify the structures (schools, academies, etc.) that could host approved hydrographer and cartographer training courses. At most, some structures such as the ARSTM (Académie Régionale des Sciences et Techniques de la Mer) in Abidjan (Ivory Coast), the RMU (Regional Maritime University) in Accra (Ghana) and the NNHS (Nigerian Navy Hydrographic School) in Port Harcourt (Nigeria) have been identified as potentially capable of hosting courses with accredited programmes.

The IHO website lists accredited training programs:
https://www.iho.int/mtg_docs/com_wg/AB/AB/AB_Misc/Recognized_Programs.pdf

Training of cartographers

In the short and medium term, as long as a hydrographic service with national competence has not been established, it does not seem necessary to train marine cartographers at the technical (CAT B) or engineering (CAT A) level.

Pending the development of such a hydrographic service with national competence, it is essential that hydrographic information be transmitted to the charting authority responsible for the production and dissemination of nautical documentation on waters under Cameroonian jurisdiction.

On the other hand, it is necessary for port entities carrying out hydrographic surveys to have cartographic restitution facilities adapted to their internal uses.

Port cartographic restitution software (in digital format S57) now makes it possible to quickly edit electronic vector port navigation charts. A port can thus create its own port charts with a level of detail and at the pace of dredging and control works, in order to meet the needs of maritime pilots in particular. It can then be made available to them (but also to the mooring service or captains' offices) applications (GPS + vector maps) running on smartphones or tablets (e. g. PPU Portable Pilot Unit, ePilotBook). The marine pilot can thus benefit from navigation tools based on near real-time data (e.g. at the immediate end of a dredging operation and a hydrographic survey).

The acquisition of such port charting systems would be accompanied by targeted training courses in the area of interest of the Autonomous Port.

Findings	Actions
Technical level Having internalized dredging operations, in addition to a retirement, the PAD needs to train its staff in hydrography and port charting	• Train a sufficient number of hydrographers in a school whose program (theoretical training) is CAT B certified. In French or English according to language skills • Ensure that they receive practical training in a port that operates dredging and has a hydrography department. Use of partnerships that may exist with foreign ports • Train a sufficient number of hydrographers in cartographic production software (custom port vector maps)
Managerial level: senior engineering staff may have initial training away from dredging, hydrography and navigational aids activities	• Already follow the seminars that IHO organizes • Know how to specify hydrographic surveys

	and prioritize them according to the risks involved • Identify the best training courses for staff • Know how to communicate with users (maritime pilots, shipping companies), the Shom, the IHO and finally all the national stakeholders identified for the coordination committee.

Note: It is recalled that some IHO capacity building actions are reserved for member countries only. As a member of IHO, Cameroon can benefit from all courses offered under the Capacity Building Programme as long as the required conditions are met.

23 Continuing education (IHO, IALA, IOC, University of Douala, national service provider companies)

Above all, it is important to be present at the seminars that IHO organizes in the EAtHC area:

- From 21 to 24 October 2019: risk analysis, specification of surveys in Rabat (Morocco)
- End of September 2020: in Lisbon (Portugal)
- Note: it is also important to pay attention to the offers of SAIHC : Southern Africa and Islands Hydrographic Commission for its proximity

But there are other international opportunities to be seized on related themes:

- IALA training courses (for navigational aids) (contact: jacques.manchard@iala-aism.org)
- IOC formations, UNESCO Intergovernmental Oceanographic Commission (for oceanography)
- Specifically concerning the tide, the Shom organizes the "REFMAR 2019 Days" in Paris - La Défense. From 27 to 29 March 2019, they will bring together data producers and users of water level measurements (https://www.sonel.org/27-29-mars-2019-Journees-REFMAR-Paris-la-Defense.html

Where national centres of expertise exist, they should be used as a basis. We may note the potential that can be offered:

- universities such as Douala for coastal and marine environments, where complex systems such as tides in estuaries and coastal erosion phenomena need to be controlled, it may be necessary to promote upstream research efforts and then translate them into operational applications,
- training centres offering cross-functional techniques such as geomatics, GIS (Geographic Information Systems), database data management, remote sensing, land mapping, etc.

National service companies providing hydrographic services

As mutual interests are well identified, it also seems appropriate that exchanges of good practices be initiated between the services in charge of port hydrography and the service companies established in Cameroon such as LOCATECH and STUDI.

Editor
Henri DOLOU

ANNEX

Annex A: Terms of Reference of the Regional Hydrographic Commission Visit Team

Background information

IHO's Capacity Building Programme aims to coordinate the development of hydrographic surveys and marine charting for its members. It was thus decided:

- promote regional cooperation in capacity building in West and Central Africa (EAtHC: IHO Eastern Atlantic Hydrographic Commission)
- identify the potential of national and regional training centres
- to explore the possibilities of organising regional seminars

1. The technical visit team is invited to visit the country to discuss issues of mutual interest in the fields of hydrography and maritime safety information.

Preparation

2. The team members, with the assistance of the staff of the Service hydrographique et océanographique de la marine français (Shom), should plan this visit after having obtained all the necessary information from the relevant organizations at the international (IHO in particular) and national levels.

Objectives of the project

3. It is expected that the visiting team:
   a. contacts the decision-making authorities of the country visited, stressing the importance of hydrography for coastal States and therefore the need to include hydrographic activities and associated nautical charts in national plans;
   b. assesses national capacities for planning and implementing the collection and processing (restitution) of hydrographic data to enable the production of maps and publications both locally and by providing data to hydrographic services with international charting portfolios;
   c. reviews and advises on measures that can be taken to improve the capacity of nations to carry out the above;
   d. stresses the fundamental importance of a national data collection system, such as port and dredging plans and local notices to mariners, which have an impact on mariners' interests;
   e. provides advice on assistance to be obtained in close liaison with the IHO Secretariat, IMO and funding agencies in order to achieve sustainable capacity building.

Report

4. A report on the team's activities and recommendations should be submitted to the President of the RHC (Regional Hydrographic Commission) at the end of the visits.

Annex B: Contact List

First name Last name	Function	Tel (+237)	Mail
PAD	**Port Authority**	**of Douala**	
George MENYE (Cracite)	Director of Dredging and Maritime Logistics	(+237) 650 32 46 26	georgescracite.menye@pad.cm menyegeorge@yahoo.fr
Idriss BEYE	Head of the Dredging Department	690 315 099	idrissbeye@yahoo.fr
André MBONGO ELLONG	Head of Hydrography Department	+237699983104	mbongoea@gmail.com // mbongoea@yahoo.fr mbongoea@yahoo.fr
Dieudonné JOMBE SEPPO	Head of the Aid to navigation department	679 53 88 49 688 38 14 15	jombe.seppodieu@yahoo.com
Joël MBITA	Head of the dredging department	699455548	joelmbita@yaho.fr
Cyrus Ngo'o	Executive Director		
Ministry of	**Transport**		
Nicolas ENOAH FOUDA	Responsible in Douala)	670 14 09 83	foudanicolas2018@gmail.com
Navy	**Cameroon**		
Gregoire FOTSO TOGA	Commander of the Naval Officer Application and Development School	6996506665	fotsotoga@yahoo.fr
University	**Douala**		
Raphaël ONGUENE	Head of the GIELM regional master's programme	655 34 34 66	ziongra@yahoo.fr
Yannick Gervais FOSSI FOTSI	Studient (Tides)		yannick.fossi.fotsi@externes.shom.fr
IALA			
Peter ZANGA ZAMBO	Environment and lighthouses and beacons in Douala		zang_peter@yahoo.fr
Embassy	**France**	**Yaoundé**	
Commander Sébastien CHATELAIN	Defence cooperation mission to Cameroon. Marine Technical Advisor	(+237) 242 19 48 31 - 698 80 57 40	ce.marine_csid@yahoo.fr sebastien.chatelain@cameroon-navy.cm
Shom	**France**	**(+33)**	
Henri DOLOU	Expert	(0) 6 86 15 14 82	henri.dolou@shom.fr
Vincent LAMARRE	Head of the External Relations Division	(0) 2 56 31 97 81 / (0) 6 03 20 13 77	dmi-rex-d@shom.fr vincent.lamarre@shom.fr

Annex C: Agenda - Events

Hourly Date	Subject - Institution concerned	Contact Information
Wednesday 13/02/19		
18h55	Arrival at Douala airport from Libreville	H Dolou
Thursday 14/02/19		
	University of Douala IUT: University Institute of Technology Training and employment" forum of the *regional master's degree in Integrated Coastal and Marine Environment Management (GIELM)* Interviews with the Director of Dredging and Maritime Logistics	Raphaël Onguene (University) (+Ird: Research Institute for Development) (+ AUF: Agence Universitaire de la Francophonie) George MENYE (Director)
Friday 15/02/19		
Morning	Ministry of Transport / River and Lake Douala Maritime District	Nicolas ENOAH FOUDA Idriss BEYE
Afternoon	Autonomous Port of Douala (PAD) Department of Dredging and Hydrography Hydrographic service (including exit in the harbour)	Idriss BEYE André MBONGO ELLONG (and his team)
Saturday 16/02/19		
Morning	Debriefing of the visit	Idriss BEYE George MENYE
23h55	Departure flight AF 953 to Paris	Mr. Henri Dolou
Sunday 17/02/19		
	Return to France	

Annex D: Photos

University of Douala
Coastal and marine issues

University Institute of Technology
Forum

Ministry of Transport
Douala river and lake maritime district

Port Authority of Douala
Dredging and Maritime Logistics Directorate
Department of Dredging and Hydrography
Hydrographic Service

Annex E-1: IHO Publication P5 – Yearbook

Cameroon / *(Cameroun*

Country information / Informations sur le pays / Información sobre el país

-Declared National Tonnage **-Tonnage national déclaré** **-Tonelaje Nacional Declarado**	12 259 046 tons (2016)
-National day **-Fête nationale** **-Fiesta naciona**	20 May
- Date ratification IHO Convention **- Date ratification Convention OHI** **- Fecha ratificación Convención OHI**	0/04/2012
- Remarks on membership **-Remarques sur l'adhésion** **-Comentarios sobre la adhesión**	Membership suspended from 01/01/2017 to 13/02/2017

Official Representative to IHO (as designated by Member Government)
Représentant officiel à l'OHI (tel que désigné par le Gouvernement Membre)

PORT AUTONOME DE DOUALA (PAD)
Mandaté par le ministère des relations extérieures
Direction du dragage et de la logistique maritime

Contact information / Informations de contact / Información de contacto

- National Hydrographer or equivalent **- Hydrographe national ou équivalent** **- Hidrógrafo Nacional o equivalente**	General Director of the Port Authority of Douala Mr Cyrus NGO'O Postal address: Direction du dragage et de la logistique maritime BP 4020, DOUALA, Cameroon Tel: + 237 233 42 01 33 Fax: + 237 233 42 67 97 E-mail: pad@portdedouala-cameroun.com
- Other point(s) of contact **- Autre(s) point(s) de contact** **- Otros punto(s) de contacto**	Responsable administratif auprès du directeur général : • Faustin DINGANA, Chef de la Division des analyses, de la prospection et de la coopération ○ faustindingana2000@yahoo.co.uk ○ (+237)678005515 Direction du dragage et de la logistique maritime : • M Georges MENYE Directeur ○ georgescracite.menye@pad.cm ○ menyegeorge@yahoo.fr ○ (+237) 650 32 46 26 Département du dragage et de l'hydrographie • M Idriss BEYE ○ idrissbeye@yahoo.fr ○ (+237) 690 315 099
- Web site **- site web** **- sitio web**	http://www.portdedouala-cameroun.com

Agency information / Information sur l'agence / Información sobre la agencia

- Top level parent organization **- Organisme mère** **- Organización asocieda de nivel superior**	Ministère des transports
- Principal functions of the organization or the department **- Attribution principales de l'organisme ou du département** **- Principales funciones de la Organización o el departamento**	Hydrographic surveys, Tidal observations, Participation in studies and work in connection with waterways, channels and port areas (topography, dredging, hydrography, bathymetry, etc) Levés hydrographiques, observations de la marée et participation aux études et travaux des voies d'eau, chenaux et plans d'eau (dragage, topographie, hydrographie, bathymétrie, etc.).
-Annual operating budget **-Budget annuel** **-presupuesto anua**	161.000.000 EURO
-Total number of staff employed **-Effectifs totaux** **-Número total de personal empleado**	850
-Total number of paper charts published **-Nombre total de cartes papier publiées** **-Número total de cartas de papel publicadas**	90 survey sheets Approach channel to the port of Douala, port areas of Douala, Kribi, Limbe, Tiko. Chenal d'accés au port de Douala, plan d'eau aux ports de Douala, Kribi, Limbe, Tiko.
-Other information of interest **-Autres informations utiles** **-Otra información de interés**	Les cartes marines papier, les cartes électroniques de navigation et les autres publications nautiques (livres des feux, annuaires des marées, instructions nautiques …) sont réalisées par des pays tiers. La France (Shom : Service hydrographique et océanographique) est responsable cartographique

Annex E-2: EAtHC Contact List

LIST OF CONTACTS IN EAtHC MEMBERS (MS), ASSOCIATED MEMBERS (AM) AND OBSERVERS (OB)

Liste des contacts dans les Etats membres, membres associés et observateurs de la CHAtO

(as known of February 2019 / tels que connus en février 2019)

Note : Names of focal points have been emphasized in yellow/ *Les noms des contacts principaux ont été surlignés en jaune*

Obsolete E-mail

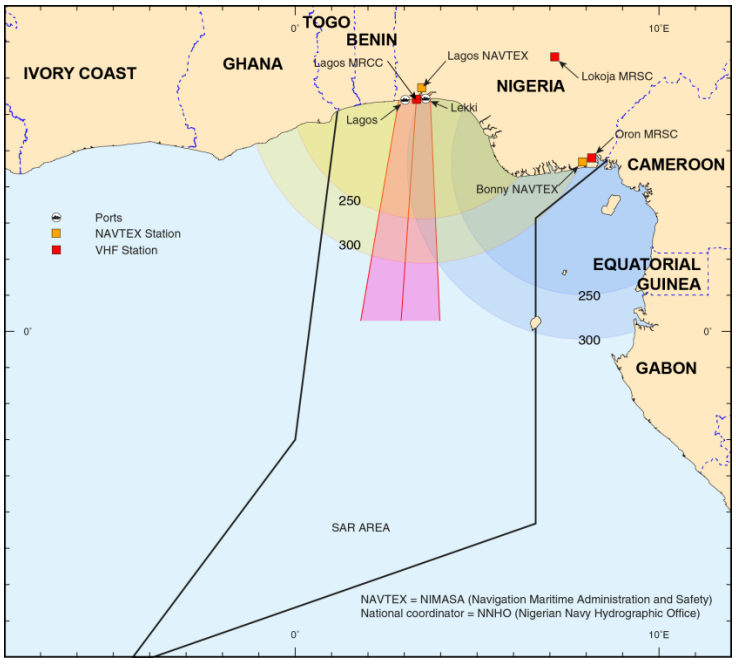
I. EAtHC Member States / Etats Membres de la CHAtO	Name / Nom	Role/Fonction	Institution	Tel, Fax & E-mail
Cameroon/Cameroun	M Cyrus NGO'O	Directeur Général	Port Autonome de Douala : PAD	Tel : + 237 33 42 01 33 Fax : + 237 33 42 67 97 E-mail: pad@portdedouala-cameroun.com
	M Georges MENYE	Directeur du dragage et de la logistique	PAD	○ (+237) 650 32 46 26 ○ georgescracite.menye@pad.cm ○ menyegeorge@yahoo.fr
	M Idriss BEYE	Chef du département du dragage et de l'hydrographie	PAD	○ (+237) 690 315 099 ○ idrissbeye@yahoo.fr
	M Njombe Sepo Dieudonné	Chef service Balisage	PAD	○ (+237)679538849 ○ Jombe.seppodieu@yahoo.fr
	M Patrice MELOM	Directeur Général	Port Autonome de Kribi : PAK	

Annex F: AVURNAV Coastal in West Central Africa - Substitution of NAVTEX by SafetyNet

Reference to be consulted: "Dissemination of Maritime Safety Information (MSI)" at:
http://www.iho.int/mtg_docs/rhc/EAtHC/EAtHC15/EAtHC15-07.5A-Perspectives_NAVTEX.pdf

1. While the normal and regulatory means of disseminating coastal warnings is NAVTEX, setting up stations (Liberia, Nigeria, Ghana) or keeping them operational (Cape Verde, Senegal, and even CORSEN in France) seems to be a financial, technical, organizational and human challenge.
2. Faced with these difficulties, some countries are tempted to declare their coastal waters as A3 and thus broadcast by SafetyNET instead of NAVTEX stations (Ghana, Nigeria).
3. Given the limited number of coastal warnings, the provisional emitting by the NAVAREA II coordinator by SafetyNET, until NAVTEX stations are set up or until countries are declared A3, seems the most pragmatic solution. This provision, which is already being applied for Senegal and Nigeria, could be proactively offered to other countries. This is what the Americans are doing for NAVAREA IV and XII areas, where the problems are similar with many states that do not have stations. Coastal States shall send to the NAVAREA coordinator their draft coastal AVURNAVs which are issued in the form of NAVAREAs after control of substance and form (local AVURNAVs must be issued locally by radiotelephony as provided for in the IMO regulatory texts).

An example: Nigeria



In the absence of NAVTEX stations it is possible to issue coastal warnings by SafetyNET. This can be done in two ways.

- Officially and permanently:
  A country can choose to declare itself to the IMO in zone A3 instead of A2, and broadcast by SafetyNET instead of NAVTEX. This is the choice France made for its 5 overseas national delegate coordinators, certainly for reasons of convenience and because of the size of the maritime areas concerned.
- On an ad hoc and transitory basis:
  The ultimate objective remains to distribute by NAVTEX. In the meantime, emissions are made by SafetyNET.

The constraints between its two options are not the same.

SafetyNET Solution Nigeria declared A3

The procedure for declaring a country in zone A3 to the IHO (WWNWS) goes through the following steps:

- Declaration in zone A3: This step includes the definition of an area (corresponding to SafetyNET coverage), an identification letter (for receiver selection) and the determination of shift schedules. All specialized publications related to GMDSS (such as radio signal books) should be corrected. The INMARSAT receiver software will have to be modified to integrate this new zone.
- Staff training: the NAVAREA II coordinator will have to ensure the training of MSI operators.
- Emission control: Nigeria will need an Inmarsat C receiving chain to control its emissions.
- Establishment of a contingency plan: Preventive measures to be defined in the event of equipment damage (local or external back-up, emissions via NAV II).
- MSIP (Maritime Safety Information Provider) certificate: obtained from IHO, the first steps have been taken.
- SafetyNET access contract: contract to be concluded directly with Inmarsat or through a service provider for SafetyNET access.

This procedure is evaluated over several months (1 year or more) and involves the IMO, the NAVAREA II coordinator, Nigeria and Inmarsat (or intermediate provider).

TRANSITORY SafetyNET Solution

Pending an official solution of type A2 (NAVTEX) or A3 (SAFETYNET), Nigeria's coastal warnings may be issued by the NAVAREA II Zone Coordinator according to the following principles:

- Drafting of coastal warnings by NNHO (Nigeria Navy Hydrographic office) MSI cell in accordance with the MSI manual;
- Sending coastal warnings by email to the NAVAREA II coordinator;
- Controls by the NAVAREA II coordinator and integration of warnings into the 04h30z and 16h30z shifts;
- Technical inspection of the emission by the NAVAREA II coordinator;

This procedure has been effective since May 2018 for Nigeria. It has also been in place for Senegal since 2012.