



NEEDS ASSESSMENT MISSION ON AIDS TO
NAVIGATION AND REVIEW OF THE STATE
OF HYDROGRAPHIC SURVEY, NAUTICAL
CHARTING AND NAVIGATIONAL AIDS

PORT SUDAN, SUDAN: 21-26 APRIL 2018

Consultants' Report

Executive Summary

Title of the course:	Needs assessment mission on aids to navigation and review of the state of hydrographic survey, nautical charting and navigational aids
Host:	Sea Ports Corporation (SPC)
Venue and date:	Port Sudan, Sudan 21 to 26 April 2018
Type:	National
Organized by:	IMO
Budget line	TC/1831-05-2000

Summary

In response to the request from national authorities in Sudan to assist them in capacity-building for their Maritime Sector, an ITCP advisory and need assessment activity was programmed in 2016 to identify priorities and the steps forward for the development of the Sudanese Maritime Sector, and draw a road map of the follow-up activities to be taken. In this regard and in line with the provisions of Chapter V of SOLAS on safety of navigation which obligates a coastal State to provide a set of services for safety of navigation of ships sailing on its coast, this activity is to assess the current state of hydrography and nautical charting and identify the real needs/requirements of Sudan in matters related to hydrography, hydrographic surveys, nautical charts and aids to navigation.

The activity, which was jointly implemented by IMO/IHO/IALA, aimed at identifying the real needs and requirements of Sudan in matters related to hydrography, hydrographic surveys, nautical charts and ships routing, as well as serving as a follow-up to previous needs assessment mission carried out by IALA in 2017.

Key words: Hydrography, ships routing, nautical charts, hydrographic surveys, aids to navigation.

Report ref.: TC/1831-05-2000

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Introduction

Sea Ports Corporation (SPC) has invited the International Maritime Organisation (IMO) together with the International Hydrographic Organisation (IHO), and the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), under the United Nations banner “Delivering as One”, to conduct a Review mission to Sudan to review analysis made and actions taken with the adoption of appropriate recommendations listed in the 2017 IALA Needs Assessment Mission report.

The mission was held from 21 April 2018 to 26 April 2018, in Port Sudan, Sudan. The experts thanked SPC, the national Competent Authority in charge of Aids to navigation within the Ministry of Transport, Roads and Bridges (MTRB), for the quality of the welcome, the efficiency of the organisation of the mission, and the impressive support delivered during all the preparation and the delivery of the mission, especially by Captain Mahmoud Sayed Ahmed (Hamouda), Deputy General Manager of Operation, SPC.

The purpose of the mission was to assist MTRB with its endeavours to comply with international obligations relating to the safety of navigation as laid down in UNCLOS, SOLAS and the publications of IHO and IALA. This was the first IMO/IHO/IALA joint mission with IMO and it can be considered as successful.

Joint Mission Findings (IALA Review)

Fifteen of the 52 recommendations delivered within the report have been done, 4 are pending. There is still an important number of recommendations (33, 63% of 52) to be included in action plans, part of an approved road map. With regard to the recommended actions, there are many good intentions, but less tangible results to be found within SPC, which is the present Competent Authority for Aids to Navigation and VTS in the Republic of Sudan; the progress made on developing regulations and on management is promising; a new national maritime law is no being drafted, to clear responsibilities for the management of AtoN services along the entire coast. The user pay system is in place is not focused on AtoN services. None of the recommendations made on the status of AtoN have been included in an action plan.

There is still a non-compliance to issue MSI and to update the charts. There have been no nomination of the national NAVAREA coordinator. The volume of commercial traffic calling for the Sudanese Red Sea side does not justify upgrading the traffic control to full Vessel Traffic Services (VTS). No new developments are expected to take place the next years that would significantly increase the traffic. There is a need for training, both for SPC AtoN and VTS staff. Possibilities to run Level 2 training courses are under consideration.

The Way Ahead

The SPC Deputy Director General showed a clear commitment to enhance the Safety of Navigation, and asked for support from IMO, IHO and IALA.

SPC considers that there is no need for routeing measures, as there is a very low collision and grounding frequency (one of the IMO goals for the joint mission).

Competency in risk analysis and management will then hopefully be expected to be enhanced with the delivery of one Level 1 certificate soon. The Indian Directorate General of Lighthouses & Lightships has send to Sudan an invitation to attend the Level 1 AtoN Management training course session scheduled in July. This will allow SPC to benefit of the needed skills and competences that will allow enhancing the quality of the proposals made to the deciders and the implementation of actions on safety of navigation.

Level 2 training courses should also be conducted. This should be made in accordance with the IALA WWA Capacity Building Strategy, with the accreditation of the training organisations by the national Competent Authority (SPC), and the delivery of the IALA model courses.

A risk analysis session using the SIRA method, part of the IALA risk management toolbox, should be conducted fall 2018, taking in account the competences acquired by the holder of the Level 1 certificate, to conduct a risk-based analysis of the maritime traffic and the maritime environment in each defined region or zone to determine the type of AtoN appropriate for each zone (Recommendation 17).

Principles of the implementation of three draft action plans have been defined during the review meeting, taking in consideration the preparation of the IMO Audit; a middle term; and a long term (see the proposed road map).

Conclusion

1. Limited progress has been made on the fifty-two recommended actions¹ from the 2017 IALA WWA Technical Needs Assessment Mission;
2. With regard to the recommended actions, there are many good intentions, and some tangible results to be found within Sea Port Corporation, which is the present Competent Authority for Aids to Navigation and VTS in the Republic of Sudan;
3. The progress made on developing regulations and preparing the IMO Audit is promising;
4. To finalise the IMO/IHO/IALA joint mission report, there is a need to receive documentation on AIS data from the MTRB terrestrial AIS network, on port traffic calls statistics, and on incidents. It should be necessary to take into account not only the number of annual fishing vessel passages, but also the number of fishing vessels in the studied areas not carrying AIS.

The Review, part of the IMO/IHO/IALA joint mission, has shown that Sudan is very aware of the need to actively adopt the recommendations in the Academy report, as an IMSAS will take place in September 2018.

The positive audit elements could be supporting the ability for Sudan to go out of the consequences of the embargo, and to develop the maritime activities. It is hoped that the rate of progress will be better over the next year or two, and if there is anything IALA can do to facilitate the further development of aids to navigation services in your great and beautiful country, IALA will do all that can be done to assist.

This mission was judged to have met its aims. All Consultants would like to thank the Deputy General Manager and his staff for their superb hospitality and very positive and cooperative spirit during the visit.

¹The list of recommendations of the report has been upgraded, to incorporate the draft recommendations, delivered at the end of the technical mission

Road Map

High Priority Action Plan

Short Term Action Plan (May/August 2018), before the IMO Audit (IMSAS)

1. A MSI national coordinator to be nominated
2. Paper chart and nautical publications to be available in SPC HQ
3. An audit of all AtoN against current official charts to be undertaken and report all discrepancies to be reported to PCA.
4. Expand Terms of Reference of AtoN Committee to create Safety of Navigation Committee
5. A National Hydrographic Coordinator post needs to be formally established within SPC or alternative organisation (with appropriate supporting documentation)
6. Standard operating procedures, job descriptions and associated documentation regarding MSI processes to be drafted and added to SPC's Quality Management System.
7. An audit across all government departments for existing hydrographic data holdings to be undertaken, and supply to PCA to be ensured
8. Bashayer Oil Terminals 1 & 2 formal stakeholder meeting to be held
9. First bi-annual practical measurement of the actual range of vital and important lit marks to be done
10. Non-compliant AtoN action plan to be established
11. Urgent modifications to non-compliant AtoN to be realised
12. 2018-2022 IALA ARM, ENG, VTS Committees attendance plan to be drafted and decisions (manhood and funding for the 4 next years) to be taken
13. Qualification and training requirements for SPC staff in charge of navigational warnings to be established
14. Qualification and training requirements for VTS personnel to be established
15. Accreditation of training organisations and/or agreement with other coastal states for AtoN trainings to be conducted
16. Accreditation of training organisations and/or agreement with other coastal states for VTS trainings to be conducted
17. Maritime incidents data-base to be established
18. AtoN Procedures documentation for the IMO Member States Audit Scheme to be drafted
19. SPC mandate (decisions, ...) to be drafted and added to the legal frame
20. AtoN name boards and physical numbering policy to be drafted and added to the legal frame

Second Action Plan

Mid-Term Action Plan (September 2018/July 2019)

1. Attendance of experts to fall 2018 and Spring 2019 IALA ARM, ENG, VTS Committees to be done
2. National register to be drafted, maintained and up-dated
3. AIS network phased suite to be installed
4. Survey of marine lanterns characteristics to be conducted
5. Non-compliant AtoN second phase modifications to be realised
6. AtoN name boards and physical numbering policy implementation to be realised
7. Sanganeb lighthouse renovation (LED/solar panels) to be realised
8. Emergency wreck marking plan to be drafted and added to the legal frame
9. MTBR and SPC attendance to Risk management Seminar (2019) to be done
10. MTBR and SPC attendance to Level 1 AtoN Management training courses (2019) to be done
11. Modern NAVTEX receiver to be installed in SPC HQ
12. Nairobi Convention ratification to be done
13. Port Sudan Port risk assessment study to be conducted

14. Forms to report observed failures to be drafted and made available
15. Process to generate Non-Conformance Reports to be drafted and added to legal frame
16. Review of existing consultancy process to be conducted, and means on how to enhance it to be drafted and added to the legal frame
17. Cost-effectiveness AtoN maintenance facilities and resources policy to be drafted and added to the legal frame
18. Aton operating fund to be drafted, added to the legal frame, and implemented
19. Justified 5-years budget to be drafted, and submitted to decision makers
20. Physical audit of all AtoN to be conducted one's a year (night and day)
21. Risk-based analysis of prioritise regions or zones to be conducted
22. Level of service statement to be drafted, validated and published
23. Strategic plan to be drafted, validated and published
24. Operational plan to be drafted, validated and published
25. Green Guidelines to be drafted, validated and published within the Strategic Plan
26. Government of Sudan should seek mechanisms to enable clarification of institutional responsibilities with regard to international maritime conventions.
27. IHO North Indian Ocean Hydrographic Commission attendance to be decided and organised
28. Funding options for surveys of approach to Bashayer Oil Terminals to be explored
29. A GIS based survey prioritisation for Sudan to assist in defining areas where initial efforts should be focussed, based on existing data, to be undertaken by PCA
30. Survey prioritisation scheme to be developed

Third Action Plan

Long Term Action Plan (September 2019/July 2020)

1. Attendance to fall 2019 and Spring 2020 IALA ARM, ENG, VTS Committees to be done
2. AIS network phased suite to be installed
3. AtoN remote monitoring capability selection review to be conducted
4. AtoN availability database to be established
5. Sanganeb Lighthouse alternative use proposal to be drafted
6. IHO Membership
7. Indigenous modern seabed mapping capability to be developed
8. Funding options to develop hydrographic programme of priority areas to be explored
9. Spatial data infrastructure within Sudan to ensure access and use of all data holdings to be developed

Legal Disclaimer

The conclusions and recommendations in the draft final report represent the opinion of the Consultants, based on the guidelines of the institutions they represent. The responsibility for any decision to implement them shall rest entirely on the national Competent Authority of Sudan.

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Glossary

For simplicity, some words and expressions used in this report should be understood as follows, unless the context otherwise requires.

- 'IHO Consultant' means the IHO representative, co-author of this report.
- 'IALA Consultant' means the IALA representative, co-author of this report.
- 'IMO' means the International Maritime Organization.
- 'IHO' means the International Hydrographic Organisation
- 'IALA' means the International Association of marine Aids to navigation and Lighthouse Authorities
- 'Mission team' means the delegation that carried out the mission to Sudan in connection with the Terms of Reference for this report, being composed of one IMO Officer and the two Consultants.
- 'Sea Ports Corporation' or 'SPC' means the Sea Ports Corporation (Sudan).
- 'Sudan' means the Republic of the Sudan.

List of Acronyms

AIS	Automatic Identification System
ATO	Accredited Training Organisation
AtoN	Aids to Navigation
CATZOC	Category Zone of Confidence (indication of data reliability on electronic navigational chart)
COLREG	International Regulations for Preventing Collisions at Sea
ECDIS	Electronic Chart Display and Information System
ENC	Electronic Navigation Chart
GIS	Geographical Information System
GT	Gross Tonnage
GMDSS	Global Maritime Distress and Safety System
GNSS	Global Navigation Satellite System
IALA	International Association of Aids to Navigation and Lighthouse Authorities
IHO	International Hydrographic Organization
IMO	International Maritime Organization
IMSAS	IMO Member State Audit Scheme
ISM	International Safety Management [Code]
ISPS	International Ship and Port Facilities Security [Code]
IWRAP	IALA Waterway Risk Assessment Program
LED	Light Emitting Diode
LoS	Level of Service
MARPOL	International Convention for the Prevention of Pollution from Ships
MBS	(The IALA) Maritime Buoyage System
MoU	Memorandum of Understanding
MSI	Maritime Safety Information
MSP	Maritime Spatial Planning
Mt	Million ton
MTBF	Mean Time between Failures
MTRB	Ministry of Transport, Roads and Bridges
MTTR	Mean Time to Repair
NCR	Non-Conformance Reports
NIOHC	North Indian Ocean Hydrographic Commission
NM	Nautical Mile
NtoM	Notice to Mariners
NIOHC	North Indian Ocean Hydrographic Commission.
PAWSA	Ports and Waterways Safety Assessment
PCA	Primary Charting Authority
PDL	Precision Direction Light (also called "PEL" light)
PMU	Police Marine Unit
PSSA	Particularly Sensitive Sea Areas
QMS	Quality Management System
SOLAS	International Convention for the Safety of Life at Sea
SPC	Sea Port Corporation (of Sudan)
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
ToR	Terms of Reference
UKHO	United Kingdom Hydrographic Office
UNCLOS	United Nations Convention on the Law of the Sea
VIMSAS	Voluntary IMO Member State Audit Scheme
VTS	Vessel Traffic Service
WWNWS	World Wide Navigational Warning Service

1. Mission Report

1.1. Introduction

Sea Port Corporation (SPC) has invited the International Maritime Organisation (IMO), together with the International Hydrographic Organisation (IHO), and the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) to conduct, free of charge for Sudan, except inland transportation costs, a joint mission to Sudan to assess the current state of hydrography and nautical charting and identify the real needs/requirements of Sudan in matters related to hydrography, hydrographic surveys, nautical charts and aids to navigation. This mission has been held under the United Nations banner “Delivering as One”

The mission has been held from 21 April 2018 to 26 April 2018, in Port Sudan. The IMO expert was Mr. Amr Hussein, Administrative and Programme Officer, Technical Cooperation Division; the IHO expert was, on behalf of IHO, Mr. David Parker, Hydrographic Programme Manager, United Kingdom Hydrographic Office; and the IALA expert was Mr. Jacques MANCHARD, IALA Senior Adviser.

The Mission team thanks SPC, the national Competent Authority in charge of Aids to Navigation within the Ministry of Transport, Roads and Bridges (MTRB), for the quality of the welcome, the efficiency of the organisation of the mission, and the impressive support delivered during all the preparation and the delivery of the mission, especially by Captain Mahmoud Sayed Ahmed (Hamouda), Deputy General Manager of Operation, Sea Port Corporation.



Meeting with SPC Deputy General Manager

The purpose of the mission was to assist MTRB with its endeavours to comply with international obligations relating to the safety of navigation as laid down in UNCLOS, SOLAS and the publications of IHO and IALA. The aim was to draw a roadmap of required activities to assist Sudan in meeting its obligations under SOLAS Chapter V as a coastal State.

IMO has conducted an IMO Advisory and Needs Assessment Mission to Assist Sudan in Capacity Building in its Maritime Sector, 7-11 February 2016. The mission team was composed of Mr Amr Hussein, Administrative and Programme Officer, Technical Cooperation Division, IMO, and Dr Aref Fakhry, Associate Professor, World Maritime University (WMU), the author of the Consultancy report submitted to IMO.

IALA has conducted a needs assessment mission for the aids of navigation in Sudan waters, 21-28 July 2017. The IALA Consultant, Mr. Jacques Manchard, IALA Senior Adviser took the opportunity back to back with the joint mission to review analysis made and actions taken with the adoption of appropriate recommendations listed in the 2017 IALA Needs Assessment Mission report delivered by himself after holding the mission.

An IALA World Wide Academy (IALA WWA) review report has been delivered to SPC. It was agreed that the recommendations and/or roadmap of IALA's mission would be jointly implemented by IMO-IALA. This mission will jointly implement the top priority follow-up action of the needs assessment mission's recommendations carried out by IALA.

This was the first IMO/IHO/IALA joint mission and it can be considered as successful.

1.2. Sudan Maritime Overview

Sudan has a range of port facilities on its east coast, which supports trade for Sudan and a number of neighbouring states; importantly including the only source of oil export for South Sudan. The ports are Port Sudan, the Bashayer Oil Terminals (1&2), Sawakin and the new Hydob Livestock Terminal. The majority are operated by Sea Ports Corporation Sudan (SPC), and government owned company, who are also the de facto Maritime Authority. There is one exception - the Bashayer Oil Terminals, which are operated by S+P Offshore – another government owned company.

Much of the coastal waters are relatively deep close to the coast, but there are many offshore and coastal coral reefs which impact of navigation. Other than data taken from imagery and some recent surveys within the ports, the majority of the coastal waters are un-surveyed. Full details of survey and charting status are available in Annex F (UKHO Report).

Sudan has been steadily building and growing its' ports to help increase import and export activity. Much of this development has been strongly assisted with Chinese investment. Sudan had already recognised that safety of navigation was a barrier to development, and presented a risk to both the environment, economy and security. SPC therefore requested assistance in this regard from IMO, who in turn requested support from IALA and IHO. Although US sanctions for Sudan were lifted in October 2017, there are still many issues with obtaining international funding and support.

Sudan will undergo their IMO Member State Audit Scheme (IMSAS) audit in September 2018. DP stated that many of the recommendations to follow could be implemented by Sudan prior to this audit.

1.3. Mission Objectives

The purpose of the mission was to conduct a safety of navigation needs assessment for Sudan, and to provide appropriate advice on possible improvements including practical, managerial, budgetary, manpower and organisational aspects.

In response to the request from national authorities in Sudan to assist them in capacity-building for their Maritime Sector, an ITCP advisory and need assessment activity was programmed in 2016 to identify priorities and the steps forward for the development of the Sudanese Maritime Sector, and draw a road map of the follow-up activities to be taken.

In this regard and in line with the provisions of Chapter V of SOLAS on safety of navigation which obligates a coastal State to provide a set of services for safety of navigation of ships sailing on its coast, this activity is to assess the current state of hydrography and nautical charting and identify the real needs/requirements of Sudan in matters related to hydrography, hydrographic surveys, nautical charts and aids to navigation.

The activity aims at drawing a roadmap of required activities to assist Sudan in meeting its obligations under SOLAS Chapter V as a coastal State.

1.3.1. IMO Terms of Reference

The Consultant for the hydrography part of this mission is required to undertake the following tasks:

1. assess, as far as practicable and within the limited duration of the in-country visit, the coastal State's obligation arising from provisions of SOLAS regulations V/9 and 27, the current state of providing or arranging hydrographic services and provisions of nautical charting and nautical publications, and identify the real needs/requirements of Sudan in this respect; and
2. provide relevant recommendations and draw a detailed roadmap with milestones for the possible follow-up actions.

The Consultant for the aids of navigation including ships' routing, ship reporting systems and vessel traffic services part of this mission, will undertake the following tasks:

1. identify the need for relevant ships' routing and ship reporting systems, if necessary to ensure the safety of navigation;
2. identify, from the top priority follow-up action of the needs assessment mission's recommendations carried out by IALA, actions relating to the provisions of SOLAS regulations V/12 and 13. Prepare for an implementation plan, and start the process, if practicable;
3. provide to the competent authorities before departing Sudan, a brief overview of the findings and conclusions; and
4. provide relevant recommendations and draw a detailed roadmap with milestones for possible follow-up actions.

1.3.2. IHO Terms of Reference

The Hydrographic Consultant was requested to undertake the following by IMO:

1. assess, as far as practicable and within the limited duration of the in-country visit, the coastal State's obligation arising from provisions of SOLAS regulation V/9, the current state of providing or arranging hydrographic services and provisions of nautical charting and nautical publications, and identify the real needs/requirements of Sudan in this respect;
2. identify the existence of an infrastructure for collection and dissemination of Maritime Safety Information (MSI) for complying with SOLAS regulation V/4 and provide recommendations for its improvement
3. provide relevant recommendations and draw a detailed roadmap with milestones for the possible follow-up actions;
4. assess the existing legislation/regulations to support safety of navigation; and
5. advise the national institutions on the importance of developing and/or implementing a National Maritime Committee, a high-level entity to deal with the matters related to the safety of navigation.

1.3.3. IALA Terms of Reference

The Consultant for the aid of navigation part of this mission is required to undertake the following tasks:

1. identify, from the top priority follow-up action of the needs assessment mission's recommendation carried out by IALA, actions relating to the provisions of SOLAS regulations V/12 and 13. Prepare for an implementation plan, and start the process, if practicable;
2. provide to the competent authorities before departing from Sudan a brief overview of the findings and conclusions; and
3. provide relevant recommendations and draw a detailed roadmap with milestones for the possible follow up of this activity.

1.4. Delivery of the mission

1.4.1. Meeting with AtoN Committee (Saturday 21 April)

The first meeting was opened by the Harbour master, Captain Mahmoud. He thanks IMO, IHO and IALA for attending the joint mission. Already IALA has made recommendations following a previous needs assessment mission, and progress in Sudan has been applied.

The IMO Officer confirms that after the 2016 mission, generic recommendations and a road map have been delivered, with legal drafting aspects. Now, the joint mission is going on, as the three sister organisations do not want to waste efforts, to duplicate actions, so a new road map will be established.

The IHO Consultant pointed the fact that expertise by the three sister organisations were overlapping, and this mission will allow to learn from each other.

The IALA Consultant thanks SPC for the delivery of the document showing the status of implementation of each of the recommendations delivered in the report after the aids to navigation needs assessment mission organised in July 2017.

Every participant to the meeting introduce itself (see the attached list of participants).

The IHO Consultant pointed the need to put in place rules and regulations to be applied in case of AtoN failure.

There are only practices, between individual people, with local warnings on VHF. Transmission to Pakistan (Navarea 9 coordinator) is not always done.

The IMO Officer pointed that problems, decreases should be highlighted, to define corrected measures that should be presented for the IMSAS Audit, scheduled next September. IMO can support Sudan (CB, training, no equipment). To be able to conduct risk analysis, both AIS data and information on events (calls, sinking, near-misses, ships collision, AtoN failures ...) should be available and taken in account. Answering to Colonel Jaffar (Navy), he indicates that IALA could then organise SIRA training sessions, to conduct risk analysis, and that IMO could be delivering support.

The IHO Consultant ask for survey plan, to prioritise, and first of all, to implement governance measures, mandatory regulations and documents, instead of operational actions, without legal frame. The proposal was made that some work could be conducted during the mission on that topic, working in sub-groups. Captain Hashim pointed that there was no accident, no incident, and underlined the necessity to define what will be done as assessment, and as assistance. For that, the responsibility of the actors, regarding the SOLAS convention (rules 4, 12, 13) should be well defined. The limits of SPC responsibility are not clear.

A Maritime Committee has been created, but is still to be implemented. It should bring benefits to MSI preparation and dissemination. The Navy is already acting as the national coordinator, but without formalised procedures. Captain Hashim confirm that it is necessary to implement regulations, not to stay with only common practices, and hope that the experts will be able to help Sudan to do so.

SPC state they are meeting MSI requirements in full by issuing local warnings, and supplying appropriate information to NAVAREA IX coordinator and UKHO as PCA. SPC reported that responsibility for SOLAS is primarily on SPC, but some elements appear to be undertaken by Navy. No-one was clear on responsibility for surveys outside of ports.

SPC now manage all AtoN in Sudanese waters – although this does not appear to have been formalised.

SPC contracted Chinese company to conduct multibeam surveys in 2014-15. SPC state that these surveys met IHO Order 1A. However, UKHO were only supplied PDFs of drawings, so gave final product CATZOC B. Engineer Ali stated all reports and metadata were supplied, so they were surprised at this.

1.4.2. Meeting with Hydrographic Teams – SPC and Navy (Saturday 21 April)

SPC have surveying department which conducts land and hydrographic surveys. They have a dual frequency single beam echo-sounder, differential GNSS, 2 x Leica Dual Frequency GNSS, 1 x Hypack 2008 licence and a range of other levels and traditional land survey equipment. However, due to an inability to interface the GPS

with their survey software, they are not currently able to conduct surveys. SPC have contacted their software provider, Hypack, who responded to say that SPC are not currently covered by any support arrangements.

Sudan Navy have a hydrographic department with a similar spread of equipment to SPC, and they are part of the military's Sudanese Surveying Corporation. The Hydrographic Team are led by Cdr Jafer Hussein Idris. Navy reported they were able to conduct 2-4 surveys a year in support of both defence and civil requirements.

It appears that Navy data was used within Sudan, none was passed to the PCA to allow the updating of current official charts.

Navy stated that they have ultimate control of access to sea areas and all activity needs permission of Navy. Navy also responsible for border security plus coordination and delivery of search and rescue. Navy will report all AtoN defects to SPC, but there is no formal agreement in place to do this.

Navy also reported that recently took ownership of survey vessel on River Nile which is equipped with multibeam sonar, and they are currently delivering a programme of river surveys to support planned increase in river-borne trade.

Both Navy and SPC have conducted hydrographic surveys within port limits and outside of port limits. Furthermore, they have designated coordinator roles to ensure good collaboration and cooperation.

A discussion took place with SPC and Navy to suggest key areas that currently presented a high navigational risk where modern surveys are required. These were all marked on a paper chart and photographed. The highest priority was agreed to be the Bashayer Oil Terminal and approach channel. A discussion took place as to whether SPC or Department of Environment would be able to put pressure on S&P Offshore (the Government Company operating the terminal) to ensure appropriate surveys were undertaken.

1.4.3. Meeting with SPC Deputy General Manager (Sunday 22 April)

Captain Hamouda (SPC) open the meeting pointing the difficult situation of Sudan, with limited bank transfers, migration of staff, need of training and support. So he thanks IMO, IHO and IALA for the decision to organise that joint mission. Taking in account the recommendations delivered by the IALA WWA, actions have been implemented, and it is necessary to work together to go forward.

The IHO Consultant pointed that with the SPC competent team, challenges could be overcome, taking in account the road map proposed in the 2016 IMO Consultancy report. The IALA WWA mission has also been an opportunity to apply the road map, and now, we will identify what is the current status.

The IMO Officer indicates that the updated road map will allow to uplift safety of navigation, with the identification of areas where the relevant priorities are, and that IMO, IHO and IALA will assist Sudan in this regard. Financial supports could be delivered by IMO, for training, but not to buy equipment.

It was noted by SPC that the current chart notes regarding reliability of AtoN on Port Sudan charts causes great offence to them, as they regard them as very reliable. A proposal was made by the IHO Consultant to undertake an audit of the AtoN compared to the current charts supplied by the UKHO. If information is inaccurate, there is a need to modify the charts. This may then allow the current notes to be removed.

The information was delivered by SPC on the ongoing upgrading of the legal frame, with a new drafting of the Shipping act. The IALA Consultant made the proposal that a document prepared by IALA on the Safety of Navigation legal frame is available, and could be sent to SPC².

² Action done after the mission

Captain Hamouda stated that there is an AtoN Committee, involving both SPC and other stakeholders. DP suggested their remit to a Safety of Navigation Committee, covering AtoN, Hydrography, Charting etc. This suggestion was welcomed.

The IMO Officer pointed that there was a need to include in that Committee representatives of Bashayer Oil Terminal 1 and Bashayer Oil Terminal 2. SPC indicate that the Maritime Safety Committee has been established by Ministerial Decree, and the AtoN Committee is subordinate to that. The IMO Officer pointed that it is necessary to know how they are complying, it should be in accordance with the Minister Decree by Ministry of Justice that created the Committee. Terms of Reference were requested.

Captain Hamouda reported difficulties in achieving development due to ongoing effects of sanctions (which have already been lifted). They are still having difficulty dealing with some banks etc. He reported that Sudan will receive its IMSAS audit at the end of 2018.

1.4.4. Visit to Port Sudan Radio Station (Sunday 22 April)

The visit was well organised with the support of Mr. Samir Barsi Tah, SPC VTS & Radio Station, with equipment and activities presentations. Access to the copies of Navigational Warnings was delivered. The case of the sinking of SHAHEEN ship was highlighted.

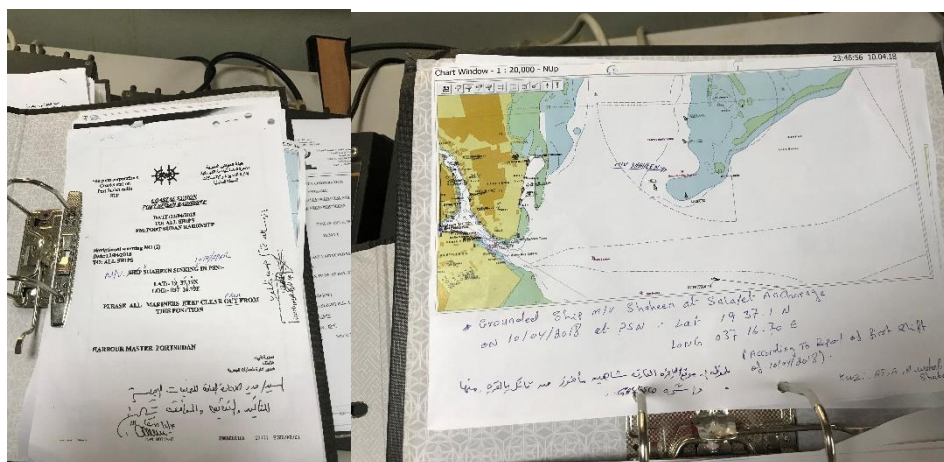


Figure n° XX: SHAHEEN Navigation warning

1.4.5. Visit to the Hydrographic Division (Sunday 22 April)

The equipment, the organisation and the work done was presented by Engineer Ali Badi, SPC Hydrographic Division.

1.4.6. Meeting with SPC QMS Team

The IALA Consultant delivers information on IALA and related QMS topics. It is very important to have a QMS activity within an organisation as SPC. The goals to be fulfilled by SPC to apply Coastal States obligations, on SOLAS Chapter V regulations 4, 12 and 13 needs to be reach with the support of quality management. Progress have to be conducted to finalise the legal frame, and QMS should be part of it (see Recommendation 23). The IMO Audit preparation will be an opportunity to highlight the work done. This should be delivering elements to be available on the SPC website, for mariners, and to create confidence. Capacity Building is an important goal and there is a need to work with other departments (SPC Marine Operations, Navy, ...).

1.4.7. Meeting with stakeholders (10h00-12h00, Monday 23 April)

The meeting is opened by Captain Hashim, setting the scene with SOLAS obligations, and pointing that some countries are landlocked, areas with restricted access. This could be a strength for Sudan, with Port Sudan and Sawakin facilities. But the AtoN on the charts are reported to be unreliable, they may be missing, unlit or out

of position. There is a responsibility for Sudan concerning the charts, and the preparation and dissemination of Maritime Safety Information. The organization (legal frame, procedures) should be defined and implemented, with specification of the limits and responsibilities of every actor, to cancel miss-interpretation.

A first presentation is delivered by the IHO Consultant (10:00 – 10:45). He indicates that it seems that SPC have a good local MSI system. There is a need to be seen as no risk about insurance, costs, does exist. Sudan government have to insure about his responsibility if he is outsourcing, taking in account Minister position, SPC delegations, end owners. There will be very high costs/benefits results for hydrography, taking in account surveys done by the Navy/Ministry of Defense and others. There is a need to formalize practices, with MoU between organizations. When data is collected, it should be shared. When planning survey activities, all Sudanese Departments should be consulted, and share data: “collect one’s, used many times”. It is also valid for AIS data. Impact of incidents should be great on Sudanese economy. Initial fact finding could be source of potential funding identification. Process should go through Awareness, Assessment, developing and implementing Plans. Training, should be organized outside of Africa or Middle East, or having somebody coming to Sudan to deliver courses. Criteria for participants have to be defined and applied. The IHO fee should be around 8,000€ for Sudan. Sudan will benefit of very efficient return with IHO membership, with access to Capacity Building training programs. Sudan could work with India, Egypt, Saudi Arabia.

IMO Officer pointed that there is a need for people who are in the adequate position in relation with the course, and that Sudan should express routing measures needs and strategy. IMO need to receive a package, with one-year Sudanese data and statistics on traffic, accidents (grounding, collisions). Then analysis could be conducted with IALA tools.

Captain Hashim answers as following: there are 1500 ship calls in harbour a year. The depth in the nearest approach (1,5Nm) is very wide (50 meters). There have been no recent groundings or collisions, the last one was a cargo coming from Rotterdam, 2000. Full statistics will be delivered before the end of the mission.

After a pause (10:45 – 11h00), a second Presentation is delivered by the IALA Consultant (11:00 – 12:00). He thanks SPC, and MTRB for the quality of the welcome and the meals, and hope it will be possible to organise a call with the Deputy General Manager at the end of the mission, to be able to deliver the first results. Then, the IMO report will be send. Taking in consideration the report delivered by the IALA WWA after the needs assessment mission on aids to navigation held in July 2017, SPC has pointed that 18 of the 43 recommendations are done, and 4 pending; that has to be validated. Meetings has already been organised with the SPC Deputy General Manager, the SPC AtoN team, the SPC QMS team, the Hydrology team, at the Radio Station. It is very important for the experts to be able to meet today the stakeholder’s representatives, to make a presentation of IALA and IALA WWA, and of the obligations of Coastal States regarding IMO instruments. The IMO Audit is schedule soon, and the status of legal frame, quality management, maritime safety information, and the delivery of the AtoN service will be part of it. Safety of navigation is an important element of the Blue Economy, and to increase it should be one of the goals. This could be achieved through routeing measures; proposals could be included in the joint mission report.

The question session was chaired by Captain Sid Ahmed AbdulGhani Sid Ahmed Elahmed, SPC QMS Manager (12:00 – 12:30).

The IMO officer answers supporting the possibility of development in the country, to face problems in relation with water quality, ballast waters, mooring and tourism. The IALA Consultant pointed that in relation with Protection Sensitive Sea Areas, as the Sanganeb area, accompanying measures, i.e. the implementation of a buffer zone, could be studied.

After the request from with Mr. Mohamed Iraqi, Senior Fisheries Inspector, Marine Fisheries Administration, the IALA Consultant has send an Email requesting support to Mr. Karl Otto, Executive Head, Sea Watch and Response, South African Maritime Safety Authority (SAMSA), South Africa, to be able to get in contact with

Mr. Mohamed Iraqi, to deliver to him information on safety equipment (GPS, ...) for small boats. This topic is one of those Karl Otto is working on. A copy of this email has also been send to Mr Joseph Amade, Deputy CEO, Agence Portuaire, Maritime et Fluviale (APMF), Madagascar, for the interest shown about that topic, at SAGNEP5, in Mauritius, after Karl Otto has been delivering information on that topic (type of beacons, use, limits,etc).

There was a request from Mr Adam Ahmed Elshriefe (alikk628@gmail.com), in charge of communication at SPC, to help him to allow his staff to be able to maintain and repair the VTS equipment. The proposal made by the IALA Consultant is to prepare the organisation of a dedicated training session. To do so, a description of the position of each of the potential trainees (10 to 20 people) should be produced, with the requested associated skills and competences, and the list of the existing gaps. The description of the existing equipment in relation with those positions should be also established. Then, on that basis, taking in account the existing IALA model courses (Level 2 for technicians), and if necessary, training courses existing or to be developed by an accredited training organisation (as for example could be in the future the Arab Academy For Science, Technology and Maritime Transport (AASTMT)), a draft programme should be prepared, to be delivered if possible in Port Sudan, and an estimation of the cost made. Those elements could then be send to IMO for potential sponsoring.

As questions arise on the importance of training and skills for mariners, IMO Officer and IALA Consultant deliver information on the CB policy of the two organizations.

Following the question on radar spare parts, from the SPC Communication service, an action has been proposed by the IALA Consultant, to prepare and organize a specific training course, if possible.

IMO Officer and IHO Consultant have been pointing the importance of the IMO actions, meetings and of the NAVTEX focal point, to find how to allow the maritime resources to take in consideration the change of climate.

1.4.8. Visit to SWAKIN Port and HYDOB Port (Tuesday 24 April)

(8:00 – 14:45)

Sawakin port is 30 miles south of Port Sudan, and is undergoing expansion and development.

Meeting with Captain Salim, Sawakin Port Harbour Master.

The HM said that the access was well equipped, with fixed lights (“lighthouses”) to clear the passage along the ships route, allowing offering a safe route, sheltered by small islands.

The IHO Consultant pointed that as the chart do not reflect the status of the AtoN. Its create miss opportunity for the port activity. There is a need to update the charts, and to disseminate notice to mariners, based on an official frame.

On site communication equipment includes one shore-based AIS station, VHF on all tugs, and allow communications with the Central Radio Station in Port Sudan. But there is a problem with the implementation of the spare parts.

The Harbour Master indicates that they are expecting to create a new anchoring area in the future, and that the implementation of new lighthouses should be made.

It was pointed by the two consultants that in case of new potential obstruction, if there was creation of hazards, reports should be made, to allow dissemination of the information to the Navarea IX coordinator (Pakistan) and that the Primary Chart Operator (UKHO) will be able to maintain and up-date charts with the latest safety critical information. If not, Sudan responsibility should be engaged. As said before, it is to the hydrographic Office (Engineer Ali), and to acting national coordinator (Jaffar, Navy) to support and implement the process.

Meeting with the Hydob Port Harbour Master.

During the visit along the channel, dredged recently to allow the ships to access to the berth, it appears that one of the temporary buoy has grounded on the sea bottom on the starboard side of the channel. The IALA Consultant pointed the fact that an adequate evaluation of the benefits and risks that could be expected choosing to implement buoys or beacons should be made. Beacons will allow to benefit of a better service to users (no restriction to the width of the channel, better visibility, easy support of equipment, low running costs), but will need a higher investment than with buoys. Buoys swinging circle will reduce the available width of the channel, as the sinker will have to take position at the bottom of the dredging slope, and their running cost will be higher, as there will be the need of the availability of a boat (tender-boat, tug) to check the status of the buoys (especially the mooring), and intervene in the shortest delay if necessary.

The HM reported that the channel entrance was 300m wide, 1 ½ miles long, and had a newly dredged and maintained depth of 12.5m. There are three berths for passenger RORO ships and 6 berths for livestock. There is an AIS station recording traffic, and fibre communications to Port Sudan. Dredging is currently ongoing using a Chinese contractor, and a survey will be conducted when complete. Various developments are planned, including improvements to AtoN for the offshore anchorage and a new container facility.

The HM reported that two ships recently sank in the area (one in the port) after being detained by Sudanese Port State Control 4 years ago. These vessels had effectively been abandoned by their owners without maintenance. This is the same circumstances for the vessel which recently sank near to Port Sudan. SPC stated that all recent wrecks had now been reported to UKHO as PCA.

The IHO Representative suggested that the procedure for reporting MSI to the PCA be formalised to ensure consistency and permanency. It was also recommended that advance warning of change to AtoN be provided to the PCA in a managed way.

The delegation were given a tour of the new livestock terminal, which has nearly completed construction a few miles south of Sawakin. The basin has been entirely dredged from the coastal coral in 2014. A survey was conducted after the capital dredging, but no surveys have taken place since while the shore infrastructure has been under development, and no further surveys are planned at this stage.

The design depth for the project was 12.5m. There is one main berth around 250m length which can normally accommodate two livestock vessels. The channel and turning basin are quite restricted, and vessels will always be required to berth using a tug. The first vessel to use the terminal will arrive on the 1st May. This will be an initial trial run. The channel is currently buoyed, with one port-hand beacon at the entrance. More beacons are planned.

The IH Consultant explained to SPC that it would normally be expected for a final survey to be conducted following completion of the construction – especially as the area may have suffered sedimentation or debris from the construction. SPC stated that they do not expect any sedimentation as there is no fresh water input and the currents along the coast are minimal.

There are future plans to develop container facility on the east side of the basin.

Note: Recommend to UKHO that naming be changed from Marsha Esh Sheik Ibrahim Livestock Terminal to Hydob Livestock Terminal.

1.4.9. Visit to Sanganeb Lighthouse (Wednesday 25 April)

1.4.10. Debriefing with those in charge of AtoN Committee (Thursday 26 April)

The IALA Consultant has been delivering more information of several topics, i.e. IALA capacity building and training; SOLAS obligations, in relation with the visits and the meetings of the mission. A presentation of the

summary of the mission to be delivered to the Deputy General Manager has been made by the IALA Consultant.

1.4.11. Meeting with Navy Department (Thursday 26 April)

The head of the Navy Department has been delivering elements of the Navy policy, and gave confirmation of the support of the Navy to the process to update the safety of navigation.

1.4.12. Briefing with SPC Deputy General Manager (Thursday 26 April)

During their meeting with the SPC Deputy General Manager on the last day of the mission, the Team provided a brief overview of the findings and conclusions of the mission. SPC Deputy General Manager assured the readiness of Sudan to work with IMO, IHO and IALA to develop and enhance this sector in the country.

1.4.13. Review of the IALA WWA recommendations (Thursday 26 April)

With the support of the SPC AtoN team, the IALA Consultant has been going through all the needs assessment mission report recommendations that have been declared by SPC done, or under development.

After analysis, it was stated that nine (instead of fifteen as said by SPC) of the fifty-two recommendations delivered within the needs assessment mission report have been done, and ten (instead of four) are pending. There is still an important number of recommendations (33, 63% of 52) to be included in action plans, part of an approved road map. The progress made on developing regulations and on management was seen promising; a new national maritime law is now being drafted, to clear responsibilities for the management of AtoN services along the entire coast.

But the user pay system in place is not focused on AtoN services. None of the recommendations made on the status of AtoN have been included in an action plan. There is still a non-compliance to issue MSI and to update the charts. There have been no nomination of the national NAVAREA coordinator.

The actions to be implemented in relation with the IALA report (see Annex E) have been incorporated in 3 action plans, to be updated taking in account IMO and IHO elements, to build a road map.

The volume of commercial traffic calling for the Sudanese Red Sea side does not justify upgrading the traffic control to full VTS services. No new developments are expected to take place the next years that would significantly increase the traffic.

SPC considers that there is no need for routing measures, as there is a very low collision and grounding frequency. This was one of the goals part of IALA TOR for the mission.

There is a need for training, both for SPC AtoN and VTS staff. The Indian DGLL has sent to Sudan an invitation to attend the Level 1 AtoN Management training course session scheduled in July 2018? And a candidate has been nominated. This will allow SPC to benefit of the needed skills and competences that will allow to enhance the quality of the proposals made to the deciders and the implementation of actions on safety of navigation. Possibilities to run Level 2 training courses are under consideration.

Level 2 training courses should also be conducted. This should be made in accordance with the IALA WWA Capacity Building Strategy, with the accreditation of the training organizations by the national Competent Authority (SPC), and the delivery of the IALA model courses.

A risk analysis session using the SIRA method, part of the IALA risk management toolbox, could be held fall 2018, taking in account the competences acquired by the holder of the Level 1 certificate, to conduct a risk-based analysis of the maritime traffic and the maritime environment in each defined region or zone to determine the type of AtoN appropriate for each prioritized zone.

To finalize the joint mission report, it was pointed that there was a need to receive documentation on AIS data from the MTRB terrestrial AIS network, on port traffic calls statistics, and on incidents. It should be necessary to take also into account the number of fishing vessels in the studied areas not carrying AIS.

1.5. Maritime activities in Sudan

1.5.1. Key maritime organisations and their responsibilities

There are many key maritime players in Sudan who contribute to how the country may run its maritime sector. These are listed below:

1.5.1.1 National Assembly Committees

The relevant National Assembly Committees are usually the last stop for proposals before determination at the plenary. Two committees are involved in passing relevant national legislations through the Parliament: Environment Committee and Security & National Defence Committee.

1.5.1.2 Ministry of Transport, Roads and Bridges

The Ministry of Transport, Road and Bridges has responsibilities across other modes of transport, including road, air, rail and in-land water transport. The Ministry has the authority over the Sea Port Corporation (SPC).

1.5.1.3 Sea Port Corporation (SPC)

The Sea Port Corporation (SPC) is placed under the authority of the Ministry of Transport, Roads and Bridges, under the Sea Ports Corporation Act 2000. SPC oversees the various Red Sea ports, as well as those located on the River Nile.

An Advisory Council for the Facilitation of Exports and Imports Operations was established by Presidential Order in 2008. The Council appears to be a type of port users' council, guiding the decisions of the Corporation. The Council is headed by the Corporation's General Manager. It is composed of ca. 17 official and private members. Official membership includes federal as well as Red Sea State government authorities.

1.5.1.4 General Marine Operations Directorate

The General Marine Operations Directorate is established within the SPC. The Directorate has two agreements to delegate statutory responsibility for ship surveys and certification from the maritime administration to two organizations: Dromon Bureau of Shipping (9 May 2015), and MACOSNAR Corporation SA Panama (12 January 2016).

1.5.1.5 Maritime education and training

The Sea Ports Corporation has its own Training Centre running short courses to personnel working in the ports. Furthermore, the Regional Centre for Consultations & Training (RCCT) was established in 2016, within the complex of the Sea Ports Corporation Training Centre, in cooperation with the Arab Academy for Science, Technology and Maritime Transport (AASTMT) of Alexandria. RCCT delivers short courses for port personnel. In addition, seafarers are trained in the navy school under the Military Academy and also in Khartoum University for some topics.

1.5.2. Maritime Traffic

There are over 10 types of maritime traffic in Sudan. Annex G gives detailed statistics on the amount of traffic for each type over a period of 17 years (from 2000 to 2017). A detailed statics for Port Sudan is presented in Annex H, showing over 8 different types of maritime traffic for ships coming in and leaving the port for 17 years covering the period from 2000 to 2017.

Sudan may expect a slight decrease of Port Sudan's maritime traffic statistics when the new port of Hydob starts operating, as it is expected that some ships might be diverted there.

1.6. Mission Activities

Mission objectives were achieved through the following actions:

- a. Review compliance with international obligations to provide appropriate AtoN services in Sudan (see Part 2 of this report);
- b. Review AtoN service provision in Sudan including legal, budgetary, managerial and organisational structures within which the current system is operating;

- c. Review how the provision of the AtoN service is managed in Sudan;
 - d. Review the volume of traffic and degree of risk in Sudan waters;
 - e. Review the existing status of aids to navigation in Sudan with the aim of proposing how the existing service might be improved;
 - f. Recommend the means by which the improved system of aids to navigation could be implemented and operated;
 - g. Review staff competency levels;
 - h. Assessment of the infrastructure for collection and dissemination of Maritime Safety Information (MSI) and identification of gaps;
 - i. Assessment of the status of hydrographic surveys in nautical charts and the existence of surveys that could potentially be used to update the charts;
 - j. Assessment of the status of nautical charts, the gaps and the existence of a cartographic plan and of a survey priority plan;
 - k. Assessment of the Marine Spatial Data Infrastructures in line with the UN-GGIM directions;
 - l. Visit to stakeholders to raise awareness on the importance of hydrography for economic development and to reduce risks;
 - m. Assessment of the existing legislation/regulations to support safety of navigation, protection of the marine environment and the blue economy;
 - n. Development/implementation of a National Maritime Committee, a high level entity to deal with the matters related to the safety of navigation;
 - o. Establishment of bilateral agreements when deemed necessary.
- The above also include the aspects related to inland navigation (MSI, surveys, charting, MSDI, legislation, etc.).

The expected outputs of the Joint Mission are the identification of the real needs/requirements of Sudan in matters related to hydrography, hydrographic surveys, nautical charts and aids to navigation and a roadmap of the required activities to assist Sudan in meeting the relevant SOLAS obligations.

2. International Obligations (UNCLOS and SOLAS Chapter V)

2.1. Introduction

Sudan is party to the *United Nations Convention on the Law of the Sea (UNCLOS)*³ and to the *International Convention for the Safety of Life at Sea (SOLAS)*⁴. This places a firm obligation on the government of Sudan to define its maritime boundaries, protect its marine environment and provide appropriate Aids to Navigation (AtoN); information to mariners and Vessel Traffic Services (VTS). However, Sudan has not adopted any of the protocols of SOLAS. Details of its maritime boundaries are shown in the country profile. This section focuses on its obligations under SOLAS Chapter V, regulations 4, 12 and 13.

2.2. SOLAS Chapter V Regulation 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.

2.3. SOLAS Chapter V Regulation 4 – Hydrographic Services

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. 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. In effect, these requirements can be described in the phases as follows:

³ Date of ratification: 25/11/1985

⁴ Date of ratification:10/05/1995

- **Phase One**
 - ✓ Establish national governance structure for Hydrography
 - ✓ Establish a Maritime Safety Information (MSI) service
 - ✓ Establish capability for collection of nautical information to maintain existing charts and publications

- **Phase Two**
 - ✓ Establish capacity to conduct systematic hydrographic surveys, data gathering and processing

- **Phase Three**
 - ✓ Establish production and maintenance of charts and publications to be distributed on an international basis.

2.4. SOLAS Chapter V Regulation 12 - Vessel Traffic Services

“Vessel Traffic Services (VTS) contribute to safety of life at sea, safety and efficiency of navigation and protection of the marine environment, adjacent shore areas, work sites and offshore installations from possible adverse effects of maritime traffic.”

“Governments may establish VTS when, in their opinion, the volume of traffic or the degree of risk justifies such services”.

“Contracting Governments planning and implementing VTS shall, wherever possible, follow the guidelines developed by the IMO⁵”.

The IMO SOLAS Chapter V Resolution 12 describes the principles and general provisions for the operation of a VTS and participating vessels, in addition to the roles and responsibilities of contracting governments, competent authorities and VTS Authorities. It also states that these Guidelines should be used in conjunction with the applicable Guidelines and Criteria for Ship Reporting Systems, resolution MSC.43 (64) and IALA Recommendations and Guidelines.

Sudan is therefore obliged to arrange for the establishment of vessel traffic services *where the volume of traffic or the degree of risk justifies such services.*

2.5. SOLAS Chapter V Regulation 13 - Establishment and Operation of Aids to Navigation

The amended Regulation 13 of SOLAS Chapter V, which came into force on 1 July 2002, states:

1. *Each Contracting Government undertakes to provide, as it deems practical and necessary either individually or in co-operation with other Contracting Governments, such Aids to Navigation as the volume of traffic justifies and the degree of risk requires.*
2. *In order to obtain the greatest possible uniformity in Aids to Navigation (AtoN), Contracting Governments undertake to take into account international recommendations and guidelines when establishing such AtoN⁶.*
3. *Contracting Governments undertake to arrange for information relating to Aids to Navigation to be made available to all concerned. Changes in the transmissions of position-fixing systems which could adversely affect the performance of receivers fitted in ships shall be avoided as far as possible and only be effected after timely and adequate notice has been promulgated.*

Comment on the status in Sudan have been made within the IALA WWA Needs Assessment Mission report. The results of the Review conducted back to back with the Joint Mission, are available within Annex E.

⁵ Refer to the Guidelines for Vessel Traffic Services adopted by IMO Resolution A.857(20)

⁶ The regulation has a footnote, making reference to IALA Recommendations, Guidelines and Manuals. Note that new publications and/or new editions of some these documents are published biannually. Refer to the IALA Bulletin and website for details.

2.6. Nairobi Convention on the Removal of Wrecks

The Convention provides a legal basis for coastal States to remove, or have removed, from their coastlines, including their territorial sea, wrecks which pose a hazard to the safety of navigation or to the marine and coastal environments, or both. It will make ship-owners financially liable and require them to take out insurance or provide other financial security to cover the costs of wreck removal. It will also provide States with a right of direct action against insurers.

The Nairobi Convention (2007) requests coastal States to mark dangerous wrecks, including within the EEZ, so long as the owner has not taken appropriate measures to eliminate the danger. Sudan is not yet party to the Nairobi Convention which entered into force in April 2015. The country is encouraged to ratify that Convention as soon as possible as it is of real benefit for Coastal States (under processing). Proposals have been made within the within the IALA WWA Needs Assessment Mission report. The status of the implementation is described in Annex E.

2.7. IMSAS

IMO has implemented the IMO Member State Audit Scheme (IMSAS) to ensure that each State respects its international commitments as outlined in the main binding IMO instruments. One of these instruments is SOLAS Chapter V on Safety of Navigation. This audit system is compulsory and according to the IMO Circular C/116/6 Progress Report on the implementation of the Scheme, the audit in Sudan will take place in September 2018. It is worth noting that the part of the audit relating to AtoN is the subject of an IALA Guideline (Guideline 1054 - Preparing for a Voluntary IMO Audit on Aids to Navigation Service Delivery). Proposals have been made within the within the IALA WWA Needs Assessment Mission report. The status of the implementation is described in Annex E.

3. AtoN Service Provision

3.1. Legal Framework

Proposals on the legal framework, funding, provision and organisation and strategic planning of the delivery of AtoN services, as the advantages of IALA membership, have been made within the within the IALA WWA Needs Assessment Mission report. The status of the implementation is described in Annex E.

3.2. Management of AtoN - General Principles

SOLAS Chapter V Regulation 13.1 requires each Contracting Government to provide, as it deems practical and necessary either individually or in co-operation with other Contracting Governments, such Aids to Navigation as the volume of traffic justifies and the degree of risk requires. SOLAS Chapter V Regulation 13.3 requires national Competent Authorities to “arrange for information relating to Aids to Navigation to be made available to all concerned”.

A Contracting Government must therefore decide what *type* of AtoN service it will provide and who will provide it; *where and why* such a service will be provided; the *level* to which such a service will be provided and how its stakeholders will be kept informed.

Competent Authorities should therefore prepare Level of Service (LoS) statements on type; extent and quality to inform both the mariner at sea and local and regional stakeholders⁷. Such statements should be reviewed on a regular basis in consultation with the stakeholders⁸.

3.3. Strategic Planning

Proposals on strategic planning, short-term planning, level of service for statement, AtoN national register, audit of listed AtoN, AtoN quality management system, AtoN inspections and conformance monitoring, user

⁷ In accordance with IALA Guideline 1004 on Levels of Service

⁸ In accordance with IALA Guideline 1079 on establishing and conducting user consultancy

consultancy, environmental management of AtoN have been made within the within the IALA WWA Needs Assessment Mission report. The status of the implementation is described in Annex E.

3.4. AtoN – Technical issues

Proposals on types of AtoN in Sudan, fixed marks, floating marks, emergency wreck buoys, marine lanterns, atmospheric transmissivity, vertical beamwidth and ambient light, AtoN maintenance, have been made within the within the IALA WWA Needs Assessment Mission report. The status of the implementation is described in Annex E.

4. Hydrographic Services in Sudan

4.1. Responsibility for Safety of Navigation

It was apparent that there was not a clear view on which organisations within Sudan had designated responsibilities relating to Safety of Navigation within Sudan. For example, four different organisations stated that outside of SPC Ports, they had responsibility to map and manage the seabed. The IHO Consultant recommended that Government of Sudan should seek mechanisms to enable clarification of institutional responsibilities with regard to international maritime conventions.

4.2. Hydrographic Coordination

SPC informed they have an AtoN Committee composed of VTS personnel, Port State Control, Telecoms, Pilots, Directors and Managers. There is also a high level Maritime Affairs Committee within government under the Ministry of Justice, which the AtoN Committee reports to. The IHO Consultant recommended that the remit of the AtoN Committee be expanded to become a Safety of Navigation Committee. This would include subjects such as AtoN, MSI, hydrography and charting requirements and Routing Measures. SPC welcomed this suggestion, and stated that they would pursue this immediately.

The IHO Consultant also suggested that a National Hydrographic Coordinator post needs to be formally established within SPC or alternative organisation (with appropriate supporting documentation) to coordinate on both a national and international level.

4.3. Maritime Safety Information

SPC stated that they are meeting MSI requirements in full by issuing local warnings, and supplying appropriate information to NAVAREA IX coordinator and UKHO as PCA. There were various examples found of where appropriate information had not been provided to the PCA, but SPC reported that appropriate items had at least been reported to NAVAREA IX coordinator. The IHO Consultant recommended that the Hydrographic Coordinator could also act as the MSI Coordinator.

4.4. Seabed Mapping Capabilities

Stakeholders reported that Sudan currently has two hydrographic survey teams – one with SPC, and the other with the Sudanese Navy. Both have single beam echo sounders and associated equipment. The teams appear to cooperate and coordinate well with each other. SPC are currently unable to survey due to a communication issue with their equipment or software, while the Navy reported they currently conduct around 4 surveys each year at various locations. The IHO Consultant asked whether any of this survey information had been passed to the current PCA, but no conclusive answer was provided.

No evidence of other departments with abilities to conduct seabed mapping (e.g. Fisheries) was found or provided.

Surveys with single beam echo sounders do not meet the highest modern IHO standards, and will enable ENCs with a Category Zone of Confidence (CATZOC) B value, indicating that full seafloor coverage had not been achieved, and uncharted dangers are likely to exist.

SPC and Navy requested support to train local staff and purchase improved equipment.

SPC have also commissioned multibeam surveys as part of various port developments. These have been supplied (but as PDFs only) to UKHO.

It was also reported that S+P Offshore, who run the oil terminals, were also seeking to create a survey capability. Based on various conversations, it is possible that S+P Offshore are seeking to grow this capability without coordination with SPC and Navy.

Navy also reported that recently took ownership of survey vessel on River Nile which is equipped with multibeam sonar, and they are currently delivering a programme of river surveys to support planned increase in river-borne trade. The IHO Consultant suggested that, if possible, personnel be rotated in the future with staff located on the coast to share experience.

4.5. Nautical Charting / Publications

Currently, this requirement is met in full by the UK Hydrographic Office, who have acted as Sudan's Primary Charting Authority since independence. However, to date this arrangement has been somewhat informal, the IH Consultant recommended that such an arrangement be formalised through a Memorandum of Understanding or similar. No evidence of any national charting, or charting capability, was found.

There are currently 6 paper charts of Sudan and they comply with the modern metric format. Apart from one chart plan, all the charts are referred to WGS84 datum which is compatible for use with modern GPS systems. Only panel B Trinkitat Harbour on chart 675 is not referred to WGS84 datum.

Paper chart	Title	Scale	NE Published
158 (INT 7008)	Berenice to Masamirit	1:750,000	18/04/2013
81	Sawakin to Ras Qassar	300,000	18/02/2016
82 (INT7128)	Outer Approaches to Port Sudan	1:150,000	17/11/2011
3492 (INT7129)	Approaches to Port Sudan	1:10,000 and 1:50,000	21/01/2016
3493	Bashayer Oil terminals	various	24/02/2011
675	Harbours and anchorages on the coast of Sudan	various	14/07/2016

The UKHO produce and maintain ENCs of the main ports and approaches to Sudan. These ENC's are in agreement and are synchronised with their equivalent paper charts.

The ENCs include survey data collected in 2014 by a Chinese contractor. The 2014-15 survey data supplied to the UKHO was received as survey sheets and was not the full survey data set. Therefore, the UKHO was unable to confirm that a full seafloor check had been carried out, subsequently the CATZOC value for these modern surveys was assessed as category B.

There are currently 11 GB ENC cells of Sudan:

Band 1 ENC	GB104704			
Band 2 ENC	GB240300			
Band 3 ENC	GB300081	GB300082		
Band 4 ENC	GB400082	GB403492	GB403493	
Band 5 ENC	GB500081	GB53492A	GB53492B	GB53493A

Charts of Sudan currently contain several cautionary notes regarding the status of the surveyed depths, the unreliability of aids to navigation and the positional accuracy of charted features.

DEPTHS

Many of the areas on this chart have not been systematically surveyed. Depths in these areas are from miscellaneous lines of passage soundings or old leadline surveys. Uncharted dangers may exist. For further details, see the Source Diagram.

CHART ACCURACY

Owing to the age and quality of the source information, some detail on this chart may not be positioned accurately. Particular caution is advised when navigating in the vicinity of dangers, even when using an electronic positioning system such as GPS.

AIDS TO NAVIGATION

The aids to navigation on this chart are reported to be unreliable. They may be missing, unlit or out of position.

SPC stated that they were very unhappy with the current warning on Admiralty Charts stating that AtoN were reported as unreliable. They requested that it should be removed as it was inaccurate and may deter vessels from using the ports. The IHO Consultant suggested that SPC conduct a full audit of all such features included on current charts and in publications, and reported any discrepancies to UKHO, who could then re-assess the requirement for this note.

No comments were received about the current UKHO charting scheme for Sudan.

The UKHO issues notices to mariners in its weekly bulletin to maintain the charts for updated information. Apart from the three surveys in 2015 UKH report they have not received very much new information to update the charts. The Geographic manager at the UKHO is in correspondence with Sudan Sea ports and understands that any new information will be supplied to the UKHO for charting purposes when it is available.

Current status of underlying surveys used in Official Charts, indicated by CATZOC diagrams is shown in Annex F.

5. Risk Management

5.1. Maritime Risk in the Waters of Sudan

Proposals have been made within the within the IALA WWA Needs Assessment Mission report. The status of the implementation is described in Annex E.

No evidence was found of analysis of risk to navigation presented by current survey status and charting.

The IHO Consultant discussed methods and benefits of conducting an analysis of relative grounding risk incorporating data such as depth, survey quality, vessel traffic and characteristics. A number of methods may be available within a Geographical Information System (GIS) to help conduct a relative survey prioritisation, and the IHO would request assistance from the UKHO as the current PCA in this regard. This should then be combined with local knowledge and experience to define a potential prioritised programme of work.

5.2. Maritime Incidents in Sudan waters

Proposals have been made within the within the IALA WWA Needs Assessment Mission report. The status of the implementation is described in Annex E.

No evidence of significant groundings caused by inadequate surveys or charting was found. Potential issues regarding appropriate reporting of incidents and resultant wrecks were discussed, and are covered by improvement actions recommended within MSI reporting.

5.3. Use of the IALA Risk Management Toolbox

Proposals have been made within the within the IALA WWA Needs Assessment Mission report. The status of the implementation is described in Annex E.

6. Training

6.1. AtoN Management Staff Competency

“The successful delivery of AtoN services depends upon competent and experienced personnel to implement and maintain such aids”.

“Recruitment, selection and training are a pre-requisite to the provision of professionally qualified personnel capable of contributing to safe and efficient AtoN operations”.

These two quotes from IALA Recommendation E-141 on Standards and Training of AtoN Personnel clearly show that without properly trained and competent personnel, the quality and reliability of an AtoN service designed to keep mariners safe cannot be achieved.

The IALA World-Wide Academy is working with other organisations in the African region to establish training hubs able to deliver IALA model courses (AtoN and VTS). It then will be possible for States who have not the possibility to accredit national training organisations to take advantage of those training hubs. Actions are under progress with South Africa, and Egypt, to do so. Sudan will be taken informed on the result of those actions.

The IMO report states: *“Today, Sudan’s maritime affairs offer the picture of an expansive and rather scarcely populated coastline, an ebullient port infrastructure and surprisingly an elusive maritime administration. The recent commissioning of ship building in China is poised to inject renewed interest in the Sudanese flag and ship operations”.*⁹

Light Dues should be used for funding the required training budget. Training should be part of the delivery of any new equipment, both when implemented, and one year after, to take in account all the questions relating to their use.

6.2. Navigational Warning Staff Competency, AtoN Manager Training and VTS Operators Training

Proposals have been made within the within the IALA WWA Needs Assessment Mission report. The status of the implementation is described in Annex E.

⁹ IMO Advisory and Needs Assessment Mission Consultancy Report to Assist Sudan in Capacity –Building in its Maritime Sector, 7-11 February 2016

7. Conclusions

7.1. Aids to Navigation Service Provider Obligations and Activity

At present Sudan has some competency related to AtoN provision, but requires additional resources to deliver an AtoN service to full international standards. SPC is fully aware of its responsibilities and is delivering an AtoN provision that comes close to a very satisfactory standard, however the presently inadequate Maritime Safety Information organisation to keep seafarers informed through Notices to Mariners etc. is a cause for concern.

The fact that Sudan has been IALA member during 49 years has allowed people, as Captain Hashim, to attend IALA Committees, and to take benefits of that participation, that still gives positive results, to be increased.

During the meeting with the Deputy General Manager on the first and last days of the mission, Sudan officials made it plain that the country would rise to the challenge of delivering both AtoN and MSI services to full international standards. Apply to IALA National Membership will demonstrate its clear commitment to improve. Legal empowerment to exercise formal quality control functions over all Authorities and Organisations operating AtoN in the waters of Sudan will be an essential step in that process.

Review status of the IALA recommendations are available in Annex E.

7.2. Hydrographic Obligations and Activity

Sudan clearly has motivated and educated professionals and organisations who should be able to meet many of Sudan's requirements for hydrographic services required both by SOLAS and the need to develop, grow and sustain Sudan's maritime economy. However, improved governance is required to better align available resources, and clear definition of organisational responsibilities required. In particular, Sudan appears to have all the elements in place to be able to deliver a functional MSI service, but key elements are not currently in place, as outlined in the following recommendations.

The majority of Sudan's seabed is not surveyed to modern standards, or in many cases, not systematically surveyed at all. In key areas this presents an increased risk to shipping, an increased liability to the Government of Sudan, and may well discourage some vessel operators from accessing Sudanese waters.

Charting requirements appear to be currently met in full by the UK Hydrographic Office. However, it is imperative that new information is channelled effectively to enable to the UKHO to maintain charts to the required standard.

Detailed IHO recommendations are available in Annex D.

7.3. IMO Instruments

As detailed under paragraph 2, it was noted that Sudan has not adopted any of the protocols of SOLAS. The obligations under SOLAS Chapter V, regulations 4, 12 and 13 were highlighted under the said paragraph. Sudan may wish to consider ratifying relevant IMO instruments, e.g. Nairobi International Convention on the Removal of Wrecks, 2007.

7.4. Administration of the Mission

The planning and execution of the administration of the Joint mission by MTRB and SPC was faultless. The experts could not have been better looked after.

8. Annex A – Programme

Date	Time	Session Details	Location
20 April	13:00	Arrival to port Sudan	Port Sudan Airport (VIP HALL)
21 April	09:00-11:00	Meeting with AtoN Committee	Harbor Master Office
22 April	08:30-09:00	Visit to S.P.C GM	General Manager Office
	09:00-10:00	Visit port Sudan radio station	SPC head quarter
	10:30-11:30	Meeting with port state control	PSC office
23 April	09:00-11:00	Meeting with stakeholders	PANORAMA HALL
24 April	08:00-14:00	Visit to SWAKIN Port and HYDOB Port	SWAKIN - HYDOB
25 April	08:00-14:00	Visit to Sanganeb lighthouse , in ports and long the coast	
26 April	09:00-10:00	Meeting With Navy Department	
	10:00-11:00	Debriefing with those in charge of AtoN	Harbor Master Office
	11:20-12:00	Briefing with SPC GM about the Mission and Submitting Gifts to Experts	General Manager Office
	14:00	IHO Expert Depart	Port Sudan Airport (VIP HALL)
	14:30	IALA Review meeting with AtoN team	Harbor Master Office
27 April	14:00-18:00	IMO and IALA Experts Depart	Port Sudan Airport (VIP HALL)

9. Annex B – List of contacts

Meeting with Stakeholders **Monday 23 April 2018 – SPC Hall**

NO	NAME	Employer
1	Eltohami Abdelmunime	Quality Management SPC
2	Samira Omer Ownour	Quality Management SPC
3	Ala Mohamed Elsaddig	Quality Management SPC
4	Amna Mohamed Tiher Ahmed	Quality Management SPC
5	Ali Mahmoud	S & P Joint Venture
6	Ahmed Hassan	BASHAYR (1)
7	Ashbo Ohaj Feki	Ministry of Environment
8	Sumi Hassan	SPC Communication
9	Dr. Maryiam Farag	SPC Planning Research
10	Dr.Mukhtar Ahmed Doushan	Sudanese Navel Academy
11	Abubakr Fadlallah	Legal Advisor SPC
12	Mahmoud Omer Ibrahim	Red Sea University
13	Abu Obieda Mirghani	Police Sea Port
14	Rami Youssef AbdElrhman	Police Sea Port
15	Mugtabba Mukhtar Gibred	Quality Management SPC
16	Hafiz Abdelrhman	Karary University
17	Php.Munjed Ali	Maritime Department Economics – Red Sea University
18	Baha Eldien Ahmed	Survey Department
19	Naser Eldim Mohamed Elhassen	Marine Protected Area Department
20	Mohamed A. Iragi	Marine Fisheries Administration
21	Thany Elday Awad	Marine Fisheries Administration
22	Ibrahim Ahmed Elkazi	Costal Station
23	Malik abdalla Mohamed	Costal Station
24	Samir Barsi Taha	SPC- VTS & Radio Station
25	Salah Salem Salman	SPC – Pilotage
26	Ali Badi	SPC – Engineer
27	Adam Ahmed Elsharif	SPC - Equipment and communications
28	ABDRHAMAN KAMIL	Baaboud Company
29	Abdrhman Abdlizeez	Baaboud Company
30	Oshaik Saydwa	Baaboud Company
31	Salah Soliman Ali	Oil monument sup. BAPCO
32	Amir khalifa Osman	Env. Sup. BAPCO
33	Cap.Musaab Abdelrahim	Maritime Studies Collage
34	Yassir Taha Elfak	Naval Base
35	Sami Sabeel Elfaki	Naval Base
36	Aisha Marzoog Mohamed	MEPA

37	Awadalla Mohamed	BASHAYR Port Operation
38	Bashir Hussein Sharif	P. BASHAYR
39	Sid Ahmed A.G.Elahmed	SPC – Quality
40	Majdy Mohamed khalefa	Marine Protected Area
41	Anwar Ibrahim Ahmed	Marine Protected Area
42	Ekhlas Adam Mohamed	Ministry of Environment (Federal) MEPA
43	Aisha Mohamed	Ministry of Environment
44	Nagla Abdulla Mohamed	Ministry of Environment
45	Mariam Ali Ahmed	Ministry of Environment
46	Dr. Mona Ibrahim Mohamed	Red Sea Fisheries Research
47	Saeed Jumau Fadul	Marine Fisheries
48	Motaz Altahir Altayeb	Marine Fisheries (MFA)
49	Mustafa Elawad Ali	Economic Security
50	Sheikh Al-Din Mohammed Al-Amin	Faculty of Marine Sciences and Fisheries
51	Ismat Abdulla	SPC – planning & Research
52	Mostafa Mohamed Ahmed	Division of Investigation – Police
53	Cap. Hashem Abdul Rahman	Maritime Administration Directorate
54	Cap. Taha Ahmed Mohamed Mokhtar	General Marine Services Directorate
55	Hammad Takolih Ogun	Marine Fisheries (MFA)
56	Mohamed AbdElhafiz Abdelhlim	General Marine Services Directorate

10. Annex C- IMO 2017 Consultancy Report Recommendations

The recommendations are grouped in six tables, corresponding to six broad areas as follows:

- International maritime relations
- Maritime infrastructure
- Maritime administration
- Maritime transport policy
- Maritime law and conventions
- Maritime human resources

Recommendations are addressed to both Sudan and the IMO.

10.1. Table n°1: Recommendations for international maritime relations

For Sudan

- a. Continue to engage with IMO by reinforcing the role and activities of the Permanent Representative of the Republic of Sudan to the IMO.
- b. Maintain the excellent transparency and frankness displayed by the authorities throughout the mission activities in further work with IMO.
- c. Seek advice on ways to undertake the development of the maritime sector in the context of foreign sanctions.

For IMO

- a. Devise a comprehensive programme of technical assistance for Sudan.
- b. If possible, assist Sudan in connecting with other UN agencies working on maritime issues, eg, UNDOALOS, UNODC, UNEP, UNCTAD, ILO, FAO and UNESCO.
- c. With help from national authorities, embrace in the provision of aid and technical cooperation, the Red Sea State authorities and other stakeholders.

10.2. Table n°2: Recommendations for maritime infrastructure

For Sudan

- a. Provide adequate funding for maritime infrastructure in general.
- b. Map out Sudan's navigational aids requirements.
- c. Consider the setting up of a Maritime Rescue Coordination Centre.
- d. Plan the provisioning of maritime craft needed for ship survey and inspection operations, possibly with the assistance of IMO as appropriate.
- e. Provide specifications of ship acquisitions to IMO.
- f. Refine and expand the Ship Inspection Directorate's website. Provide a bilingual interface to the website.
- g. Prize and promote the sustainable exploitation of Sudan's other maritime infrastructure, including marine biodiversity and heritage.

For IMO

- a. Initiate contact with IHO with a view to carrying out marine charting activities in Sudan as needed.
- b. Investigate with Sudan the need for assistance with regard to navigational aids requirements.
- c. Provide advice on the setting up of a Maritime Rescue Coordination Centre.
- d. Assist the maritime administration in the provision of the Arabic text of IMO conventions.

10.3. Table n°3: Recommendations for maritime administration

For Sudan

- a. Consider the establishment of a unit for maritime affairs within the Ministry of Transport, Roads and Bridges.
- b. Increase the number of marine surveyors and inspectors in the Marine Operations Directorate.
- c. Clarify the structure of the maritime administration and consider the setting up of an independent maritime administration.

For IMO

- a. Assist Sudan in connection with the clarification of its maritime administration's structure.

10.4. Table n°4: Recommendations for maritime transport policy

For Sudan

- a. Devise a national maritime transport policy with assistance from IMO and possibly other UN bodies, eg, UNCTAD.
- b. Muster effort to ratify progressively as many IMO conventions as possible and prepare the relative required national implementing legislation with assistance from IMO giving priority to the following IMO Conventions: 1988 Protocols to SOLAS, 1974 and Load Lines, 1966 Conventions; Protocol of 1992 to the CLC 1969 Convention; Protocol of 1992 to the FUND 1971 Convention; Bunker Convention, 2001; LLMC 1976
- b. Convention; FAL, 1965 Convention.
- c. Seek possible help from UNCTAD on the 'single window' facility.
- d. Prize and promote the sustainable exploitation of Sudan's marine biodiversity and heritage.
- e. Call for a national workshop on ways to safeguard and protect the rich biodiversity present in Sudanese coastal waters especially in light of the risks posed by shipping and port development, ideally in coordination with other international and regional organisations such as UNEP and PERSGA.

For IMO

- a. Provide Sudan with advice and guidance on the regulatory framework and procedures for ship registration.
- b. Guide Sudan on the setting and operation of a Maritime Rescue Coordination Centre.
- c. Provide Sudan with help in addressing non-Convention ships.
- d. Provide advisory assistance in the area of ISPS Code-particularly related to electronic surveillance.
- e. Source the provision to Sudan of capacity building in connection with the piracy and the means and campaigns of combating it.
- f. Assist Sudan in the provision of guidelines and specifications for ship waste port reception facilities.
- g. Target the Ministry of Environment, Forestry and Physical Development with information about IMO and what it can do, in particular as to the protection of vulnerable marine areas of biological diversity. Provide the Ministry with IMO environmental conventions.

10.5. Table n° 5: Recommendations for maritime law and conventions

For Sudan

- a. Clarify the legal status and structure of the maritime administration by revamping any existing legislation if necessary.
- b. Prepare for and ratify as many IMO conventions as possible, with assistance from IMO.
- c. Bring necessary amendments to national maritime legislation (both primary and secondary), including, but not limited to, the items listed below.
- d. Amend and expand national maritime legislation to imbricate it more closely with IMO conventions and standards.
- e. Review flag entitlement for new corporate structures.
- f. Remedy the deficiencies arising from the reference to 'international and regional conventions ratified by Sudan' in section 4(b) of the MTA 2010.
- g. Remedy the deficiencies arising from the reference to 'merchant ships' and 'international and regional conventions ratified by Sudan' in section 6(1) of the MTA 2010.
- h. Improve the definition of 'pleasure craft' in regulation 3 of the Pleasure Craft (Maritime Licensing) Regulations 2015 with a view to clarifying any overlap with the scope of application of IMO conventions such as SOLAS, STCW and MARPOL.
- i. Seek assistance from IMO or other parties on current draft maritime legislation.
- j. Include officials from the Ministry of Justice in Sudan's delegations to some IMO meetings (particularly the Legal Committee meetings), with coordination by the Ministry of Foreign Affairs.

For IMO

- a. Assist Sudan on the ratification and implementation of IMO conventions including transposition of IMO conventions provisions into national law.

10.6. Table n°6: Recommendations for maritime human resources

For Sudan

- a. Assess all current maritime human resources capabilities and needs.
- b. Adopt a recruitment strategy for maritime recruitments and invest in qualified human resources.
- c. Adopt a maritime education and training programme or strategy giving priority to the identification and nomination of public officers to follow WMU and IMLI post graduate courses.
- d. Work toward retaining maritime human resources.
- e. Disseminate fellowships and training opportunities as widely as possible, using modern social media as much as possible to reach to the young generations.

For IMO

- a. Assist in the implementation of the STCW Convention.
- b. Increase Sudan targeting for fellowships at WMU, IMLI and IMSSEA.
- c. Provide short courses on IMO Instruments and on flag, port and coastal State duties and obligations.
- d. Establish contact, possibly via WMU and IMLI, with Sudanese universities, particularly those already engaged in maritime studies, with a view toward enhancing local capacities and inclusion in wider academic maritime networks.

11. Annex D – IHO Recommendations

11.1. IHO Phase 1 Capacity – Maritime Safety Information

- a. The terms of reference of the AtoN Committee, as described by SPC General Manager, be expanded to become a Safety of Navigation Committee. This would include subjects such as AtoN, MSI, Hydrography and Charting requirements and Routing Measures.
- b. A National Hydrographic Coordinator post needs to be formally established within SPC or alternative organisation (with appropriate supporting documentation) with the following duties:-
 - Local coordination for MSI issues, survey priorities, new developments etc...
 - Participate as hydrographic representative on Safety of Navigation Committee.
 - International conduit for the dissemination of MSI and changes to charted information internally within Sudan, and to the NAVAREA IX Coordinator (Pakistan) and/or chosen Primary Charting Authority as appropriate.
 - National coordinator for all relevant marine spatial data.

[Note: It should not be necessary to create a new post to undertake this coordination role – rather the requirement be added to an existing suitable job description, as it may only require around 1 day per month to complete these tasks once established.]

- c. Standard operating procedures, job descriptions and associated documentation regarding MSI processes should be drafted and added to SPC's Quality Management System, currently under development.

11.2. IHO Phase 2 Capacity – Seabed Mapping

- d. If Sudan were to join the IHO, IHO could consider options for how to provide immediate support to SPC to enable hydrographic data collection to commence using their single beam echo sounders and associated equipment. This will include limited and specific software training, general hydrographic training and potentially financial support to unblock specific minor issues such as updating software.
- e. Funding should be sought, either internally from the Ministry of Energy or on an international basis to commission IHO Order 1A surveys of the final approaches to the Bashayer Oil Terminal, where the risk of potential uncharted features remains high.
- f. IHO recommend the Hydob Livestock Terminal be re-surveyed prior to being brought into full service, as the dredging was conducted in 2014, and all construction has taken place since this survey. Therefore, a survey will confirm that there has been no sedimentation, slippage of channel banks or debris from the construction.
- g. Such surveys should be initially provided technical support from IHO or chosen Primary Charting Authority to ensure appropriate IHO standards are met or exceeded.
- h. SPC and partners should develop a survey prioritisation scheme for the coast of Sudan, seeking IHO or PCA assistance where required.
- i. Government of Sudan should explore sources of funding to enable longer term seabed mapping programmes to modern standards to be sustained. IHO or current PCA may be able to advise.

11.3. IHO Phase 3 Capacity - Charting

- j. Unless Sudan intends to begin production and distribution of nautical charts to be made available on an international basis, SPC formalise their relationship with a chosen Primary Charting Authority through a Memorandum of Understanding or similar.
- k. SPC should investigate whether any hydrographic data already exists across all government departments which could be used to update and improve all official nautical charts for Sudan. This will reduce risk of groundings and encourage access.
- l. Any data discovered should be passed to a chosen Primary Charting Authority, including information on new obstructions, wrecks, cables, aids to navigation, port developments and offshore energy features. All appropriate metadata should also be provided.
- m. IHO should request current PCA re-access notes on current official charts stating that navigation aids are reported to be unreliable. This should be coordinated with evidence from IALA.

- n. SPC should undertake a full review of all current AtN and key features on Admiralty Charts and Publications, as the current recognised official products for Sudan, to identify incorrect information. Any such errors should be highlighted to the UKHO, and UKHO should update all products as appropriate.
- o. UKHO should change naming on chart of new livestock terminal at Marsha Esh Sheik Ibrahim to Hydob Livestock Terminal.

11.4. General

- p. It is recommended that Sudan consider membership of the IHO (expected annual cost 8000 Euro) to enable access to IHO Capacity Building and allow influence, particularly through the North Indian Ocean Hydrographic Commission, where membership will allow Sudan to influence and access regional Capacity Building support.
- q. Appropriate representative from Sudan should participate in the next North Indian Ocean Hydrographic Commission.
- r. In support of the National Hydrographic Coordinator post, a spatial data infrastructure should be established within SPC or alternative organisation to act as a central repository and access portal for all appropriate marine geospatial data.
- s. Government of Sudan should seek mechanisms to enable clarification of institutional responsibilities with regard to international maritime conventions.
[Current departmental responsibilities do not seem clear, which may lead to gaps or wasted resource though overlaps. Although the ultimate goal should be amending or establishing legislation, Ministerial Decree may be an appropriate intermediate measure.]

11.5. Other actions

- t. Sudan should request that their current PCA undertake a GIS based survey prioritisation for Sudan to assist in defining areas where initial efforts should be focussed, based on existing data.

12. Annex E - Progress of IALA WWA individual Recommendations

Rec. 1.1 - MSI National Coordinator	<i>An appropriately competent officer within Sudan organisations (SPC, Sudan Navy ...) is nominated formally as the MSI national coordinator.</i>
Status:	Pending
Comments (+)	<ol style="list-style-type: none"> 1. Similar to Rec. 1 of the draft recommendation list: <i>A meeting should be convened between SPC and the Navy (and other bodies if needed) with the aim of developing a clear process 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. Once developed, both UKHO and NAVAREA IX Coordinator (Pakistan Navy Hydrographic Department) should be informed formally.</i> 2. Similar to Rec. 3 of the draft recommendation list: <i>A national WNWNS coordinator should be designated within national legislation and the NAVAREA IX Coordinator (Pakistan Navy Hydrographic Department) informed when this has been actioned.</i>
Rec. 1.2- NAVTEX	<i>A modern digital NAVTEX receiver should be procured and installed in the SPC Headquarters building to confirm the issue of navigational warnings generated by itself and other organisations and to monitor all other NAVTEX broadcasts.</i>
Status:	Yet to begin
Comments (+)	<ol style="list-style-type: none"> 1. Rec. 5 of the draft recommendation list
Rec. 2 - Paper charts and Nautical Publications	<i>SPC obtains, holds and maintains corrected copies of the paper charts and appropriate Nautical Publications covering the waters of Sudan.</i>
Status:	Pending
Comments (+)	<ol style="list-style-type: none"> 1. Similar to Rec. 22 of the draft recommendation list: <i>SPC should maintain a comprehensive and up to date suite of Charts and Nautical Publications covering Sudan waters as an essential element of its AtoN management process.</i>
Rec. 3.1 - AtoN-related charted differences	<i>SPC takes immediate action to compare detail shown in Nautical Publications and published charts with in-house knowledge and compile a list of all AtoN-related charted differences before informing the UKHO as soon as practicable.</i>
Status:	Pending
Comments (+)	<ol style="list-style-type: none"> 1. Similar to Rec. 2 of the draft recommendation list: <i>SPC takes immediate action to issue a navigational warning covering changes to aids to navigation characteristics in the approaches to Sudan.</i>
Rec. 3.2 - Hydrographic organisations	<i>SPC should conduct a study and take the appropriate contacts to allow Sudan to benefit of the support of hydrographic organisations (i.e. UKHO, Pakistan Navy Hydrographic Department ...).</i>
Status:	Pending
Comments (+)	<ol style="list-style-type: none"> 1. Rec. 23 of the draft recommendation list
Rec. 3.3 - Log of all NAVAREAS	<i>SPC maintains a log of all NAVWARNS covering the waters under its jurisdiction with immediate effect.</i>

Status:	Done
Comments (+)	1. Rec. 4 of the draft recommendation list

Rec. 4.1 - Port calls database	<i>As part of its risk management process, SPC develops and maintains a comprehensive database of port calls for all classes of vessel from all available sources.</i>
Status:	Done
Comments (+)	1. Similar to Rec. 7 of the draft recommendation list: <i>As part of its risk management process, SPC should develop and maintain a comprehensive database of port calls for all classes of vessel from all available sources.</i>

Rec. 4.2 – Maritime incidents database	<i>SPC should develop and maintain an effective annual database of all maritime incidents in the waters of Sudan and use such data in its risk assessment and management processes.</i>
Status:	Pending
Comments (+)	1. Rec. 27 of the draft recommendation list

Rec. 5 - AIS network	<i>SPC to procure and install a phased suite of AIS Base Stations and associated software and hardware to cover the waters of Sudan based on a risk-based analysis of requirement.</i>
Status:	Committee: Done Suite: Pending
Comments (+)	Similar to Rec. 8 of the draft recommendation list: <i>SPC should put in place with the cooperation of other ministries and bodies concerned (Navy, Fisheries Ministry, Ecology Ministry...) a committee to procure and install the needed AIS Base Stations and associated software and hardware to cover all the waters of Sudan.</i>

Rec. 6.1 - AIS transponders	<i>SPC should consider to fit the pilot launch vessels with an AIS transponder and make an AIS transponder compulsory for specific classes of yachts and local passenger vessels that operate in Sudan waters</i>
Status:	Yet to begin
Comments (+)	Not part of the draft recommendation list, part of the final report

Rec. 6.2 – Port Sudan VTS implementation	<i>SPC, working closely with key stakeholders, should instigate a formal risk assessment process before the implementation of the Port Sudan VTS.</i>
Status:	Yet to begin
Comments (+)	Rec. 8 of the draft recommendation list

Rec. 7 – ARM, ENG, VTS Committees attendance	<i>For SPC to send an observer experts to the IALA ARM, ENG, VTS Committees that will take place at IALA Headquarters in October 2017.</i>
Status:	Yet to begin
Comments (+)	1. Similar to Rec. 17 bis of the draft recommendation list: <i>As soon as Sudan will be IALA Member, the Republic of Sudan, as represented by SPC (National Member), should send an expert to attend the AtoN Requirements and Management (ARM) Committee meetings, and</i>

	<p><i>an expert to attend the AtoN Engineering and Sustainability (ENG) Committee meetings, to take benefit of the membership.</i></p> <p>2. Rec. 17 of the draft recommendation list: <i>As soon as the VTS center will be operational, the Republic of Sudan, as represented by SPC (as IALA National Member), should send an expert to attend the VTS Committee meetings, to take benefit of the membership.</i></p>
Rec. 8 - Nairobi Convention ratification	<i>To consider the ratification of the Nairobi Convention in the national maritime legislation</i>
Status:	Yet to begin
Comments (+)	1. Not part of the draft recommendation list
Rec. 9 - IMSAS preparation	<i>For Sudan to use this report to start preparing for the IMO Member State Audit Scheme (IMSAS), which will take place after 2017, by producing a "Procedures for the establishment and maintenance of Aids to Navigation" document.</i>
Status:	Yet to begin
Comments (+)	1. Not part of the draft recommendation list
Rec. 10 - SPC responsibilities	<i>SPC being the Competent Authority for the AtoN provision needs within all Sudan waters to be formalized in national maritime legislation.</i>
Status:	Pending
Comments (+)	1. Similar to Rec. 5 of the draft recommendation list: <i>Sudan legal frame to be completed to allow SPC to be in charge of all AtoN within the Sudan waters, for the Sudan Coastal States obligations within SOLAS Convention, regulations 12 and 13.</i>
Rec. 11 - SPC mandate	<i>The final national maritime legislation to give the mandate to SPC to exercise control of the AtoN provision and the absolute right to approve, disapprove or exercise full quality control functions over the installation, modification, operation, maintenance or removal of all AtoN in all waters of Sudan, including its EEZ.</i>
Status:	Yet to begin
Comments (+)	1. Similar to Rec. 6 of the draft recommendation list: <i>SPC should put in place and apply the needed processes and regulations to be implemented to allow the SPC General Manager to sign decisions for creation, modification and suppression of aids to navigation for all the existing aids to navigation, whether is the owner (SPC, Navy, Private companies).</i>
Rec. 12.1 - AtoN operating fund	<i>MTRB should consider the precise mechanism for generating a reliable flow of revenue into an "AtoN operating fund" under its control which would be ring-fenced for the exclusive purpose of the installation, maintenance, repair, replacement or removal of all SPC and other government and private-owned AtoN, and where appropriate for the training and career development of nominated AtoN managers or technicians.</i>
Status:	Yet to begin
Comments (+)	1. Not part of the draft recommendation list

Rec. 12.2 - Budget	<i>SPC should prepare a justified 5-year budget of anticipated expenditure on the procurement, installation and maintenance costs of present and future AtoN in waters for which SPC have jurisdiction.</i>
Status:	Yet to begin
Comments (+)	1. Rec. 14 of the draft recommendation list
Rec. 13 - MTRB Safety of Navigation Manager	<i>The post of Safety of Navigation Manager, with specific duties to address obligations under SOLAS Chapter V, be formally established at MTRB and a person should be nominated to fulfil this function.</i>
Status:	Done (SPC position)
Comments (+)	1. Similar to Rec. 9 of the draft recommendation list: <i>SPC should nominate a "safety of navigation" manager as the international standards coordinator to monitor new IALA publications and ensure that managers take appropriate action to implement such standards.</i>
Rec. 14 - IALA National Membership	<i>SPC apply for National membership of IALA so that Sudan is represented formally at IALA.</i>
Status:	Done
Comments (+)	1. Similar to Rec. 15 of the draft recommendation list: <i>The Republic of Sudan, as represented by SPC, should apply for full membership of IALA.</i>
Rec. 15 - Strategic Plan	<i>MTRB and SPC should develop and publish a strategic plan for the provision of AtoN services based on IALA Guideline 1052 on Quality Management for AtoN Authorities.</i>
Status:	Yet to begin
Comments (+)	1. Similar to Rec. 16 of the draft recommendation list: <i>SPC should prepare a specific AtoN Strategic Plan (based on IALA Guideline 1052 on Quality Management for AtoN Authorities) and publish the plan on its website.</i>
Rec. 16 - Operational Plan	<i>Once the appropriate competency has been gained, SPC should produce and publish an Operational Plan which sets out clear Levels of Service statements to the mariner within all Sudan waters.</i>
Status:	Yet to begin
Comments (+)	1. Similar to Rec. 17 of the draft recommendation list: <i>– SPC should develop and maintain an annual NAVPLAN from which Levels of Service Statements can be generated.</i>
Rec. 17 - Risk-based analysis	<i>Once the necessary competency has been gained, SPC should conduct a risk-based analysis of maritime traffic and the marine environment in each defined region or zone to determine the type of AtoN appropriate for each zone.</i>
Status:	Yet to begin
Comments (+)	<ol style="list-style-type: none"> 1. Similar to Rec. 18 of the draft recommendation list: <i>– SPC should define zones in which the type of AtoN service will be provided and then conduct a numerical analysis of maritime traffic and the marine environment in each defined region or zone.</i> 2. Similar to Rec. 45 of the draft recommendation list: <i>SPC should conduct a risk-based review of any zone where implementation of new aids to navigation is under consideration to</i>

	<i>determine what aids to navigation should be installed taking in account the volume of traffic and degree of risk, based on IALA Guideline 1018</i>
Rec. 18 - Level of Service	<i>A Level of Service statement for the type, extent and quality of the AtoN service provided by SPC should be prepared in accordance with IALA Guideline 1004 and published on the SPC website.</i>
Status:	Yet to begin
Comments (+)	1. Similar to Rec. 19 of the draft recommendation list: <i>Levels of Service statements for the type, extent and quality of the AtoN service provided by SPC should be prepared in accordance with IALA Guideline 1004 and published on the SPC website.</i>
Rec. 19 - AtoN National Register	<i>SPC develops and maintains a National Register of AtoN, liaising with the appropriate land or hydrographic survey organisations to determine the precise positions of such AtoN.</i>
Status:	Yet to begin
Comments (+)	1. Similar to Rec. 20 of the draft recommendation list: <i>SPC should develop, maintain and update a National Register of Aids to Navigation as part of a QMS and circulate this database, either in hard and/or soft copy, to key stakeholders including other AtoN service providers, if any, and the Pakistan Navy Hydrographic Department.</i>
Rec. 20 – National Register and AtoN physical audit	<i>SPC should conduct a physical audit of all AtoN listed in the newly prepared National Register then update that Register based on the findings of the audit.</i>
Status:	Pending
Comments (+)	1. Similar to Rec. 21 of the draft recommendation list: <i>SPC should conduct a physical audit of all charted and existing AtoN in the waters of Sudan so that the National Register of AtoN can be populated with accurate data.</i>
Rec. 21 - Action plan to refurbish all non-IALA compliant marks	<i>SPC should produce an action plan with target dates to refurbish all non-IALA compliant marks so that they match the specifications set out in the IALA Maritime Buoyage System for Region B.</i>
Status:	Pending
Comments (+)	1. Similar to Rec. 10 of the draft recommendation list: <i>SPC to up-grade the needed aids to navigation to be modified</i>
Rec. 22 - Forms to be available on the website	<i>SPC should prepare forms which can be emailed or downloaded from its website that can be used to report observed AtoN failures or to request approval to install, modify or remove an AtoN not owned by SPC.</i>
Status:	Yet to begin
Comments (+)	1. Not part of the draft recommendation list
Rec. 23 - Non-Conformance reports	<i>A formal process to generate Non-Conformance Reports for each failure of all AtoN should be developed by SPC as part of an in-house Quality Management System based on the principles of ISO 9001.</i>

Status:	Yet to begin
Comments (+)	1. Similar to Rec. 23 of the draft recommendation list: <i>A formal process to generate Non-Conformance Reports for each AtoN failure should be developed as part of the SPC Quality Management System.</i>

Rec. 24 - AtoN failures database	<i>In the longer term, a database of AtoN should be developed which can be used to calculate actual availability of individual AtoN from records of AtoN failures</i>
Status:	Yet to begin
Comments (+)	1. Similar to Rec. 24 of the draft recommendation list: <i>A second database of AtoN should be developed which can be used to calculate actual availability of individual AtoN from records of AtoN failures.</i>

Rec. 25 - AtoN monitoring	<i>SPC conducts a review of all AtoN in Sudan waters to determine how each will be monitored based on its IALA Availability Category before taking the appropriate phased procurement action to fit selected AtoN with a remote monitoring capability.</i>
Status:	Yet to begin
Comments (+)	1. Similar to Rec. 25 of the draft recommendation list: <i>SPC should conduct a review of all AtoN to determine how each will be monitored based on its IALA availability Category before taking the appropriate procurement action to fit selected AtoN with a remote monitoring capability.</i>

Rec. 26 - Consultancy process	<i>SPC conduct an internal review of the existing user consultancy process to determine whether more formal conventional consultancy or a local user forum might enhance the present process.</i>
Status:	Yet to begin
Comments (+)	1. Similar to Rec. 26 of the draft recommendation list: <i>SPC should conduct an internal review of its user consultancy processes to determine how formal conventional consultancy or local user fora would enhance the present informal process.</i>

Rec. 27 - IALA Green Guidelines	<i>For SPC to adopt IALA Green Guidelines and publish them in the Strategic Plan and on the website.</i>
Status:	Yet to begin
Comments (+)	1. Not part of the draft recommendation list

Rec. 28 - Attendance to the seminar on risk management tool	<i>MTRB and SPC should consider sending one or two participants on the one-week seminar on risk management tool to be held in South Africa in 2018.</i>
Status:	Pending
Comments (+)	1. Similar to Rec. 46 of the draft recommendation list: <i>SPC should nominate a suitable participant to attend the next IALA Risk Management course to be delivered in 2018 in South Africa so that the appropriate competencies in their use of can be gained to enhance the process of providing an optimum mix of AtoN in the waters of Sudan.</i>

Rec. 29 - Port Sudan Port risk assessment	<i>A risk assessment with key stakeholders should be held to determine the requirement for Port Sudan Port</i>
Status:	Yet to begin
Comments (+)	1. Not part of the draft recommendation list
Rec. 30 - AtoN name boards and physical numbering	<i>SPC to implement a national policy on the use name boards and physical numbering to assist the identification of marks and the preservation of their signal colours.</i>
Status:	Yet to begin
Comments (+)	1. Not part of the draft recommendation list
Rec. 31 - Sanganeb Lighthouse renovation	<i>SPC to conduct a study with key stakeholders for the Sanganeb lighthouse renovation from incandescent/generator set ups to LED/solar arrangements to reduce power and the risk of pollution.</i>
Status:	Yet to begin
Comments (+)	1. Not part of the draft recommendation list
Rec. 32 - Sanganeb Lighthouse preservation	<i>SPC should take action to preserve Sanganeb lighthouse as an operational historic national monument.</i>
Status:	Yet to begin
Comments (+)	1. Not part of the draft recommendation list
Rec. 33 - Bashayer Oil Terminals 1 and 2	<i>A formal stakeholder meeting should be held to determine the appropriate number, positions and type of buoys to mark the Bashayer Oil Terminal 1 and Bashayer Oil Terminal 2.</i>
Status:	Yet to begin
Comments (+)	1. Not part of the draft recommendation list
Rec. 34.1 - Emergency wreck buoy	<i>SPC to make available in Sudan port one emergency wreck buoy as part of a developed Emergency Wreck Marking Plan.</i>
Status:	Done
Comments (+)	1. Similar to Rec. 31 of the draft recommendation list: <i>SPC should make available in Port Sudan and in Sawakin an appropriate Emergency Wreck Buoy and lantern so that it can be deployed rapidly to mark new wrecks or dangers</i>
Rec. 34.2 - Emergency wreck marking plan	<i>SPC should develop an emergency wreck marking plan</i>
Status:	Yet to begin

Comments (+)	1. Rec. 32 of the draft recommendation list
Rec. 35.1 - Marine lanterns range, beamwidth and light levels determination	<i>SCP should contact an IALA Industrial Member to determine the nominal range, vertical beamwidth and ambient light levels that have been set on all marine lanterns supplied in the last 5 years</i>
Status:	Yet to begin
Comments (+)	1. Not part of the draft recommendation list
Rec. 35.2 - Range of vital and important lit marks	<i>SPC should conduct biannual practical measurements of the actual range of vital and important lit marks as part of its Level of Service statement procedures for Quality.</i>
Status:	Yet to begin
Comments (+)	2. Rec. 36 of the draft recommendation list
Rec. 35.3 - Sea bed obstructions	<i>SPC should conduct surveys on the obstructions on the sea bed (cables,...), to define, put in place and apply a policy on marking obstructions on the sea bed.</i>
Status:	Yet to begin
Comments (+)	1. Rec. 48 of the draft recommendation list
Rec. 36 - AtoN maintenance facilities and resources	<i>For SPC to consider how to ensure that appropriate and cost-effective AtoN maintenance facilities and resources are developed within its own organisation or through contracted-out services supplied by a private company.</i>
Status:	Yet to begin
Comments (+)	1. Not part of the draft recommendation list
Rec. 37 - MTBR Safety Manager attendance to Level 1 AtoN manager course	<i>When nominated, the MTRB Safety of Navigation Manager should gain international competency through participation in the "Level 1" AtoN manager courses delivered by a regional Accredited Training Organisation.</i>
Status:	Yet to begin
Comments (+)	1. Not part of the draft recommendation list
Rec. 38 - SPC attendance to Level 1 AtoN manager course	<i>SPC should nominate a suitable participant as soon as possible to gain international competency through participation in the "Level 1" AtoN manager courses delivered by a regional Accredited Training Organisation.</i>
Status:	Pending

Comments (+)	<ol style="list-style-type: none"> 1. Similar to Rec. 43 of the draft recommendation list: <i>SPC should nominate a suitable participant to attend the next Level 1 AtoN manager course to be delivered in 2018 in South Africa.</i> 2. Invitation send by India (DGLL)
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Rec. 39 - VTS personnel qualifications and training requirements	<i>SPC should determine the qualifications and training requirements for VTS personnel, based where appropriate on IALA Recommendations, Guidelines and model courses.</i>
Status:	Yet to begin
Comments (+)	<ol style="list-style-type: none"> 1. Not part of the draft recommendation list

Rec. 40- Training organisations accreditation	<i>SPC should accredit an appropriate national or foreign training organisation to deliver compliant training for its existing VTS personnel in accordance with international obligations and standard and then start the process of training its VTS personnel at that ATO.</i>
Status:	Pending
Comments (+)	<ol style="list-style-type: none"> 1. Similar to Rec. 11 of the draft recommendation list: <i>In case of decision to implement a Port Sudan Harbour VTS, SPC should accredit a training organisation for the delivery of the training certificates to VTS operators, accordingly to the international obligations and standards</i>

Rec. 41 - SPC staff training	<i>SPC should ensure that staff in charge of navigational warnings are trained to the appropriate standard so that international obligations are met in full.</i>
Status:	Yet to begin
Comments (+)	<ol style="list-style-type: none"> 1. Not part of the draft recommendation list

Rec. 42 - Recommendations review	<i>Sudan conducts a full review of the 43 recommendations set out in this report and develops of prioritised list of actions with realistic target dates for completion.</i>
Status:	Done
Comments (+)	<ol style="list-style-type: none"> 1. Similar to Rec. 45 of the draft recommendation list: <i>SPC should invite the IALA WWA, together with IMO and IHO, to conduct a Review mission to Sudan at the beginning of 2018 to review actions taken with the adoption of appropriate recommendations listed in this report.</i> 2. Similar to Rec. 41 of the draft recommendation list <i>SPC should put in place a specific Committee to continue the work done with the stakeholders during the Needs Assessment Mission, to allow analysing the IALA WWA Needs Assessment Mission report, the recommendations, and make proposals for the action plan, to be prepared for the Review</i>

Rec. 43 - IALA Review	<i>MTRB invites IALA to conduct a review of MTRB's analysis with the aim of removing Sudan from the list of IALA's target States.</i>
Status:	Done
Comments (+)	<ol style="list-style-type: none"> 1. Not part of the draft recommendation list

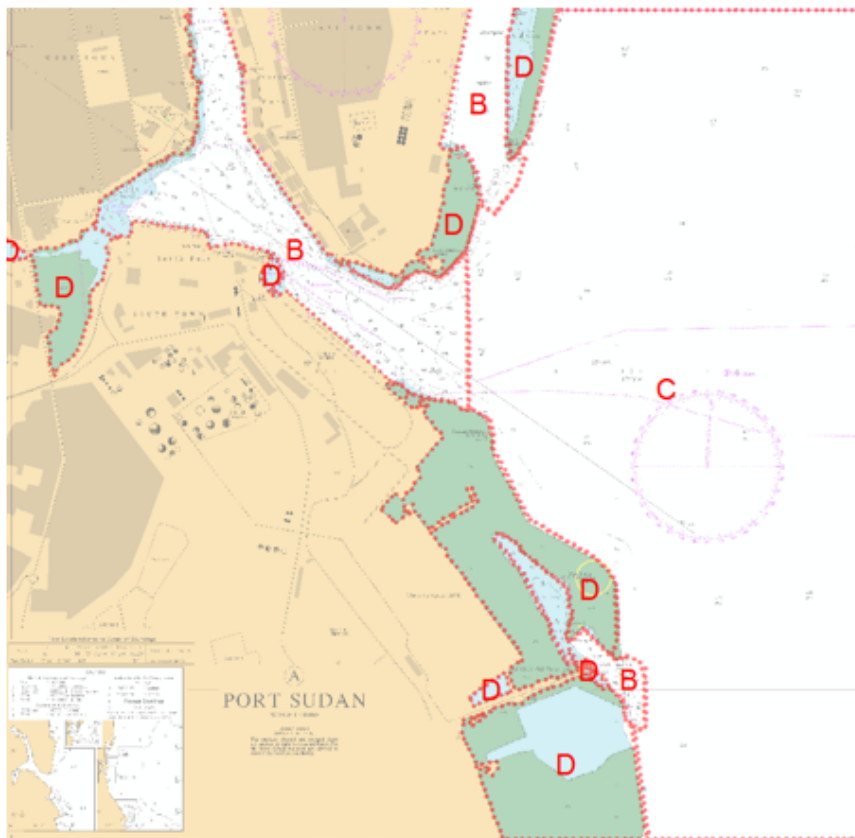
13. ANNEX F: Surveys and charts status

CATZOC Values for survey data used in GB ENC's of Sudan

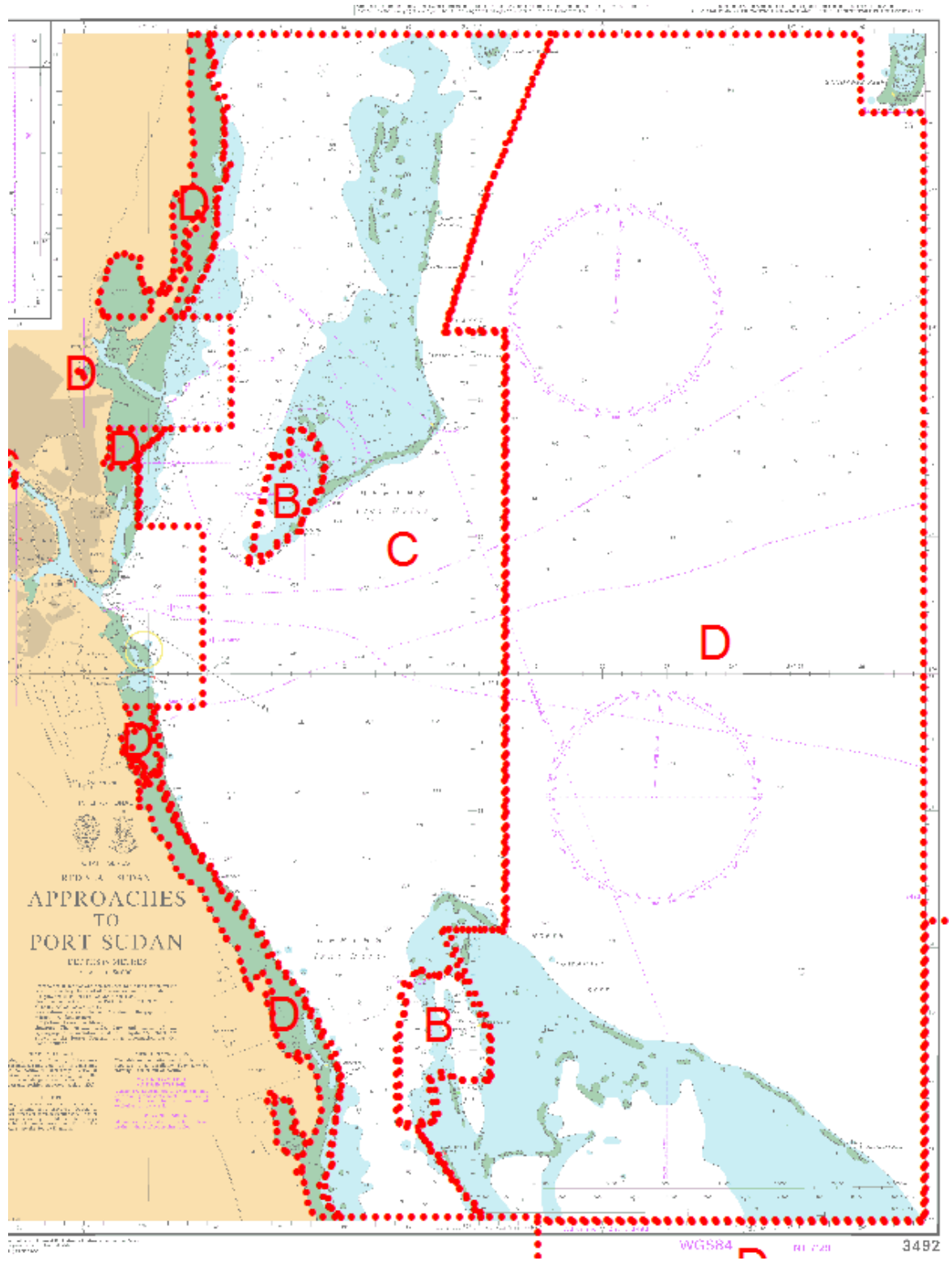
Key to CATZOC values and meanings

ZOC	Seafloor Coverage	Typical Survey Characteristics
A1	Full area search undertaken. Significant seafloor features detected and depths measured	Controlled, systematic survey high position and depth accuracy achieved; using DGPS or a minimum three high quality lines of position (LOP) and a multibeam, channel or mechanical sweep system
A2	Full area search undertaken. Significant seafloor features detected and depths measured	Controlled, systematic survey achieving position and depth accuracy less than ZOC A1 and using a modern survey echosounder and a sonar or mechanical sweep system
B	Full area search not achieved; uncharted features, hazardous to surface navigation are not expected but may exist	Controlled, systematic survey achieving similar depth but lesser position accuracy than ZOC A2 using a modern survey echosounder, but no sonar or mechanical sweep system
C	Full area search not achieved, depth anomalies may be expected	Low accuracy survey or data collected on an opportunity basis such as soundings on passage
D	Full area search not achieved, large depth anomalies may be expected	Poor quality data or data that cannot be quality assessed due to lack of information
U	Unassessed - The quality of the bathymetric data has yet to be assessed	

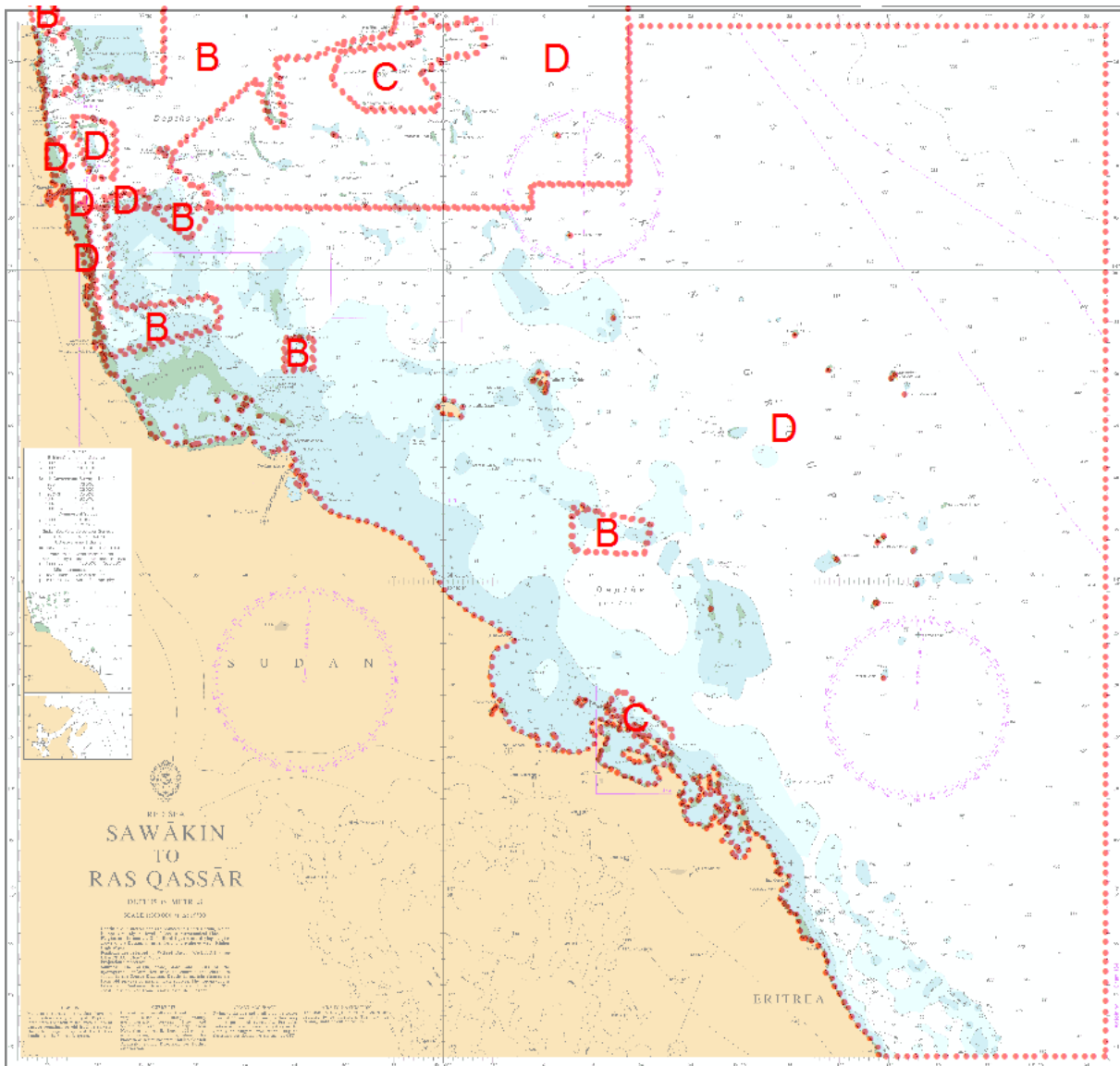
Port Sudan



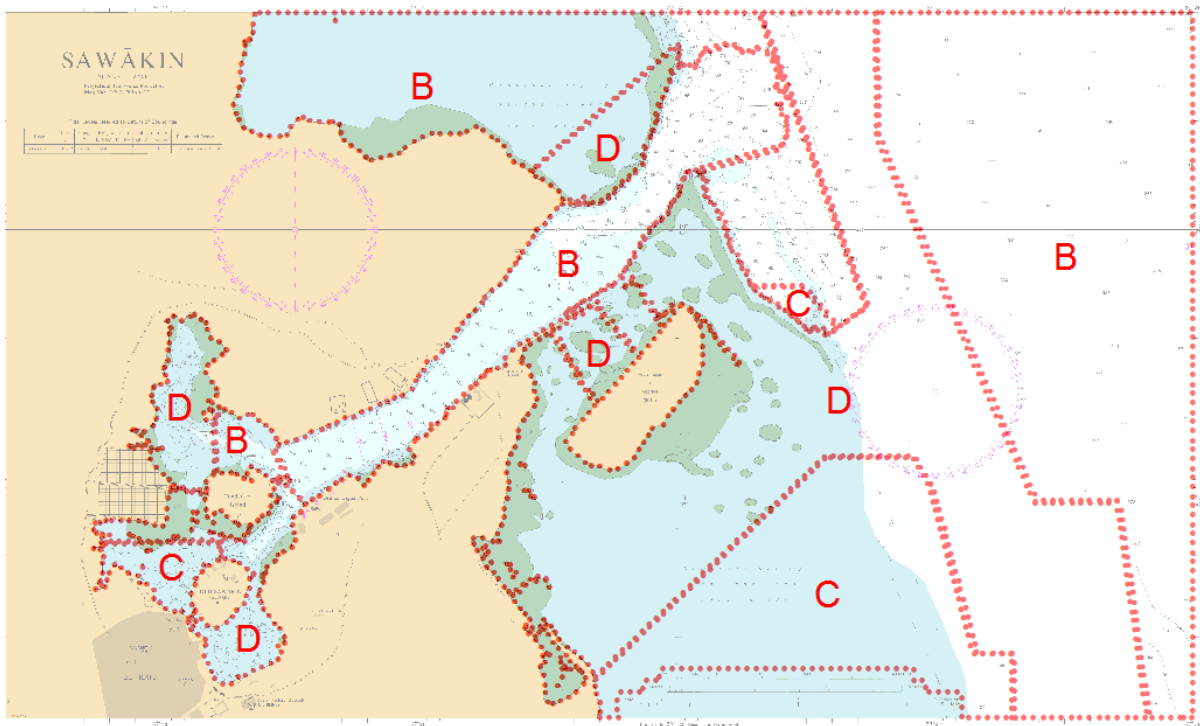
Approaches to Port Sudan



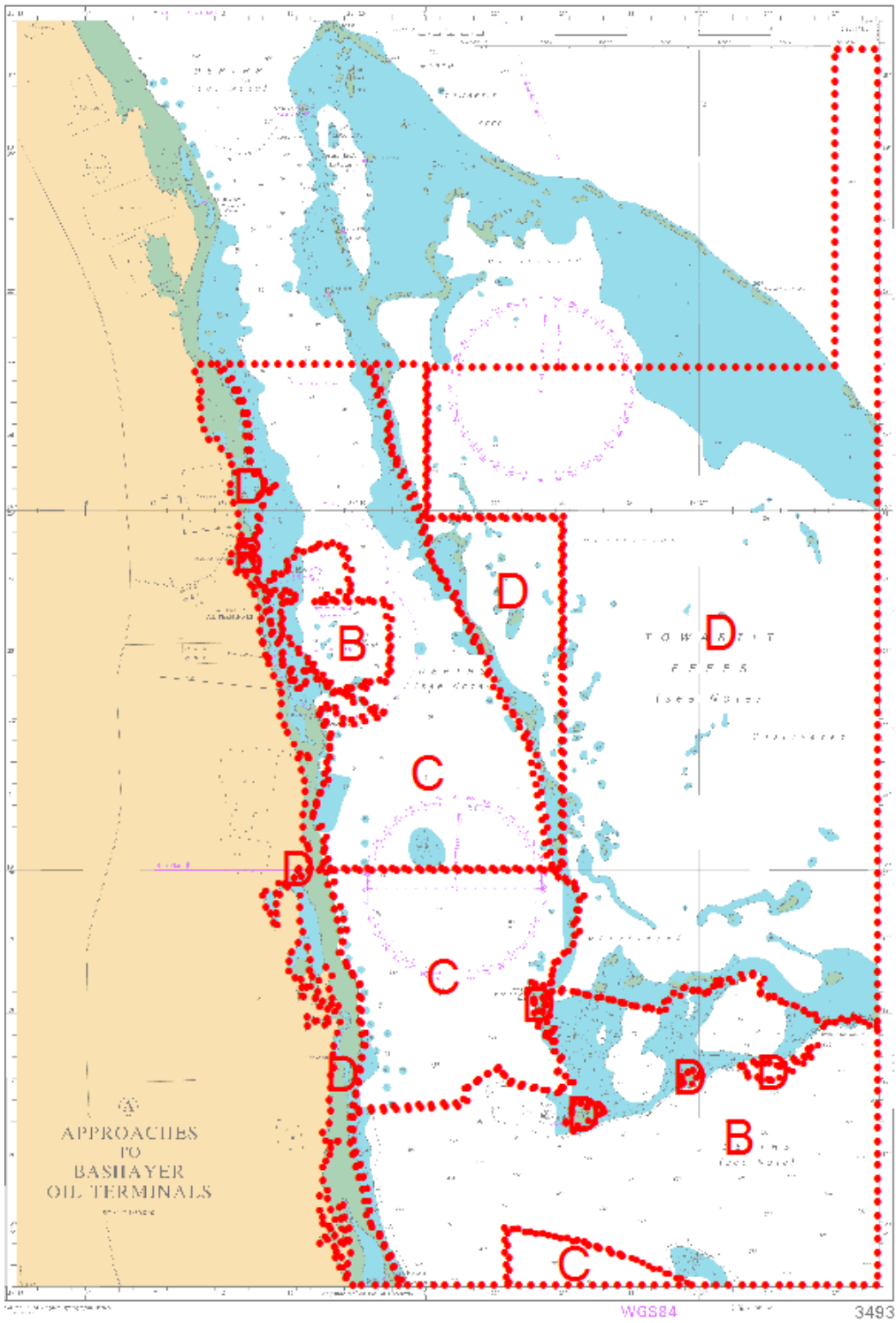
Approaches to Sawakin



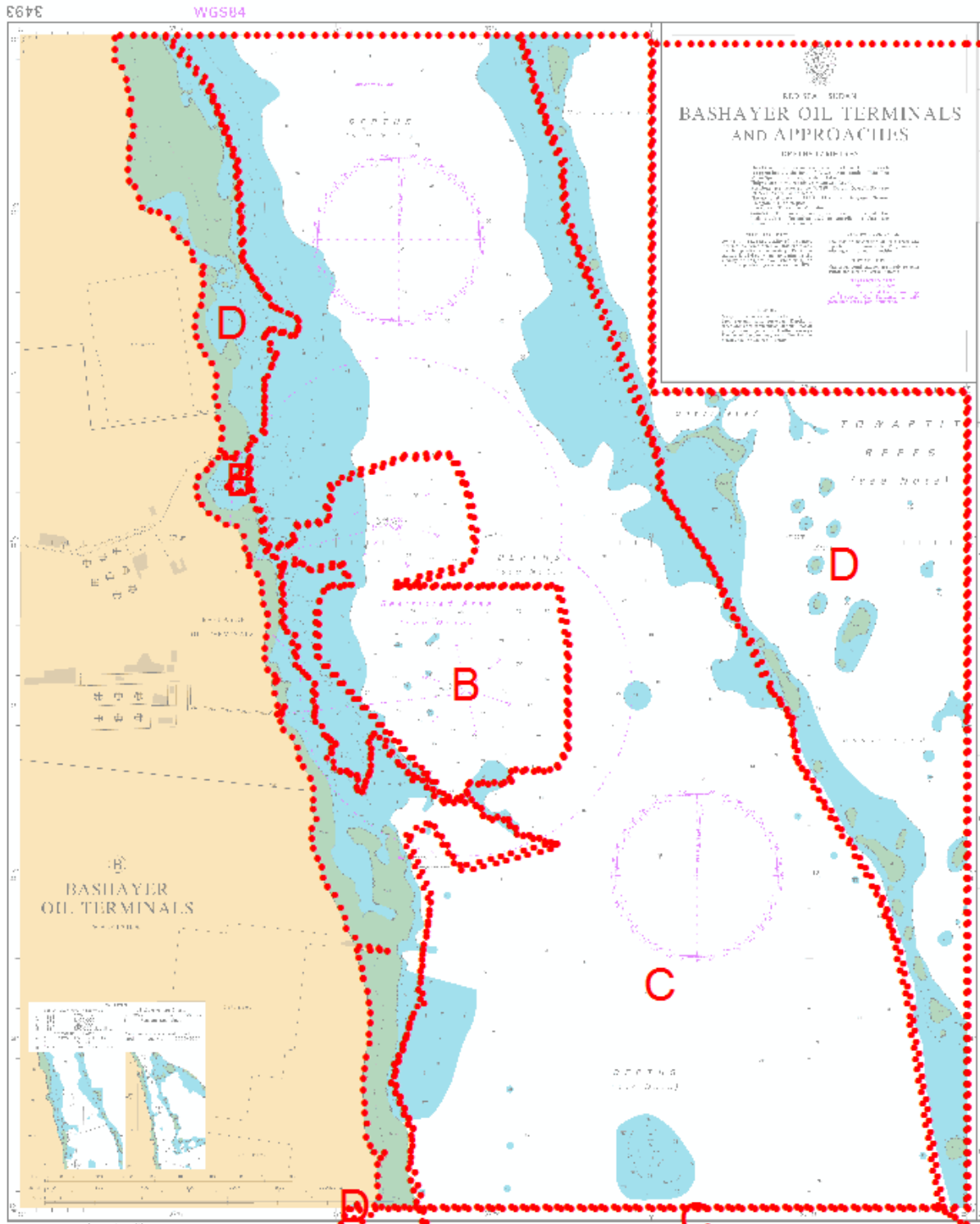
Sawakin



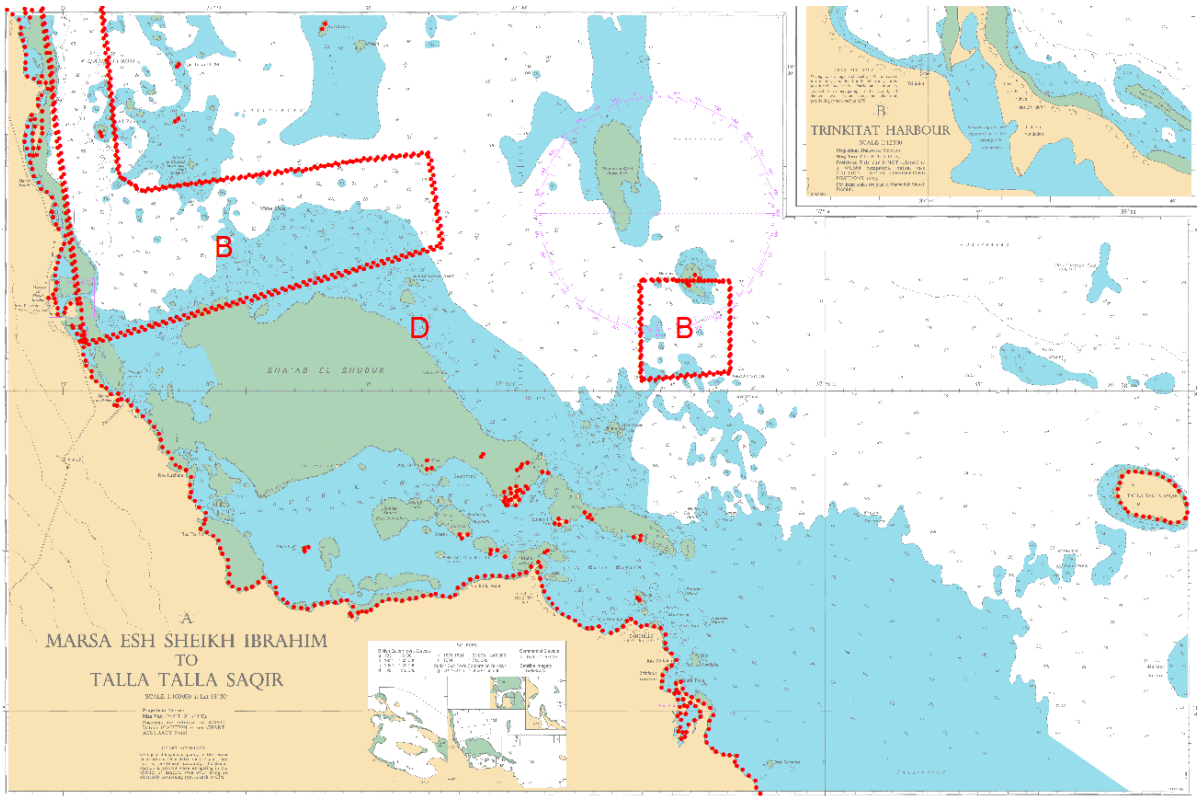
Approaches to Bashayer Oil Terminals



Bashayer Oil Terminals



Approaches to Marsa Esh Sheikh Ibrahim



14. ANNEX G: Traffic Statistics for Ships

Traffic statistics for ships

Year	Passenger.	Gen Cargo	CONT	RORO	TANKERS	CAR CARR.	DRY BULK	LIVESTOCK	LIQUID BULK	GAS CARR.	OTHER	TOTAL
2000	296	293	313	51	104	38	88	130	0	0	18	1331
2001	242	328	304	85	87	42	92	0	0	0	24	1204
2002	377	299	329	98	85	44	118	255	0	0	78	1683
2003	373	268	284	138	80	67	111	172	0	0	96	1589
2004	326	332	278	155	107	56	125	176	0	14	150	1719
2005	329	517	420	135	102	75	130	225	0	11	95	2039
2006	335	543	406	122	70	88	132	211	19	5	11	1942
2007	404	354	325	107	59	46	159	120	36	0	6	1616
2008	300	357	372	60	67	45	102	57	32	0	45	1437
2009	372	321	451	47	47	80	115	219	25	0	52	1729
2010	275	299	371	41	52	82	101	223	34	0	16	1494
2011	258	270	305	31	71	50	75	328	39	0	19	1446
2012	260	223	294	32	67	32	73	406	55	0	20	1462
2013	316	236	345	56	72	47	79	430	32	0	35	1648
2014	320	181	320	41	80	50	81	521	34	0	22	1650
2015	296	224	304	47	75	49	61	594	42	0	7	1699
2016	299	147	283	37	54	53	61	522	41	0	0	1554
2017	295	299	229	21	77	40	13	499	45	6	12	1573

15. ANNEX H: Traffic Statistics for Port Sudan

Traffic Statistics for Port Sudan

Year	General Cargo	CONTAINERS	RORO	TANKERS	CAR CARR.	DRY BULK	LIQUID BULK	GAS CARR.	OTHER	TOTAL
2000	293	313	51	104	38	88	0	0	18	905
2001	328	304	85	87	42	92	0	0	24	962
2002	299	329	98	85	44	118	0	0	78	1051
2003	268	284	138	80	67	111	0	0	96	1044
2004	332	278	155	107	56	125	0	14	150	1217
2005	517	420	135	102	75	130	0	11	95	1485
2006	543	406	122	70	88	132	19	5	11	1396
2007	354	325	107	59	46	159	36	0	6	1092
2008	357	372	60	67	45	102	32	0	45	1080
2009	321	451	47	47	80	115	25	0	52	1138
2010	299	371	41	52	82	101	34	0	16	996
2011	270	305	31	71	50	75	39	0	19	860
2012	223	294	32	67	32	73	55	0	20	796
2013	236	345	56	72	47	79	32	0	35	990
2014	181	320	41	80	50	81	34	0	22	809
2015	224	304	47	75	49	61	42	0	7	809
2016	147	283	37	54	53	61	41	0	0	733
2017	299	229	21	77	40	13	45	6	12	779