



IHO Capacity Building Programme

The State of Hydrography and Nautical Charting in The Co-operative Republic of Guyana



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Abbreviations

ALB	Airborne Laser Bathymetry
AtoN	Aids to Navigation
BA	British Admiralty [Chart]
dwt	Dead Weight Tonnage
Ed	Edition
EEZ	Exclusive Economic Zone
ENC	Electronic Navigational Chart
GF	Guyana Fisheries
GLSC	Guyana Lands and Surveys Commission
GMS	Guyana Meteorological Service
ICZM	Integrated Coastal Zone Management
IHB	International Hydrographic Bureau
IHO	International Hydrographic Organization
IMO	International Maritime Organization
Lidar	Light Detection and Ranging
LOA	Length overall
MARAD	Maritime Administration Department
MBES	Multi Beam Echo Sounder
MoU	Memorandum of Understanding
MSDI	Marine Spatial Data infrastructure
MSI	Maritime Safety Information
MSP	Maritime Spatial Planning
NE	New Edition (of a navigational chart)
NtoM	Notice to Mariners
RHC	Regional Hydrographic Commission
RNC	Raster Navigational Chart
SAG	Shipping Association Guyana
SBES	Single Beam Echo Sounder
SOLAS	[United Nations] Convention of the Safety of Life at Sea
ToR	Terms of Reference
TTW	Territorial Waters
UKHO	United Kingdom Hydrographic Office
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environmental Programme
WMO	[United Nations] World Meteorological Organization

Executive Summary

The government of Guyana became a State Party to the SOLAS Convention on 10 March 1998 and appears to understand the provisions in SOLAS Chapter V Regulations 9 and 4 to ensure that appropriate hydrographic and charting services are made available. The technical visit increased the awareness of national hydrography, the relatively poor state of hydrography and nautical charting in Guyana and its potentially adverse impact on economic growth, safety of navigation and protection of the marine environment.

In common with many countries there is a degree of confusion over the meaning of maritime safety information in the hydrographic context as opposed to the ship registry context. There is no recognised Maritime Safety Information (MSI) infrastructure in place in Guyana to promulgate urgent navigational and meteorological warnings including urgent charting information or to feed new and updated information to the United Kingdom Hydrographic Office (UKHO) as the Primary Charting Authority (PCA) such that it can be incorporated into the existing charts, thereby keeping them up to date and fit for purpose.

Currently there is no national mechanism to determine priorities for surveys or charting or to communicate changing conditions or circumstances to the PCA (UKHO). Similarly the national data gathering programme is suspended due to a lack of trained hydrographers and hydrographic equipment and a viable survey launch. The former is being addressed with officers currently under training; the matter of equipment should also be addressed urgently such that these officers can conduct the urgent work required and for which their training has prepared them.

For historical reasons, the production of nautical charts and publications required under SOLAS for Guyana is produced by the UKHO as the PCA. The nine charts covering Guyana's waters and ports are of variable quality with some still to be metricated and most not referenced to WGS84. UKHO devised a comprehensive chart updating programme, however, significant new hydrographic data will be required if the chart coverage of Guyana is to meet national needs and international obligations.

The improvement of charts covering Guyana should be a matter of particular concern to the Government of Guyana. Every effort should be made to work with the UKHO, which is the producer of the only comprehensive collection of nautical charts and publications covering Guyana, with vital new and revised information to help improve these charts and keep them up to date.

The gathering and forwarding of new and relevant chart information must be actively encouraged under a national programme for chart improvement and maintenance. An urgent local review of existing charts is required to identify discrepancies and to provide up to date information to the UKHO particular in view of the proposed chart modernization programme.

The less than ideal state of nautical charting in Guyana and the lack of a coherent MSI service to promulgate navigational and meteorological warnings, search and rescue information and other urgent safety-related information, including urgent information related to charts is potentially having an adverse impact on Guyana's economy as well as putting the safety of life at sea and protection of the marine environment at increased risk. This is because of the inherent risk of maritime incidents and the adverse effect on efficient and effective shipping operations.

The appointment of a National Hydrographic Authority and a National Maritime Safety Information Coordinator is absolutely essential to support charting through the UKHO and to ensure that the charts of Guyana are improved. The National Hydrographic Authority should be supported by the establishment and active participation of a National Hydrographic Consultative Committee.

The Cooperative Republic of Guyana, as a State Party to the SOLAS Convention, is required to ensure that appropriate paper charts, ENCs and maritime safety information are available in accordance with Regulations 9 and 4 of Chapter V of that Convention. In this regard Guyana is not meeting in full its treaty obligations. An improvement in the flow of MSI data to the NAVAREA Coordinator and the UKHO is a simple and vital first step in improving the country's SOLAS obligations. Through the reinvigoration of a national hydrographic capability Guyana government is taking steps to address the urgent need for hydrographic data and this initiative should be encouraged. For the provision of charts and publications it is considered to be in Guyana government's best interest to maintain and foster its links with UKHO for the provision of nautical charts and publications. By taking these steps Guyana can demonstrate its commitment to and compliance with the delivery of hydrographic services as required by SOLAS.

Recommended Actions

The following recommended actions are provided for consideration by the relevant authorities:

(1) **The Government of Guyana** should:

- a. formally designate a **National Hydrographic Authority** to be responsible for coordination and ensuring the provision of appropriate nautical charting services for Guyana in accordance with the requirements of the International Convention on the Safety of Life at Sea (SOLAS), and in accordance with the principles established by the IHO;
- b. allocate regular funding and travel support for the **National Hydrographic Authority** to fulfil the duties of the Office and to represent Guyana in appropriate forums, and in particular, to attend relevant meetings of the MACHC;
- c. ensure that a **Maritime Safety Information (MSI) Coordinator** position is established as soon as possible to fulfil Guyana's treaty obligations under SOLAS V/4 - *navigational warnings*;
- d. ensure that the **Maritime Safety Information (MSI) Coordinator** is nominated and able to attend the Phase One Chart Awareness Course in late May 2013, an MACHC Capacity Building course.
- e. ensure the development and execution of a **National Maritime Safety Information Plan** – by ensuring that field checks are carried out on the current charts and publications and the results are forwarded promptly to the PCA (UKHO);
- f. to provide all MARAD archive hydrographic data to the PCA (UKHO) for use in the compilation or revision of the existing charts of Guyana;
- g. Discuss with the Brazilian Government the possibility of hydrographic training assistance;

(2) **The National Hydrographic Authority** should:

- a. liaise with Regional Team 3 at the UKHO to ensure that new navigationally significant information is forwarded and included in existing charts of Guyana;
- b. apply, through the MACHC, for training for the MSI Coordinator under the IHO Capacity Building Program;
- c. organise an urgent national programme of review of all the published charts of Guyana and inform the PCA (UKHO) of all detail that is incorrectly shown on these charts. Such a national programme should encourage all mariners and other interested parties to report discrepancies on existing charts together with as much information as possible on what should actually appear in the charts;
- d. review the existing **bilateral arrangement** with the **Primary Charting Authority (UKHO)**;
- e. establish and chair a **National Hydrographic Committee** or forum that coordinates national hydrographic requirements including input to a **National Charting Plan**, a **National Hydrographic Survey Plan** and a **National Maritime Safety Information Plan**. This group should include representatives from all stakeholder sectors, including but not be limited to: shipping, environmental protection, survey and mapping, national infrastructure development, coastal zone management, marine exploration, resource exploitation – minerals, fishing, maritime boundary delimitation, maritime transport, maritime defence and security, disaster management and tourism.

(3) **The Government of Guyana** should

- a. actively support existing hydrographic surveyors in the enhancement of national hydrographic surveying; provide funding to equip the Guyana Hydrographic Unit with a survey launch and a sidescan sonar system;
- b. provide on-going funding for the regular maintenance and routine replacement of hydrographic and cartographic equipment and for the training and requalification of operators; also adequately remunerate present qualified staff to encourage new recruits in these specialist field

- c. establish and fund a national marine cartographic capability such that Guyana can provide specialist chart products for national use and to be sufficiently informed to participate in decisions regarding chart coverage and availability;
- d. engage overseas hydrographic advice to guide and assist the **National Hydrographic Authority** and stakeholders to enhance in-country hydrographic data gathering capability and to foster close liaison and possible support from recognized national hydrographic authorities in other countries.



REPORT



1 Introduction

The International Hydrographic Organization (IHO) is an intergovernmental technical organization, currently comprising 81 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.

A proposal for a technical and advisory visit to Guyana to help 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 was raised at a meeting of the MACHC. As a result the Capacity Building Sub Committee approved and funded a visit to Guyana to assess the current status of hydrography and to raise awareness in the country of the importance of hydrography and nautical charting.

Mr Bob Wilson and Mr Jeff Bryant, seconded from the United Kingdom Hydrographic Office (UKHO), carried out a hydrographic awareness and technical assessment visit to Guyana between 13 and 15 January 2013.

This resulting report has been written with the express intention of assisting the government of Guyana to arrange and strengthen 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, a detailed analysis of the needs and current status of charting, major conclusions and a number of recommended actions for consideration by the relevant authorities.

2 Technical Visit Programme

The IHO Technical Team arrived in Georgetown, Guyana, on Sunday 12 January. In-country arrangements for the technical visit were arranged by Mr Troy Clarke, Senior Hydrographic Surveyor, Ports and Harbours Division, Maritime Administration Department, Guyana. On the first day an initial courtesy call was paid on the Acting Director General of the Maritime Administration Department (MARAD), Ms C. Rogers MSc, after which the IHO Technical Team spent the remainder of the day at the Guyana Hydrographic Office. The second day took the form of a morning seminar which was well attended by a wide range of marine sector stakeholders and a courtesy call on the Hon. Minister of Public Works in the afternoon. The details of those attending the various meetings are shown in The following recommended actions are provided for consideration by the relevant authorities:

(4) **The Government of Guyana** should:

- h. formally designate a **National Hydrographic Authority** to be responsible for coordination and ensuring the provision of appropriate nautical charting services for Guyana in accordance with the requirements of the International Convention on the Safety of Life at Sea (SOLAS), and in accordance with the principles established by the IHO;

- i. allocate regular funding and travel support for the **National Hydrographic Authority** to fulfil the duties of the Office and to represent Guyana in appropriate forums, and in particular, to attend relevant meetings of the MACHC;
- j. ensure that a **Maritime Safety Information (MSI) Coordinator** position is established as soon as possible to fulfil Guyana's treaty obligations under SOLAS VI/4 - *navigational warnings*;
- k. ensure that the **Maritime Safety Information (MSI) Coordinator** is nominated and able to attend the Phase One Chart Awareness Course in late May 2013, an MACHC Capacity Building course.
- l. ensure the development and execution of a **National Maritime Safety Information Plan** – by ensuring that field checks are carried out on the current charts and publications and the results are forwarded promptly to the PCA (UKHO);
- m. to provide all MARAD archive hydrographic data to the PCA (UKHO) for use in the compilation or revision of the existing charts of Guyana;
- n. Discuss with the Brazilian Government the possibility of hydrographic training assistance;

(5) **The National Hydrographic Authority** should:

- f. liaise with Regional Team 3 at the UKHO to ensure that new navigationally significant information is forwarded and included in existing charts of Guyana;
- g. apply, through the MACHC, for training for the MSI Coordinator under the IHO Capacity Building Program;
- h. organise an urgent national programme of review of all the published charts of Guyana and inform the PCA (UKHO) of all detail that is incorrectly shown on these charts. Such a national programme should encourage all mariners and other interested parties to report discrepancies on existing charts together with as much information as possible on what should actually appear in the charts;
- i. review the existing **bilateral arrangement** with the **Primary Charting Authority (UKHO)**;
- j. establish and chair a **National Hydrographic Committee** or forum that coordinates national hydrographic requirements including input to a **National Charting Plan**, a **National Hydrographic Survey Plan** and a **National Maritime Safety Information Plan**. This group should include representatives from all stakeholder sectors, including but not be limited to: shipping, environmental protection, survey and mapping, national infrastructure development, coastal zone management, marine exploration, resource exploitation – minerals, fishing, maritime boundary delimitation, maritime transport, maritime defence and security, disaster management and tourism.

(6) **The Government of Guyana** should

- e. actively support existing hydrographic surveyors in the enhancement of national hydrographic surveying; provide funding to equip the Guyana Hydrographic Unit with a survey launch and a sidescan sonar system;
- f. provide on-going funding for the regular maintenance and routine replacement of hydrographic and cartographic equipment and for the training and requalification of operators;
- g. establish and fund a national marine cartographic capability such that Guyana can provide specialist chart products for national use and to be sufficiently informed to participate in decisions regarding chart coverage and availability;
- h. engage overseas hydrographic advice to guide and assist the **National Hydrographic Authority** and stakeholders to enhance in-country hydrographic data gathering capability and to foster close liaison and possible support from recognized national hydrographic authorities in other countries.

Annex A – List of Contacts. The remainder of the visit period was spent in discussion with Guyana Hydrographic Office staff.

The meetings and seminar allowed the IHO Technical Team to present the national economic benefits of reliable charting and national hydrography to many senior government representatives and allow discussions on the

current status of hydrography and charting in Guyana. From these meetings various options to improve the current situation were explored.

Amongst other relevant IHO documents the team passed an electronic copy of the IHO *Inter-Institutional Agreement for the Establishment of a Hydrographic and Oceanographic Committee* to the interim committee for consideration to formalize the workings of the committee. In addition the team passed a soft copy of the UKHO's *International Code of Practice* to the Guyana Hydrographic Office.

3 General Assessment

The following is a general assessment of the situation in Guyana regarding hydrography and nautical charting services. A discussion of available options, several conclusions and recommended actions, supported by a number of Annexes then follows.

3.1 National Hydrographic Awareness

The visit increased the awareness of national hydrography, the relatively poor state of hydrography and nautical charting in Guyana and its potentially adverse impact on economic growth, safety of navigation and protection of the marine environment but only at a working level.

The Guyana authorities seem not to be aware of the treaty obligations under the UN Convention on the Safety of Life at Sea (SOLAS) Chapter V Regulations 9 and 4 to ensure that appropriate hydrographic and charting services are made available nor the benefits to the national economy brought by a good national hydrographic programme and structure. Guyana became a State Party to this Convention on 10 March 1998.

Guyana Hydrographic Office (GHO) produces an annual survey plan forwarded to the Director General of the Maritime Administration Department to report to the Minister. The mechanism used to determine local priorities for surveys or charting is through personal contact with the immediate stakeholders (pilots, ship masters, etc); there is no pan-departmental discussion. GHO routinely communicate changing conditions or circumstances to the Primary Charting Authority (PCA), the United Kingdom Hydrographic Office (UKHO). The PCA (UKHO) publishes and maintains the nautical charts and publications that mariners require to navigate safely and effectively in Guyana waters.

An explanation of the many benefits that hydrography provides to a coastal State such as Guyana was explained in detail with the technical team referring to IHO Publication M-2 – *The Need for National Hydrographic Services*.

It is strongly recommended that Guyana invite the President of the Directing Committee of the International Hydrographic Organization, Captain R E WARD Royal Australian Navy, to visit Guyana to meet with and brief the various Ministers with responsibilities for or interests in Guyana's maritime environment.

3.2 National Maritime Structure

The Ministry of Public Works has the responsibility for SOLAS the majority of which is carried out by the Maritime Administration Department (MARAD); the responsibility for hydrographic surveying matters is with the Ports and Harbours Division, Hydrographic Office. Other organisations with an interest in hydrographic matters are the Shipping Association Guyana (SAG) the Guyana Lands and Surveys Commission (GLSC), Guyana Meteorological Service (GMS) and Guyana Fisheries (GF)

Guyana is not a Member of the IHO but is an Associate Member of the MESO-American and Caribbean Sea Hydrographic Commission (MACHC). Guyana has an extant hydrographic Bilateral Arrangement with UKHO, its Primary Charting Authority (PCA).

3.3 Maritime Safety Information

Maritime Safety Information (MSI) consists of the promulgation of navigational and meteorological warnings, search and rescue information and other urgent safety-related information, including urgent information related to charts. IHO Publication S-53 - *Joint IMO/IHOWMO Manual on Maritime Safety Information* provides detailed

information about MSI. In addition MSI in its broadest sense includes navigational chart and publication maintenance.

There is currently no formalized Maritime Safety Information (MSI) organization in Guyana. This means that the existing charts published and maintained by the UKHO do not necessarily contain the latest navigational significant information, nor, and more importantly, are mariners arriving from overseas aware of new navigational significant information through the WWNWS.

The routine maintenance of charts and publications, to include changes in buoyage and man-made topography for example, is as important as new survey data if charts are to be maintained to the standard required for safe navigation. This information has to come from the nation State and be passed to the Primary Charting Authority (UKHO) for action. In the case of Guyana, local information is supplied to the UKHO, average less than one per annum. The following table shows the current publication date of charts covering the Republic of Guyana, together with a reference to the last notice to mariners (NtoM) that has been issued and the total number of NtoMs that have been applied to each chart since its publication. The table is correct to 04 February 2013.

BA Chart	Title	Year of Chart Publication (Last NtoM/Year)	NtoMs issued in the last five years
99	Entrances to Rivers in Guyana and Suriname	NE 25 May 2006 456/12	10
519	Georgetown	NE 6 Mar 1992 3086/12	8
527	Approaches to Demerara and Essequibo Rivers	NC 6 Jan 1966 2601/12	5
533	Georgetown and Mouths of Demerara and Essequibo Rivers	NE 10 Jul 1964 2601/12	5
572	Essequibo River to Corentyn River	NE 8 Nov 1968 2601/12	6
2687	Approaches to the Berbice River	NC 19 May 1967 2601/12	7
2782	Essequibo River - Leguan Island to Mamarikuru Island including West Channel	LC 16 Aug 1963 4948/06	1
2783	Essequibo River - Mamarikuru Island to Bartica including the Entrance to the Mazaruni River	LC 3 Mar 1972 4948/06	1
2784	Entrance to the Berbice River	6 Aug 1954	3

There appears to be no in-country linkage for government agencies to feed information through to the mariner via chart and publication amendments or navigational warnings. In addition to establishing a regular MSI service, the government of Guyana is strongly urged to organise a review of all the published charts of Guyana as soon as possible and to inform the PCA (UKHO) of all differences; this is particularly relevant and urgent given the PCA's programme to modernize the charting of Guyana in 2013/14.

To improve the MSI situation in Guyana the country should apply for a place on the Phase One Maritime Safety Information Course in Trinidad and Tobago in May 2013; this is a MACHC Capacity Building event. For the maximum benefit to be obtained from this course Guyana should select a suitable candidate who will be responsible for MSI in Guyana.

3.4 Hydrographic Surveying

In the period up until the mid-1960s the United Kingdom had a survey ship on station in the region conducting surveys for chart production programmes, since this time large area medium scale to large scale survey operations have all but ceased. The GHO conducts large scale survey data in the ports, harbours and navigable stretches of the river system of Guyana.

National hydrographic data gathering has been severely limited due to a lack of equipment (survey platform and equipment) and adequate trained personnel. Surveys have been confined mainly to port facilities and berths although not all the data arising from these surveys has been passed to the PCA (UKHO) to maintain the charts of Guyana.

Foreign research cruises have taken place in Guyana's waters; however, although data was collected, none of the data has reached the GHO or been passed to the PCA (UKHO) to maintain the charts of Guyana.

3.5 Nautical Charting

There is no national capacity for either paper or digital chart production nor is there any intention to establish such a capacity. Although the government of Guyana appears satisfied with the current service provided by the PCA (UKHO) there is strong ministerial desire for Guyana to establish its own chart production facility and publish charts to replace those of the PCA. It is recommended that GHO staff visit UKHO to consider the issues and investment required for chart production in Guyana. It is also recommended that Guyana consult with the Hydrographic Office in Suriname on this issue.

The PCA (UKHO) provides national paper, raster and ENC coverage; there is no INT chart coverage of Guyana. The UKHO ENC coverage mirrors the paper and raster charting.

There is no nautical chart production facility or sales outlet in Guyana, the nearest Admiralty Chart Agents is in Trinidad.

Of the nine nautical charts covering Guyana published and maintained by the PCA (UKHO) on behalf of the government of Guyana only one (BA572) has currently been modernised in that depths are shown in metres and modern chart symbols are used. None of the charts can be used directly with GNSS nor can the difference in position between GNSS and the chart be determined making navigation purely by GNSS potentially hazardous. Each of the six charts covering Guyana carries the following note:

**CAUTION: SATELLITE - DERIVED
POSITIONS**

Positions obtained from Global Navigation Satellite Systems, such as GPS, are normally referred to WGS84 Datum. The differences between satellite - derived positions and positions on this chart cannot be determined; mariners are warned that these differences **MAY BE SIGNIFICANT TO NAVIGATION** and are therefore advised to use alternative methods of obtaining positional information, particularly when navigating close to the shore or in the vicinity of dangers.

It was apparent during the IHO visit that a comprehensive chart updating programme is required if the existing chart coverage of Guyana is to meet national needs. UKHO has plans for the modernization of the current published charts to metric, WGS84 versions during 2013/14. It should be noted, however, that whilst this will improve the mariner's ability to position his ship correctly using GNSS the hydrographic data upon which the charts are based will be the same as that currently published with the exception of any data provided by the GHO.

The process of chart improvement to meet contemporary requirements relies on the availability of new and revised information both hydrographic and topographic. Much of this information can be collected relatively inexpensively by local authorities, stakeholder organizations and individuals and be forwarded to the PCA (UKHO). Other information is likely to exist locally that could be included in revised charts. However, it must be found and forwarded to the PCA (UKHO). Dedicated surveys will nevertheless be required for certain key areas.

A comprehensive analysis of the existing charting situation in Guyana is contained in Annexes E and F.

3.6 National Hydrographic Resources

There are few specialist staff (one Sworn Land Surveyor with in excess of twenty five years in hydrographic surveying experience and one IHO Cat B along with two technicians holding diplomas in land surveying) currently

practicing within the government of Guyana and the hydrographic equipment is limited in its capability (SBES and DGPS). The GHO does not have a dedicated survey vessel.

4 Options for the Way Ahead

4.1 Bilateral Arrangements for the Production and Maintenance of Charts and Publications

It is vital that where there is no in-country chart production or maintenance facility, a coastal State establishes and maintains a close liaison with its PCA through a bilateral agreement; in the case of Guyana this is the UKHO with a bilateral signed in 2011. Subject to the continuing mutual agreement between Guyana government and the UKHO, Guyana should continue to rely on the UKHO to publish its charts and nautical publications. It is recommended that the terms of the bilateral should be reviewed annually by Guyana and amendments discussed with UKHO.

However, if the PCA (UKHO) is to publish and maintain charts of Guyana successfully there is a fundamental requirement for Guyana to ensure that the PCA is provided with all the relevant information required for inclusion in charts covering Guyana.

The establishment of a National Hydrographic Authority and a National Maritime Safety Information Coordinator is absolutely essential to support the PCA (UKHO) and the NAVAREA IV Coordinator. This should also be supported by input from a National Hydrographic Committee. The gathering and forwarding of new and relevant chart information must be actively encouraged under a national programme for chart improvement and maintenance.

4.2 National Hydrographic Authority

The IHO recommends that every coastal State should designate a National Hydrographic Authority responsible for coordinating hydrography and charting in the country. The role of the National Hydrographic Authority is to be the principal national and international point of contact and to act on behalf of the government to ensure that the State meets its international obligations that proper MSI and nautical charting services are available to mariners. The National Hydrography Authority is the first point of contact for in-country stakeholders and for maintaining relations with relevant international organisations. In the case of Guyana, these contacts would include the IHO, MACHC, the PCA (UKHO), the US National Geospatial-Intelligence Agency and other countries and agencies that might support hydrographic development and assistance in Guyana.

In Guyana, MARAD may be the most appropriate body to be the National Hydrographic Authority. Such an arrangement is similar to that in a number of states, whereby the national Maritime Safety Administration/Authority has responsibility for the development and coordination of the provision of hydrographic surveying and nautical charting services in those countries. Many other countries have adopted a similar arrangement.

4.3 National Hydrographic Committee

Ensuring that a State's charts contain all relevant information requires the support of all in-country stakeholders. Similarly, to ensure that the national chart coverage and associated services meet the needs of the all the stakeholders requires wide input. For this reason, the IHO recommends the establishment of a National Hydrographic Committee to provide input to the hydrographic programme and setting national charting and surveying priorities. In this way, the stakeholders are in a position to assist in the continuing maintenance of the charts, longer term planning and perhaps also to the programme budget.

A National Hydrographic Committee should include representatives from all relevant stakeholder sectors, including, but not limited to:

- Shipping
- Environmental protection
- Survey and mapping
- National infrastructure development
- Coastal zone management
- Marine exploration
- Resource exploitation – minerals, fishing

- Maritime boundary delimitation (UNCLOS, others)
- Maritime transport
- Maritime defence and security
- Disaster management
- Tourism

All hydrographic stakeholders need to be involved in contributing to Guyana national hydrographic program. This is not only to identify and prioritise national requirements, but also to contribute to the execution of the programme. This could be through help in-kind, such as the provision of boats, or personnel or through contributions to enlist contract support – for example for surveys of areas targeted for development. A key role for the stakeholders is to educate and encourage everyone to forward all relevant new or changed hydrographic information to the national coordinator for hydrography and charting.

4.4 National Maritime Safety Information Coordinator

The IHO recommends that every coastal State should designate a national MSI coordinator. It is recommended that MARAD assumes the role of national MSI coordinator. This would ensure that MSI services are the direct responsibility of the National Hydrographic Authority. This, in turn, would enable navigationally significant information to be collected efficiently and reliably and subsequently promulgated both through immediate warnings to shipping when warranted and through the incorporation of new or revised information in existing published charts.

4.5 Chart Improvement and Maintenance Programme

For coastal States that do not have an in-country chart production and maintenance capability, the IHO considers that an active national programme of information gathering is vital. This programme must encourage all mariners and other interested parties to report all discrepancies in the existing charts and to provide as much information as possible on what should actually be shown on the charts. For Guyana, such information can be reported directly to the PCA (UKHO) using a hydrographic note, or by any other mechanisms that alert the PCA (UKHO) that changes are required to existing charts. The method and format for providing the information is much less important than ensuring that the PCA (UKHO) is alerted in the first place. The UKHO produces a Code of Practice giving guidance on the information required and the format in which it can be sent to the PCA (UKHO).

As there is no in-country capability to undertake systematic surveys for chart improvement purposes, assistance should be sought from regional neighbours or by engaging survey assistance under commercial contract.

4.6 Temporary Hydrographic Adviser(s)

The IHO recommends that it is highly desirable to engage hydrographic advisers when an in-country hydrographic capability is being established or strengthened. Given the nation's growing economic links with Brazil, it is recommended that in the first instance Guyana approach Brazil for any assistance required.

5 Technical Visit Conclusions

Based on discussions and the facts obtained, the following principal conclusions have been reached:

- (1) MARAD's hydrographic section is staffed by professionals with a determination to provide the government of Guyana with the hydrographic services it requires, however, the hydrographic section is unable to deliver these services due particularly to a lack of a survey vessel capable of operations at a distance from Georgetown. Such a vessel as that recently purchased as a pilot launch would be suitable for this task.
- (2) MARAD's hydrographic section is equipped with a single beam echo sounder and a satellite navigation system. For a modest financial outlay the hydrographic section could be provided with a small hull mounted side scan sonar (such as Starfish) which would greatly enhance its capability and bring its surveys almost to international standards.
- (3) The current lack of coherent MSI services could be having an adverse impact on Guyana economy as well as putting the safety of life at sea and protection of the marine environment at increased risk.
- (4) Whilst the cooperation of foreign governments through the provision of hydrographic services to Guyana is applauded, the failure to pass hydrographic data for updating nautical charts published by the Primary Charting Authority (UKHO) is impeding the improvement of the safety of navigation within Guyana waters and the business of national hydrographic stakeholders.
- (5) The improvement of charts covering Guyana should be a matter of particular concern to the national government. Every effort should be made to work with the Primary Charting Authority (UKHO) in its chart modernization programme in 2013/14.
- (6) An urgent local review of existing charts is required to identify discrepancies and to provide up to date information to the PCA (UKHO) in support of its chart modernization programme in 2013/14.
- (7) The establishment of a national hydrographic structure, centred on an effective national hydrographic committee would potentially improve the national situation regarding hydrography and charting.

6 Recommended Actions

The following recommended actions are provided for consideration by the relevant authorities:

- (7) **The Government of Guyana** should:
 - o. formally designate a **National Hydrographic Authority** to be responsible for coordination and ensuring the provision of appropriate nautical charting services for Guyana in accordance with the requirements of the International Convention on the Safety of Life at Sea (SOLAS), and in accordance with the principles established by the IHO;
 - p. allocate regular funding and travel support for the **National Hydrographic Authority** to fulfil the duties of the Office and to represent Guyana in appropriate forums, and in particular, to attend relevant meetings of the MACHC;
 - q. ensure that a **Maritime Safety Information (MSI) Coordinator** position is established as soon as possible to fulfil Guyana's treaty obligations under SOLAS V/4 - *navigational warnings*;
 - r. ensure that the **Maritime Safety Information (MSI) Coordinator** is nominated and able to attend the Phase One Chart Awareness Course in late May 2013, an MACHC Capacity Building course.
 - s. ensure the development and execution of a **National Maritime Safety Information Plan** – by ensuring that field checks are carried out on the current charts and publications and the results are forwarded promptly to the PCA (UKHO);
 - t. to provide all MARAD archive hydrographic data to the PCA (UKHO) for use in the compilation or revision of the existing charts of Guyana;
 - u. Discuss with the Brazilian Government the possibility of hydrographic training assistance;

(8) **The National Hydrographic Authority** should:

- k. liaise with Regional Team 3 at the UKHO to ensure that new navigational significant information is forwarded and included in existing charts of Guyana;
- l. apply, through the MACHC, for training for the MSI Coordinator under the IHO Capacity Building Program;
- m. organise an urgent national programme of review of all the published charts of Guyana and inform the PCA (UKHO) of all detail that is incorrectly shown on these charts. Such a national programme should encourage all mariners and other interested parties to report discrepancies on existing charts together with as much information as possible on what should actually appear in the charts;
- n. review the existing **bilateral arrangement** with the **Primary Charting Authority (UKHO)**;
- o. establish and chair a **National Hydrographic Committee** or forum that coordinates national hydrographic requirements including input to a **National Charting Plan**, a **National Hydrographic Survey Plan** and a **National Maritime Safety Information Plan**. This group should include representatives from all stakeholder sectors, including but not be limited to: shipping, environmental protection, survey and mapping, national infrastructure development, coastal zone management, marine exploration, resource exploitation – minerals, fishing, maritime boundary delimitation, maritime transport, maritime defence and security, disaster management and tourism.

(9) **The Government of Guyana** should

- i. actively support existing hydrographic surveyors in the enhancement of national hydrographic surveying; provide funding to equip the Guyana Hydrographic Unit with a survey launch and a sidescan sonar system;
- j. provide on-going funding for the regular maintenance and routine replacement of hydrographic and cartographic equipment and for the training and requalification of operators;
- k. establish and fund a national marine cartographic capability such that Guyana can provide specialist chart products for national use and to be sufficiently informed to participate in decisions regarding chart coverage and availability;
- l. engage overseas hydrographic advice to guide and assist the **National Hydrographic Authority** and stakeholders to enhance in-country hydrographic data gathering capability and to foster close liaison and possible support from recognized national hydrographic authorities in other countries.

Annex A – List of Contacts

Name	Organization	Contact No Direct Mobile	Email Address
Mr R. Benn Minister	Ministry of Public Works		
Ms C. Rogers Director General	Guyana Maritime Administration Department	(592) 225 7330	marad@maritimegy.com
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Thaeshwari Pooran			tpooran@hotmail.com

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Randolph Choo Shee Nam	Private Hydrographic Consultant FRICS (1976).	(592) 226 5749 (592) 668 3136	randolphcsn@yahoo.com
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Annex B – Guyana’s Dependency on Hydrography and Charting

1. Introduction

Guyana, the only English speaking country on the continent of South America, was ceded to Great Britain in 1814 and named British Guiana. On 26 May 1966, British Guiana became an independent member of the Commonwealth, with the name Guyana, and on 23 February, 1970, it became the world’s first Co-operative Republic under an Executive President. The population of Guyana is estimated at about 785,000 (2009).¹

The Cooperative Republic of Guyana is a coastal state with a coastal line approximately 460 miles in length occupying the northeast coast of South America. Guyana has an Exclusive Economic Zone (EEZ) of approximately 136,000 square kilometres of which some 52,000 square kilometres is continental shelf. The total land area of the country is 197,000 square kilometres. The country has an extensive river system with two rivers forming the boundary with neighbouring Brazil and Suriname. The rivers empty out into the North Atlantic Ocean along a wide and shallow region of coastal waters where the 50m contour is some 35 miles offshore. The rivers, are of limited navigational use due to rapids and waterfalls. The only ports are located within the mouths of the rivers.²

Guyana is divided roughly into three regions. The first region consists of a low alluvial coastal belt extending from 10 to 40 miles inland, the eastern part of which is intensively cultivated, containing some 90% of the population. The second region is a mountainous area of dense rain forest, rising from low sand plateaux and hillocks behind the coastal belt to a 2743 m high summit at the junction of the Guyana--Brazil--Venezuela borders. The third region is that of open savannah country with cattle ranches in the southwest part of Guyana.³

The country has extensive mineral resources including bauxite, of which there are large deposits up Demerara River, gold, diamonds, copper, tungsten, iron, nickel, quartz and molybdenum and manganese. Alumina is also produced. Agricultural products are principally sugar--cane and rice; others of importance are coconuts, cassava, mangoes, pumpkins and squash, bananas and plantains. Timber covers about 77% per cent of the country.

Exports in 2004 were chiefly sugar, gold, diamonds, fish, rice, crustaceans and molluscs; other commodities included rice, timber and bauxite. Main imports include petroleum and its products, machinery and transport equipment, manufactured goods, food and live animals.



The Co-operative Republic of Guyana⁴

¹ NP7A p.9

² NP7A p.9

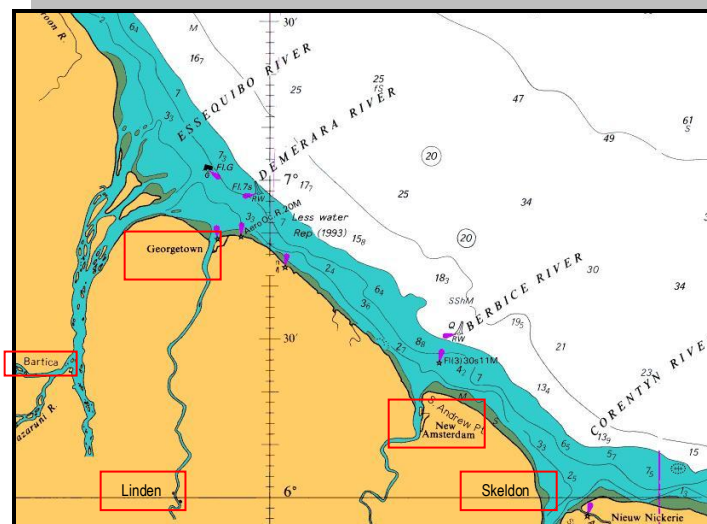
³ NP7A p.9

⁴ <https://www.cia.gov/library/publications/the-world-factbook/geos/gv.html> [accessed 4 Jan 2013]

2. Ports and Harbours

Guyana's ports, harbours and anchorages are:

- Georgetown (6°48'.77N 58°10'.26W) Principal port and capital
- New Amsterdam (6°14'.49N 57°31'.36W) Commercial port
- Linden (6°00'.40N 58°18'.20W) Bauxite ore terminal
- Skeldon (5°53'.58N 57°07'.92W) Minor harbour
- Bartica (6°24'.20N 58°37'.10W) Minor anchorage port



Georgetown

The main port of entry for the Guyana is Georgetown (6°48'.77N 58°10'.26W) at the mouth of the Demerara River. Maritime Administration Department (MARAD) is the port authority with the berths operated by a number of private agencies. The principal exports are sugar, rice, molasses, bauxite, gold, timber, seafood, agricultural products and rum. All imports enter through Georgetown. The Port of Georgetown offers public and private tidal berthing facilities.

A mudflat, with depths of less than 5.0m, extends 10 miles NE from the mouth of Demerara River. The mudflat and bar fronting the river are liable to change. A channel, dredged to a depth of 6.9 m in 1990, leads through the mudflat and bar into the harbour of Georgetown; maintenance dredging is conducted with current limiting depth of 4.5m. However, depths in the channel may also be liable to change. The bottom is mud to a depth of 18.0m or more. The upper layer of this mud is known locally as "sling mud"; it is from 0.6 to 1.2 m thick and is of a very soft, almost liquid consistency. Vessels can force a passage through this mud even though drawing 0.3 m or more than the actual depth of water.

New Amsterdam

The town and harbour of New Amsterdam (6°14'.49N 57°31'.36W), which had a population of about 5000 in 2009, stands on the east bank of the Berbice River 4 miles south of Saint Andrew Point. Berbice River is approximately 300 miles long, of which 175 miles is navigable. The port's primary purpose is the export of bauxite.

There is a transshipment terminal in the entrance to the river along with several berths along the east bank of the river from New Amsterdam to Everton, 3½ miles south. There is also a commercial berth at Blairmont on the west bank. Silting takes place along river frontage on both sides of the river at New Amsterdam, but vessels may safely lie aground, the bottom being soft mud.

The approach channel for Berbice River has been dredged and is maintained to 8.3m and to a width of 80m along the leading lines. Vessels with draughts up to approximately 11m can navigate the dredged channel. Vessels with draughts of up to 3.0m can ascend the river for 45 miles, to Fort Nassau, those drawing 3.7m for 105 miles and those drawing 2.1m for about 175 miles.

Linden

Linden (Mackenzie) (6°00'.40N 58°18'.20W), which had a population of about 43,000 (2009), is an important bauxite ore terminal operated by a Chinese company, BOSAI. MARAD is the Port Authority. Linden lies approximately 56 miles upstream from Georgetown on the Demerara River; the river here is about 137 m wide and is navigable by vessels of 22,000 dwt, with a draught of up to 6.5 m, as far as the bauxite terminal. Linden has two bauxite berths for vessels up to 173 m in length with an alumina berth 1 mile north of the bauxite berths which is also used for discharging general cargo and caustics. Coasting vessels of shallow draught can proceed 45 miles above Linden.

Skeldon

Skeldon (5°53'.58N 57°07'.92W) is situated on the west side of the Corentyn River, about 6 miles SW of Bluffpoint the E entrance point. Guyana's main sugar processing plant operated by the Guyana Sugar Corporation is situated at Skeldon. There are two berths: Springlands Wharf, situated at the north end of the town, can handle vessels 70m in length. Moleson Creek, 8 miles southwest of Springlands Wharf, is an international river ferry terminal connecting Guyana and Suriname and hence a port of entry.

The Corentyn River entrance is fronted by a bar which partly dries. Vessels with a maximum draught of 4.7m can enter the river. From December to February, a heavy sea frequently prevents vessels drawing more than 2.7 m from entering owing to the risk of hitting the bottom.

Bartica

Bartica (6°24'.20N 58°37'.10W), is a large town standing at the confluence of Essequibo and Mazaruni Rivers. Vessels with draughts up to 4.7m can reach Bartica where small wooden jetties and landing slips are situated along its shores. There is an anchorage for vessels and a barge service to discharge cargo.

3. Coastal and River Link Routes

There is an extensive network for local feeder vessels and barges to move goods from the interior to the coastal ports and harbours, particularly Georgetown. Feeder vessels provide for the movement of goods and passengers along the coast of Guyana and to interior locations. The illustration below encapsulates the trading situation in Guyana; shown in the illustration are the wharves at Georgetown with a barge alongside, a foreign trading vessel moored in the stream and a smaller feeder vessel proceeding upstream.



4. Sea Defences

Sea defences are major concern for Guyana with much of the inland coastal area lying below sea level. During the IHO Technical Team's visit the sea defences were breached near Georgetown causing chaos on the main road link out eastwards from the city. The Ministry of Public Works Work Services Group is responsible for the maintenance of sea defences, determination and monitoring of mean sea level (MSL) in support of this work is a vital. MSL determination and monitoring is conducted through a benchmark network, tidal observation and analysis. Differences in land datum along the coast give rise to the uncertainty of the relative movement of MSL along the coast.

5. Cruise Ship Operations

Guyana enjoys a very limited cruise ship trade; however, the Ministry of Tourism is actively promoting the long-term development of cruise ship visits to Guyana.



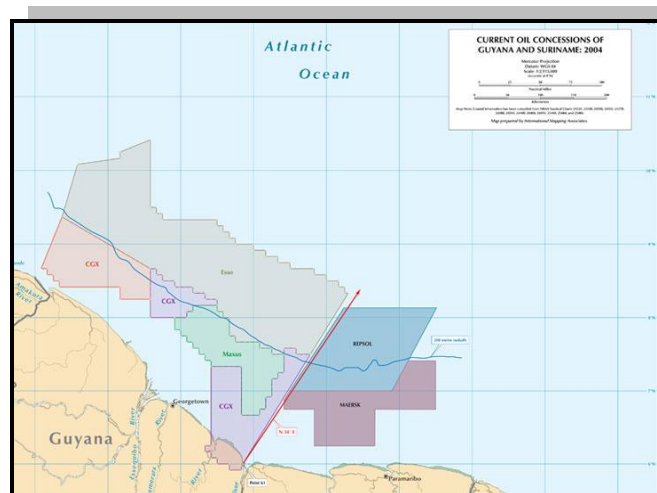
Cruise ship Le Levant alongside at Georgetown⁵

6. Shipping Routes including Navigable Channels

No main shipping routes pass through Guyana's waters.

7. Offshore Oil and Gas

Exploration for oil and gas has been in progress for a number of years but without success. Current concessions are shown in the diagram below.



⁵ http://www.guyanachronicleonline.com/site/index.php?option=com_content&view=article&id=25724:second-cruise-ship-for-the-year-calls-on-port-georgetown&catid=4:top-story&Itemid=8 [Accessed 8 January 2013]

8. Maritime Claims

Under its Maritime Boundaries Act (1977) and the Exclusive Economic Zone (Designation of Area) Order (1991) Guyana claims a 12 mile territorial sea, an exclusive economic zone (EEZ) of 200 miles. On 6 September 2011, the Republic of Guyana submitted to the Commission on the Limits of the Continental Shelf, in accordance with Article 76, paragraph 8, of the United Nations Convention on the Law of the Sea (UNCLOS).⁶ The total EEZ area totals approximately 1,332,000 square kilometres⁷ an area over 600 times larger than its land area. The Guyana has a Continental Shelf area of approximately 48,800 square kilometres.⁸

Guyana has maritime boundaries with Barbados (EEZ only), Suriname and Venezuela. Guyana does not have an agreed boundary with Barbados rather it has an EEZ Co-operation Treaty, dating from December 2003, whereby in the overlap zone of the two EEZs the two countries agree to share rights and jurisdiction equally. The boundary with Suriname was fixed on 17 September 2007 when the arbitral tribunal constituted pursuant to Article 287 of the UNCLOS rendered its award in the Guyana/Suriname arbitration. The boundary with Venezuela has yet to be agreed.

9. Defence including Marine Police

The Guyana Defence Force Coast Guard (GDFCG) is a branch of the Guyana Defence Force; it is a maritime, military, multi-mission service. GDFCG, which operates one offshore patrol vessel, five river and inshore patrol vessels and one landing craft has operates primarily in the river estuaries and Guyana's territorial waters. The marine Police operate in the immediate inshore areas, river estuaries and the rivers of Guyana. Both organizations expressed an interest in improved surveys and charting of the country's extensive river system.



The offshore patrol vessel GDF *Essequibo*⁹

10. Environment

It was not possible to assess any specific environmental requirement for hydrography during the visit.

11. Marine Parks and Reserves

Guyana's only marine related reserve is at Shell Beach, located on the extreme northwest coast of Guyana for the protection of turtles. The reserve is along the shore and has very limited reach to seaward.

12. Vigias

There are no vigias within Guyana's waters.

⁶ <http://www.un.org/Depts/los/LEGISLATIONANDTREATIES/STATEFILES/GUY.htm> [accessed 8 January 2013]

⁷ <http://www.seaaroundus.org/eez/690.aspx> [accessed 7 September 2012]

⁸ <http://www.seaaroundus.org/eez/690.aspx> [accessed 7 September 2012]

⁹ <http://www.demerarawaves.com/index.php/2011/11/27/2874/Latest/coast-guard-vessel-damaged.html> [accessed 7 January 2013]

13. Fishing

It has been noted that the fisheries sector is of critical importance to Guyana's economy. Its importance is evident in five key areas:¹⁰

- fish is the major source of animal protein in Guyana;
- fisheries contributed 5.9 % of the country's GDP in 2009;
- Guyana's export earnings from fisheries totalled US\$115,572,000 or 5.1% of total exports;
- the fishing industry employs some significant numbers in harvesting and processing whilst many more benefit indirectly from fishing-related occupations, such as boat-building and boat maintenance activities; and
- the fishery sector is a significant net contributor to the Government's revenue. Indeed, the ratio of the sector's revenues to the government's expenditure on it is more than 80 to 1.

The fisheries sector of Guyana comprises three primary components: marine fisheries, inland fisheries, and aquaculture.

Most of Guyana's fishing occurs in the relatively shallow waters of the continental shelf. The marine resources exploited within the EEZ are mainly the demersal fishery resources and, to a much more limited extent, the pelagic fish resources which are to be found both over the continental shelf and toward the continental slope. Some of the demersal species, particularly prawns and shark, are showing clear signs that they are being exploited at an unsustainable rate. On the other hand, some deep slope demersal and pelagic species are underexploited in spite of their greater potential. From a commercial viewpoint, the most important stocks may be the cross-boundary species. Harvesting these stocks and ensuring that they are exploited in a sustainable manner will require joint initiatives with Venezuela, Suriname, French Guiana and Brazil.

14. Tourism and Coastal Recreational Amenities

It was not possible to assess any tourism requirement for hydrography during the visit.

15. Education and Science

It was not possible to assess any education or science requirement for hydrography during the visit.

16. Planned Maritime Developments in Guyana's Waters

- Proposed manganese export transshipment facility at the Wani River mouth.
- Deepwater harbour at Berbice
- Deepening of Georgetown Harbour through Public Private Partnership
- Dredging of the Demerara River for a bauxite transshipment facility
- Guyana Gold Fields Incorporated support terminal on the west bank of the Essequibo R in the vicinity of Buck Hall

¹⁰ <http://www.statisticsguyana.gov.gy/trade.html#partners1> and <http://www.sdn.org.gy/nds/chapter13.html> [accessed 7 January 2013]

Annex C – Existing Hydrographic Data for Guyana

1. General

Admiralty charts of Guyana's coastal waters and ports depend mainly on Admiralty surveys from the 1960s; no systematic surveys of Guyana's coastal waters have been conducted since this time. Large scale surveys have been undertaken by the Guyanan government and commercial organizations in the ports and port approach channels.

2. National Data

An archive of national hydrographic data does not exist and it has to be assumed that all data gathered under previous survey campaigns has been incorporated into modern charting although this could not be verified. It was apparent that not all surveys conducted by MARAD had been forwarded to the PCA (UKHO) and it is strongly recommended that this is done as a matter of urgency in the preparation of new charts for Guyana.

3. United Kingdom Hydrographic Office

The UKHO has an extensive hydrographic archive for Guyana. All survey data held by UKHO has been incorporated into the current published charts. It is recommended that Guyana government formally request from the United Kingdom government a complete list of surveys conducted by the United Kingdom in Guyana EEZ and TTW, the list of surveys to include dates, survey methods, scales and geographic area covered for inclusion in the national database.

4. 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 16 May 2007 is shown in the table below. Given the imprecise delineation of the 200m contour and the incomplete knowledge of surveys undertaken in Guyana waters the figures in and for C-55 are at best approximate. It was not possible to revise the figures during the visit.

Area Code	Definition	C55 (%)
A1	Area adequately surveyed (<200m)	70
A2	Area adequately surveyed (>200m)	0
B1	Area requiring resurvey at larger scale or to modern standards (<200m)	30
B2	Area requiring resurvey at larger scale or to modern standards(>200m)	0
C1	Area which has never been systematically surveyed (<200m)	0
C2	Area which has never been systematically surveyed (>200m)	100

IHO C-55 Guyana - Status of Hydrographic Surveys [Updated 16 May 2007]¹¹

¹¹ IHO C55 Region B p.14 http://www.iho.int/iho_pubs/CB/C-55/C-55_Eng.htm [Accessed 7 January 2013]

Annex D – Charting Analysis of Guyana’s Waters

1. Guyana Chart Coverage

The Republic of Guyana does not have a chart production capability and relies historically on the UKHO to fulfil this function. The résumé of chart coverage for Guyana shown in IHO Publication C-55 - *Status of Nautical Charting* (updated 16 May 2007) 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 ENCs
Small Scale:			
Offshore Passage	100 (100)	100 (100)	100 (100)
Medium Scale:			
Landfall, Coastal Passage	100 (100)	100 (100)	100 (100)
Large Scale:			
Approaches and Ports	100 (100)	100 (100)	60 (60) ¹

1) No ENC coverage of Essequibo River, however, GB charts 2782 and 2783 provide raster coverage.

IHO C55 Status of Chart Coverage

While C-55 shows that Guyana is reasonably well covered by charts, it must be noted that the quality of those charts and the data from which those charts are derived are largely inadequate.

2. British Admiralty Charts

2.1 General

For historical reasons the United Kingdom, through the United Kingdom Hydrographic Office (UKHO) remains the Primary Charting Authority (PCA) for Guyana.

Of the six nautical charts covering Guyana published and maintained by the PCA (UKHO) on behalf of the government of Guyana only two (BA 519 and 572) have been modernised in that depths are shown in metres and modern chart symbols are used. None of the charts can be used directly with GNSS nor can the difference in position between GNSS and the chart be determined making navigation purely by GNSS potentially hazardous. Each of the six charts covering Guyana carries the following note:

**CAUTION: SATELLITE - DERIVED
POSITIONS**

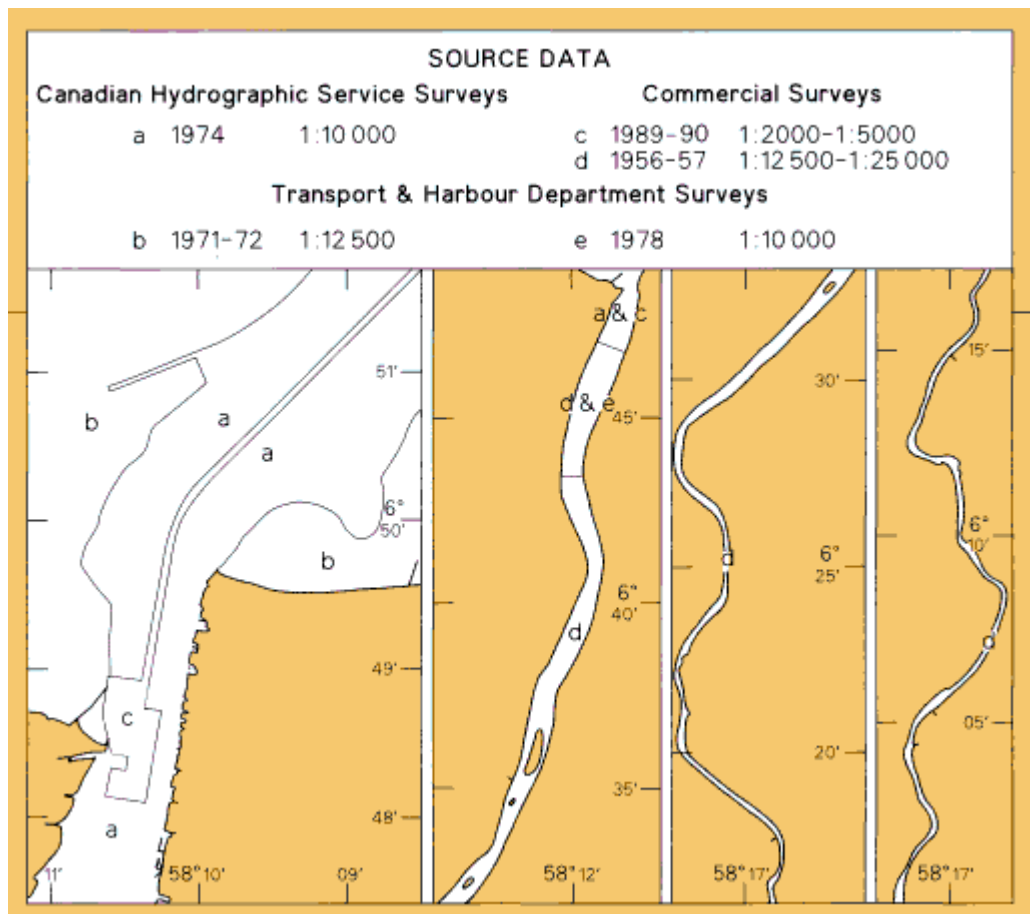
Positions obtained from Global Navigation Satellite Systems, such as GPS, are normally referred to WGS84 Datum. The differences between satellite - derived positions and positions on this chart cannot be determined; mariners are warned that these differences **MAY BE SIGNIFICANT TO NAVIGATION** and are therefore advised to use alternative methods of obtaining positional information, particularly when navigating close to the shore or in the vicinity of dangers.

2.2 British Admiralty Chart Review

A discussion of British Admiralty charts and the data upon which they are based are included in the table below. In reading this section it should be remembered that the charts of Guyana are about to be modernized by UKHO but that none of the bathymetric data will be updated due to a lack of survey data.

BA Chart	Area	Remarks
99	Entrances to Rivers in Guyana and Suriname	BA 99 mainly covers rivers in Surinam. The Corentyn River, which forms the border between Surinam and Guyana, is the only part of relevance for Guyana. The chart is based on Netherlands Government charts from 1976. The chart is in fathoms and is not referenced to WGS84.
519	Georgetown	Georgetown is the capital city of Guyana and the main port of entry. Data for this chart comes primarily from surveys in the early 1970s (single beam echo sounder and no side scan sonar) with large scale commercial surveys of the dredged channel from 1990. Large scale surveys of certain berths in Georgetown have been conducted by the Transport and Harbours Department but may not be shown on the current published chart. The chart is metricated and referenced to WGS84.

The Source Data diagram from BA 519 is reproduced below.



BA Chart	Area	Remarks
527	Approaches to Demerara and Essequibo Rivers	BA 527 covers the approaches to the two main rivers leading into Georgetown (the Demerara River) and to the interior (Demerara and Essequibo Rivers). The chart depends for its source material on British navy surveys from 1960 to 1964 (single beam echo sounder and no side scan sonar). The chart is in fathoms and is not referenced to WGS84.
533	Georgetown and Mouths of Demerara and Essequibo Rivers	BA 533 covers the inner approaches to the two main rivers leading into Georgetown (the Demerara River) and to the interior (Demerara and Essequibo Rivers). The chart depends for its source material on British navy surveys from 1960 (single beam echo sounder and no side scan sonar). The chart is in fathoms and is not referenced to WGS84.
572	Essequibo River to Corentyn River	BA 533 covers the coast from the Essequibo River to the Corentyn River on the border with Surinam. The chart depends for its source material on British navy surveys from 1962 to 1966 and Netherlands Government charts from 1966 (single beam echo sounder and no side scan sonar). Although this chart is metricated it is not referenced to WGS84.
2687	Approaches to the Berbice River	BA 2687 covers the outer approaches to the Berbice River. The chart depends for its source material on Transport and Harbours Department surveys from 1952 (single beam echo sounder and no side scan sonar). The chart is in fathoms and is not reference to WGS84.
2782	Essequibo River - Leguan Island to Mamarikuru Island including West Channel	BA 2782 covers the estuary of the Essequibo River, an important area of future development in Guyana. The chart depends for its source material on Harbours Department surveys in the 1920s by hand lead and visual position fixing with later additions in the 1960s (single beam echo sounder and no side scan sonar). The chart is in fathoms and is not reference to WGS84.
2783	Essequibo River - Mamarikuru Island to Bartica including the Entrance to the Mazaruni River	BA 2783 covers the Essequibo River above Mamarikuru Island an area used mainly by river traffic. The chart depends for its source material on Harbours Department surveys in the 1920s by hand lead and visual position fixing with later additions in 1971 (single beam echo sounder and no side scan sonar) by the Transport and Harbours Board. The chart is in fathoms and is not reference to WGS84.
2784	Entrance to the Berbice River	BA 2784 covers the approaches to the Berbice River and the bauxite terminal. The chart depends for its source material on Transport and Harbours Board surveys from the 1950s (single beam echo sounder and no side scan sonar) although the dredged channel over the Bar is routinely dredged. The chart is in fathoms and is not referenced to WGS84.

Annex E – IHO Yearbook

GUYANA (REPUBLIC OF)

MARITIME ADMINISTRATION DEPARTMENT HYDROGRAPHIC OFFICE Georgetown Ferry Stelling GEORGETOWN, DEMERARA	
Department – Ministère – Ministerio	Ministry of Public Works, Maritime Administration Department, Ports and harbours Division
Principal functions - Attributions principales. - Principales funciones.	Hydrographic surveys, tide tables, harbour, river and coastal surveys, aids to navigation, dredging, List of Lights, Notices to Mariners.
Telephone:	Director General: + 592 225 7330 / 226 3356 Harbour Master + 592 226 7842 Supt. Of Surveys: + 592 226 0860
Fax:	+ 592 226 9581
E-mail:	marad@networksgy.com
Website:	No website
Date of establishment and Relevant National Legislation - <i>Date de fondation et législation nationale concernée</i> – Fecha de establecimiento y Leyes nacionales de referencia	Transport and Harbours ordinance 1931 and (amendment) Act 1977, the Guyana Shipping Act (No. 7 of 1998) and the Guyana Shipping Regulation (No. 4 of 2001).
Name and rank of the Director or Head - Nom et grade du directeur – Apellidos y graduación del Director	Ms Claudette Rogers Acting Director General
Name and rank of the Head of the Hydrographic Office	