



## CAPACITY BUILDING SUB-COMMITTEE

## PROCEDURE 5

## Part 2

## REPORT MODEL

**IDENTIFICATION**

|                       |                                     |
|-----------------------|-------------------------------------|
| <b>Project Number</b> | (to be filled by CBSC)              |
| <b>Project Name</b>   | Introduction to Hydrographic Survey |

**FINANCIAL REPORT**

|   | Resources |           |       | Comments |
|---|-----------|-----------|-------|----------|
|   | requested | allocated | spent |          |
| Contribution by countries involved  |           |           |       |          |
| Contribution by other parties   |           |           |       |          |
| Contribution from CBSC Fund   |           |           |       |          |
| Total Cost (Euros)  |           |           |       |          |
| Breakdown of CBSC Fund expenditure (i.e. travel expenses, per diem, venue hire, etc.) |           |           |       |          |

**RESULTS**

| Results   |  |
|---|--|
| Date of start   | 29 <sup>th</sup> September 2014  |
| Date of finish  | 10 <sup>th</sup> October 2014  |
| Changes in scope or focus                             | none   |
| Results achieved (output, product, etc.)              | The course succeeded in delivering an introduction to Hydrographic survey. This was evidenced in the exam scores. Several students with no prior training in hydrography obtained a +70% score.                                  |
| Comparison with the Achievements and benefits awaited | The course achieved its aim in providing a appreciation of the need for hydrography and detailing some of the complexities involved in this field. Students were enthusiastic, asked good questions and were keen to learn more. |
| Problems experienced                                  | Practical work was hindered due to some local organizational difficulties and equipment breakdowns. Several students did not understand English language adequately for the course and this was reflected in the exam results.   |
| Suggestion for improvement for similar projects       | Conduct telephone interviews with student in the language to be used for the course. Ensure they have enough   |

|                                   |  |
|-----------------------------------|--|
|                                   | <p>understanding of the language before confirming a place. If the student does not have enough understanding of the language but must still attend the course this should be highlighted to the instructors and provision made for translation during class and or translation of the training material.</p> <p>The host nation should be made more aware of what is expected of them in terms of responsibility and the need for preparation before the course starts. They should also be made aware of the high profile nature of these courses. The local organizational difficulties on this course could have been avoided with better prior preparation.</p> |
| Suggestion for follow-up projects | A follow up course with more practical work and to include hands on experience with Multi-beam sonar.  |
| Valuation                         | 80%  |

---

CBSC Secretary

---

CBSC Chairman



## CAPACITY BUILDING SUB-COMMITTEE

## PROCEDURE 5

## Part 3

## ASSESSMENT MODEL

**IDENTIFICATION**

|                       |                                     |
|-----------------------|-------------------------------------|
| <b>Project Number</b> | (to be filled by CBSC)              |
| <b>Project Name</b>   | Introduction to Hydrographic Survey |

|   | <b>Performance indicator</b>                  | <b>Mark</b> | <b>Comments</b>  |
|---|---|-------------|--|
| - | <b>Arrangements</b>                           |             |  |
|   | Organisation of the project                   | 3           | Generally good, but some difficulties with local organization of equipment which affected the practical elements of the course.<br>The classroom facilities were very good with up to date computers and AC equipment. |
|   | Involvement(contribution) of                  |             |  |
|   | National partners                             | 3           | Good classroom facilities. Good survey equipment which was suitable for the course but let down by organization during the practical work.   |
|   | Regional partners                             |             |  |
|   | RHC   |             |  |
|   | IHB   |             |  |
| - | <b>Efficiency of the project</b>              |             |  |
|   | Goals achieved                                | 3           | The Course achieved its goal in enthusing the majority of students on the subject of Hydrography. Language difficulties did mean that not all students were able to fully understand the material.                     |
|   | Planned timing                                | 4           | Enough time was allotted for the course. Though several students did comment that they would like to do a longer course.   |
| - | <b>Future perspectives</b>                    |             |  |
|   | Need of similar project (locally, regionally) | 4           | A more practically focused course including Multibeam sonar would be of interest to the students.  |
|   | Impact on future development                  | 4           | Many students left the course with ideas on how to integrate their new knowledge into their current work.  |
| - | <b>Procedure of CBSC</b>                      |             |  |
|   | Application form                              |             |  |

|  |                         |   |  |
|--|-------------------------|---|--|
|  | Support received        | 3 |  |
|  | Follow up and reporting |   |  |

Each of the performance indicators indicated in the table is rated according to the scale provided:

- 0 = 0-20%
- 1 = 20-40%
- 2 = 40-60%
- 3 = 60-80%
- 4 = 80-90%
- 5 = 90-100%

---

CBSC Secretary

---

CBSC Chairman

| Attendee   | Gender | Title    | First names / Given names (as on passport) | Surname (as on passport) | Nationality |
|------------|--------|----------|--|--------------------------|-------------|
| Trainee 1  | Male   | Mr       | ZOUBOUDOU<br>KOUNDJOUROU                   | HALIFA                   | Comorian    |
| Trainee 2  | FEMALE | Mrs.     | ESTER PROSPER                              | ULAYA                    | TANZANIAN   |
| Trainee 3  | MALE   | PRIVATE  | NEL DEREK<br>MARCUS                        | HYPOLITE                 | SEYCHELLOIS |
| Trainee 4  | MALE   | MR       | BERNARD RICHARD                            | ERNESTA                  | SEYCHELLOIS |
| Trainee 5  | Male   | Mr.      | Aullin Austin                              | Lundu                    | Malawian    |
| Trainee 6  | MALE   | MR       | BENARD KIPKORIR                            | MUTAI                    | KENYAN      |
| Trainee 7  | Female | Mrs      | Norolalao Viviane                          | RAKOTONDRAINIBE          | Malagasy    |
| Trainee 8  | Male   | Mr       | Devendra Ragoonath                         | Madhow                   | Mauritian   |
| Trainee 9  | MALE   | CAPTAIN  | PETER CANISIUS<br>JOACQUIM                 | KAJADU                   | MALAWIAN    |
| Trainee 10 | MALE   | Captaine | DJASSIMI                                   | ABDULLAHI                | Comorian    |
| Trainee 11 | MALE   | Mr       | OLIVER                                     | MAINA                    | KENYAN      |
| Trainee 12 | Male   | Capt.    | Jean Hubert                                | Noel                     | Mauritian   |

 Passports being obtained

0 No entry received for this field

Tel: +27 21 7872412  
Fax: +27 21 7872233  
Email: [hydrosan@iafrica.com](mailto:hydrosan@iafrica.com)



South African Navy  
Hydrographic Office  
Private Bag X1  
Tokai  
7966  
REPUBLIC OF SOUTH AFRICA  
01 August 2014

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

**SOUTHERN AFRICA AND ISLANDS HYDROGRAPHIC COMMISSION (SAIHC)  
AND INTERNATIONAL MARITIME ORGANISATION (IMO) CAPACITY  
BUILDING WORK PROGRAM: INTRODUCTION TO HYDROGRAPHIC SURVEY  
TRAINING COURSE, MAPUTO, MOZAMBIQUE, 29 SEPTEMBER TO 10  
OCTOBER 2014**

The 2014 IHO Capacity Building Work Programme allows for the provision of support for the delivery of, and attendance at an Introduction to Hydrographic Survey training course with the objective of giving participants an understanding of the requirements, principals and conduct of hydrographic surveying for national purposes. The course will be primarily theoretical with practical demonstrations of surveying techniques.

On this occasion the SAIHC is delighted to welcome the IMO as a partner in this capacity building activity.

The training course will be held in Maputo, Mozambique from 29 September to 10 October 2014. Details of the course are provided at Annex A. Please note that the course is given in English.

The IHO Capacity Building Fund/IMO Technical Cooperation Committee fund will provide full support (flights, transfers and a daily subsistence allowance) for **ONE** participant per country. **Please note that any other associated expenses (e.g. travel insurance, pocket money, etc...) should be covered by the candidate's organization.**

You are kindly requested to send, by email, the accompanying Application Form (Annex B), to Steve Barnett, (Email address: [steve.barnett@ukho.gov.uk](mailto:steve.barnett@ukho.gov.uk)), **no later than 18<sup>th</sup> August 2014**. It is important that the accompanying application form is completed electronically and returned as an Excel file or on an Excel-compatible format.

In order to facilitate the provision of e-tickets to selected participants, you are strongly encouraged to include with the application form a copy of the applicant's passport and a reliable e-mail address where the ticket can be sent to. Please note that if trainees require a visa in order to attend the course they should apply as soon as they are accepted on the course. If trainees fail to attend due to their own oversights or errors then costs incurred by the IHO on their behalf may be recovered from their employing authority. There is every likelihood that this training opportunity is over subscribed, so it is imperative that applicants respond promptly and Part 1 of the Application Form at Annex B is completed accurately and candidly as this information might be used in a selection process (if required).

Should you need more information or have any special request, please contact me directly at [hydrosan@iafrica.com](mailto:hydrosan@iafrica.com).

Chairman Southern Africa & Islands Hydrographic Commission (SAIHC)

**Distribution List:**

- 1.- Angola
- 2.- Comoros
- 3.- Kenya
- 4.- Madagascar
- 5.- Malawi
- 6.- Mauritius
- 7.- Mozambique
- 8.- Namibia
- 9.- Seychelles
- 10.- Tanzania

**Copy to:**

- 11.- Captain Alberto Costa Neves (IHB)
- 12:- Mr Jeff Bryant (CB Coordinator SAIHC)

**Attachments:**

- Annex A: Course Outline  
Annex B: Application Form

**NOTE: To improve efficiency this letter is being sent only by e-mail.**

**SOUHERN AFRICA & ISLANDS HYDROGRAPHIC COMMISSION  
(SAIHC)  
Introduction to Hydrographic Survey Course  
Monday 29<sup>th</sup> September to Friday 10<sup>th</sup> October 2014  
COURSE OUTLINE**

**Day 1 – Classroom**

**1. Introduction to Basics of Hydrographic Surveying Course**

- History of hydrography
- Hydrography today
- International hydrography
- Essential elements of a hydrographic survey
- Multibeam introductory video

**2. Errors and Uncertainty [Trainer 1]**

- Types of errors
- Precision and accuracy
- Normal distribution
- Standard deviation
- Confidence levels
- Uncertainty
- Practical exercise

**3. Geodesy [Trainer 2]**

- What is geodesy
- Coordinate systems
- Shape of the Earth
- Spheroids/ellipsoids
- Reference frames
- WGS84
- Datum shifts
- Projections
- UTM

**4. Horizontal positioning and GNSS [Trainer 1]**

- Determination of position
- Types of GNSS
- GPS basics
- GNSS augmentation (DGPS)
- Carrier phase techniques
- Vertical datum separation models

**5. Tidal Theory [Trainer 2]**

- What are tides
- Fundamental Principles
- Newtonian laws of gravity and motion
- Equilibrium tide
- Lunar tides
- Solar tides
- Spring/neap tides
- Tidal regimes
- Real tides
- Amphidromic points
- Met effects

## **6. Measuring Tides and Vertical Datums [Trainer 2]**

- Why measure tides
- Predicting tides
- Types of tide gauge
- GPS tides
- Considerations for tide gauge location
- Sources of error in measuring tides
- Reducing soundings
- Vertical datums
- Admiralty Chart Datum
- Vertical control networks
- Transfer of datum using co-tidal charts

## **7. Survey Control and Tide Gauge Calibration [Trainer 1]**

- 3D Control
- The need for survey control
- Establishing Control Points
- Extending the Vertical
- Calibration of Tide Gauge
- Levelling

### **Day 2 - Practical Exercise, Field work**

- Calibration of tide gauge and levelling

### **Day 3 – Classroom**

## **8. Acoustic Theory [Trainer 2]**

- Physics of underwater acoustics
- Using acoustics to measure distance
- Sound velocity/celerity
- Measuring sound speed
- Frequencies

## **9. SBES Surveying Principles [Trainer 2]**

- SBES transducers
- Beam Characteristics
- SBES limitations
- Operational considerations

## **10. SBES Calibration [Trainer 2]**

- Calibrating for sound speed
- Performing a 'bar check'

## **11. MBES Basic Principles [Trainer 1]**

- Types of Swath systems
- Beam forming and steering
- Amplitude and phase bottom detection
- MBES requirements and characteristics
- MBES Common Errors

## **12. Vessel Motion [Trainer 1]**

- Inertial Navigation Technology
- Heave
- Timing Integration with sonar
- Operational considerations and errors
- Conclusions from motion sensor comparison experiment

### **13. MBES Calibration [Trainer 1]**

- Dimensional Control
- Patch Test Procedure
- Post Calibration

### **14. Standards and Specifications [Trainer 1]**

- The need for standards and specifications
- IHO S-44
- Case study – UK CHP Survey specification
- Planning to meet the specification
- Communicating the uncertainty to the user
- Survey error model

### **15. Survey Planning**

- Reconnaissance
- Environmental considerations
- Safety and disaster planning
- Tidal data
- Mobilisation and
- Calibration site location
- Data quality
- Line planning
- Data management and quality assurance

#### **Day 4 – Boat based field work**

- SBES and MBES surveying

#### **Day 5 – Boat based field work**

- SBES and MBES surveying

#### **Day 6 – Boat based field work**

- SBES and MBES surveying

#### **Day 7 – Classroom**

- processing, SBES

#### **Day 8 – Classroom**

- processing, MBES

#### **Day 9 – Classroom**

- processing, MBES + QC

#### **Day 10 – Classroom**

- (AM) processing, MBES + QC
- (PM) Exam