



REPORT

Technical Visit

to

THE KINGDOM OF SAUDI ARABIA

26-28 March 2007

Technical Visits to the Kingdom of Saudi Arabia
(IHO Work Program 2007, Tasks 2.1.7 and 2.1.10)
26 - 28 March 2007

I.- General Information.

One of the strategic issues identified in the International Hydrographic Organization (IHO) Strategic Plan is Capacity Building, which is essentially the building of effective national organizations where needed or the improvement of existing capabilities. Therefore advisory visits to assess requirements and shortcomings, as well as the promotion and coordination of technical cooperation are very important.

The IHO Program 2 “Capacity Building” addresses principally the requirements for Member States to fulfil their roles. Nevertheless there are still several other States that do not have yet any hydrographic capability, and therefore IHO needs to support and encourage those countries to establish such capability. Raising global awareness of the importance of hydrography and encouraging the establishment of new Hydrographic Offices are vital to achieve a global coverage of effective hydrographic services, which is the role of the IHO.

In this line, Program 2 “Capacity Building” of the IHO Work Program 2007, has included the following Tasks:

a) Task 2.1.7. Carry out visits of Technical Cooperation to the following countries and organizations: ROPME Sea Area Hydrographic Commission (RSAHC) & North Indian Ocean Hydrographic Commission (NIOHC) including Egypt, Sudan and Djibouti and others to be determined (with the participation of the International Hydrographic Bureau (IHB) the IHO Secretariat).

b) Task 2.1.10 Technical Visits to be paid by IHB to the RSAHC and NIOHC Technical visits including Egypt, Sudan, Djibouti, Iran, Kuwait and Qatar. Possible also **Saudi Arabia**, Eritrea and Yemen (if not executed in 2006) to include contact with PERSGA national representatives and IMO regional representative), first quarter 2007.

The inclusion of these technical visits in the IHO Work Program was due to a decision of the 2nd RSAHC and the approved IHO Capacity Building Work Program for 2007.

In November 2006, the IHB started organizing these Technical Visits. Due to the complexity of the coordination required, the IHB decided to prepare various travel options and it was planned to undertake the visit to the Kingdom of Saudi Arabia from the 26 to 28 March 2007. The Kingdom of Saudi Arabia main interest was to receive during the visit, preliminary advice on the establishment of a National Hydrographic Office, and the visit was programmed with this objective in mind.

II.- Participant and Program

The participant was Capt. Hugo GORZIGLIA, IHB Director in charge of Capacity Building (CB) matters and coordinator of the ROPME Sea Area Hydrographic Commission activities (RSAHC). The visit program is provided in **Annex A**.

III.- The Technical Visit

1. Status of the Kingdom of Saudi Arabia

The Kingdom of Saudi Arabia became the 78th IHO Member State on the 27th February 2007, that is to say, just a few days before the technical visit took place. The focal point for Saudi Arabia is the General Directorate of Military Survey (GDMS) that with its Hydrographic Survey Department (HSD), both under the Ministry of Defence and Aviation, represents the country at the IHO. The Kingdom participates in two Regional Hydrographic Commission of the IHO: the North Indian Ocean and the ROPME Sea Area Hydrographic Commissions.

The following figures indicate the importance of the maritime sector to the Kingdom of Saudi Arabia economy and development:

- 95% of Saudi imports and exports pass through the Kingdom's sea ports.
- 70% of the cargo handled are exports.
- 2 million TEUs are handled annually.
- 12,000 ships visit Saudi ports annually (one ship every 30 minutes).
- 97% of The Ports' staff are locals. In marine piloting they are all Saudi nationals.

The Kingdom of Saudi Arabia has an extensive coastline of approximately 3502 km and has 8 major ports (industrial and commercial) of which 5 are on the Red Sea coast and 3 on the Arabian Gulf coast. The Saudi Seaports Authority (SSA) is responsible for the survey requirements of all Saudi Arabian commercial port, providing hydrographic services and charts for the ports and its approaches as needed. The SSA has a regular periodic program for surveying the Kingdom's seaports and the routes. SSA is the national agency responsible for the maintenance of navigational aids and the broadcasting of navigational warnings liaising with NAVAREA IX Coordinator. There are about 633 navigational aids, the periodic maintenance of which is done by two vessels dedicated for this purpose; one serves the Kingdom's Red Sea coast, while the other operates in the Gulf. The Kingdom of Saudi Arabia is member of the Executive Committee of the International Association of Lighthouses Authorities (IALA).

The Global Maritime Distress and Safety System (GDMSS) is with the Border Guard General Directorate under the Ministry of Interior. Three well technically advanced international systems have been installed and coordination is in progress with all other concerned agencies in order to activate the GDMSS, considered an important aid to the Kingdom's efforts for carrying its obligation under the Search and Rescue Convention.

Other national components related with hydrography are:

- The Ministry of Petroleum and Mineral Resources (oil company).
- The Ministry of Transport, King Abdul Aziz University (College of Marine Sciences).
- The Meteorology and Environmental Protection Administration (MEPA).
- The National Commission for Wildlife Conservation and Development (NCWCD).

The Kingdom of Saudi Arabia is member of the Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA).

The existing nautical charts mainly correspond to the product of a project executed in the eighties, contracted by the SSA that provided over 80 charts of the territorial waters at different scales. The HSD is working with other national entities on a program to carry out the required update in accordance with approved international standards.

To update the charts considered to be of high priority, the HSD has an on-going program of cooperation with the United Kingdom's Hydrographic Office (UKHO) the objective of which is to survey these areas aiming at producing digital and paper-printed charts. HSD specialists being involved in the hydrographic survey work and the production of charts done jointly by GDMS and UKHO. Also there are cooperation programs with Pakistan to survey specific areas of importance. Data collected by off-shore oil company Aramco, in its area of concession, is also being gathered to be used in the effort to update the charts of the Arabian Gulf issued by UKHO. The production of ENC's has not yet started.

Efforts are being made by the HSD with the Faculty of Marine Sciences of the King Abdulaziz University in Jeddah to establish a national data center that could handle all marine and hydrographic information aiming the highest possible availability to all the community, mainly researchers and hydrographers.

There are no dedicated hydrographic training and education facilities in Saudi Arabia and universities run courses oriented to land surveying and topographic mapping. The King Abdulaziz University in Jeddah is specialized in marine sciences and has recently established a maritime department that is working actively in the establishment of a hydrographic training program. The HSD is demanding with urgency training on hydrographic survey and nautical cartography for the naval officers that have just join the Department.

Despite of the maritime nature of the Kingdom of Saudi Arabia, the Kingdom does not have a National Hydrographic Office. Nevertheless, agreement has been reached at a governmental level to raise the level of the GDMS changing its status to General Commission for Survey, under which Hydrography will fall. The HSD is working towards the establishment of the hydrographic component in the form of National Hydrographic Office, an initiative that considers all governmental agencies active in the field of hydrography, nautical charting and various maritime activities.

2. Organization and staff

Lt. General Morayyea H. AL-SHAHRANI is the Director of GDMS and Rear Admiral Abdul Rahman Mohd – AL SHEHRI is the Director of the Hydrographic Survey Department of the GDMS. Part of the staff that participated in the meetings were:

- Capt Mohammed Al-Thukair
- Capt Mohammed Al-Harbi
- Lt Cdr Abdulaha Al-Ahmari
- Lt Waleed Al-Muhanna
- C.V. Faisal Al-Saaq

3. Meetings

During the technical visit several meetings took place with authorities of the Kingdom of Saudi Arabia responsible for maritime safety issues. These meetings were held in the Conference Room of PERSGA Headquarters, Jeddah, during one-day and a half, 27 and 28 March 2007.

3.1.- First Day Meetings.

Dr. Ziad Abu-Ghararah, Secretary General of PERSGA, made the opening of the first day meetings. He gave a warm welcome to the IHO representative and referred to the structure and objectives of PERSGA. Dr. Abu-Ghararah highlighted the intense maritime traffic and shipping that take place in the Red Sea, where the risk of accident constitutes a permanent concern of all countries in the region. To contribute to avoid maritime accidents PERSGA has made great efforts in hydrography aiming to improve safety to navigation especially on areas where traffic is intense, helping to establish separation schemes that have been adopted by the International Maritime Organization (IMO). He concluded by saying that hydrography was very important for the region due to the enclosed characteristics of the Red Sea and the potential environmental impact that any accident could cause to the valuable existing ecosystem.

Rear Admiral Abdulrahman Mohd Al-Shehri, Director of the Hydrographic Survey Department of the GDMS welcomed the IHO representative and expressed the importance of the visit as the Kingdom was now an IHO Member State and was moving towards the establishment of a National Hydrographic Office. He appreciated the excellent coordination work PERSGA does in the region, indicating that progress so far made was in great part due to PERSGA permanent and persistent support. In fact the headquarters of PERSGA in Jeddah has been used in the past for several hydrographic related meetings, including the 5th NIOHC meeting in 2005.

The IHO representative thanked both previous speakers and highlighted the opportunity of this technical visit, considered the first official meeting after having Saudi Arabia joined the IHO. He commented that the existence of PERSGA should be considered as a regional strength that should be strongly considered by the IHO as a coordination platform facilitating the work of the NIOHC. As the objectives of PERSGA are closely related to those of the IHO, further developments in the field of hydrography in the region should well take this into consideration.

After these introductory remarks, an IHB presentation covering the following main points followed:

- a) Objective of the Technical Visit
- b) General concepts of Hydrography
- c) The international scenario related to hydrography
- d) The IHO
- e) SOLAS V Regulations 4 and 9 States' general responsibilities
- f) Challenges and Conclusions
- g) Discussion

The conclusions of the presentation highlighted the importance of establishing a National Hydrographic Office with the responsibility to provide official hydrographic, nautical cartography and safety to navigation services in accordance to SOLAS. Also it was considered very important to establish a National Hydrographic Committee or similar body, to coordinate the national hydrographic efforts to facilitate the Kingdom of Saudi Arabia to become inserted in the regional and worldwide arena. All related national agencies should participate in this Committee with a national view rather than with an agency view. Finally it was recommended to undertake a study to

identify the shortcomings, opportunities, threats and strengths, and the best way forward to improve the present situation, with a systematic national and strategic approach.

The presentation generated a very interesting and positive discussion. All participants were given the possibility to express their views from their perspective. In general it was felt that the idea of establishing both bodies had unanimous support.

After the discussion that followed the IHB presentation, Dr. Ahmed Salah Khalil offered a presentation on Reduction of Navigation Risk & Marine Pollution in the PERSGA Region. The establishment of PERSGA in 1982, namely “The Jeddah Convention”, has made possible the coordination of several initiatives that aiming protection of the marine environment, has as an important hydrographic related component. Highlights of PERSGA have been: a new vessel traffic separation scheme put into operation in the southern Red Sea, with plans for further extension to other areas; improve navigation survey data, resolving some unknown and uncertain obstructions; plans for the preparation of sensitivity maps for the Red Sea; plans for the extension of Automatic Identification System (AIS) and Vessel Traffic System (VTS), among others initiatives. It was made evident the importance of the MOUs signed by PERSGA and other international organizations, a situation that could be considered by the IHO, as a mechanism to enhance hydro-cartographic coordination and cooperation in the region.

A presentation on Hydrographic Survey and its application in PERSGA Region originally considered in the program was cancelled to benefit the discussion. Nevertheless the IHO representative was provided with a full paper of the mentioned presentation.

To finalize the morning session, the Director of the HSD, emphasising the concept under which the new national structure was being considered, explained a complete description of the national situation. It was made clear that the General Commission for Survey would considered a mixture of military and civilian staff, and will take over as leading authority in charge of survey works in general. Admiral Al-Shehri highlighted the importance of taking advantage of the IHO experience in the establishment of such a national agency. Following, a wide discussion took place analysing the national as well as international relations that such a new organization should have. In fact many national sectors were identified as demanding hydro-cartographic products and services. In the same manner, regional and other international organizations were identified as important partners.

At lunch the discussion was concentrated in hydrographic training. The IHO representative was provided with a preliminary draft copy of a Hydrographic Survey Program that is under preparation by members of the Department of Maritime Studies, Marine Science Faculty, King Abdulaziz University. The course, after having considered by the National Focal point might be sent to the International Advisory Board for consideration and possible homologation to international standards.

In the afternoon Lt. Cdr. Naji Mansour Al Johani from the Border Guard General Directorate, Ministry of Interior provided a complete presentation of its mission, especially as regard to Search and Rescue (SAR). Lives and property care are the objectives of the SAR infrastructure. He explained the distribution of the facilities and the characteristics of the two specialized centres in support of SAR operations, one in the Red Sea and one in the Persian Gulf.

In the evening a very interesting discussion took place with Dr. Khalid Zubier and colleagues from the Faculty of Marine Sciences of the King Abdulaziz University as regard to the steps required to establish a National Marine Data Centre.

3.2.- Second Day Meetings.

During the second day a representative from the Saudi SeaPort Authority provided a presentation highlighting the responsibilities of the organization as regard to hydrography and charting. It was reported that the last systematic hydrographic survey project in conjunction with the production of its nautical charts dates 1982, and that an update of the information was absolutely required. The former hydrographic launch does not exist any longer, but plans for a new contract is underway. It was indicated that exists good cooperation with the HSD. The presentation did not give evidences of the level of knowledge and know-how the personnel involved has to define terms of reference to call for a contract and later to exercise the quality control and quality assurance of the final product. As regard to the provision of Marine Safety Information, it was confirmed that relevant information ios passed to the NAVAREA IX Coordinator.

The last presentation was made by the IHO representative on the establishment of a National Hydrographic Office. The scheme for the presentation followed is provided in **Annex B**. This was a very interactive presentation and all elements within it were deeply commented and discussed. It was made clear that some very crucial definitions need to be taken at higher level, as they fall into national strategic objectives. Also it was emphasized that there are no recipes, but the examination and study of some examples on how other nations have organized their Hydrographic Offices might be of great value. The presentation provided included some of these examples.

After this presentation and following discussion, the Director of the HSD closed the meeting thanking the IHO for the support provided. He requested that the report of the technical visit include a set of conclusions and recommendations that would help the Kingdom of Saudi Arabia to move forward the initiative of establishing a National Hydrographic Office and any other aiming to improve the actual situation in order to be able to provide a hydrographic and cartographic service according to the international standards.

IV. Conclusions and Recommendations:

As a result of the discussions, the IHB representative would like to offer the following conclusions and recommendations to the hydrographic authorities of the Kingdom of Saudi Arabia.

1.- The Kingdom of Saudi Arabia has a privileged geographic position from a maritime perspective with a huge and increasing maritime activity. Its hydrographic and related authorities seem to be fully aware of the importance of hydrography. Despite of the individual roles some of these national agencies have and the efforts they make, the Kingdom does not have within its governmental structure a formal National Hydrographic Office responsible for this important subject, that should be considered as a national strategic objective. . It has been concluded that there are no recipes in terms of the ideal structure of a National Hydrographic Office, therefore studying existing structures and agreeing high level conceptual definitions at a high governmental level seem vital before start working the details. It is strongly recommended that the emerging willingness to establish a National Hydrographic Office continues “full speed ahead” monitored by the HSD with the support of the IHB and the IHO, taking advantage of the Kingdom’s IHO membership status

2.- The meetings had during the technical visit should be considered as a starting point for further discussions on the way the Kingdom would like the IHO to provide advice in establishing a National Hydrographic Office and a National Hydrographic Committee integrated by all the national agencies, the academic and the private sector that benefit from the hydro-cartographic products and services, an idea that seems to capture the interest of those that participated in the meetings. It is recommended to adopt administrative measures to put in place both bodies, the

National Hydrographic Office and the National Hydrographic Committee (NHC). One of the first recommended tasks to be assigned to the NHC would be to carry out a “Strength, Weakness, Threats and Opportunities” analysis, to identify a national program that would improve the national hydrographic capabilities based on the national strategic objectives and real needs.

3.- Considering the length of the Kingdom’s coast line; the importance of the maritime sector in the economy of the country; the huge maritime traffic in Saudi’s waters and the associated risk that this pressure puts in the marine environment, the Kingdom does not have a hydrographic survey launch. It does not sound logic that despite the maritime nature of the Kingdom of Saudi Arabia there is no one platform capable of conducting a hydrographic surveys to the modern standards required by the international conventions signed by the Kingdom (SOLAS). From the IHO perspective the funding of a minimum hydrographic surveying capability should not be considered as an expenditure but as an investment, due to the contribution this capability will make to ensure safety to navigation and protection of the marine environment. It is strongly recommended that deep thoughts be given to this limitation and the way to overcome it.

4.- It seems that the Kingdom does not have infrastructure and sufficient trained personnel to take advantage of the new and complex technologies used by modern hydrographic offices in the different phases of a hydrographic survey and production of nautical charts in the various formats of presentations. The existing nautical chart coverage requires update and a national program aiming to provide the hydrographic services identified in SOLAS, regulation 9 seems recommended to be developed. The training can be obtained abroad in the short term, but it is also recommended to support the establishment of a national capacity to offer formal hydrographic and nautical cartography training programs, that could solve national requirements in the medium term. Personnel must be kept abreast of methodologies, protocols, processes and quality control of the final products, just to mention a few aspects, and not having a national infrastructure to offer this training constitutes a limitation. Main training areas are ENC’s, MultiBeam and Marine Safety Information (MSI) matters, for which the IHO coordinates through the Capacity Building Committee opportunities that could be considered by the HSD. For the time being the Kingdom cannot rely on the former International Maritime Academy (IMA), for its hydrographic and nautical cartographic training needs, as the Academy has ceased its activities. It is therefore recommended to work closely with the King Abdulaziz University the Hydrographic Survey Program under development, aiming its submission to the International Advisory Board for eventual recognition as an international program. It is important to take note that in the region there are no hydrographic programs recognized by the mentioned board.

5.- PERSGA constitutes an excellent platform for developing hydrographic capabilities in the region, in which Saudi Arabia, as a new IHO Member State could play a key role in helping the IHO to raise awareness on the importance of hydrography, especially in countries non IHO Members. The objectives of PERSGA have some common elements with those of the IHO and the PERSGA network could be used as a formal link, providing support to the NIOHC efforts to coordinate hydrographic development in the Red Sea and Gulf of Aden. It is recommended that before any formal MOU is subscribe between IHO and PERSGA (this is an initiative under consideration after the technical visit paid to Saudi Arabia), Saudi Arabia takes the lead in making the two organizations working as closer as possible on the areas of common interest.

6.- It is evident that hydrographic data is being captured by several parties. In fact, the Kingdom has developed a procedure to be followed by research institutions willing to conduct research on Saudi waters; the SSP hires companies to run surveys in the ports, and other surveys are conducted jointly with foreign hydrographic offices. Nevertheless a national entity tasked to archive all these data does not exist, and data is disperse and not ready for further studies by other national agencies.

It is recommended to give attention to a project being proposed by a scientific group of the King Abdulaziz University named “Saudi Oceanographic Data and Information Center”. Also it is strongly recommended to define the scope of this Center, from a national and international perspective, as all data and information generated constitute a valuable national asset. The establishment of a national data centre to effectively archive this information and to make a much extended use of it is highly recommended, especially nowadays that there is an increasing interest in developing national, regional and global spatial data infrastructure, where different data bases should be able to be combined in an attempt to offer products and services for a better decision making.

7.- Recognizing its active involvement in the work of the RSAHC and NIOHC and considering that the Kingdom of Saudi Arabia is now an IHO Member States, it is recommended that an evaluation be made by the HSD in order to identify eventual representation of Saudi Arabia in the most suitable IHO technical bodies. The closer Saudi Arabia becomes with all the bodies of the IHO, the better shall be the understanding to define and start managing a National Hydrographic Office.

Monaco, 23 April 2007.



Hugo Gorziglia
Captain – Chilean Navy
IHB Director

Annexes:

“A” IHB Technical Visit Program.

“B” Scheme of the Presentation on National Hydrographic Offices.

ANNEX A

IHB TECHNICAL VISIT PROGRAM

Monday 26 March 2007

Time	Event
2100	Arrive to Jeddah International Air Port. Transport to Intercontinental Hotel.

Tuesday 27 March 2007

Time	Event
0900	Depart from Hotel to PERSGA Headquarters
1000-1015	Welcome Addresses by: <ul style="list-style-type: none">• Dr. Ziad Abu-Ghararah, Secretary General PERSGA (Regional Organization for the Conservation of the Environment of the red sea and Gulf of Aden)• Rear Admiral Abdul Rahman Al-Sheri, Military Survey Saudi Arabia• Captain Hugo Gorziglia, IHB Director
1015- 1030	Introduction of Participants
1030-1200	Presentation by Captain Gorziglia, IHB Director
1200-1230	Presentation by Rear Admiral Abdul Rahman Al-Sheri, Military Survey Saudi Arabia
1230-1315	Reduction of Navigation Risk & Maritime Pollution in the PERSGA Region by Dr. Ahmed Salah Khalit (PERSGA)
1345-1530	Lunch
1600-1700	Presentation by Lt Cdr. Naji Mansour Al Johani , Border Guard.
1700-1800	General discussion among participants.

Wednesday 28 March 2007

Time	Event
0830-1000	Presentation by Port Authority
1000-1130	Presentation on National Hydrographic Offices. General discussion among participants
1130- 1230	Discussion on future activities
1230	Closure of the meeting
1500	Transport to Airport
1700	Depart to Qatar

ANNEX B

SCHEME OF THE PRESENTATION

ESTABLISHMENT OF A NATIONAL HYDROGRAPHIC OFFICE

GENERAL COMMENTS:

WHY DO WE WANT TO ESTABLISH A NHO?

- BECAUSE WE HAVE A NATIONAL UNDERSTANDING OF THE CONTRIBUTION HYDROGRAPHY CAN OFFER TO NATIONAL DEVELOPMENT?
- BECAUSE WE WANT TO HAVE A NATIONAL AGENCY RESPONSIBLE FOR THE PROVISION OF HYDROGRAPHIC SERVICES AS RECOMMENDED BY SOLAS CONVENTION?
- BECAUSE WE WANT TO CONCENTRATE EXISTING NATIONAL EFFORTS TODAY DISPERSED IN JUST ONE AGENCY?
- BECAUSE WE NEED A NATIONAL TECHNICAL REGULATORY BODY?

SUPPORTIVE NATIONAL LEGISLATION

TO SUCCEED IT IS VITAL TO HAVE GOVERNMENTAL SUPPORT AT THE HIGHEST LEVEL. IN THIS SENSE A NHO REQUIRES A PROPER LEGISLATION ESTABLISHING:

- a. MISSION AND FUNCTIONS
- b. GENERAL ORGANIZATION
- c. DECISION MAKING PROCESS
- d. RESPONSIBILITIES OF KEY STAFF
- e. SOURCE(S) OF BUDGET PROVISION
- f. REPORTING SYSTEM
- g. NATIONAL AND INTERNATIONAL RELATIONS

MISSION

THE NHO IS THE HIGHEST NATIONAL TECHNICAL AND PERMANENT AUTHORITY AS REGARD TO HYDROGRAPHY, NAUTICAL CARTOGRAPHY AND MARINE SAFETY INFORMATION.

ITS MAIN MISSION IS TO PROVIDE HYDROGRAPHIC, NAUTICAL CARTOGRAPHIC AND MARINE SAFETY INFORMATION, PRODUCTS AND SERVICES AIMING TO CONTRIBUTE TO SAFETY TO NAVIGATION ON SAUDI ARABIAN INTERIOR WATERS, TERRITORIAL SEA AND EXCLUSIVE ECONOMIC ZONE.

IT IS ALSO THE MISSION OF THE NHO TO PROVIDE THE INFORMATION AND PRODUCTS REQUIRED FOR THE NATIONAL DEFENCE AS WELL AS THOSE CONTRIBUTING TO SCIENTIFIC RESEARCH AND OTHER NATIONAL AND INTERNATIONAL ACTIVITIES OF SAUDI ARABIA INTEREST. (This is an example)

FUNCTIONS

- TO PREPARE, PROPOSE AND KEEP UPDATED A NATIONAL HYDROGRAPHIC AND NAUTICAL CARTOGRAPHIC PLAN.
- TO PREPARE, PROPOSE, EXECUTE AND MONITOR ALL HYDROGRAPHIC AND NAUTICAL CARTOGRAPHIC ACTIVITIES.

- PROVIDE STANDARDS FOR THE EXECUTION OF HYDROGRAPHIC SURVEY AND THE PRODUCTION OF NAUTICAL CHARTS
- CERTIFICATE ALL HYDROGRAPHIC SURVEYS EXECUTED AND NAUTICAL CARTOGRAPHIC PRODUCED BY THIRD PARTIES.
- PROVIDE MARINERS WITH TIMELY AND RELIABLE MARINE SAFETY INFORMATION.

GENERAL ORGANIZATION

a) Model A

DIRECTOR
 TECHNICAL DEPUTY DIRECTOR
 = HYDROGRAPHY
 = CARTOGRAPHY
 = MARINE SAFETY INFORMATION

ADMINISTRATIVE DEPUTY DIRECTOR
 = FINANCES

b) Model B

DIRECTOR
 DEPUTY DIRECTOR
 = HYDROGRAPHY
 = CARTOGRAPHY
 = MARINE SAFETY INFORMATION
 = ADMINISTRATION
 = FINANCES

DECISION MAKING PROCESS

ANNUAL WORK PROGRAM AND BUDGET PREPARATION, SUBMISSION, APPROVAL, EXECUTION.

- + WHAT SOURCES OF INFORMATION TO CONSIDER FOR THE PREPARATION OF THE PROPOSAL?
- + HOW ARE PRIORITIES CONSIDERED?
- + HOW ARE ESTIMATED THE FINANCIAL RESOURCES?
- + TO WHOM THE WP & BUDGET ARE SUBMITTED?
- + WHO DECIDES AT THE END?

RESPONSIBILITIES OF KEY STAFF

- = DIRECTOR (RANK AND SPECIALISM)
- EXTERNAL RESPONSIBILITIES (LIABILITY/ PROPOSALS)
- INTERNAL RESPONSIBILITIES (MANAGEMENT/INVESTMENT)
 = DEPUTY DIRECTOR (RANK AND SPECIALISM)
- INTERNAL RESPONSIBILITIES (ADVICE/CONTROL/COORDINATE)
 = HEADS OF DEPARTMENTS (RANK AND SPECIALISM)
- INTERNAL RESPONSIBILITIES (PLANNING/COORDINATE/LEAD/CONTROL/ADVICE)

BUDGET

- SOURCES
 - NATION'S ANNUAL DIRECT BUDGET
 - MINISTRY OF DEFENCE
 - ANY FUTURE ESPECIAL LAW
 - FROM SALES OF PRODUCTS & SERVICES
 - OTHERS

REPORTING SYSTEM

- ANNUAL REPORT
 - PERFORMANCE MEASUREMENT
 - ACCOUNTABILITY

NATIONAL AND INTERNATIONAL RELATIONS

- NATIONAL HYDROGRAPHIC COMMITTEE
- OTHER NATIONAL BOARDS
- INTERNATIONAL REPRESENTATION

NHO INTERNAL DEVELOPMENT

THE FOUR LEG TABLE

- INFRASTRUCTURE
- TECHNOLOGY
- PERSONNEL
- BUDGET

INFRASTRUCTURE

- THE PREMISES
- CONSIDER WORK FLOW
- COMMUNICATIONS INTERNAL / EXTERNAL
- MEETING/CLASSROOM FACILITIES
- PREPARED FOR "ROUND THE CLOCK" WORK

TECHNOLOGY

(SOFTWARE / HARDWARE / EQUIPMENT / INSTRUMENTS)

- DATA GATHERING
 - SURVEYING PLATFORMS
 - POSITIONING
 - DEPTH DETERMINATION
 - TIDES AND CURRENTS (WAVES?)
 - BASIC FIELD PROCESSING AND QC
 - OTHERS
- DATA PROCESSING
 - TIDES AND CURRENTS PROCESSING
 - BATHYMETRIC PROCESSING
 - VALIDATED INFORMATION / DATA BASE
- PRODUCTION (SOFTWARE, HARDWARE AND EQUIPMENTS)
 - PAPER CHART

- DIGITAL CHART
- ENC
- PUBLICATIONS
- SPECIAL PRODUCTS ON DEMAND
- ARCHIVING (PHYSICAL AND DIGITAL)
 - NATIONAL DATA CENTER
 - EXCHANGE WITH OTHER NATIONAL AND INTERNATIONAL GEOSPATIAL DATA BASES
 - DEDICATED SERVER
- SELECTION AND ACQUISITION PROCEDURES
- BASIC AND ADVANCE TRAINING
- MAINTENANCE
- TECHNICAL SERVICE & SUPPORT (RED LINE)
- RENOVATION/UPDATE PROGRAM
- RAPID DEPLOYMENT UNIT PORTABLE EQUIPMENT

PERSONNEL

- TEAM WORK SPIRIT
- RELIABLE / RESPONSIBLE
- EDUCATION / TRAINING / EXPERIENCE / UPDATED
- MILITARY? CIVILIANS? BOTH?
- PERMANENCY / ROTATION /
- TRAINING PROGRAM / REFRESHMENT COURSES
- HOW MANY IN EACH ACTIVITY? RENOVATION POLICY
- CRITICAL PATHS / MULTIPURPOSE PERSONNEL?
- INTERNATIONAL EXPOSURE
- RAPID DEPLOYMENT UNIT

BUDGET

- MAINTENANCE BUDGET (ALMOST ZERO ACTIVITY)
- OPERATION BUDGET (MAINTENANCE + WP)
- DEVELOPMENT BUDGET (OPERATION + IMPROVEMENT)
- BUDGET JUSTIFICATION (COST V/S BENEFITS)
- ANNUAL BUDGET / FORECASTED BUDGET MEDIUM TERM

----- the end -----