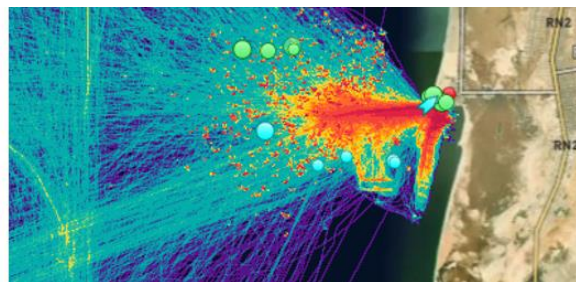
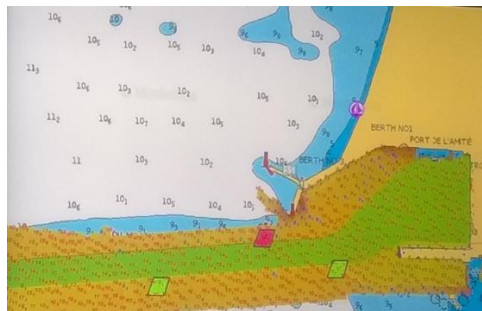




IHO - Capacity Building Work Programme TECHNICAL VISIT IN MAURITANIA REPORT 16 - 20 January 2023



Our thanks to :



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et des Pêches :



Port Autonome de
Nouakchott dit "
Port de l'Amitié " :



With the concours of :



Service hydrographique
et océanographique de
la marine (France)



Secrétariat de l'OHI
(Monaco)

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ABSTRACT

Since the last Technical Visit in 2002, little significant progress has been observed. The development of Mauritania in terms of hydrography and nautical cartography must be completely reviewed:

- first by supporting two organizations that have demonstrated responsibilities and ambitions in terms of navigation safety and the maritime economy: **AMAM** (Mauritanian Agency for Maritime Affairs, IMO contact point) and **MN** (Marine Nationale, IHO contact point);
- through an all-encompassing approach integrating, in addition to hydrography: physical oceanography, integrated management of coastal zones, nautical cartography, fishing, State Action at Sea;
- by also mobilizing actors other than those of Maritime Affairs and the Mauritanian Navy (environment, oceanographic research, land mapping and university training) with very related interests who can only play win/win by cooperating together on shared projects possibly with pooled resources and skills;
- provided that all the institutional and operational actors can meet at least in a **National Coordination Committee**, allowing to efficiently share issues, projects, human and material resources and finally results for socio-economic purposes.

The creation of a **National Hydrographic Service** as well as **membership of the IHO** are among the strong wishes expressed by Mauritania.

This report does not claim to be exhaustive, there are certainly potentialities which have not been inventoried and which should have been considered, it nevertheless offers some recommendations which are based on successful experiences elsewhere in Europe and Africa.

Concerning maritime navigation, with regard to ratified international conventions, in particular SOLAS (providing hydrographic services in order to establish and disseminate the information and nautical documentation necessary for the safety of navigation in its waters), the capacities of Mauritania are in terms of development:

- **not very active for phase 1:** collection and transmission of **maritime safety information/nautical information** (MSI) to NAVAREA II. The transmission of corrections to nautical publications, in particular nautical charts to the Shom, is only too occasional;
- **not acquired for phase 2: hydro-oceanographic surveys** through the acquisition and archiving of data. **Above all, it is necessary to be able to verify or correctly specify the depths of the port areas and their access;**
- **not acquired for phase 3,** namely the **production of official nautical charts.** A Franco-Mauritanian co-edition may be formally set up (SOLAS agreement) within the framework of an **Administrative Arrangement.**

This report includes a set of findings and proposals for action. To make it more accessible, it can be broken down to be the subject of targeted actions. The National Coordination Committee to be set up will be able to distribute and plan the tasks between its various stakeholders: **roadmap**

MAIN COMMENTS, RECOMMENDATIONS

The majority of the recommendations are to be followed within the National Coordination Committee and therefore to be included on the agenda of the first meetings.

Object	Comments – Recommendations
	Phases 1,2,3 of development
Phase 1 development Maritime Safety Information (MSI)	<ul style="list-style-type: none"> • Clearly identify all the players in the maritime world who can provide nautical information and benefit from it: National Navy (MN), Mauritanian Coast Guard (GCM), Operators of the General Directorate of Hydrocarbons (DGH), Mauritanian Institute for Oceanographic Research and Fisheries (IMROP), ports (particularly pilots), shipping companies, fishing, Mauritanian Agency for Maritime Affairs (AMAM) • In order to consolidate the current execution, in accordance with the international regulations (IMO-IHO) and the national texts, specify by an interministerial instruction the methods of the collection and the diffusion (urgent, fast, deferred) of the information nautical (MSI: Maritime Safety Information): a coordinated action of the AMAM and the MN which has means of observation and communication • The main ports (Nouadhibou, Tanit, Nouakchott, N'Diago) must be responsible for issuing local AVURNAVS • Note: these recommendations can complement those that IALA can express on its side on aids to navigation
Phase 2 development Hydro-oceanographic surveys from data acquisition to archiving	<ul style="list-style-type: none"> • Identify all national needs (with socio-economic issues) in terms of surveys [Ports, representatives of the State at sea for safety and security (GCM, MN), petroleum, oceanography, coastal environment, etc.] and prioritize them • Identify all the possibilities of pooling equipment resources (ships/boats) (GPS, echo sounders, tidal observatories) and human resources (geomaticians, hydrographers, oceanographers, cartographers, computer scientists, logisticians, managers). It will be necessary: <ul style="list-style-type: none"> ○ equip with a portable system (inter-region and port employment) for port hydrography (a single-beam sounder in shallow waters should suffice initially) ○ to train more hydrographers for the acquisition of hydro-oceanographic data: that of IHO certified category B hydrographer is strongly recommended • Concerning boats an embarkations Mauritania is not deprived of them with those of the National Navy, the GCM and the IMROP

	<ul style="list-style-type: none"> • Logic leads to the creation of a National Hydrographic Service: the MN has strongly expressed its intention to do so
Phase 3 development Cartographic production	<ul style="list-style-type: none"> • The publication of nautical charts with Shom must now be conceived within the framework of a France/Mauritania co-production to be formalized, as advised by the IHO, in an Administrative Arrangement (a completed project is circulating). Charts of Mauritania will then feature the logo of the country's Hydrographic Service • It is nevertheless logical and necessary for Mauritania to be able to gradually gain autonomy and already respond independently to specific cartographic needs such as sovereignty maps of State Action at Sea or those of marine protected areas • It is therefore necessary to clearly identify the capacities already existing in the country (eg: Directorate of Cartography and Geographic Information (DCIG), cartographic service of the armies, DGH, etc. in terms of geomatics in order to pool them through projects common • Constitute a national database with the objectives of collecting, qualifying and making available hydrographic and oceanographic data (depths, tides, nature of the bottom, topography of the coast, landmarks, beaconing, etc.). This database must be initialized with existing data (including historical data from Shom). These are very numerous offshore: extension of the continental shelf (UN /DOALOS), oil, IMROP surveys of the continental slope, etc. • Designate one or more national referents by type of data • Produce a first support map for maritime public policies: meet the needs of State Action at Sea (institutional limits, EEZ, continental shelf extension, fishing zones, marine protected areas, etc.) • Training of new expert agents in nautical cartography: that of IHO-certified nautical cartography preparer of category B will deserve to be followed once the development of phase 2 (hydrographic surveys) has been completed.
	International relations: IHO, Régional/EAtHC, France
Involvement in the Regional Hydrographic Commission (EAtHC)	<p>Be present at the regional level</p> <ul style="list-style-type: none"> • Participer à la prochaine CHAtO (18ième) plénière de 2024 qui aura lieu au Maroc (Casablanca les 15, 16 et 17 mai) • https://iho.int/fr/commission-hydrographique-de-l-atlantique-oriental • En particulier participer au séminaire hydrographique qui précédera (13 et 14 septembre 2022) au même endroit.

	<ul style="list-style-type: none"> • Participate in the next EAtHC (18th) plenary of 2024 which will take place in Morocco (Casablanca on May 15, 16 and 17) • https://iho.int/en/eastern-atlantic-hydrographic-commission • In particular participate in the hydrographic seminar which will precede (13 and 14 September 2022) at the same place. • Point of contact : henri.dolou@shom.fr
Administrative Arrangement (AA) with France	<ul style="list-style-type: none"> • This arrangement has been proposed. It will allow Mauritania to be in compliance with SOLAS. Even more, it will offer the conditions for the development (until its autonomy) of hydrography and nautical cartography of the country, in particular through training;
Surveys - results: Updating nautical charts	<ul style="list-style-type: none"> • It is fundamental (quality of SOLAS charts) to provide Shom with all available data (port surveys, new infrastructures, offshore surveys, etc.) accompanied by quality files (metadata on the means used during the survey). This fundamental work will allow Mauritania to develop its national hydrographic database • Contact all the "operators" who may have survey data and send them to Shom with the metadata (parallel archiving of these data in Mauritania) • It should be noted that without the explicit authorization of the owners of the data, their use by the Shom is restricted to updating nautical charts. They are neither disseminated nor used in other products without the express written consent of the owners.
	Mauritania
Creation of one or more national databases	It is essential that Mauritania archives all the data mentioned above in a sustainable manner for free and shared valorization
Government (Interministerial)	<p>Develop a national framework: the National Coordination Committee (Aids to Navigation, Hydrography, Physical Oceanography, Marine Cartography) [Name and acronym to be defined]</p> <p>This committee would make it possible to efficiently share issues, projects, human and material resources and finally results.</p> <p>The following institutional and/or operational actors will be particularly involved: MN, AMAM, IMROP, GCM, PORTS, DGH, environment, fishing, University when training and research are put in place for the sea and the coast (marine geosciences) ...</p>

	This is a committee with interministerial competence. At the same time, set up a National Hydrographic Service (designation of the Ministry that will host it) and provide it with the means
Navy Marine Nationale	<ul style="list-style-type: none"> • The Navy has many advantages: <ul style="list-style-type: none"> ▪ Ability to observe (or collect) nautical events at sea, to decline Maritime Safety Information (MSI) and disseminate it ▪ Ability to identify the navigation needs of users (all) of the country and specify the nautical documents (nautical charts, tide tables, notice to mariners, etc.) necessary ▪ Ability to implement floating means (nautical capacities) which can be equipped (with funding) with hydro-oceanographic data acquisition systems ▪ Some hydrographic staff already trained in approved schools (+ provisional plan for new training), etc. • It is one of the entities able to host a National Hydrographic Service (natural correspondent of the IHO)
AMAM Maritime Affairs	<ul style="list-style-type: none"> • Recently created, this agency, corresponding to the IMO, plays an essential role in matters of maritime navigation; • As a regulatory actor for the State, it must, in connection with the Navy, be able to prepare an instruction of interministerial scope which would specify the methods of collection and dissemination (urgent, rapid, deferred) of nautical information (MSI : Maritime Safety Information). This instruction would consider international regulations (IMO-IHO) and existing national texts.
	Formation
Basic training (CAT B) for technicians in hydrography or cartography	<p>Training in hydrography (data acquisition) remains fundamental and a priority (before that in cartography)</p> <p>A request for training in this direction should be relaunched with Spain (IHM) which has already trained CAT A and CAT B and France (Shom and ENSTA Bretagne) which can also train them.</p> <p>With regard to France, it will be advisable to approach its embassy (defence mission), in Nouakchott, in order to include this request in the cooperation plan (CAT B).</p> <p>CAT A training is of course encouraged.</p>



Fishing fleet at the port of Tanit



Unloading at the port of Nouakchott

MAIN CONTINUOUS ACTION

Above all, Mauritania must maintain permanent relations with the NAVAREA II coordinator, who is also the cartographic authority for Mauritanian waters (France/Shom), so that the MSIs (Maritime Safety Information) are distributed in time to navigators (e.g. via SafetyNet in the event of an emergency) and that nautical documents (e.g. nautical charts) are updated at the appropriate frequency (e.g. sailing directions, new editions of charts).

Transmission MSI :

coord.navarea2@shom.fr or coord.navarea2@gmail.com (Emergency email address)
Tel: +33 2 56 31 24 24 24 (D7 - H24) and (GSM) +3 6 24 80 08 92 Fax: +33 2 56 31 24 84

Non urgent nautical information :

Surveys, plans of port : bri@shom.fr / copy : na-om@shom.fr and dmi-rex-d@shom.fr

Other nautical information

na-om@shom.fr or dops-psm-na-omer-infonaut@shom.fr / copy : bri@shom.fr and dmi-rex-d@shom.fr

Adresse Postale adresse :

Département « Informations et Ouvrages Nautiques »
Service hydrographique et océanographique de la marine (Shom) 13 rue du Châtellier
CS 92803 - 29228 BREST CEDEX 2 FRANCE

HYDROGRAPHIC SURVEYS IN MARCH-APRIL 2023: SPECIFIC RECOMMENDATIONS

The Technical Visit was an opportunity to introduce the bathymetric campaign that Shom (French hydrographic vessel *Laplace*) will carry out in Mauritania in March-April 2023.



Laplace



Hydrographic Launch

This is a major operation that goes beyond simple one-off hydrographic surveys to update nautical charts. This operation is also part of a framework of technical exchanges and capacity development. It also involves work at sea in the context of the restructuring of Mauritanian maritime affairs and the creation of a national hydrographic service, not to mention the stated desire to join the IHO.

It is important to see that the conditions will be met to now co-publish official nautical charts (signature of the SOLAS Administrative Arrangement). This can only be done by carrying out data and information exchange flows based on a network of actors who know each other and work together (maritime pilots, navy, Coast Guard, ports, Mauritanian maritime affairs agency, institute of oceanography IMROP, Shom...).

At the hydrographic level (phase 2 of development of hydrography) the venue of the *Laplace* must be an opportunity to bring together hydrographers from the two countries.

It is more particularly asked to the hydrographer LV Sidi Abdalla CAT A of the Mauritanian Navy [(+222) 33 10 00 00] and the hydrographer engineer Alban Lalanne CAT A of Shom [(+33) 6 32 97 86 61] to concert to bring together the best conditions for the success of the mission.

This ranges from the exchange of existing bathymetric data to the inventory of hydrographic datums of survey areas. This before the arrival of *Laplace*!

Everyone should be aware that it would be regrettable to devote time of ships or hydrographic launches in areas where the bathymetry is sufficiently known (data and metadata). Rear Admiral Mohamed Cheikhna TALEB MOUSTAPH, Chief of Staff of the Navy, reminded us that it was necessary to optimize the use of resources in order to carry out important work which would otherwise not be undertaken for lack of time.

The arrival of the *Laplace* should also be an opportunity to present equipment, their conditions of use and maintenance within the framework of the development of the future Mauritanian hydrographic service.

To be done same time:

1. The Mauritanian Navy begins to play the fundamental role of a National Hydrographic Service (and is recognized as such) of managing all the country's bathymetric data for the benefit of all the organizations that need it (navigation, oceanographic studies, environment, soil and subsoil exploitation, etc.). We are talking about databases here. They are the ones that will be able to accommodate the 2023 data from *Laplace* and all those already available to Shom.
2. Make available to all navigators in the country nautical documents (or data) likely to consolidate its issues of blue economy, safety, security, etc. as defended during the Technical Visit.

The recent data (not exhaustive) already identified during the VT are as follows:

- Survey of the Spanish Navy in Nouakchott
- Considerable survey of the entire continental slope as it appears in IMROP documents encountered during the VT (Mauritania Institute for Oceanographic Research and Fisheries). Preview on the map relating to coral reefs on: <https://www.imrop.mr/recif-corallien-en-mauritanie/>. It is also noted the presence of a "Wolof" seamount discovered about 90 km south of Nouakchott (200 m above the seabed)!
- Surveys of oil operators (Direction Générale des Hydrocarbures met during the VT)
- Surveys resulting from the creation of new ports in particular N'Diogo (a bathymetric survey to control existing bathymetries could be sufficient) (beware of hydrographic zeros as LV Sidi Abdalla pointed out)

INTRODUCTION

1 Preparation of the technical visit - Background

The visit was planned as part of the IHO Capacity Building Program for the year 2023:

- *CBWP 2023: action A-01 - «Technical Visit to Mauritania».*

It was initiated in close relationship with Lieutenant Sidi Abdalla, Head of the National Navy Operational Center (MN/COM).

The terms of reference of the visit are recalled in Annex B.

2 Composition of the team

The visiting team consisted of:

<u>Name</u>	<u>Role</u>
Henri DOLOU	Project manager at Shom for African affairs (France on behalf of the IHO)

Were closely associated:

- Lieutenant d Sidi Abdalla already mentioned (participation in all visits)
- Commander Stéphane Congues, technical military adviser to the Navy Chief of the Navy Staff (Mauritania)

The involvement of Rear Admiral Mohamed Cheikhna TALEB MOUSTAPH, Chief of the Navy Staff, was decisive.

PART A – OVERALL ASSESSMENT OF THE SITUATION IN REGION

3 Efficacy of the Technical Visit

Many intentions were formalized during the Technical Visit.

In a strong way, the Mauritanian Navy has expressed its desire to create a **National Hydrographic Service**. The conditions under which this can be conceived have been discussed and are detailed in this report.

Already a member of IMO, the country also wants to **join IHO**.

The importance of creating a **National Hydrographic Committee** is understood.

As well as the importance of a **“SOLAS” Administrative Arrangement** with France which will also serve as a basis for the gradual transfer of skills. The official nautical charts of Mauritania will thus be able to be co-produced by France and Mauritania (coat of arms of this country on the charts).

As pointed out by one of the representatives of the General Directorate of Hydrocarbons, this requires a "roadmap" to be drawn up at the end of the Technical Visit and based on this report. It will then be possible to integrate all the issues related to hydrography: navigation to ports, of course, but also: marine environment, control of coastal risks, oceanography, sea bottom exploitation, education, etc.

The follow-up of actions (to be included in the roadmap) resulting from written recommendations will make it possible to measure the real effectiveness of the visit in the long term. However:

- That it could have been prepared prior to the trip through exchanges and analyzes of existing reports and texts;
- That the issues of hydrography, oceanography and cartography have been addressed. However, this is essentially in terms of maritime navigation. Issues specific to the marine environment, research and training have not been addressed for lack of time;
- The following appointments were held (chronological order – appendix E specifies the main authorities met):
 1. Navy - Marine Nationale (**MN**) :
 - a. Operation Center - Centre Opérationnel de la Marine (**COM**)
 - b. Navy General Staff - État-Major de la Marine (**EMM**)
 2. General Directorate of Hydrocarbons (**DGH**) of the Ministry of Petroleum, Mines and Energy (**MPME**)
 3. Mauritanian Agency for Maritime Affairs (**AMAM**) of the Ministry of Fisheries and Maritime Economy (**MPEM**)
 4. Autonomous Port of Nouakchott known as Port de l’Amitié (**PANPA**) of the Ministry of Equipment and Transport (**MET**)
 5. Port of **TANIT** (visit)
 6. Mauritanian Institute for Oceanographic Research and Fisheries (**MROP**) of **MPEM**
- That a restitution meeting (conclusions – recommendations) at the end of the visit could take place at the Navy General Staff (introduced by the Chief of Staff) with the following stakeholders: MN, AMAM, DGH.

A trip to Nouadhibou would certainly have made it possible to broaden hydrographic awareness in connection with SOLAS obligations. Interviews with maritime pilots could also have improved this report. The Technical Visit nevertheless made it possible to meet a local maritime transport operator necessarily interested in improving nautical documentation: CMA CGM.

Reusable communication media have been provided bearing:

- On issues and governance (institutional context);
- On hydro-oceanography-marine cartography (challenges and professions);
- On the current description, in Mauritania, of the development (according to IHO standards) of hydrography and nautical cartography;
- Finally, on the main lessons learned immediately at the end of the Technical Visit.

The discussions were professional and constructive. Recommendations have been made. Some of them, shared during the summary meeting, can be carried out in the short term, such as:

- In accordance with international regulations (IMO-IHO) and national texts, specify by an interministerial instruction the methods of collection and dissemination (urgent, rapid, deferred) of nautical information (MSI: Maritime Safety Information) for all waters under Mauritanian sovereignty.
- When *Laplace* Hydrographic survey ship comes to exchange (sharing of existing data in Mauritania and *Laplace* surveys that comply with international standards) to improve, as a matter of priority, through the updating of nautical charts, the conditions of access to the two new ports of Tanit and N'Diogo. Take advantage of these exchanges to gain skills.



Tanit



N'Diogo

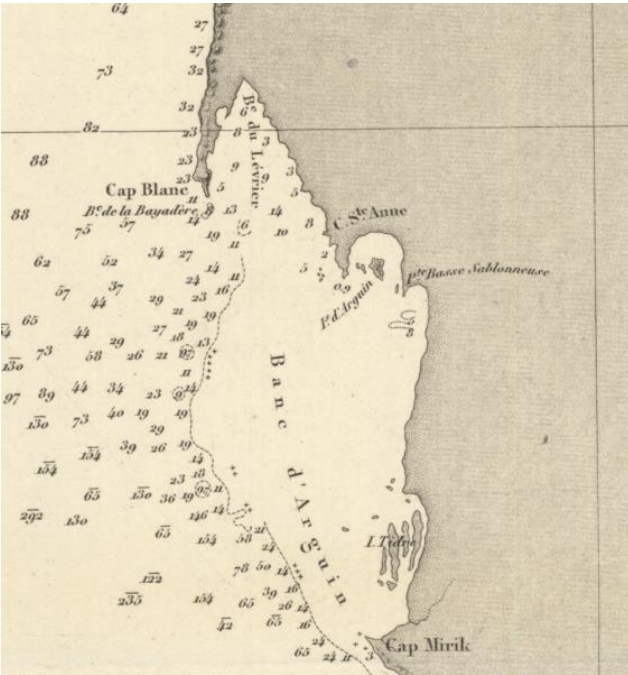
- Develop a national coordination body for Hydrography, Physical Oceanography, Marine Cartography and Aids to Navigation that is multidisciplinary and inter-ministerial;
- Continue to participate in meetings, work and seminars of EAHC (Eastern Atlantic Hydrographic Commission);
- Mobilize to master the processes of data acquisition (hydro-oceanographic), their qualification, storage, sharing, dissemination, etc. It is advisable to quickly equip a portable integrated system of hydrography (Bathymetry) by shallow waters to have capacities allowing to intervene in the ports and their access as well as the zones by shallow waters not yet surveyed.

It should be noted that the technical exchanges focused on the obligations of the SOLAS convention (chapter V) as well as on the expected socio-economic benefits. As such, hydrographic investments can generate very substantial and very rapid financial savings, in particular via:

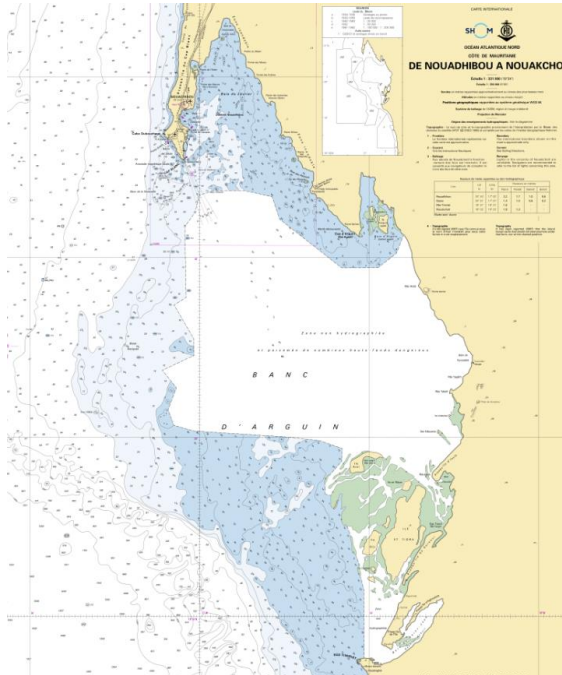
- minimization of dredging operations;
- optimization of ship loading;
- the reception of new vessels with greater capacities but with much more demanding dimensions in terms of navigation constraints.

They also focused on the expected benefits in terms of the marine environment, particularly at the land-sea interface (coastal development – coastal protection).

For the record (Nouadhibou, Banc d'Arguin):



1870



1998

4 International and regional cooperation – Defense


a. [International and Regional Organizations]

OHI/IHO Status	Regional Hydrographic Commission	OMI/IMO	AISM/IALA
Non Member	Associated member CHaTO/EAtHC	Member	Non Member

b. [Defence and security arrangements]: Topic not covered during the visit.

PART B – MAURITANIA – ASSESSMENT

5 Involvement in the Regional Hydrographic Commission (EAtHC)

Constats	Actions
<p>In recent years, Mauritania's participation in EAtHC meetings has been very low. The country was nevertheless represented by the Navy during the EAtHC (17th) plenary which took place in Cape Verde (September 28, 29 and 30, 2022)</p>	<ul style="list-style-type: none"> • Participate in the next EAtHC (18th) plenary of 2024 which will take place in Morocco (Casablanca on May 15, 16 and 17) https://iho.int/fr/commission-hydrographique-de-l-atlantique-oriental
	<ul style="list-style-type: none"> • In particular participate in the hydrographic seminar which will precede (13 and 14 September 2022) at the same place. • Point of contact : henri.dolou@shom.fr

6 Preliminary liaison

The visit was mainly prepared through discussions with the Mauritanian Navy and the collection of open information on the Internet.

Shom was consulted as:

- NAVAREA II Coordinator (permanent role);
- EAtHC Capacity Development Coordinator (permanent role);
- International chart Portfolio Coordinator for Region G (permanent role);
- Producer of hydrographic surveys (occasionally);
- Producer (he could become a co-producer with Mauritania) of nautical charts and nautical publications (permanent role).

Shom provided copies (GeoTiff and paper charts on site) of the nautical charts listed in Appendix H.

7 Technical Visit contact Points – IHO Focal Points (P5-Yearbook)

The Technical Visit contact points are listed in Appendix D.

Concerning the IHO publication P5 an update is necessary: it is provided in annex G.

Current IHO Yearbook reference (page 310):

https://iho.int/uploads/user/pubs/periodical/P5YEARBOOK_ANNUAIRE.pdf

The update includes the two organizations previously mentioned in P5, namely the Directorate of the National Navy and the Directorate of the Merchant Navy, which have become: National Navy (MN) and Mauritanian Agency for Maritime Affairs (ANAM).

Current names and correspondents are listed there. Membership of the IHO and the appointment of state and technical officials to the new national coordination committee (Hydrography, Physical Oceanography, Cartography, Aids to Navigation) will eventually lead to a review of these representations.

Links IHO :

- Yearbook/P-5 : https://iho.int/uploads/user/pubs/periodical/P5YEARBOOK_ANNUAIRE.pdf
- EAtHC : <https://iho.int/en/basic-commission-documents-2>

DESCRIPTION OF MARITIME ACTIVITIES

8 National Maritime Affairs - Actors

The duration of the visit (4 working days) made it possible to meet important players in the maritime transport chain. Due to lack of time, he nevertheless has missed a meeting with maritime pilots and, to be more exhaustive, the visit to the ports of Nouadhibou.

The talks focused on the issues associated with hydrography: beyond safety of navigation (international commitments – SOLAS), socio-economic performance through port capacities for receiving ships (including larger ones) and the optimization of their loading (through the depths shown on the nautical charts).

It was recalled that hydrography is an applied science dealing with the measurement and description of the physical elements of the seas and coastal areas. That its mastery necessarily intervenes in coastal protection (coastal development) thus underlining the transversal character of hydrography (physical oceanography is part of it) and consequently, at the governmental level, its interministerial ambition.

In terms of capabilities, according to the IHO criteria (The three phases: maritime safety information, surveys, cartography), the levels of development, according to IHO, are described in the chapter “PROPOSAL FOR COORDINATION AND DEVELOPMENT OF CAPACITIES”.

8.1 Main players

8.1.1 Navy - Marine Nationale (MN)	
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Sources : exchanges of 17,18,19 et 20 January 2023 et Internet

The Navy (MN) is under the supervision of the Ministry of National Defense.

Its missions are to ensure national sovereignty within the limits of the maritime zones provided for by the national and international rights of which the Islamic Republic of Mauritania avails itself, to participate in national development through the surveillance and control of fishery resources and to carry out humanitarian operations (rescue at sea). The protection of maritime and river coasts is part of its missions.

In the marine field, the Navy strives to ensure compliance with ratified international conventions and more generally the provisions relating to the exploitation of the marine environment, maritime navigation and the fight against pollution.

Regarding hydrography, the issues are as follows:

- The availability and quality (including updating) of national nautical charts (SOLAS obligation). The current provisions (French charts) should be changed by formalizing them (“IHO” recommendation) within the framework of an Administrative Arrangement (AA) Mauritania/France. AA to be completed in order - already - to move towards a Franco-Mauritanian co-edition of the charts (Mauritania, Shom and OHI logos).

- The involvement of the Navy in the national hydrography. This involvement could lead to the creation of a Mauritanian Hydrographic Service
- The establishment and participation in a NHC(National Hydrography Committee) which could extend its mandate to (physical) oceanography and nautical cartography.
- Representation of Mauritania at IHO (International Hydrographic Organization)

Note: The *Laplace* mission (Shom Hydrographic survey ship/France) in 2023 in Mauritania will allow the sharing of data and experience (including the embarkation of Mauritians)

<p>8.1.2 Mauritanian Agency for Maritime Affairs (AMAM)</p>	
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Sources : exchanges of 18 and 20 January 2023 and Internet

AMAM (founded in 2022) is under the supervision of the Ministry of Fisheries and Maritime Economy (MPEM).

It is a public establishment of an industrial and commercial nature, endowed with legal personality and financial autonomy, and invested with a public service mission.

AMAM replaces the Directorate of the Merchant Navy.

It is the single focal point of the International Maritime Organization (IMO).

AMAM is responsible in particular for the management of ships, maritime safety and security, the management of maritime transport, the management of the maritime professions, the protection and preservation of the marine and coastal environment, the management of seafarers, and management of the Public Maritime Domain.

As such, its mission is to ensure the implementation, monitoring, control and evaluation of maritime aids to navigations and hydrographic devices.

Editor's note: hydrography is not in itself a material device like lighthouses and beacons, but a whole organization comprising data acquisition at sea, their processing and their use in nautical products, in particular official nautical charts (SOLAS) whose distribution is guaranteed. Hydrography is an activity under the responsibility of a national hydrographic service (IHO focal point) whose outlines are described elsewhere in this report.

Regarding the safety of navigation, the issues are as follows:

- The implementation of the SOLAS convention (chapter V, rules 9 and 4)
- The “IMO”, “IHO”, “IALA” complementarity in international bodies

8.1.3 Autonomous Port of Nouakchott dit « Port de l'Amitié » (PANPA)



Sources : exchanges of 17 and 18 January 2023 and Internet

PANPA is under the supervision of the Ministry of Equipment and Transport (MET).

Harbor Master & Quality Department (not met)

This department in charge of the functions of Quality, Port Police, regulations, assistance to ships, maritime safety and security comprises four departments, including the Harbor Master's Department, which itself has a "Security of navigation ».

This department oversees navigation safety (Radio communication, AIS, VTS, Radar and nautical conditions).

It has pilots.

Technical Department (met)

This direction includes in particular the **department of studies and development of infrastructures** who is subdivided into two sections:

- **Studies and monitoring of projects**
- **Measurements database**

This last section must ensure the bathymetric operations in order to establish charts with the **objective of:**

- to ensure the safety of navigation in the port (quays, channel, turning circles)
- assess the quantity of sediment to be removed during dredging operations.

During the technical visit, this service no longer had systems dedicated to hydrography. The department used able to have:

- Single-beam echo sounder
- Centimeter precision GPS
- Hypack software

8.1.4 Mauritanian Institute for Oceanographic Research and Fisheries (IMROP)



Sources : exchanges of 19 January 2023 and Internet

IMROP is under the supervision of the Ministry of Fisheries and Maritime Economy (MPEM).

It is a public institution of an administrative nature, with a cultural and scientific objective.

It has legal personality and financial autonomy.

As specified in the decree of 2002-036, the main purpose of the IMROP is maritime and continental fishery resources. Its mission is to provide public authorities with the knowledge necessary for the management and sustainable use of aquatic resources and environments.

Physical oceanography is not mentioned in IMROP's remit, but the fact remains that this science certainly provides data used by its agents (244 agents including 159 scientists). The strength of IMPROP also lies in its ability to acquire data at sea (oceanographic vessels). Beyond the management of fisheries data, one can guess the need to extend the control of biological parameters to all environmental data of the marine environment (physical oceanography, hydrography/bathymetry then included).

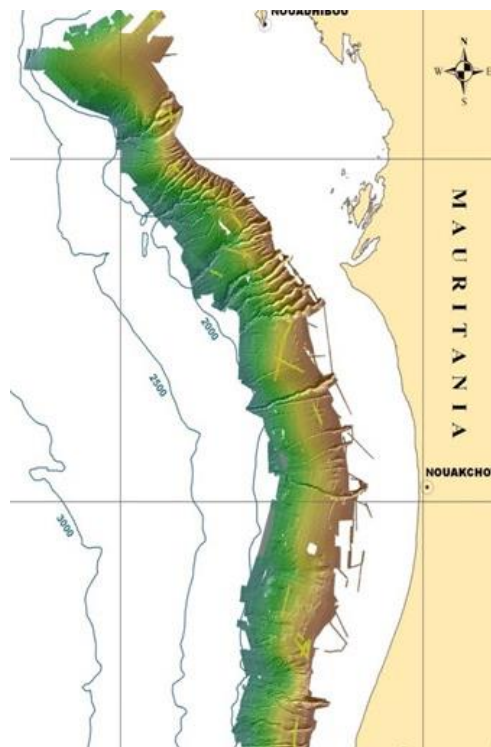
IMROP is an establishment that has been able to develop international cooperation such as with:

- The French Research Institute for Development (IRD): a framework agreement for scientific and technical cooperation between the two institutes was signed on September 19, 2022 in Nouakchott. In addition to fishing ecology, oceanography and the marine environment are part of it [<https://www.imrop.mr/accord-cadre-de-cooperation-scientifique-et-technique-entre-linstitut-de-recherche-for-ird-and-limrop-development/>]
- Japan (JICA) [<https://www.imrop.mr/arrivee-a-limrop-dune-mission-technique-japonaise-pour-le-renouvellement-du-navire-oceanographique-al-awam/>] (included oceanographic vessels)
- Germany (KW) [<https://www.imrop.mr/arrivee-dune-mission-de-la-cooperation-allemande-kw-pour-la-creation-dun-complexe-operationnel-et-scientifique-a-nouadhibou/>]

Last but not least, IMROP has experience in seeking national, regional and international funding.

Miscellaneous:

The map relating to coral reefs according to <https://www.imrop.mr/recif-coralien-en-mauritanie/> is a bathymetric map, data intended to be archived in a dedicated and shared national database where all the bathymetry waters under Mauritanian sovereignty should be archived (foreign and national scientific campaigns, oil prospecting, French "historical" surveys, new National Hydrographic Service, ports, etc.)



Challenges:

- The complementarity "Oceanography", "Hydrography",
- The potential for pooling human (eg oceanographers, data managers, etc.) and material (eg, ships, on-board observation systems at sea, etc.) capacities
- Shared databases (Geoportals) as part of the opening of public data (open data) to take advantage of ICT

Participation in the National Committee for Hydrography ... Oceanography ... Marine Cartography

8.1.5 Directorate General of Hydrocarbons (DGH)	
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Sources : exchanges of 18 an 20 January 2023 and Internet

The **DGH** is under the supervision of the Ministry of Petroleum, Mines and Energy (MPME). It has the capacity to collect, centralise, store (databases) and disseminate geophysical data. A fundamental asset for the country both in terms of bathymetry and tools to manage georeferenced data.

8.2 Coordination: AEM (State Action at Sea) and “National Coordination Committee for aids to navigation, hydrography, oceanography and nautical cartography”

8.2.1 State Action at Sea (AEM) (Civilian)

Civil” State Action at Sea (AEM) is the responsibility of the Mauritanian Coast Guard.

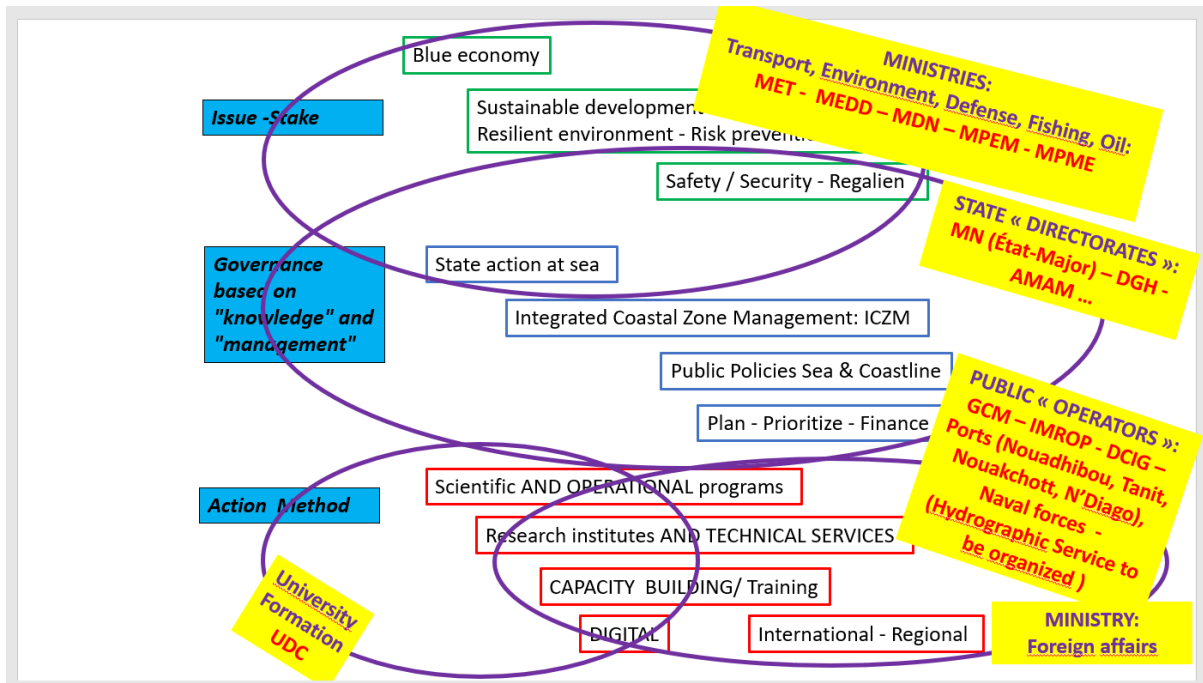
8.2.2 “National Coordination Committee for aids to navigation, hydrography, oceanography and nautical cartography”

See chapter :

COORDINATION AND CAPACITY DEVELOPMENT PROPOSAL

/ National Coordination/Consultation Committee (Hydrography, Physical Oceanography, Marine Cartography, Aids to Navigation)

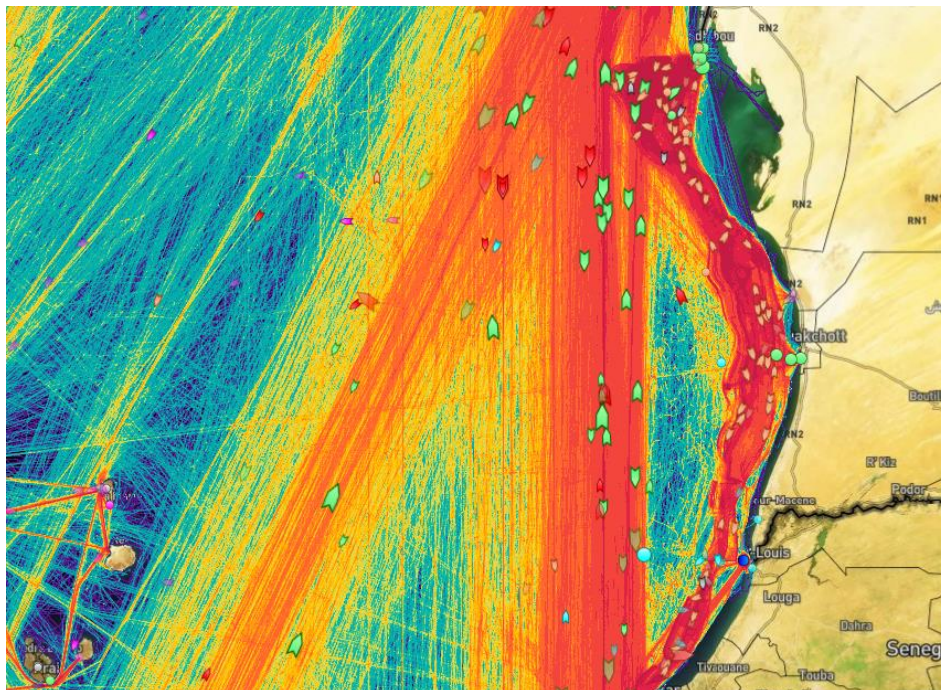
- Its necessity is recognised: many common needs, shareable skills, resources to be pooled (through agreements, budgetary compensation if necessary);
- Its multidisciplinary (transport/navigation, coastal environment, safety/security, fishing, research and education in oceanography, etc.) and inter-ministerial nature was underlined;
- Note: such a committee does not, however, constitute an operational national body for research, development and hydro-oceano-cartographic production. Such an operational body is necessary. It is a National Hydrographic Service. Should not underestimate the investment necessary for its study and constitution (status, governance, budget, material and human resources, etc.). The implementation of structures and operational means is part of the “Action/Method” level of the following figure. The subject is obviously to be debated, at an interministerial level, between the actors concerned. The Navy has expressed its desire to create within it a Hydrographic Service with a national vocation



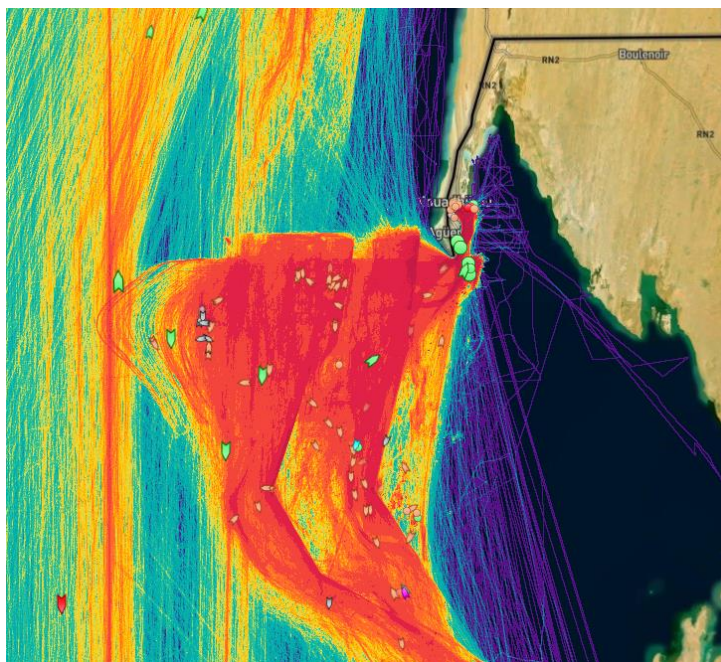
9 Maritime Trade and Traffic – Nautical Cartography/CATZOC

9.1 Maritime traffic

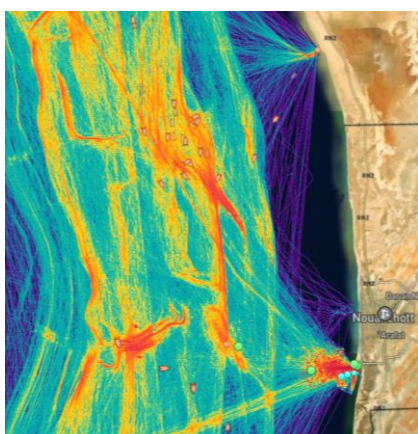
AIS data (source : <https://www.marinetraffic.com>)



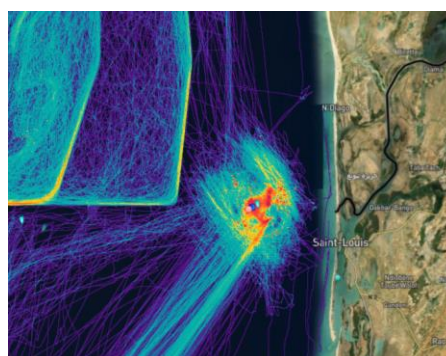
General maritime traffic situation - Mauritania



Nouadhibou



Nouakchott and Tanit



Saint-Louis (Sénégal) and N'Diogo (new harbour of Mauritania)

9.2 Charting/CATZOC

9.2.1 Official cartography of Mauritania (see Annex H)

France ensures in fact (pending greater autonomy from Mauritania) the function of "Primary Chart Authority" through the production of nautical documentation made by the Shom on Mauritanian waters. This cartographic responsibility is in the formalization phase as part of a draft Administrative Arrangement "AA -SOLAS" between France and Mauritania. AA also including a skills transfer training component.

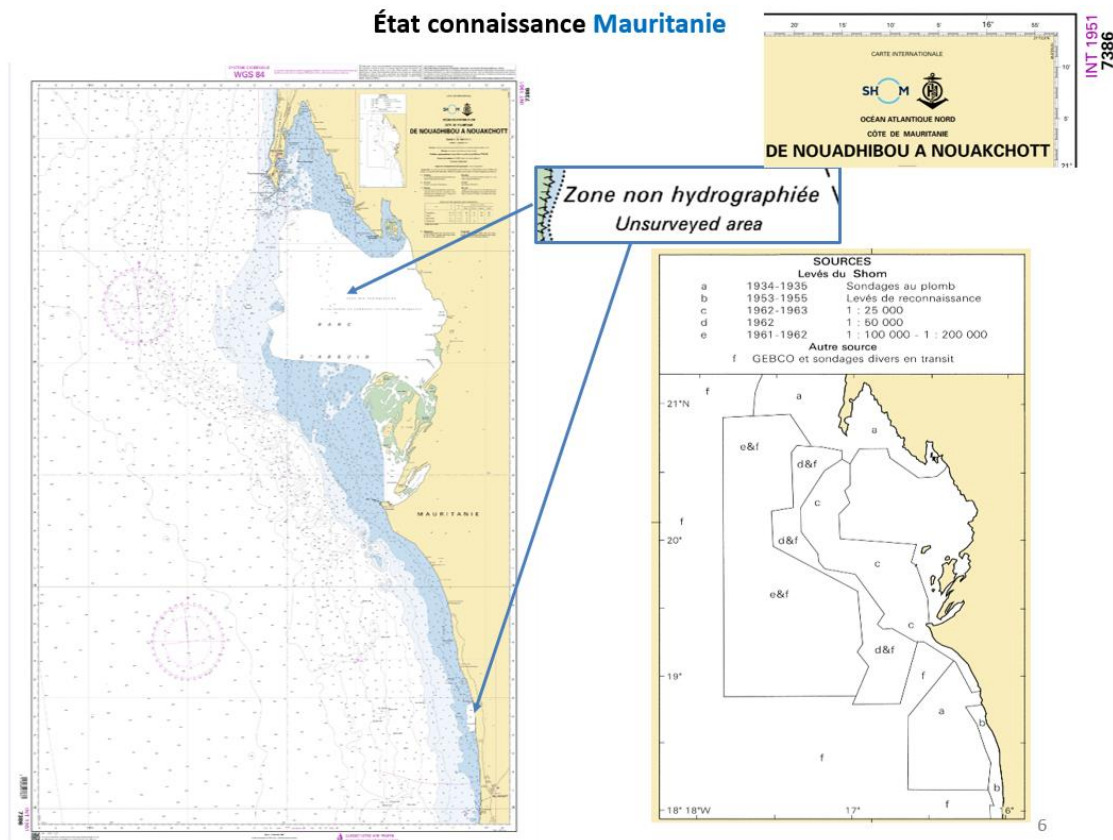
Mauritanian waters are covered by a set consisting of paper charts, digital rasters in GeoTiff format and Electronic Navigational Charts (ENC). These products cover the most important known navigation needs. The quality of these maps can be assessed through the states of knowledge described in the following chapter.

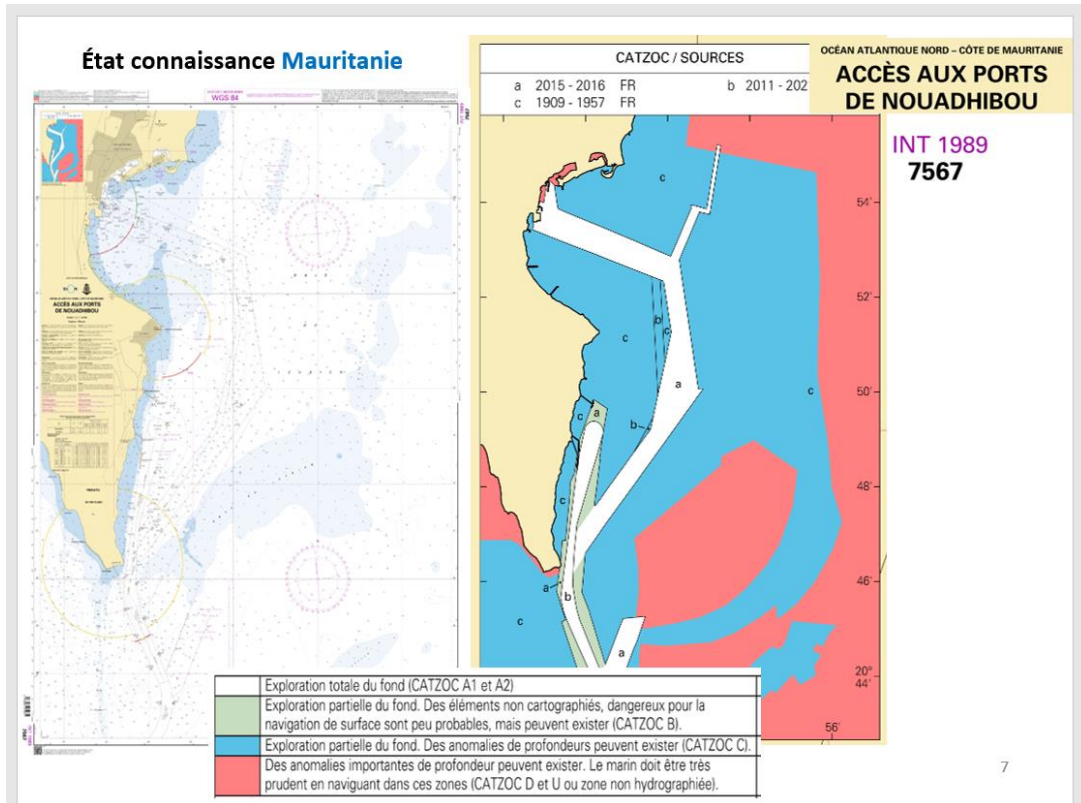
Concerning maritime navigation (access to ports, waiting and anchorage areas, quays) it depends fundamentally on regular bathymetric updates.

Updates that are insufficient (see notes on the development of phase 2 concerning hydrographic surveys).

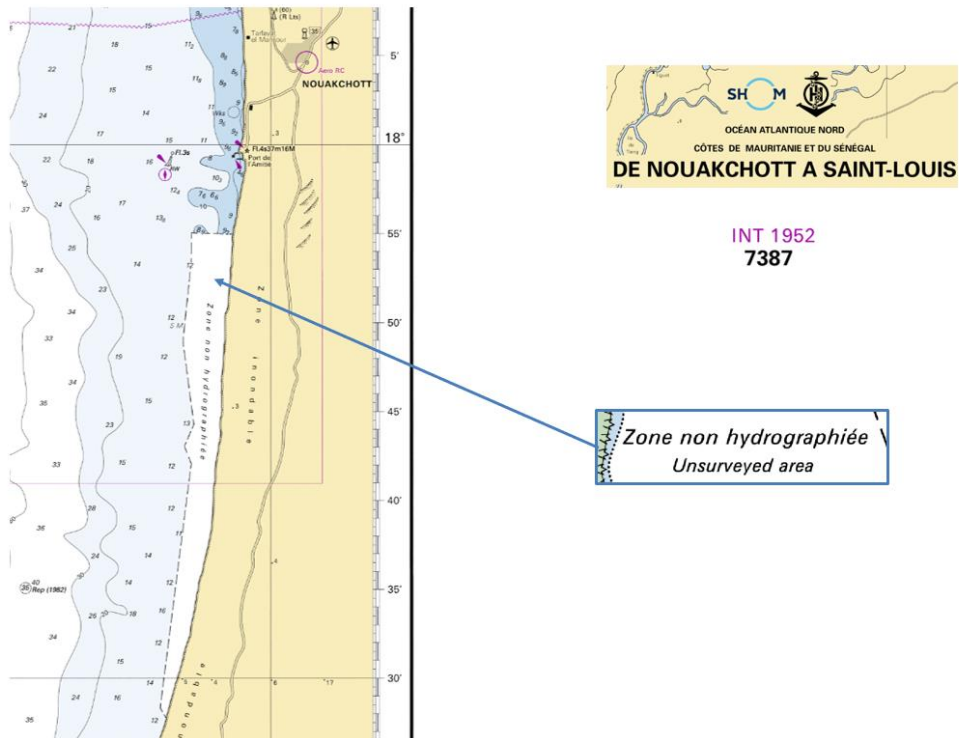
In particular, the following two recent ports should be taken into account: Tanit (fishing) and N'Diago.

9.2.2 State of knowledge




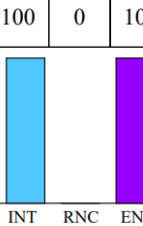
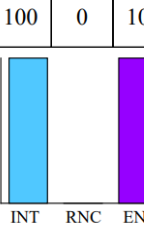
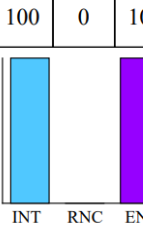

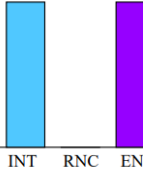

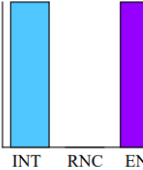

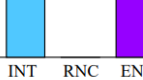
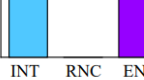
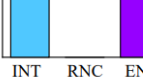


État connaissance Mauritanie



Source : <https://iho.int/uploads/user/pubs/cb/c-55/c55.pdf>

Mauritania (G)

Nautical charting / Cartographie marine / Cartografía náutica			Offshore passage Navigation au large Pasaje offshore			Landfall and Coastal passage Atterrissage et navigation côtière Recalada y Pasaje costero			Approaches and Ports Approches et ports Aproches y puertos		
Coverage of charts published Couverture des cartes publiées Cobertura de cartas publicadas			100 0 100			100 0 100			100 0 100		
 Covered by INT or other paper charts meeting S-4 Couvert par des cartes papier INT ou autres conformes S-4 Cubiertas por cartas de papel INT o otras cumpliendo S-4											
 Covered by RNC meeting S-61 Couvert par des RNC conformes S-61 Cubiertas por RNC cumpliendo S-61											
 Covered by ENC meeting S-57 Couvert par des ENC conformes S-57 Cubiertas por ENC cumpliendo S-57											
Paper charts showing depth in meters Cartes papier avec les profondeurs en mètres Cartas de papel con profundidades en metros		100 %	Paper charts referenced to a satellite datum Cartes papier rapportées à un système géodésique satellitaire Cartas de papel referidas a un datum satelital			100 %			Data source Source des données Origen de los datos		
Notes Notes Notas	1. Data provided by France, courtesy of Mauritania. 2. Large scale paper coverage: Nouadhibou covered by GB1699. 3. Large scale ENC coverage : partially covered by GB ENCs.										

Comments :

- There are areas where hydrographic knowledge is insufficient (very old surveys) or even non-existent (non-surveyed areas). By correlating this knowledge with the current (including cabotage) and especially planned navigation zones, it will be possible to conduct a risk analysis and prioritize the hydrographic surveys to be carried out. This is again a subject to be submitted to the coordination committee (navigational aids included).

10 Responsibility for maritime safety

At the state and regulatory level, this responsibility falls to the Mauritanian Agency for Maritime Affairs (AMAM), which is under the supervision of the Ministry of Fisheries and Maritime Economy (MPEM). This agency ensures in particular compliance with the application of the maritime conventions of the International Maritime Organization (IMO).

11 Responsibilities of the defense forces (Navy: MN, Mauritanian Coast Guard GCM)

Navy of MDN :

See the chapter Main actors/Navy

Mauritanian Coast Guards of MPEM :

References: Internet, discussions with Navy

The GCM is responsible for the Civil Action of the State at Sea. It is placed under the authority of the Minister in charge of Fisheries.

It is responsible for monitoring, control, civil surveillance of fishing activities, search and rescue at sea in the waters under the country's jurisdiction. The GCM is also responsible, if necessary in collaboration with the competent administrations:

- environmental protection in the marine environment;
- aids to navigation;

The GCM is manned by personnel from the Navy.

As part of its responsibilities (rescue included) the GCM is concerned with the collection and dissemination of nautical information (Maritime Safety Information : MSI). To fulfill its missions (safety, security, environment) the GCM needs (exercise of the AEM) nautical documents: nautical charts, current atlas, specific maps of the AEM (ex: maritime delimitations - boundaries). The potential for national pooling of material capacities (e.g. ships that can be permanently or temporarily equipped with on-board observation systems at sea, etc.) should be noted. Its participation in the NHC (National Hydrographic Committee ... Oceanography ... Marine Cartography) is potentially important.

12 Coastal zone management and environmental protection

The subject was not specifically addressed. The establishment of marine protected areas necessarily leads to:


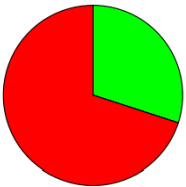
- to be managed (e.g. ecological monitoring), to acquire georeferenced data at sea and on the coast (their acquisition and restitution are based on common techniques with hydrography and cartography);
- plotting their limits on maps/charts.
- There are coastal management programs in West Africa such as WACA (West Africa Coastal Areas) that have been launched and are now dealing operationally with coastal environmental challenges. Mauritania is a stakeholder. These programs necessarily need marine geophysical data
- It should be noted that Shom, through a program financed by the FFEM (French Fund for the Global Environment) was able to digitize historical data from Senegal, such as charts and bathymetric maps useful for environmental studies. evolution over time of the coastline (erosion rates).

C-55 INDICATORS

13 Status of hydrographic surveys in the national maritime area

Source : <https://iho.int/uploads/user/pubs/cb/c-55/c55.pdf>

Mauritania (G)

Hydrographic surveying / Levés hydrographiques / Levantamientos hidrográficos							
Survey coverage Couverture hydrographique Cobertura hidrográfica		Depth < 200m Profondeur < 200m Profundidad < 200m			Depth > 200m Profondeur > 200m Profundidad > 200m		
■	Adequately surveyed Correctement hydrographié Adecuadamente levantado	1	32	67	30	0	70
■	Re-survey required Nécessitant de nouveaux levés Requiere nuevo levantamiento						
■	Never systematically surveyed Jamais hydrographié systématiquement Nunca levantado sistemáticamente						
Notes Notes Notas	1. Data provided by France, courtesy of Mauritania.						

Note:

- these indicators are solely based on the data available to Shom;
- the Technical Visit made it possible to identify many sources of data that Shom did not use for the publication of nautical charts;
- More particularly for depths greater than 200 m, the indicators could largely be revised upwards with the surveys carried out by:
 - oceanographic research organizations (including fishing), for example those of IMROP on the continental slope;
 - service providers who have operated for the study of the extension of the continental shelf
 - operators for oil exploration;
- as presented in chapter 9, hydrographic knowledge nevertheless remains particularly poor near the coasts (many areas not surveyed).

14 Collection and circulation of nautical information

It is essentially suitable for the main observers at sea and along the coast (MN, GCM, oil operators, oceanographic research, etc.) to provide information:

- At NAVAREA II (rapid broadcast of MSI on Inmarsat);
- At Shom in order to update nautical publications in a timely manner, in particular by notice to mariners. The transmission should be based on a state organization to be set up (probably AMAM).

The flow of information must relate to:

- nautical charts (eg: new depths, guaranteed dredging depths , new quays, new navigational aids to navigation, wrecks removed, submarine cables, etc.);
- sailing directions;
- list of lights;

- tides. Harmonic constants used for predictions to be made more reliable and accurate using water level observations (currently non-existent or non-operational tide gauges).

15 Hydrographic survey capacity

This ability is non-existent.

The consequences are very harmful in terms of port operations (arrival and poorly loading of ships due to lack of knowledge of the seabed: depth, nature, obstructions) and ultimately maritime economy.

It is possible to develop this capacity at a lower cost with an extremely short return on investment. Above all, this requires organization (see the National Coordination Committee) and funding (estimated at less than €50,000 for on-board equipment).

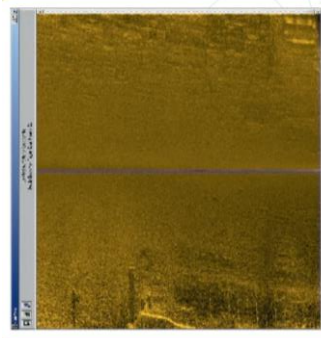
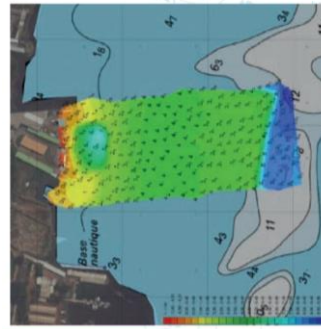


Navy vessel likely to be dedicated to hydrography

These capabilities consist of:

- floating means (boats, inflatable): they exist in the Navy, the CCG and the IMROP
- an acoustic echo sounder (single beam sufficient at first)
- a side sonar for detecting obstructions
- a GPS
- a data acquisition system (PC and specific software)
- tide gauges and leveling means
- boat handling skills (sailor)
- human skills in the acquisition and processing of hydrographic data (hydrographer, geomatician)

Regarding this specific equipment, there are portable integrated systems (in suitcases that can be moved by plane to travel between ports) which are marketed.



16 Independent nautical chart production capacity

Marine cartography

There are no official capacities for the production of nautical charts, nor for their updating and distribution. This is entrusted (currently without formalization) to France (Shom).

Land cartography

The time devoted to the Technical Visit did not make it possible to assess the country's own capacities in terms of civil and military land mapping.

The "Land/Sea" cartographic complementarity (coastal topography, geodetic networks, leveling/vertical references, toponymy, etc.) is highlighted here.

There are capabilities in terms of localization, leveling, databases, geographic information systems, toponymy and geomatics that can be shared.

Concerning civil cartography, the country has a Department of Cartography and Geographical Information (DCIG) dependent on the General Directorate for Territorial Planning and Regional Action (DGATAR) of the Ministry of Housing , Urban Planning and Regional Development (MHUAT). This DCIG, again according to information on the Internet, has a Geographic Information Service and a Cartography and Land Surveys Service.

Miscellaneous :

- The Japan International Cooperation Agency (JICA) has contributed to the development of geographic databases
- In terms of coastal risk management and more particularly marine flooding (sea surges), hydrographers (sea level: tide, extreme levels/storm surges, changes due to climate change), meteorologists and land cartographers (Digital Terrain Models) necessarily cooperate (sharing of referentials and georeferenced data)
- There is certainly shareable data in terms of Integrated Coastal Zone Management (ICZM)

COORDINATION AND CAPACITY BUILDING PROPOSAL

17 National Coordination/Consultation Committee (Hydrography, Physical Oceanography, Marine Cartography, Aids to Navigation)

The hydrographic activities necessary for the country will be able to develop gradually, in a pragmatic way, from a single organization already endowed with floating and human resources.

It is nevertheless likely that they will be able to develop all the more easily and quickly by pooling resources in the country.

It is up to the main body that will be responsible for hydrography to be able to take into account all current and future needs extended to the whole country.

At the heart of pooling:

the acquisition of hydro-oceanographic data at sea (coast) and in ports with existing ships or launches:

- their qualifications, archiving, shared distribution
- shared projects (navigation, marine environment) on the creation of a “marine geosciences” knowledge base.

The Technical Visit does not conclude with the creation of an additional committee/commission if one already existed in "maritime" matters (safety, security, environment, economy, etc.).

But the coordination must be well organized (strong recommendation of the IHO for all countries).

The multidisciplinary and interministerial nature of the issues must also be able to be organized around the AEM.

Whatever its name, this committee (inter-ministerial, inter-agency) will be an essential link in the operational organization of the Mauritanian State (technical services for study, data management, production, etc.) to be set up (and therefore to be financed) for the execution of development programs in hydrography, oceanography, nautical cartography (sea and coast) and aids to navigation. The organization and execution of training in Mauritania and abroad is part of the development programs and therefore the subjects of the committee.

Propositions :

- First of all: gather around a table the potential actors of this future committee to first precisely define its mandate and its members. IHO publication M2 provide IHO recommendations « *The need for national hydrographic services* » : https://iho.int/uploads/user/pubs/misc/M-2_3.0.7_E_06142018.pdf ;
- It is a question of launching a dynamic at the institutional and technical levels, by specifying the corresponding actors: hydrographers, oceanographers, aids to navigation, surveyors, geomaticians, cartographers without forgetting the support functions in particular in computer science;
- The collection of needs (navigation, environment, etc.) in products (eg maps) and services (eg tide forecasts, extreme coastal events, etc.) will naturally lead to specifying the needs for the acquisition of hydrographic and oceanographic data. An essential step before prioritizing

these acquisitions, and planning them by identifying the organizations (to be supported) or companies (to be contracted) that can carry them out;

- The collection of needs (navigation, environment) data collection is only economically conceivable if these are widely shared (one data - several applications – the SOLAS application through nautical documents being only one among many others) and exploited. The problem then arises of archiving and disseminating data at the national level. The techniques and tools are better and better mastered with databases and communication and download portals. Nevertheless, this requires IT structures and dedicated skills to be set up. This is a fundamental structural point to be put on the agenda of the first meeting: setting up an infrastructure of marine geospatial data (MSDI – Maritime Spatial Data Infrastructure). Here too, it must be possible to rely on what already exists.

18 Phase 1 Hydrographic capacities: MSI and GMDSS

18.1 Introduction

Maritime Safety Information (MSI), as defined in International Maritime Organization Resolution A.705(17) and detailed in the joint IHO/IMO/WMO Handbook on MSI (IHO Special Publication S-53), consist of the collection and dissemination of navigational and weather warnings, search and rescue information and other urgent safety information, including nautical information relating to nautical documentation.

The dissemination of these MSI is based on the Global Maritime Distress and Safety System (GMDSS) an international system that uses telecommunications means for search and rescue at sea (SAR) and the prevention of maritime accidents.

In addition, MSIs in their broadest sense include the updating of navigation charts and other nautical publications (list of lights, radio signal, sailing directions, etc.). The MSIs need an organization (procedures for collecting, transcribing and transmitting information, maintained equipment, trained personnel) with a national MSI coordinator in relation with the navigators, the cartographic authority (France /Shom) and NAVAREA II (France /Shom).

18.1 Level of development

Phase	Object	Level of de development - Remarks
1	Collection and transmission of maritime safety information / nautical information (MSI) to NAVAREA II, transmission of	To be confirmed <i>"The country fulfils its national obligations in a sustainable manner"</i> ¹ It is not proven that all RSM are communicated to the NAVAREA II coordinator. Shom can receive information directly from certain ports (Nouakchott, Nouadhibou, Cansado) for updating charts. An inter-ministerial instruction where efficiency must above all count, may specify the roles of the stakeholders: GCM, MN, AMAM, DGH, etc.

¹ Référence : <https://iho.int/uploads/user/Inter-Regional%20Coordination/CBSC/MISC/Templates%20Procedures/PDF/Procedure%2011.pdf>

	corrections to nautical publications in particular nautical charts to Shom	
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19 Phase 2 Hydrographic capacities: conducting surveys

19.1 Introduction

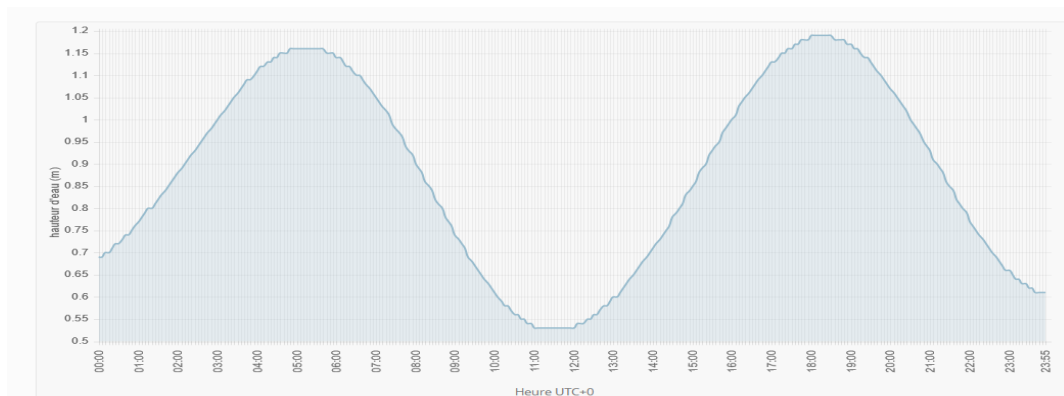
These capacities mainly consist in conducting bathymetric surveys (depths to the level of the Lowest Astronomical Tide considering the tide).

The exhaustive inventory of existing bathymetric data (scientific research, oil, extension of the continental shelf, foreign hydrographic services, ports, etc.) would make it possible to properly target the priority data to be acquired and consequently the priority means of necessary equipment. In terms of safety of navigation and economic optimization, it seems a priority to have means for shallow waters to guarantee the depths of ports and their accesses.

19.2 Level of development

Phase	Object	Level of de development - Remarks
2	Hydrographic and oceanographic surveys through data acquisition	<p>Eventually <i>"The country is aware of its national obligations but does not have "national" means to do it"</i></p> <p>It is sorely lacking in bathymetric resources. Actual depths in ports (along quays) will be uncertain without bathymetric surveys. This generates both risks (depths lower than the soundings of official nautical charts) and port under-exploitation (depths estimated to be lower than reality). Obstructions (anchors, chains, wrecks, etc.) could exist in navigation, waiting or even anchorage areas. The tide, for lack of observatory but also of skills is not mastered. Among other things, it is necessary to define the hydrographic datums (levels of the lowest astronomical tides referenced on nautical charts) wherever hydrographic surveys must be conducted (and the tides predicted).</p> <p>This lack of bathymetric means (GPS, single beam echo sounder, side sonar for detecting obstructions, tidal observatory) is also detrimental to the development of new ports such as N'Diogo and even the control of new marine protected areas. However, the country does not lack floating resources: in particular MN, GCC and IMROP, nor skills in geolocation or geomatics.</p>

		<p>It is nevertheless certain that a hydrographic capacity (floating means, echosounder, GPS, tide gauge, PC, trained personnel) is not out of reach once all the stakeholders have taken the time to meet, share their needs and pool their resources. This is above all the interest of the National Coordination Committee for Hydrography (we will add oceanography, nautical cartography and aids to navigation) to constitute.</p> <p>PHASE 2 (surveys not small funds) IS A PRIORITY</p> <p>Please note that mastering the conduct of hydro-oceanographic surveys includes their specification (upstream) and their qualification (ultimately downstream). Two skills that are also essential when operations are outsourced. It is indeed necessary to be in a position to obtain just enough at the right price (subcontractors must not be judge and jury as for example for dredging).</p>
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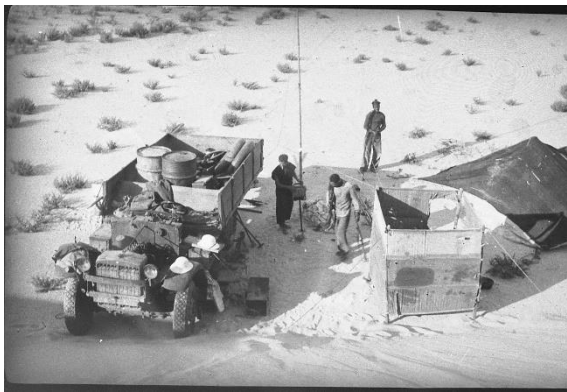
Marée à Nouakchott

19.3 What skills – capacities to develop a National Hydrographic Service (HS)?

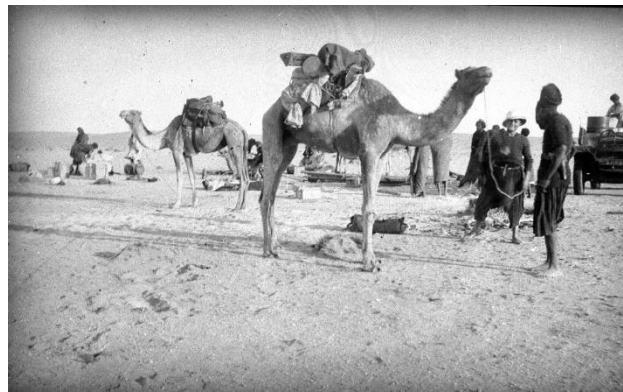
The following indications are those given at the end of the Technical Visit during the feedback meeting:

- Be able to properly identify the issues/needs (navigation, environment, risks, exploitation of the sea, State Action at Sea, etc.) of the country that can be provided with hydrographic and oceanographic (physical) data;
- A single HO must be able to cover all the needs, including those of the ports;
- Be able to decline these needs by specifying acquisitions of georeferenced data at sea and on the coast (bathymetry, tide, sea bottom, topography, toponymy, etc.);
- Be able to bring together material resources (possibly within a sub-regional framework):
 - Ships or launches;
 - On-board (GPS, sounders, etc.) and on-shore (tide gauges) data acquisition systems;
 - Processing systems (GIS);
 - Archiving systems (shared database);

- Being able to bring together (qualified) human resources (provisional management of skills and workforce):
 - Sailors: to sail ships or boats;
 - Hydro-oceanographers: to implement the measurement systems. To guarantee the quality of these measurements (compliance with IHO standards), follow qualifying training cycles in approved schools (OHI – FIG - ACI) (Spain, France, etc.):
 - Engineer level: CAT A (already 1 in Mauritania/MN, in progress +2 naval officers in Spain);
 - Higher Technician Level: CAT B (already 1 in Mauritania/MN, effective to be completed);
 - Marine cartographers (geomatics).



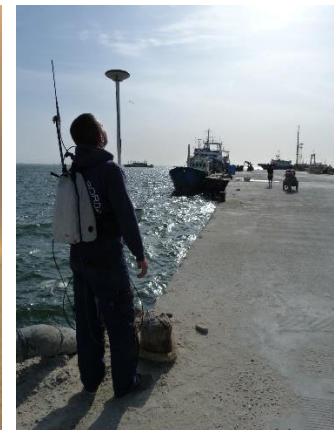
Hydrographic Mission of Senegal and Mauritania (1934-1936) Installation and camp in Mauritania



Camel transport of equipment



Hydrographic survey of *Borda* à Nouadhibou (2016)



Topography GNSS at Nouadhibou (2016)

20 Phase 3 Hydrographic capacities: production of nautical charts

20.1 Introduction

This is, above all, to provide mariners with official nautical charts that meet SOLAS requirements. This provision can be provided by Mauritania or in an organized manner with a third country. Due to less significant regulatory constraints (standards, updating and dissemination), cartographic documents (geomatics) for various applications such as coastal development, management of marine

protected areas, environmental monitoring or specific AEM maps, must be able to be produced by Mauritania itself.

20.2 Level of development

Phase	Object	Level of de development - Remarks
3	Production of nautical charts and publications	<p>Eventually</p> <p><i>“The country fulfils its national obligations through a third party”</i></p> <p>An Administrative Arrangement (AA-SOLAS) could formalize cooperation with France (Shom) and thus comply with the SOLAS convention. It is logical and necessary that Mauritania can gradually gain autonomy and already meet specific cartographic needs such as sovereignty maps of State Action at Sea. The AA must facilitate this (training included). It is therefore necessary to clearly identify the already existing capacities in terms of geomatics in order to pool them through joint projects. This is one of the first actions to be carried out within the “National Coordination Committee” It is by exchanging data (and metadata) with the Shom, and simultaneously by checking how these are used to update nautical charts, that the transfer of skills can be initiated.</p>

21 Summary of the assessment of national hydrographic capacities - Table

IHO	EAtHC	NHC (1)	Phase 1 (2) Capacity	Phase 2 (3) Capacity	Phase 3 Capacity
NON Member	Associated Member	NO	NO	NO (3)	NO (4)

(1) National Hydrographic Committee (role of national coordination) (National Coordination Committee)

(2) Maritime Safety Information

(3) Hydro-oceanographic surveys (priority to be given to ports) through data acquisition and archiving

(4) “SOLAS” charting. Co-publishing with France (Shom) under an administrative arrangement

FORMATION

22 Basic training of hydrographic technicians (not only!)

Initial training of hydrographers

This is fundamental.

Mauritanian Navy currently has one CAT A and one CAT B hydrographer. However, they do not work in a structure dedicated to hydrography. The Navy plans to strengthen its CAT A (+2) and CAT B (1) hydrographers.

In an operational context, the availability of qualified senior hydrographic technicians (CAT B) is essential.

The recommended training is that offered by schools whose programs are approved by the FIG/IHO/ICA (International Federation of Surveyors, International Hydrographic Organization, International Cartographic Association) with Category B (CAT B).

The practical training which supplements the theoretical training of the schools will be, for the hydrographers with vocation port, opportunely carried out in a port operating dredging and having a service in charge of hydrography.

The homologated school of the Spanish Navy (Hydrographic Institute) which has already trained Mauritanian sailors remains a preferred solution.

In addition, the Shom school (French-speaking) also offers training approved in Category B: the Superior Certificate of Hydrographers, the program of which can be consulted (page 43) on:

https://www.shom.fr/sites/default/files/2020-10/Offre_formation_2020-2021_Web.pdf.

Point of contact at Shom: Chief hydrographer engineer Ronan Le Roy, head of the Shom training division and director of education: drh-for-d@shom.fr.

This license level 3 training is very demanding in terms of initial knowledge of mathematics and physics. It can be followed by young people who already have experience in geomatics, geodesy, physical oceanography or even maritime navigation.

This training will give enough versatility to future students to satisfy almost all the skills needed for data acquisition at sea and on the coast. The CAT B hydrographer can, on his return to his country, train the "hydrographer's assistants" that the country needs ("CAT C").

Requests for training have been made in this regard by ANAM (Letter No. 20 -168 /ANAM/DG of December 16, 2020). Shom responded to this in its annual Administrative Arrangement follow-up letter (No. 020 Shom/DMI/NP of June 3, 2022). The issue of funding is addressed here.

: the human investment must be accompanied by an investment in equipment so that the trained personnel can immediately after their training put their knowledge into practice and thereby acquire the field experience necessary for the obtaining full FIG/IHO/ICA "Category B" certification.

Initial training of "marine" cartographers

This is also an objective worth considering, even if it is less urgent than in hydrography. The country will eventually need cartographic services to cover the waters under its sovereignty.

It is moreover this "cartographic" desire that will generate the need for data and therefore for hydrographic surveys.

The progressive part that Mauritania will take in the production of nautical charts (therefore in connection with the Shom), its own capacity to produce sovereignty charts for the AEM, can only benefit from solid training in cartography dedicated to navigation sea.

A category B training (CAT B) is therefore recommended.

Shom's school (French-speaking) offers such a CAT B training course: Marine cartography technician preparation course, the program of which can be consulted (page 48) again on https://www.shom.fr/sites/default/files/2020-10/Offre_formation_2020-2021_Web.pdf.

It is however necessary to note that, unlike the Shom Category B approved hydrographer training, this cartographer preparation training is not open every year but on an irregular basis depending on the internal needs Shom (generally with a frequency of 5/6 years between each session).

Point of contact at Shom: Chief hydrographer engineer Ronan Le Roy, head of the Shom training division and director of education: drh-for-d@shom.fr.

Also have "support" and "managerial" skills – Apply

The personnel, once trained, will have to quickly put their theoretical knowledge (school) into practice and then validate their practical qualification after two years: that is to say, move on to operations by conducting surveys exploited by cartographers and marine environment specialists. It is also recalled the importance:

- the "Support" function in specific equipment (GPS, echo sounder, tide gauges, etc.): maintenance in operational condition of equipment, IT (software, databases, webmaster, etc.);
- the "management" function which will be very important to coordinate (committee) in a global way at the national level (inter organizations) the development of hydrography and nautical cartography of the country:
 - completeness of the needs (to be planned) to be met (navigation, coastal development, coastal protection, etc.);
 - definition of the corresponding products (charts in particular);
 - identification of all stakeholders (public and private) who have an interest in cooperating to derive benefits (they come together to pool capacities);
 - definition of the production systems to be implemented: hydro-oceanographic, cartographic and support functions (logistics);
 - definition of the means of intervention at sea (boats, embarkations);
 - definition of infrastructures on land for data processing and archiving;
 - definition of governance (supervision, contracts of objectives and means, therefore financing, agreements);
 - definition of human resources needs in sufficient quantity and quality for all structures and all professions combined.

23 Continuous training in hydro-oceano-cartography and related activities (aids to navigation, port infrastructure development and coastal protection) - Management

At the international level in hydrography

There are actually many opportunities and facilities to maintain knowledge in hydrography. It is still necessary to know them and be encouraged to follow them.

- IHO:
 - which offers training materials at: <https://iho.int/fr/publications-sur-le-renforcement-des-capacites> . In particular, there is a high-quality hydrography manual;
 - who organizes seminars. In particular, EAtHC will organize a seminar which will precede EAtHC 18 in 2024 (<https://iho.int/en/eastern-atlantic-hc>)
- Shom (<https://www.shom.fr/>) which in addition to the statutory training of its school (CAT B) also offers opportunities for training in tide gauges (<https://www.sonel.org/>);
- AFHy: Association Francophone d'Hydrographie (<https://www.afhy.fr/>) where in particular hydro-cartographers of ports and rivers meet.
- without forgetting the other countries which, like Spain, also offer training opportunities.

Note :

- Also identify the E-learning opportunities that will develop, in particular the future IHO E-learning platform within which training materials will be available.
- There is a need for regional training schools (West and Central Africa) in hydro-oceanography-cartography. It is necessary to get out of the current situation where there would be no other alternative than to enroll the agents to be trained in hydrographic schools outside the African continent. They may be French or English speaking. The contacts that the IHO has been able to have so far on West and Central Africa have not really made it possible to identify the structures (schools, academies, etc.) immediately ready to host training courses for hydrographers and certified cartographers. The following have thus been identified as potentially suitable for training courses:
 - Two national hydrographic services - likely to offer complete training courses approved by the IHO/ACI/FIG (CAT B) - having recently considerably increased their hydro-oceanographic capacities, namely:
 - Nigeria: the NNHO (Nigerian Navy Hydrographic Office) which has a school in Port Harcourt (NNHS: Nigerian Navy Hydrographic School);
 - Morocco: DHOC (Hydrography, Oceanography and Cartography Division) of the Royal Navy;
 - Two maritime education centers more likely to offer more specialized training than approved, namely:
 - RMU (Regional Maritime University) of Accra (Ghana) ;

- ARSTM (Académie Régionale des Sciences et Techniques de la Mer) of Abidjan (Ivory Coast).

Various at national level (Mauritania)

It is possible that national skills (public, private) could not be inventoried during the Technical Visit, such as:

- qualified surveyors;
- specialists in remote sensing (a mean widely used in hydrography);
- professionals in GIS (Geographic Information Systems) (in support of the professions mentioned above). This is certainly at the Directorate General of Hydrocarbons (DGH) and the Directorate of Cartography and Geographic Information (DCIG);
- IT specialists skilled in databases or even distribution websites;
- engineers and technicians from engineering companies.

These are transversal skills essential to the development of hydro-oceanography-cartography. They constitute a potentially poolable, at least complementary, skills base on which Mauritania can rely.

These skills will be particularly important within the national coordination committee. Participation in IHO meetings and more particularly in EAtHC meetings and seminars allows exchanges with counterparts from other coastal States of West and Central Africa.

Editor



Henri DOLOU

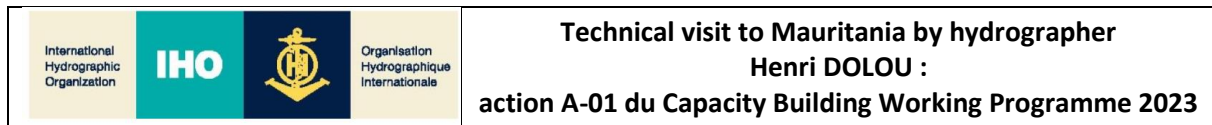
ANNEXES

Annexe A : Abreviations

AEM	Action de l'État en Mer <i>State action at sea</i>
AMAM	Agence Mauritanienne des Affaires Maritimes (MPEM) (Anciennement Direction de la Marine Marchande : DMM)
CATZOC	<i>Category Zone of Confidence</i> Catégorie Zone de confiance
CBSC	<i>Capacity Building Sub-Committee (IHO)</i> Sous-comité de renforcement des capacités (OHI)
CBWP	<i>Capacity Building Work Programme (IHO)</i> Programme de travail de renforcement des capacités (OHI)
CHN	Comité Hydrographique National <i>National Hydrographic Committee</i>
DCIG	Direction de la Cartographie et de l'Information Géographique (MHUAT)
DGATAR	Direction Générale de l'Aménagement du Territoire et de l'Action Régionale
DGH	Direction Générale des Hydrocarbures (MPME)
EAtHC CHAto	<i>Eastern Atlantic Hydrographic Commission (IHO)</i> Commission Hydrographique de l'Atlantique orientale (OHI)
ECDIS	<i>Electronic Charts Display Information System</i>
ENC	<i>Electronic Navigational Chart (sea)</i> Carte électronique de navigation (mer)
GCM	Garde Côtes Mauritanienne <i>Coast Guards</i>
GMDSS SMDSM	<i>Global Maritime Distress and Safety System</i> Système Mondial de Détresse et de Sécurité en Mer
IALA AISM	<i>International Association of Marine Aids to Navigation and Lighthouse Authorities</i> Association Internationale de Signalisation Maritime
IHO OHI	<i>International Hydrographic Organization</i> Organisation Hydrographique Internationale
IMO OMI	<i>International Maritime Organization</i> Organisation Maritime Internationale
IMROP	Institut Mauritanien des Recherches Océanographiques et des Pêches (MEPM)
IOC COI	<i>Intergovernmental Oceanographic Commission</i> Commission Océanographique Intergouvernementale
IRD	Institut de Recherche pour le Développement
MDN	Ministère de la Défense Nationale
MEDD	Ministère de l'Environnement et du Développement Durable
MET	Ministère de l'Équipement et des Transports
MHUAT	Ministère de l'Habitat, de l'Urbanisme et de l'Aménagement du Territoire
MPEM	Ministère des Pêches et de l'Économie Maritime
MPME	Ministère du Pétrole, des Mines et de l'Énergie
MN	Marine Nationale
MOWCA OMAOC	<i>Maritime Organization of West and Central Africa</i> Organisation Maritime de l'Afrique de l'Ouest et Centrale

MRCC	<i>Maritime Rescue Coordination Centre</i>
MSDI	<i>Maritime Spatial Data Infrastructure</i> Infrastructures de données spatiales maritimes
MSI RSM	<i>Maritime Safety Information</i> Renseignement de Sécurité Maritime
NAVAREA	<i>NAVigational AREAs (WWNWS)</i> Zones de navigation (SMAN) NAVAREA national coordinator: responsible for dissemination of MSI (RSM)
NC CM	<u><i>Nautical Charts</i></u> Carte marine
NHC CNH	<i>National Hydrographic Committee</i> Comité National Hydrographique
NtMs	<i>Notice to Mariners</i> Avis aux navigateurs
PCA	<i>Primary Charting Authority</i> Autorité cartographique principale
PANPA	Port Autonome de Nouakchott dit Port de l'Amitié (MET)
RHC CHR	<i>Regional Hydrographic Commission (EAtHC)</i> Commission Hydrographique Régionale (CHAtO)
Shom	Service hydrographique et océanographique de la marine (France) <i>French Hydrographic and Oceanographic Service (French national hydrographic office)</i>
SMAN	Système mondial d'avertissement de navigation <i>Worldwide Navigational Warning Service (WWNWS)</i>
SMDSM	Système mondial de détresse et de sécurité en mer <i>Global Maritime Distress and Safety System (GMDSS)</i>
SOLAS	<i>[United Nations] Convention for the Safety of Life at Sea</i> Convention pour la sauvegarde de la vie humaine en mer
WACA	<i>West Africa Coastal Areas Management program</i> Programme de gestion du littoral ouest-africain
WACA/FFEM	WACA/Fonds Français pour l'environnement Mondial <i>WACA/French Facility for Global Environment</i>

Annex B : Terms of reference of the visit team of the Regional Hydrographic Commission



Context

The IHO (International Hydrographic Organization) Capacity Building Program aims to coordinate the development of the capacities of Member and Associate States in the field of hydrography and nautical cartography in order to meet the objectives of IHO and the obligations related to Chapter V of the SOLAS Convention, the United Nations Convention on the Law of the Sea and other international instruments.

It was thus decided:

- to promote regional cooperation in capacity building in West and Central Africa (EAtHC IHO Eastern Atlantic Hydrographic Commission)
- to identify the potential of national and regional training centers;
- to study the possibilities of organizing regional seminars.

On the proposal of France, which coordinates the IHO Capacity Building Program for EAtHC, the IHO Capacity Building Sub-Committee proposes to conduct a technical visit to the country.

Goals

The general objectives of the technical visits are as follows:

- discussions with the decision-making authorities of the country visited, emphasizing the importance of hydrography for coastal states and therefore the need to include associated hydrographic and nautical cartography activities in national plans;
- support the development of a national system for the collection and diffusion of maritime safety information (MSI) integrated within the Worldwide Navigational Warning Service (WWNWS);
- assessment of national capacities in terms of planning and carrying out the collection and use of hydrographic data in order to allow the production and updating of the nautical documentation essential for the safety of navigation and in support of others uses (infrastructure management, environmental protection, development of the blue economy, etc.);
- development of recommendations with the actors of the visited country in order to strengthen these capacities in a long-lasting and sustainable manner;
- preparation of IMO audits (IMSAS) and follow-up of recommendations in connection with hydrographic services;
- promote the emergence of development projects in the field of hydrography and nautical cartography in conjunction with IHO secretariat, IMO and funding agencies in order to obtain the sustainable establishment of capacities.

Report

A report on the activities and recommendations of the team will be submitted to the president of the Regional Hydrographic Commission after the visits.

For IHO, 10 October 2022 Julien SMEECKAERT
Capacity Building coordinator for EAtHC



Annex C : Reference texts

Note: this list (in French) is not exhaustive

Textes de référence de la Mauritanie

Objet	Référence officielle
AMAM Décret portant création, organisation et fonctionnement de l'Agence Mauritanienne des Affaires Maritimes	Décret de 2022
IMROP Décret fixant les règles d'organisation et de fonctionnement de l'Institut Mauritanien de Recherches Océanographiques et des Pêches, ex - Centre National de Recherches Océanographiques et des Pêches	Décret n° 2002 - 036 07 mai 2002
DCIG Attributions du Ministre de l'Habitat, de l'Urbanisme et de l'Aménagement du Territoire et l'organisation de l'administration centrale de son Département : <ul style="list-style-type: none">• MHUAT<ul style="list-style-type: none">○ Direction Générale de l'Aménagement du Territoire et de l'Action Régionale<ul style="list-style-type: none">▪ Direction de la Cartographie et de l'Information Géographique	Décret n° 001-2020 du 14 janvier 2020
GCM Création d'une structure dénommée Garde côte Mauritanienne	Loi n° 2013-041 du 12 novembre 2013 portant création d'une structure dénommée Garde côte Mauritanienne

Texte de référence de la France (Shom)

Objet	Référence officielle
Coopération entre la République française et la République islamique de Mauritanie en matière d'hydrographie, d'océanographie et de cartographie marine	À confirmer - Actuellement en projet

Annex D : List of main contacts - Telephones - Mails – Websites

Prénom NOM	Fonction	Tél (+222)	Mail
MPEM			
Ministère des Pêches		et de l'Économie Maritime	
M Babana YAHYA	Inspecteur Général du MPEM	46 58 04 58	elbouyahya@yahoo.fr
Sous tutelle MPEM			
MPEM/AMAM		Agence Mauritanienne des Affaires Maritimes	
Valid SIDATTY	Directeur Général	46 86 63 36	vsidaty69@yahoo.fr
Mohamed Yeslem AHMED ELHACEM	Directeur Général Adjoint	46 53 73 31	amyeslem@yahoo.fr
MPEM/IMROP		Institut Mauritanien des Recherches Océanographiques et des Pêches	
Cheikh HEJBOU	Chef du Centre de Nouakchott	49 33 89 44 22 42 10 17	cheikhmsh67@gmail.com
Sous tutelle MPME : Ministère du Pétrole des Mines et de l'Énergie			
MPME/DGH		Direction Générale des Hydrocarbures	
Moustapha BECHIR	Directeur Général des hydrocarbures	45 24 43 07 43 00 10 25	mobechir@yahoo.fr
Eba Mohamed ETHMANE	Directeur de l'exploration – production (données)	42 42 03 49 36 69 18 22	eba_med@hotmail.com
Mouamar Rachid SALEH	Directeur du Suivi des Projets et de l'Environnement	45 24 43 07 43 00 10 52 48 63 08 35	ouldrachid@yahoo.fr
MDN			
Ministère de la		Défense Nationale	
MDN/MN		Marine Nationale	
CA Mohamed Cheikhna TALEB MOUSTAPH	Contre-Amiral Chef d'État-Major de la Marine	42 77 59 01 20 58 00 09	talebmoustaph61@hotmail.com
Capitaine de Vaisseau Sidina CHOUD	Capitaine de Vaisseau Chef d'État-Major de la Marine adjoint	26 74 58 69	sidinach@gmail.com
Lieutenant de Vaisseau Sidi Abdalla	Hydrographe CAT A Chef du COM Chef de projet montée en puissance du service Hydrographique	33 10 00 00	samwrknav@gmail.com poc2@armee.mr
Capitaine de Frégate Stéphane CONGUES	Conseiller militaire technique à l'état-major de la Marine mauritanienne	44 32 42 86	conseiller.emm@outlook.fr
Ports			
PANPA		Port Autonome de Nouakchott dit Port de l'Amitié (MPEM)	
Moustapha Mohamed YAHYA	Directeur Technique	47 39 31 32	denebjana@gail.com
Mohamed Lemine TAH	Directeur Technique Adjoint	47 39 31 49	lemine.vall@gmail.com

Compagnie	de navigation	CMA CGM	
Christophe JOURDAN	CMA CGM Mauritanie Directeur Général	41 42 70 00	nkt.cjourdan@cma-cgm.com
Shom (OHI)	France	(+33)	
Henri DOLOU	Hydrographe	(0) 6 86 15 14 82	henri.dolou@shom.fr
Pierre-Yves DUPUY	Directeur des missions institutionnelles et des relations internationales	(0) 2 56 31 24 04 (0) 6 38 78 59 55	pierre-yves.dupuy@shom.fr
Julien SMEECKAERT	Chef de la division des relations extérieures	(0) 2 56 31 97 81 / (0) 6 03 20 13 77	dmi-rex-d@shom.fr julien.smeekaert@shom.fr
Ronan LE ROY	Directeur de l'enseignement de l'école du Shom	(0) 2 56 31 24 09	ronan.le.roy@shom.fr
Philippe Pellaé	Chef du secteur Outre-Mer et pays étrangers (NA/OMER)	(0) 2 56 31 21 90	philippe.pellae-arthaud@shom.fr
Dominique LE PEN	Expert nautique Afrique et Océan Indien	(0) 2 56 31 22 78	dominique.le.pen@shom.fr na-om@shom.fr
Alban LALANNE	Ingénieur hydrographe chargé du <i>Laplace</i>	(0) 6 32 97 86 61	alban.lalanne@shom.fr
Divers	Autres contacts actuels du	Shom	Dominique Le Pen
Mohamed Fayçal Ould Beyrouk	Nouakchott PANPA/DT	36 30 27 34	beiroukfaical@yahoo.fr
Bowba Ould Abdallahi	Nouadhibou PAN/DT	26 74 75 21	Bawba_a@yahoo.fr
MANAMA SA	Nouadhibou Mauritanienne de Navigation Maritime	22 32 08 16	manama@manama.mr manama.ops@gmail.com
Moussa Dabo	Cansado Chef du pilotage	45 74 19 46	mdabo@snim.com

IMROP : Institut Mauritanien des Recherches Océanographiques et des Pêches	https://www.imrop.mr/
MN : Marine Nationale	http://armee.mr/fr/node/745
PANPA : Port Autonome de Nouakchott dit " Port de l'Amitié "	http://www.port-nouakchott.com/fr
DGH : Direction Générale des Hydrocarbures	https://www.petrole.gov.mr/spip.php?article69
Shom	https://www.shom.fr/
OHI	https://iho.int/fr/

Annex E : Agenda – Events

Object – Event	Observations
J1 : Tuesday 17 January 2023	
➤ Centre Opérationnel de la Marine (COM). Préparatifs	<ul style="list-style-type: none"> • Lieutenant de Vaisseau Sidi Abdalla (Chef du COM). Présent à tous les évènements par la suite
➤ Réunion de lancement de la Visite Technique en présence de : Marine Nationale (MN), Ministère des pêches et de l'économie maritime (MPEM), Port Autonome de Nouakchott dit Port de l'Amitié (PANPA)	<ul style="list-style-type: none"> • Capitaine de Vaisseau Sidina CHOUD Chef d'État-major (CEM) adjoint de la Marine (CEM) • Capitaine de Frégate Stéphane CONGUES conseiller du CEM • M Babana YAHYA Inspecteur Général du MPEM • M Mohamed Leine TAH Directeur technique adjoint du PANPA
➤ Entretiens avec le Chef d'État-major de la Marine (CEM)	<ul style="list-style-type: none"> • Contre-amiral Mohamed Cheikhna TALEB MOUSTAPH
J2 : Wednesday 18 January 2023	
➤ Direction Générale des Hydrocarbures (DGH) du Ministère du Pétrole, des Mines et de l'Énergie (MPME)	<ul style="list-style-type: none"> • M Moustapha BECHIR, Directeur Général • M Eba Mohamed ETHMANE, Directeur de l'exploration – production (données) • M Mouamar Rachid SALEH, Directeur du Suivi des Projets et de l'Environnement
➤ Agence Mauritanienne des Affaires Maritimes (AMAM) du Ministère des Pêches et de l'Économie Maritime (MPEM)	<ul style="list-style-type: none"> • M Valid SIDATTY ; Directeur Général • M Mohamed Yeslem AHMED ELHACEM Directeur Général Adjoint
➤ Port Autonome de Nouakchott dit Port de l'Amitié (PANPA) du Ministère de l'Équipement et des Transports (MET)	<ul style="list-style-type: none"> • M Moustapha Mohamed YAHYA Directeur Technique
J3 : Thursday 19 January 2023	
<ul style="list-style-type: none"> ➤ Visite du Port de Tanit ➤ Institut Mauritanien des Recherches Océanographiques et des Pêches (MROP) du MPEM 	<ul style="list-style-type: none"> • M Cheikh HEJBOU Chef du Centre IMROP de Nouakchott
J4 : Friday 20 January 2023	
➤ Restitution (conclusions – recommandations) de la Visite Technique introduite par le CEM en présence de représentants de l'AMAM et de la DGH	<ul style="list-style-type: none"> • Contre-amiral Mohamed Cheikhna TALEB MOUSTAPH (MN) • M Mohamed Yeslem AHMED ELHACEM Directeur Général Adjoint (AMAM) • M Eba Mohamed ETHMANE, Directeur de l'exploration – production (DGH) • M Mouamar Rachid SALEH, Directeur du Suivi des Projets et de l'Environnement (DGH)
➤ CMA CGM Mauritanie	<ul style="list-style-type: none"> • Christophe JOURDAN Directeur Général

Annex F : Photos



Centre Opérationnel de la Marine Nationale (MN/COM) du Ministère de la Défense Nationale (MDN)

A droite (on right) son Commandant : Lieutenant de Vaisseau Sidi Abdalla (hydrographe CAT A) également chef de projet « montée en puissance d'un service hydrographique »



Marine Nationale (MN) et Ministère des Pêches et de l'Économie Maritime (MPEM)

De gauche à droite (from left to right) : Capitaine de Frégate Stéphane CONGUES (conseiller du chef d'État-Major de la Marine) – Henri DOLOU (OHI) – Inspecteur Général M Babana YAHYA (MPEM)



Dans le bureau du Chef d'État-Major de la Marine

Quatrième à partir de la gauche (fourth from left) : Contre-Amiral Mohamed Cheikhna TALEB MOUSTAPH



Port Autonome de Nouakchott

À gauche (on left) sur fond d'un levé bathymétrique du port de Nouakchott : M Mohamed Lemine TAH Directeur Technique adjoint du PANPA



dit Port de l'Amitié (PANPA) du Ministère de l'Équipement et des Transports (MET)

À droite (on right) M Moustapha Mohaùed YAHYA

Directeur Technique du PANPA



Direction Générale des Hydrocarbures (DGH) du Ministère du Pétrole des Mines et de l'Énergie (MPME)
De gauche à droite (from left to right) : Eba Mohamed ETHMANE (Directeur de l'exploration – production) - Sidi Abdalla - Henri DOLOU - Moustapha BECHIR (Directeur Général des hydrocarbures) - Mouamar Rachid SALEH (Directeur du Suivi des Projets et de l'Environnement)



Agence Mauritanienne des Affaires Maritimes (AMAM) du Ministère des Pêches et de l'Économie Maritime (MPEM)

De gauche à droite (from left to right) : Mohamed Yeslem AHMED ELHACEM (Directeur Général Adjoint) - Valid SIDATTY (Directeur Général) - Henri DOLOU - Sidi Abdalla



Institut Mauritanien des Recherches Océanographiques et des Pêches (IMROP)

On right : M Cheick HEJBOU Chef du Centre de Nouakchott



Réunion de restitution et de recommandations de fin de Visite Technique OHI
Principaux participants : Marine Nationale, Agence Mauritanienne des Affaires Maritimes,
Direction Générale des Hydrocarbures

Annex G : Contact IHO (Publication P5 – Annuaire/Yearbook)

Mauritania / Mauritanie

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

- Declared National Tonnage -Tonnage national déclaré -Tonelaje Nacional Declarado	
- National day -Fête nationale -Fiesta nacional	28 November
- Remarks on membership - Remarques sur l'adhésion -Comentarios sobre la adhesión	

CONTACT OHI : MARINE NATIONALE

Contact information / Informations de contact / Información de contacto

- National Hydrographer or equivalent - Hydrographe national ou équivalent - Hidrógrafo Nacional o equivalente	- Contre-amiral Mohamed Cheikhna TALEB MOUSTAPH Chef d'État-Major de la Marine ○ (+222) 42 77 59 01 ○ (+222) 20 58 00 09 ○ talebmoustaph61@hotmail.com
- Other point(s) of contact - Autre(s) point(s) de contact - Otros punto(s) de contacto	- Lieutenant de Vaisseau Sidi Abdalla MOHAMED (CAT A) Chef du Centre Opérationnel de la Marine Chef de projet développement de l'hydrographie ○ (+222) 33 10 00 00 ○ samwrknav@gmail.com
- Web site - site web - sitio web	

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

- Top level parent organization - Organisme mère - Organización asociada de nivel superior	- Ministère de le Défense Nationale (MDN)
- Principal functions of the organization or the department - Attributions principales de l'organisme ou du département - Principales funciones de la Organización o el departamento	- Service hydrographique National en projet de constitution
- Other information of interest - informations utiles - Otra información de interés	Les cartes marines papier, les cartes électroniques de navigation et d'autres publications nautiques sont réalisées par des pays tiers. La France (Shom : Service hydrographique et océanographique de la marine) est responsable cartographique

CONTACT OMI : AGENCE MAURITANNIENNE DES AFFAIRES MARITIMES (AMAM)

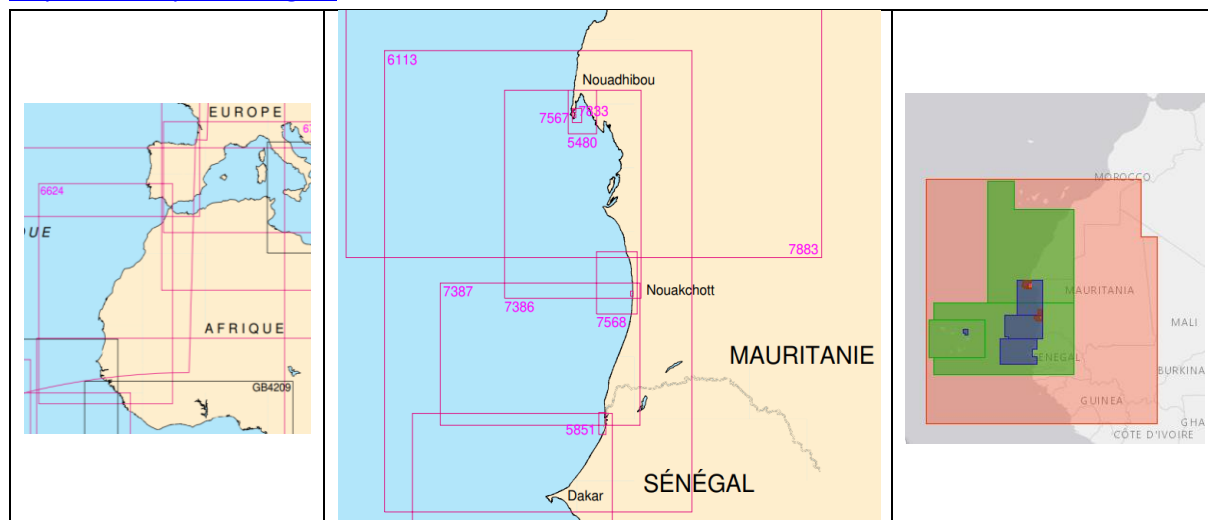
Contact information / Informations de contact / Información de contacto

Directeur Général	- Valid SIDATTY ○ (+222) 46 86 63 36 ○ vsidaty69@yahoo.fr
Directeur Général Adjoint	- Mohamed Yeslem AHMED ELHACEM ○ (+222) 46 53 73 31 ○ amyeslem@yahoo.fr

Annex H : Charting (Paper charts and Electronic Navigational Charts)

<https://diffusion.shom.fr/pro/catalogues>

<https://www.primar.org/#/>



ENC			Cartes Marines françaises
FR166240	Islas Canarias to Freetown	Overview 3 000 000	CM 6624 : De Lisbonne (Lisboa) à Freetown (1 : 3 500 000)
			CM 7883 : Du Cap Tarfaya (Cap Juby) à Râs Timirist (Cap Timiris) - Islas Canarias (1 : 1 100 000)
			CM 6113 : Du Cap Blanc au Cap Vert (1 : 881 744)
ES201083	Cape Yubi to Ras Timiris	General 700 000	
PT262101	Cabo Verde to Senegal	General 699 999	
FR373860	Nouadhibou to Baie de Tânit	Coastal 350 000	CM 7386 : De Nouadhibou à Nouakchott (1 : 331 000)
FR373870	Nouakchott to fleuve Sénégal	Coastal 350 000	CM 7387 : De Nouakchott à Saint-Louis (1 : 336 000)
FR475680	Mauritania - Approches to Nouakchott	Approach 90 000	CM 7568 : Approches de Nouakchott (1 : 100 000) Cartouche : A - Port de Nouakchott - Port de l'Amitié (1 : 15 000)
FR57568A	Mauritanie - Port de Nouakchott - Port de l'Amitié	Harbour 12 000	CM 7568 : Approches de Nouakchott (1 : 100 000) Cartouche : A - Port de Nouakchott - Port de l'Amitié (1 : 15 000)
GB41690D	Approches to Nouadhibou	Approach 90 000	
			CM 5480 : Baie du Lévrier (1 : 78 830) (région Nouadhibou)
GB401699	Africa - West Coast - Nouadhibou	Approach 45 000	
FR575670	Approches to Nouadhibou harbours	Harbour 22 000	CM 7567 : Accès aux ports de Nouadhibou (1 : 22 500)
FR67833A	Port de Nouadhibou (Port-Étienne)	Berthing 4 000	CM 7833 : Ports et terminaux de Nouadhibou • Cartouche : A - Port de Nouadhibou (Port-Étienne) (1 : 7 500) • Cartouche : B - Port minéralier de Noua. (Cansado) (1:7 500)