



## **IHO Capacity Building Programme**

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# **A National Hydrographic Strategy for the The Solomon Islands**



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**February 2012**

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## Abbreviations

AHO	Australian Hydrographic Office
AHS	Australian Hydrographic Service
ALB	Airborne Laser Bathymetry
AtoN	Aids to Navigation
BA	British Admiralty Chart (UKHO)
dwt	Dead Weight Tonnage
EEZ	Exclusive Economic Zone
ENC	Electronic Nautical Chart
GNSS	Global Navigation Satellite Systems
ICZM	Integrated Coastal Zone Management
IHB	International Hydrographic Bureau
IHO	International Hydrographic Organization
IMO	International Maritime Organization
Lidar	Light Detection and Ranging
LINZ	Land Information New Zealand ( New Zealand Hydrographic Office)
LOA	Length overall
MBES	Multi Beam Echo Sounder
MID	Ministry of Infrastructure Development
MSDI	Marine Spatial Data infrastructure
MSI	Maritime Safety Information
MSP	Maritime Spatial Planning
NOAA	National Oceanographic and Atmospheric Administration
NtoM	Notices to Mariners
PCA	Primary Charting Authority
RHC	Regional Hydrographic Commission
RNC	Raster Nautical Chart
RNZN	Royal New Zealand Navy
SBES	Single Beam Echo Sounder
SIG	Solomon Islands' Government
SINHCC	Solomon Islands National Hydrographic Consultative Committee
SIHU	Solomon Islands Hydrographic Unit
SIMSA	Solomon Islands Maritime Safety Administration
SIPA	Solomon Islands Port Authority
SOLAS	United Nations Convention of the Safety of Life at Sea
SWPHC	South West Pacific Hydrographic Commission
ToR	Terms of Reference
TTW	Territorial Waters
UKHO	United Kingdom Hydrographic Office
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Programme
WGS84	World Satellite Datum

# Executive Summary

## Background

The deteriorating state of hydrography and nautical charting in the Solomon Islands was highlighted at the 7th and 8th SWPHC meetings and at an IMO/IHO Technical Cooperation Workshop. As a result SWPHC recommended that an IHO technical and advisory visit be made to the Solomon Islands. The visit was approved by the IHO Capacity Building Sub Committee (CBSC) and conducted in October 2009 by Captain Robert WARD (IHB Director) and Ingénieur en chef Michel HUET (IHB Assistant Director).

The IHO CBSC later agreed to a second stage support visit to assist in regenerating the national hydrographic capability of the SIG, assess the current status of charting and hydrography in the country and to provide advice to the government and to stakeholders on a way ahead. Mr Bob WILSON, International Hydrographic Projects' Manager, was seconded from the United Kingdom Hydrographic Office (UKHO) to carry out this visit.

Mr WILSON visited Honiara between 19 February and 2 March 2012. Meetings, in the form of individual discussions and a workshop for the Solomon Islands National Hydrographic Co-ordination Committee (SIHCC), were arranged with as many hydrographic and nautical charting stakeholders as possible. When not engaged on visits Mr Wilson worked in SIMSA with SIHU staff. The staff of SIMSA, in particular SIHU, were very helpful and accommodating throughout the visit; the work in this report has been developed in close partnership with SIHU.

## National Hydrographic Situation

The Solomon Islands' government and its colonial predecessor benefited from the early 1960s from the work of a government hydrographic unit under the Marine Department. Transferred to the Department for Lands and Surveys in the late 1990s the Solomon Islands Hydrographic Unit (SIHU), and with it national hydrography, went into decline along with most other government agencies due to civil unrest. The Solomon Islands Maritime Safety Administration (SIMSA) was formed in April 2009 on the dissolution of the Marine Department. As part of the reorganization SIMSA assumed responsibility for national hydrography and as a result the almost moribund SIHU was formally transferred from the Department of Lands and Surveys on 1 December 2011. There is clear support for SIHU within SIMSA and the parent ministry (Ministry of Infrastructure Development (MID)). This support will need to continue for some years before SIHU is fully established and functioning efficiently. SIMSA's new structure allows for a Chief Hydrographic Officer, a Senior Hydrographic Officer, a Hydrographic Draughtsman and a Hydrographic Technician; all four positions are now filled with trained staff with the exception of the Hydrographic Technician.

SIHU's great strength is its trained staff and their enthusiasm for their profession with strong support from SIMSA senior management and MID. The previously published national chart series is now out of date and requires modernizing and republishing possibly along the lines of the successful chart modernization programme undertaken in Papua New Guinea and supervised by the Australian Hydrographic Service. The United Kingdom Hydrographic Office (UKHO) remains the primary charting authority for the Solomon Islands until, when and if, SIHU is capable of assuming this role. The UKHO published charts of the islands suffer from a lack of modern data which was once provided by SIHU.

## National Hydrographic Development

There is a clear development path for national hydrography in the Solomon Islands which was developed along with the plan for the establishment of SIMSA. During the Technical Visit this plan was enhanced and enlarged to cover the next four years of hydrographic development and is contained within this report.

SIHU development follows the three IHO Capacity Building phases: Maritime Safety Information (MSI); Hydrographic Surveying; Nautical Charting. The establishment of an MSI organization is within SIHU's current capability and will allow the ready dissemination for radio navigational warnings and UKHO chart corrections. Hydrographic surveying, with the procurement of a simple portable survey system, is also well within the current staff's capability once a training refresher period has been conducted. It is suggested that SIHU's hydrographic capability be limited to minor surveys and chart maintenance work, larger more complex surveys should be undertaken in partnership with SOPAC or regional hydrographic services. The re-establishment of SIHU's nautical charting capability should be a priority programme to complete the final Capacity Building phase. SIHU's charts are of good quality and were well produced. Modern digital techniques designed to print charts locally, and only as required strongly favour small hydrographic organizations such as SIHU. The SIHU charts previously published complement those published by UKHO; UKHO does not have the capacity to publish the local charts provided by SIHU.

Training is required to bring the skills already learnt by SIHU to modern standards and to equip the new graduate trainee with skills for the future. MSI training is available in the region. Hydrographic training is required on the new equipment with training surveys to hone old skills. Cartographic training is more complex as systems and methods have altered considerably in the past decade, however, once learnt the new methods will provide for self-sufficiency in nautical charting in SIHU - a situation undreamt of even five years ago. All new SIHU staff engaged should be trained in both hydrographic surveying and nautical charting to maximise staff usage, versatility and guard against the loss of skills.

### **Principal Conclusions**

Following a period of decline national hydrography in the Solomon Islands, providing it is supported as is currently planned, has a good future. The SIHU's key asset is its staff followed by the temporarily defunct national chart series.

SIHU must be re-equipped to conduct MSI and hydrographic surveying functions as a matter of urgency. The equipment required is readily available and 'low cost', it should be possible to see SIHU fully operational in MSI and hydrographic surveying by the end of 2012.

The regeneration of the national chart series, local chart compilation and chart production should be seen as a longer term (five years) goal. Following the PNG model all of SIHU's charts can be brought back into production. SIHU, with the correct training and equipment, can emulate other regional offices in publishing national charts to suit national needs that cannot otherwise be met.



# REPORT



## 1. Introduction

The International Hydrographic Organization (IHO) is an intergovernmental technical organization, currently comprising 80 Member States. The IHO seeks to ensure that all States with coastlines and maritime interests provide adequate and timely hydrographic data, products and services, thereby advancing maritime safety and efficiency in support of the protection and sustainable use of the marine environment. The IHO is the recognised competent authority of the United Nations for hydrography and nautical charting. The International Hydrographic Bureau (IHB), based in Monaco, is the secretariat of the IHO.

The IHO has encouraged the establishment of Regional Hydrographic Commissions (RHCs) to coordinate hydrographic activity and cooperation at the regional level. The RHCs are made up predominantly of IHO Member States; however, other regional States also participate as Associate Members. RHCs are not formal bodies of the IHO, but work in close harmony with the Organization to help further its ideals and program. RHCs meet at regular intervals to discuss such things as mutual hydrographic and chart production problems, plan joint survey operations, and resolve schemes for medium and large scale International Chart coverage in their regions. Non-Member States may participate as RHC Associate members; the Solomon Islands currently has Observer status in the South West Pacific Hydrographic Commission (SWPHC).

As a result of a national request to the SWPHC this report has been written with the express intention of assisting the Solomon Islands' government (SIG) to strengthen and develop its hydrographic effort to meet its current and future needs and in turn, to meet its international maritime obligations under the UN Convention on the Safety of Life at Sea (SOLAS). The report comprises a description of the visit, major conclusions and a number of recommended actions for consideration by the relevant organizations.

The report is supported by various Annexes and Appendices providing detailed information including the dependence on hydrography and nautical charting of various sectors in the Solomon Islands, an analysis of the current survey state, an analysis of the existing charting situation, a sustainable national hydrographic structure and a proposed programme for modern hydrography surveys in the Solomon Islands.

## 2. Technical Visit

The former Deputy Superintendent of the Solomon Islands Marine Division, Captain Pascal OHOAU, highlighted the deteriorating state of hydrography and nautical charting in the Solomon Islands at the 7th and 8th SWPHC meetings and at an IMO/IHO Technical Cooperation Workshop. As a result at the SWPHC's 9th meeting the Commission recommended that an IHO technical and advisory visit be made to the Solomon Islands to assess the current status of hydrography and to raise awareness in the country of the importance of hydrography and nautical charting. This visit was approved by the IHO Capacity Building Sub Committee and conducted in October 2009 by Captain Robert WARD (IHB Director) and Ingénieur en chef Michel HUET (IHB Assistant Director). An assessment of the current situation and progress on the recommendations to date is at Annex C.

The IHO Capacity Building Sub Committee via SWPHC later agreed to a second stage support visit to assist in regenerating the national hydrographic capability of the SIG, assess the current status of charting and hydrography in the country and to provide advice to the government and to stakeholders on a way ahead. Mr Bob WILSON, International Hydrographic Projects' Manager, was seconded from the United Kingdom Hydrographic Office (UKHO) as part of the IHO Capacity Building Programme to carry out this visit.

Mr WILSON visited Honiara between 19 February and 2 March 2012. The principal host officer for the visit was Mr Edward TOKURU, Director, Solomon Islands Maritime Safety Administration (SIMSA). Meetings, in the form of individual discussions and a workshop for the Solomon Islands National Hydrographic Co-ordination Committee (SIHCC), were arranged with as many hydrographic and nautical charting stakeholders as possible. When not engaged on visits Mr Wilson worked in SIMSA with SIHU staff. The staff of SIMSA, in particular SIHU, were very

helpful and accommodating throughout the visit; the work in this report has been developed in close collaboration with SIHU.

The details of those attending the various meetings are shown at Annex B - List of Contacts.

## 3. Solomon Islands Hydrographic Assessment

### 3.1 General Remarks

The Solomon Islands' government (SIG) and its Administration clearly have an awareness of the fundamental importance and benefits of hydrography and nautical charting to the Solomon Islands, a country which has an almost total dependence for its survival on maritime trade. Cabinet papers have been presenting the case for national hydrography and proposing membership of both IHO and the SWPHC. The SIHCC has been established which with the re-establishment of the Solomon Islands Hydrographic Unit (SIHU) should improve hydrography nationally. The SIG's awareness of the State obligations under SOLAS Regulations is clear and current plans for hydrography are addressing these obligations. Until the recent re-establishment of SIHU there was no mechanism in place to determine local priorities for charting or for surveys. This situation is changing and across the broad front of hydrography there is a national drive to improve and capitalize on national hydrography.

### 3.2 Solomon Islands Hydrographic Unit

The Solomon Islands Maritime Safety Administration (SIMSA) was formed in April 1994 on the dissolution of the Marine Department. SIMSA is currently an 'Administration', however, the long-term goal is to restructure it as an 'Authority' thereby minimizing short-term political influence, allowing revenue to be generated, limiting the Solomon Islands' risk of exposure in relation to marine accidents and align with other marine regulators in the region. As part of the reorganization SIMSA assumed responsibility for national hydrography and as a result the almost moribund Solomon Islands Hydrographic Unit (SIHU) was formally transferred from the Department of Lands and Surveys on 1 December 2011. In June 2011 it was noted that whilst most of SIMSA's structure was in place and functioning, six areas required continuing support with the SIHU being one of these areas. There is clear support for SIHU within SIMSA and the parent ministry (Ministry of Infrastructure Development (MID)). This support will need to continue for some years before SIHU is fully established and functioning efficiently. SIMSA's new structure allows for a Chief Hydrographic Officer, a Senior Hydrographic Officer, a Hydrographic Draughtsman and a Hydrographic Technician; all four positions are now filled.

A detailed analysis and discussion of a national hydrographic structure for the Solomon Islands and specifically for SIHU is at Annex D.

### 3.3 Maritime Safety Information

There is no clearly established Maritime Safety Information (MSI) infrastructure that coordinates its activities with the Worldwide Navigation Warning service implemented globally by the IMO, IHO and WMO. Until the re-establishment of SIHU there was no national MSI coordinator appointed to collate and promulgate new and important navigation information through the relevant regional and worldwide maritime communications channels. SIHU has now assumed this responsibility although a data flow has yet to be established. SIMSA, through its Search and Rescue (SAR) unit, promulgates information to shipping throughout the Solomon Islands broadcasting daily at 0200, 0900, 1500 and 2200. Liaison with the NAVAREA X coordinator has been spasmodic. Mariners arriving from overseas are not always aware of recent navigational significant information before getting to the Solomon Islands.

Currently there is very limited liaison between the maritime authorities in the Solomon Islands and the UKHO's chart compilers and maintainers in Regional Team 5, the section responsible for producing and maintaining the existing charts of Solomon Islands, an issue which has to be addressed now.

The current charts of Solomon Islands, with two exceptions published in 1992 and 1995, were all published in 2009. None of the charts have been updated regularly since publication; the most recently published charts, have only had between one and three notice to mariners (NtoM) in almost three years whilst the two older charts have had two and eight respectively. The routine maintenance and updating of charts and publications, to include changes in buoyage and wrecks for example, is as important as new survey data if charts are to be maintained to the standard required for safe navigation.

The following table shows the current publication date of charts covering the Solomon Islands, the reference of the last notice to mariners (NtoM) and the total number of NtoMs affecting the chart since publication; table correct to 17 February 2012.

BA Chart	Title	Published (Last NtoM/Year)	NtoMs issued since Publication
17	Plans of the Santa Cruz and Adjacent Islands	14 Aug 1992 NM 2829/95	2
1708	Bougainville Strait	Ed 2 17 Sep 2009 -	0
1709	Manning Strait	Ed 2 17 Sep 2009 NM 1316/10	1
1713	Sealark Channel and Approaches to Honiara	Ed 3 17 Sep 2009 -	0
1714	Russell Islands	Ed 3 1 Oct 2009 -	0
1735	Plans in the New Georgia Group	Ed 2 1 Oct 2009 NM 1316/10	1
1747	Anchorage in the Solomon Islands	Ed 3 17 Sep 2009 -	0
1750	Anchorage in Guadalcanal	2 Jun 1995 NM 1879/11	8
1766	Harbours in the Solomon Islands	Ed 2 1 Oct 2009 -	0
3994	Bougainville Island to Ghizo Island	Ed 2 24 Sep 2009 NM 2488/10	3
3995	Choiseul Island to New Georgia Island	Ed 2 24 Sep 2009 NM 2488/10	2
3996	Santa Isabel Island to Guadalcanal Island	Ed 3 24 Sep 2009 NM 2065/11	1
3997	Indispensable Strait	Ed 2 24 Sep 2009 -	0
3998	San Cristobal Island to Malaita Island	Ed 3 24 Sep 2009 -	0

The SIG is strongly urged to organise a review of all the charts of Solomon Islands and relay to the PCA (UKHO) all differences from that shown on the current charts as soon as possible. The UKHO produces a Code of Practice giving guidance on the information required and the format in which it should be sent to UKHO. Digital and hard copies of the Code of Practice were passed to SIMSA for distribution to the relevant Solomon Islands authorities.

### 3.4 Hydrographic Surveying

Up until the late 1990s the Solomon Islands benefited from the services of a well trained and staffed national hydrographic organization. This organization, latterly SIHU, conducted minor surveys throughout the islands keeping both national charting and international charting in a good state of maintenance. SIHU's work until the early 1970s was supplemented by major surveys conducted by the British navy. Much of the data shown on

present day charts come from these two sources. Internal instability in the country brought this situation to an end and for almost a decade no effective national hydrographic organization existed. This means that the existing charts published and maintained by the PCA (UKHO) do not necessarily contain the latest navigationally significant information.

SOPAC, the marine geoscience division of the Secretariat to the Pacific Community (SPC), has been conducting multibeam echo sounder (MBES) surveys in support of scientific and environmental activities in many of the islands of the Pacific over the last ten years or more, including Solomon Islands. While not achieving the IHO S-44 standards of survey accuracy, much of the data is, most likely, suitable for inclusion in charts. Currently, there is no formal mechanism in place to ensure that this data is brought to the attention of and made available to the relevant chart producers. However, the recent conclusion of a Memorandum of Understanding between the IHO and SPC will be able to address this, assisted by a proposed Cooperation Arrangement between SPC and UKHO to allow routine access to and use of data gathered by SOPAC. SIHU is recommended to develop a strong liaison with SOPAC.

Several other organizations (e.g. Australian Department of Defence and Royal New Zealand Navy) have conducted hydrographic surveys in a number of locations in the Solomon Islands. This data may not always have been forwarded to the PCA (UKHO). The SIG, when granting permission for survey operations within its territorial waters should stipulate that one condition of this permission is for the final processed data to be forwarded to the PCA (UKHO). Similarly the government should request that data arising from surveys within its Exclusive Economic Zone (EEZ) should similarly be forwarded.

A detailed analysis and review of hydrographic surveying is at Annexes E, F and G.

### 3.5 Nautical Charting

The nautical charts of Solomon Islands published and maintained by the UKHO on behalf of the SIG have, with one exception, been metricated (in essence recompiled to show depths in metres and using modern chart symbology) and brought on to a satellite datum (WGS84) such that they can be used with global navigation satellite systems (GNSS). However, it should be noted that whilst the charts are referred to WGS84 the data on which the charts are based most probably will not be. This is the reason that the warning note shown below is displayed on the charts.

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

The exception noted above is BA1638 *Charts and Plans in Northern Solomon Islands* which is based on survey data from 1943 and the late nineteenth century.

The difference between GNSS derived positions and those plotted on some of the charts is likely to be significant and could lead ships into dangerous situations. Despite warnings placed on the relevant charts mariners are increasingly relying heavily on GNSS for positioning in all parts of the world. In these circumstances, it is possible that incidents will occur unless the Solomon Islands charts are made fully compatible with GNSS. Modern Solomon Islands mapping is referred to WGS84.

Nautical charts of Solomon Islands cannot be purchased locally as there is no recognised chart agent in the country. Charts must be obtained from agents in Fiji or elsewhere in the world.

It is apparent that some of the existing BA charts and plans of Solomon Islands have been published for historical reasons and may not be of areas used by modern shipping; indeed they may even tempt ships to enter areas that it would be wiser to avoid. A number of Solomon Islands national charts exist but are out of publication, it is suggested that these charts are regenerated and eventually replace the lesser used plans on UKHO charts. Charts and plans should be withdrawn on a rolling basis as Solomon Islands charts become available.

Stated briefly, a joint SIMSA/UKHO chart modernization programme is required to improve existing chart coverage for both national and international needs. The modernization of existing charts and plans should in the first instance incorporate islands and topographical features confirmed as being on WGS84 from modern mapping to

allow for the compatibility of navigation by both GNSS and traditional means. Secondly Solomon Island charts, when republished, should replace those essential for local shipping.

These improvements and the retention of relevant nautical charts for Solomon Islands should allow for:

- the safe conduct of inter-island traffic;
- the safe passage of SOLAS shipping in and around the Solomon Islands;
- charting of relevant ports and location; and
- general charting coverage of all areas referenced to the WGS84 datum.

The process of chart modernization to meet contemporary requirements relies on the availability of new and revised information both hydrographic and topographic. Some of this information can be obtained by local authorities, stakeholder organizations and individuals and be forwarded to the PCA (UKHO). Other information exists that could be included in revised charts. Dedicated surveys will nevertheless be required for key areas.

The emerging technology of satellite derived bathymetry (SDB) may offer a very cost effective way of providing at least reconnaissance level data to be used in those areas not critical for navigation.

An analysis of the existing charting situation is contained in Annex H - Charting Analysis of Solomon Islands Waters.

### 3.6 Hydrographic Development Plan

Following assessment during the IHO Technical Visit it is recommended that SIMSA's key hydrographic objectives should be:

- The immediate improvement in the flow and quality of MSI;
- Re-generation of the national hydrographic office infrastructure;
- A comprehensive check of UKHO charted data;
- Acquire portable survey equipment and conduct refresher training;
- Commence delivery of the national hydrographic programme;
- Re-generation of the national nautical chart series;
- Publish and maintain local charts for sale in the Solomon Islands.

A revised development plan based on that previously published and circulated by SIMSA within the SIG is at Annex D Appendix 7.

## 4. Conclusions and Recommendations

The once well established Solomon Island's national hydrographic capability went into a long period of decline. Senior staff planning the establishment of SIMSA showed both a clear awareness of the need for national hydrography and the foresight to re-establish the SIHU within SIMSA. The need for national hydrography has been articulated at the highest levels of government and gained understanding and support. At the time of the IHO Technical Visit the staffing for SIHU was complete and the new accommodation almost ready for occupation with funding in place to re-equip the unit.

SIHU's strength is in its personnel and the support from SIMSA and MID. Of the four personnel in SIHU two are trained hydrographers, one a trained nautical cartographer and a graduate entry holding a marine sciences degree. The trained staff require a period of refresher training but demonstrate a clear professional understanding of their respective fields and the task ahead of them. The staff are enthusiastic and keen to get on with rebuilding SIHU, in this they are well supported by the Director, SIMSA, his staff and the parent ministry. Assuming the equipment procurement programme is carried out in full and swiftly SIHU should be fully functioning for MSI and hydrography by the end of 2012; regeneration of the national chart series will take longer but should be pursued to complement charts published by UKHO. Hydrography in the Solomon Islands has been carefully re-established and should have a good future.

A list of recommendations following the IHO Technical Visit is contained at Annex A.

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## Annex A – List of Recommendations

It is recommended that the relevant authorities consider the following actions:

- (1) **The Solomon Islands government** should continue to support SIMSA and SIHU in ensuring the provision of appropriate hydrographic surveying and nautical charting services for the Solomon Islands in accordance with the International Convention on Safety of Life at Sea (SOLAS). Ref 3.2
- (2) **SIMSA** should ensure that **SIHU** establishes and maintains regular contact with the NAVAREA X Coordinator and UKHO for the provision of MSI. Ref 3.3
- (3) **SIHU** should forward copies of the UKHO International Code of Practice for the provision of MSI data along with nautical chart and publication correction data to SIG authorities. Ref 3.3
- (4) **SIMSA/SIHU** is recommended to develop a strong liaison with **SOPAC** in the delivery of the national hydrographic programme. Ref 3.4
- (5) **SIMSA/SIHU** should inform external agencies that have conducted surveys in the national waters and EEZ of the Solomon Islands (**Australian Department of Defence, France, Royal New Zealand Navy and SOPAC**) that **SIG** grants permission for this data to be used by the PCA (UKHO) and request that the data should be forwarded to UKHO at the earliest opportunity. Ref 3.4, Annex F
- (6) **SIMSA/SIHU** should engage with UKHO to ensure the routine updating of charts and publications and to implement a chart modernization programme for the Solomon Islands. Ref 3.5, Annex C paragraph e,
- (7) **SIMSA/SIHU** should implement a programme to regenerate the previously published national chart series. In doing so **SIMSA/SIHU** should liaise with the **Australian Hydrographic Service** and the **Hydrographic Office of Papua New Guinea** to gain experience from a similar project in Papua New Guinea. Ref 3.5, Annex D.
- (8) **SIMSA/SIHU** should carefully consider and implement the proposed **Hydrographic Development Plan**. Ref 3.6 and Annex D Appendix 7.
- (9) **SIG** to seek membership of **SWPHC** and **IHO**. Ref Annex C paragraphs c. and l.
- (10) **SIMSA** to support **SIHU** in the provision of hydrographic equipment. Ref Annex C paragraph f.
- (11) **SIMSA** should request the formal transfer of hydrographic documents from the **Surveyor-General** to **SIHU**.
- (12) The **Ministry of Foreign Affairs** and the **Solomon Islands' Maritime Police** should be invited to join the **SIHCC**. Annex D Appendix 2
- (13) To provide a hydrographic focus for the work of the **SIHCC** members should be invited to review the proposed amendments to **SIHCC's Terms of Reference**. Annex D Appendix 3
- (14) **SIHCC** should establish the post of **National Hydrographic Coordinator**. Ref Annex D
- (15) **SIHU** to be recognized by the **SIG** at the **National Hydrographic Office**. Ref Annex D Appendix 3
- (16) **SIG** should recognize the **National Hydrographic Structure**. Ref Annex D Appendix 4
- (17) **SIMSA/SIHU** should at the earliest opportunity begin delivery of the National Survey Programme. Ref Annex G Appendix 1.
- (18) **SIMSA/SIHU** should request a placement for SIHU's nautical cartographer at the **Australian Hydrographic Office** for a period of one month to provide refresher training and familiarization with modern methods including print-on-demand chart production. Ref Annex D.
- (19) **SIMSA** should consider increasing the staffing level of SIHU by another nautical cartographer in the short-term and to consider recruitment for succession planning in the medium-term. Ref Annex D.
- (20) **SIMSA** should request through **SWPHC** for **MSI training** in-country for all SIHU staff. Ref Annex D
- (21) After re-equipping **SIHU** with hydrographic equipment and completing system training **SIMSA** should request through **SWPHC** for a short term training team from AHS, LINZ, the UK or USA to conduct an in-country training and assessment period to ensure practices and results are adequate for IHO order surveys to be conducted. Ref Annex D

- (22) **SIMSA/SIHU** should make early provision for the graduate entry, Mr MANI, to attend an **IHO Cat B Hydrographic Course** in mid to late 2013. Ref Annex D
- (23) **SIMSA** should as a matter of urgency procure for **SIHU** and before the procurement of the main hydrographic equipment outfit a hand held GPS receiver and a digital camera to commence the comprehensive chart check required. The estimated cost of this procurement is SBD2,000. Ref Annex D
- (24) **SIMSA** should ensure that SIHU's new hydrographic office accommodation is adequately equipped with standard and specialist office equipment, IT including an internet connection and air conditioning. Annex D
- (25) **SIMSA** should support **SIHU's** bid for the procurement of portable equipment required to allow SIHU to conduct single-beam and side-scan sonar surveys. **SIHU** should be equipped with a SBES, sidescan sonar, a data logging and processing system, RTK GPS positioning system, a tide gauge and a level and tachstaff as an absolute minimum. It is recommended that for geodetic positioning ashore the services of the Surveyor-General's staff should be engaged. Annex D
- (26) **SIMSA** should consider and approve Terms of Reference (ToRs) for **SIHU** and its staff. Proposed ToRs are at Annex D Appendices 5 and 6.
- (27) **SIMSA** to request **UKHO** forward copies of all previous **SIHU** surveys and published charts to **SIHU** to reform the national hydrographic archive. Ref Annex F
- (28) **UKHO** to review **SOPAC** and other data to update charting of the Solomon Islands.
- (29) **SIG** to request **SOPAC** or **hydrographic offices in the region** to assist in investigating the vigias within the waters of the Solomon Islands to enable their removal from the published chart or to show correct depths in the correct position. Ref Annex G
- (30) **SIMSA** to request **UKHO** forward a copy of **HMOGs** to **SIHU**.

## Annex B – List of Contacts

<b>Ministry of Infrastructure Development</b>	Permanent Secretary	Mr Moses Soajonga VIRIVOLOMO psmid@pmc.gov.sb + 677 28605
<b>Ministry of Lands, Housing and Survey</b>	Surveyor-General	Mr Jackson VAIKOTA jvaikota@lands.gov.sb
<b>Ministry of Mines, Energy and Rural Electrification</b>	Director of Mines	Mr Peter AUGA + 677 26352
<b>Ministry of Tourism &amp; Culture</b>	Director of Tourism	Mrs M. MAKABO
<b>Ministry of Fisheries and Marine Resources</b>	Director	Mr James TERI
	Deputy Director	Mr Alex CARLOS
<b>Ministry of Environment, Conservation and Meteorology</b>	Director of Meteorology	Mr David HIRIASIA + 677 38071
	Deputy Director of Environment	Mr Tia MASOLO
<b>Ministry of Planning and Aid Coordination</b>		Ms Nichola KAUA nkaua@planning.gov.sb
<b>Solomon Islands' Maritime Safety Administration (SIMSA)</b>	Director	Captain Edward TOKURU etokuru@hotmail.com
	Head of Maritime Operations	Mr Brian AONIMA briaoka@yahoo.com
	Chief Hydrographic Officer	Mr Clifford OLISUKULU colisukulu@gmail.com
	Principal Hydrographic Officer	Mr Tony HANUAGI Hanuagi.tony11@gmail.com
	Senior Cartographic Officer	Mr John DALOMAE dalomaej@gmail.com
<b>Solomon Islands' Maritime Transport Association</b>	President SIMTA	Mr Joseph MAELAUA
<b>Solomon Islands' Ports Authority</b>	General Manager	Mr William BARILE b.barile@sipo.com.sb
	Harbour Master	Captain Judah KULABULE j.kabule@sipa.com.sb
<b>Solomon Islands' Visitor Bureau Ltd</b>	General Manager	Mr Michael R. TOKURU mtokuru@sivb.com.sb

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## Annex C – Review of IHO Technical Visit 2009

### Summary

Commendable progress has been made to re-establish the SIHU and a hydrographic capability under SIMSA since the IHO visit in 2009. The block on progress has been the lack of trained staff; this has now been resolved and with the refurbishment of SIHU's office accommodation almost complete, will be able to function as an entity. MSI is a clear priority and can be established as a process whilst awaiting new hydrographic equipment. SIMSA/SIHU is fortunate in having trained and experienced staff albeit lacking in recent experience. A national Hydrographic Consultative Committee has been formed and has met on three occasions including that during February 2012; the establishment of a Chief Hydrographic Officer at SIMSA should provide the impetus to keep this committee functioning. SIMSA attended the SWPHC meeting in Brisbane (February 2012) and is awaiting Cabinet approval to sign the SWPHC Statutes as an associate member. IHO membership is under consideration.

### Technical Report Review of Recommendations

The IHO Technical Visit team which visited the Solomon Islands in October 2009 made the recommendations listed below. Notes in *italics* indicate the situation as it exists (February 2012).

- a. **The Solomon Islands government** to formally designate an authority, such as SIMSA, to be responsible for ensuring the provision of the national hydrographic service in accordance with the international Convention on Safety of Life at Sea (SOLAS) and contemporary international practice.

*Completed, SIMSA is the established administrative authority for hydrography. All hydrographic responsibility has passed from the Surveyor General although the final transfer of documents has yet to be completed.*

- b. **The Solomon Islands government** to ensure that the designated national hydrographic authority establishes at least:

- 1) a national MSI Coordinator position, and
- 2) a hydrographic surveyor and/or a survey technician position.

*Four positions have been filled; however, it is too early for the post holders to establish themselves in post.*

- c. The **national hydrographic authority** (SIMSA?) to seek associate membership of the South West Pacific Hydrographic Commission (SWPHC).

*In progress, submission is awaiting Cabinet approval.*

- d. The **national hydrographic authority** (SIMSA?) to apply, through the SWPHC, for MSI training under the IHO Capacity Building Program. IHO-sponsored MSI training is programmed to be held in Australia in 2010.

*Not done due to a lack of staff, SIMSA to apply for the next available MSI course.*

- e. The **national hydrographic authority** (SIMSA?) to establish liaison with the UKHO's Regional Team 5B to ensure new navigational significant information is forwarded and included in existing charts of the country.

*Not done due to a lack of staff. Contact will be made following IHO Technical visit 2012. Full chart check will be completed with new staff in post.*

- f. The **national hydrographic authority** (SIMSA?) to obtain at least one outfit of portable hydrographic surveying equipment. An estimated breakdown of cost is shown in Annex B. Funding will also be required for ongoing maintenance of the equipment and for the training and re-qualification of personnel;

*Not done due to a lack of staff.*

- g. The **national hydrographic authority** (SIMSA?) to seek appropriate training for hydrographic personnel. There are limited opportunities for internationally recognised hydrographic training. A list of courses is contained in IHO publication C-47 - *Training Courses in Hydrography and Nautical Cartography, 6th Edition*. Noting that the Solomon Islands prefers in-country training to maximise attendance by trainees, On the Job Training (OJT) may be available through the US NAVOCEANO Mobile Training Team program (NMTT). Cost will depend on the length of the course. A pamphlet at Annex C contains all information

about NMTT training. Application should be made by presenting the pamphlet to the Security Affairs Officer at the U.S. Consulate in Honiara (or US Embassy in Papua New Guinea). The Consulate or Embassy will determine whether US funding is available for the training. Additionally, training may be available from Australia under the Defence Cooperation Programme or directly through liaison with the Hydrographer of Australia. It may be possible for an Australian Deployable Geospatial Support Team to deploy to the Solomon's and provide OJT in a similar way to the US NMTT program;

*SIHU is now staffed with two IHO Cat B surveyors, both are experienced but neither has practised for the past few years and thus OJT is required once surveying equipment is procured and in country.*

- h. The **national hydrographic authority** (SIMSA?) to engage an overseas hydrographic adviser to guide and assist during the re-establishment of an in-country hydrographic capability and to foster close liaison and possible support from recognized national hydrographic authorities in other countries.

*Replaced by RHC CB initiatives, although SIMSA state that access to an advisor would be preferred.*

- i. **The Solomon Islands government** to form a national hydrographic consultative committee, chaired by the designated hydrographic authority, to coordinate national hydrographic requirements. This committee should include representation from all stakeholder groups, including but not limited to: maritime police, ship operators, port authorities, maritime education authorities, provincial representatives, tourism operators, fisheries, geology, and coastal survey, and SOPAC and other potential assistance agencies;

*First Briefing Meeting held 31 March 2011 with Terms of Reference agreed. SIHCC meeting held during the IHO Technical visit February 2012.*

- j. **The Solomon Islands Department of Lands and Surveys** to relinquish responsibility for the extant Bilateral Arrangement between the Solomon Islands Department of Lands and Surveys and the UKHO done on 27 August 2004, and signed for the Solomon's by the Permanent Secretary to the newly designated SI hydrographic authority;

*New Bilateral Arrangement signed in Honiara in April 2011 between SIMSA and UKHO.*

- k. **The Solomon Islands Department of Lands and Surveys** to transfer all hydrographic records and materials to the custody of the newly designated hydrographic authority. This would include survey records, charts, chart documentation and any hydrographic equipment (if still existing). The Surveyor-General has indicated that such a transfer is logical and acceptable to his Department;

*Formal request yet to be sent to the Surveyor-General, awaiting the refurbishment of SIHU's offices due end February 2012.*

- l. **The Solomon Islands government** to initiate to apply for membership of the IHO (details available in IHO publication M-2), including ensuring on-going funding for annual contributions (about €10,000 per annum) and travel support for SI representatives to attend relevant meetings.

*In progress, Cabinet approval granted with MID awaiting formal notification to proceed.*

## Annex D – National Hydrographic Structure

### A National Hydrographic Structure

#### Responsibilities of a Maritime State

Each coastal State has international, regional and national responsibilities. This section outlines some of those that are applicable to the general field of hydrography to highlight the requirement for hydrographic data in its broadest sense across the widest aspect of national interest. International conventions provide a coastal State with the regulations that permit the establishment of the limits of its seas and lay down the obligations placed on a coastal State

In 1967, Malta's Ambassador to the United Nations made a ground breaking speech highlighting the dangers posed by super-Power rivalry that was spreading to the oceans, pollution that was poisoning the seas, conflicting legal claims and their implications for a stable order and the rich potential that lay on and under the seabed. He ended with a call for 'an effective international regime over the seabed and the ocean floor beyond a clearly defined national jurisdiction ... It is the only alternative by which we can hope to avoid the escalating tension that will be inevitable if the present situation is allowed to continue'. An exercise to regulate the seabed became a global diplomatic effort to regulate and formulate rules for all ocean areas, all uses of the seas and all of its resources resulting the adoption in 1982 of the United Nations Convention on the Law of the Sea (UNCLOS).. The convention came into force in 1994; the Solomon Islands government signed the Convention in June 1997.

Fundamentally UNCLOS states that the sovereignty of a coastal State extends beyond its land territory and internal waters and, in the case of the Solomon Islands its archipelagic waters, to an adjacent belt of sea, described as the territorial sea. This sovereignty extends to the air space over the territorial sea as well as to its seabed and subsoil. A coastal State's sovereignty over the territorial sea and its wider exclusive economic zone (EEZ) is exercised subject to UNCLOS and to other rules of international law. This sovereignty also brings with it obligations, a key one of these is covered by the International Convention for the Safety of Life at Sea (SOLAS).

The SOLAS Convention is the most important of all international treaties concerning the safety of shipping. The first version was adopted in 1914, in response to the *Titanic* disaster, the present Convention was adopted in 1974 and is referred to as 'SOLAS, 1974, as amended'. The Solomon Islands government is a signatory to SOLAS and has, therefore, under SOLAS Chapter V Regulation 9, undertaken 'to arrange for the collection and compilation of hydrographic data and the publication, dissemination and keeping up to date of all nautical information necessary for safe navigation.' Similar obligations relating to nautical charting and nautical publications exist under Regulations 2, 4, 19 and 27. Extracts of the regulations are at Appendix 1 to this Annex.

#### Need for a National Hydrographic Structure

A maritime state requires a balanced national maritime policy designed to fulfil its international obligations and obtain the national economic benefits that can be derived from its sea area. The development of a national maritime policy requires a sound knowledge of the geographical, geological and geophysical features of the seabed and coast, as well the currents, tides and all other necessary environmental data. All of this data must then be properly processed and stored such that it is readily accessible to government departments to provide for the safe and efficient operation of maritime traffic, coastal zone management, exploration and exploitation of marine resources, environmental protection and maritime defence.

To address adequately those areas discussed above it is necessary to create a National Hydrographic Structure. The various national agencies involved with hydrographic data in its broadest sense, specifically that agency recognized as the National Hydrographic Office, will form this vital government grouping. It is through such a structure that the systematic data collection carried out on the coast and at sea produces and disseminates information in support of maritime navigation safety and marine environment preservation, defence and exploitation.

Many potential benefits flow from an efficient national hydrographic structure which forms a vital part of the national environmental, spatial data and transport infrastructure. Whilst it is difficult to quantify the economic and commercial benefits that such a structure can bring there are many examples of where the lack of such a structure has cost government large sums in duplicate data gathering exercise or projects that have failed to deliver the required result for the want of hydrographic data. However, as an indication of what might be gained, several

studies by IHO Member States have suggested that there is a cost to benefit ratio of about 1:10 for major maritime nations. Volumes of international maritime trade continue to grow, and both now and in the future the exploitation of sustainable development of the national maritime zones will be a major pre-occupation of government and industry. For further information reference should be made to IHO Publication M-2 'National Maritime Policies & Hydrographic Services' which can be downloaded free at [http://www.iho.int/iho\\_pubs/misc/M-2\\_3.0.1\\_E\\_19OCT2011\\_TheneedforNHS.pdf](http://www.iho.int/iho_pubs/misc/M-2_3.0.1_E_19OCT2011_TheneedforNHS.pdf)

## National Hydrographic Agencies

In modern government a number of agencies have interests in hydrographic data and will provide or procure such data to meet their specific responsibilities in fulfilment of that government's wider maritime responsibilities; these agencies are essential elements of the national infrastructure. Agencies with hydrographic interests support safe and efficient navigation, foster national maritime development, help to safeguard life and property at sea, facilitate the protection of the marine environment and support the administration and sustainable development of the national maritime zones.<sup>1</sup>

## Co-ordination of the National Hydrographic Effort

Co-ordination of effort in common fields of endeavour is essential if governments are to work efficiently and are not to waste valuable resources; this is particularly relevant to the gathering and use of hydrographic data. By the careful and considered co-ordination of survey planning data can be collected once to the highest appropriate standard. Examples abound in the most sophisticated of governments where the same or similar hydrographic data has been gathered in the same area either concurrently or in a short time frame due to a lack of co-ordination of national effort. In this regard the establishment of a co-ordinating body, the National Hydrographic Committee/Commission, as part of a national maritime structure is strongly recommended. Membership of this national body should include representatives from all government agencies with interests in maritime affairs.

## Funding

The organization of the above structure is cost free: national hydrography is not. It is essential that a mechanism for funding hydrography as an element as fundamental to government services as air traffic control is provided. This can be either direct funding, sponsored from international agencies or a combination of both. Occasionally data gathering operations can and are conducted by friendly nations under co-operation agreements. Without adequate funding all of the foregoing will fail.

# A Structure for Hydrography in the Solomon Islands

## National Hydrographic Need

It will be clear from the arguments presented in this report that there are within a coastal State's government and its economy a wide variety of users of hydrographic data. The specifications for the collection, processing, archiving and dissemination of hydrographic data may vary between users, however, there is sufficient overlap to make it prudent for governments to bring users together to ensure that the requirements are met with the minimum of government resources being committed to the task. To ensure this a national hydrographic structure is a priority for all States regardless of their hydrographic capability. This policy is also in line with the recommendations of the IHO.<sup>2</sup>

## National Hydrographic Structure

A national hydrographic structure should aim to provide the required hydrographic data and services to users – both public and private – with the minimum expenditure of government resources. Those engaged in hydrography should view such a structure as an aid to delivering hydrographic services and not an attempt by any one government body to take control of national hydrography.

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<sup>1</sup> IHO Publication M2 *National Maritime Policies and Hydrographic Services* p.iii

<sup>2</sup> IHO Publication M2 *National Maritime Policies and Hydrographic Services* pp.13-15

With the establishment of SIMSA, including within it the SIHU, and the Solomon Islands Hydrographic Consultative Committee (SIHCC) there is within the SIG the foundation of a national hydrographic structure.

## National Hydrographic Consultative Committee

At the centre of a national hydrographic structure is the National Hydrographic Committee titled the Solomon Islands Hydrographic Consultative Committee (SIHCC) in the Solomon Islands. The SIHCC is a forum where all users of hydrographic data can meet to learn of developments with other users, put forward their own requirements and for single or multiple users to develop coordinated hydrographic programmes. Additionally users can be informed of developments in the field of hydrography and proposals for international and national legislation affecting the need for hydrography.

Government agencies forming the SIHCC and their areas of responsibility or interest are listed in Appendix 2 to this annex. The SIHCC's Terms of Reference (ToRs) as tabled at the Inaugural Meeting are at Appendix 3. The ToRs were reviewed during the IHO Technical Visit; amendments in red are respectfully proposed.

## National Hydrographic Co-ordinator

Within the national structure there is a role for a National Hydrographic Co-ordinator, the agency taking this responsibility should have extensive experience in hydrographic matters. The Co-ordinator should be responsible for the secretarial management of the SIHCC and liaison between members in between meetings. The only candidate for this post in the Solomon Islands is considered to be SIMSA's Chief Hydrographic Officer. Proposed amendments to include the National Hydrographic Coordinator in the SIHCC ToRs are at Appendix 3 to this annex.

## National Hydrographic Organization

A national hydrographic organization should be formally established, by international custom this organization is part of the ministry responsible for SOLAS and for liaison with IMO. This organization is usually responsible for the discharge of national responsibilities under SOLAS V 1974 (as amended) and for liaison with the IHO and the Regional Hydrographic Commission. The SIMSA has, by the Act of 2009 establishing SIMSA, also been established as the national hydrographic organization. Within SIMSA SIHU is by default the Solomon Islands Hydrographic Office.

## Formalizing the National Structure

It is recommended that the national hydrographic structure as discussed in this review is formally established and recognized within the government framework. A proposed national structure for the Solomon Islands is contained at Appendix 4.

## Funding

The careful planning which marked the transfer of hydrographic responsibilities from the Surveyor-General's department to SIMSA included funding for staffing, refurbishment of the office accommodation, provision of office equipment (including IT) and importantly the hydrographic re-equipping of SIHU. An unforeseen element in funding is the regeneration of the national chart series, however, at this stage it is difficult to develop budgetary figures for this activity. Without steady and sustained funding SIHU will not be able to operate. It would appear that adequate funding provision has been made to re-establish SIHU.

## National Survey Programme

The Solomon Islands, through the SIHCC, should develop a national hydrographic programme. The seabed of the Solomon Islands EEZ is, with the exceptions of periodic seismic shift and siltation at river mouths, considered to be relatively stable thus once these waters are properly surveyed they will not require resurveying (other than for minor maintenance surveys) for many years. SIHU does not at present have the facility to carry out this work although it is in SIMSA's work plan to provide a hydrographic data gathering capability. Through the SIHCC, survey programmes should be developed to cover the following areas in the priority:

- the nation's sea area out to the limit of the declared archipelagic zone;
- isolated oceanic dangers;

- the nation's sea area from the limit of the declared archipelagic zone to the extent of the continental shelf (EEZ) limit.

A detailed hydrographic survey programme is at Annex G Appendix 1.

## National Nautical Charting Programme

At paragraph 35 of the IHO Technical Visit report of October 2009 it was considered that 'It is unrealistic in the current circumstances to consider establishing an in-country chart production facility'; it is considered that this situation has changed. In its previous existence SIHU produced national charts of a high standard, the demise of the cartographic capability and the advance of print technology have rendered the printing and updating of these charts impracticable. However, these charts can probably be resurrected as in the manner in which those of Papua New Guinea have been in recent years. Fortunately the re-staffing of SIHU included a trained nautical cartographer able, with a degree of retraining, to assist in the programme and maintain the charts once they are re-published. It is also understood that another nautical cartographer, currently with the Surveyor-General, could be transferred to SIHU to assist in the programme and ensure a degree of succession planning. It is recommended that SIHU should liaise with AHO and request a placement for the nautical cartographer at the AHO for approximately one month's refresher training and to investigate a chart regeneration programme.

## Solomon Islands Hydrographic Unit

SIHU should be formally established as the National Hydrographic Office. A brief analysis of the roles and responsibilities as currently undertaken by SIHU is at Appendix 6. The following sections outline the structure and facilities proposed for a small but efficient organization to fulfil the three phases of the IHB hydrographic office development plan (Phase 1 Maritime Safety Information (MSI), Phase 2 Hydrographic Surveying, Phase 3 Nautical Charting).

## Duties and Responsibilities

The SIHU will act as the national focal point for MSI, conduct limited hydrographic surveys, develop hydrographic surveys for external agencies (SOPAC, LINZ, Australian Hydrographic Service, etc) to deliver, produce local and publications and maintain a national hydrographic archive. In addition it is strongly recommended that SIMSA promote the regeneration of the small, although dormant, national chart series which complements the UKHO series. It is very much in the interest of the Solomon Islands maritime community that these charts are once more published.

Draft Terms of Reference for the SIHU are contained in Appendix 5.

## Personnel

SIHU has an establishment of only four personnel of which two are fully trained hydrographic surveyors at IHO Cat B level although, not having survey experience for a number of years, they will require refresher training. Age is also a factor in that the Chief Hydrographic Officer is in the latter part of his career. It is strongly recommended that the staffing levels are raised slightly to allow for succession planning and to relieve some of the inevitable pressure to come on the current team. This should be done over a period of possibly five years to spread seniority, experience and the training requirement.

To strengthen the capability of the team it is recommended that all members of the team are cross trained. In doing so all members of the team would be interchangeable allowing for unexpected staff losses, leave, illness, etc without a loss of capability to carry out the essential duties of the organization.

A proposed structure with an outline of responsibilities is Appendix 6.

## Training

The staffing of SIHU was completed during the IHO Technical Visit with the last staff member, Mr Malesi MANI, a recent graduate in Marine Sciences from the University of the South Pacific joining on the final day. All staff members, with the exception of Mr MANI, are fully trained hydrographers or cartographers.

SIMSA should request through AHS or SWPHC for MSI training to be conducted in-country to bring all staff members to an adequate level of competency in MSI.

The three trained staff members require specific training on the equipment to be procured and general refresher hydrographic training. It is suggested that for these personnel training should be given on the equipment by the manufacturer following which a training survey should be conducted. Dependent upon the results of the training survey it might be appropriate for a short term training team from AHS, LINZ, the UK or USA to conduct an in-country training and assessment period to ensure practices and results are adequate for IHO order surveys to be conducted.

Mr John DALOMAE, SIHU's cartographer, was trained at UKHO in 1997 and was employed on nautical cartography and MSI duties until 2003. Mr DALOMAE, in the first instance, requires refresher training in modern cartographic methods and MSI data handling and processing. It is suggested that SIHU apply to AHS to take up an open offer for an attachment to AHO (approximately four weeks) proposed at the recent SWPHC in Brisbane. Specialist software and equipment training will be required in due course. In a similar manner to hydrography it would be appropriate for an advisor visit to be made to SIHU by AHS, LINZ or UKHO once nautical cartography is re-established at SIHU.

The graduate entry into SIHU requires full training and it is suggested that this be both hydrographic and cartographic training. After a period of approximately a year's experience with hydrographic survey operations in the Solomon Islands application should be made for Mr MANI to attend an IHO Cat B course, possibly at the RAN school in Sydney. Further training in cartography should be given once the cartographic section is functioning and the Mr MANI has gained some cartographic experience.

## Hydrographic Survey Capability

The newly re-established SIHU has no hydrographic equipment. Prior to the Chief Hydrographic Officer's appointment to SIHU on 6 February 2012, discussion had taken place between SIMSA and SOPAC on the use of SOPAC equipment. In a letter to SIMSA from SOPAC, dated 7 June 2011, it was agreed that SIMSA could have the use of SOPAC equipment on a cost recovery basis including 'a day rate for wear and tear ...., as well as accompanying technical survey personnel from SOPAC'. Discussion with SOPAC has revealed that for a two week loan period, the minimum period for a survey of any significance, SIMSA could expect to pay in the order of US\$11,500. Further it is apparent that booking well in advance is essential as at the time of the IHO visit (February) the equipment was not available until August. It is considered that for the equivalent of approximately 9 loans of two weeks each SIMSA could equip SIHU with a system able to meet IHO Order 1a survey standard and have complete availability thereby maximising the use of personnel for field operations. Further, without a permanent system in country it is considered that SIHU will never regain the experience required of it nor will it be able to react to short notice surveys required of it in, for example, a post earthquake scenario or simply to confirm depths at berths in the main ports.

In discussions with the Chief Hydrographic Officer it is clear that he has a firm understanding of the portable equipment required to allow SIHU to conduct single-beam and side-scan sonar surveys. SIHU should be equipped with a SBES, sidescan sonar, a data logging and processing system, RTK GPS positioning system, a tide gauge and a level and tachstaff as an absolute minimum. For geodetic positioning ashore the services of the Surveyor-General's staff should be engaged.

Before the procurement of the main hydrographic equipment outfit SIHU should be provided as a matter of urgency with a hand held GPS receiver and a digital camera to commence the comprehensive chart check required. The estimated cost of this procurement is SBD2,000.

## National Chart Production Capability

SIHU compiled and produced nautical charts over a number of years with a chart series totalling approximately 14 charts; the exact number is unknown as record copies, with the exception of those at UKHO, have been lost. Copies of these charts are located in SIHU (limited coverage) and the UKHO archive (full coverage). The charts were well compiled and produced and should be re-generated in a similar manner to those of Papua New Guinea (PNG) possibly seeking guidance from the Australian Hydrographic Office (AHO) which played a major role in the PNG project. SIHU has a trained nautical cartographer to support this programme and maintain the charts in the future. Once this programme is completed SIHU will require a print-on-demand facility to publish the charts.

## Hydrographic Office Accommodation

Dedicated and refurbished office accommodation is being provided for SIHU and should be ready for occupation before the end of March 2012. The office should be equipped with storage space and facilities for both equipment and hydrographic archive material. Given the nature of the climate, the reliance on IT equipment and the preservation of documents the office accommodations should be fully air conditioned at all times. Specialist

storage facilities should be provided for the safe storage of hydrographic archive records. Dedicated internet access in the Hydrographic Office is essential for the efficient delivery of hydrographic and cartographic services, disseminating MSI data quickly and efficiently, downloading UKHO Notices to Mariners, maintaining contact with PCA (UKHO), and maintaining contact with foreign government hydrographic offices, the regional hydrographic commission members and IHO.

## SIHU Development and Action Plan

It is considered that there are three main development areas in the re-establishment of the SIHU: they are, in order, the re-establishment of the hydrographic office's infrastructure including the re-establishment of a functioning MSI organisation; the re-establishment of SIHU's field survey capability and the re-establishment of the production of national nautical charts of the Solomon Islands. The transfer of SIHU to the Lands and Surveys Department and the generally instability of the nation's governing infrastructure in the late 1990 and early 2000s did little for the maintenance or development of SIHU and it and its records went into decline, therefore, rebuilding SIHU's office structure and the necessary support documentation is the first priority. SIHU cannot develop unless it has a firm structure on which to build. Concurrent and overlapping this is the re-establishment of a field survey capability using portable survey systems (SBES, SSS and RTK GPS). The final element is to regenerate the national chart series. These charts were well produced and are able to be modernized and brought back into production in a similar manner to charts of Papua New Guinea. The main elements and initial breakdown are given below whilst a detailed plan is at Annex D Appendix 7.

- Re-establish SIHU infrastructure and establishment of MSI infrastructure
  - Establish national hydrographic archive
  - Establish MSI organization
  - Undertake UKHO chart update programme
  - Review IHO Technical Visit Report
  - Develop national hydrographic database
  - Determine and review national tide gauge data
- Re-establish SIHU Hydrographic Capability
  - Define and agree national hydrographic survey plan
  - Establish hydrographic survey capability
  - Develop plans for externally conducted surveys
- Re-establish SI Nautical Cartographic Capability
  - Regeneration of the national chart series
  - Publication of national charts

# Appendix 1 – Extracts of SOLAS Regulations

## **SOLAS Chapter V – 1/7/02**

The SOLAS (Safety of Life at Sea) Convention is published by the IMO (International Maritime Organisation). SOLAS Chapter V refers to the Safety of Navigation for all vessels at sea.

### **Regulation 9 – Hydrographic Services**

1. Contracting Governments undertake to arrange for the collection and compilation of hydrographic data and the publication, dissemination and keeping up to date of all nautical information necessary for safe navigation.
2. In particular, Contracting Governments undertake to co-operate in carrying out, as far as possible, the following nautical and hydrographic services, in the manner most suitable for the purpose of aiding navigation:
  - .1 to ensure that hydrographic surveying is carried out, as far as possible, adequate to the requirements of safe navigation;
  - .2 to prepare and issue nautical charts, sailing directions, lists of lights, tide tables and other nautical publications, where applicable, satisfying the needs of safe navigation;
  - .3 to promulgate notices to mariners in order that nautical charts and publications are kept, as far as possible, up to date; and
  - .4 to provide data management arrangements to support these services.
3. Contracting Governments undertake to ensure the greatest possible uniformity in charts and nautical publications and to take into account, whenever possible, relevant international resolutions and recommendations.
4. Contracting Governments undertake to co-ordinate their activities to the greatest possible degree in order to ensure that hydrographic and nautical information is made available on a world-wide scale as timely, reliably, and unambiguously as possible.

*The specific parts of SOLAS relating to nautical charts are:*

### **Regulation 2 Definitions**

2.2 Nautical chart or nautical publication is a special-purpose map or book, or a specially compiled database from which such a map or book is derived, that is issued officially by or on the authority of a Government, authorized Hydrographic Office or other relevant government institution and is designed to meet the requirements of marine navigation.

### **Regulation 19 Carriage requirements for shipborne navigational systems and equipment**

A revised version of SOLAS V/19 came into force on 1 January 2011 and states:

2.1 All ships irrespective of size shall have:

2.1.4 Nautical charts and nautical publications to plan and display the ship's route for the intended voyage and to plot and monitor positions throughout the voyage. An electronic chart display and information system (ECDIS) is also accepted as meeting the chart carriage requirements of this subparagraph. Ships to which paragraph [2.10] applies shall comply with the carriage requirements for ECDIS detailed therein; 2.1.5 back-up arrangements to meet the functional requirements of subparagraph 2.1.4, if this function is partly or fully fulfilled by electronic means.

Footnote to regulation 2.1.4

Paper nautical charts sufficient to meet the requirements of sub-paragraph .4 and regulation 27 may be used as a back-up arrangement for ECDIS. Other back-up arrangements for ECDIS are acceptable (see Appendix 6 to resolution MSC.232 (82), as amended).

### **Regulation 27 Nautical Charts and Nautical Publications**

Nautical charts and nautical publications, such as sailing directions, lists of lights, notices to mariners, tide tables and all other nautical publications necessary for the intended voyage, shall be adequate and up to date.

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## Appendix 2 – SIHCC Members

Department	Responsibility or Interest
Ministry of Culture and Tourism	Cruise Ships Marine Based Tourism Marine Archaeology
Ministry of Development and Aid Coordination	Maritime Affairs Coastal and Marine Development
Ministry of Environment Conservation and Meteorology	Marine Environment Coastal Zone Management Marine Resources Spatial Data Infrastructure
Ministry of Finance and Treasury	Maritime Projects
Ministry of Fisheries and Marine Resources	Fish Habitat and Conservation Marine Reserves and Habitats Fisheries Licensing
Ministry of Foreign Affairs	UNCLOS Maritime Boundaries Foreign Research Cruises
Ministry of Forest	Timber Exporting
Ministry of Infrastructure Development	Maritime Affairs Shipping Regional Development Programmes
Ministry of Lands, Housing and Survey	Mapping Geodesy
Ministry of Mines and Energy and Rural Electrification	Sub-sea mining
Solomon Islands Maritime Police	Search and Rescue Anti-smuggling Monitoring National Waters
Solomon Islands Maritime Safety Administration	IHO Shipping SOLAS UNCLOS Hydrography
Solomon Islands Port Authority	Solomon Islands International Ports
Forum Fisheries Development	Fish Habitat and Conservation Marine Reserves Fisheries Licensing

Note: the Ministry of Foreign Affairs is not a SIHCC member it is recommended that this important ministry be invited to participate as a full member of SIHCC.

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## Appendix 3 –SIHCC Terms of Reference

Amendments to the initial draft TORs as drafted and proposed by the IHO Technical visit in February 2012 are shown in red.

### Solomon Islands Hydrographic Consultative Committee Terms of Reference

#### 1. Role/Purpose

##### Objectives

The role of the Solomon Islands Hydrographic Consultative Committee (SIHCC) will be to provide strategic direction and leadership to ensure the discharge of Solomon Islands' obligations as a maritime nation in term of the resumption of survey and provision of data to update navigational charts and publications in respect of Solomon Islands' waters.

##### Outcomes

The SIHCC sets out to take an overview of Solomon Islands as a potential and eventually active member of IHO and member of the South West Pacific Hydrographic Commission (SWPHC). Deliverables will be:

- Monitoring and guidance of SIMSA in pursuit of IHO/SWPHC membership
- Guidance to Solomon Islands Hydrographic Unit (SIHU) in meeting the obligations of IHO/SWPHC membership
- **Guidance to SIHU in meeting the Solomon Islands' obligations under SOLAS**
- Represent the interests of stakeholders and the community
- Governance: Providing an overview to ensure that SIHU transparently represents the interests of the community and stakeholders

#### 2. Definitions

For these initial Terms of Reference, the following meanings are defined:

Term or Abbreviation	Meaning	Details
MID	Ministry of Infrastructure Development	Solomon Islands ministry with responsibility for the maritime sector.
SIMSA	Solomon Islands Maritime Safety Administration	An Administration under MID enabled by the Maritime safety Act 2009 to take responsibility for hydrography in Solomon Islands
SIHU	Solomon Islands Hydrographic Unit	A unit to be established within SIMSA to implement Solomon Islands Government's obligations as a maritime nation in respect of navigational charting
IHO	International Hydrographic Organization	The international body with responsibility for the standardization of navigational charts
IHB	International Hydrographic Bureau	Operating entity of IHO
SWPHC	South West Pacific Hydrographic Commission	Regional committee of IHB
UKHO	United Kingdom Hydrographic Office	Charting authority for Solomon Islands waters

### 3. Term

The Terms of Reference are effective from 1 April 2011 and will continue until 31 March 2012 or until amended by the Members or terminated by MID.

### 4. Membership

Membership of the National Hydrographic Committee is listed below.

The organizations and departments listed in the table are full members of the committee, are voting members and form the quorum for the meetings. If all full members of the meeting are unable to attend a particular meeting, it may be possible for ex-committee endorsement to be obtained from the absent member. Other relevant stakeholders may be co-opted onto the SIHCC as required. The senior delegate present from a member organization or department attending the meeting will cast the vote for that organization or department.

- **Ministry of Infrastructure Development**
- Ministry of Culture and Tourism
- Ministry of Development Planning and Aid Coordination
- Ministry of Environment Conservation and Meteorology
- Ministry of Fisheries and Marine Resources
- **Ministry of Foreign Affairs**
- Ministry of Forests
- Ministry of Lands, Housing and Survey
- Ministry of Mines, Energy and Rural Electrification
- Solomon Islands Port Authority
- National Fisheries Development Ltd
- Forum Fisheries Agency
- Solomon Islands Maritime Transport Association
- **Solomon Islands Maritime Safety Administration**
- **Solomon Islands Maritime Police**

### 5. Roles, Responsibilities and Expectations

The SIHCC will:

- **Continuously review the hydrographic needs of the Solomon Islands government;**
- **Co-ordinate hydrographic projects across government to provide maximum return for minimum resource expenditure;**
- **De-conflict hydrographic projects within government;**
- **Develop co-ordinated hydrographic projects requiring external funding;**
- **Review proposed international regulations to ensure that hydrographic matters are properly aligned;**
- **Monitor the national archiving and databasing of hydrographic data and allow its use by public and private bodies.**

The SIHCC is accountable for:

- Fostering collaboration
- Removing obstacles to the SIHU's successful management, delivery and implementation of navigational charting of Solomon Islands' waters
- Maintaining at all times the focus of the SIHU in the agreed scope, outcomes and benefits
- Monitoring and managing the factors outside the SIHU's control that are critical to its success
- Providing lobbying and advocacy in any forum, including liaison with the SIG, that may be desirable to assist SIHU achieve its objectives.

The members of the SIHCC will commit to:

- Attending all SIHCC meetings
- If unable to attend an SIHCC meeting, nominate an alternate and proxy
- Wholeheartedly champion the SIHU within and outside of work areas
- Take any opportunity to uphold the importance of hydrographic capability to representatives of Solomon Islands Government, community and potential stakeholders
- Share all communications and information across all SIHCC members where it is relevant to SIHU or hydrographic activities relating to Solomon Islands

- When asked to support specific initiatives, make timely decisions and take action so as not to hold up the project
- Notifying members of the SIHCC, as soon as practical of any matter arising which may be deemed to affect the development of SIHU, SIHCC or hydrographic capability in Solomon Islands

Members of the SIHCC will expect:

- That each member will be provided with complete, accurate and meaningful information in a timely manner
- To be given reasonable time to make key decisions
- To be alerted to potential risks and issues that could impact on hydrography or hydrographic capability in Solomon Islands as they arise
- Open and honest discussions, without resort to any misleading assertions
- On-going 'health checks' to verify the overall status of SIHU, SIHCC and progress towards declared objectives

## 6. Meetings

- All meetings will be chaired by *[insert name and organization]*
- A meeting quorum will be *[insert number]* members of the advisory group
- Decisions made by consensus (i.e. members are satisfied with the decision even though it may not be their first choice). If not possible, SIHCC makes the final decision.
- Meetings will be coordinated by the National Coordinator
- Meetings will be held *[how often]* for *[specify time]*
- If required subgroup meetings will be arranged outside of these times at a time convenient to subgroup members.

### Meeting Minutes and Agenda

- The National Coordinator will prepare and distribute agendas, minutes and supporting papers.
- SIHCC Agendas and Minutes are to be maintained by the National Coordinator with a record of the date of the meeting and date of issue.
- Actions raised are to be annotated with an identifier which uniquely identifies each action to the meeting where the action was first raised, the owner of the action and a target date for completion of the action. Actions of a continuing nature, which have no short-term completion date, should become agenda items.
- At each SIHCC meeting, all actions recorded in the previous meeting minutes are to be either formally cleared or formally recorded as carried forward. The carry forward record should identify the target completion date and, if appropriate, any agreed time extension.
- Formal correspondence to the SIHCC is to be copied to the National Coordinator and shall be filed (on paper and electronically).
- Decisions and endorsements agreed by the SIHCC will be formally recorded in minutes. Hydrographic related agreements 'ex committee' will be formally raised and recorded in the next meeting minutes.
- The National Coordinator shall arrange for the distribution of SIHCC minutes to all attendees and any other interested parties.

## 7. National Hydrographic Co-ordinator

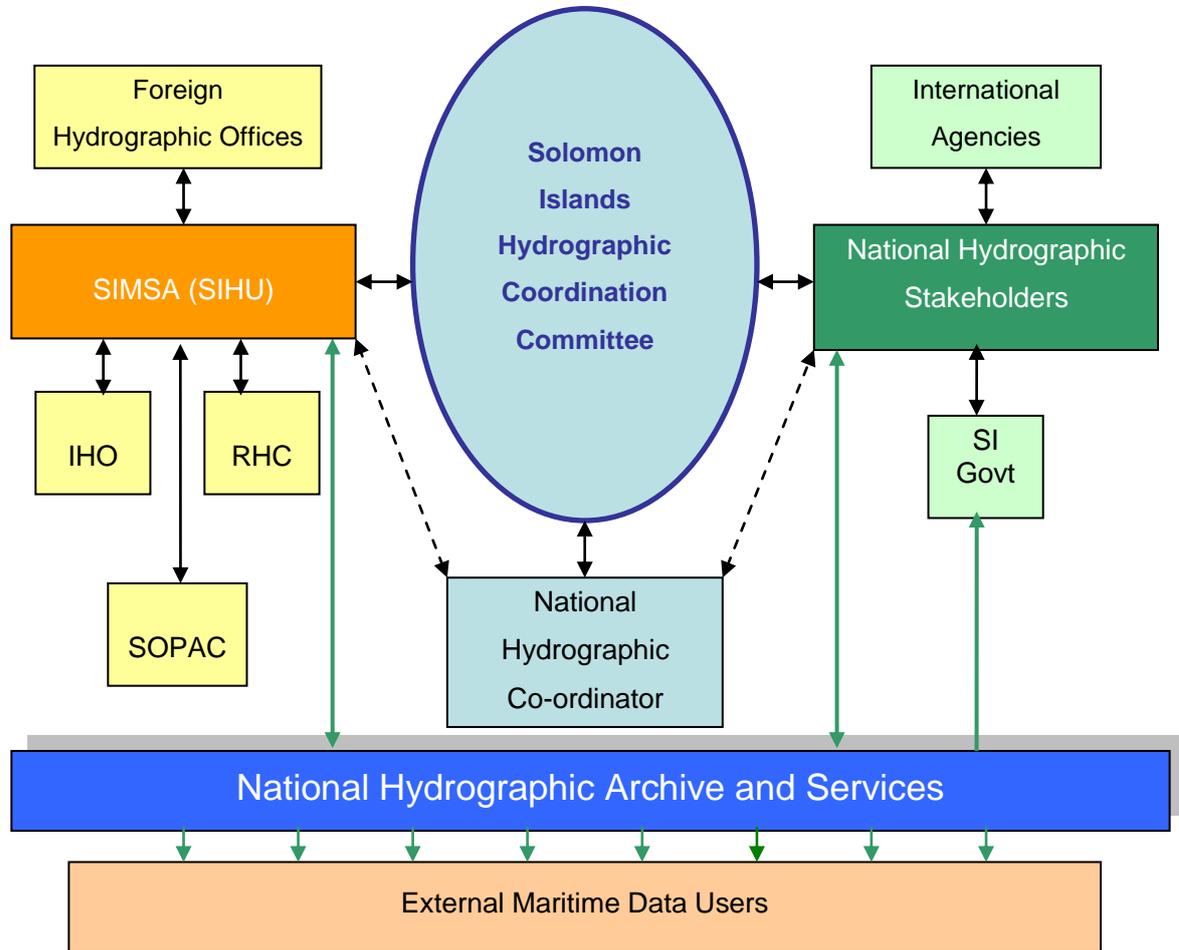
The National Coordinator shall be the SIMSA Chief Hydrographic Officer. The National Hydrographic Coordinator will act as the Secretary for the SIHCC. The Coordinator will arrange the meeting venue, produce and disseminate the Agenda, arrange for Minutes to be taken and circulated and will liaise with SIHCC members outside of committee meetings to further the business of the SIHCC.

## 8. Amendment , Modification or Variation

These Terms of Reference may be amended, varied, or modified in writing after consultation and agreement by SIHCC members.

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## Appendix 4 – National Hydrographic Structure



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## Appendix 5 – Draft SIHU Terms of Reference

### Solomon Islands Hydrographic Unit (SIHU) Terms of Reference

#### Purpose

The purpose of the Solomon Islands Hydrographic Unit (SIHU) is to act as the national agency for hydrography within the Solomon Islands Government and specifically to discharge the nation's responsibilities under SOLAS and in particular SOLAS Chapter V Regulation 9.

This purpose was endorsed by the Ministry of Infrastructure Development on [Date] [Reference].

#### Responsibilities

##### Maritime Safety Information

- To be the national focal point for all MSI data;
- To assess and disseminate MSI as required by the WWNWS, GMDSS and national information systems including Notices to Mariners;
- To assess and disseminate MSI to foreign hydrographic offices producing navigational charts and publications of Solomon Islands waters;
- To maintain an archive of all MSI data including source, assessment, and why, when and how cancelled.

##### Hydrographic Surveys

- To plan, execute and process area hydrographic surveys to IHO Orders of Survey;
- To propose, plan and monitor surveys to be conducted by external agencies;
- To ensure that all hydrographic data is forwarded to the Primary Charting Authority;
- To maintain an archive of all hydrographic survey data.

##### Navigational Charts and Publications

- Maintain a close liaison with the Primary Charting Authority to maintain the primary navigational charts and publications for the Solomon Islands;
  - To revive and maintain for publication previous Solomon Islands charts;
  - To develop and produce specialised charts for national purposes;
  -
- The following item is for longer term consideration:*
- Develop national ENC coverage of Solomon Island waters.

##### Aids to Navigation (AtoNs)

- To advise on the location and type of AtoNs for the Solomon Islands;
- To maintain a record of all AtoNs in the Solomon including date established, position, height details, characteristics.

##### SIMSA

- Provide general advice and assistance to SIMSA on hydrographic and related matters.

##### Solomon Islands Hydrographic Consultative Committee

- To be a member of the Solomon Islands Hydrographic Consultative Committee;
- The Chief Hydrographic Officer to be the national Hydrographic Coordinator;
- To provide professional hydrographic advice to the SIHCC.

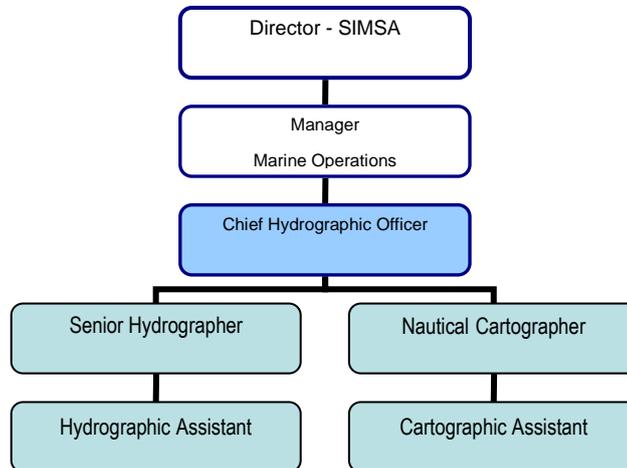
## **Authority**

The SIHU has authority as follows:

- Direct liaison with departments within the Solomon Islands government in pursuance of its purpose;
- Direct liaison with the SIHCC;
- To be a member of the SIHCC;
- Direct liaison with the International Hydrographic Bureau;
- Direct liaison with the Regional Hydrographic Commission;
- Direct liaison with SPC-SOPAC;
- Direct liaison with all foreign government hydrographic offices in pursuance of its purpose.

## Appendix 6 – SIHU Staffing and Organization

### Organizational Chart



### Duties

<b>Chief Hydrographic Officer</b>	<p>To ensure that SIMSA discharges the nation's responsibilities under SOLAS and in particular SOLAS Chapter V Regulations 2, 4, 9, 19 and 27.</p> <p>Supervise the work and operation of the SIHU.</p> <p>To check MSI data before dissemination by the Nautical Cartographer</p> <p>Provide advice and assistance to SIMSA on hydrographic and related matters.</p> <p>To be the SIHCC National Coordinator.</p> <p>To provide professional hydrographic advice to the SIHCC</p>
<b>Senior Hydrographer</b>	<p>Plan and oversee the execution and processing of hydrographic surveys to IHO S44 Standard</p> <p>Deputise for the Chief Hydrographic Officer in his absence</p> <p>Supervise the work of the Assistant Hydrographer</p> <p>Shadow the work of the Nautical Cartographer to deputise for him in his absence</p> <p>Provide advice as required regarding national AtoNs</p>
<b>Assistant Hydrographer</b>	<p>Assist in the planning, execution and processing of hydrographic surveys to IHO S44 Standard as required by the Senior Hydrographer.</p> <p>Assist the Nautical Cartographer in the processing of MSI</p>

**Nautical Cartographer**

Develop and maintain Solomon Islands national charts.

Assess UKHO charts and publications of the Solomon Islands for consistency with the local situation and propose amendments to the Chief Hydrographic Officer.

Shadow the work of the Senior Hydrographer to deputise for him in his absence

Assess and disseminate MSI to foreign hydrographic offices producing navigational charts and publications of Solomon Islands waters.

Maintain an archive of all MSI data including source, assessment, and why, when and how cancelled.

To maintain a record of all AtoNs in the Solomon Islands including date established, position, height details, characteristics

To maintain a record of all wrecks including survey history, position, least depth and narrative of the loss of the vessel and subsequent salvage if appropriate.

To assist in field survey operations

**Cartographic Assistant**

Assist the Nautical Cartographer

Assist with field survey operations

## Appendix 7 – Hydrographic Development Plan

The following plans have been copied from existing SIMSA plans for SIHU. The format has been retained for future use by SIMSA with comments, amendments and additions generated during the IHO Technical Visit shown in red.

### RECOMMENDATIONS FOR SOLOMON ISLANDS

INITIAL RECOMMENDATION (Dec 2009/Mar 2010)	REVISED RECOMMENDATIONS
<p>SIG formally agrees to the transfer of responsibility for SI hydrographic services from the Ministry of Land, Housing and Survey, Department of lands and Survey, to the Ministry of Infrastructure Development, by means of a Memorandum of Understanding signed by Ministers and transfer of the responsibility of the bilateral agreement between SIG and IHO UKHO.</p>	<p><b>Recommendation unchanged</b></p>
<p>SIMSA forms a hydrographic unit within SIMSA. The unit required may comprise a minimum of two staff but may require one or two additional persons.</p>	<p><b>Recommendation varied:</b> SIMSA forms a hydrographic unit within SIMSA. The unit required may comprise three to four staff eventually but may require less. Initial focus will be on one recruit as 'Chief Hydrographic Officer' but the role will predominantly be point of contact (POC) for MSI.</p> <p><b>Recommendation varied:</b> Following the IHO Technical visit the Chief Hydrographic Officer to recommend to Director SIMSA the necessary steps for the regeneration of the SI Hydrographic Unit to undertake the three capability phases of Capacity Building as defined and recommended by IHO being Phase One MSI; Phase Two Hydrographic Surveying; Phase Three Nautical Cartography.</p>
<p>The unit be equipped with survey equipment as suggested above but only if specific funding can be secured. Additional staff may be required if the unit becomes so equipped. The equipment will be capable of being used in vessels of opportunity.</p>	<p><b>Recommendation varied:</b> The unit may be equipped eventually with survey equipment but only as staff are settled in and trained to ensure that equipment can be used and maintained satisfactorily. An approach to SOPAC may be made to access equipment held in Fiji. Any equipment will be capable of being used in vessels of opportunity.</p> <p><b>Recommendation varied:</b> The unit will be equipped with portable survey equipment for its trained staff to conduct routine minor surveys for the safety of navigation and in support of SIG development plans. Any equipment will be capable of being used in vessels of opportunity.</p>
<p>SIMSA explores all possible avenues for funding and assistance in kind, by training and by mentoring in the region.</p>	<p><b>New recommendation:</b></p> <p>SIMSA progresses a relationship with IHO and the SWPHC to ensure that status is recognised as 'potential member state', thus opening up opportunities for training under the IHO Capacity Building program.</p>
<p>SIG will assist and facilitate SIMSA in meeting SIG's obligations under its membership of IHO bodies, including continuing funding of representation at regional meetings, and accepting liability for any outstanding debts incurred in its behalf previous to transfer of responsibility to SIMSA.</p>	<p><b>Recommendation remains largely unchanged</b> except that most funding for capacity building will be from IHO/SWPHC</p>

INITIAL RECOMMENDATION (Dec 2009/Mar 2010)	REVISED RECOMMENDATIONS
<p>After establishment of SIMSA and the SIHU, SIMSA seeks on behalf of SIG associate membership of the regional body SWPHC, (South West Pacific Hydrographic Commission of IHO)</p>	<p><b>The order has changed here.</b> Application for the SWPHC should be in parallel with an application for IHO membership. This should be given a high priority.</p>
<p>SIG only considers full membership at a later date if justified by developments (such as major economic development or major increase in vessel registry activities, e.g., through a second or supplementary register.</p>	<p><b>New recommendation:</b> An application for full membership of IHO should be progressed. The lead time is such that no significant cost will be incurred for 3 to 4 years. When approval is given, the membership does not become active or fees charged until the applicant nation has signed 'accession'.</p>
<p>SIG will assist and facilitate SIMSA in meeting SIG's obligations under IMO SOLAS obligations in particular with respect to SOLAS Regulation 9 – Hydrographic Services, Regulation 19 Carriage requirements for shipborne navigational systems and equipment and Regulation 27 Nautical Charts and Nautical Publications</p>	<p><b>Recommendation inserted February 2012</b></p>
<p>SIG will assist and facilitate SIMSA in the regeneration of the SI national paper chart series. The unit will be equipped with cartographic equipment for its trained staff to publish and maintain the national paper chart series as required under SOLAS.</p>	<p><b>Recommendation inserted February 2012</b></p>

## ACTION LIST

Recommendation	Action	Sub tasks	Who to carry out	Timing	Cost Implications
SIG/MID formally designate an authority, such as SIMSA, to be responsible for the provision of the national hydrographic service.	Recommendation put to MID	Develop proposal	TA	By end March 2010 <b>(completed)</b>	Nil; TA activity
		Draft regulations (?)	TA	By end January 2010(covered under MSA Act 2009 – no need for Regs) (completed)	Nil; TA activity
	MID advises community	Media release setting out planned change	TA for PS, MID	April 2010 <b>(completed)</b>	Nil; TA activity
All SI stakeholders called to a stakeholder meeting to discuss hydrographic requirements and explore options	Meeting to be held in 'workshop' format to establish nature of requirements to be met by SIHU	<ul style="list-style-type: none"> <li>Develop stakeholder list</li> <li>Convene workshop</li> <li>Record outcomes</li> </ul>	SIMSA with support from: <ul style="list-style-type: none"> <li>UKHO</li> <li>NMSA</li> </ul>	April 2010 <b>(completed)</b>	Cost of venue, catering etc. estimated US\$5,000 to be met from TA Training Budget
SIMSA establishes unit/staff  <i>[Note: All actions from this point are modified by the SIG reserve on recruitment. The Action Plan will be re-scheduled when recruitment is possible – at this stage estimated at Q2 2011. Effect will be to shift many target dates back by one year as shown]</i>	Designate a national MSI Coordinator position	Re draft organization chart	TA	April 2010 (completed)	Nil; TA activity
	Recruit or promote to new positions (a) MSI coordinator and (b) hydrographic surveyor and/or a survey technician	Draft or amend Position Descriptions	TA	May/June 2010 (completed)	Salary cost to MID and already budgeted for (part of MID establishment submission)
		Appoint staff	SIMSA	June – December 2011 (originally June 2010) <b>(completed)</b>	
		Training	IHO	June – September 2011 <b>(Training to be deferred until SIHU is re-equipped)</b>	Tuition costs to IHO. Travel costs and accommodation costs (US\$20K?)
Form a National Hydrographic Consultative Committee	Approach stakeholders to form committee	List and contact potential committee members. Develop terms of reference	SIMSA	October 2010 <b>(completed)</b>	Costs may be incurred to encourage active meetings. Estimated US\$4,000 pa
Investigate and pursue opportunities for close relationships with key members in IHO	<ul style="list-style-type: none"> <li>Develop approach to Australian Hydrographic Service (AHS), <b>Land Information New Zealand (LINZ) and the United Kingdom Hydrographic Office (UKHO)</b></li> <li>Develop approach to NMSA</li> </ul>	<ul style="list-style-type: none"> <li>Approach AHS via DFAT</li> <li><b>Approach LINZ</b></li> <li><b>Approach UKHO through the Bilateral Arrangement</b></li> <li>Direct approach to NMSA with invitation for key staff to visit SI</li> </ul>	ESIMSA/SIMSA	November/December 2010  <b>(Deferred to June 2012 after establishment of SIHU staff)</b>	Nil; TA activity

Recommendation	Action	Sub tasks	Who to carry out	Timing	Cost Implications
SIG to seek associate membership of the South West Pacific Hydrographic Commission (SWPHC)	SIMSA seeks membership	Prepare submission	SIMSA with ESIMSA and IHO assistance	December 2010  (Deferred until June 2012 pending Cabinet approval applied for)	Nil initial cost. Ongoing costs should be comparable to existing 'observer' status
SIG applies for membership of the IHO	MID/SIG makes application to Monaco Government	Gain SIG Cabinet approval	SIMSA/MID	January 2011  (Deferred until June 2012 pending Cabinet approval applied for)	Nil cost initially. After three years €9,000 pa plus costs attending overseas meetings, etc
Responsibilities for hydrography transferred to SIMSA	Submission prepared for presentation to Ministers	Develop submission	TA	July 2011 (completed)	Nil; TA activity
	MOU signed between Ministers	Draft MOU and obtain buy-in and sign-off	TA	July 2011 (completed)	Nil; TA activity
	Documents transferred		SIMSA	August/September 2011 (Deferred to March 2012)	Nil; administrative only
	Lands and Surveys relinquish responsibility for UKHO Bilateral Arrangement between Solomon Islands Department of Lands and Surveys. Responsibility signed over to MID	Seek ministerial approval	TA plus Marine Department	March 2011 (completed)	Nil; administrative only
		Prepare paperwork to facilitate transfer	TA plus Marine Department	September 2011 (completed)	
		Agreement executed and advice to IHO	Department of Lands and Surveys, MID and IHO UKHO	September 2011 (completed)	
	Advice to industry/stakeholders through stakeholder meeting	Advise verbally at meeting	SIMSA	April 2011 (completed)	Nil
Scoping study	Consultant to establish possible requirements, options, equipment and training needs  Scoping study conducted under IHO's capacity Building Programme	<ul style="list-style-type: none"> <li>Seek funding (e.g. RAN/AusAid)</li> <li>Draft TOR</li> </ul>	SIMSA/MID	April 2011 (completed) February 2012 by IHO Technical Visit)	Estimates US\$30,000 funded by overseas donors. Costs borne by IHO Capacity Building Fund

Recommendation	Action	Sub tasks	Who to carry out	Timing	Cost Implications
Acquire equipment  Note: Equipment procurement may be held off pending results of scoping study and costed options. Timing shown is aimed at disbursing funds allocated by end of TA.	Obtain portable hydrographic surveying equipment	Assess and justify need. Prepare proposal for ADB/MID approval	SIMSA with TA	May 2011  (Deferred until March 2012 on the establishment of trained staff)	Nil: SIMSA/TA activity
		Seek funding	SIMSA with TA		
		Purchase or assume equipment	SIMSA	June 2011  (Deferred until June 2012)	US\$150,000 (TA funding if other assistance not obtained)
		Training	External/IHO	March 2011 onward  (Deferred until June 2012 onwards)	US\$50,000 estimated
Overseas advisor appointed	Seek advisor to guide and assist in the re-establishment of an in-country hydrographic capability.	Liaise with other hydrographic agencies. Seek funded mentor role	SIMSA	November 2011  (Deferred, under consideration)	Cost may be funded by other agencies. Role only justified if donated funds
<b>Re-establish SIHU infrastructure</b>					
Establish national hydrographic archive	Transfer archive from Surveyor-General to SIHU	Formal request to be made to the Surveyor-General	SIMSA	March 2012	Nil; SIMSA activity
	SIHU muster and archive documents	Develop archive catalogue	SIHU	May 2012	Nil; SIHU activity
	Compare national archive listing with UKHO listing and request transfer of digital copies of survey records	<ul style="list-style-type: none"> <li>Request SI archive record from UKHO</li> <li>Request digital copies of SI survey drawing held by UKHO</li> </ul>	SIHU	May to July 2012	Nil; SIHU activity
	Obtain non-UKHO survey data	<ul style="list-style-type: none"> <li>Request survey data and reports, digital and hard copy, from SOPC, RNZN and AHS</li> <li>Ensure new data is passed to UKHO for chart action</li> </ul>	SIMSA	April to July 2012	Nil; SIMSA activity

Recommendation	Action	Sub tasks	Who to carry out	Timing	Cost Implications
Establish MSI organization	Inform maritime stakeholders that the SIHU is the focal point for MSI data.	Verbal/written communication as appropriate	SIMSA	March 2012	Nil; SIMSA activity
	Forward copies of the UKHO Code of Practice to maritime stakeholders as information for MSI data to be passed to SIHU	SIHU to brief stakeholders on requirement for MSI data	SIHU	March 2012	Nil; SIMSA/SIHU activity
	Inform NAVAREA X Co-ordinator that SIHU is the MSI POC in SI	Email/fax to NAVAREA X Coordinator	SIMSA/SIHU	March 2012	Nil; SIMSA/SIHU activity
	Conduct in-country MSI training	SIMSA to request SWPHC/AHS/LINZ/UKHO for assistance	External agency to be decided	July 2012	Nil: request capacity building assistance
	Fully functioning MSI organization established	None	SIHU/SIMSA	o/c of task above	Nil; SIMSA/SIHU activity
Undertake UKHO chart update programme	Inform UKHO RT5 that SIHU is the POC in SI	Email/fax to UKHO RT5	SIMSA/SIHU	March 2012	Nil; SIMSA/SIHU activity
	Inform UKHO International Partnering that all charts, publications, NtoMs, etc from UKHO should be forwarded to the Chief Hydrographic Officer, SIHU	Email/fax to UKHO International Partnering	SIMSA	March 2012	Nil; SIMSA/SIHU activity
	Request outfit of charts (paper and raster) and publications for SIHU use from UKHO	Forward formal request to UKHO International Partnering	SIMSA/SIHU	April 2012	Nil; SIMSA/SIHU activity under SI/UKHO Bilateral Arrangement
	Conduct a thorough chart check of UKHO charts of SI to bring BA charts up to date	<ul style="list-style-type: none"> <li>Review charts against the situation in the field</li> <li>Review charted data against nationally held information e.g. aids to navigation</li> <li>Review charts against published data</li> </ul>	SIHU	December 2012	Inter-island travel and subsistence costs.  Equipment required hand held GPS and digital camera cost approximately SBD2000.00

Recommendation	Action	Sub tasks	Who to carry out	Timing	Cost Implications
Review IHO Technical Visit Report	IHO report to be reviewed by SIHCC	Report to be distributed to SIHCC members	SIHCC/SIMSA	April 2012	Nil; SIHCC and SIMSA activity
	SIHCC agreement on recommendations to take forward	Develop list of recommendations for adoption	SIHCC/SIMSA	May 2012	Nil; SIHCC and SIMSA activity
	Review current action plan against adopted recommendations		SIHCC/SIMSA	May 2012	Nil; SIHCC and SIMSA activity
Develop national hydrographic database	Develop base data listings including document archive, Lights List, Wreck List, Tidal Data Listing	Develop appropriate listings	SIHU	December 2012	Nil; SIHU activity
Determine and review national tide gauge data	Determine fixed tide gauges and operating authorities in SI and record locations		SIHU	December 2012	Nil; SIHU activity
	Obtain tide gauge data and forward to UKHO for analysis and updating of SI tidal constituents and predictions.		SIHU	December 2012	Nil; SIHU activity
<b>Re-establish SI Hydrographic Capability</b>					
National hydrographic survey plan	Review IHO Technical Visit report and confirm priorities for national hydrographic surveys by SIHU	Present priority listing to SIMSA/MID for approval	SIHU	July 2012	Nil; SIHU activity
Establish hydrographic survey capability	Receive hydrographic survey equipment		SIMSA/SIHU	September 2012	Nil; SIMSA/SIHU activity
	Conduct hydrographic equipment training		SIHU	September 2012	Nil; SIHU activity
	Conduct training survey at Honiara as part of equipment acquisition		SIHU	October 2012	Nil; SIHU activity
	Commence national hydrographic survey programme	Surveys from prioritized national plan	SIHU	On completion of the training survey	
	Continuation training in country	Prepare request to external agencies – AHS, USN, UK	SIMSA/SIHU	Date to be confirmed but approx six months after training survey in Honiara	

Recommendation	Action	Sub tasks	Who to carry out	Timing	Cost Implications
Develop plans for externally conducted surveys	Review IHO Technical Visit report and confirm priorities for externally sourced national hydrographic surveys	Prepare request to external agencies – SOPAC, AHS, RNZN	SIMSA/SIHU	June 2012	Nil; SIMSA/SIHU activity
<b>Re-establish SI Cartographic Capability</b>					
Regeneration of the national chart series	Obtain scanned images of all previously published SI charts from UKHO	Forward formal request to UKHO International Partnering	SIMSA/SIHU	July 2012	
	Obtain advice from AHS after experience with the PNG project	Nautical cartographer to visit AHS	SIMSA/SIHU	November 2012	T&S to Wollongong NSW
	Obtain commercial quotations for regeneration	Assistance from AHS	SIMSA/SIHU	February 2013	Await commercial proposal
	Seek funding	Request to MID	SIMSA	May 2013	
	Chart regeneration project		SIHU/AHS	June 2013 to Dec 2014	
Publication of national charts	Develop equipment listing (plotter, paper, inks, IT software and hardware) to print nautical charts in SI		SIHU	January 2014	
	Seek funding	Request to MID	SIMSA	May 2014	Approximate cost to establish the print facility US\$40,000
	Acquire equipment, conduct training and commence production	AHS or LINZ assistance	SIHU	By December 2014	

## Annex E – Solomon Islands' Dependency on Hydrography and Charting

### Introduction

The Solomon Islands are strategically located on sea routes between the South Pacific Ocean, the Solomon Sea, and the Coral Sea. From 1946 to 1968, the Solomon's recovered slowly from the effects of war during which time the capital was transferred from Tulaghi to Honiara to take advantage of the infrastructure left behind by the US military. In 1974 a new constitution was adopted establishing a parliamentary democracy and ministerial system of government and in the following year the name Solomon Islands replaced that of British Solomon Islands Protectorate. Becoming self-governing in 1976 the Solomon's gained independence on 7 July 1978 as a constitutional monarchy within the British Commonwealth, with the British Sovereign as Head of State represented locally by the Governor-General.

Ethnic violence, government malfeasance, and endemic crime have undermined stability and civil society. In July 2003, at the government's request Australia led a multi-national force to restore peace and disarm ethnic militias. The Regional Assistance Mission to the Solomon Islands (RAMSI) has generally been effective in restoring law and order and rebuilding government institutions. It is possibly no coincidence that this period matches the decline of national hydrography in the Solomon Islands.

The majority of Solomon Islands are mountainous and rugged and are for the most part covered with dense forests and rank undergrowth. All the larger islands are well-watered by rivers with steep courses over most of their length. The country's main industries include palm oil and rice milling, fish canning and freezing, and saw-milling. Main exports include copra, timber, fish and palm oil products. The country is reported as having extensive reserves of minerals and there is much mineral exploration in progress.

### Solomon Islands

The Solomon Islands consist of a double chain of six large islands and many smaller ones extending about 930 miles of ocean in a SE/NW direction, lying between 5°00'S and 12°30'S, and 155°30'E and 169°45'E. The Solomon Islands territory also includes the Santa Cruz Islands and Duff Islands, lying between 9°40'S and 12°45'S, and 165°40'E and 167°15'E, are part of Solomon Islands.



Islands forming the Solomon Islands<sup>3</sup>

The Solomon Islands rely heavily for their existence on the import and export of goods by sea. The islanders have throughout their history relied on the sea for sustenance; life in the modern world has made this reliance even more essential.

<sup>3</sup> <https://www.cia.gov/library/publications/the-world-factbook/geos/bp.html> [accessed 23 Feb 2012]

## Ports and Harbours

The ports of entry into the Solomon Islands are at Honiara (9°25'S 159°58'E) on Guadalcanal Port Noro (8°13'S 157°12'E) on New Georgia. Both are operated by the Solomon Islands Port Authority in Honiara.

- **Honiara (9°25' · 5S 159°57' · 5E)** is situated on the S shore of Lungga Roads which lies on the N side of Guadalcanal. The city lies either side of Point Cruz, a low coral tongue extending 2 cables from the coast. Honiara is the capital and administrative centre of the nine other provinces of the Solomon Islands; Honiara is the tenth province and the main port of entry. Exports include timber, copra, fish and fish products, palm oil, rice and cocoa, whilst imports are most manufactured consumer goods, machinery and petroleum products.<sup>4</sup>



Honiara<sup>5</sup>

- **Port Noro (8°13'S 157°12'E)** lies in Hathorn Sound which is a continuation southwards of Kula Gulf. Port Noro is a shipment port for copra and frozen fish. Port Noro is a port of entry.



Port Noro<sup>6</sup>

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<sup>4</sup> NP60 p.86

<sup>5</sup> Google Earth

<sup>6</sup> Google Earth

## Inter-Island Communication Routes

Inter-island communication for both passengers and freight is primarily by sea using local cargo and ferry vessels. This service is supplemented by air services using an extensive network of island runways. Freight for Solomon Islands enters the country through Honiara or Port Noro as shipment hub points and is then transhipped to other islands.

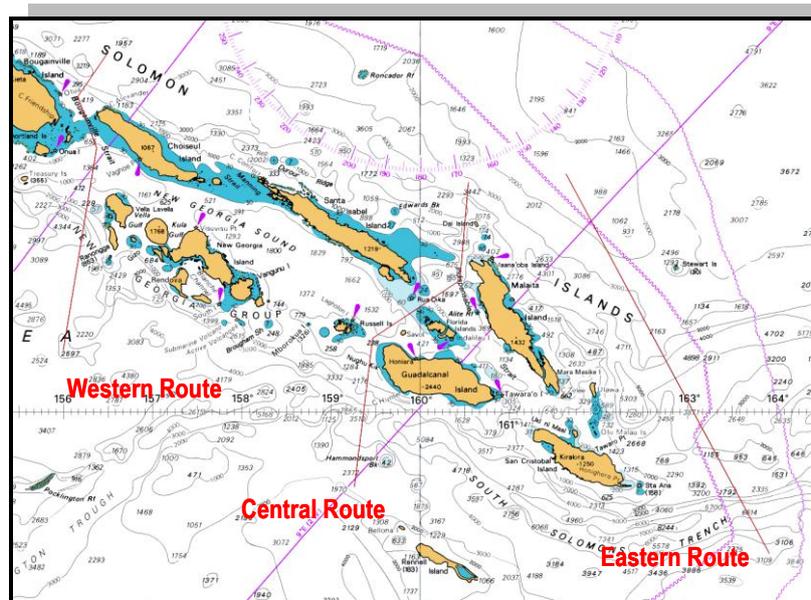
## Cruise Ship Operations

There are at present no major cruise ships operating in the Solomon Islands due to earlier political instability but now to a lack of modern hydrographic data and nautical charts. Smaller cruise ships frequent destinations within the Solomon Islands although not in large numbers. However, the SIG is making progress in encouraging the cruise ship industry to return to the Solomon's and in doing so fully recognizes the importance of hydrography in establishing the trade. The need for hydrography was highlighted to SIG's Ministry of Tourism and Culture at a tourism conference in New Zealand in 2011 when, amongst others, Carnival Australia raised the importance of good hydrography to enable cruise ship operations. Representatives from the Ministry of Tourism and Culture recently visited Vanuatu to learn from that country's extensive cruise ship operation experience and here again the importance of hydrography was emphasised to the SIG team. A Tourism Task Force paper was prepared in 2011 and has been accepted by Cabinet, in addition a UNDP study in 2011 looking into port development also reviewed cruise ship operations; these reports were not available during the IHO Technical Visit. The Ministry of Tourism has completed a Cruise Ship policy paper which is currently awaiting endorsement by Cabinet. Identified within this paper are prospective cruise ship locations in addition to those already identified by Carnival Australia and discussed elsewhere in this paper. It is clear that the government tourism sector is well aware of the urgent need for hydrography before cruise ship operations can resume in the Solomon Islands.

## Shipping Routes including Navigable Channels

Three main shipping routes pass through the waters of the Solomon Islands; in the west, through Bougainville Strait between Bougainville and Choiseul Islands; in the centre passing between the Russell Islands and Guadalcanal crossing to Indefatigable Strait and its northerly exit; to the east passing eastwards of Guadalcanal and Malaita Island. The routes connect Australia and New Zealand with the ports in Japan and Eastern Asia.

Charted information indicates that the route through Bougainville Strait is free from offshore hazards, that the central route (with the exception of the shoals marked by Rua Dika light) and eastern route are also free from offshore hazards.



Major Shipping Routes through Solomon Island's Waters<sup>7</sup>

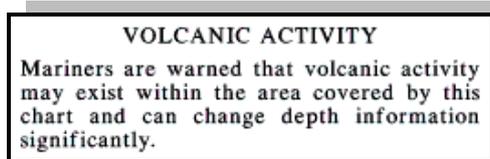
<sup>7</sup> NP136 p.161

## Vigias, Volcanic and Seismic Activity

Seismic activity is frequently recorded in and around the Solomon Islands. On 2 April 2007 an undersea earthquake measuring 8.1 on the Richter scale occurred 345 km WNW of the capital Honiara; the resulting tsunami devastated coastal areas of Western and Choiseul provinces with dozens of deaths and thousands dislocated; the provincial capital of Ghizo was especially hard hit and was reported that the land there had risen as a result of the earthquake. Sites of major volcanoes in the Solomon Islands are shown below.<sup>8</sup>



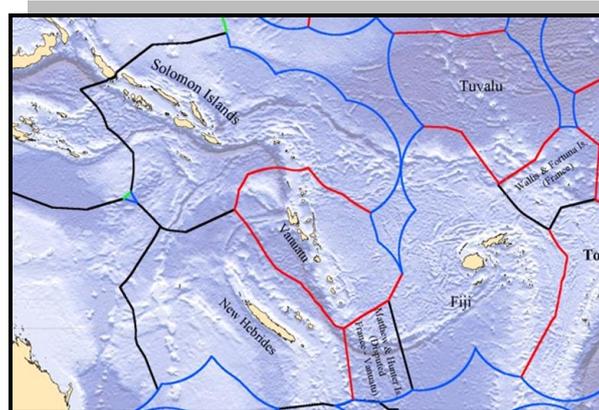
Volcanic activity in the region is noted on a number of charts with warnings that depth information can change significantly from that charted.



An Analysis of Isolated Reefs and Vigias within Solomon Island's EEZ is at Annex G, Appendix 2.

## Maritime Claims

The Solomon Islands claim a 12 mile territorial sea, a contiguous zone of 24 miles and an EEZ of 200 miles.<sup>9</sup> The total EEZ area totals approximately 680,000 square kilometres. As can be seen from the diagram below, of the Solomon Islands' maritime boundaries only that with Vanuatu has yet to be agreed.



- | Boundaries                  | Maritime zones             |
|-----------------------------|----------------------------|
| — Agreed boundaries         | — Exclusive Economic Zones |
| — Median lines (not agreed) | — Exclusive Fishery Zones  |

<sup>8</sup> [http://vulcan.wr.usgs.gov/lmgs/Gif/SolomonIslands/Maps/map\\_solomon\\_islands\\_volcanoes.gif](http://vulcan.wr.usgs.gov/lmgs/Gif/SolomonIslands/Maps/map_solomon_islands_volcanoes.gif) [accessed 12 March 2012]  
<sup>9</sup> NP61 p.9

## Defence including Coastguard

The waters of the Solomon Islands are patrolled by two 31.5m patrol craft operated by the Solomon Islands Maritime Police. The police vessels have on occasions grounded due to inadequate charting and frequently operate in poorly surveyed or charted waters. The north coast of Choiseul Island within the barrier reef extending from Manning Strait north-westwards to the Kamangga River is of particular concern to maritime police operations. There is no national defence interest in the Solomon Islands.

## Sub-sea Mining

Sub-sea mineral exploration operations at depths of up to 1,500 metres have been undertaken for the past five years and continue. The aim of such operations is to define areas rich in gold, copper, zinc, etc for eventual extraction. Survey operations, including bathymetry, are conducted by commercial companies as part of the exploration.

## Environment and Meteorology

Environmental and meteorological issues within the Solomon Islands government are the responsibility of the Ministry of Fisheries and Marine Resources. There is little current environmental interest for bathymetry in the coastal zone regions within the Solomon Islands. Conservation surveys have been conducted at Anavon Island in the Manning Strait, the data was not seen, however, it should be reviewed by SIHU for possible charting action.

The Meteorological Office is responsible for liaising with external agencies such as Geoscience Australia and NOAA for permanent tide gauges established by these agencies within the Solomon Islands. The permanent gauge located at the Solomon Islands Maritime Police Patrol Boat Base in Mbokona Bay, Honiara, has been recording data since 1994. It appears that this data, which is related to land datum and hence chart datum, has not been used for tidal analysis. It is recommended that SIHU obtain access to this data and forwards it to either UKHO or AHS for analysis and development of updated tidal constituents and thereby improved tidal predictions for the area. Similarly SIHU should maintain an interest in the new NOAA gauge at Ghizo for future analysis and development of updated tidal constituents. An interesting feature of the Honiara gauge is that it records variations in topographic height thereby aligning sea level changes with land level changes to provide a determination of relative sea level change.

## Fishing

National fishing is confined to inshore waters within the Solomon Islands. Fisheries developments are those related to harbour infrastructure where it is understood that in excess of 40 new fishery harbours are to be constructed within the Solomon Islands over the next three to four years. It is understood that contract hydrographic surveys will be conducted at these locations and it is recommended that SIHU maintain a close liaison with the Ministry of Fisheries and Marine Resources as these projects develop. Tuna fishing is conducted under licence to foreign vessels within the Solomon Islands EEZ. Catches are transferred to ships for export at either Honiara or Port Noro.

## Tourism and Coastal Recreational Amenities

In addition to the requirement for adequate surveys and charting required by cruise ships and discussed earlier in this section there is a need for inshore charting at larger scales for the growing number of small craft operating in the tourism market in Solomon Islands.

## Education and Science

There do not appear to be any educational or scientific programmes sponsored by the SIG requiring or including the gathering of bathymetric data.

## Planned Maritime Developments in Solomon Islands' Waters

The SIG has an extensive and ambitious plan for the expansion of marine facilities throughout the country. The developments are for regional development centres, cruise ship destinations and fish harbours; the developments are summarized in the table below. Survey plans within this report have been developed from the list below, however, it is extremely difficult to allocate a specific priority to each survey at this stage.

<b>Location BA Reference Chart</b>	<b>Reason</b>
Choiseul Bay, Bouganville Island BA1708	Regional development centre for Choiseul Province. Choiseul Bay to become the main provincial administrative centre with international port status.
Ghizo Island BA1735	Regional development centre for Western Province as the main provincial centre; discharge port for oil supplies; development of cruise ship destination for major cruise ships
Anovona Island BA1709	Development of cruise ship destination for small cruise ships
Upi – North New Georgia BA3995	Development of cruise ship destination for small cruise ships
Tetepari BA3995	Development of a marine conservation area
Marovo Lagoon – Vangunu Island BA3995	Development of cruise ship destination for small cruise ships; fishing grounds; increased marine through traffic
Ndoma – Guadalcanal Island BA1713	Regional development centre for Guadalcanal Province. To become the main provincial administrative centre with international port status.
Kozoruru – Santa Isabel BA3996	Fisheries development
Tulaghi – Florida Islands BA1713	Regional development centre for Central Islands' Province. To become the main provincial administrative centre; development of cruise ship destination for small cruise ships; development of marine tourism.
Mandolean Island – Florida Island BA1713	Development of cruise ship destination for major cruise ships
Honiara – Guadalcanal Island BA1750	Upgrade of the one of the currently two major international ports in SI
Tenarau – Guadalcanal Island BA1750	Fisheries development
Marau Sound – Guadalcanal Island BA1750	Development of cruise ship destination for small cruise ships; fisheries development
Suava Bay – Malaita Island BA3997	Regional growth centre for Malaita Province. The main provincial administrative centre is at Auki.
Bina Harbour - Malaita Island BA1747	Regional growth centre with international port status. The main provincial administrative centre is at Auki.
Waisisi - Malaita Island BA3997	Regional growth centre with international port status. The main provincial administrative centre is at Auki.

Location BA Reference Chart	Reason
Faumamanu - Malaita Island BA3998	Regional growth centre for Malaita Province. The main provincial administrative centre is at Auki.
Liwe - Malaita Island BA3998	Regional growth centre for Malaita Province. The main provincial administrative centre is at Auki.
Kirakira – San Cristobal Island BA3998	Regional development centre for Makira Ulawa Province. To become the main provincial administrative centre.
Santa Anna Island BA3998	Situated in Makira Ulawa province. Development of cruise ship destination for small cruise ships, primary destination before visiting Honiara.
Three Sisters Islands BA3998	Tourist resort development, possible future cruise ship destination.
Nende – Santa Cruz BA17	Main provincial centre for Temotu province. Development of cruise ship destination for small cruise ships.

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## Annex F – Existing Hydrographic Data for Solomon Islands

### General

Survey operations until the mid-1970s were conducted by the SIHU and the British navy, after this period surveys were carried out by SIHU until its effective demise in 1999 since which time no national data gathering has taken place. French and SOPAC research cruises have obtained bathymetric data although this has not been passed to the PCA (UKHO) for charting. Similarly RNZN, and possibly AHS and US surveys have been conducted, although when consulting source data diagrams on BA charts there is no indication of its inclusion. SIHU's hydrographic archive no longer exists; SIHU should request a transfer of SIHU data from the UKHO to re-establish the archive.

### National Data

Archive national hydrographic data does exist although little data appears to remain in-country. It is assumed that all data gathered under previous national survey campaigns has been incorporated into modern charting although this could not be verified. As noted above SIHU should request a transfer of SIHU data from the UKHO to re-establish the national hydrographic archive.

A bi-product of the offshore mineral exploration that has been taking place for the past five years and continues is bathymetry in the ocean regions of the Solomon Islands EEZ. Whilst details of sub-sea geology, etc, are commercially sensitive it is understood that bathymetry in some quite extensive areas could be released.

### Australia

It is understood that AHS has conducted surveys within the Solomon Islands during the period that SIHU was under the control of the Surveyor-General. Records do not exist in SIHU of such surveys, however, as the archive is far from complete survey data may have been passed to SIHU and been lost. SIHU should request AHS provide a list of surveys, if any' conducted in the waters of the Solomon Islands particularly since 1998.

### France

A SOPAC Report dated 2008 notes that from 19 August to 16 September 1993 IFREMER gathered MBES data off Honiara during the SOPACMAPS Project. The research ship was RV *l'Atalante* using a Simrad EM12 MBES system. SIHU should request copies of this data from the French authorities or through SOPAC.

### New Zealand

HMNZS *Resolution* conducted surveys in the Solomon Islands in late 2011 including a survey at Ghizo. SIHU should request copies of all survey data (digital and analogue) from these surveys and any previous surveys conducted by the RNZN in Solomon Islands' waters since 1998.

### United States of America

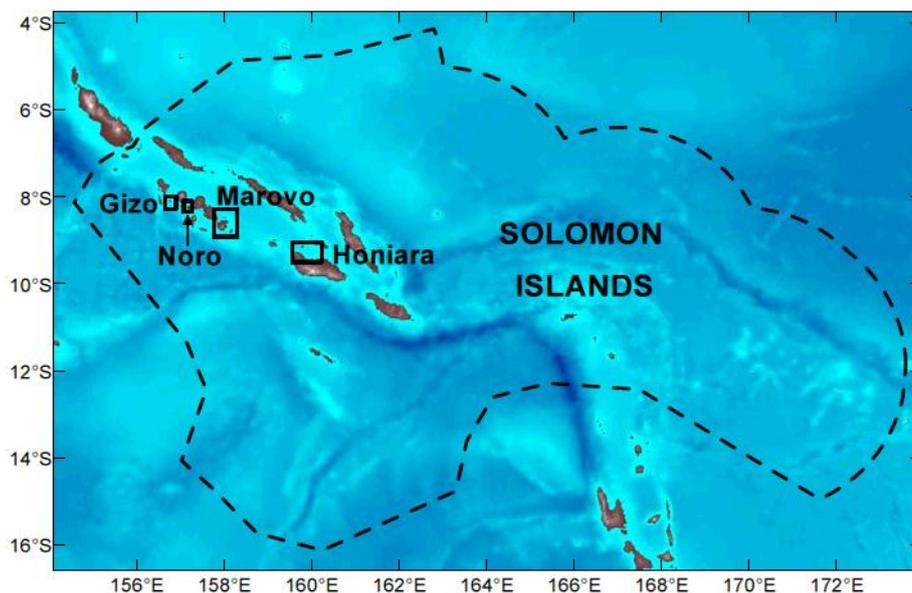
It is understood that no American military surveys have been conducted within Solomon Islands' waters in recent years although this could not be verified by the Solomon Islands authorities. The SIHU through the SIG is strongly recommended to investigate the possible existence of such data through the SWPHC.

### United Kingdom Hydrographic Office

The UKO has probably the single most comprehensive hydrographic archive for the Solomon Islands. All survey data held by UKHO has been incorporated into the current published charts. Given the lack of control of historic SIHU data within the Solomon Islands UKHO should be asked to both forward a list of SIHU surveys held and be asked to transfer digital geo-referenced copies to SIHU.

### SPC SOPAC

A high-resolution bathymetric mapping survey of the four areas in the Solomon Islands was undertaken by SOPAC as part of the SOPAC/EU project 'Reducing Vulnerability of Pacific ACP States'. The surveys, of Ghizo, Guadalcanal North Coast, Marovo and the approaches to Port Noro, were carried out in June and July 2005, resulting in the acquisition of a large quantity of MBES data. SIHU should request a copy of the data and accompanying report whilst at the same time giving permission for UKHO to have and use the data to update UKHO charting. The survey achieved good coverage of the seafloor; the areas surveyed are shown in the diagrams below.



## Summary of Current State of Surveys

The current state of surveys as summarized in IHO Publication C-55 'Status of Hydrographic Surveying and Nautical Charting Worldwide' Third Edition (2004) updated 27 September 2011 is shown in the table below. Solomon Island's EEZ is approximately 828,000 square kilometres of which that >200m depth is approximately 107 times that of the area <200m which totals approximately 7,744 square kilometres. Given the imprecise delineation of the 200m contour and the incomplete knowledge of surveys undertaken in Solomon Island's waters outside of the 200m contour the figures in and for C-55 are at best approximate. Given the research conducted during the technical visit the figures have been revised and are shown in the right-hand column.

Area Code	Definition	C-55 (%)	Revised Value (%)
A1	Area adequately surveyed (<200m)	10	13
A2	Area adequately surveyed (>200m)	30	32
B1	Area requiring resurvey at larger scale or to modern standards (<200m)	30	30
B2	Area requiring resurvey at larger scale or to modern standards(>200m)	10	10
C1	Area which has never been systematically surveyed (<200m)	60	57
C2	Area which has never been systematically surveyed (>200m)	60	58

IHO C-55 Solomon Islands - Status of Hydrographic Surveys [Updated 16 May 2007]<sup>10</sup>

<sup>10</sup> IHO C55 Region L p.11 [http://88.208.211.37/iho\\_pubs/CB/C-55/C-55\\_Eng.htm](http://88.208.211.37/iho_pubs/CB/C-55/C-55_Eng.htm) [Accessed 23 Oct 2011]

## Annex G – Proposals for Hydrographic Surveys in the Solomon Islands

### Introduction

Arising from the decade or so during which very little hydrographic data of any description was gathered in the Solomon Islands and the modern day pressures to encourage maritime trade and development there is a significant and urgent requirement for new surveys to support development and modern charting. It is considered that a three track approach should be adopted to meet this need; surveys conducted by SIHU for development work; wide area surveys and higher resolution surveys conducted by SOPAC or regional hydrographic services; major area surveys linked to possibly environmental or fisheries surveys funded through aid programmes. The requirement for surveys and corresponding outline survey specifications are contained within this annex.

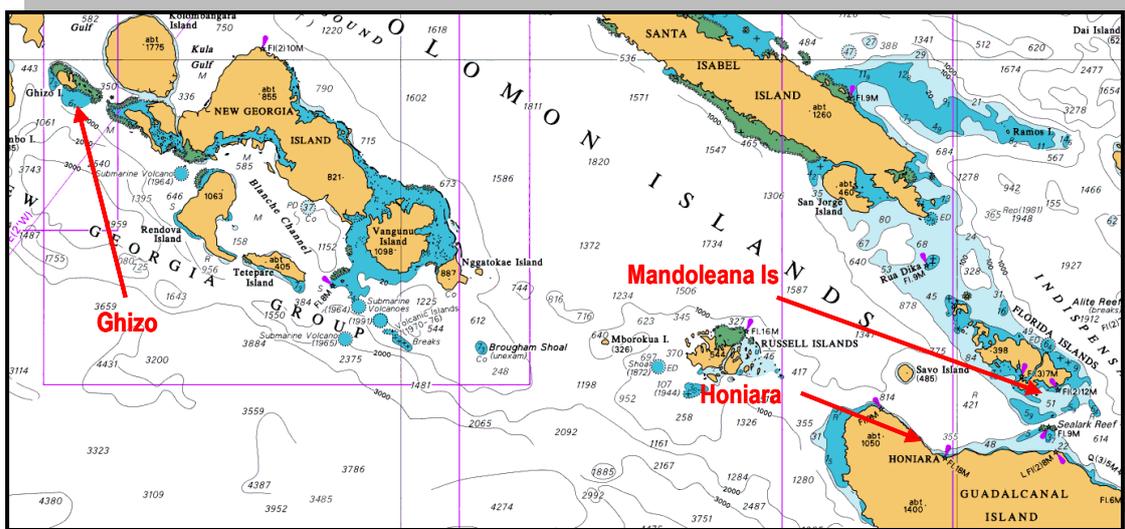
### Ports and Harbours

Honiara port on Guadalcanal and Port Noro on New Georgia are the two main ports in the Solomon Islands. Changes to charted information in Honiara port are well known in SIMSA and SIHU and are of concern to the port authority. A resurvey of Honiara is the highest priority for surveys. The port authority General Manager and the Harbour Master commented on the apparent change in seafloor topography before and after the rainy season, both requested that the immediate port area be resurveyed at least every year after the rainy season but preferably twice a year. The greater part of Port Noro and approaches was surveyed by SOPAC in June/July 2005 using MBES, unfortunately the inshore areas were not included within the survey. The SOPAC data should be reviewed with the intention of completing the inshore work.

### Cruise Ship Operations

Carnival Australia, one of the larger cruise operators in the region, with the improved domestic situation in the Solomon Islands is now exploring the possibility of adding the country to its list of cruise destinations. As with many other destinations in the Pacific the lack of hydrographic data makes destination identification and planning difficult, if not impossible. During discussions at the South West Pacific Hydrographic Commission meeting in Brisbane in February 2012 Carnival Australia expressed an interest in visiting Honiara, the Florida Islands and Ghizo. Details of the surveys required are listed below and have been included in the hydrographic plan contained within this report.

Location BA Chart No.	Approx Position	Preliminary Survey Requirement
Honiara BA1750	9° 26'S 159° 58'E	<ul style="list-style-type: none"> <li>• SBES</li> <li>• Deepwater Berth and approach</li> <li>• Anchorage</li> <li>• Position navigation aids</li> <li>• Ground control to reference existing chart in WGS84 i.e. position charted structures or CONSPIC features</li> </ul>
Mandoleana Island BA1713	9° 13'S 160° 18'E	<ul style="list-style-type: none"> <li>• MBES</li> <li>• Passage from Sealark Channel to the island</li> <li>• Anchorage</li> <li>• Tender access / landing location</li> <li>• Ground control to reference existing chart in WGS84 i.e. position charted structures or CONSPIC features</li> </ul>
Mbambanga Is BA 1735	8° 08'S 156° 53'E	<ul style="list-style-type: none"> <li>• MBES</li> <li>• Passage from SW to the anchorage</li> <li>• Anchorage</li> <li>• Tender access / landing location</li> <li>• Ground control to reference existing chart in WGS84 i.e. position charted structures or CONSPIC features</li> </ul>



Carnival Australia's Prospective Visit Locations

## Shipping Routes and Channels

The shipping routes around the Solomon Islands pass a number of offshore shoals and vigias which should if at all possible be investigated and confirmed or removed from the charts. The main channel requiring resurveying is Bougainville Strait due to the increased maritime activity expected following the development of Choiseul Bay.

## Vigias

The volcanic nature of the region and incomplete surveys of the Solomon Islands has given rise to a number of vigias reported and charted within the waters surrounding the Solomon Islands. SOPAC or regional hydrographic organizations should be requested in assisting the SIG in investigating the vigias to either remove them from the published chart or show correct depths in the correct positions.

## Maritime Boundaries

It was not possible during the IHO Technical Visit to determine the requirement for surveys to support maritime boundary claims.

## Environment

There does not appear to be any requirement for bathymetric surveys to support environmental programmes in the Solomon Islands.

## Coastal Zone Development

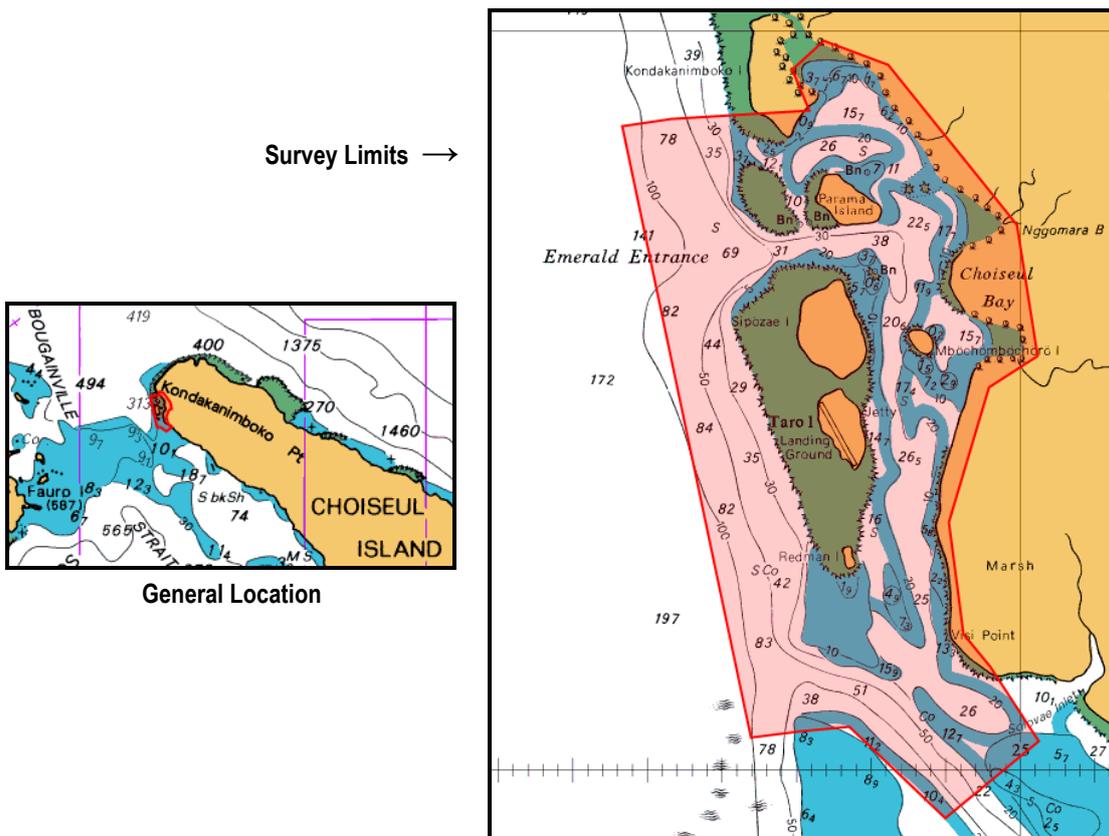
A large number of coastal zone developments are planned throughout the islands; these are discussed at Annex E. Some of these locations have been included in the initial hydrographic work plan.

## Appendix 1 – Hydrographic Survey Requirements

The survey requirements outlined in this appendix have been derived from detailed discussion with maritime stakeholders in the Solomon Islands, Carnival Australia and SIHU Hydroscheme 1999. The format used here has been taken from that previously used by SIHU and is a derivative of that used by the Australian Hydrographic Service. It is assumed in developing the survey listing that SIHU will be equipped with single beam echo sounder (SBES) and side scan sonar (SSS) as discussed elsewhere in this paper. Surveys are summarized in the table below and shown in more detail in the following pages.

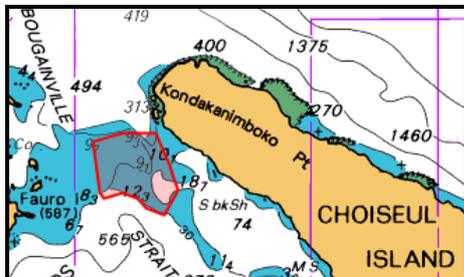
Priority	Name	Survey System/Order	Area (km <sup>2</sup> )
<b>Solomon Islands Hydrographic Unit Surveys</b>			
1	Honiara	SBES & SSS	2
2	Choiseul Bay and Approaches	SBES & SSS	31
3	Port Noro	SBES & SSS	15
4	Ndoma and Approaches	SBES & SSS	3
<b>Externally Sourced Surveys (AHS, NZ, SOPAC)</b>			
1	Bougainville Strait	MBES/IHO Order 1a	245
2	Approaches to Ghizo	MBES/IHO Order 1a	33
3	Mandoleana Island and Approaches	MBES/IHO Order 1a	85
4	Mbambanga Island and Approaches	MBES/IHO Order 1a	33

<b>Name</b>	<b>Choiseul Bay and Approaches</b>
<b>Purpose</b>	Regional centre and port development
<b>Sponsor</b>	Ministry of Infrastructure Development (MID)
<b>Priority</b>	<b>Commercial</b> High
	<b>Security</b> Medium
	<b>Environment</b> Low/Medium
<b>Current Survey</b>	British government survey 1972-3 at 1:50,000
<b>Survey Discussion</b>	Under MID's regional development plan Choiseul Bay will be developed as a regional centre with a port facility. The current survey does not support a charting scale larger than 1:50,000 which is inadequate for the required scale charting of 1:20,000. The original survey using SBES, without SSS, at medium scale allows the possibility of shoals being missed and a larger scale survey with SSS is required. Data gathered will be used for a new chart of Choiseul Bay and Approaches.
<b>Survey Specifications</b>	SBES and SSS at 1:10,000
<b>Charts affected</b>	BA 1708 <i>Bougainville Strait</i> (1:75,000); BA 3994 <i>Bougainville Island to Ghizo island</i> (1:300,000); no SI chart.

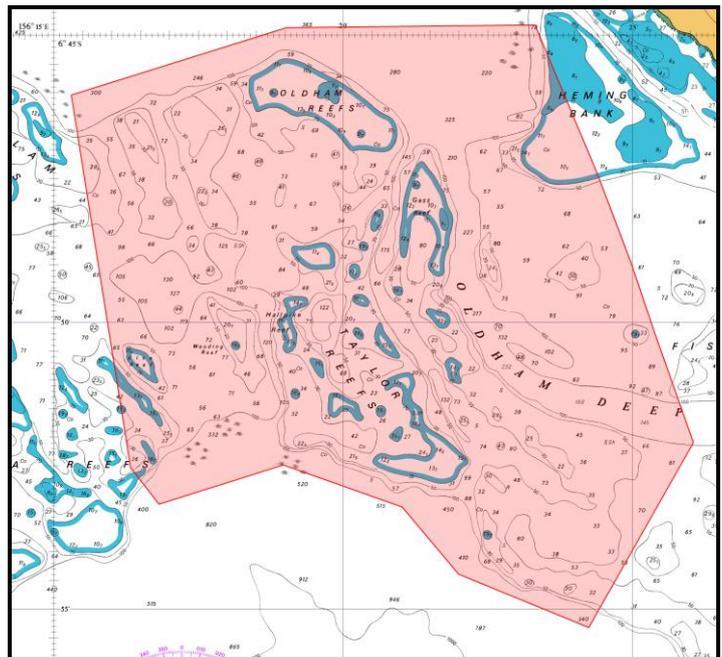


<b>Name</b>	<b>Bougainville Strait</b>						
<b>Purpose</b>	Regional centre and port development						
<b>Sponsor</b>	Ministry of Infrastructure Development (MID)						
<b>Priority</b>	<table border="0"> <tr> <td><b>Commercial</b></td> <td>High</td> </tr> <tr> <td><b>Security</b></td> <td>Medium</td> </tr> <tr> <td><b>Environment</b></td> <td>High</td> </tr> </table>	<b>Commercial</b>	High	<b>Security</b>	Medium	<b>Environment</b>	High
<b>Commercial</b>	High						
<b>Security</b>	Medium						
<b>Environment</b>	High						
<b>Current Survey</b>	British government survey 1972-3 at 1:50,000						
<b>Survey Discussion</b>	Under MID's regional development plan Choiseul Bay will be developed as a regional centre with a port facility. Access to the port may be via Bougainville Strait. The original survey using SBES, without SSS, at medium scale allows the possibility of shoals being missed and MBES survey is required to support usage by modern shipping. Data gathered will be used to update BA 1708 <i>Bougainville Strait</i> (1:75,000)						
<b>New Survey</b>	IHO Order 1a – Approximate area 245km <sup>2</sup>						
<b>Charts affected</b>	BA 1708 <i>Bougainville Strait</i> (1:75,000); BA 3994 <i>Bougainville Island to Ghizo island</i> (1:300,000)						

Survey Limits →

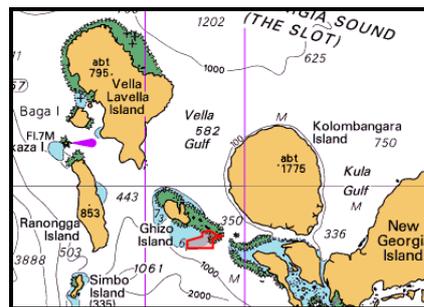


General Location

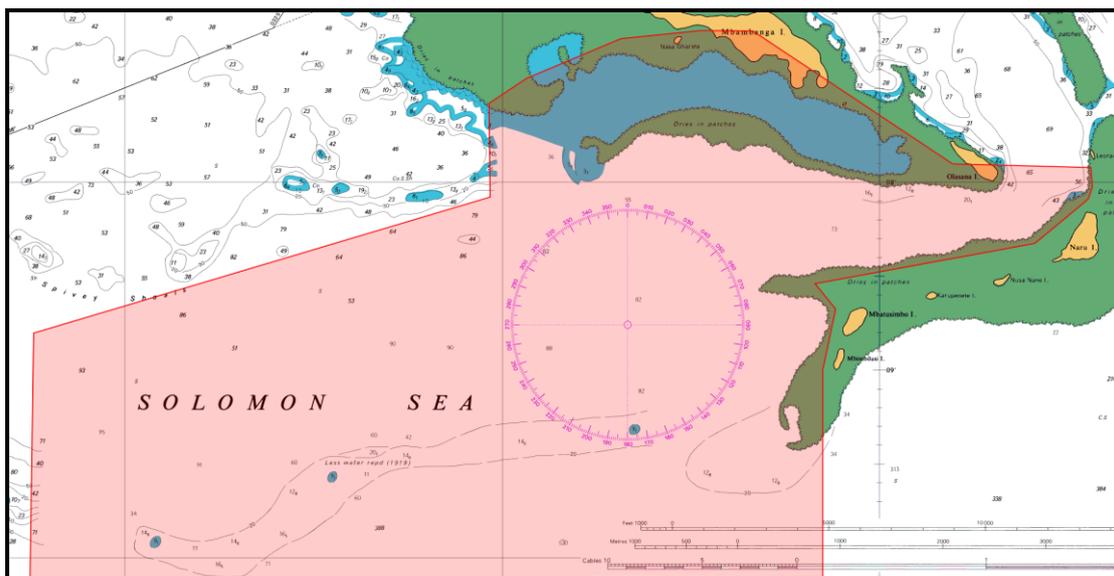


<b>Name</b>	<b>Approaches to Ghizo</b>
<b>Purpose</b>	Cruise Ship Location
<b>Sponsor</b>	Ministry of Tourism
<b>Priority</b>	<b>Commercial</b> High
	<b>Security</b> Medium
	<b>Environment</b> Medium
<b>Current Survey</b>	Mainly British government survey 1884-94 at between 1:24,000 and 1:63,000
<b>Survey Discussion</b>	Cruise lines operating out of Australia are seeking new locations and want to visit the Solomon Islands. Mbambanga Island, SE of Ghizo, has been selected as a possible location. However, the approach to the islands is based on small scale surveys dated 1884 to 1894 and are wholly inadequate and unsafe for either planning or visits. The survey area is extended southwards to cover the long shoal extending W from the reef at Mbimbilusi Island. To minimize risk this survey should be to IHO Order 1a. Data gathered will be used to update BA1735 <i>Plans in the New Georgia Group</i>
<b>Survey Specifications</b>	IHO Order 1a
<b>Charts affected</b>	BA1735 <i>Plans in the New Georgia Group</i> (1:25,000): BA 3994 <i>Bougainville Island to Ghizo island</i> (1:300,000)

General Location →

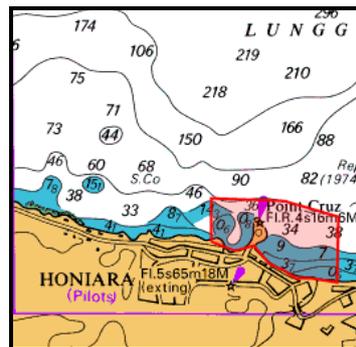


Survey Limits

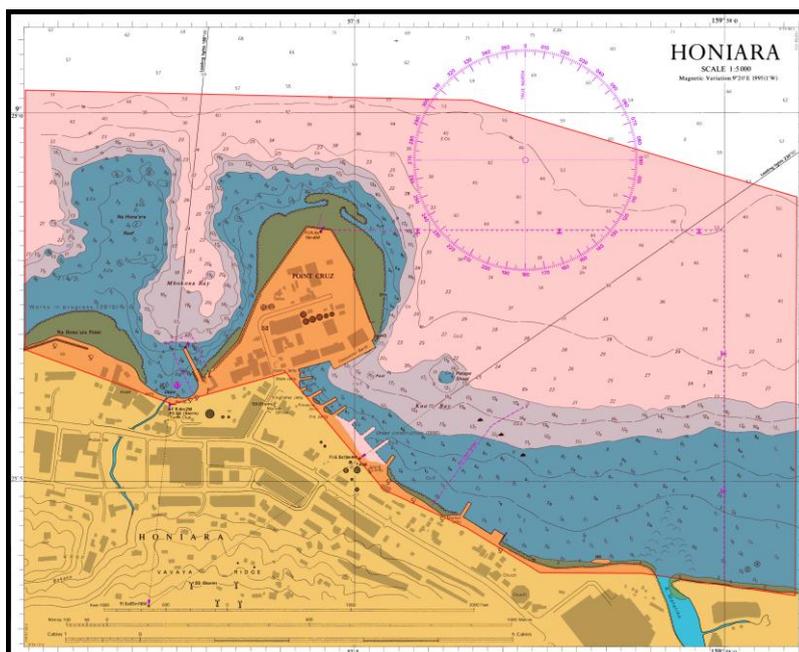


<b>Name</b>	<b>Honiara</b>						
<b>Purpose</b>	Safe operation of the port of Honiara						
<b>Sponsor</b>	Solomon Islands Port Authority						
<b>Priority</b>	<table border="0"> <tr> <td><b>Commercial</b></td> <td>High</td> </tr> <tr> <td><b>Security</b></td> <td>Medium</td> </tr> <tr> <td><b>Environment</b></td> <td>Medium</td> </tr> </table>	<b>Commercial</b>	High	<b>Security</b>	Medium	<b>Environment</b>	Medium
<b>Commercial</b>	High						
<b>Security</b>	Medium						
<b>Environment</b>	Medium						
<b>Current Survey</b>	Various large scale Solomon Islands government surveys 1960-93						
<b>Survey Discussion</b>	The seabed E and W of Point Cruz is known to alter with the annual change of winds, the result of siltation from the River Mataniko to the E of Point Cruz and now from the increase in jetties to the E of Honiara affecting the long shore drift. Uncertain depths have caused groundings off the River Mataniko and are causing concern to visiting ships and the port operator. This survey should be undertaken at least annually. Data gathered will be used to update BA1750 <i>Anchorage in Guadalcanal</i> .						
<b>Survey Specifications</b>	SBES and SSS						
<b>Charts affected</b>	BA1750 <i>Anchorage in Guadalcanal</i> (1: 5,000); SI 24 Honiara						

General Location →



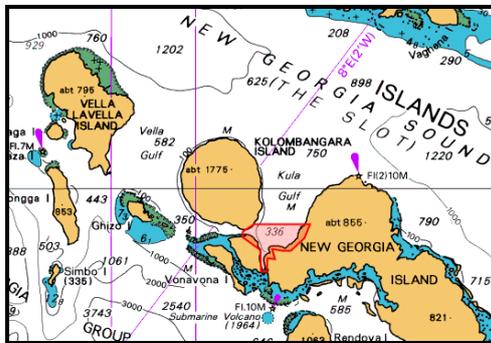
Survey Limits



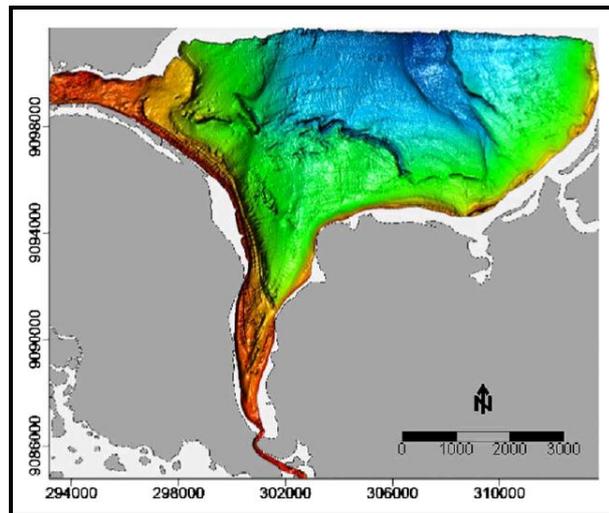


<b>Name</b>	<b>Port Noro</b>	
<b>Purpose</b>	Safe operation of Port Noro	
<b>Sponsor</b>	Port Authority	
<b>Priority</b>	<b>Commercial</b>	High
	<b>Security</b>	Medium
	<b>Environment</b>	Low
<b>Current Survey</b>	The approach to Port Noro (Blackett Strait and Kula Gulf) surveyed by SIHU in 1971 at a scale of 1:50,000. Port Noro itself, also by SIHU, between 1963 and 1975 at scales between 1:10,000 and 1:18,000.	
<b>Survey Discussion</b>	To complete the survey undertaken by SOPAC in 2005 during which the inshore waters were not included in the survey programme	
<b>Survey Specifications</b>	SBES and SSS at 1:5,000	
<b>Charts affected</b>	BA1735 <i>Plans in the New Georgia Group</i>	

Survey Limits →

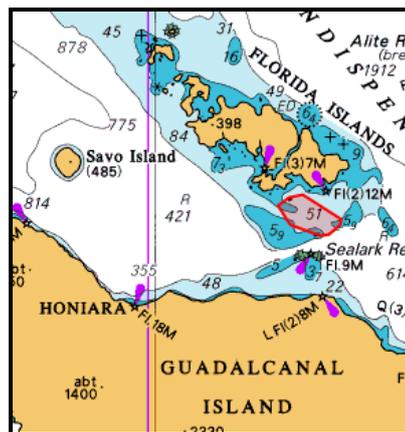


General Location

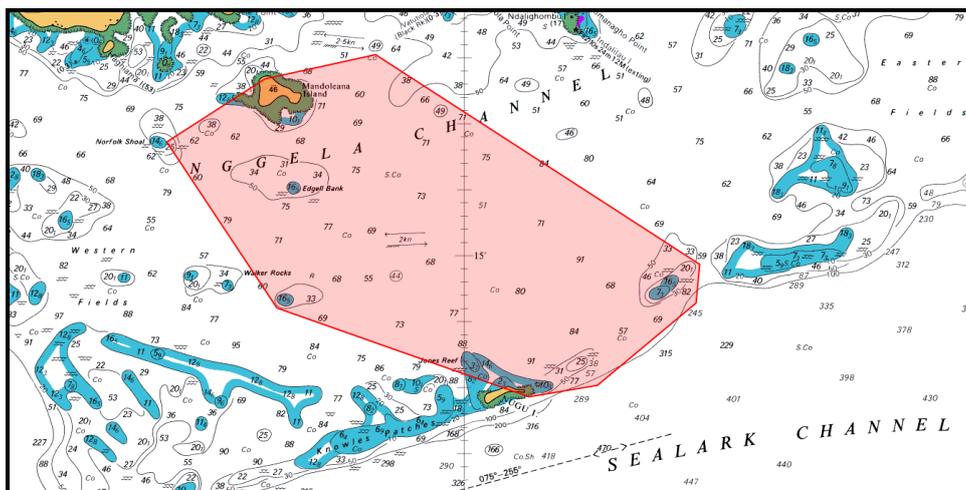


<b>Name</b>	<b>Mandoleana Island and Approaches</b>	
<b>Purpose</b>	Cruise ship approach route and anchorage	
<b>Sponsor</b>	Ministry of Tourism and Culture	
<b>Priority</b>	<b>Commercial</b>	High
	<b>Security</b>	Medium
	<b>Environment</b>	Low
<b>Current Survey</b>	British Admiralty survey dated 1912 at a scale of 1:72,000	
<b>Survey Discussion</b>	To determine a safe approach route to and anchorage off of Mandoleana Island for cruise ships with a draft of up to 9 metres.	
<b>Survey Specifications</b>	IHO Order 1a - Approximate area 85 km <sup>2</sup>	
<b>Charts affected</b>	BA1713 <i>Sealark Channel and Approaches to Honiara</i>	

General Location →

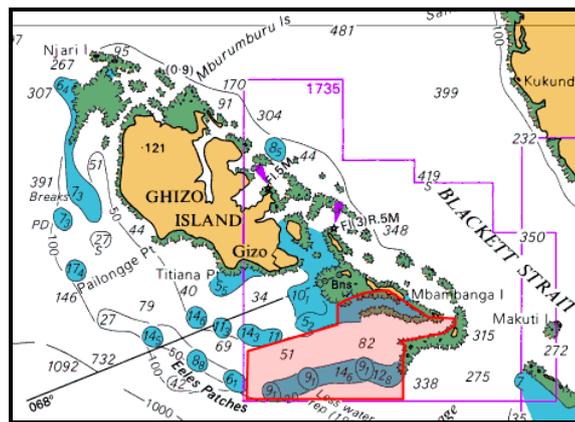


Survey Limits

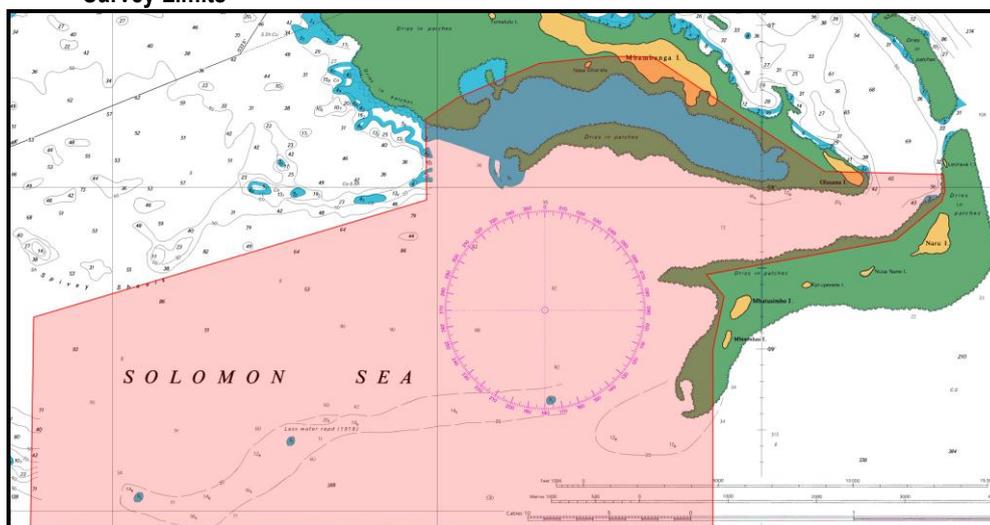


<b>Name</b>	<b>Mbambanga Island and Approaches</b>	
<b>Purpose</b>	Cruise ship approach route and anchorage	
<b>Sponsor</b>	Ministry of Tourism and Culture	
<b>Priority</b>	<b>Commercial</b>	High
	<b>Security</b>	Medium
	<b>Environment</b>	Low
<b>Current Survey</b>	British Admiralty surveys between 1884 and 1894 at scales between 1:24,000 and 1:63,000.	
<b>Survey Discussion</b>	To determine a safe approach route to and anchorage off of Mbambanga Island for cruise ships with a draft of up to 9 metres.	
<b>Survey Specifications</b>	IHO Order 1a - Approximate area 33 km <sup>2</sup>	
<b>Charts affected</b>	BA 1735 <i>Plans in the New Georgia Group</i>	

General Location →



Survey Limits

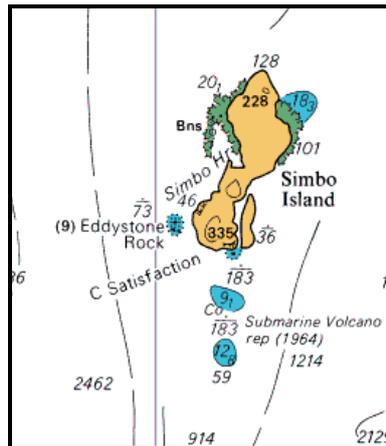


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## Appendix 2 – Analysis of Isolated Reefs and Vigias within Solomon Islands' EEZ

### Simbo Island Southwards

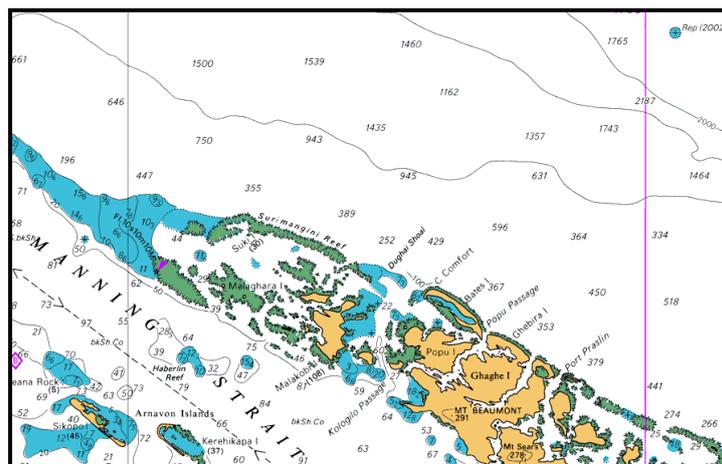
Lat	Long	Depth	Remarks
8° 8'S	156° 32' E	9.1m – 12.8m	Submarine Volcano reported 1964



Extract from BA3994

### Santa Isabel Northwards

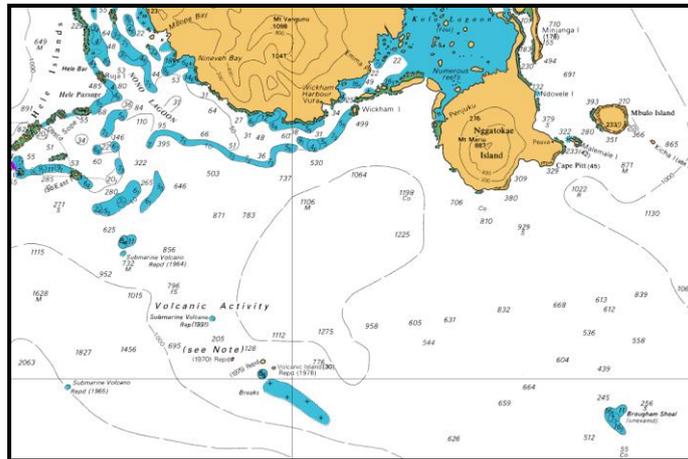
Lat	Long	Depth	Remarks
7° 11'S	158° 22' E	Rock awash	Reported 2002



Extract from BA3995

### Vangunu Island Southwards

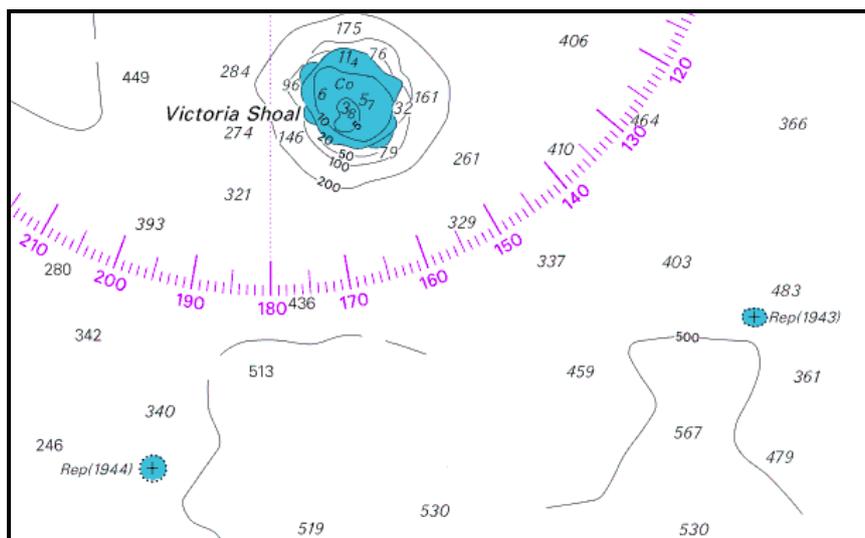
Lat	Long	Depth	Remarks
8°57'S	157° 55' E	Various	Shoals and drying features due to volcanic activity reported 1964 -1991
9°02'S	158° 17' E	7.3m	Brougham Shoal (Unexamined)



Extract from BA3995

### Pavuvu Island Southwestwards

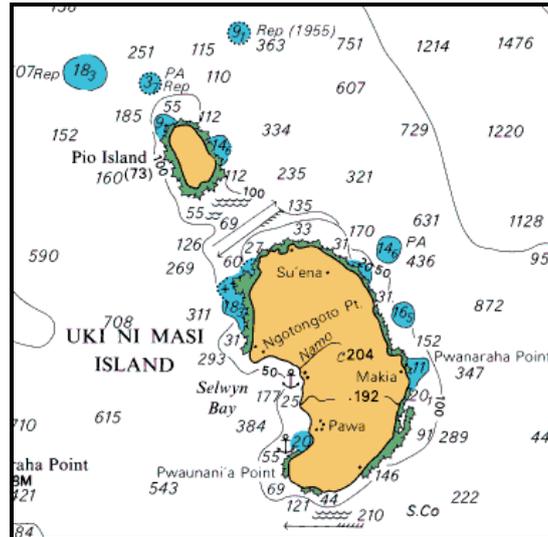
Lat	Long	Depth	Remarks
9°12'S	159° 02' E	Rock awash	Reported 1944
9°22'S	159° 04' E	Rock awash	Reported 1943



Extract from BA1714

### Uki Ni Masi Island Northwestwards

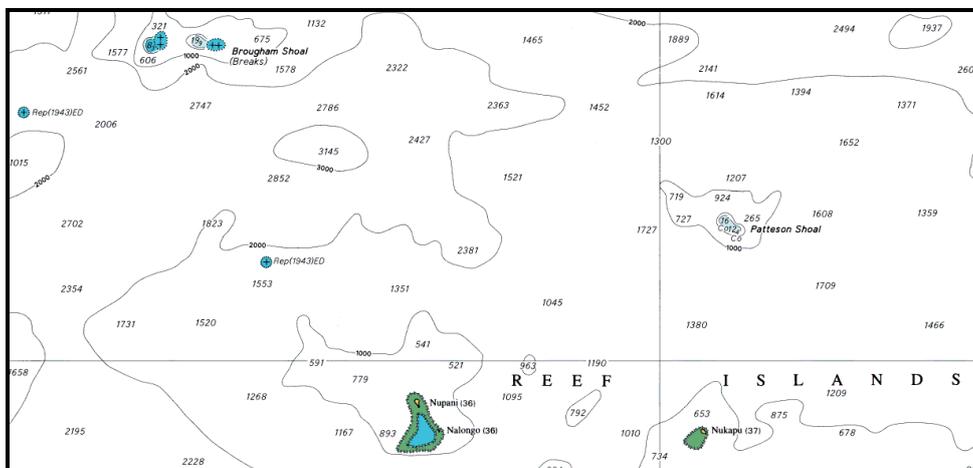
Lat	Long	Depth	Remarks
10°08'S	161° 42' E	9.1m	Reported 1955
10°09'S	161° 38' E	18.3m	Reported
10°09'S	161° 49' E	3.7m	Reported (Position Approximate)



Extract from BA3998

### Reef Islands Northwestwards

Lat	Long	Depth	Remarks
9°43'S	165° 16' E	Rock awash	Reported 1943 (Existence Doubtful)
9°53'S	165° 33' E	Rock awash	Reported 1943 (Existence Doubtful)



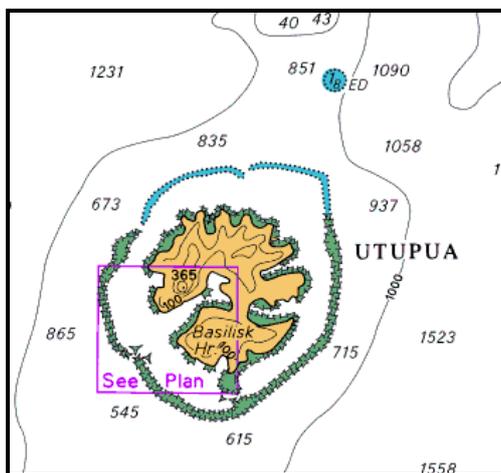
Extract from BA17



Extract from BA17

Utupua Northeastwards

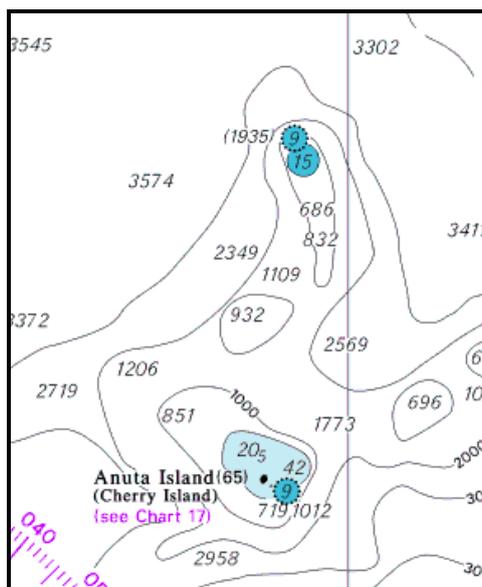
Lat	Long	Depth	Remarks
11°07'S	166° 36' E	1.8m	Existence Doubtful



Extract from BA17

Anuta Island Northwards

Lat	Long	Depth	Remarks
11°00'S	169° 54' E	9m	Reported 1935



Extract of BA4633

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## Annex H – Charting Analysis of Solomon Islands' Waters

### Solomon Islands National Charts

Nautical charts for domestic traffic and purposes have been produced in the Solomon Islands since the late 1960s. The charts are all metric and referenced using UK Directorate of Overseas Survey datums and maps. The charts were well produced and those that remain in private ownership are still being used. SIHU holds only a limited number of the original charts published; UKHO holds archive copies of other SIHU charts (shown highlighted). UKHO should be requested to supply digitally scanned copies of those charts not held by SIHU to complete the archive and for use in a chart regeneration programme.

No. Published	Name	Scale	Area Coordinates	Remarks
BSIP 01 1968	Choiseul Wagina to Panggoe	1:100,000	6° 50'S 157° 06' E 157° 45 E 7° 28'S	Survey data from 1971. Fathoms and feet.
BSIP 02 1968	Choiseul Sumbi Point To Kumbokumbo Point	1:100,000	6° 52.5'S 156° 36' E 157° 07.5' E 7° 28'S	Survey data from 1968. Fathoms and feet.
BSIP 03 1971	Ghizo Harbour and Approaches	1:18,000	8° 02'S 156° 48.8' E 156° 55.5' E 8° 08'S	Metric full colour chart, no dimensions.
BSIP 04 1971	Langa Langa Lagoon Auki to Mbuma	1:25,000	8° 45.5'S 160° 40.8' E 160° 46.7' E 8° 58.1'S	Survey data from 1913 to 1970. Fathoms and feet.
BSIP 05 1972	Malaita Island Kwai and Uru Harbours	1:30,000	8° 40'S 160° 43.5' E 160° 49.4' E 8° 22.1'S	Metric full colour chart (593.0x794.0). Area covered is a SIG development area and the export of palm oil.
BSIP 06 1973	Lau Lagoon Approaches to Takwa	1:15,000	8° 16.8'S 160° 54' E 161° 04 E 8° 52.5'S	Survey data from 1973. Metric full colour chart, no dimensions.
BSIP 08 1972	Kolombangara Island Blackett Strait	1:50,000	8° 01'S 156° 53.6' E 157° 13.0' E 8° 12.6'S	Survey data from 1971. Metric full colour chart, no dimensions.
BSIP 09 1973	San Cristobal Star Harbour	1:20,000	10° 44.7'S 162° 13.1' E 162° 19.8' E 10° 49.3'S	Survey data from 1973. Dyeline of metric chart, no dimensions.

No. Published	Name	Scale	Area Coordinates	Remarks
BSIP 09 1974	Malaita Island Harbours and Anchorages in North Malaita			Metric full colour chart (593.0x794.0).
	Kwakwaru Harbour	1:5,000	Un-graduated	Survey data from 1971
	Mbita'ama Harbour	1:12,500	Un-graduated	Survey data from 1971
	Tae passage & Sulofou	1:30,000	8° 26.6'S 160° 50' E 160° 53.3 E 8° 28.4'S	Survey data from 1973
	Uru Harbour	1:20,000	8° 49.6'S 160° 57.6' E 161° 01.3 E 8° 51.7'S	Survey data from 1971
	Matakwalao Bay	1:20,000	8° 20.2'S 160°40.8' E 160° 43.6 E 8° 22.4'S	Survey data from 1971
	Malu'u Harbour	1:20,000	8° 18.8'S 160°36.3' E 160° 38.5 E 8° 22.4'S	Survey data from 1971
	Aoke Harbour	1:12,500	8° 45.2'S 160°41.1' E 160° 42.4 E 8° 46.8'S	Survey data from 1970
SI 07 1978	Marovo Lagoon Mbili Passage to Hele Bar	1:50,000	8° 28.0'S 157°47.0' E 158° 13.0' E 8° 46.3'S	Metric full colour chart (953.8x675.0). Referenced using Directorate of Overseas Surveys maps. SIHU surveys 1966-68. SOPAC survey available to update SE area off Merusu for the export of palm oil.
SI 12 1988	Florida Islands	1:75,000	8° 49.1'S 159°53.0' E 160° 32.4' E 9° 15.1'S	Metric full colour chart (960.0x640.0).Source data is AHS 1982; SI Marine Dept 1970-71; British Admiralty 1912; Admiralty charts. SW area at Mandoleana Island is the proposed cruise ship location
	Siota Harbour Plan	1:10,000	9° 02.6'S 160°17.6' E 160° 18.9' E 9° 04.5'S	Survey data from 1969
SI 23 1984	Rendova island Kenelo Point	1:10,000	8° 25.5'S 157°15.4' E 157° 17.5' E 8° 28.3'S	Metric full colour chart (525.0x382.0). Source data unspecified and undated
SI 24 1986	Honiara Port	1:2,500	9° 25.0'S 159°57.1' E 159° 58.3' E 9° 25.8'S	Metric full colour chart (897x664).
SI 300 1984	Guadalcanal to San Jorge and Maana Oba Islands	Not applicable	Not applicable	Special training chart. Not to be used for navigation.

As SIMSA/SIHU currently does not have a chart producing capability it relies on UKHO to fulfil this function. The IHO C-55 'Status of Nautical Charting' (updated 17 August 2011) résumé is shown in the table below. The figures in brackets show revised values as supplied by UKHO for this report.

Chart Type	% Covered by INT Charts	% Covered by RNCs	% Covered by ENC's
<b>Small Scale:</b> <b>Offshore Passage</b>	100 (100)	100 (100)	0 (100)
<b>Medium Scale:</b> <b>Landfall, Coastal Passage</b>	100 (100)	100 (100)	0 (100)
<b>Large Scale:</b> <b>Approaches and Ports</b>	100 (100)	100 (100)	0 (29)

#### IHO C55 Status of Chart Coverage

## UKHO Charts

For historical reasons the United Kingdom, through the United Kingdom Hydrographic Office remains the Primary Charting Authority (PCA) for the Solomon Islands. With one exception (BA1638 *Plans in Northern Solomon Islands*) all charts are referred to WGS 84, however, a number of charts with which they are linked are on varying reference systems such that making the transfer of positions from chart to chart difficult and inaccurate. The data from which the charts are compiled is noted as being in many cases old, imperfect and on undefined reference systems such that some charts carry the note:

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

BA Chart	Title	Scale	Published Lasted Updated	Annual Sales 2010 (2011)
17	Plans of the Santa Cruz and Adjacent Islands Santa Cruz Islands Ndendö Is – Graciosa Bay Anuta or Cherry Island Tikopia Island Vanikolo Island – Manieve and Tevai Bays Vanikolo Island – Pallu Passage Utupua Island – Basilisk Harbour	1:500,000 1:50,000 1:25,000 1:50,000 1:50,000 1:50,000 1:50,000	14 Aug 1992 NM 2829/95	109(103)
1708	Bougainville Strait	1:75,000	Ed 2 17 Sep 2009 -	140(145)
1709	Manning Strait	1:100,000	Ed 2 17 Sep 2009 NM 1316/10	99(93)
1713	Sealark Channel and Approaches to Honiara	1:100,000	Ed 3 17 Sep 2009 -	159(156)
1714	Russell Islands	1:50,000	Ed 3 1 Oct 2009 -	36(45)
1735	Plans in the New Georgia Group Ghizo harbour and Approaches Ringgi Cove Port Noro Blackett Strait Lever Harbour	1:25,000 1:15,000 1:20,000 1:50,000 1:7,500	Ed 2 1 Oct 2009 NM 1316/10	119(112)

BA Chart	Title	Scale	Published Lasted Updated	Annual Sales 2010 (2011)
1747	Anchorage in the Solomon Islands Santa Isabel Island – Allardyce Harbour Santa Isabel Island – Maringe Lagoon Santa Isabel Island – Thousand Ships Bay Malaita Island – Auki Harbour Malaita Island – Kwakwara Harbour Malaita Island – Bina Harbour	1:20,000 1:75,000 1:75,000 1:12,500 1:10,000 1:20,000	Ed 3 17 Sep 2009 -	49(57)
1750	Anchorage in Guadalcanal Lunga Roads Honiara Marau Sound	1:20,000 1:5,000 1:50,000	2 Jun 1995 NM 1879/11	133(131)
1766	Harbours in the Solomon Islands Rennell Island - Lughugi Bay Florida Islands – Tulaghi Bay New Georgia Island – Viru Harbour San Cristobal Island – Kirakira Bay San Cristobal Island – Star Harbour	1:30,000 1:15,000 1:12,500 1:10,000 1:20,000	Ed 2 1 Oct 2009 -	44(74)
3994	Bougainville Island to Ghizo Island	1:300,000	Ed 2 24 Sep 2009 NM 2488/10	361(382)
3995	Choiseul Island to New Georgia Island	1:300,000	Ed 2 24 Sep 2009 NM 2488/10	234(264)
3996	Santa Isabel Island to Guadalcanal Island	1:300,000	Ed 3 24 Sep 2009 NM 2065/11	226(257)
3997	Indispensable Strait	1:300,000	Ed 2 24 Sep 2009 -	285(292)
3998	San Cristobal Island to Malaita Island	1:300,000	Ed 3 24 Sep 2009 -	225(260)

#### Summary of UKHO Charting

### Future Chart Programme

During the Technical Visit a careful review of the existing charting was undertaken with stakeholder representatives from the SIG. It is recommended that charting remain as at present until SIHU charts are regenerated, new surveys for chart modernization are completed and locations for port, harbour and cruise ship development are clearly defined. This, of course, does not negate the update of current charts using data gathered but not yet passed to the PCA for charting.