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METHODOLOGICAL GUIDEBOOK FOR MRCC & COAST STATION EMERGENCY TELECOMMUNICATIONS SURVEY

UNDER THE SMART SEAS TOOLKIT
FOR DISASTER RESILIENCE PROJECT

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TABLE OF CONTENTS

PART A: INTRODUCTION

BACKGROUND

Seafarers are exposed to a wide range of risks at sea, from piracy to natural disasters. As a primary means of emergency communications, the International Convention for the Safety of Life at Sea, *SOLAS* (IMO 2004[1]), and the 2012 Cape Town Agreement (IMO 2012[2]), obliges all passenger and cargo ships[3], as well as fishing vessels exceeding 300 gross tonnage (GT) (over 24 metres in length) to be outfitted with two-way VHF radiotelephone apparatus and licensed operators.

Small-scale fishing vessels, usually 12 metres and below, are recommended[4] but not obligated to carry radio equipment by international law. These vessels account for roughly 93.1% of the Caribbean commercial capture fisheries fleet (CRFM 2018[5]). Small-scale fishing vessels are subject to particularly high levels of exposure at sea, and all too often face crisis situations with no communications recourse. Investigations of the Caribbean ICT Research Programme have found a variety of shortcomings that perpetuate low levels of radio adoption among small-scale fishers. These include but are not limited to low levels of compliance with international obligations[1,2] as well as inadequacies in various operational matters such as radio licensing procedures and application forms; marine working channel information; public awareness on the rationale for radio licensing; and radio training for seafarers.

Figure 1 Three Small-scale Fishing Vessels at the Tourist Hotspot of Marigot Bay, St. Lucia

[1] International Maritime Organization (IMO). 2004. "*International Convention for the Safety of Life at Sea*". Available at: http://library.arcticportal.org/1696/1/SOLAS_consolidated_edition2004.pdf

[2] International Maritime Organization (IMO). 2012. "2012 *Cape Town Agreement*". Available at: https://wwwcdn.imo.org/localresources/en/About/Conventions/Documents/Consolidated%20text%20of%20the%20Agreement.pdf

[3] At least 3 two-way VHF radiotelephone apparatus shall be provided on every passenger ship and on every cargo ship of 500 gross tonnage and upwards. At least, 2 two-way VHF radiotelephone apparatus shall be provided on every cargo ship of 300 gross tonnage and upwards but less than 500 gross tonnages.

[4] FAO/ILO/IMO. 2012. "*Safety Recommendations for Decked Fishing Vessels of Less than 12 metres in Length and Undecked Fishing Vessels*". edited by FAO. Rome: FAO. Available at: https://www.fao.org/3/i3108e/i3108e.pdf

[5] Caribbean Regional Fisheries Mechanism (CRFM). 2018. "*CRFM Statistics and Information Report for 2018*". Available at: https://www.crfm.int/images/CRFM_Statistics_and_Information_Report_2018_Final.pdf

Motivation

Maritime Rescue Co-ordination Centres[6] ("*MRCCs*") and coast stations are often the first to respond to distress, urgency and safety alerts by seafarers; playing a critical role in relaying emergency communications and directing vessels to assist those in need. As for all coast stations and marine band radio operators, they are obligated to maintain watch over the international emergency channels: VHF channels 16 and 70, as well as 2182kHz.

Publicly available data on coast station and MRCC infrastructure and operational capacities are currently unavailable. This limits governments, regulators, as well as national and regional agencies with mandates and interests in maritime operations, from gauging the effectiveness and efficiency of provisions, the adequacy of available resources, and assessing existing gaps. The Caribbean Spectrum Management Taskforce ("*SMTF*") has undertaken to perform baseline data gathering on emergency communications in the maritime bands as a first step to evaluating gaps.

Objectives

The *SMTF MRCC and Coast Station Survey* (see Appendix for draft survey instrument) sets out to perform baseline data gathering on emergency maritime communications, to identify the state of emergency telecommunications in the Caribbean, the gaps which exist, and gap-filling measures.

Additionally, a resource pack for seafarers, particularly small-scale fishers, will be produced as outputs of this exercise, as captured in the *Planned Outputs & Templates* section of this guide.

Scope

The *SMTF MRCC and Coast Station Survey* sets out to survey managerial and technical staff from national coast stations and MRCCs within CTU member states. It gathers the following types of information:

1. *General station information*: what coast stations and MRCCs exist within the Caribbean? Who operates them? How and through what channels can seafarers contact them?
2. *Station personnel*: what job positions are in place for operating these stations?
3. *Radio equipment*: what radio equipment are in use by these stations?
4. *Station Operations*: what are the scheduled transmissions made by these stations, and what channels are used for these transmissions?
5. *National maritime communications policy and regulatory provisions*: what policy and regulatory provisions exist for the marine channel assignments, band plans and channel availability, licensing fees, and subsidies on operating these stations?

[6] A unit responsible for promoting efficient organization of search and rescue services and for coordinating the conduct of search and rescue operations within a search and rescue region. Source: International Maritime Organization (IMO), International Convention on Maritime Search and Rescue, 2000. Available at: http://nmsa.gov.pg/wp-content/uploads/2016/11/SAR-Convention-1979-pdf.pdf

Intended Data Use

The findings of this survey will articulate with those of ITU/CTU/TATT *Smart Seas Toolkit (SST) for Disaster Resilience*[7] to, among other things, develop:

1. A registry of coast stations and MRCCs within the Caribbean
2. A simulated coverage map of coast stations and MRCCs within the Caribbean
3. A registry of channel usage within the marine band, including primary working channels for all coast stations (other than VHF channel 16)
4. Print-ready, wallet-sized call card design with MRCC and coast station contact details by country, for printing and distribution by fisherfolk organizations, ports, etc.
5. An output report, which includes the above artefacts, along with a simulated coverage analysis and recommendations to fill any uncovered gaps based on the responses
6. A policy brief, with recommendations to improve the state of emergency communications provisions offered by existing coast stations and MRCCs within the Caribbean

The results of this survey therefore contribute to the larger picture, of:

1. Determining the state of emergency telecommunications within the Caribbean
2. Identifying the gaps and recommending gap-filling solutions
3. Informing future policy and regulatory decisions
4. Harmonizing the Caribbean community through a common priority: safety at sea

Proposed Schedule

Activity	Due Date
CIRP submits methodological guidebook, instrument & user guidebook to SMTF for review	25 Feb 2022
SMTF members complete list of contacts for instrument's distribution; and provide feedback on methodological guidebook, instrument & user guidebook	4 Mar 2022
CIRP adopts feedback and recommendations, returning updated methodological guidebook, instrument & user guidebook to SMTF	11 Mar 2022
CTU completes spreadsheet of contact information for respondent agencies (same as those with responsibility to submit data to MARS)	18 Mar 2022
CTU issues survey to respondents using contact info on spreadsheet	21 Mar 2022
CTU issues first reminder to submit survey	15 Apr 2022
CTU issues second reminder to submit survey	29 Apr 2022
Deadline for survey submission	6 May 2022
CIRP identifies all non-submissions to CTU for targeted request to submit	13 May 2022
CIRP analyses submissions and prepares report	9 May 2022
CIRP submits report to SMTF for review	1 Aug 2022

[7] Smart Seas Toolkit (SST) for Disaster Resilience. Project information available at: https://www.itu.int/net4/ITU-D/CDS/projects/display.asp?ProjectNo=9RLA21019

PART B: SURVEY DESIGN

The survey (see Appendix) is designed to gather the most important data under the SMTF's initiative to "*conduct a survey of marine communications to include infrastructure and national Maritime Rescue Coordination Centre (MRCC) arrangements, as well as relevant national policy and regulatory provisions, channel use, operations and associated capacity*[8]". It comprises 5 sections:

1. Section 1: general station information
2. Section 2: station personnel
3. Section 3: radio equipment
4. Section 4: station operations
5. Section 5: policy and regulatory provisions

SECTION 1: GENERAL STATION INFORMATION

This section captures the names, positions and contact details for MRCCs and coast stations within the Caribbean. Table 1 summarizes the fields and respective intended use of data gathered.

Table 1 Station Information Section Design

ID	Field	MARS Field	Field Type			Data Use
			Short Answer	Drop-down	Check-box	
S1-01	Has your station submitted to the ITU MARS database in the last 2 years?	✓			✓	to check whether member states have been complying with the ITU coast station reporting requirements
S1-02	Administration	✓	✓			to populate a registry of, and map the coast stations and MRCCs in the Caribbean
S1-03	Admin symbol	✓	✓			
S1-04	Station name		✓			
S1-05	Station type				✓	
S1-06	Countries of responsibility		✓			
S1-07	Agency responsible		✓			to identify sources of inadequacy and best practice
S1-08	Language(s)			✓		to identify potential language barriers which exist among coast stations
S1-09	Services	✓		✓		to map stations to the services they provide
S1-10	Callsign		✓			

[8] Spectrum Management Taskforce 2021 Action Plan not published.

ID	Field	MARS Field	Field Type			Data Use
			Short Answer	Drop-down	Check-box	
S1-11	MMSI		✓			to populate a registry of, and map the coast stations and MRCCs in the Caribbean
S1-12	Telephone	✓	✓			
S1-13	Mobile	✓	✓			
S1-14	Fax	✓	✓			
S1-15	Telex	✓	✓			
S1-16	Satellite Phone	✓	✓			
S1-17	Station Address	✓	✓			
S1-18	Email	✓	✓			
S1-19	Website	✓	✓			
S1-20	Num. Notes	✓	✓			to complete the ITU MARS forms
S1-21	Sea Areas	✓		✓		to identify the sea area coverage achieved by the coast stations
S1-22	Remarks	✓	✓			to capture any additional information from the respondent

SECTION 2: STATION PERSONNEL

This section sets out to capture the station personnel required for coast stations and MRCCs in the Caribbean, as well as the responsibilities and workloads. Additional entries to the *Station Personnel* section can be completed using the additional sheets in the survey's Appendix A. **Error! Reference source not found.** summarizes the fields and respective intended use of data gathered.

Table 2 Station Personnal Section Design

ID	Field	MARS Field	Field Type			Data Use
			Short Answer	Drop-down	Check-box	
S2-01	Job title		✓			to identify the key personnel responsible for, and involved in, the daily operations of coast stations and MRCCs
S2-02	How many in this role per shift?		✓			to assess whether provisions are adequate and to potentially identify best practice
S2-03	Prerequisite knowledge, skills, experience and certifications		✓			to assess whether the job-holder's knowledge, skills, experience and certifications are suitable for coast

ID	Field	MARS Field	Field Type			Data Use
			Short Answer	Drop-down	Check-box	
						stations & MRCCs in the Caribbean[9]
S2-04	Average weekly working hours		✓			to assess whether workloads are reasonable for efficient operations and to potentially identify best practice
S2-05	Shift duration		✓			
S2-06	Responsibilities		✓			to identify the scope of work and the tasks and responsibilities vested with each staff member

SECTION 3: RADIO EQUIPMENT

This section sets out to capture the technical specifications of the coast station/MRCC radio transceiver system, and their connected antennas. Additional copies of the *Radio Equipment* section can be completed using the additional sheets in the survey's Appendix B. **Error! Reference source not found.** summarizes the fields and respective intended use of data gathered.

Table 3 Radio Equipment Section Design

ID	Field	MARS Field	Field Type			Data Use
			Short Answer	Drop-down	Check-box	
Transceiver specifications						
S3-01	Transceiver position**Error! Bookmark not defined.**	✓	✓			to simulate signal coverage, which may be different from the station's location
S3-02	Site elevation above sea level (metres)		✓			
S3-03	Manufacturer		✓			to consult the equipment's technical specifications for verifying the data gathered, obtaining all other data for simulations, and to compare
S3-04	Model number		✓			

[9] Sample job description for a radio operator in Trinidad & Tobago can be found at: https://www.caribbeanjobs.com/Radio-Operator-Temporary-Job-123814.aspx

ID	Field	MARS Field	Field Type			Data Use
			Short Answer	Drop-down	Check-box	
						equipment among the stations surveyed
S3-05	Installation date		✓			to determine the age of the equipment and whether it requires maintenance/upgrades
S3-06	Last inspection		✓			to confirm whether inspection compliance is met. May provide rationale on station performance
S3-07	Frequency band/s	✓			✓	to identify and map the marine band usage, and identify common channels used among stations
S3-08	Generator available?		✓			to determine and estimate station uptime during outages
S3-09	Generator discharge time		✓			to determine the additional service availability during outages, in gauging the system's capabilities during national emergencies
Antenna specifications						
S3-10	Manufacturer		✓			to consult the equipment's technical specifications for verifying the data gathered, obtaining all other data for simulations, and to compare equipment among the stations surveyed
S3-11	Model number		✓			
S3-12	Azimuth		✓			to be used in station identify the direction of signal propagation, in the case of directional antennas

Section 4: Station Operations

This section sets out to capture the channel usage, schedules and information transmitted by stations within the Caribbean. **Error! Reference source not found.** summarizes the fields and respective intended use of data gathered.

Table 4 MRCC & Coast Station Survey Section 4 Design

ID	Field	MARS Field	Field Type			Data Use
			Short Answer	Drop-down	Check-box	
Channel bands, uses & schedules						
S4-01	Channel/frequency		✓			to identify and map the working channels, as well as populate a registry of and map the channel use and transmission schedule for coast stations and MRCCs in the Caribbean
S4-02	Start time		✓			
S4-03	Channel use		✓			
S4-04	Service	✓	✓			
S4-05	Callsign	✓	✓			
S4-06	MMSI	✓	✓			
S4-07	Sel Call	✓	✓			
S4-08	Watch hours	✓	✓			
S4-09	Time zone	✓	✓			
S4-10	Remote name	✓	✓			
S4-11	Emission Class	✓	✓			to identify and map the radio emissions of the coast stations and MRCCs in the Caribbean
S4-12	Frequency Band	✓	✓			to identify and map the marine band usage, and identify common channels used among stations
S4-13	Transmit Power	✓	✓			to be used in coverage simulations
Information sources						
S4-14	Information type		✓			to identify the classifications of data available to coast stations and MRCCs
S4-15	Service	✓	✓			To identify and map the various types of services/stations within the Caribbean
S4-16	Information source		✓			to validate the authenticity of the data received
S4-17	Update period		✓			to determine whether the routine update period is appropriate for the information conveyed
Data Capture and Record Keeping						

ID	Field	MARS Field	Field Type			Data Use
			Short Answer	Drop-down	Check-box	
S4-18	Does your station record all incoming radio traffic?				✓	to identify whether the station complies with SOLAS' regulations for data recording[10]
S4-19	What format is the recorded data stored as?				✓	to identify existing, and recommend best practices for, data storage formats in the Caribbean
S4-20	Is the recorded data shared with other maritime safety agencies?				✓	to identify data sharing practices in the Caribbean, and identify which agencies (national coast guards, regional MRCCs, etc.) are privy to this data
S4-21	If yes, who is the data shared with?		✓			to identify and share best practices for data backup and sharing
S4-22	Are backups made to the data recorded?				✓	
S4-23	If yes, what backup method is used?				✓	
S4-24	If no, are there any future plans for backing up the data?				✓	
S4-25	What data protection and privacy policies, if any, exist for the data that is being recorded?		✓			

10 IMO. 2004. "International Convention for the Safety of Life at Sea". Chapter V: Radiocommunications, Regulation 17: "A record shall be kept to the satisfaction of the Administration and as required by the Radio Regulations, of all incidents connected with the radiocommunication service which appear to be of importance to safety of life at sea."

SECTION 5: POLICY & REGULATORY PROVISIONS

This section sets out to identify the policy and regulatory provisions which facilitate coast station and MRCC operation within the Caribbean. **Error! Reference source not found.** summarizes the fields and respective intended use of data gathered.

Table 5 MRCC & Coast Station Survey Section 5 Design

ID	Field	MARS Field	Field Type			Data Use
			Short Answer	Drop-down	Check-box	
S5-01	Local telecoms regulator	✓	✓			to map the regulators with jurisdiction in the Caribbean
S5-02	What national tax concessions are available to aid in operational costs of stations?		✓			to identify whether tax breaks and/or incentives are available to support the operations of national coast stations and MRCCs
S5-03	What operational tariffs are levied on this station?	✓				to identify the tariffs that are imposed on the station
S5-04	Which marine band plan does your country use?				✓	to identify which common marine band channels are in use within the Caribbean
S5-05	Yearly Marine Band License Cost	✓	✓			to identify the yearly Marine Band License Cost within the Caribbean
S5-06	Currency	✓	✓			to identify the currency of the Marine Band License Cost within the Caribbean
S5-07	What national policies/ regulations exist for maritime search and rescue operations?		✓			to identify the national policies, regulations or procedures to be followed during maritime search and rescue operations. Useful in assessing the validity of these regulations vis-à-vis the countries participating in this survey.
S5-08	Over what period do national regulators specify		✓			to determine how often RF equipment at coast stations should be re-inspected, for each of the surveyed country, and

ID	Field	MARS Field	Field Type			Data Use
			Short Answer	Drop-down	Check-box	
	transceivers should be inspected? (years)					determine whether such a standard exists and is enforced.
S5-09	What is the maximum transmit power, specified by your country's regulator? (dBm)		✓			to identify the regulatory, transmit power limits, and determine, through simulations, whether such a limit will allow coast stations and MRCCs to cover their areas of responsibilities.
S5-10	What national policies and provisions are in place to facilitate joint operations between neighbouring countries during maritime emergencies?		✓			to identify the policies, regulations and procedures for cooperation between neighbouring states within the Caribbean during maritime emergencies, and identify barriers to cross-country collaboration.

PART C: PLANNED OUTPUTS & TEMPLATES

This section details the expected outputs of this survey, and provides sample templates for population using the data gathered. It guides the survey development to only pose questions for which are essential for producing the outputs.

The planned outputs of this survey, originally identified in the "*Intended Data Use*" section, include but are not limited to:

1. A registry of coast stations and MRCCs within the Caribbean
2. A simulated coverage map of coast stations and MRCCs within the Caribbean
3. A registry of channel usage within the marine band, including primary working channels for all coast stations (other than VHF channel 16)
4. Print-ready, wallet-sized call card design with MRCC and coast station contact details by country, for printing and distribution by fisherfolk organizations, ports, etc.
5. An output report, which includes the above artefacts, along with a coverage analysis and recommendations to fill any uncovered gaps based on the responses
6. A policy brief, with recommendations to improve the state of emergency communications provisions offered by existing coast stations and MRCCs within the Caribbean

Each output can be mapped to their respective questions in the survey, as shown in Table 6:

Table 6 Mapping of Survey Inputs to Project Outputs

Output Document	Inputs from Survey (ID)
A registry of coast stations and MRCCs within the Caribbean	S1-01, S1-02, S1-03, S1-04, S1-05 & S1-10
A simulated coverage map of coast stations and MRCCs within the Caribbean	S1-01, S1-03, S1-08, S1-09, S3-01, S3-02, S3-03, S3-06, S3-09, S3-10 & S3-11
A registry of channel usage within the marine band, including primary working channels for all coast stations (other than VHF channel 16)	S1-01, S1-02, S1-03, S1-04, S4-01, S4-02, S4-03, S4-04, S4-05 & S4-06
A policy brief, with recommendations to improve the state of emergency communications provisions offered by existing coast stations and MRCCs within the Caribbean	Likely to draw on *all* outputs
Print-ready, wallet-sized call card design with MRCC and coast station contact details by country, for printing and distribution by fisherfolk organizations, ports, etc.	S1-01, S1-02, S1-03, S1-04, S1-05 & S1-09
An output report, which includes the above artefacts, along with a coverage analysis and recommendations to fill any uncovered gaps based on the responses	Likely to draw on *all* outputs

Sample registries for the coast stations and MRCCs in the Caribbean, as well as their channel use, are presented, as follows.

Registry of Coast Stations and MRCCs within the Caribbean

A registry of coast stations and MRCCs within the Caribbean can be developed, as shown in Table 7, using the responses taken from questions S1-01, S1-02, S1-03, S1-04, S1-05 and S1-10.

Table 7 Registry of Coast Stations & MRCCs within the Caribbean Template

Station Name	CS/ MRCC	Country	Countries of Responsibility	Position		Station Contact Details		
				LAT	LONG	Phone No.	Callsign	MMSI

Station Name	CS/ MRCC	Country	Countries of Responsibility	Position		Station Contact Details		
				LAT	LONG	Phone No.	Callsign	MMSI

REGISTRY OF CHANNEL USAGE WITHIN THE CARIBBEAN'S MARINE BAND

A registry of channel usage within the marine band can be developed, as shown in Table 8, using the responses taken from questions S1-01, S1-02, S1-03, S1-04, S4-01, S4-02, S4-03, S4-04, S4-05 and S4-06.

Table 8 Registry of Channel Usage within the Caribbean's Marine Band

Country	Station Name	Band	Channel/Frequency	Start Time	Channel Use