SAIHC12-5.3F

REPUBLIC OF MOZAMBIQUE

NATIONAL INSTITUTE OF HYDROGRAPHY AND NAVIGATION

NATIONAL REPORT TO

THE 12th SOUTHERN AFRICA AND ISLANDS HYDROGRAPHIC COMMISSION CONFERENCE

Dar-Es-Salaam – Tanzania
21st – 23rd September 2015

1. General

This report aims to make a summary approach of the activities carried out by the Mozambican Hydrographic Office – The National Institute of Hydrography and Navigation, since the 2014 Southern Africa and Islands Hydrographic Commission Conference, covering the following areas:

- Hydrographic surveys;
- Cartographic production;
- Capacity building;
- Oceanographic activities;
- Marine signalization;
- Status of the approval of the Protocol of Amendments to the IHO Convention.

2. The Hydrographic office

The National Institute of Hydrography and Navigation (INAHINA) is the Mozambican official Hydrographic Office (HO), working under the Ministry of Transport and Communications. Its main function is to ensure safety of navigation in the waters under the Mozambican jurisdiction trough marine signalization, production and distribution of nautical charts (presently only paper charts), among others nautical documents, through which safety of navigation and access to the country main ports, namely Maputo (south), Beira (center) and Nacala (north) are ensured. Hydrographic surveys and charting activities also take place among several small harbors and inland waters.

Being marine signalization the core goal of INAHINA, hydrographic and oceanographic activities have played an important role in others fields rather than charting, through its transversality. INAHINA has also been involved in several maritime activities, such as coastal management studies, boundaries delimitation projects, scientific studies, designed for use in the planning, implementation, monitoring and coordination process of coastal management policy, dredging and marine protection.

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- **Delegations (Branches):**

Local representation of INAHINA along the Mozambican territory is ensured by four (4) delegations, territorially and regionally distributed:

1. Beira (central Mozambique);
2. Quelimane (central Mozambique);
3. Nacala (north Mozambique);
4. Pemba (north Mozambique).

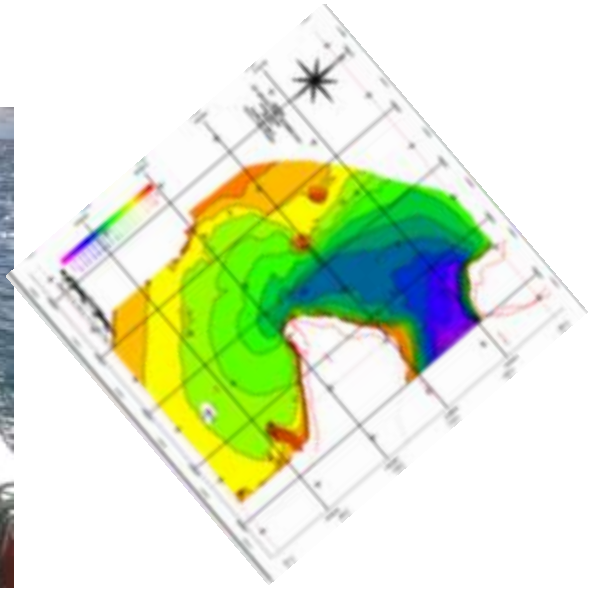
2.1 New General Director

Change has taken place at the Mozambican HO management of INAHINA. Mr. Simião **Munguambe,** a former Delegate at INAHINA's Beira Delegation, was recently appointed as new General Director of INAHINA, in replacement of Mr. Augusto **Bata**, who exerted the same position for the last eight years. The new General Director was vested approximately two months ago but has already shown commitment with all issues related to IHO and SAIHC.

3. Surveys

3.1 New surveys

Surveys are generally concentrated at the main national ports for the cartographic production purposes (production and publication of new charts or charts update). Aiming at producing new charts for the harbor of Mocimboa da Praia (chart 16 312), surveys were recently carried out in north Mozambique, in Cabo Delgado province to be precise, where new survey have been scheduled to take place by the end of this year.



3.2 Planned surveys

As it was referred in 3.1, the Moz HO is finalizing procedures to carry out another three surveys scheduled to take place still this year in northern Mozambique in the ports of Angoche, Moma and Macuse. The ToR for these surveys, which will take at least thirty days each, have already been finalized and it's expected that respective charts be produced in the beginning of 2016.

Another two surveys were planned to take place in Gaza and Maputo City, both south provinces of Mozambique. They will be carried out respectively in the Bilene's lagoon and in Costa do Sol beach, with the main objective of producing charts for pleasure craft. These surveys are of high importance, particularly in the Costa do Sol beach, where deaths from bathers were recently reported (it's understood that there's a linkage between these deaths and the works actually in progress in the edge of Maputo bay, although not proven). Thus, it's believed that this information will be of much help for the Mozambican Marine Institute's lifeguards to save bathers lives.

3.3 Equipment

The table below shows the main hydrographic equipment at INAHINA.

Equipment	Quantidade	Model/Referency	Manufacturer
Positioning equipment	Four (4) kits	CS Viva	Leica GS10
	One (1) Kit	Aquarius 02	Ashtech

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Singlebeam echosounders	Two (2) kits	Deso 300	Atlas
	Four (4) Kits	Deso 30	Atlas
Multibeam echosounders	One (1) kit	2022	R2Sonic
Side Scan Sonar	Two (2) Kits	2094D	Kongsberg / 1020
		Pulsar	Kongesberg
SVP (Sound Velocity Profiler)	Three (3)	miniSVP	Valport /44860
Motion sensor (MRU)	One (1) kit	SeaTex	SeaTex

In general, the items listed in the table above are in good operating conditions and some of them are brand new.

3.3.1 New equipment

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3.4 New ships

The Mozambican hydrographic office (INAHINA) has started an inversion with regard to the equipment approach. The pictures bellow show the two recently delivered workboats, designed for hydrographic and maintenance of the channel of access to the Maputo Port activities, both labeled as ***Lago Niassa*** and ***Linga Linga*** respectively.
INAHINA has also started a procurement aiming to acquire one hydrographic surveys boat. The survey boat is under construction and it is expected to be delivered by the end of 2015 or in the beginning of 2016 the latest, duly equipped with a multi beam echosounder.

New survey work boat under construction

4. New charts & updates

See 3.4 below

4.1 ENC's

See 7.2

4.2 INT Charts

No new INT charts produced or updated since the last report. The Mozambique HO is still negotiating with the UKHO and IHPT a way out to reinitialize the edition of the Mozambican INT charts, namely charts Beira and Nacala ports and the Beira port's approximation chart.

4.3 National Paper Charts

New Charts or updated Charts published:

National Paper Charts	Reference	Status
Approach to the Port of Beira	16204	Updated
Port of Beira	16303	Updated
Port of Nacala	16310	Updated

4.3.1 Charts for pleasure Craft

Please see 3.2.

5. New publications

Publications issued by INAHINA are generally physical: charts, tide table, reports and they may be acquired at the INAHINA headquarters in Maputo. The main new publication for this period is the tide forecast (Tide Table) for 2015 and 2016, as described ahead.

5.1 Problems encountered

As it was referred previously, it is necessary to find out an alternative way to make the internal publications available. Digitalization of the publications is actually the main challenge.

6. MSI

The MSI is under responsibility of the Marine National Institute (INAMAR).

7. Capacity Building (needs)

- Training in ENC production;
- Training in multi beam echo sounder system operation;
- Hydro Cat A training course.

7.1 Training received

There isn't any update regarding training received.

7.2 Cartographic training

In a world that the use of ENC's is constantly raising, ENC's production by INAHINA is considered one of its highest priorities, what requires appropriate training in this field.
Aiming at reaching that goal, a training process has already been started. Three cartographers will be involved in ENC on job training at the South African Hydrographic Office still this year, for one month.

8. Oceanographic activities and Tide gauge network

The oceanographic activities can be categorized as follow: tide observing (measurement, digitalization and validation); analysis and prediction of tides (modeling, calculation of the average level, production of tide table); scientific studies (data collection, processing, compilation); and the use of GEBCO bathymetric models: mat lab; Ocean View date; Arc-GIS.
Within the last 12 months (since the last report) the oceanography service has been busy carrying out, among others, the following activities:
a) Inspection of tide gauge in Pemba (scale maintenance tides and tide gauge analog);

b) Review levelling milestones within the Country (altimetry control in Maputo, Pemba and Moma);
c) Mounting a tides scale in Palma and in Mozambique Island aiming at aiding hydrographic activities - surveys;
d) Levelling of 4th order in Chinde and Pebane (districts of Zambezia Province).
e) Scan, Validation and Data File: tidal data collection (temperature and salinity) in the Ports of Maputo, Quelimane and Nacala.
f) Analysis and prediction of tides: Tide forecast for 2015 and 2016, using the mike21 and T_tide model.
g) Operating Parameter Measurement: Measured in Maputo Bay (March) and in the estuary of the Good Signs in Quelimane (April).
h) Studies on physical and coastal processes: Hydrodynamic modelling of the Pemba Bay;
i) Geostrophic currents in Maputo Bay;
j) Water bodies in Maputo Bay.
A senior oceanographer from INAHINA was called to join the Southern Africa Development Community (SADC) team, whose main purpose is to assess this regional organization in the field of studies and management of projects involving shared waters.

9. Marine Signalization

Marine signalization is the core activity of INAHINA. It is the main goal of all activities carried out at the hydrographic and oceanography levels, along with the cartographic production. The coverage of the marine signalization in Mozambique is actually esteemed at 97%. As a result of recent inversion regarding equipment, it can be expected to be raised to 98% briefly.

INAHINA operates a large network of buoys and lighthouses, 57 lighthouses and 84 buoys, distributed along the Mozambican coast. Maintaining this network is a continuous challenge, which is largely increased by the acts of sabotage and destruction that some of these equipment are sometimes object. The lack of a marine signalization monitoring system is another challenge, which difficult prompt detection of failures and delays the maintenance of aids to navigation.

9.1 New Equipments

- New TRB 400 lanterns to be installed in the lighthouses of Inhaca and Ponta Caldeira (in Maputo & Nampula province respectively);
- New TRB200 lanterns installed in the lighthouses of Bazaruto and Barra (in Inhambane province);
- New VRB 25 type lantern installed in the Ponta Zavora lighthouse;
- Aids to Navigation Monitoring System to be installed in the Port of Maputo.

10. Participation in IHO working Groups

As IHO Member State, Mozambique has participated in the IHO and RHC meetings, such as International Hydrographic Conference, Extraordinary International Hydrographic Conference (2014), CBSC Meeting and, since 2009, has successively participated in all SAIHC meetings.

- **Another participations in international fora are related to the fields of marine signalization and coastal management and it includes:**

- Participation in the 18th IALA conference, held in La Coruna, Spain;
- Participation in the international conference on reducing the risk of Tsunamis in the Indian Ocean, Omã, 22nd – 26th March 2015;
- Participation in the 3rd Session of the Sub Commission Intergovernmental Oceanographic Commission (IOC) for Africa and Adjacent Island States;
- Sustained Forum on Ocean Observations for the IOC - Group V (Africa and Arab countries)
- The Second Expedition Indian Ocean - IIOE-2;
- Regional Meeting on the Western Indian Ocean Plan, Nairobi, Kenya April 2015;
- Participation in the coordination meeting for mitigation of tsunamis in Pacific, United States, 22nd – 24th April 2015.

11. Bilateral partnerships

Bilateral partnerships are strongly recommended by the IHO as a framework for the global surveying and charting coverage. Mozambique cooperation with others HO involves the Portuguese Hydrographic Office and the United Kingdom Hydrographic Office.
Recently, last August to be precise, IHPT General Director visited INAHINA and met with his Mozambican counterpart, where matters of interest for future collaboration among both HO were discussed.

In the light of collaboration with the UKHO, a Mozambican delegation visited the UKHO headquarter in February 2014, during which the Instrument of Collaboration between was revised and approved.

12. Status of Approval of the Protocol of Amendments to the IHO Convention

The process of approval of the Protocol of Amendments to the IHO Convention is still ongoing. Since the last visit by the IHO President to Mozambique, Captain Robert Ward, and following the meeting with Deputy Minister of Transport and Communications of Mozambique, this issue have been placed as one of top priorities of the Mozambican Government. As it was stated in the beginning of this report, the new General Director is also committed in conducting the approval process of the Protocol of Amendments. Taking into account the recent events, it is expected that the document be approved still this year or in the beginning of 2016.

13. Needs (short and medium term)

Below are some of the Mozambican HO short and medium terms needs:

- Rehabilitation of the actual buoy maintenance vessel - Bazaruto. This have been planned to take place this year but was lately delayed;
- Procurement to acquire new survey boat (boat under construction);
- Training in multi beam echo sounder system operation;
- Hydrographic Cat A training course;
- Marine signalization monitoring system;
- Training in ENC production (three cartographers will be involved in ENC on job training at the SAN HO by the end of September, for one month);
- Production of craft charts for Bilene and Bazaruto beaches.

14. Conclusion

The Republic of Mozambique is and will continue committed to improving the hydrographic services provided to the international maritime community as part of its contribution to safety of navigation worldwide;

For compliance of this objective, Mozambique recognizes the need and importance of complying with the guidelines issued by International Organizations such as IHO, IALA, IMO, etc;

One of the main constraints faced by INAHINA is related to the brain drain to the private sector companies, especially those operating in the prospection of hydrocarbon. This puts to the Moz HO, on the one hand, the challenge of finding out ways of motivating employees (mainly hydrographers and oceanographers, among others), in order to assure continued growth of hydrography and related activities. On the other hand, it raises the need of developing local training initiatives (usually rare or even non-existent) or to demand them from outside, which is generally expensive and limited.

It is necessary that hydrographic surveys are extended to cover other areas rather than concentrating them in the ports and ports approximation channels. The hydrographic surveys initiative recently presented by the Hydrographic Service (still awaiting approval), whose objective is to produce charts for pleasure craft for the Bilene lagoon and Costa do Sol beach (as above referred).