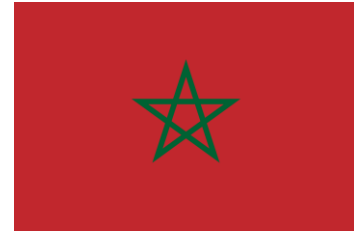




**IHO - Capacity Building  
Work Programme  
TECHNICAL VISIT  
IN THE KINGDOM OF MOROCCO  
REPORT 15 - 19 Mai 2023**



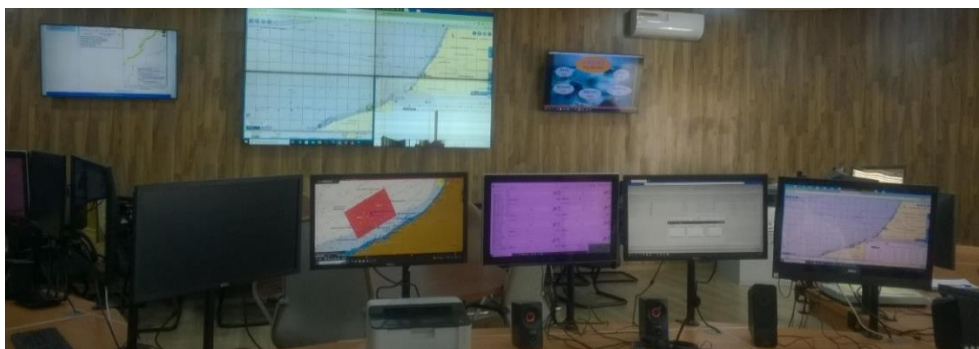
**IMO Member State Audit Scheme Programme (IMSAS) contribution**



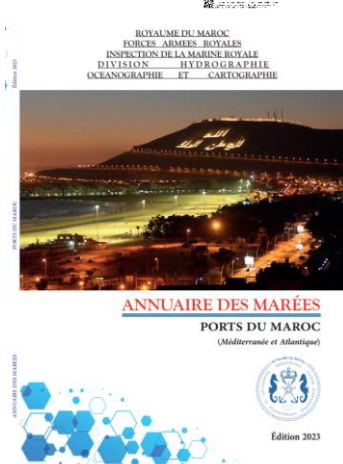
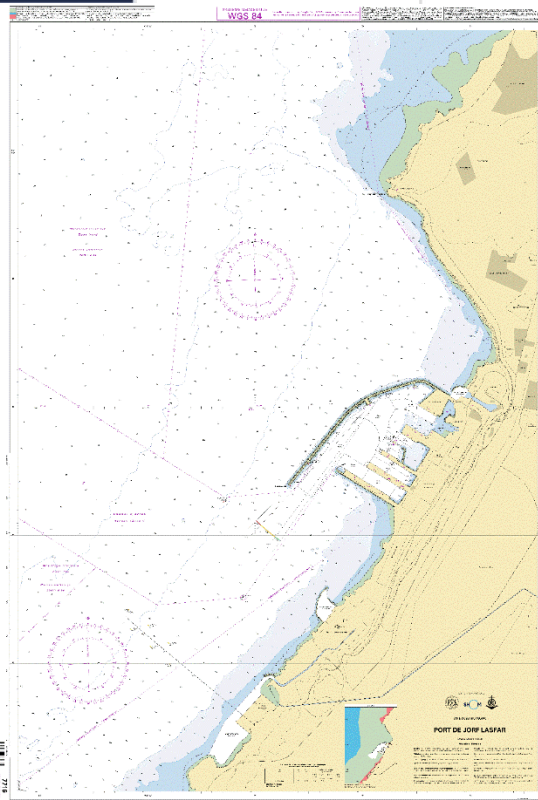
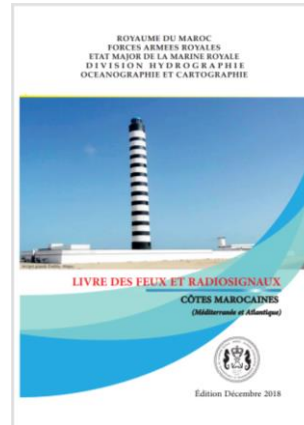
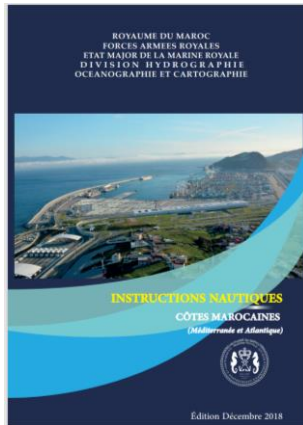
**Royal Moroccan Navy Hydrographic, Oceanographic and marine Cartographic Division**



**Multi-Mission Hydro-Oceanographic Vessel *Dar Al Beida***



**Maritime Rescue Coordination Centre**



2023 - 30 Avril GAN n° 66  
**Groupe d'Avis aux Navigateurs**

**PLAN**

<b>INFORMATIONS.....</b>	<b>3</b>
1.1. Avertissements spéciaux.....	3
1.2. Avertissements urgents de navigation (AVIRNAV) en vigueur.....	3
1.3. Avis aux Navigateurs (AVINAV) en vigueur.....	3
1.4. Avis préliminaires, temporaires et divers.....	7
Liste des avis préliminaires, temporaires et divers parus du 15 au 30 avril 2023.....	7
Récapitulatif des avis préliminaires, temporaires et divers.....	7
1.5. Avertissements NAVAREA.....	8
Avertissements NAVAREA II.....	8
Avertissements NAVAREA III.....	8
<b>CORRECTIONS.....</b>	<b>9</b>
2.1. Cartes marocaines reproduites avec le SHOM.....	9
2.2. Instructions nautiques des côtes marocaines.....	9
2.3. Livre des feux et Radiosignaux des côtes marocaines.....	9
2.3.1. Correction temporaire.....	9
Zone Méditerranée (Du Cap Spartel à la frontière Est du Royaume) parus du 15 au 30.04.23.....	9
Récapitulatif des corrections (Zone Méditerranée).....	9
Zone Atlantique (Entre Cap Spartel et Cap Blanc) parus du 15 au 30.04.23.....	9
Récapitulatif des corrections (Zone Atlantique).....	9
2.3.2. Correction permanente.....	12
2.4. Autres ouvrages.....	12
<b>NOUVELLES PUBLICATIONS.....</b>	<b>13</b>
3.1. Cartes.....	13
3.2. Ouvrages.....	13

*All our thanks to:*



Inspection de la Marine Royale



Division d'Hydrographie, d'Océanographie et de Cartographie marine de la Marine Royale



Ministère de l'Équipement et de l'Eau (MEE)



Direction des Ports et du Domaine Public Maritime (DPDPM du MEE)



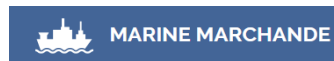
Agence Nationale des Ports (ANP du MEE)



Direction Générale de la Météorologie (DGM du MEE)



Ministère du Transport et de la Logistique (MTL)



Direction de la Marine Marchande (DMM du MTL)



Centre de Surveillance du Trafic Maritime (CSTM du MTL/DMM)



Ministère de l'Agriculture, de la Pêche maritime, du Développement rural et des Eaux et Forêts (MAPMDREF)



Agence Nationale de la Conservation Foncière, du Cadastre et de la Cartographie (ANFCC du MAPMDREF)



Maritime Rescue Coordination Centre (MRCC du MAPMDREF)

Avec le concours de :



Service hydrographique et océanographique de la marine (France)



IHO secretariat (Monaco)

## Contents

Contents .....	4
ABSTRACT .....	7
INTRODUCTION .....	9
1 Preparation of the technical visit - Background .....	9
1.1 Preparation of the technical visit .....	9
1.2 Methodology .....	9
2 Composition of the team.....	10
PART A – OVERALL ASSESSMENT OF THE SITUATION IN REGION .....	11
3 Efficacy of the Technical Visit .....	11
4 International and regional cooperation – Defense .....	12
PART B – MOROCCO - ASSESSMENT .....	13
5 Involvement in Regional Hydrographic Commissions (EAtHC, MBSHC) .....	13
6 Preliminary liaison .....	13
7 Technical Visit contact Points – IHO Focal Points (P5-Yearbook).....	13
DESCRIPTION OF MARITIME ACTIVITIES .....	14
8 National Maritime Affairs - Actors .....	14
8.1 Main players .....	14
8.1.1 Actors who participated in the Technical Visit (Photos) .....	14
8.1.2 Direction de la Marine Marchande (DMM) - Direction of the Merchant Navy.....	15
8.1.3 Direction Générale de la Météorologie (DGM) - General Directorate of Meteorology	15
8.1.4 Centre de Surveillance du Trafic Maritime (CSTM) Tanger - Maritime Traffic Monitoring Center.	16
8.1.5 Direction des Ports et du Domaine Public Maritime (DPDPM) - Directorate of Ports and Public Maritime Domain.....	16
8.1.6 Agence Nationale des Ports (ANP) National Ports Agency.....	16
8.1.7 Agence Nationale de la Conservation Foncière, du Cadastre et de la Cartographie (ANCFCC) National Agency for Land Conservation, Cadastre and Cartography .....	16
8.1.8 Maritime Rescue Coordination Centre (MRCC) du Département des Pêches Maritimes (DPM) - Maritime Rescue Coordination Center (MRCC) of the Department of Maritime Fisheries (DPM)	16
8.1.9 DHOC .....	17
8.2 Coordination: AEM (State Action at Sea) and “National Coordination Committee for aids to navigation, hydrography, oceanography and nautical cartography” .....	19

9	Maritime Trade and Traffic – Nautical Cartography/CATZOC.....	19
9.1	Maritime traffic .....	19
9.2	Charting/CATZOC.....	20
9.2.1	Official cartography of Morocco (see Annex F).....	20
9.2.2	State of knowledge.....	21
10	Responsibility for maritime safety .....	23
11	Responsibilities of the defense forces.....	23
12	Coastal zone management and environmental protection .....	23
C-55	INDICATORS.....	24
13	Status of hydrographic surveys in the national maritime area .....	24
14	Collection and circulation of nautical information.....	24
15	Hydrographic survey capacity .....	25
16	Independent nautical chart production capacity .....	25
	COORDINATION AND CAPACITY BUILDING .....	26
17	National Coordination/Consultation Committee (Hydrography, Physical Oceanography, Marine Cartography, Aids to Navigation).....	26
18	Phase 1 Hydrographic capacities: MSI and GMDSS.....	28
18.1	Introduction.....	28
18.1	Level of development.....	28
19	Phase 2 Hydrographic capacities: conducting surveys.....	30
19.1	Introduction.....	30
19.2	Level of development.....	30
20	Phase 3 Hydrographic capacities: production of nautical charts .....	31
20.1	Introduction.....	31
20.2	Level of development.....	31
21	Summary of the assessment of national hydrographic capacities - Table.....	31
	FORMATION .....	32
22	Basic training of technicians and engineers in hydrography and nautical cartography .....	32
23	Continuous training in hydro-oceanography - cartography and related activities (aids to navigation, port infrastructure works and coastal protection) - Management.....	33
	ANNEXES.....	34
	Annex A : Abbreviations .....	34
	Annex B-1 : Terms of reference of the visit team of the Regional Hydrographic Commission.....	36
	Annex B-2 : SOLAS requirements (Chapter V rules 9 and 4) .....	37
	Annex B-3 : IMSAS – Consolidated Audit Summary Report (CASR) -Extracts in English .....	38

Annex C-1 : Missions, Organisation, Capacités en moyens navals The Hydrography, Oceanography and marine Cartography Division (DHOC): Missions, Organization, Naval Capabilities.....	41
Annex C-2 : Reference texts (Decrees, Standard, Administrative Arrangement, etc.) .....	43
Annex D : List of main contacts -Telephones - Mails.....	45
Annex E : Agenda – Events .....	47
Annex F : Charting (paper et electronic) .....	48
Annex F-1 : Coproduction Shom/DHOC .....	48
Annex F-2 : Future production DHOC.....	50
Annexe G: Capacity Building Publication N° C-16: National Hydrographic Regulations - Règlements hydrographiques nationaux. ....	51
Annex H : État des levés hydrographiques et de la cartographie marine à travers le monde - Status of Hydrographic Surveying and Charting Worldwide Publication C-55 .....	55
Annex I : Referents by fields of activity .....	57
Annex J : Commitment of the Kingdom of Morocco (CNCHOC) in favor of the achievement of the objectives of the Ocean Decade (UNESCO/IOC) .....	58



## ABSTRACT

The development of Morocco in the field of hydrography and nautical cartography can be described as exemplary for having built up in a remarkable time capacity comparable to those of European countries which are also members of the IHO. Evidence could be provided.

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), Morocco's capacities are in terms of development:

- **acquired for phase 1:** collection and transmission of maritime safety information/nautical information (**MSI**) to NAVAREA II and III, as well as transmission of corrections to nautical documents, in particular nautical concerning rule 9 of chapter V SOLAS:charts. The responsibilities of the various Moroccan stakeholders are clearly defined and ensured;
- **also acquired for phase 2: hydro-oceanographic surveys** through the acquisition and archiving of data;
- **acquired for phase 3**, namely the **production of official nautical charts**. This is nevertheless a phase still involving a third country within the framework of an administrative arrangement currently being amended for the distribution of the charts. This for a limited period, the autonomy of Morocco being assured in the short term.

Many strengths are noted in the report:

- concerning rule 9 of chapter V SOLAS:
  - a very efficient hydro-oceanographic fleet, standards and operational guides made available;
  - an independent production capacity for nautical charts and nautical publications (notices to mariners included);
- concerning rule 4 of chapter V SOLAS: documented management of navigational warnings;
- concerning the IHO: involvement in regional commissions (EAtHC vice-chairmanship) and working groups (MSDI, S-100)

This within the very open, very organized and very active national framework of the National Coordination Committee in the fields of Hydrography, Oceanography and Marine Cartography (CNCHOC).

There are of course always points to improve, well known by the actors met, this concerns in particular:

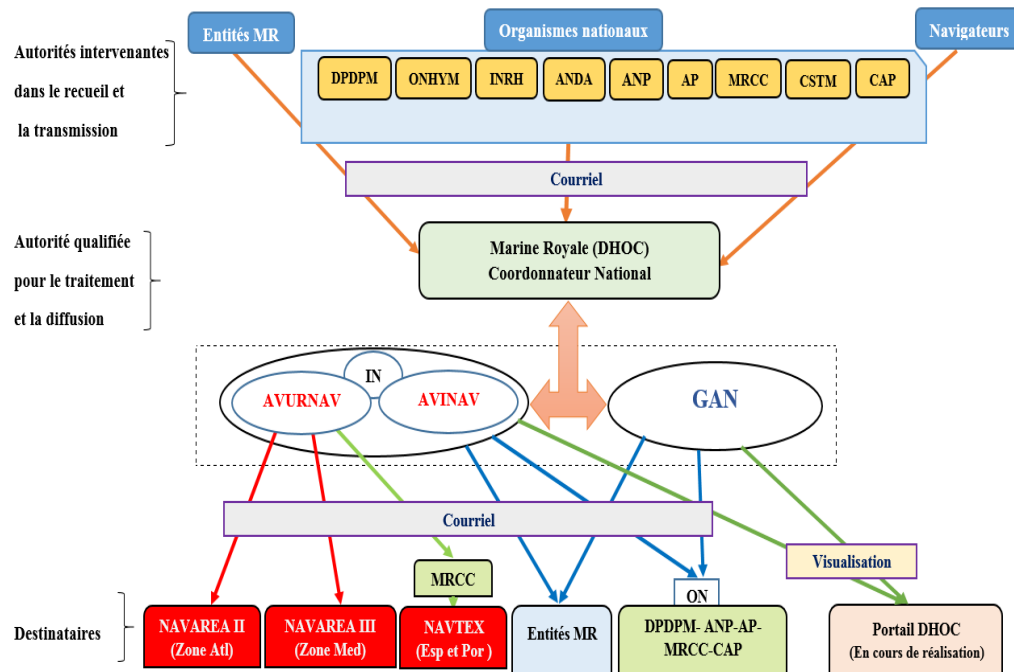
- the finalization of a shared network of real-time tide observatories
- means of long-term management (archiving, sharing, etc.) of data and metadata (GIS - Structured databases), processes and procedures (document management managed in configuration);
- the means of distributing charts, nautical publications and notices to mariners (website);
- the on-site training in Morocco of hydrographic technicians as part of a course approved CAT B by the IHO and therefore leading to a diploma at an international level. This within the framework of a forward-looking management of staff and skills in Morocco, which can be extended to the sub-region (training of foreigners);
- the strengthening of links with the scientific community, which makes it possible to encourage innovation, particularly in terms of physical oceanography and integrated management of coastal zones.

This report does not claim to be exhaustive, there is certainly potential that has not been valued.

**Chapitre V de la convention SOLAS – Règle 9 : Services hydrographiques**  
**SOLAS Chapter V Regulations 9: Hydrographic services**

	<b>Rassembler et de compiler des données hydrographiques</b> <i>Collection and compilation of hydrographic data</i>	<b>Publier, diffuser</b> <i>Publication, dissemination</i>	<b>Tenir à jour</b> <i>Keeping up to date</i>
<b>Levés hydrographiques</b> <i>Hydrographic Surveys</i>	DHOC, DPDPM, ANP ...	Concerns charts and nautical publications	Concerns charts and nautical publications
<b>Cartes marines et ENC</b> <i>Nautical Charts and ENC</i>	DHOC, DPDPM, ANP, ANFCC, DPM ...	DHOC + Shom (only DHOC term)	DHOC + Shom (only DHOC term)
<b>Instructions Nautiques</b> <i>Sailing Directions</i>	DHOC, DPDPM, ANP, INRH ...	DHOC	DHOC
<b>Livre des feux</b> <i>Lists of Lights</i>	DPDPM, DHOC	DHOC	DHOC
<b>Annuaire des marées</b> <i>Tide</i> <small>Concerne cartes et ouvrages nautiques</small> <i>Tables</i>	DPDPM, ANP, DHOC	DHOC	DHOC
<b>Avis aux navigateurs</b> <i>Notice to mariners</i>	MR, MRCC, DHOC, DPDPM, ANP...	DHOC	DHOC

**Chapitre V de la convention SOLAS – Règle 4 : Avertissements de navigation**  
**SOLAS Chapter V Regulations 4 – Navigational Warnings**



Nota: In order to verify the level of development of the country, the IHO publication C-16 (Capacity Building Publication: National Hydrographic Regulations) has been completed (Annes G).



## INTRODUCTION

### 1 Preparation of the technical visit - Background

#### 1.1 Preparation of the technical visit

The visit was planned as part of the IHO capacity development activity program as it had been studied for the year 2022, at the request of Morocco in order to prepare an IMSAS audit (now planned in July 2024):

- *CBWP 2022: action A-09 - «Technical Visit to Morocco».*

It was initiated in close relationship with Captain (Navy) Mostafa TAFRHY, head of the DHOC and the Lieutenant Commander Abdallah HADOU, head of the cartography section. The generic IHO terms of reference for the visit are given in Annex B-1 (they clearly include the preparation of IMSAS audits).



**DHOC - Kick-off meeting of the Technical Visit**

**From left to right : Henri DOLOU (OHI), CV Mostafa TAFRHY (Chef de la DHOC), CC Abdallah HADOU (chef de la section cartographie de la DHOC)**

#### 1.2 Methodology

The Technical Visit did not comprehensively address all topics of hydrography, physical oceanography and cartography with all relevant Moroccan stakeholders.

However, she has discussed “safety of maritime navigation” requirements with all sections of the DHOC and other national bodies. Organizations which should also be audited by the IMO in 2024 and therefore be able to report on their “SOLAS” activities in relation to the DHOC.

Particular attention has of course been paid to the application of international texts and more particularly the SOLAS convention of the IMO (important extracts relating to chapter V rules 9 and 4 in Annex B-2).

## **“IMO” approach**

Reference: *What is IMO audit?*

*“The audit scheme, using the IMO Instruments Implementation Code (III Code) as the audit standard, aims to provide an audited Member State with a comprehensive and objective assessment of how effectively it administers and implements those mandatory IMO instruments which are covered by the Scheme.*

*The International Maritime Organization (IMO) Member State Audit Scheme (IMSAS) is a mandatory audit under IMO Res.”*

In addition to the SOLAS convention taken up by the IHO, particular attention has been paid to the IMO audit reports or their summaries as they can be consulted on the IMO website (see Annex B-3).

## **« IHO » approach**

Particular attention has been paid to publication M-2: “The need for national hydrographic services” on “<https://iho.int/en/miscellaneous-publications> which:

- includes SOLAS extracts (listed in annex B-2);
- lists the functions of a national hydrographic service: what must be provided to fulfill international obligations either directly or in coordination with other providers:
  - Maritime Safety Information
  - Hydrographic surveys;
  - Nautical charts;
  - Other nautical documents: sailing directions, lists of lights, tide tables, notices to mariners

## **« AISM/IALA » approach (for memory)**

- The document “G1115 Preparing for an IMO Member State Audit Scheme (IMSAS) on VTS” was consulted on: “<https://www.iala-aism.org/product/g1115/>” (the requirements for the provision of hydrographic services are reminded there);
- Oral exchanges were conducted with an IALA expert on the preparation of IMSAS audits on aids to navigation in general.

## **2 Composition of the team**

For the IHO, the visiting team consisted of:

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

Lieutenant Commander Abdallah HADOU, head of the cartography section of the DHOC, participated in all the interviews.

## PART A – OVERALL ASSESSMENT OF THE SITUATION IN REGION

### 3 Efficacy of the Technical Visit

The effectiveness of the visit will be able to be measured through the outcome of the targeted actions suggested in this report. They are often already expressed in DHOC or CNCHOC action plans. It is proposed to do so in addition to the recommendations and actions listed during the last EAtHC/EAtHC n° 17 of 2022 in Cape Verde (<https://iho.int/en/eathc17-2022>).

A progress report can be made during EAtHC N°18 which will take place in Morocco in May 2024 before the IMSAS audit.

It can already be noted:

- 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 in terms of maritime navigation (environment and research themes have not been explored in depth);
- That the following interviews have been honored (agenda in annex E):
  1. DGM: General Directorate of Meteorology
  2. DMM: Direction of the Merchant Marine
  3. CSTM/Tangier: Maritime Traffic Monitoring Center
  4. DPDPM: Directorate of Ports and Public Maritime Domain
  5. ANP: National Ports Agency
  6. ANFCC: National Agency for Land Conservation, Cadastre and Cartography
  7. MRCC: Maritime Rescue Coordination Center
  8. DHOC: Division of Hydrography, Oceanography and marine Cartography
    - a. Hydrography
    - b. Geodesy and tides
    - c. Cartography
    - d. Nautical publications
    - e. Secretary of the National Hydrographic Committee: CNCHOC
- That a restitution meeting at the end of the visit was held at the DHOC with the participation of Commodore LOUDIYI, Deputy Inspector of the Royal Navy and former head of the DHOC;
- That all the actors able to collect nautical information were already well aware of the SOLAS obligations (chapter V) ensured by Morocco, at the local, coastal and wide level in connection with France (NAVAREA II) and Spain (NAVAREA III).

It should be noted that the technical exchanges, beyond the obligations of the SOLAS convention, also focused on the expected socio-economic benefits. As such, it is recalled that hydrographic investments 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.

Although the exchanges did not focus on the expected benefits in terms of the marine environment, in particular at the level of the land-sea interface (coastal development – coastal protection), the fact remains that the contribution of the DHOC and more broadly that of the CNCHOC is fully understood in this area.

**4 International and regional cooperation – Defense**


a. [International and Regional Organizations]


<b>OHI/IHO Status</b>	<b>Regional Hydrographic Commission</b>	<b>OMI/IMO</b>	<b>AISM/IALA</b>
Member (ADN/MR/DHOC)	Member of CHAtO/EAtHC (ADN/MR/DHOC)	Membre (MTL/DMM)	Membre (MEE/DPDPM)

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

## PART B – MOROCCO - ASSESSMENT

### 5 Involvement in Regional Hydrographic Commissions (EAtHC, MBSHC)

	<p>Eastern Atlantic Hydrographic Commission (EAtHC) Commission hydrographique de l'Atlantique Oriental (CHAtO)</p>
---	--

Constats	Actions
<p>Morocco is always represented at EAtHC meetings. He has just taken the vice-presidency of this commission. The next plenary EAtHC (No. 18) will be organized in Morocco in Casablanca (May 15, 16 and 17, 2024: <a href="https://iho.int/fr/commission-hydrographique-de-l-atlantique-oriental">https://iho.int/fr/commission-hydrographique-de-l-atlantique-oriental</a>). The presidency of the EAtHC should then be ensured by Morocco.</p>	<ul style="list-style-type: none"> <li>• The possible actions are those of any member of the IHO and EAtHC in particular;</li> <li>• Concerning the EAtHC, these actions are listed online at: <a href="https://iho.int/en/eathc17-2022">https://iho.int/en/eathc17-2022</a> (see post meeting documents also including decisions and recommendations);</li> <li>• In terms of Capacity Development in the region, it is proposed that Morocco join the actions carried out in particular by France and Portugal</li> </ul>
	<ul style="list-style-type: none"> <li>• More particularly participate in the hydrographic seminar which will precede (May 13 and 14, 2024) at the same place EAtHC N°18.</li> <li>• Shom organization; point of contact: <a href="mailto:henri.dolou@shom.fr">henri.dolou@shom.fr</a></li> </ul>

Note: the DHOC also represents Morocco at the MBSHC

### 6 Preliminary liaison

The visit was mainly prepared through exchanges with the DHOC and the collection of open information on the Internet (including the IMSAS reports of the IMO). Shom was consulted as a co-producer (with Morocco) of nautical charts.

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

The Technical Visit contact points are listed in Annex D.

IHO publication P5 is up to date.

Current IHO Directory reference:

[https://iho.int/uploads/user/pubs/periodical/P5YEARBOOK\\_ANNUAIRE.pdf](https://iho.int/uploads/user/pubs/periodical/P5YEARBOOK_ANNUAIRE.pdf)

## DESCRIPTION OF MARITIME ACTIVITIES

### 8 National Maritime Affairs - Actors

The duration of the visit (5 working days) made it possible to meet important players in the maritime transport chain.

The talks focused on the issues associated with hydrography, mainly those related to the safety of navigation (international commitments – SOLAS). The socio-economic performance through the port capacities for receiving ships (including larger ones) and the optimization of their loading (through the depths shown on the nautical charts) could however also be mentioned.

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.

This is perfectly perceived and shared in Morocco through the functioning of the CNCHOC (National Coordination Committee in the fields of Hydrography, Oceanography and Marine Cartography).

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

It was not a surprise, Morocco meets its international obligations in terms of hydrographic services and navigational warnings.

The activities of the main players are briefly described below. It is through the operation of the CNCHOC that their roles are highlighted.

#### 8.1 Main players

##### 8.1.1 Actors who participated in the Technical Visit (Photos)



**Direction de la Marine Marchande (DMM), Direction Générale de la Météorologie (DGM),  
Centre de Surveillance du Trafic Maritime (CSTM)**

**In the front row from left to right: A. Atide (DMM), Mostafa TAFRHY, Hassan BOUKSIN (DGM), Henri DOLOU,  
In the second front row from left to right: Abdallah HAHOU, Driss DAKHAL (DHOC/ONE), Younes ALAHIANE (VTS Tanger)**





**Direction des Ports et du Domaine Publique Maritime (DPDPM), Agence Nationale des Ports (ANP),  
Agence Nationale de la Conservation Foncière, du Cadastre et de la Cartographie (ANCFCC)**  
From left to right : Nisrine LAZAR (DPDPM), Mohamed ELAICHATI (ANP), Mohammed EL BAHRAOUI (ANCFCC),  
Mostafa TAFRHY, Henri DOLOU



**Maritime Rescue Coordination Centre (MRCC)**  
From left to right : Abdallah HAHOU, Henri DOLOU, Mostafa TAFRHY, Driss DAKHAL, Mohammed DRISSI (MRCC)

### **8.1.2 Direction de la Marine Marchande (DMM) - Direction of the Merchant Navy**

The Direction of the Merchant Navy (DMM) manages the maritime transport sector. The DMM is responsible with, among other things:

- define the policy and ensure the organization and control of maritime transport;
- ensure the safety and security of the navigation of merchant ships and the prevention of pollution of marine origin;
- monitor and manage maritime traffic in the area of the Strait of Gibraltar.

### **8.1.3 Direction Générale de la Météorologie (DGM) - General Directorate of Meteorology**

The DGM contributes to ensuring the safeguard of human life and property on the coast and at sea. To do this, Maroc Météo receives data from an observation set collected by buoys, ships, maritime weather stations and weather satellites. This information is added to that collected on land to be analyzed by meteorologists in order to enable them to make the right decisions at the right time, thanks in particular to alerts and weather reports on the state of the sea, the wind on the sea surface and many meteorological parameters.

#### **8.1.4 Centre de Surveillance du Trafic Maritime (CSTM) Tanger - Maritime Traffic Monitoring Center.**

The CSTM in Tangier houses a system dedicated to monitoring maritime traffic in the Strait of Gibraltar area. It implements a VTS service.

Its mission is to ensure the safety of maritime navigation in the Strait of Gibraltar.

The dissemination to navigators of all available nautical and meteorological information is done regularly 6 times a day in three languages: Arabic, English and French.

#### **8.1.5 Direction des Ports et du Domaine Public Maritime (DPDPM) - Directorate of Ports and Public Maritime Domain**

Among its attributions can be noted:

- Characterizing the port and maritime public domain by collecting oceano-climatological (swell, wind, etc.), hydrographic (and developing related documents such as coastal maps), geomorphological information (beaches, estuaries, lagoons, marshes, rocky coasts...) and nautical.
- Ensure the monitoring and treatment of the coastline.
- Ensure the installation, operation and maintenance of maritime signaling equipment (Aids to navigation) outside ports throughout the public maritime domain.

#### **8.1.6 Agence Nationale des Ports (ANP) National Ports Agency**

The National Ports Agency (ANP) is the authority and regulatory body for the new Moroccan port system. It exercises its powers over all the ports of the Kingdom with the exception of the port of Tangier Mediterranean.

Among its administrative structures, the harbor offices which are the true operational heart of the port activity. These watch over international regulations such as the SOLAS convention.

With the aim of optimizing the competitiveness of the national economy in general and of the ports in particular, the Agency works to improve the quality of services, the security of port operations and the reduction of transit costs. (capacity increase) and logistics costs.

#### **8.1.7 Agence Nationale de la Conservation Foncière, du Cadastre et de la Cartographie (ANCFCC) National Agency for Land Conservation, Cadastre and Cartography**

The ANCFCC exercises, on behalf of the State, the attributions in terms of (terrestrial) cartography. It is responsible, among other things, for:

- the establishment and revision of the topographical map of the Kingdom at any scale;
- carrying out basic infrastructure works relating to geodetic and leveling networks;
- the coordination, centralization and conservation of topographic and photogrammetric documents drawn up by administrations, local authorities and public establishments.

#### **8.1.8 Maritime Rescue Coordination Centre (MRCC) du Département des Pêches Maritimes (DPM) - Maritime Rescue Coordination Center (MRCC) of the Department of Maritime Fisheries (DPM)**

The MRCC is responsible for the National SAR system: Mission to save lives at sea.

At the operational level, he oversees the dissemination of safety messages and weather reports

### 8.1.9 DHOC

The role of the DHOC is perfectly defined (constitutive decree, see annex C2).

Its interactions with other players in the maritime world as well (CNCHOC).

A description of the DHOC is given in annex C1.

The DHOC, during the Technical Visit, was able to present its productions and the teams formed for their production.

#### Cartography



DHOC/Cartographie

From left to right: MP Nouredine MOURTADAH, MP Ismail RAHMANI, MP Hassan HOUMAN, MP Kcem CHBIKA, CC Abdallah HAHOU, Henri DOLOU, OE Mohammed BERGHAZI

#### Hydrography



DHOC/Hydrographie

From left to right:

Sm Aouane ( S.hydro), Sm Chachoue ( S.Carto), Sm Moustaghit ( S.hydro), Lv Amri ( chef de la section hydro), Mr Henri Dolou, OE2 Moumni ( chef de la cellule G.G), MP Saadi ( S.hydro), SM Ouzzif ( S.hydro), Sm Merketan ( S.hydro), Sm Jeddou ( S.hydro), Mp Rehmani ( S. carto).

Absents : Lv Letni (chef de la S.section acquisition et traitement), Pm amine Benamran ( S.Hydro) et le Mp Houman (S. hydro/G.G)

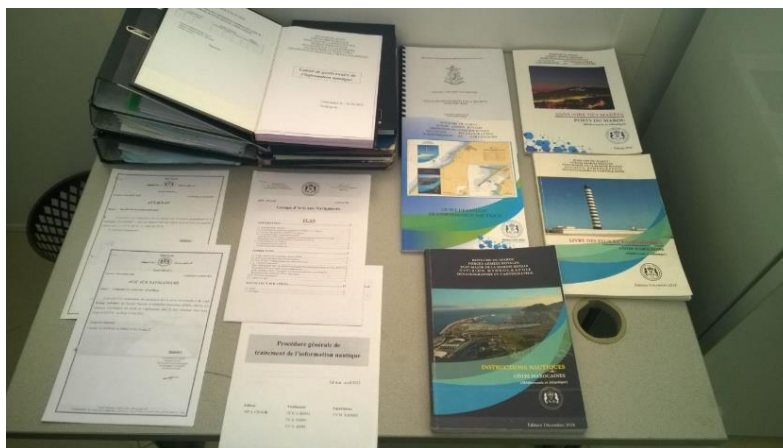


### Nautical publications and Equipments



DHOC/ONE : Ouvrages Nautiques et Équipements

From left to right : Henri DOLOU, CF Driss LAKHAL, MP Abdelahad CHAKIB, PM Noureddine GARMOUH

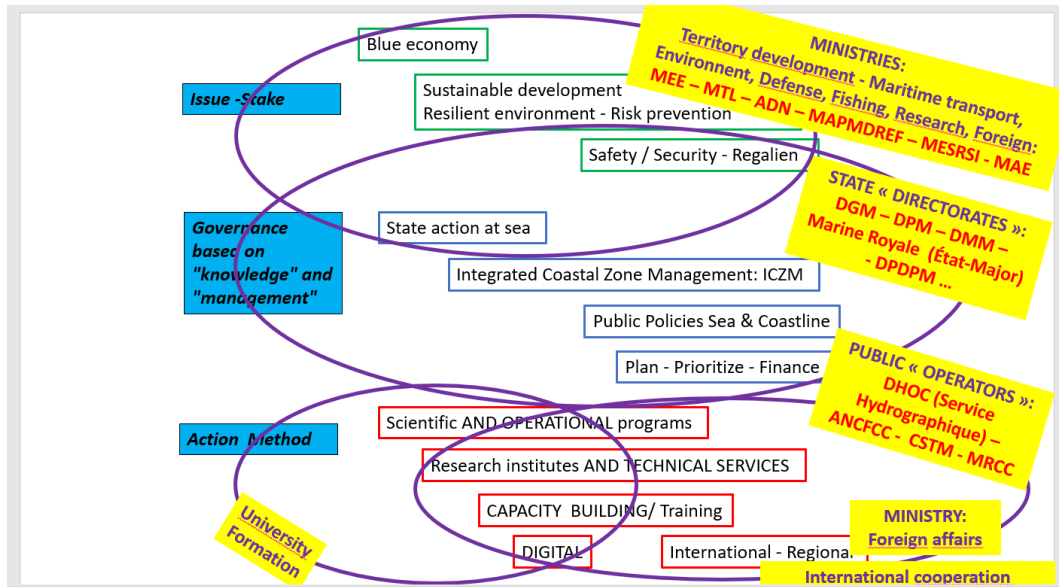


Production: Sailing Directions, List of Lights, Tide, Notices to Mariners, Nautical Information Management Guide



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

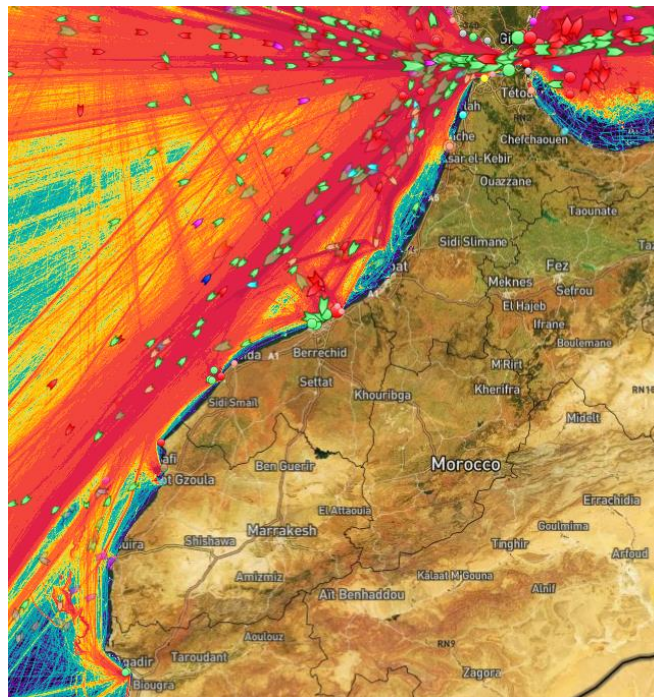
State Action at Sea was not specifically addressed.  
 However, the coordination function is extremely developed.  
 See chapter: COORDINATION AND CAPACITY DEVELOPMENT



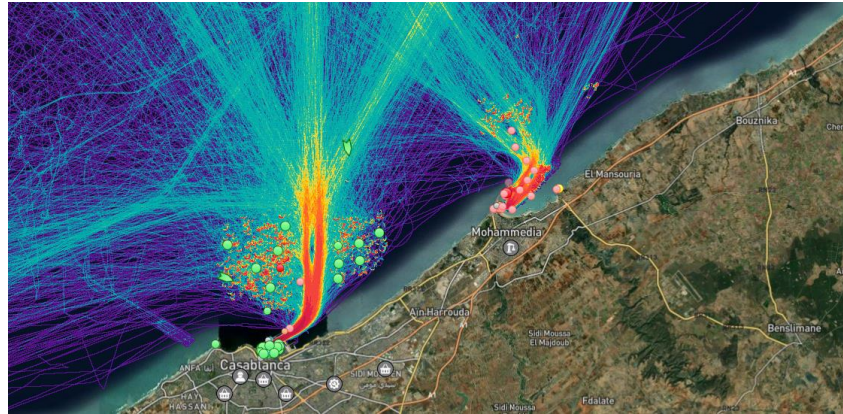
## 9 Maritime Trade and Traffic – Nautical Cartography/CATZOC

### 9.1 Maritime traffic

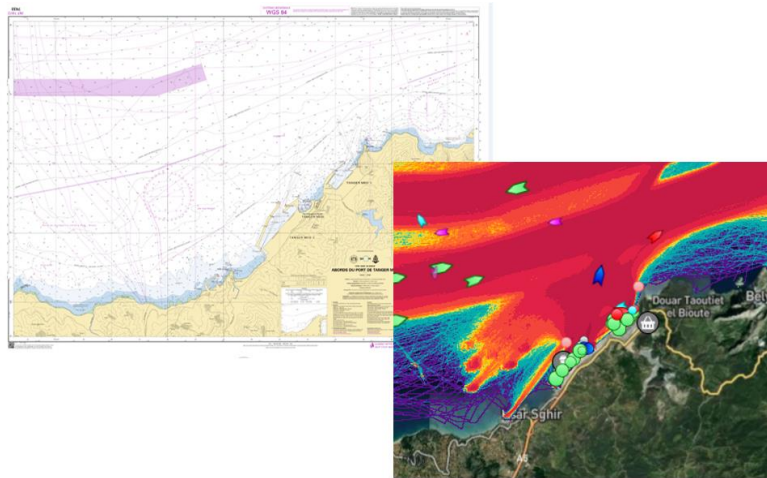
AIS data (source : <https://www.marinetraffic.com> )



General maritime traffic situation between Agadir et Tanger Med.



**Casablanca and Mohammedia**



**Around the port of Tangier Med.**

## 9.2 Charting/CATZOC

### 9.2.1 Official cartography of Morocco (see Annex F)

#### **Current situation**

The official cartography of Morocco is the subject of charts produced by France (even Spain) and more and more charts co-produced (mainly by Morocco) by France and Morocco. Publishing and distribution are currently handled by France. This is organized within the framework of the Administrative Arrangement (AA) relating to cooperation between Morocco and France in the field of hydrography, oceanography and nautical cartography (January 21, 2008).

#### **Upcoming developments**

This situation will soon change as soon as Morocco acquires the capacity to distribute (and market) its charts and other nautical documents. For the charts produced by itself (which, in practice, is already the case for many of them), the publishing and distribution of paper charts and ENC (via PRIMAR) will be done under its responsibility (France withdrawing).

For the other charts not yet produced by Morocco itself, France will continue to produce and distribute them. Eventually all maps of Morocco will be produced, edited and distributed by Morocco (total withdrawal of France). This will be recorded in an amendment to the AA mentioned above).



## Chart quality

These products cover the most important known navigation needs.

The quality of these charts can be assessed through the states of knowledge described in the following chapter.

It already appears that the main economic ports have been the subject of recent bathymetric work taken into account in a quality cartography meeting the needs of navigation and respecting the standards of the IHO.

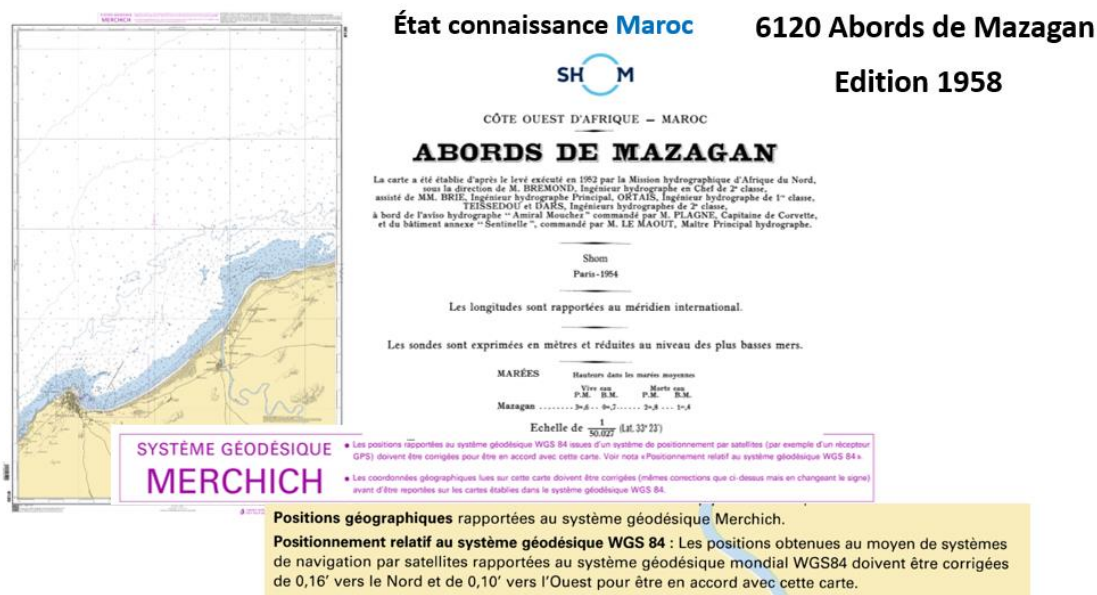
Where the seabed can change rapidly, the quality of the charting of access to ports, waiting and mooring areas, and quays obviously depends on regular bathymetry updates (generally ensured locally). This seems to be able to be mastered within the framework of the CNCHOC.

Note: in shallow waters (ports and access in the Atlantic mainly) the quality of knowledge of the depths (at a given moment) will also depend on tides. Morocco already has tides observatories. There are plans to increase the number and offer real-time broadcasts.

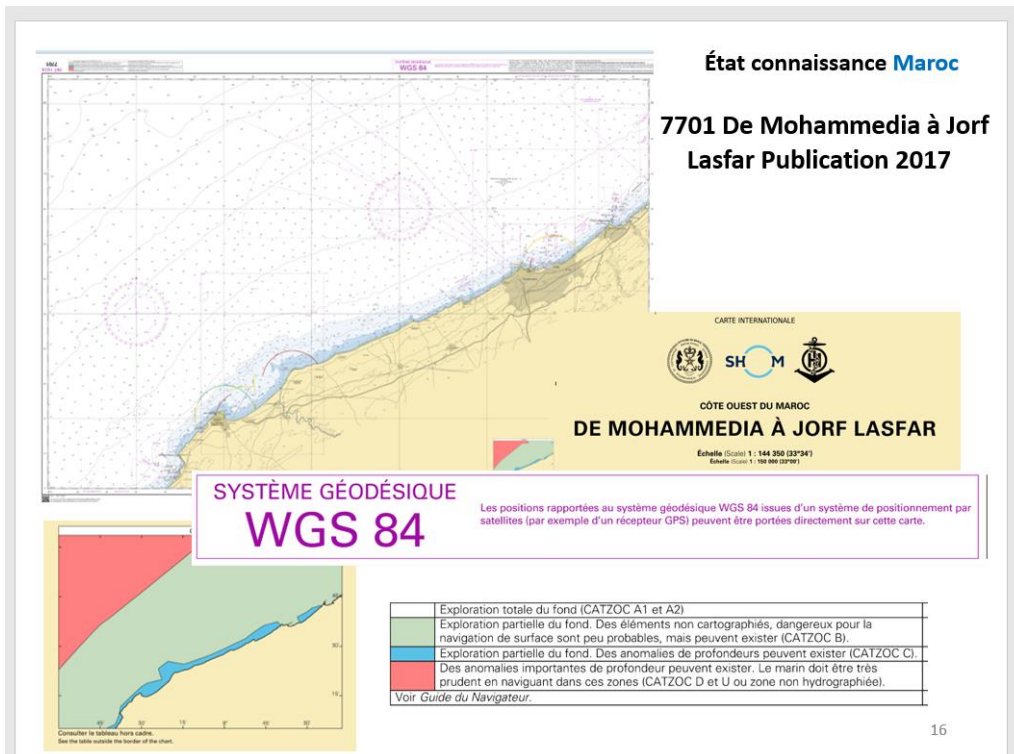
### 9.2.2 State of knowledge

Indicators from IHO C-55 are given in Annex H.

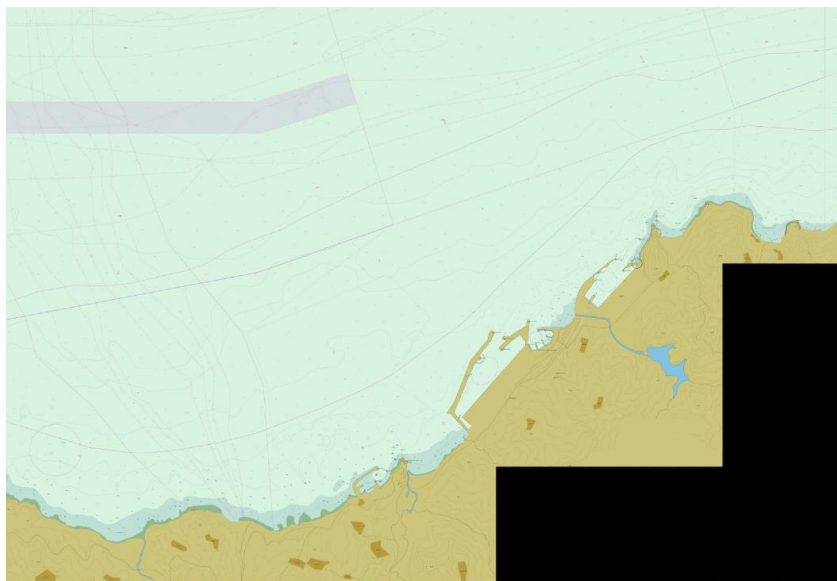
Some illustrations of the quality of the cards.



### French chart established with old standards



**Chart co-produced by Morocco and France according to modern standards (WGS84)**



**ENC (FR67707) co-produced by Morocco (mainly) and France – recent publication**

Comments :

- There are therefore charts whose quality must be improved. The subject is well known in Morocco;
- Now equipped with hydrographic capabilities, it will be possible to define and carry out a program for updating bathymetry which will allow the gradual replacement of these old invoice charts;

- These charts must always be updated;
- It is always interesting to correlate knowledge (uncertainties on the value and position of the data used on the charts) with the current navigation zones (AIS) and above all planned. This allows risk analyzes (as IALA/IALA can also do), the results of which will make it possible to prioritize the hydrographic surveys to be carried out. An activity that can obviously be carried out within the CNCHOC (navigation aids included).

## **10 Responsibility for maritime safety**

At the state and regulatory level, this responsibility falls under the Direction de la Marine Marchande (DMM) which is under the supervision of the Ministry of Transport and Logistics (MTL).

This department ensures in particular compliance with the application of the maritime conventions of the International Maritime Organization (IMO).

She will be the focal point of the upcoming IMSAS audit.

## **11 Responsibilities of the defense forces**

They were clearly defined through Royal Decree No. 1.14.84 of October 20, 2014.

Dahir fixing the attributions of the inspection of the Royal Navy in the fields of hydrography, oceanography and nautical cartography.

## **12 Coastal zone management and environmental protection**

The subject was not addressed

## C-55 INDICATORS

### 13 Status of hydrographic surveys in the national maritime area

The indicators are given in Annex H.

Their representativeness is good for cartography.

They are to be checked for hydrographic surveys and the GMDSS/GMDSS.

It is proposed that the DHOC take full charge of these indicators from now on for charting (it has all the elements) and the GMDSS (in conjunction with the MRCC).

Regarding hydrographic surveys, it is proposed that the DHOC:

1. First retrieves all existing surveys in digital form. It is a question here of supplementing the data specific to the DHOC, already archived, with those of foreign countries, scientific campaigns included (France/Shom in particular but also undoubtedly Spain);
2. acquires a specialized bathymetric data management tool (organized database). The development framework is that of "MSDI". The Technical Commission "CT-GIS" of the CNCHOC is likely to develop these structuring provisions in conjunction with other Moroccan organizations also concerned with national databases. It should be noted that Morocco also participates in the work of the MSDI WG of the IHO;
3. get in touch with Shom service (DMI/PLAN) which calculates these indicators for France. Shom will be able to provide the method, the script and the tools used for the calculations (determination of surfaces weighted by the CATZOC associated with the data, use of Global Mapper on the DHOC bathymetric database).

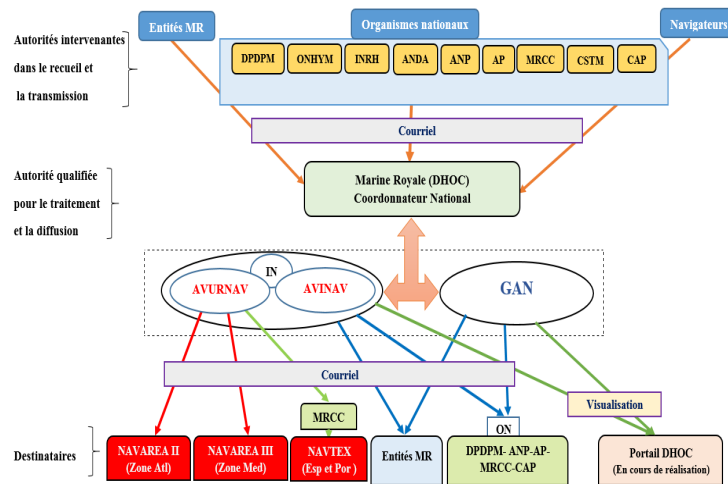
Note: these indicators clearly show the lack of hydrographic knowledge (surveys) in depths lower or higher than 200 m. This more particularly for the Mediterranean. The new survey hydrographic means of the country will make it possible to very significantly improve these indicators relating to surveys and ultimately those relating to charts and ENCs (more than their number their quality around the CATZOC).

### 14 Collection and circulation of nautical information

As shown in the figure below, the collection and circulation of nautical information is organized nationally, regionally and internationally.

The flow of information must relate to:

- nautical charts (eg: new depths, guaranteed dredging sills, new quays, new navigational aids, wrecks removed, submarine cables, etc.);
- sailing directions;
- list of lights;
- tides. The harmonic constants used for the predictions must be made more reliable and precise using the observations of water heights as is planned.



Note: see also the chapter dedicated to DHOC (section ONE: Nautical Publications and Equipment)

## 15 Hydrographic survey capacity

This capability has been established within the Royal Navy (DHOC): see Annex C1. It makes it possible to respond to all types of surveys with staff trained in schools homologated according to international standards (FIG/OHI/ACI).

The capacities specific to the ports have not been verified, they are often based on those of subcontracting companies (of the ANP) correctly equipped according to the DHOC. The qualifications of the personnel of these companies have not been verified. It is nevertheless unlikely that the operators were able to follow approved (IHO) training courses such as personnel of the DHOC.

Subcontracting companies can benefit from training organized within the CNCHOC.

A network of tidal observatories makes it possible to process the bathymetry along the coast.

## 16 Independent nautical chart production capacity

DHOC now has operational capacities for the production of nautical charts and their updating. It remains to manage their distribution (and marketing) so that the autonomy of the country is complete.

## COORDINATION AND CAPACITY BUILDING

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

#### CNCHO and CT

The CNH (National Hydrographic Coordination Committee) is the CNCHOC: National Coordination Committee in the fields of Hydrography, Oceanography and Marine Cartography.



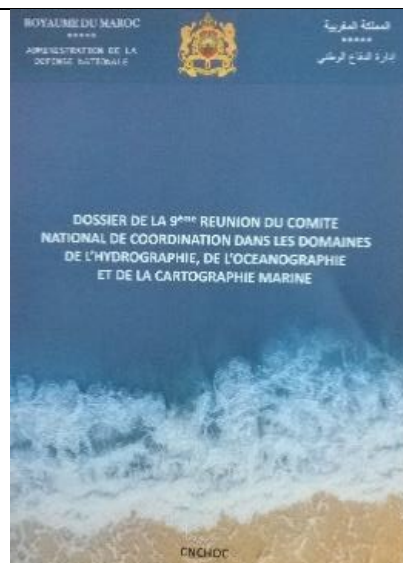
The members of the CNCHOC at its constitution (2014)

Four technical commissions (TC subject to terms of reference) have also been set up, these are:

1. "Hydrography" TC [referent: DHOC]
2. "Oceanography" TC [referent: INRH - National Institute for Fisheries Research]
3. "Tide" TC [referent: DHOC]
4. "GIS" TC [referent: CRTS - Royal Center for Spatial Remote Sensing]

#### Meetings, minutes

- Monthly meetings are the subject of minutes and relate particularly to the exchange of data and information. Exchanges which may be the subject of agreements between different ministerial departments.
- A very detailed annual file (on the right) is made up of the results of past achievements, the progress of the current action plan and finally the future action plan





### **Multidisciplinarity - Interministerial - Pooling**

The multidisciplinary and interdepartmental nature of the issues is very well perceived.

The CNCHOC is an essential link in the operational organization of the Moroccan State set up for the execution of development programs in hydrography, physical oceanography, marine cartography (sea and coast) and aids to navigation. Training (e.g. carrying out a hydrographic survey) is part of CNCHOC's activities.

The organization and execution of training in Morocco (or abroad) for the benefit of the various organizations or companies involved in hydrography, physical oceanography and cartography can be part of development programs and therefore of committee topics.

At the heart of pooling:

- acquisition of hydro-oceanographic data at sea (and 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.

### **Dynamic**

A real dynamic exists at the institutional and technical levels. The actors know each other, meet and together decide on the actions to be taken, which are followed.

The collection of needs (navigation, environment, etc.) in products (eg charts) 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 data is only economically conceivable if these are widely shared (one data - several applications - the SOLAS application through nautical documents being only one among others) and exploited. This raises the problem of archiving and disseminating data at the national level.

Techniques and tools are better and better mastered with databases and communication and download portals. The fact remains that this requires IT structures and dedicated skills to be set up.

This is a fundamental structural point which, moreover, has already been dealt with within the CNCHOC (CT "GIS"): setting up a marine geospatial data infrastructure (IDGM in French, MSDI – Maritime Spatial Data Infrastructure in English).

### **Commitment to the Decade of the Ocean**

Note the commitment of the Kingdom of Morocco to the achievement of the objectives of the Ocean Decade through the program "*Strengthening hydrographic and oceanographic observations in support of marine scientific research*" defined within the framework of the CNCHOC (Annex J).

IHO publication M2 which makes IHO recommendations "The need for national hydrographic services": [https://iho.int/uploads/user/pubs/misc/M-2\\_3.0.7\\_E\\_06142018.pdf](https://iho.int/uploads/user/pubs/misc/M-2_3.0.7_E_06142018.pdf) is known.

# 18 Phase 1 Hydrographic capacities: MSI and GMDSS

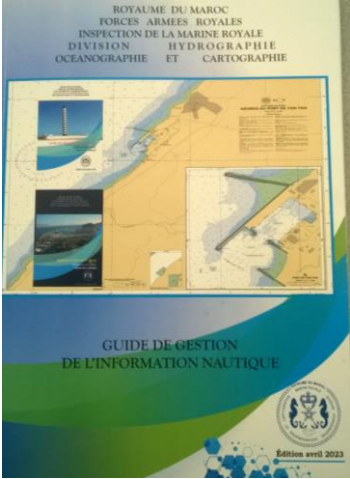
## 18.1 Introduction

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.

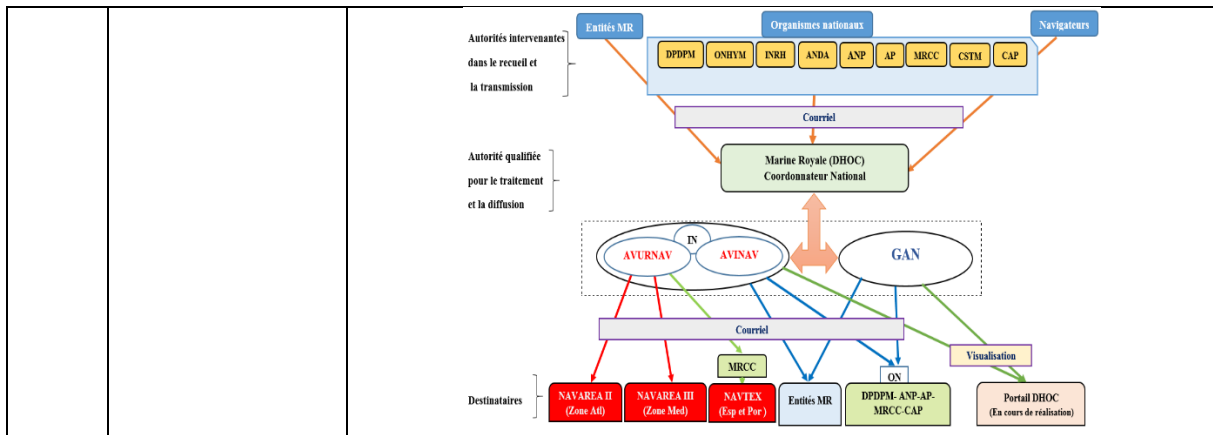
The dissemination of these MSI is based on the Global Maritime Distress and Safety System, an international system that uses telecommunications means for search and rescue at sea (SAR) and the prevention of maritime accidents.

In addition, MSIs in their broadest sense include the updating of navigation charts and other nautical publications (list of lights, radio signal works, nautical instructions, etc.). MSI 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 producer of nautical documents (France and Morocco currently, Morocco alone in the long term), NAVAREA II (France/Shom) and NAVAREA III (Spain/IHM).

## 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 and III Transmission of corrections to nautical publications in particular to nautical charts	<p><b>Confirmed</b></p> <p><i>“The country fulfils its national obligations in a sustainable manner”<sup>1</sup></i></p> <p>Communication to NAVAREA II (France for the Atlantic) and NAVAREA III (Spain for the Mediterranean) is ensured.</p> <p>Morocco produces its nautical publications itself and can therefore correct them. A nautical information management guide has been drawn up by the DHOC, which is the national coordinator.</p>  <p>The management of nautical information in Morocco is well described in the following figure (see § 14 “Collection and circulation of nautical information”)</p>

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



Note: the Technical Visit did not cover the means of disseminating the MSI. The fact remains that the actors met (they have often been able to visit foreign MRCCs) have begun to reflect on the means they wish to use: NAVTEX, NAVDAT (there are NAVTEX/NAVDAT ready), satellite systems (SafetyNet from Inmarsat, SafetyCast from Iridium).



Maritime Rescue Coordination Centre (MRCC)



Maritime Rescue Coordination Centre (MRCC)

## 19 Phase 2 Hydrographic capacities: conducting surveys

### 19.1 Introduction

These capacities mainly consist in conducting bathymetric surveys (depths brought back to the level of the lowest tide taking into account the tide). The sharing of responsibilities (bathymetry, topography) between organizations is defined as follows:

- port areas before and under construction: DPDPM
- port areas after commissioning: ANP
- elsewhere: DHOC

### 19.2 Level of development

Phase	Object	Level of de development - Remarks
2	Hydrographic and oceanographic surveys through data acquisition	<p><b>Confirmed</b></p> <p><i>The country fulfils its national obligations in a sustainable manner</i></p> <p>Morocco has offshore (DHOC), coastal (DHOC) and port (DHOC and ANP service providers) resources.</p> <p>The observation of tides is mastered (many observatories on the increase).</p> <p>DHOC has drafted a national standard (supplementing IHO publication S-44) regarding the minimum requirements for the conduct of hydrographic surveys.</p> <div data-bbox="758 1034 1182 1478" data-label="Image"> </div> <p>A guide accompanies this standard.</p> <p>Other strengths:</p> <ul style="list-style-type: none"> <li>• The provision by the DHOC of directories of hydrographic datums (vertical references)</li> <li>• The determination of a maritime zone for the calibration of bathymetric sounders</li> <li>• The organization of courses in hydrography (also in the management of nautical information) for the benefit of the CNCHOC</li> </ul> <p>The main point to improve concerns structured databases. The subject is well known by the DHOC which:</p> <ul style="list-style-type: none"> <li>• is already equipped with storage bays, servers, a computer network</li> <li>• who can rely on the "GIS" CT of the CNCHOC</li> </ul>

		<ul style="list-style-type: none"> <li>as well as the work of the “MSDI” WG of the IHO</li> </ul> <p>Port hydrography is the responsibility of the ANP, which only has software to analyze hydrographic data. Bathymetric data acquisitions are carried out by service providers well equipped with nautical resources (small speedboats and zodiacs) and scientific equipment (SMF, GPS, etc.).</p>
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## 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.

### 20.2 Level of development

Phase	Object	Level of de development - Remarks
3	Production of charts and nautical publications	<p><b>Confirmed</b></p> <p>Officially and legally with France under an Administrative Arrangement <i>“The country fulfills its national obligations through a third party”</i>.</p> <p>In practice, the DHOC now masters the entire cartographic production process (paper charts and ENC’s). As soon as DHOC has finalized its distribution capacities (linked to marketing), and this for all of its charts, it can be said that: <i>“The country fulfills its national obligations in a sustainable manner”</i></p> <p>Morocco, for nautical charts, will therefore experience a transitional period during which a (growing) part of its cartography will be entirely produced by itself and another (decreasing) in co-production with France. The production of nautical charts is accompanied by tidal predictions.</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
Membre	Membre	OUI	OUI	OUI (3)	OUI (4)

- (1) National Hydrographic Committee (role of national coordination): Morocco has a very active National Coordination Committee in the fields of Hydrography, Oceanography and Marine Cartography (CNCHOC)
- (2) Maritime Safety Information
- (3) Hydro-oceanographic surveys
- (4) “SOLAS” charting. Currently Co-production with France (Shom) under an Administrative Arrangement. Evolution in progress for a progressive autonomy almost recorded for an already important part of the necessary nautical charts

## FORMATION

### 22 Basic training of technicians and engineers in hydrography and nautical cartography

#### **CAT A approved training in hydrography and CAT B in hydrography and cartography**

DHOC has CAT A and CAT B hydrographers.

It also has CAT B cartographers.

All those who have followed “FIG/OHI/ACI” approved courses (International Federation of Surveyors, International Hydrographic Organization, International Cartographic Association) have been trained abroad (Europe).

#### **Non-approved training of hydrographic technicians**

Important training efforts of the DHOC on site in Casablanca have already been ensured, namely:

- A first training course for hydrographic technicians with the support of France (school year 2015-2016)
- A second and a third identical training by Morocco itself (school years 2015-2016 and 2016-2017)

#### **Needs analysis: GPEEC (human resources in sufficient number and quality over time)**

The Technical Visit did not examine the match between human resources and production objectives. This undoubtedly deserves to be done within the framework of a Forecast Management of Jobs, Workforce and Skills (GPEEC in French).

It will certainly be necessary to continue to train hydrographers and cartographers (already those of the DHOC but also those in charge of port hydrography).

If the volume of CAT A will undoubtedly remain limited (training abroad then remaining to be preferred), this is not the case for CAT B, especially in hydrography.

#### **CAT B approved training in hydrography in Morocco**

The feasibility of a CAT B approved hydrographer training, on site in Morocco, now deserves to be finalized. To reach a critical size of promotions, the numerous needs in national personnel (DHOC but also ports including subcontractors, operators in fields related to hydro-oceanography, etc.) and regional (particularly in French language) beyond the borders of the Morocco will deserve to be taken into account.

The frequency of training may be adjusted over time (not necessarily every year but at regular intervals). The practical training which supplements the theoretical training of the schools will be, for the hydrographers with port vocation, opportunely carried out in a port operating dredging.

Note: the necessary human resources are not limited to hydrographers and cartographers, it is also recalled the importance:

- the “Support” function in specific equipment (GPS, depth echosounder, tide gauges, etc.): maintenance in operational condition (MCO) of equipment, IT (software, databases, webmaster, etc.);



- the "management" function which is very important for coordinating the development of hydrography and nautical cartography in 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 (ships, boats, launches);
  - 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.

This is well received at DHOC and CNCHOC.

### **23 Continuous training in hydro-oceanography - cartography and related activities (aids to navigation, port infrastructure works and coastal protection) - Management**

This subject has not really been discussed. However, it is well integrated into the strategy of the DHOC (Capacity building and integration of new technologies / Human resources) recalled below:

- A211: Monitoring and development of HOC skills
- A212: Implementation in Morocco of FIG-OHI approved hydro/ocean training
- A213: HOC training for the benefit of national organizations
- A214: HOC training for PFAs

**Note :**

- Also identify the E-learning opportunities that will develop, within foreign hydrographic services on the one hand (eg Shom in French) and on the other hand around the future E-learning platform of the IHO where 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.

Editor



Henri DOLOU

## ANNEXES

### Annex A : Abbreviations

ADN	Ministère délégué auprès du Chef du gouvernement chargé de l'Administration de la Défense Nationale
ANCFCC	Agence Nationale de la Conservation Foncière, du Cadastre et de la Cartographie du MAPMDREF
ANP	Agence Nationale des Ports
BHO2M	Bâtiment Hydro-Océanographique Multi-Missions ( <i>Dar Al Beida</i> ) de la MR
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 NHC	Comité Hydrographique National <i>National Hydrographic Committee</i>
CNCHOC	Comité National de Coordination dans les domaines de l'Hydrographie, de l'Océanographie et de la Cartographie marine
CSCO	Commission de Suivi et de Coordination Opérationnelle du CNCHOC
CRTS	Centre Royal de Télédétection Spatiale
CSTM	Centre de Surveillance du Trafic Maritime (Ministère transport – Tanger)
DGM	Direction Générale de la Météorologie du MEE
DHOC	Division d'Hydrographie, d'Océanographie et de Cartographie marine (de la Marine Royale) <i>Royal Moroccan Navy Hydrographic, Oceanographic and marine Cartographic Division</i>
DMM	Direction de la Marine Marchande du MTL
DPDPM	Direction des Ports et du Domaine Publique Maritime du MEE
DPM	Direction des Pêches Maritimes du MAPMDREF
EAtHC CHAto	<i>Eastern Atlantic Hydrographic Commission (IHO)</i> Commission Hydrographique de l'Atlantique Oriental (OHI)
ECDIS	<i>Electronic Charts Display Information System</i>
ENC	<i>Electronic Navigational Chart</i> Carte électronique de navigation
GAN	Groupe d'Avis aux Navigateurs
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
IMSAS	<i>IMO Member State Audit Scheme Programme</i> Programme d'audit des États Membres de l'OMI
INRH	Institut National de Recherche Halieutique du MAPMDREF
IOC COI	<i>Intergovernmental Oceanographic Commission</i> Commission Océanographique Intergouvernementale

INRH	Institut National de Recherche Halieutique
IMSAS	<i>IMO Member State Audit Scheme</i> Audit des États Membres de l'OMI
MSI RSM	<i>Maritime Safety Information</i> Renseignement de Sécurité Maritime
MR	Marine Royale
MRCC	<i>Maritime Rescue Coordination Centre</i> Centre de Recherche et de Sauvetage Maritime
MSDI	<i>Maritime Spatial Data Infrastructure</i> Infrastructures de données spatiales maritimes
MAPMDREF	Ministère de l'Agriculture, de la Pêche Maritime, du Développement Rural et des Eaux et Forêts
MEE	Ministère de l'Équipement et de l'Eau
MTL	Ministère du Transport et de la Logistique
MTEDD	Ministère de la Transition énergétique et du Développement durable
MERSI	Ministère de l'Enseignement supérieur, de la Recherche Scientifique et de l'Innovation
NAVAREA	<i>NAVigational AREAs (WWNWS)</i> Zones de navigation (SMAN)
NC CM	<i>Nautical Charts</i> Carte marine
NtMs	<i>Notice to Mariners</i> Avis aux navigateurs
ONE	Ouvrages Nautiques et Équipements de la DHOC
PCA	<i>Primary Charting Authority</i> Autorité cartographique principale
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

## Annex B-1 : Terms of reference of the visit team of the Regional Hydrographic Commission



### Contexte

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. This is the main objective of the technical visit.**
- 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 chairman of the Regional Hydrographic Commission after the visits.

For IHO, 11 April 2023 Julien SMEECKAERT  
Capacity Building coordinator for EAtHC



## Annex B-2 : SOLAS requirements (Chapter V rules 9 and 4)

**Extract of IHO Publication M-2 (Version 3.0.7 – June 2018)**  
**“THE NEED FOR A NATIONAL HYDROGRAPHIC SERVICE”**  
**International Obligations to Provide Hydrographic Services**  
**(SOLAS Chapter V Regulations 9 and 4)**

### **SOLAS\_Chapter V**

International Obligations to Provide Hydrographic Services

International Convention on the Safety of Life at Sea

In July 2002, a revised Chapter V of the International Convention on the Safety of Life at Sea (SOLAS) entered into force.

**Regulation 9** of SOLAS Chapter V specifies very clearly the hydrographic services which have to be provided by Contracting Governments. The provision of these hydrographic services is, in effect, an obligation for the Contracting Governments under an International Treaty Law

#### **SOLAS CHAPTER V - REGULATION 9 Hydrographic Services**

1. Contracting Governments undertake to arrange for the collection and compilation of hydrographic data and the publication, dissemination and keeping up to date of all nautical information necessary for safe navigation.
2. In particular, Contracting Governments undertake to co-operate in carrying out, as far as possible, the following nautical and hydrographic services, in the manner most suitable for the purpose of aiding navigation:
  - 2.1. to ensure that hydrographic surveying is carried out, as far as possible, adequate to the requirements of safe navigation;
  - 2.2. to prepare and issue nautical charts, sailing directions, lists of lights, tide tables and other nautical publications, where applicable, satisfying the needs of safe navigation;
  - 2.3. to promulgate notices to mariners in order that nautical charts and publications are kept, as far as possible, up to date; and
  - 2.4. to provide data management arrangements to support these services.
3. Contracting Governments undertake to ensure the greatest possible uniformity in charts and nautical publications and to take into account, whenever possible, relevant international resolutions and recommendations.\*
4. Contracting Governments undertake to co-ordinate their activities to the greatest possible degree in order to ensure that hydrographic and nautical information is made available on a world-wide scale as timely, reliably and unambiguously as possible.

\* Refer to the resolutions and recommendations adopted by the International Hydrographic Organization.

**Regulation 4** of SOLAS Chapter V places an obligation on Contracting Governments to ensure that appropriate navigational warnings are issued.

#### **SOLAS V/4 – Navigational Warnings**

Each Contracting Government shall take all steps necessary to ensure that, when intelligence of any dangers is received from whatever reliable source, it shall be promptly brought to the knowledge of those concerned and communicated to other interested Governments. \*

\* Refer to the Guidance on the IMO/IHO World-Wide Navigational Warning Service adopted by the Organization by resolution A.706 (17), as amended

## Annex B-3 : IMSAS – Consolidated Audit Summary Report (CASR) -Extracts in English

Reference : IMO : CL N° 4317 of 15 September 2020

([https://wwwcdn.imo.org/localresources/en/OurWork/MSAS/Documents/MSAS/Casr/Circular%20Letter%20No.4317%20-%20Imo%20Member%20State%20Audit%20Scheme%20-%20Consolidated%20Audit%20Summary%20Report\(Casr\)%20\(Secretariat\).pdf](https://wwwcdn.imo.org/localresources/en/OurWork/MSAS/Documents/MSAS/Casr/Circular%20Letter%20No.4317%20-%20Imo%20Member%20State%20Audit%20Scheme%20-%20Consolidated%20Audit%20Summary%20Report(Casr)%20(Secretariat).pdf))

This document offers lessons learned from 11 audits completed in 2018 and 7 audits completed in 2019.

- Findings (FD)
- Root cause
- Corrective action

The purpose of this annex is simply to recall (selection on the keyword "hydrogra"), for the context of the audit, the type of remarks and corrective actions that may have been made by the IMO to other countries than Morocco.

Extracts (hydro.) from CL N° 4317 of 15 September 2020:

### **FD**

879 The maritime administration had not taken the necessary measures to collect and compile **hydrographical** data and publish, disseminate and maintain all nautical information necessary for safe navigation (SOLAS 1974, regulation V/9; III Code, paragraph 47).

### **Root cause**

880 The provisions of regulation 9, chapter V of SOLAS 1974 and the related standards of the International **Hydrographic** Organization (IHO) were not sufficiently known. Moreover, the State had not transposed into its national legislation the applicable international rules concerning collection and compilation of **hydrographic** data to keep all nautical charts and nautical publications up to date, and to disseminate all nautical information necessary for safe navigation.

### **Corrective action**

881 The maritime administration will implement the following actions:

- .1 develop and implement national legislation, guidelines and documented procedures for the collection and compilation of **hydrographic** data in order to maintain up to date all nautical charts and nautical publications and to disseminate all information necessary for the safety of navigation; and
- .2 designate a national coordinator for the provision of **hydrographic** services and establish a national **hydrography** commission to ensure that designated State entities implement the documented guidelines and procedures for collecting, compiling, publishing, disseminating and maintaining updated **hydrographic** data.

### **FD**

894.... Furthermore, references to nautical charts that did not meet international standards were included in the notices to mariners (SOLAS 1974, regulation V/9; SOLAS 1974, regulation V/13; III Code, paragraph 49).

### **Root cause**

895 The following factors contributed to this finding:

- .1 lack of awareness of coastal State obligations; and
- .2 absence of a legal basis, including regulations, guidelines and procedures.

### **Corrective action**

896 The nodal entity of the maritime administration will establish an inter-institutional working group comprising all government entities involved in the implementation and enforcement of SOLAS 1974, Chapter V, tasked to define, and recommend assignment of, related responsibilities and obligations to involved entities. Once the responsibilities have been defined and assigned among the entities involved, a decree containing technical provisions on AtoN, **hydrographic**

<p>services and notices to mariners will be enacted and implemented in order to ensure the availability of all services and their compliance with international standards. Subsequently, the performance of entities involved will be evaluated through a mechanism to be implemented within an overall strategy, to be developed.</p>
<p><b>FD</b> 927 ... effective implementation of the coastal State obligations ... <b>Root cause</b> 928 The lack of financial resources and qualified personnel prevented the assignment of respective coastal State obligations to specific responsible entities. <b>Corrective action</b> ... the need for systems and equipment for this purpose and the need for human resources. Additional funds will be requested from the government and relevant services implemented in accordance with the mandatory requirements.</p>
<p><b>FD</b> 957 There was no evidence of a system in place, including policies, procedures and resources ... for the establishment of <b>hydrographical</b> and meteorological services. <b>Root cause</b> 958 Not all entities involved were aware of the obligations of the State with regards to the provision of <b>hydrographic</b> and meteorological services and the maintenance of AtoN. <b>Corrective action</b> 959 ...designate a focal point for collection and compilation of <b>hydrographic</b> data, including their submission to the contracted <b>hydrographic</b> services for publication in nautical charts and, upon receipt, dispatch of relevant nautical information and documents to all parties concerned.</p>
<p><b>FD</b> 966 The <b>hydrographic</b> services provided by the State did not fulfil all the requirements, such as issuance of, or appropriate arrangements for the issuance of, sailing directions, lists of lights, tide tables and other nautical publications, <b>Root cause</b> 967 There was a lack of expertise in the maritime administration in the area of <b>hydrographic</b> activities. The State was in the process of organising assistance through cooperation with another country in the region for conducting a risk assessment on the status of <b>hydrography</b> at the time of audit. <b>Corrective action</b> 968 The responsible ministry will make appropriate arrangements for the issuance of sailing directions, lists of lights and tide tables and other nautical publications upon completion and finalisation of the ongoing survey work undertaken through technical cooperation. Appropriate training programmes on the subject will be identified and arranged for the relevant personnel on <b>hydrography</b> through entities such as the International <b>Hydrographic</b> Organization (IHO) or other States.</p>
<p><b>FD</b> 993 The maritime administration could not ensure effective implementation of the coastal State obligations ... relating to <b>hydrographic</b> services, aids to navigation (AtoN) and meteorological ... <b>Root cause</b> 994 There were no clear responsibilities assigned to the different entities that comprise the maritime administration. <b>Corrective action</b> 995 The entities that comprise the maritime administration will establish a committee ... in order to develop recommendations for assignment of clear responsibilities for coastal State activities.</p>
<p><b>FD</b> 1002 ... <b>hydrographic</b> services. Consequently, those services were found not effectively established</p>



**Root cause**

1003 ... lack of suitably trained staff to perform coastal State functions, such as AtoN and hydrographic services.

**Corrective action**

1004 ... coordinate and support the training of staff, acquisition of assets and equipment for providing these services.

**FD**

1068 Although there was an agreement with another State for the provision of hydrographic services, the State had not always fulfilled its obligations relating to hydrographic services

**Root cause**

1069 lack of competent personnel, hydrographic ship and/or equipment and insufficient financing for hydrographic activities; and

**Corrective action**

1070 provide human and financial resources, including appropriate training for personnel,

**FD**

1086 The arrangements for the collection and compilation of hydrographic data and the publication, dissemination and keeping up to date all nautical information necessary for safe navigation did not fully meet the requirements (SOLAS 1974, regulation V/9; III Code, paragraph 47).

**Root cause**

1087 ... responsible for conducting hydrographic surveys of sea areas outside port limits and publishing nautical charts was not available. As a result, full details of the national hydrographic services could not be provided.

**Corrective action**

1088 The National Hydrographic Office, who is authorized by law to conduct hydrographic surveys of the sea areas outside port limits, has fully implemented the obligations of SOLAS 1974, regulation V/9. Under this authority, nautical charts are produced by hydrographic offices of other States. This function is performed in coordination with the International Hydrographic Organization (IHO) and the status of hydrographic surveys and navigation charts of State's sea areas will be updated in the new edition of IHO C-55 publication. This corrective action will be completed by 31 December 2020

## **Annex C-1 : Missions, Organisation, Capacités en moyens navals The Hydrography, Oceanography and marine Cartography Division (DHOC): Missions, Organization, Naval Capabilities**

Source : DHOC (25 April 2023)

### **➤ MISSIONS OF DHOC :**

The Hydrography, Oceanography and marine Cartography Division (DHOC) of the Royal Navy is the national body responsible for the production and distribution of nautical documents, by virtue of Dahir N°1-14-84 of October 20, 2014 , setting its powers. This Division, which is part of the Royal Navy, has also been designated the 'National Coordinator of Nautical Information', since May 2, 2018.

Led by a Senior Naval Officer appointed by His Majesty the King, Supreme Chief and Chief of the General Staff of the Royal Armed Forces, may God assist him, on the proposal of the Inspector of the Royal Navy and assisted in his duties by a Senior Naval Officer named 'Deputy Officer', the DHOC is responsible for ensuring, by virtue of the aforementioned Dahir, the following missions:

- The collection, archiving, processing and representation on paper or electronic media, of the data necessary for the knowledge of the hydrographic and oceanographic environment in order to satisfy the safety of navigation;
- The development, updating and dissemination, when they are not confidential, of nautical charts and nautical documents relating to maritime areas under national jurisdiction;
- Coordination and exchange of information with State services and public institutions involved in the fields of hydrography, oceanography and nautical cartography;
- Participation in work relating to the delimitation of national maritime borders;
- The representation of the Kingdom of Morocco within International and Regional Maritime Organizations.

### **➤ ORGANISATION :**

The Division of Hydrography, Oceanography and marine Cartography (DHOC) is articulated as follows:

- Secretariat;
- Secretariat of the National Coordination Committee in the fields of Hydrography, Oceanography and Cartography (CNCHOC).
- Meteorology-Oceanography Operational Center (COMETOC);
- Programs Section;
- Hydrography Section;
- Oceanography Section;
- Nautical Documents Production Section;
- Technical Support Section;
- Finance section.

In addition, in terms of HOC qualifications, DHOC personnel are as follows:

- (15) Hydrographers [**of which (05) CAT-A et (04) CAT-B**];
- (07) Cartographers [**of which (04) CAT-B**];
- (01) Oceanographer ;

- (04) Nautical information
- (05) computer scientist ;
- (02) Meteorologists ;
- (02) Responsible for managing the archiving and storage of nautical documents.

➤ **CAPACITIES IN NAVAL MEANS :**

The Hydrography, Oceanography and marine Cartography Division (DHOC) has the following nautical resources:

- A Hydro-Oceanographic Multi-Mission ship (BHO2M) 72m long with two hydrographic launches of 9m each, latest generation, equipped with systems adapted to surveys meeting the standards of the International Hydrographic Organization (IHO). This BHO2M has multi-beam echo sounders, shallow and deep, single-beam echo sounders, sediment echo sounders and current meters.
- A hydrographic launch 'HYDRO-01' for coastal surveys, equipped with single and multibeam echo sounders and side-scan sonar.
- A "cormoran" for port surveys, equipped with a single-beam echo sounder.

In terms of HOC software, DHOC uses CARIS software in its various production lines. For the tide (processing, harmonic analyses, predictions), the DHOC uses two softwares: "Premmar" (developed by the DHOC itself) and "Geotide" (acquisition).



**Figure 1 :** BHO2M 'Dar Al Beida'



**Figure 2 :** Vedette hydrographique 'Hydro-01'



**Figure 3 :** Cormoran 'C-33'

## Annex C-2 : Reference texts (Decrees, Standard, Administrative Arrangement, etc.)

Note : This list is not exhaustive

Object	Official reference
<ul style="list-style-type: none"> <li>This Dahir lays down the attributions of the inspection of the Royal Navy in the fields of hydrography, oceanography and nautical cartography, responsible, within the framework of its missions of State action at sea , to exercise the powers inherent in the fields of hydrography, oceanography and nautical cartography in the waters under national jurisdiction in the Atlantic and the Mediterranean.</li> <li>He creates the division of hydrography, oceanography and marine cartography</li> </ul>	<p><b>Décret Royal N° 1.14.84 du 20 octobre 2014 Dahir fixant les attributions de l'inspection de la marine royale dans les domaines de l'hydrographie, de l'océanographie et de la cartographie marine.</b></p>
<ul style="list-style-type: none"> <li>Creation of the CNCHOC in charge of ensuring the harmonization of the actions of the public services and any party intervening in the said fields</li> <li>And to contribute to the definition of national policy in the fields of hydrography, oceanography and nautical cartography and to approve development programs in these fields, particularly in terms of hydrographic surveys, research in oceanography and development projects nautical charts.</li> <li>The Royal Navy Inspectorate, through the DHOC, provides the secretariat.</li> </ul>	<p><b>Décret N° 2-14-330 du 30 octobre 2014 portant création du comité national de coordination dans les domaines de l'hydrographie, de l'océanographie et de la cartographie marine (CNCHOC)</b></p>
<ul style="list-style-type: none"> <li>Transfer of Nautical Information management between the Ministry of Equipment, Transport, Logistics and Water (DPDPM) and the Royal Navy (Maritime Affairs)</li> </ul>	<p><b>Procès-verbal du 02 mai 2018 de passation des attributions en matière de gestion de l'information nautique</b></p>
<ul style="list-style-type: none"> <li>National Standard (supplementing IHO publication S-44) concerning minimum requirements for the conduct of hydrographic surveys</li> </ul>	<p><b>Norme N-2023-01/DHOC/HYDR</b></p>
<ul style="list-style-type: none"> <li>Authorization for marine scientific research in the fields of hydrography, oceanography, and nautical cartography in Moroccan waters (concerns in particular campaigns conducted by foreign organizations)</li> <li>Provision and interpretation of data, report (ART.19)</li> </ul>	<p><b>Décret N° 2-20-710 du 20 rabii (27 octobre 2020) fixant les conditions et les modalités de délivrance des autorisations de recherche scientifique marine dans les eaux sous juridiction nationale</b></p>
<ul style="list-style-type: none"> <li>Arrangement for the exchange and dissemination of nautical information, as approved by the CNCHOC at its second meeting held in 2016;</li> </ul>	<p><b>Résolution du rapport du PV de la deuxième réunion du CNCHOC (2016</b></p>

## "Strategic Action Plan 2023-2027"

Such a DHOC plan has been prepared. It is essentially based on two references:

- The 2025 vision of the DHOC declined from the global vision 2030 of the Royal Armed Forces;
- The decisions taken by the National Coordination Committee in the fields of Hydrography, Oceanography and Cartography (CNCHOC), during its annual meetings.

This "Strategic Action Plan" is based on four Strategic Directions (Orientations Stratégiques /OS) broken down into strategic objectives and actions. It's about :

- OS 1: Acquisition of autonomy in the HOC domains [surveys, databases, cartography, etc.];
- OS 2: Capacity building and integration of new technologies [Human Resources skills, establishment of FIG/IHO-approved hydro/ocean training courses, Web-portal, etc.];
- OS 3: Contribution to scientific research in waters under national jurisdiction [marine environment, oceanographic and geophysical applications, partnerships with universities and the national departments concerned, etc.];
- OS 4: Active participation at the national, regional and international levels in the HOC domains [seat on the IHO Council, participation in its working groups, chairmanship of regional hydrographic commissions (EAthC, CHMMN)]

### Reference text France (Shom) / Maroc (DHOC)

Object	Official reference
Cooperation between Morocco and France in hydrography, oceanography and nautical cartography	Arrangement administratif du 21 janvier 2008 entre le ministre de la défense de la République Française et le ministre délégué auprès du Premier Ministre, chargé de l'administration de la défense nationale du Royaume du Maroc en matière d'hydrographie et de cartographie marine Note: this administrative arrangement is being amended to take into account the progressive autonomy of Morocco

## Annex D : List of main contacts -Telephones - Mails

Prénom NOM	Fonction	Tél (+212)	Mail
<b>DHOC</b>			
<b>Division d'Hydrographie</b>		<b>D'Océanographie</b>	<b>et de Cartographie marine</b>
		+212 522 294028 +212 53770 4607	<a href="mailto:divhoc_mr@yahoo.com">divhoc_mr@yahoo.com</a>
CV Mostafa TAFRHY	Chef de la Division	663 47 08 89	<a href="mailto:dhoc-cdiv-mr@far.ma">dhoc-cdiv-mr@far.ma</a> <a href="mailto:tafrhyadam@gmail.com">tafrhyadam@gmail.com</a>
CF Abderrahim KHOUKHTOU	Adjoint chef de division	650 91 37 55	<a href="mailto:abderrahim.mho@gmail.com">abderrahim.mho@gmail.com</a>
CF Driss LAKHAL	Chef de la section Ouvrages Nautiques et Équipements	06 61 40 74 95	<a href="mailto:lakhal.dr@gmail.com">lakhal.dr@gmail.com</a>
CC Abdallah HADOU	Chef de la cartographie	06 64 15 40 99	<a href="mailto:abdellah.hadou@gmail.com">abdellah.hadou@gmail.com</a>
OE Mohamed BERGHAZI	Adjoint chef cartographie		
LV Amine AMRI	Chef de la section hydrographie	06 71 23 13 84	<a href="mailto:amri.amine@gmail.com">amri.amine@gmail.com</a>
EV1 Mehdi LATNI	Adjoint au chef de la section hydrographie		<a href="mailto:latni.mehdi@gmail.com">latni.mehdi@gmail.com</a>
OE Hamid MOUMNI	Responsable Géodésie et Marée		
LV Ayoub BELATTMANHI	Océanographie		
<b>DPDPM</b>			
<b>Direction des Ports et</b>		<b>du Domaine</b>	<b>Publique Maritime</b>
Mlle Nisrine LAZAR	SSPNC	06 67 69 40 97	<a href="mailto:lazar@mtpnet.gov.mr">lazar@mtpnet.gov.mr</a>
<b>ANCFCC</b>			
<b>Agence Nationale de la</b>		<b>Conservation Foncière,</b>	<b>du Cadastre et de la</b>
			<b>Cartographie</b>
Mohammed EL BAHRAOUI		06 79 89 21 18	<a href="mailto:mo.elbakraoui@ancfcc.gov.ma">mo.elbakraoui@ancfcc.gov.ma</a>
<b>DGM</b>			
<b>Direction Générale de la</b>		<b>la Météorologie</b>	
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<b>DMM</b>			
<b>Direction de la Marine</b>		<b>Marchande</b>	
A. Atide			<a href="mailto:a.atide@yahoo.fr">a.atide@yahoo.fr</a>
<b>ANP</b>			
<b>Agence Nationale des</b>		<b>Ports</b>	
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<b>MRCC</b>			
<b>Maritime Rescue</b>		<b>Coordination Centre</b>	<b>(DPM)</b>
<b>DPM</b>			
<b>Direction des Pêches</b>		<b>Maritimes</b>	
Mohammed DRISSI			
<b>CSTM/Tanger</b>			
<b>Centre de Surveillance</b>		<b>du Trafic Maritime</b>	
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Pierre-Yves DUPUY	Directeur des missions institutionnelles et des relations internationales	02 56 31 24 04 06 38 78 59 55	<a href="mailto:pierre-yves.dupuy@shom.fr">pierre-yves.dupuy@shom.fr</a>
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Ronan LE ROY	Directeur de l'enseignement de l'école du Shom	02 56 31 24 09	<a href="mailto:ronan.le.roy@shom.fr">ronan.le.roy@shom.fr</a>
Philippe PELLAE	Chef du secteur Outre-Mer et pays étrangers (NA/OMER)	02 56 31 21 90	<a href="mailto:philippe.pellae-arthaud@shom.fr">philippe.pellae- arthaud@shom.fr</a>
Dominique LE PEN	Expert nautique Afrique et Océan Indien	02 56 31 22 78	<a href="mailto:dominique.le.pen@shom.fr">dominique.le.pen@shom.fr</a> <a href="mailto:na-om@shom.fr">na-om@shom.fr</a>
Amandine LEFRANCOIS	NAVAREA II	02 56 31 26 09	<a href="mailto:amandine.lefrancois@shom.fr">amandine.lefrancois@shom.fr</a>
CC Anthony BAEDER	Mission de coopération de défense, Rabat – Maroc Coopérant à École Royale Navale (ERN), Casablanca	+212 (0) 6 61 21 73 26	<a href="mailto:anthony.baeder@diplomatie.gov.fr">anthony.baeder@diplomatie.gov.fr</a>

CV : Capitaine de Vaisseau / *Captain (CAPT, O6)*

CF : Capitaine de Frégate / *Commander (CDR, O5)*

CC : Capitaine de Corvette / *Lieutenant Commander (LCDR, O4)*

LV : Lieutenant de Vaisseau / *Lieutenant (LT, O3)*

OE : Officier des Equipages / *Officer of Crews*



## Annex E : Agenda – Events

Organisme	Ministère
DHOC : Division d'Hydrographie, d'Océanographie et de Cartographie marine	ADN : Ministère délégué auprès du Chef du gouvernement chargé de l'Administration de la Défense Nationale
ANCFCC : Agence Nationale de la Conservation Foncière, du Cadastre et de la Cartographie	MAPMDREF : Ministère de l'Agriculture, de la Pêche maritime, du Développement rural et des Eaux et Forêts
DGM : Direction Générale de la Météorologie	MEE : Ministère de l'Équipement et de l'Eau
DMM : Direction de la Marine Marchande	MTL : Ministère du Transport et de la Logistique
CSTM : Centre de Surveillance du Trafic Maritime	MTL
DPM : Direction des Pêches Maritimes	MAPMDREF
DPDPM : Direction des Ports et du Domaine Publique Maritime	MEE
ANP : Agence Nationale des Ports	MEE
MRCC : Maritime Rescue Coordination Centre	MAPMDREF /DPM
MR : Marine Royale	ADN

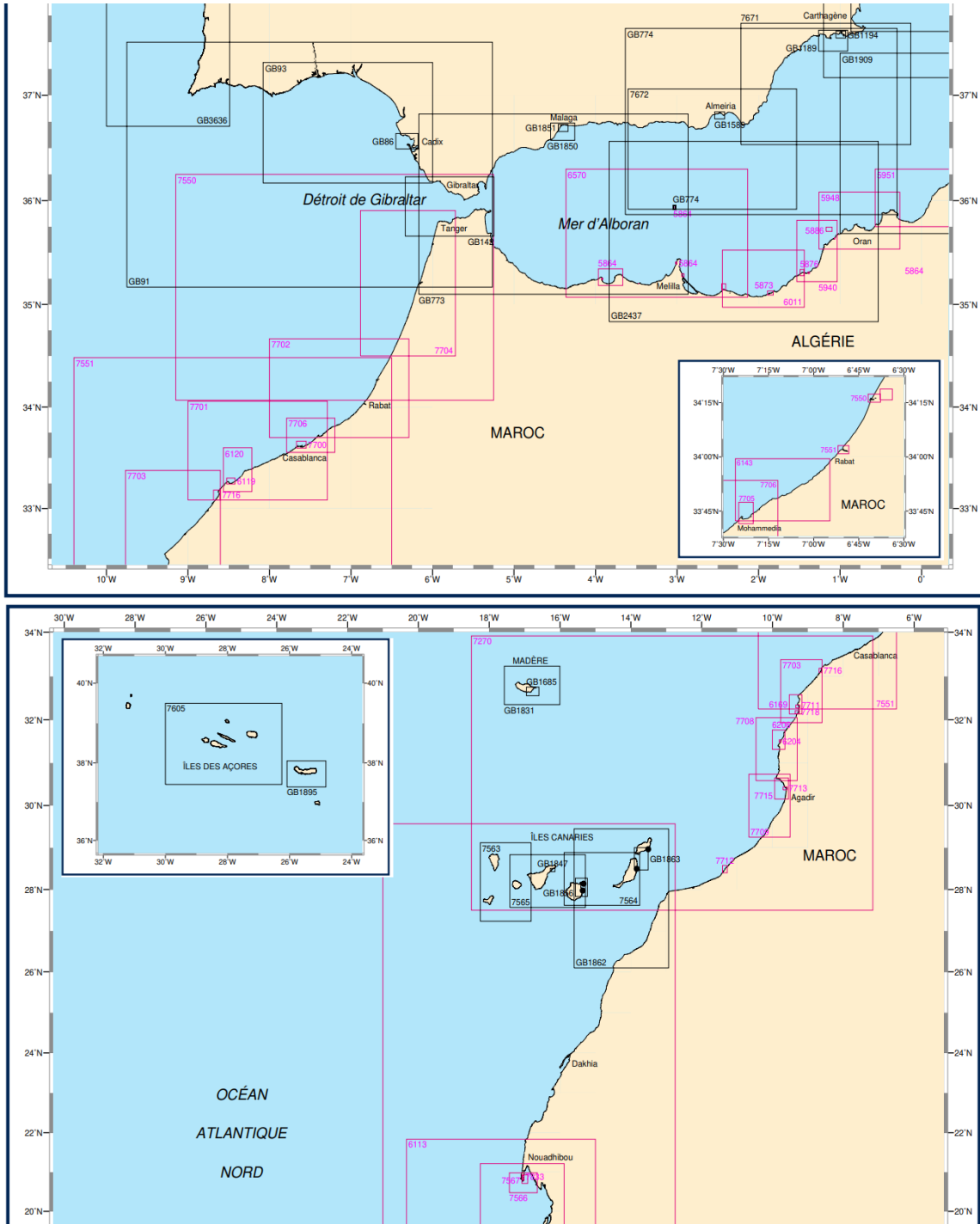
Object – Events	Observations
<b>J1 : Monday 15 May 2023</b>	
➤ Initial coordination meeting	• CV Mostafa TAFRHY - DHOC -auditeur
➤ Examination of the legal corpus defining the attributions of the DHOC and the CNCHOC	
➤ Study of Resolution A. 706 (Dissemination of MSIs)	
➤ Review of measures taken to implement international obligations in the provision of hydrographic services (SOLAS Chapter V rules 4 and 9)	
<b>J2 : Tuesday 16 May 2023</b>	
➤ Interview and discussions with CNCHOC partners and Members	• Auditeur/DHOC • DGM • DMM • CSTM/Tanger
➤ DHOC	• DHOC/Cartographie • DHOC/Ouvrages Nautiques
<b>J3 : Thursday 17 May 2023</b>	
➤ Interview and discussions with CNCHOC partners and Members	• Auditeur/DHOC • DPDPM • ANP • ANCFCC
➤ DHOC	• DHOC/Hydrographie • DHOC/géodésie et marégraphie • CNCHOM (secrétariat)
<b>J4 : Wednesday 18 May 2023</b>	
➤ Visit of MRCC of Bouznika	• Auditeur/DHOC • MRCC (DPM)
➤ Preparing for closing meeting	
<b>J5 : Friday 19 May 2023</b>	
➤ Closing meeting	• Auditeur/DHOC • Commodore LOUDIYI /MR

## Annex F : Charting (paper et electronic)

### Annex F-1 : Coproduction Shom/DHOC

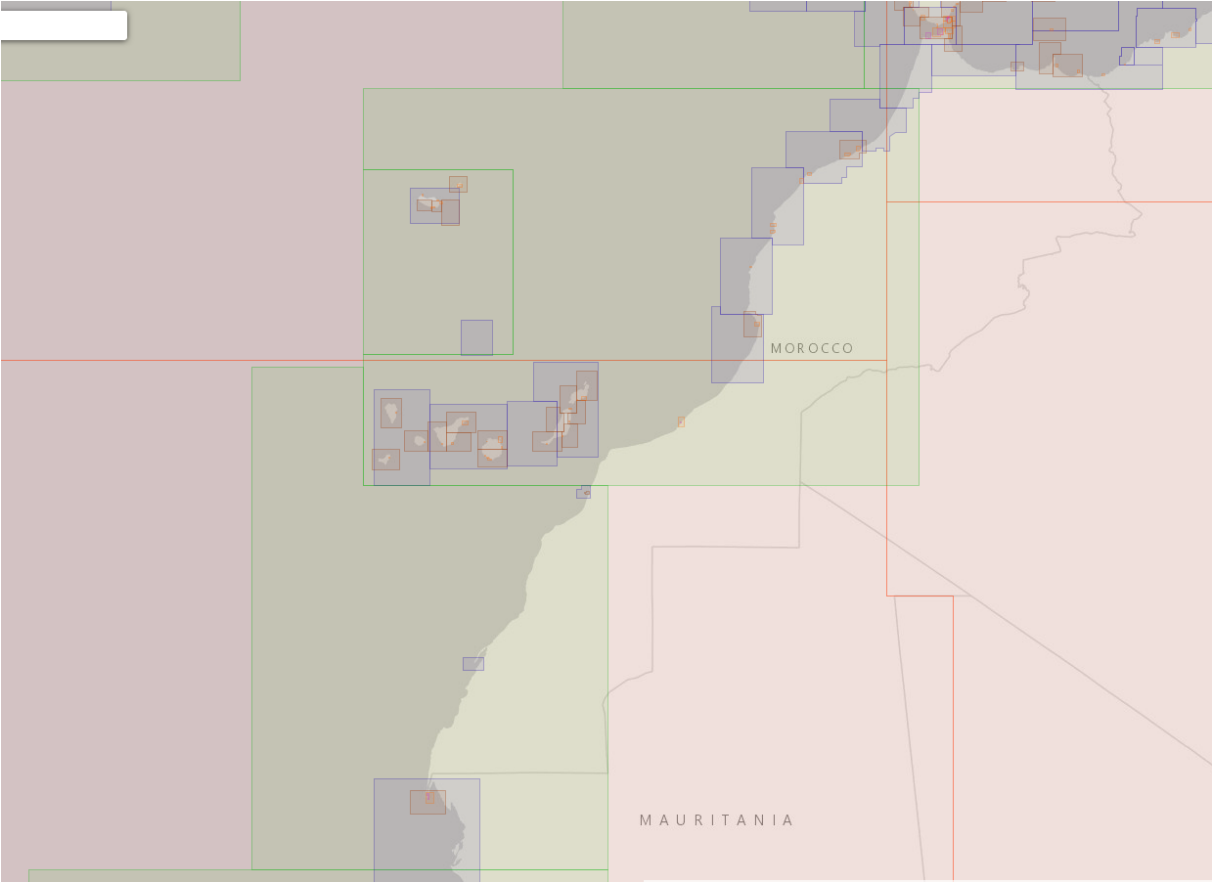
#### Paper charts (and GeoTiff)

Source : Shom (<https://services.data.shom.fr/static/catalog/4A/004-ZKA.pdf>)



**Electronic Navigational Chart (ENC)**

Source : PRIMAR





## Annexe G: Capacity Building Publication N° C-16: National Hydrographic Regulations - Règlements hydrographiques nationaux.

Référence: <https://iho.int/en/capacity-building-publications>

January 2008 C-16- Template (See IHO CL 09/2016)

IHO Regulation on:	IHO Description, dates and links:	Maroc Réponse en FRançais	Morocco Answer in ENGLISH
SOLAS Convention Convention SOLAS Convención SOLAS	Explanation/description of how the roles, tasks and responsibilities for implementation of the SOLAS Convention are achieved.	<p>La mise en œuvre de la convention SOLAS est assurée par différentes institutions du Maroc qui dépendent de différents ministères comme ceux en charge des pêches maritimes, du transport, de l'équipement et par ailleurs de l'administration de la défense nationale. Au sein de cette dernière, l'inspection de la Marine Royale au travers la DHOC est plus particulièrement responsable des obligations concernant les « services hydrographiques » (chapitre 5 – règle 9) et les « avertissements de navigation » (chapitre 5 – règle 4).</p> <p>Ces institutions se retrouvent au sein d'un comité hydrographique national institué et très actif le CNCHOC.</p> <p><b>Références : voir ci-dessous</b></p>	<p>The implementation of the SOLAS convention is ensured by various Moroccan institutions which depend on various ministries such as those in charge of maritime fisheries, transport, equipment and also the administration of national defence. Within the latter, the Royal Navy inspectorate through the DHOC is more particularly responsible for the obligations concerning "hydrographic services" (chapter 5 - rule 9) and "navigational warnings " (chapter 5 - rule 4).</p> <p>These institutions are found within an instituted and very active national hydrographic committee, the CNCHOC.</p> <p><b>References: see below</b></p>
National Hydrographic Service Service hydrographique national Servicio Hidrográfico Nacional	Establishment of the structure and functioning of the National Hydrographic Service.	<p>Le Service Hydrographique National est la DHOC</p> <p><b>Référence :</b> <b>Dahir n° 1-14-84 du 20 octobre 2014 fixant les attributions de l'inspection de la marine royale dans les domaines de l'hydrographie, de l'océanographie et de la cartographie marine.</b></p>	<p>The National Hydrographic Service is the DHOC</p> <p><b>Reference :</b> <b>Dahir n° 1-14-84 du 20 octobre 2014 fixant les attributions de l'inspection de la marine royale dans les domaines de l'hydrographie, de l'océanographie et de la cartographie marine.</b></p>

<p>Nautical charting Cartographie marine Cartografía Náutica</p>	<p>Regulation on the responsibilities related to nautical charting if not defined in the regulation of the National Hydrographic Service or others.</p>	<p>Les responsabilités relatives à l'élaboration, la mise à jour et la diffusion des cartes marines sont définies dans le Dahir précédemment cité <b>Référence :</b> <b>Dahir n° 1-14-84 du 20 octobre 2014 (ART.2.)</b></p>	<p>The responsibilities relating to the development, updating and distribution of nautical charts are defined in the aforementioned Dahir <b>Reference :</b> <b>Dahir n° 1-14-84 du 20 octobre 2014 (ART.2.)</b></p>
<p>Hydrographic surveys in the jurisdictional waters Levés hydrographiques dans les eaux sous juridiction Levantamientos hidrográficos en aguas jurisdiccionales</p>	<p>Regulatory procedures for the execution of hydrographic surveys in the national jurisdictional waters by national and foreign vessels. Obligations to deliver the collected data to the National Hydrographic Service or to the National or Marine Spatial Data Infrastructure (NSDI or MSDI).</p>	<p>Une norme nationale (complétant la publication S-44 de l'OHI) a été rédigée concernant les exigences minimales pour l'exécution des levés hydrographiques. Les procédures et méthodologies à suivre pour la conduite de projets hydrographiques sont décrites dans un guide technique. Pour les services publics marocains, l'obligation de fournir des données à la DHOC est précisée dans le décret (ART.4) constitutif du CNCHOC (voir ci-dessous). Les conditions dans lesquelles peuvent être autorisées et conduites des recherches scientifiques (d'organismes étrangers en particulier) sont précisées dans le décret cité ci-dessous. <b>Références :</b></p> <ul style="list-style-type: none"> <li>• <b>NORME Réalisation de levés bathymétriques N-2023-01/DHOC/HYDRO (reprise dans Norme Nationale PNM 30.9.000 – 2023)</b></li> <li>• <b>Guide Technique Réalisation de levés hydrographiques G-001-2022/DHOC/HYDRO</b></li> <li>• <b>Décret N° 2-20-710 du 20 rabii (27 octobre 2020) fixant les conditions et les modalités de délivrance des autorisations de recherche</b></li> </ul>	<p>A national standard (supplementing IHO publication S-44) has been drafted concerning the minimum requirements for carrying out hydrographic surveys. The procedures and methodologies to be followed for conducting hydrographic projects are described in a technical guide. For Moroccan public services, the obligation to provide data to the DHOC is specified in the decree (ART.4) establishing the CNCHOC (see below). The conditions under which scientific research may be authorized and conducted (by foreign bodies in particular) are specified in the decree cited below. <b>Reference :</b></p> <ul style="list-style-type: none"> <li>• <b>NORME Réalisation de levés bathymétriques N-2023-01/DHOC/HYDRO (reprise dans Norme Nationale PNM 30.9.000 – 2023)</b></li> <li>• <b>Guide Technique Réalisation de levés hydrographiques G-001-2022/DHOC/HYDRO</b></li> <li>• <b>Décret N° 2-20-710 du 20 rabii (27 octobre 2020) fixant les conditions et les modalités de délivrance des autorisations de recherche scientifique marine dans les eaux sous juridiction nationale</b></li> </ul>

		<b>scientifique marine dans les eaux sous juridiction nationale</b>	
<p>Creation of the National Hydrographic Committee Création d'un comité hydrographique national Creación del Comité Hidrográfico Nacional</p>	<p>Establishment and terms of reference of the National Hydrographic Committee as defined in the IHO Capacity Building Strategy and in the IHO Publication M-2: The need for National Hydrographic Services.</p>	<p>Le Comité Hydrographique National existe. Son secrétariat est assuré par l'Inspection de la Marine Royale dont dépend la DHOC. Les réunions sont mensuelles et font participer toutes les parties prenantes marocaines. La traçabilité de ces réunions est assurée. <b>Référence :</b> <b>Décret N° 2-14-330 du 30 octobre 2014 portant création du Comité National de Coordination dans les domaines de l'Hydrographie, de l'Océanographie et de la Cartographie marine (CNCHOC)</b></p>	<p>The National Hydrographic Committee exists. Its secretariat is provided by the Royal Navy Inspectorate on which the DHOC depends. Meetings are monthly and involve all Moroccan stakeholders. The traceability of these meetings is ensured. <b>Reference :</b> <b>Décret N° 2-14-330 du 30 octobre 2014 portant création du Comité National de Coordination dans les domaines de l'Hydrographie, de l'Océanographie et de la Cartographie marine (CNCHOC)</b></p>
<p>Establishment of a National or Marine Spatial Data Infrastructure (NSDI or MSDI) Création d'une infrastructure de données spatiales nationales ou maritimes (NSDI ou MSDI) Establecimiento de una Infraestructura Nacional o Marítima Espacial (NSDI o MSDI)</p>	<p>Establishment of the NSDI/MSDI as defined in the IHO Publication C-17 Spatial Data Infrastructures: "The Marine Dimension" - Guidance for Hydrographic Offices.</p>	<p>Une infrastructure légère existe à la DHOC pour les levés (métadonnées incluses) hydrographiques qu'elle a pu réaliser elle-même. Cela peut convenir dans un premier temps tant que le volume de levés à gérer n'est pas trop important et que toutes les données extérieures (France en particulier) n'ont pas encore été récupérées et archivées. <b>Recommandation</b> Compte tenu de la montée en puissance de la DHOC et des autres organismes contribuant à l'hydrographie nationale, il devient maintenant indispensable de créer une infrastructure de données spatiales (portails de communication inclus). Cette infrastructure devra prendre en compte toutes les données hydrographiques et océanographiques voire cartographiques existantes en lien avec les référents thématiques (hydrographie, marée, géodésie, océanographie, géophysique, aides à la navigation, cartographie.)</p>	<p>A light infrastructure exists at the DHOC for the hydrographic surveys (metadata included) that it has been able to carry out itself. This may be fine initially as long as the volume of surveys to be managed is not too large and all the external data (France in particular) has not yet been retrieved and archived. <b>Recommendation</b> Given the rise of the DHOC and other organizations contributing to national hydrography, it is now becoming essential to create a spatial data infrastructure (communication portals included). This infrastructure will have to consider all the existing hydrographic and oceanographic or even cartographic data in connection with the thematic referents (hydrography, tide, geodesy, oceanography, geophysics, aids to navigation, cartography, etc.) designated in Morocco (DHOC,</p>



		<p>désignés au Maroc (DHOC, DPDPM, INRH, ANCFCC ...). Le cadre du CNCHOC, en particulier sa Commission Technique (CT) « SIG » est tout fait adapté aux développements nécessaires. Le CT pourra s'appuyer sur la publication C-17 de l'OHI : (<a href="https://iho.int/en/capacity-building-publications">https://iho.int/en/capacity-building-publications</a>) et les travaux du GT « Marine Spatial Data Infrastructures » de l'OHI auquel la DHOC participe(<a href="https://iho.int/en/msdiwg">https://iho.int/en/msdiwg</a>)</p>	<p>DPDPM, INRH, ANCFCC, etc.). The framework of the CNCHOC, in particular its Technical Commission (CT) "SIG/GIS" is completely adapted to the necessary developments. The CT may rely on IHO publication C-17: (<a href="https://iho.int/en/capacity-building-publications">https://iho.int/en/capacity-building-publications</a>) and the work of the IHO "Marine Spatial Data Infrastructures" WG to which DHOC participates(<a href="https://iho.int/en/msdiwg">https://iho.int/en/msdiwg</a>)</p>
<p>Other relevant national legislations and regulations Autres législations et règlements nationaux pertinents Otras disposiciones y legislaciones nacionales pertinentes</p>	<p>Additional information that can be shared with other countries. This could be: - Guidance for the maritime community on the Maritime Safety Information (MSI) system - Best practices guide</p>	<p>Transfert de la gestion de l'Information Nautique entre le Ministère de l'Équipement, du Transport, de la Logistique et de l'Eau (DPDPM) et la Marine Royale (Affaires Maritimes). Depuis de 2018 la DHOC est le coordonnateur national de l'information nautique. Un guide de la gestion de l'information nautique a été élaboré par le DHOC <b>Référence :</b> • Procès-verbal du 02 mai 2018 de passation des attributions en matière de gestion de l'information nautique • Guide de gestion de l'information nautique (Edition mars 2023)</p>	<p>Transfer of Nautical Information management between the Ministry of Equipment, Transport, Logistics and Water (DPDPM) and the Royal Navy (Maritime Affairs). Since 2018, the DHOC has been the national coordinator of nautical information. A guide to the management of nautical information has been drawn up by the DHOC <b>Reference :</b> • Procès-verbal du 02 mai 2018 de passation des attributions en matière de gestion de l'information nautique • Guide de gestion de l'information nautique (Edition mars 2023)</p>

## Annex H : État des levés hydrographiques et de la cartographie marine à travers le monde - Status of Hydrographic Surveying and Charting Worldwide Publication C-55

Référence : <https://iho.int/en/capacity-building-publications>

<https://iho.int/en/iho-c-55>

Online update : [https://iho.formstack.com/forms/web\\_form\\_c55](https://iho.formstack.com/forms/web_form_c55)

Extract (09 Mai 2023)

### Morocco - Atlantic (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	2	28	70	29	65
	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 according to FR-MA Technical Agreement signed on January 21st 2008.					

Maritime Safety Information / Renseignements sur la sécurité maritime / Información sobre seguridad marítima		
GMDSS implementation Mise en œuvre du SMDSM Implementación SMSSM	Status Status Estado	Notes Notes Notas
Master plan Plan cadre Plan principal	Unknown	
A1 area Zone A1 Zona A1	Unknown	
A2 area Zone A2 Zona A2	Unknown	
A3 area Zone A3 Zona A3	Unknown	
NAVTEX NAVTEX NAVTEX	Unknown	
Safety NET Safety NET Safety NET	Unknown	

### Morocco - Atlantic (G)

Nautical charting / Cartographie marine / Cartografía náutica									
Coverage of charts published Couverture des cartes publiées Cobertura de cartas publicadas		Offshore passage Navigation au large Pasaje offshore			Landfall and Coastal passage Atterissage et navigation côtière Recalada y Pasaje costero			Approaches and Ports Approches et ports Aproches y puertos	
	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	100	0	0	100	0	50	100	66
	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. Small scale ENC coverage by ENC produced by PT 2. Large scale ENC coverage, partially covered by ENC produced by ES and GB								

Maritime Safety Information / Renseignements sur la sécurité maritime / Información sobre seguridad marítima		
Navigational information Informations nautiques Información náutica	Status Status Estado	Notes Notes Notas
Local warnings Avertissements locaux Avisos locales	Unknown	
Coastal warnings Avertissements côtiers Avisos costeros	Unknown	
NAVAREA warnings Avertissements NAVAREA Avisos NAVAREA	YES	Through NAVAREA II
Information on ports and harbours Information sur les ports et rades Información sobre puertos	Unknown	

Last update / Mise à jour / Actualización: 30/08/2022

### Morocco - Méditerranée (F)

Hydrographic surveying / Levés hydrographiques / Levantamientos hidrográficos						
Survey coverage Couverture hydrographique Cobertura hidrográfica	Depth < 200m Profondeur < 200m Profundidad < 200m			Depth > 200m Profondeur > 200m Profundidad > 200m		
	<p><b>%</b> Adequately surveyed Correctement hydrographié Adecuadamente levantado</p> <p><b>%</b> Re-survey required Nécessitant de nouveaux levés Requiere nuevo levantamiento</p> <p><b>%</b> Never systematically surveyed Jamais hydrographié systématiquement Nunca levantado sistemáticamente</p>	0	0.4	99.6		
Notes Notes Notas	Data provided by France according to FR-MA Technical Agreement signed on January 21st 2008. 2. Data now derived from survey GIS polygonal surfaces method. New values might divert significantly					

Maritime Safety Information / Renseignements sur la sécurité maritime / Información sobre seguridad marítima		
GMDSS implementation Mise en œuvre du SMDSM Implementación SMSSM	Status Status Estado	Notes Notes Notas
Master plan Plan cadre Plan principal	YES	Radiocommunications maritimes, volume 4 (924-RNA) published by SHOM.
A1 area Zone A1 Zona A1	Unknown	
A2 area Zone A2 Zona A2	Unknown	
A3 area Zone A3 Zona A3	Unknown	
NAVTEX NAVTEX NAVTEX	NO	
Safety NET Safety NET Safety NET	NO	

### Morocco - Méditerranée (F)

Nautical charting / Cartographie marine / Cartografía náutica									
Coverage of charts published Couverture des cartes publiées Cobertura de cartas publicadas	Offshore passage Navigation au large Pasaje offshore			Landfall and Coastal passage Atterrisage et navigation côtière Recalada y Pasaje costero			Approaches and Ports Approches et ports Aproches y puertos		
	<p><b>%</b> 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</p> <p><b>%</b> Covered by RNC meeting S-61 Couvert par des RNC conformes S-61 Cubiertas por RNC cumpliendo S-61</p> <p><b>%</b> Covered by ENC meeting S-57 Couvert par des ENC conformes S-57 Cubiertas por ENC cumpliendo S-57</p>	100	0	100	100	0	100	80	0
Paper charts showing depth in meters Cartes papier avec les profondeurs en mètres Cartas de papel con profundidades en metros	Paper charts referenced to a satellite datum Cartes papier rapportées à un système géodésique satellitaire Cartas de papel referidas a un datum satelital			Data source Source des données Origen de los datos			France		
Notes Notes Notas									

Maritime Safety Information / Renseignements sur la sécurité maritime / Información sobre seguridad marítima		
Navigational information Informations nautiques Información náutica	Status Status Estado	Notes Notes Notas
Local warnings Avertissements locaux Avisos locales	Unknown	
Coastal warnings Avertissements côtiers Avisos costeros	Unknown	
NAVAREA warnings Avertissements NAVAREA Avisos NAVAREA	YES	Through NAVAREA II
Information on ports and harbours Information sur les ports et rades Información sobre puertos	Unknown	

Last update / Mise à jour / Actualización: 30/06/2017

## Annex I : Referents by fields of activity

<b>DEPARTEMENT /ORGANISME</b> <b>MEMBRE DU CNCHOC</b> <b>Ministry Institution</b>	<b>DOMAINE D'ACTIVITE</b> <b>Activity</b>	<b>REFERENT</b>
Ministère de l'Équipement et de l'Eau	Aides à la navigation	DPDPM
	Délimitation portuaire	
Ministère de l'Agriculture, de la Pêche Maritime, du Développement Rural et des Eaux et Forêts	Courant	INRH
	Océanographie	
	Récifs artificiels, fermes aquacoles, aires marines protégées aux fins de pêche, madragues,...	DPM
Ministre de la Transition énergétique et du Développement durable	Fond cartographique (cartes géophysiques)	Direction de la Géologie
	Magnétisme	
	Gravimétrie	
Marine Royale	Bathymétrie	Division d'Hydrographie, d'Océanographie et de Cartographie marine (DHOC)
	Nature du fond	
	Marée	
	Épaves, points de croche, obstructions..	
	Câbles sous-marins, émissaires..	
	Fond cartographique (cartes marines)	
	Zones sous réglementations spéciales	
Agence Nationale de la Conservation Foncière, du Cadastre et de la Cartographie	Topographie	ANCFCC
	Géodésie	
	Photogrammétrie	
Ministère de l'Enseignement supérieur, de la Recherche Scientifique et de l'Innovation	Recherche Scientifique dans le domaine HOC	Direction de la Recherche Scientifique et l'Innovation

## **Annex J : Commitment of the Kingdom of Morocco (CNCHOC) in favor of the achievement of the objectives of the Ocean Decade (UNESCO/IOC)**

**Source : DHOC**

### **Introduction**

The United Nations General Assembly proclaimed the United Nations Decade of Ocean Science for Sustainable Development 2021-2030 (hereafter “Decade”) in order to mobilize interested actors around the world on a common framework that will put science at the service of countries in their implementation of the Sustainable Development Goal on the ocean. The proclamation of this Decade is the culmination of efforts by the Intergovernmental Oceanographic Commission (IOC) of UNESCO to promote international cooperation in the field of ocean sciences. It will make it possible to coordinate research, observation systems, capacity development, maritime spatial planning and marine risk reduction programs in order to improve the management of ocean and coastal zone resources.

### **Commitment of the Kingdom of Morocco to the achievement of the objectives of the Ocean Decade**

As part of the calls for action of the decade, the Kingdom of Morocco proposed a program entitled: **“Strengthening hydrographic and oceanographic observations in support of marine scientific research”**. This program, defined within the framework of the National Coordination Committee in the fields of hydrography, oceanography and cartography (CNCHOC), was selected and labeled project No. 154 by the IOC of UNESCO. A tripartite working meeting between members of the CNCHOC of the National Commission for Education, Science and Culture (CNESC) and the IOC took place on March 11, 2022 at the CNESC headquarters to discuss the plan of actions planned to implement the proposed program.

### **The objective of this initiative is to increase hydrographic and oceanographic knowledge on the Moroccan marine area in the Atlantic Ocean and in the Mediterranean Sea through in-situ measurements, collected through marine scientific research campaigns.**

The program in question proposes four actions aimed at improving environmental knowledge in Moroccan waters, by developing a very varied national observation network.

- 1.** Realization of high-resolution hydrographic surveys meeting the international standards of the International Hydrographic Organization using the latest generation equipment.
- 2.** Realization of seasonal oceanographic campaigns in the Atlantic Ocean and the Mediterranean Sea in order to study the variability and the evolution of the ocean through hydrological measurements.
- 3.** Sea level monitoring by tide gauges installed in Moroccan ports through the tidal observatory project launched within the framework of the CNCHOC.
- 4.** Weather and ocean monitoring in coastal areas through the implementation of an HF radar network project led by the General Directorate of Meteorology and the installation of several buoys and automatic weather stations by the National Ports Agency (ANP).