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Hydrographic Office
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SOUTH AFRICA
19 July 2011

File ref: FOF/HYD/R/320/19/1

Mr. H.C. Kanyangala
Department of Surveys
Ministry of Lands, Housing & Urban Development
Private Bag B525
LILONGWE
MALAWI

Dear Mr Kanyangala

SOUTHERN AFRICA AND ISLANDS HYDROGRAPHIC COMMISSION (SAIHC)
ADVISORY VISITS: COUNTRY REPORT: MALAWI

References: a) *FOF/HYD/R/320/19/1 – SAIHC Letter No 3/2010 dated 24 August 2010*
b) *FOF/HYD/R/320/19/1 dated 30 March 2011*

1. As part of SAIHC's Capacity Building programme a SAIHC team headed by the SAIHC Chairman, Captain Abri Kampfer SAN, supported by a Norwegian Hydrographic Service representative, Mr Herman Iversen visited Malawi during the period 20 to 24 June 2011. The report arising from this visit is forwarded for your consideration and comment.
2. The main report at Annex A is based on the previous report dated 04 February 2008. For ease of reference the previous report has been used as the basis for this report with the visit team's comments added to each section in italics and underlined. Sections where no comments are made indicate that previous ones remain extant.
3. May I on behalf of the team thank the Department of Surveys and in particular Mr Michael Mzunzu for the unstinting support and assistance given to the team before and during the visit. In summary the team considers that good progress has been made in number of areas since the previous visit and that there is a greatly willingness and enthusiasm to promote national hydrography in Malawi which SAIHC will do all that it can to support. The bringing together of key hydrographic stakeholders developed a rapport that the team recommends should be capitalized upon soon or risk the loss of momentum. The key element is the urgent establishment and encouragement of a National Hydrographic Committee to promote and coordinate hydrographic effort for the national good.

On behalf of the Southern Africa and Islands Hydrographic Commission
Yours sincerely,

Captain Abri Kampfer SAN
Chairman

ANNEX A TO
FOF/HYD/R/320/19/1
DATED 19 JUL 11

COUNTRY REPORT: MALAWI

INTRODUCTION

1. **RHC Involvement.** Malawi is not an IHO member, but is an associate member of the SAIHC. It was represented at the 7th SAIHC Conference in September 2009 and a National Report was available to the SAIHC Visit Team. Malawi has yet to start its application for membership of IHO and was strongly encouraged to do so by the SAIHC team.
2. **Preliminary Liaison.** Mr Michael Mzunzu, Chief Surveyor, Malawi Survey Department assisted with co-ordination of the visit and compiled the visit programme.
3. **Points of Contact.** Details in the IHO Year Book for the Department of Surveys, to which the Hydrographic Survey Unit (HSU) reports, require minor amendment. These amendments are at Appendix 2.

RECORD OF PROCEEDINGS

4. Discussions with Marine Stakeholders were held using facilities in Monkey Bay, at the Marine College Library. Details of the stakeholders and sequence of events are attached as Appendix 3. During the round table discussions it was decided to re-visit the previous visit report of 2008 to ascertain progress made on recommendations, confirm status of maritime activities in Malawi, identify new opportunities and determine areas where hydrographic capacity building assistance may be required.

ICEIDA HYDROGRAPHIC PROJECT

5. Status of follow-up actions resulting from the ICEIDA Evaluation Report as follows:
 - a. If the lake is to be completely covered the input from Mozambique is essential. It will be an interesting development if a multilateral Project with the neighbouring country will become a reality and facilitate achieving the aim of a fully charted lake.
Comment: From Apr 06 to Jun 07 a joint project was conducted utilizing TIMBA and MSU staff assisting INAHINA staff in the data collection phase in Mozambique waters. Still some outstanding issues with regards to the use of TIMBA and it is not known when the data collected will be utilized for the production of new charts. MSU does not have access to the survey data.

Update: Still have no access to the data. Will be requested the next SAIHC meeting.
 - b. Due to lack of necessary navigational aids it is mandatory to install some lighthouses and buoys to increase safety. *Comment: This is an ongoing issue and was also discussed during the 2006 IHO/SAIHC Technical visit. It should be placed on the agenda of the National Hydrographic Committee (NHC) and dealt with as a priority issue.*

Update: An ongoing project has imported solar powered fixed lights (some installed), buoys will be installed next year. There has been a challenge to protect the installations from theft. It is also an intention to create a separate department of Aids to navigation.

- c. A system of Notices to Mariners should be implemented as charts of the lake become available. The base radio station might be used as a first step in promulgating navigational warnings on Lake Malawi by broadcasting Maritime Safety Information (MSI), Navigational and meteorological warnings, meteorological forecasts and other urgent safety-related messages. *Comment: MSU will be responsible for the maintenance of the official charts through Notices to Mariners. The production and distribution of such notices will require further discussion. The process to introduce a system dealing with MSI should also be tabled at the next NHC.*

Update: The met-department is broadcasting forecasts using standard radio and TV, but these are not targeted to mariners. A cooperation with Mozambique is needed to approach this matter for the waters charted by them. There is an ongoing process to establish a department responsible for aids to mariners. Discussion should be held about the method for sending notices to mariners, as many users do not have VHF. The Malawi Defence Force reported that current procedures to notify public on naval exercises is to liaise to local chiefs and to transmit notices of exercise on local radio stations. The visiting team noted very good mobile telephone coverage and suggests that this should be exploited as a means of transmitting safety information as text messages to registered users.

- d. It is necessary to intensify the knowledge of the personnel to handle the new cartographic technology. *Comment: Refresher courses and further training can be dealt with through Capacity Building initiatives.*

Update: MSU should put the requirements into the Malawi national report.

- e. Because of unstable power it is mandatory to buy a power generator for the office to be able to continue the daily work. Power failure in Monkey Bay can last for days. *Comment: Apparently the situation has now improved to such an extent that this is no longer a requirement.*

Update: Confirmed that a generator is no longer required. However a UPS is needed to protect work and equipment.

- f. Continued training of personnel in surveying and charting is essential. Training should be ongoing even for experienced personnel not to become stale in the event of new technologies. *Comment: The SAIHC Capacity Building Plan allows for training and Malawi should ensure that they participate in these activities. Some free courses are also available from time to time and although acceptance is not guaranteed, all efforts should be made to apply for these courses in good time.*

Update: Malawi has applied for courses and should continue doing this. A staff member of the Malawi survey department has attended a hydrography course in Denmark utilizing Malawi financial resources.

- g. The Malawian Government must contribute a new vehicle and replace the Timba's rubber boat. *Comment: MSU should ensure that these critical deficiencies be rectified through budget action.*

Update: At the moment, no working rescue boat exists. When acquiring a new boat (funding is available), usage as a survey platform should be considered.

- h. The Hydrographic Unit has a need to be in touch with local computer companies to maintain and solve network or general computer problems. *Comment. It appears that*

the Department of Surveys has an IT section in Lilongwe. It is critical that all efforts should be made to upgrade computer security at the MSU and consider alternative internet solutions other than dial-up connectivity.

Update: MSU should consider using SkyBand in combination with WiFi solution as the current solution using mobile dongles is expensive and not practical for large data transmissions. Computer security has improved slightly, but updating using the current data connection is not satisfactory.

- i. Cooperation with hydrographic office should be on a permanent basis. *Comment: MSU should continue with efforts to remain in touch with the Hydrographic Office of Iceland.*

Update: No further contact has been achieved.

- j. Reproduction of the Sailing Directions is needed. That could indeed be done in cooperation with Marine Department. *Comment: This is an ongoing issue and was also discussed during the 2006 IHO/SAIHC Technical visit. It should be placed on the agenda of the National Hydrographic Committee (NHC) and dealt with as a priority issue.*

Update: This will be a priority issue, once the Timba is operational again. Use of Ships of Opportunity should also be considered, using own staff to collect the necessary information, including pictures. This should be done in close liaison with the Malawi Shipping Company. The Malawi Maritime safety and the marine department of the ministry of transport and public infrastructure are the main role players, but it is recommended that one single authority assumes full responsibility in close liaison with other interested parties.

- k. The subscriptions for license for cartographic software must be updated every year. *Comment: MSU should ensure that this requirement is reflected in the budget of the unit.*

Update: Caris license has expired, but assurances were given that the license will be renewed. The Visit Team suggests that the Malawi services also look to other software, including any free software that might be used.

REVIEW OF 2006 AND 2008 IHO/SAIHC TECHNICAL VISIT REPORTS

- 6. Status of follow-up actions resulting from 2006 IHO/SAIHC Technical visit:
 - a. *Encouragement of Formation of a NHC, Development of a National Hydrographic Strategy, and RHC Membership.* The Surveyor General was urged to implement regular meetings of the Special Committee on Hydrography. SAIHC support was pledged. In subsequent discussions with the Minister, it was indicated that Malawi will pursue membership of IHO, and guidance on the process will be provided by SAIHC. ACTION: **Malawi Survey Department; SAIHC Chairman.** *Ongoing*
 - b. *Encouragement of Effective and Timely Collection and Promulgation of Hydrographic Information.*
 - i. The Special Committee should give urgent consideration to the identification of the focal point mandated to collect and promulgate urgent navigational safety information. ACTION: **Special Committee for Hydrography.** *Ongoing*

- ii. The Special Committee should identify the optimum means of promulgation of urgent navigational and safety information for lake users, including assessment of the benefit of using any regional GMDSS arrangements which are developed for MSI.
ACTION: **Malawi Survey Department and Marine Department.** *Ongoing*
 - c. Encouragement of Development of Hydrographic Capability. Malawi should consider seeking SAIHC support with the following:
 - i. Conduct of a follow-up advisory visit to the HSU and Survey Department.
ACTION: **Malawi Survey Department and Chairman SAIHC.** *Completed*
 - ii. Identification of opportunities for field and office experience with IHO Member States. ACTION: **Malawi Survey Department and Chairman SAIHC.** *Achieved through joint survey project with Mozambique and a cartography course for one member at the SA Navy Hydrographic Office.*
 - iii. Preparation of bids to the IHO CBC, particularly for funding of training.
ACTION: **Malawi Survey Department and Chairman SAIHC.** *Ongoing*
7. Status of follow-up actions resulting from 2008 IHO/SAIHC Technical visit:
- a. The National Hydrographic Committee, under the leadership of the Malawi Survey Department, have a critical role to play in ensuring that Malawi satisfies all hydrographic requirements and at the same time ensuring that all measures are in place to assist with safe navigation. The formation of a simple and effective MSI system is the most important element of Phase One and should be addressed as a priority.
Comment: Still valid. Many accidents have occurred. The provision of safety information to users must be prioritized. Local radio stations could be used to broadcast information and communication with local chiefs could also be a possibility.
 - b. The Malawi Survey Department should ensure that the MHU have an operating budget that makes provision for renewal of software licenses, replacement and repair of equipment and training of personnel.
Complete
 - c. Computer security should be improved and care should be taken to keep backup copies of all digital data.
(Security: see above) Backup is made to CDs and several sets should be made before recycling the CDs. Some backup sets should be kept off-site. Backup routines should be made systematically and new technology (online, memory sticks, portable hard drives, etc) should be exploited.
 - d. The updating and publication of Sailing Directions (Lake Malawi Pilot) should be undertaken by the MHU with the assistance of qualified mariners. *Outstanding, but will be prioritised.*
 - e. Whilst the RV TIMBA will be fitted with new engines care should be taken to introduce a planned maintenance schedule for the complete vessel that will include daily, weekly and monthly routines. The technical training department at the Marine College should be approached for assistance.

Confirmed with Marine College that training courses are available and personnel of RV TIMBA should attend. A maintenance plan for the whole ship should be made.

- a. Vessels of opportunity should be identified that can be utilised as survey launches with portable survey equipment whilst the TIMBA is not operational. Should be considered even when RV TIMBA is operational as savings on the deployment of the ship can be made especially for small harbour surveys.
- b. A programme of Print on Demand (POD) should commence to get the new charts on the market. Charts should be made available to the Marine College to assist with navigational training.
- c. Consideration should be given to request assistance from the IHO Capacity Building Committee for the provision of a project advisor for the Shire-Zambezi waterway project as early as 2009. Still a requirement, but not an immediate priority.

2009 MALAWI NATIONAL REPORT PRESENTED AT 7TH SAIHC MEETING

8. The national report submitted to the 7th SAIHC meeting made mention of several problems and specific issues that the MSU had to deal with and discussions were limited to these issues to obtain more clarity and identify possible solutions. The issues reflected in the report and the comments are as follows:

- a. Status of RV TIMBA. New main engines have been purchased for TIMBA and will be fitted soon. The overall condition of TIMBA is good with minor defects, but more attention should be given to ship's husbandry and routine maintenance to prevent costly repairs to the hull and equipment that could have been prevented through a proper maintenance programme.
- b. Status of Survey Equipment. RTK Systems are available for positioning and as the priority surveys are planned for harbours and approaches it will be more than suitable, but may require some additional components obtainable through the suppliers of the RTK equipment. It does however result in a substantial cost saving as no subscription fee will be payable. The echosounder on TIMBA is a fairly early model and it would be recommended that it rather be replaced than to attempt any repairs. It is possible that the transducer may still be usable with a new system. If the requirement exists to obtain full bottom coverage of approaches and harbours, it will be advisable to consider investing in a shallow-water side-scan sonar.
- c. Lack of a Survey Launch. The requirement for a shallow draft launch to conduct surveys in coastal and shoal areas is valid, but results in an additional requirement for a portable echosounder. TIMBA requires a new rubber boat and it is the opinion that this can also be utilised as a survey launch deployable from TIMBA or by road on a trailer. It will be advisable to invest in a rigid hull inflatable boat as it is more durable. In the mean time consideration should be given to identify craft in other government departments, eg Police and Marine Unit, that can be utilised as a survey launch.
- d. Printing of Charts. It is the opinion that consideration should be given to commence with print-on-demand (POD) programme of all the new charts. The current demand of charts is fairly low and from discussions it will most probably remain so for some time. Colourfast ink should be acquired for the A0 printer to print the charts. The new charts can be made available to users of the lake almost immediately on demand or provided as limited stock to the various points of selling.

- e. Production of Sailing Directions. Sailing Directions and Notices to Mariners are the responsibility of a Hydrographic Office. Mariners should use the Sailing Direction with the navigational charts to ensure that they have all available information to navigate safely. MHU should undertake the responsibility to revise and produce the Lake Malawi Pilot with advice from staff of the Marine Department, Malawi Lake Services and the local fishermen. The qualified and experienced mariners can assist with the provision of information on safe routes, avoidance of navigational dangers and instruction on entering or leaving harbours, which can only be obtained through many years of practical experience of sailing on the Lake. The MHU surveyors should sail with vessels to get exposure to the requirements of the mariners and note any visual aids to navigation that should be placed on charts to assist mariners with navigation. Once the Lake Malawi Pilot has been updated and back in use, any new information albeit from surveys or information supplied by mariners, will be promulgated by Notices to Mariners for updating the publication and the charts.

MALAWI S-55 INPUT

9. Input of 2008 is unchanged as no new surveys were conducted nor charts produced. It was indicated that future priority effort will be placed on harbours and approaches and areas where development has taken place.

DESCRIPTION OF MARITIME ACTIVITIES

10. A round table meeting of authorities engaged in activities on Lake Malawi confirmed the continued importance of water transportation on the Lake and the following should be noted:

- a. Trade and maritime traffic. A fixed scheduled regional and national passenger service are provided by the Malawi Shipping Company. There are also numerous small wooden passenger vessels capable of carrying up to 40 passengers. Road transportation is also considered as a popular alternative. Mention was made of a possible introduction of a fast ferry service to the islands and the possibility of cruise ship was also mentioned. Planning is also being conducted to develop a RO-RO facility at Kata Bay.

Only two harbours have facilities for tanker handling, but no tanker is operational at present. Main bulk cargo transportation is sugar and fertilizer, but there is a possibility to expand into shipment of coal and cement. Mention was made of a requirement for a new harbour at Kanbwe, specifically for the transportation of cement.

- b. Fisheries. There is local artisanal activity. Four trawlers are operated commercially. The Fishery Department also operates a RV. Some fish farms are operational, but are kept close inshore. There is a definite requirement that these facilities should be properly marked with the necessary buoys and that such areas are also depicted on the national charts. Concern was also expressed by the fishing company MALDECO that heavy losses are being experienced through theft of fish from the fish cages. In addition to the depiction of allocated fish farming areas, all marine reserves and protected areas should also be indicated to allow for law enforcement patrols in these areas to prevent theft and illegal fishing.
- c. Safety of Navigation. The Marine Department is responsible for the ports and for the maintenance of existing aids to navigation. There is currently no buoy tender and the Marine Department will have to identify a suitable vessel that can be utilised as a buoy tender. As there is plans to upgrade the buoyage system in the near future this requirement will have to be prioritised. The need for a light to mark a submerged rock

near Nkoma Island was highlighted by the maritime community as it was considered to be a danger to navigation. Tide gauge information is currently not available to the mariners, but suitable methods should be identified to make this information available to the public, e.g. newspapers. It was confirmed that the chart datum is 472m above mean sea level and the current water level is 474m.

- d. Chart Requirements. The Malawi Defence Force conducts exercises on the lake and requires dedicated exercise areas to be indicated on charts. There are at the moment no official promulgated areas and charting action will therefore have to wait. The Marine College expressed a need for new charts with metric units to train students as the existing charts of Lake Malawi are in imperial units. A need was also expressed for an ECDIS simulator for training purposes. The MSU should give consideration to outsource the capture of all the charts of Lake Malawi in S-57. Magnetic variation is not known as there is no magnetic observatory in Malawi. There is however online free available magnetic models that should be considered to be used as an interim measure.
- e. National Hydrographic Committee. The Stakeholders Forum should be formalized as the National Hydrographic Committee and a fixed meeting schedule should be established. The pro forma NHC agreement on the IHO website was provided to the Malawi Survey Department to be considered to be used as the basis agreement for a Malawi National Hydrographic Committee. The Minutes of the last Stakeholders Meeting held in 2010 was provided to the Visit Team and the hydrographic requirements identified are attached as Appendix 4. This document is a very good start and should be formalised as the National Hydrographic Services Requirement. The next step should be to prioritise the requirements and allocate resources to achieve the required objectives.

CAPACITY BUILDING

11. Feedback was provided to the meeting on upcoming capacity building events planned and approved for 2011 and 2012. These included the IMO funded 2-weeks Regional Training Course on Basic ENC and ENC Production that will be held in Durban (24 Oct to 04 Nov), Workshop on Port and Shallow Water Surveys to be held in Simon's Town (14 – 18 Nov) and a Phase I Skills and Chart Awareness Course to be held in 2012, possibly in Nairobi, Kenya. The Malawi Survey Department was encouraged to participate in these events and to continuously identify capacity building requirements and raise them formally through the SAIHC channels. The Visit Team would recommend that consideration should be given to request assistance to get TIMBA's survey systems back into operation once the mechanical problems have been rectified.

CLOSURE AND SITE VISITS

12. The meeting formally closed by late afternoon on Wednesday, 22 June 2011 and the forenoon of Thursday 23 June 2011 was spent on visiting facilities in Monkey Bay to allow for achieving full visibility. The visit to the Marine Training College was most interesting and it was noted that the training facilities provided by projects funded by JICA and ICEIDA was adequate, well maintained and fully utilised. A short visit was also conducted to the Fishery Research Unit and the Malawi Defence Force base in Monkey Bay where the team could view the two new main engines for TIMBA. The site visits were concluded with a visit to Maldeco Fisheries in Mongochi. The visit to the Norwegian Embassy in Lilongwe on 24 June 2011, allowed the Acting Survey General, Mr H C Kanyangala and the Chief Surveyor, Mr. M Mzunzu to brief the Norwegian Ambassador, Mr Asbjørn Eidhammer, on the Malawi Hydrographic Status and request to be considered for possible assistance in the Norwegian Aid Programme.

CONCLUSION

13. The work of the Hydrographic Unit should be made visible at high levels of government and achievements made on limited funding will assist greatly in promoting the cause. All efforts should therefore be made to get new charts on the market and in publishing a new Lake Pilot. This can be done within present capabilities and with limited funding.

14. The SAIHC Visit Team noted the marked improvement in Hydrographic awareness and progress made since the previous visit. The value of round table discussions of all relevant interested parties was again noted and should be formalised through regular meetings of a NHC.

APPENDIX 1 TO
FOF/HYD/R/320/19/1
DATED 19 Jul 11

MINISTRY OF LANDS, HOUSING & URBAN DEVELOPMENT
DEPARTMENT OF SURVEYS - HYDROGRAPHIC DIVISION

DRAFT PROGRAMME FOR THE IHO/SAIHC VISIT TEAM

DATE	<u>VENUE</u>	<u>TIME</u> (HRS, CAT)	ACTIVITY	ACTORS
Monday, 20 June 2011	Lilongwe airport	12:25	Welcome SAIHC Technical team	Surveyor General personnel / Chief Staff Surveyor/
	Lilongwe	15:00	Courtesy call on PS / Hon Minister	SAIHC Team / Surveyor General
Tuesday, 21 June 2011	Ministry Headquarters Zowe Conference Room	09:00 - 09:30	Presentation on World Hydrography Day	Surveyor General SAIHC Team
	Ministry Headquarters Zowe Conference Room	09:30 - 12:30	Roundtable Discussions with Stakeholder	SAIHC Technical Team/ Stakeholders
		14:00	Travel to Mangochi, Monkey Bay	SAIHC Team/ CSS Marine Dept Marine Safety Division Head
Wednesday, 22 June 2011	Monkey Bay	09:00 - 09:30	Visit Hydrographic Ship RV Timba & Lake Services Boatyard	SAIHC Team Hydrographic personnel Marine Services Personnel Surveyor General
		09:30 - 10:30	Discussions with Marine Dept on Radio Navigational warnings	SAIHC Team Hydrographic personnel Marine Services Personnel Surveyor General
		10:30 - 11:30	Discussions on Hydrographic project	SAIHC Team Hydrographic personnel Surveyor General
	Monkey Bay	11:30 - 12:30	Discussions on Capacity Building issues	SAIHC Team Hydrographic personnel Surveyor General

Wednesday, 22 June 2011	Monkey Bay	12:30 - 14:00	Lunch Break	All
		14:00 - 17:00	Discussions continued	SAIHC Team Hydrographic personnel Surveyor General
		17:00	Closure	SAIHC Team leader/ SG
Thursday, 23 June 2011	Monkey Bay	09:00 - 10:00	Visit Marine Training College	SAIHC Team SG
		10:00 - 11:00	Visit Fisheries Research Unit & Marine Defence	SAIHC Team SG
	Mangochi	11:00 - 13:00	Visit MALDECO fisheries	SAIHC Team Surveyor General
		13:00	Departure for Lilongwe	SAIHC Team SG
Friday, 24 June 2011	Lilongwe	9:00 - 11:00	Visit Norwegian Embassy	SAIHC Team SG
	Lilongwe	11:00	Travel to airport & Departure	SAIHC Team/ SG Personnel

APPENDIX 2 TO
FOF/HYD/R/320/19/1
DATED 19 JUL 11

AMENDMENT TO ENTRY FOR MALAWI IN THE IHO YEAR-BOOK

MALAWI (REPUBLIC OF)

HYDROGRAPHIC SURVEY UNIT
Department of Surveys
Ministry of Lands, Housing and Urban Development

Name and rank of the Director or Head: Mr H.C. Kanyangala, Acting Survey General

MARINE DEPARTMENT
Ministry of Transport and Public Infrastructure
P/Bag A81
Lilongwe
MALAWI

Captain T. W. Kamanga, Chief Surveyor of Vessels

Telephone: (265) 01 755 546

FAX: (265) 01 758893

E-mail: admin@marinegov.net

**APPENDIX 3 TO
FOF/HYD/R/320/19/1
DATED 19 Jul 2011**

SUMMARY OF EVENTS

Date

Event

Visit to Malawi

20 Jun 11	Arrived Lilongwe, Malawi. Welcomed by acting Survey General, Mr H C Kanyangala and the Chief Surveyor, Mr. M Mzunzu																																		
21 Jun 11	<p>Meeting the Principal Secretary, Ministry of Lands, Housing and Urban Development, Mr. Fletcher E.Y. Zenengeya.</p> <p>Travel by road to Mangochi.</p> <p>Stake holder meeting in Monkey Bay, at the Marine College Library chaired by Mr M. Mzunzu, Chief Staff Surveyor, with the following attendees:</p> <table border="1"> <tr> <td>Mr Hastings Mbale</td> <td>Water resources department</td> </tr> <tr> <td>Mr E S Hojane</td> <td>Marine Police</td> </tr> <tr> <td>Mr Bryson Banda</td> <td>Wildlife</td> </tr> <tr> <td>Mr Dixie Kwatani</td> <td>Civil Aviation</td> </tr> <tr> <td>Mr Joshua Chitsonga</td> <td>Malawi Shipping Company</td> </tr> <tr> <td>Mr Simon Mphuka</td> <td>Malawi Defence Force</td> </tr> <tr> <td>Mr Precious Jali</td> <td>Malawi Defence Force</td> </tr> <tr> <td>Mr Peter Limau</td> <td>Department of Surveys</td> </tr> <tr> <td>Mr Burton Kandindi</td> <td>Department of Surveys</td> </tr> <tr> <td>Mr David Longue</td> <td>Department of Surveys</td> </tr> <tr> <td>Mr George Mwale</td> <td>Club Makokola</td> </tr> <tr> <td>Mr Geoffrey Kanyerere</td> <td>Fisheries Department</td> </tr> <tr> <td>Mr Fredrick Sadyalunda</td> <td>Marine Technical College</td> </tr> <tr> <td>Anthony Khoropa</td> <td>Marine Technical College</td> </tr> <tr> <td>Capt. T W Kamanga</td> <td>Marine Department</td> </tr> <tr> <td>Mr H C Kanyangala</td> <td>Acting Survey General</td> </tr> <tr> <td>Miss Gladys Chirambo</td> <td>Department of Surveys</td> </tr> </table>	Mr Hastings Mbale	Water resources department	Mr E S Hojane	Marine Police	Mr Bryson Banda	Wildlife	Mr Dixie Kwatani	Civil Aviation	Mr Joshua Chitsonga	Malawi Shipping Company	Mr Simon Mphuka	Malawi Defence Force	Mr Precious Jali	Malawi Defence Force	Mr Peter Limau	Department of Surveys	Mr Burton Kandindi	Department of Surveys	Mr David Longue	Department of Surveys	Mr George Mwale	Club Makokola	Mr Geoffrey Kanyerere	Fisheries Department	Mr Fredrick Sadyalunda	Marine Technical College	Anthony Khoropa	Marine Technical College	Capt. T W Kamanga	Marine Department	Mr H C Kanyangala	Acting Survey General	Miss Gladys Chirambo	Department of Surveys
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Capt. T W Kamanga	Marine Department																																		
Mr H C Kanyangala	Acting Survey General																																		
Miss Gladys Chirambo	Department of Surveys																																		
22 Jun 11	Continued stake holder meeting in Monkey Bay, Visit to the dockyard and inspection of MV Timba																																		
23 Jun 11	<p>Visits to Marine Technical College, Malawi Defence Force base, Malawi Fishery Research Unit in Monkey Bay.</p> <p>Visit to Maldeco Fisheries in Mongochi.</p> <p>Depart for Lilongwe.</p>																																		
24 Jun 11	<p>Meeting with the Norwegian Ambassador, Asbjørn Eidhammer (Visit Team, Mr H C Kanyangala & Mr M. Mzunzu)</p> <p>Depart from Lilongwe</p>																																		

**APPENDIX 4 TO
FOF/HYD/R/320/19/1
DATED 19 JUL 11**

**STAKEHOLDER REQUIREMENTS FROM THE HYDROGRAPHIC SURVEY OF LAKE
MALAWI AND OTHER MAJOR WATER BODIES**

STAKEHOLDER	KEY ACTIVITY	REQUIREMENTS
1) Marine Services Department	Safety of Navigation	<ul style="list-style-type: none"> - New lights for new hazards - Large scale charts for examinations - Electronic Charts Display Information System (ECDIS)
(a) Marine Training College	Training	<ul style="list-style-type: none"> - Training Charts for each category of Charts produced (covering Likoma and Chizumulu, Chilumba area, Cape Maclear, Chipoka, Mbamba Bay [Other side], Makanjila, and the Eastern arm) - Electronic Chart Display and Information System (ECDIS) - Plot radio stations including other notable features such as churches on charts
(b) Marine Services Department	Shire/Zambezi water way	<ul style="list-style-type: none"> - Thorough surveys at the World Inland port of Nsanje and detailed charts.
(c)	Lake Malawi Ports	<ul style="list-style-type: none"> - Detailed charts for Lake Malawi ports and anchorages (existing and future) - Buoys installed and shown on the charts in accordance with International Association of Lighthouses Authority (IALA)
2. Fisheries	Small scale caged farming	<ul style="list-style-type: none"> - Digital maps near the shore lines (for Small scale caged farming) to cover all districts along Lake Malawi)
	Zoning of water masses (Private/public ownership) to demarcate boundaries	<ul style="list-style-type: none"> - Hydrographic Charts to cover these
	Fishing in outcrop rocks in the Lake (potential areas for sustainable fishing)	<ul style="list-style-type: none"> - Bathymetric Sheets

	Determination of a fishing ground from the shoreline	<ul style="list-style-type: none"> - Determination distances in nautical miles or new metric system
3. MALDECO	Fishing	<ul style="list-style-type: none"> - More detailed information on Domira Bay - Provide detailed information around MALDECO anchorage to cover Cage Areas - Indicate concentration of major fishing grounds - Highlighting of major shores based installations like Transmitters on Nkopola Hill - Indication of major hotels along the shorelines -
4. Environmental Affairs Department	EIAs (Assessment of impacts of agro-chemicals on the shoreline)	<ul style="list-style-type: none"> - Charts to show depth of Lake Malombe and Upper Shire - Boundary of Lake Malawi National Park (Cape Maclear) - Zoning of the Shoreline of the entire Lake Malawi - (All these to be replicated to the whole country) -
5. Malawi Lake Services (MLS)	Safety of Navigation	<ul style="list-style-type: none"> - Charts for safety of navigation - Some Bathymetric data should be made available on demand - Need for information from Fort Maguire to Chilinda, Saidi Matola, Lukoloma, Malindi up to Samama, Shire river entrance up to L. Malombe, Liwonde - Eastern Coast line from Makanjila, Mozambique and Tanzania - Western coast line (Mnema, Chia in Nkhotakota) - Bana-Kasitu Area - Three Regional charts (Northern portion, Central Portion and Southern Portion) and One chart for the entire Lake -
6. Tourism Industry (Club Makokola)	Tourists sailing/Pleasure boating	<ul style="list-style-type: none"> - Detailed charts on the small Islands for tourists vessels (Boadzulu Island, and way to Lake Malombe up to upper Shire towards Liwonde, Makanjila) - Charts also to show areas of attraction (Hotels e.t.c.)

7. Malawi Police Service (Marine Police)	Security/ Patrols	<ul style="list-style-type: none"> - Provision of Charts covering the entire Lake Malawi - Provision of Information concerning navigation on all navigable water bodies of Malawi (Lakes Chilwa, Malombe and the Shire River)
8. Malawi Defence Force (MDF)	Border patrols/ security	<ul style="list-style-type: none"> - Ordinary navigation charts covering the whole Lake Malawi (MDF navigates everywhere in the Lake for security operations) - Information indicating international boundaries - Southern Part of the Lake so shallow, many obstacles which are not know, need for large scale (Detailed) maps/thorough surveys. e.g. Lake Malombe. - Military Training Exercise Areas (Coordinates to be provided by MDF)
9. Department of Surveys	Provide hydrographic information	<ul style="list-style-type: none"> - Repair of the engines for the RV Timba - Hydrographic surveys of the Lake and other major water bodies -
10. Water Resources Department	- Mapping and Monitoring	<ul style="list-style-type: none"> - Rates of sedimentation - Water quality stratification - Developments along the Lake - Frequently flooded areas -
11. Water Supply Department	Water quantity and quality	<ul style="list-style-type: none"> - Positioning of intakes along the water bodies - River profiles and cross-sections - Markings of river mouths -
12. Irrigation Department	Infrastructure development	<ul style="list-style-type: none"> - Rates of sedimentation - Positioning of intakes along the water bodies - River profiles and cross-sections
13. Meteorological Services Department		<ul style="list-style-type: none"> - NOT PRESENT AT MEETING
14. ESCOM	Generation of Hydro-power electricity	<ul style="list-style-type: none"> - River profiles (depth and width at various places) - Rate of siltation/sedimentation for various rivers - Rivers flow rate (Modern flow monitoring methods of rivers) - Types of aquatic weeds

15. Department of Tourism	Tourism promotion and development	<ul style="list-style-type: none"> - Detailed charts of all water bodies including Islands - Details of attractions, accommodation, along water bodies - Developments along the Lake, water quality, depth and distances, discoveries. E.g. Ship wrecks - Sailing Pilots - Designation of Bilharzia free areas -
16. Department of Civil Aviation	Search and Rescue (SAR) operations in conjunction with the Marine Services Department	<ul style="list-style-type: none"> - Coordinates (WGS84) of Lake/River Boundary - Positions (Coordinates WGS84) of important features along the lakeshore or rivers (or near lakeshore) e.g. light houses, ports, masts, obstacles) - Lake depth profile (Lake/River) and positions -
17. Department of Disaster Management Affairs	Hazard Mapping/ Disaster risk management	<ul style="list-style-type: none"> - Flood prone areas - Safe areas for human use, e.g. safe from crocodile attacks - Areas that experience strong winds especially those close to human settlements -
18. Department of Geological Surveys	Exploration for hydrocarbons, heavy mineral sands, rock phosphates etc Geo-hazard Mapping	<ul style="list-style-type: none"> - Detailed digital and hardcopy 2D and 3D high resolution Lake bed images (maps) for major water bodies - Raw data collected during Lake bed mapping - Bathymetric charts for Lake Malawi - Level and rate of sedimentation in the major water bodies
19. Department of Land Resources and Conservation	Protection of/Rehabilitation of degraded riverbanks	<ul style="list-style-type: none"> - Charts/digital maps for degraded river/stream banks
20. Ministry of Health and Population Services	Delivery of health services and information	<ul style="list-style-type: none"> - Detailed charts for specific places of anchorage - Accurate depths at anchorage and beaching places