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SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Title - Sujet HF-DSC/GMDSS SYSTEM	
Solicitation No. - N° de l'invitation F7048-130065/A	**Amendment No. - N° modif.** 004
Client Reference No. - N° de référence du client F7048-130065	**Date** 2014-09-08
GETS Reference No. - N° de référence de SEAG PW-$$QF-103-24561	
File No. - N° de dossier 103qf.F7048-130065	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2014-10-07	**Time Zone** **Fuseau horaire** Eastern Daylight Saving Time EDT
F.O.B. - F.A.B. Specified Herein - Précisé dans les présentes **Plant-Usine:** ☐ **Destination:** ☐ **Other-Autre:** ☑	
Address Enquiries to: - Adresser toutes questions à: Eddy, Kathie	**Buyer Id - Id de l'acheteur** 103qf
Telephone No. - N° de téléphone (819) 956-0768 ( )	**FAX No. - N° de FAX** (819) 956-5650
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Issuing Office - Bureau de distribution

Electronics, Simulators and Defence Systems Div.
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Canada

Solicitation Amendment # 004 is issued to:

1) Respond to the questions # 006 to 011 below from industry:

Question # 006

Please confirm that you indeed need all equipment, systems manuals and diagrams translated into French.

Response # 006

The System Maintenance Manual developed in accordance with Annex A - SOW shall be in both English and French. The accompanying Original Equipment Manufacturer (OEM) manuals and diagrams can be in English only. The System Operations Manual shall be in both French and English.

Question # 007

Please confirm that operator and maintenance training session needs to be conducted in both English and French.

Response # 007

As per Annex A - SOW 4.14.3, training shall be provided in English and French for operational training and in English for maintenance training.

Question # 008

What is the timeframe for contract award?

Response # 008

Canada expects to award the resulting Contract within the bid validty date as per the 2003 (2014-03-01) Standard Instructions - Goods or Services Subsection 05.4 which was amended in Part 2 - Bidder Instructions - Article 1 of the Request for Proposal (RFP).

Question # 009

What is the proposed timeframe for equipment installation?

Response # 009

For bid purposes, the required timeframe for equipment installation is during the non-operational period from 1 January to 30 April, with the equipment to be operational no later than 1 May. In addition, the bidder may propose an alternate installation period for CCG consideration.

Question # 010

Section 4.13.2.1g indicates the CCG will be responsible to “installation of all antenna and transmission lines” Who will be supplying the equipment for this? Is this part of the contractors responsibility or CCG responsibility?

Response # 010

The new antennas have already been installed, are operational and are connected to the existing system. The only Contractor responsibility would be to interface the new transmitter/receiver equipment to the antenna terminations, located inside the transmitter and/or receiver buildings. This would be part of the Contractor’s responsibility under Annex A - SOW 4.13.3.1a.

Question # 011

I would like to repeat my previous request for a better RFQ document. The one that has been submitted is not user friendly or searchable and is too cumbersome to work with. Tables of compliances cannot be copied and pasted to completion. Can you please get a version that is searchable and can be manipulated better for a more accurate response?

Response # 011

A searchable PDF version of the RFP documentation has been included with this Amendment.

All other terms and conditions remain unchanged.

Fisheries and Oceans Canada | Pêches et Océans Canada

Canadian Coast Guard | Garde côtière canadienne

EKME #2469819

HF-DSC/GMDSS System Replacement

F7048-130065

Canadian Coast Guard

Statement of Work

Canada

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Published under the Authority of:

Integrated Technical Services Directorate
Fisheries and Oceans Canada
Canadian Coast Guard
Ottawa, Ontario

K1A 0E6

EKME #2469819
HF-DSC/GMDSS STATEMENT OF WORK

Cat. No. FsXX-XXXX/YYYY
ISBN X-XXX-XXXXX-X

Document template :	English
Print Format:	Double Sided
Last revision:	Sept 01, 2004
Compatibility:	Word 97 & 2002 (XP)

Disponible en français : Remplacement du système ASN/SMDSM énoncé de travail

Printed on recycled paper

Document Control

Record of Amendments

#	Date	Description	Initials
1	02 August 2013	First Release	GF/LHG
2	17 November 2013	Incorporate PWGSC Comments (minor revisions)	GF
3	25 March 2014	Final Version	GF

Approvals

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Technical Authority, Technical Services	Jean Harvey	Approved:	
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Asset Class Manager, Service Delivery	Andrew McGregor	Approved:	
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Table of Contents

INTRODUCTION

1.1 PURPOSE

Canada has a life-cycle management requirement to replace the existing High Frequency-Digital Selective Calling/Global Maritimes Distress and Safety System (HF-DSC/GMDSS) located in the Central and Arctic Region of the Canadian Coast Guard (CCG). The System provides services to mariners in Arctic waters north of 70° latitude. These services include the transmission and receipt of HF-DSC messages for Distress, Urgency and Safety, including Narrow Band Direct Printing (NBDP) and Voice (Single Side Band) communications.

1.2 SCOPE

This Statement of Work (SOW) establishes the overall requirements for the engineering, integration, delivery, installation, testing, commissioning, documentation, spares, and training of the CCG operational and maintenance staff for an HF-DSC/GMDSS System (referred to as the "System" herein) for the Canadian Arctic. It identifies the equipment and services to be provided by the Contractor and the work methodology to be followed during the Contract.

1.3 OPERATIONAL REQUIREMENT

The CCG has provided HF-DSC/GMDSS communication services to the maritime community in Arctic waters north of 70° latitude since the late 1990s, including HF-DSC messages for Distress, Urgency and Safety, Narrow Band Direct Printing (NBDP) and Single Side Band (SSB). The System is operated by the Marine Communications and Traffic Services (MCTS) Centre in Iqaluit, Nunavut, by the CCG's Central and Arctic Region. Due to reach its normal end-of-life, the System is in need of replacement.

The HF-DSC/GMDSS consists of dual workstations at the Iqaluit MCTS Centre, a local transmitter and receiver site (in Iqaluit), and a remote site located at the joint NAV CANADA/Coast Guard receiver site in Resolute Bay, NU.

1.4 APPLICABLE DOCUMENTS

Documents cited in this SOW are listed below. Unless otherwise specified, the issuance or amendment of documents invoked for this Contract ***shall*** be those in effect on the date of contract award.

a) Technical Statement of Requirements (TSOR), HF-DSC/GMDSS System Replacement, EKME document #2469823;

b) ISO 9001:2008/Cor 1:2009, Quality Management Systems – Requirements;

c) ISO/IEC 90003:2004, Guidelines for the Application of ISO 9001:2000 to Computer Software;

d) ISO 10007:2003, Quality Management – Guidelines for Configuration Management;

e) ASME Y14.34-2008, Engineering Drawing and Related Documentation Practices; and

f) CA-014-000-NU-TD-001 Electronic Technical Data Deliverables (supplied by CCG).

1.5 DOCUMENT CONSISTENCY

The Contractor ***should*** bring to the attention of Canada any perceived inconsistencies between the SOW and the documents attached or referenced in this SOW.

2 CONTRACT DELIVERABLES

2.1 PROJECT DELIVERABLES

2.1.1 Equipment

The HF-DSC/GMDSS System ***shall*** be composed of Commercial-off-the-Shelf (COTS) equipment to the maximum extent practical. COTS is defined as: in production and all significant components (i.e. transmitters, antenna switching matrix and receivers) currently in operational use. The Contractor ***shall*** provide and install all equipment, mounting hardware and accessories that comprise the System. This ***shall*** include the following:

a) Quantity 1 – Remote Receiver Site System in Resolute Bay, NU in accordance with the requirements of the TSOR and this SOW;

b) Quantity 1 – Transmitter Site System in Iqaluit, NU in accordance with the requirements of the TSOR and this SOW;

c) Quantity 1 – Receiver Site System in Iqaluit, NU in accordance with the requirements of the TSOR and this SOW; and

d) Quantity 1 – MCTS Centre System in Iqaluit, NU in accordance with the requirements of the TSOR and this SOW.

2.1.2 Spare Parts

The Contractor ***shall*** deliver the spare parts, specialized test equipment, tools, and software as agreed to subsequent to the Spares Provisioning Meeting.

2.1.3 Training

The Contractor ***shall*** provide training courses, and develop and supply training documentation, as elaborated in this SOW.

2.1.4 Documentation

The Contractor ***shall*** provide all project and technical documentation for the System as specified in this SOW. The Contract Data Requirements List (CDRL) table in Appendix C details required documents that ***shall*** contain information as specified in the Data Item Deliverable (DID). The format for each of these required DIDs is included in Appendix B. Guidance on the format or content of any other document deliverables is contained in the body of the SOW.

3 PROJECT MANAGEMENT

The Contractor ***shall*** be responsible for the overall management of the development, design, production, pre-delivery testing, delivery, installation, System set-up, on-site testing, commissioning, training and warranty support, in accordance with the requirements stated in the SOW and the TSOR.

3.1 PROJECT TEAM IDENTIFICATION

3.1.1 Contractor's Team

3.1.1.1 The Contractor ***shall*** identify its own Project Manager (PM) for the project.

3.1.1.2 Any change to the PM ***shall*** require the approval of Canada, and the required qualification and experience submitted for the PM at Bid ***shall*** be maintained.

3.1.2 Use of Sub-Contractors

3.1.2.1 The Contractor ***shall*** ensure that all work conducted by Sub-Contractors complies with all requirements of this document and the TSOR.

3.2 PROJECT REVIEW AND CONTROL

3.2.1 Project Management and Risk Management Plans

3.2.1.1 The Contractor's Project Management Plan (PMP) ***shall*** be developed in accordance with PMBOK® Guide or equivalent practices and include the information contained in DID PM-01 *Project Management Plan*.

3.2.1.2 The Contractor's Risk Management Plan ***shall*** include the information contained in DID PM-03 *Risk Management Plan*. This plan may be a sub-component of the PMP.

3.2.1.3 A preliminary PMP (including the Master Schedule) and Risk Management Plan ***shall*** be submitted with the bidder's proposal.

3.2.1.4 One electronic copy and three printed copies of the final PMP, including the baseline Master Schedule showing the critical path, high-risk items, and the associated Risk Management Plan, ***shall*** be submitted for review and acceptance within two weeks after the Project Kick Off meeting.

3.2.1.5 The Contractor shall manage the Contract in accordance with the approved PMP.

3.2.1.6 In the event that there is substantive concern with the wording of any contractual/project document, the Contractor ***shall*** submit a *Request for Clarification* DID CM-03 to the Contracting Authority (CA).

3.2.2 Not Allocated

3.2.3 Project Review and Meetings

3.2.3.1 The following meetings and reviews ***shall*** be conducted by the Contractor:

a) Project Kick-Off (Chair Contract Authority (CA) and PM);
b) Preliminary Design Review (Chair TA);
c) Critical Design Review (Chair TA);
d) Project Progress Review (Chair CA and PM);
e) Spares Provisioning Meeting (Chair TA and PM);
f) Factory Acceptance Test Readiness Review (Chair TA and PM);
g) Installation Readiness Review (Chair TA): and
h) Final Project Review (Chair CA and PM)

3.2.3.2 Where practical, reviews and meetings will be scheduled to be held in conjunction with a regular Project Progress Review meeting.

3.2.4 Conduct of Meetings

3.2.4.1 The Chair for each review meeting ***shall*** be as described in Section 3.2.3.1. unless otherwise agreed to by both the Contractor and Canada.

3.2.4.2 The Contractor ***shall*** be responsible for the following in preparing for, and conduct of, these reviews and meetings:

a) Host and convene the reviews and meetings at the Contractor's facility unless otherwise agreed by Canada;
b) Prepare the meeting agenda and provide to Canada for approval;
c) Ensure a proper level of participation by Sub-Contractors, suppliers, and subject matter experts;
d) Organize and present briefings as necessary;
e) Provide appropriate facilities and administrative services;
f) Provide test data, design data, and analysis supporting the review;
g) Record, publish, and distribute minutes and action items documented in the reviews and meetings; and
h) Maintain files of records, action item database, and documentation from all reviews and meetings.

3.2.4.3 At the discretion of Canada, certain meetings will be conducted via teleconference. Meetings conducted by teleconference ***shall*** use web hosting capabilities, and ***should*** also utilize video if required to support the intent of the meeting.

3.2.4.4 One electronic copy of the agenda and related documents for these meetings ***shall*** be provided to Canada at least two weeks prior to the meeting, for approval. Canada will approve the agenda prior to the review or meeting;

3.2.4.5 The Contractor ***shall*** record the Minutes of all meetings, highlight action items, and provide both in a document for distribution. The Minutes may be in Contractor format as agreed to by Canada.

3.2.4.6 The Contractor ***shall*** produce the Minutes of the above meetings ten working days after the meeting.

3.2.4.7 The final Minutes and action items ***shall*** require Canada's approval to be declared official.

3.2.4.8 The reviews and meetings may be cancelled at the discretion of Canada. Rescheduling of reviews and meetings by the Contractor ***shall*** be done only with the approval of Canada.

3.2.5 Kick-Off Meeting

3.2.5.1 Within two weeks of Contract Award, the Contractor ***shall*** meet with Canada to:

a) Introduce Canada and Contractor management teams;

b) Review the PMP, including control processes, the project schedule, milestones, and deliverables;

c) Discuss project risks and any other issues that may affect the project or equipment performance or deliverables;

d) Discuss on-site inspections and their timings;

e) Clarify any outstanding questions related to the requirements, Contract and Contractor's proposal; and

f) Discuss any other business.

3.2.6 Preliminary Design Review

3.2.6.1 The Contractor ***shall*** conduct a Preliminary Design Review (PDR) with Canada, in accordance with the approved schedule.

3.2.6.2 Three weeks prior to the PDR, the Contractor ***shall*** supply all final relevant technical data and documentation (the PDR Package) to Canada for approval. The PDR will proceed at the discretion of Canada.

3.2.6.3 The PDR Package, including System Design Documentation, ***shall*** consist of one electronic copy.

3.2.6.4 During the PDR, the Contractor ***shall*** demonstrate its understanding of each requirement and explain how each of the requirements ***shall*** be met.

3.2.6.5 The final version of the PDR package ***shall*** include:

a) Preliminary System Design Documentation Package (PDR Package), which ***shall*** include (*relevant DIDs are in brackets*):

1. Technical description of the System.
2. Equipment block-diagrams (TDM-02).
3. Mechanical and interface drawings and schematics (TDM-02).
4. User interface documentation.
5. Parts lists and component sources, where known.
6. Identification of long lead-time components with schedule and impacts.

b) Preliminary Test Plan (TE-02); and

c) System Maintenance Concept document.

3.2.6.6 Within three weeks after the PDR, the Contractor ***shall*** supply to Canada one electronic copy of the updated PDR Package.

3.2.6.7 Following resolution of any design issues identified during the PDR, Canada will approve, in writing, the PDR. This approval is required before proceeding with the design implementation.

3.2.7 Critical Design Review

3.2.7.1 The Contractor ***shall*** conduct the Critical Design Review (CDR) with Canada when the final design is complete and all relevant documentation has been submitted for approval. The CDR ***shall*** be held in accordance with the approved schedule.

3.2.7.2 During the CDR, the Contractor ***shall*** demonstrate:

a) That the final design of the System under review meets the design requirements established in the TSOR (in matrix format as per example in Acceptance Test Procedures (DID TE-03), with content to be agreed upon prior to CDR by Canada and the Contractor); and

b) That the final design meets the System Reliability and Availability requirements as required by the TSOR and Reliability Data (DID SE-09).

3.2.7.3 Three weeks prior to the CDR, the Contractor ***shall*** supply all relevant final technical data and documentation (CDR Package) to Canada for approval. The CDR will proceed at the discretion of Canada.

3.2.7.4 The CDR Package, including System Design Documentation, ***shall*** consist of one electronic copy.

3.2.7.5 The CDR Package ***shall*** consist of, ***but not be limited to***, the following (*relevant DIDs are in brackets*):

a) Final technical description of System including:

i. Final detailed System and equipment block diagrams (TDM-02);

ii. Production drawings and schematics (TDM-02);

iii. Final Equipment Breakdown Structure (TDM-02);

iv. Final user interface design document; and

v. Initial Equipment Installation Plan & Data Package (TDM-03)

b) System Reliability and Availability report (SE-09);

c) Final Interface specifications;

d) Preliminarily Recommended Spare Parts List (SC-01);

e) Identification of System components with long lead-times with schedule and impacts;

f) Final Test Plan (TE-02);

g) Preliminary System Manuals (TDM-05); and

h) Preliminary Factory Acceptance Test (FAT) and Site Acceptance Test (SAT) Test Procedures (TE-03)

3.2.7.6 Within three weeks of the CDR, the Contractor ***shall*** supply to Canada one electronic copy of the updated CDR Package.

3.2.7.7 Following resolution of any design issues identified during the CDR, Canada will approve, in writing, the CDR. This approval is required before proceeding with the next phase of the work**.**

3.2.8 Project Progress Review

3.2.8.1 The Contractor ***shall*** conduct Project Progress Review (PPR) meetings with Canada's Project Team members.

3.2.8.2 Project Progress Review meetings will be conducted monthly subject to the discretion of Canada.

3.2.8.3 The PPR ***shall*** encompass the complete project status as of the review date. During PPR meetings, the Contractor ***shall*** review the current DID PM-02 *Contractor's Progress and Status Report*. During this review the Contractor ***shall*** also focus on:

a) Variations from planned progress and the corrective action to be taken during the next reporting period;

b) An explanation of foreseeable issues and proposed resolutions, including an assessment of their impact on the contract in terms of scope, schedule, System performance, and risk; and

c) Other business as mutually agreed to by the CCG, CA, and Contractor.

3.2.9 Spares Provisioning Meeting

3.2.9.1 At Canada's discretion, a Spares Provisioning Meeting (SPM) ***shall*** be held. The SPM may be combined with another meeting for efficiency, as mutually agreed to by Canada and the Contractor.

3.2.9.2 Three weeks before the SPM, the Contractor ***shall*** provide to Canada one electronic copy of the final Recommended Spare Parts List (RSPL DID SC-01).

3.2.10 Installation Readiness Review

3.2.10.1 An Installation Readiness Review (IRR) ***shall*** be conducted to ensure that all plans, materials, equipment and resources are ready for the installation.

3.2.10.2 Three weeks prior to this review, the Contractor ***shall*** supply to Canada one electronic copy of all relevant technical data and documentation (IRR Package) for review preparation purposes. This ***shall*** include the Equipment Installation Plan & Data Package (DID TDM-03) and the Training Plan (DID-TT-03).

3.2.10.3 The IRR will be a collaborative effort between the CCG and the Contractor to review the installation plans, responsibilities of each party and provide an opportunity to identify any outstanding items or issues before resources are deployed to the Arctic to begin installation.

3.2.10.4 The timing of the IRR will be mutually agreed to at the CDR.

3.2.11 Final Project Review Meeting

3.2.11.1 The Contractor ***shall*** hold a Final Project Review meeting at a time to be agreed to by Canada and the Contractor.

3.2.11.2 The Final Project Review will confirm that the following are complete:

a) The installation is complete;
b) The SATs are complete and all test results are approved;
c) The SAT Reports are correct and complete and delivered;
d) All documentation and deliverables have been delivered and approved;
e) All outstanding project issues have been dealt with; and
f) All milestones are met including all additional scope.

3.2.12 Additional Progress Review Meetings

3.2.12.1 At Canada's discretion, additional progress review meetings ***shall*** be held to resolve specific issues.

3.2.13 Project Reporting and Communications

3.2.13.1 The Contractor ***shall*** monitor progress and deliver electronic monthly Progress Reports (DID PM-02) to Canada commencing one month after Contract Award until project completion.

3.2.13.2 The Contractor ***shall*** advise Canada, by email, as soon as the Contractor has become aware of problems affecting the project schedule or contract deliverables. Upon such notification, Canada will advise whether a meeting or other action is required.

3.2.13.3 The Contractor ***shall*** maintain a historical, chronological, and up-to-date list of Action Items in accordance with DID PM-02.

4 TESTING

4.1 GENERAL

4.1.1 The FAT and SAT are formal tests which demonstrate to Canada that the Contractor's HF-DSC/GMDSS System is compliant with all requirements included in the TSOR and SOW.

4.1.2 Canada reserves the right to waive the requirement for any test called up by DID TE-02 (Test Plan and Report) or to call up additional tests to demonstrate that the Contractor's HF-DSC/GMDSS System is compliant with the requirements included in the TSOR and SOW.

4.1.1 Canada, at its discretion, shall witness any or all tests including unit and system tests at the facility where the testing is performed.

4.2 TEST PLANS AND PROCEDURES

4.2.1 The Contractor ***shall*** develop an overall Test Plan (DID TE-02 *Test Plan and Report*), which details the methodology for the equipment and system level FAT and SAT.

4.2.2 The Contractor ***shall*** develop Test Procedures for the FAT and SAT (DID TE-03 *Acceptance Test Procedures*). The Test Procedures ***shall*** be designed to demonstrate that the complete System meets or exceeds all requirements of the TSOR and this SOW.

4.2.3 The Test Plan ***shall*** be provided to Canada for review as part of the PDR package (preliminary) and CDR package (final).

4.2.4 The test schedule ***shall*** form part of the Master Schedule.

4.2.5 Two weeks prior to the scheduled test, the Contractor ***shall*** submit to Canada one electronic copy of the final FAT and SAT Test Procedures (DID TE-03). Printed copies of the Test Procedures ***shall*** be supplied to Canada witnesses during tests.

4.2.6 The result of each Test Procedure ***shall*** demonstrate that the HF-DSC/GMDSS System meets the operational and performance requirements as stated in the TSOR and this SOW and will be subject to Canada's approval.

4.3 FAILURES DURING TESTING

4.3.1 The Contractor ***shall*** be responsible for the resolution of all failures observed during all test phases, which include, but are not limited to, equipment repair or re-design necessary to correct the failures and to perform partial or complete System re-test subject to Canada's discretion and approval.

4.4 TEST DIAGNOSTIC ROUTINES

4.4.1 Any local and remote test diagnostic routines useful for trouble-shooting hardware and software problems ***shall*** be provided to Canada.

4.4.2 Diagnostic tests for remote sites ***shall*** be available from the MCTS Centre by remote communication interface, as defined in the TSOR.

4.5 TESTS AT FACTORY

4.5.1 System Verification Tests

4.5.1.1 The equipment ***shall*** be fully pre-tested by the Contractor before the formally witnessed FAT.

4.5.1.2 The Contractor ***shall*** independently perform System verification tests (unit and system integration) to verify that the System and sub-systems meet all technical and operational design parameters and requirements, including the control software and Graphical User Interface.

4.5.1.3 System verification tests ***shall*** be conducted in accordance with the approved FAT Test Procedures (DID TE-03). The timing of these tests will be discussed at the CDR meeting.

4.5.1.4 Upon successful completion of the verification tests, the Contractor ***shall*** provide to Canada one electronic and one printed copy of the System Verification Test Report, signed by the appropriate Contractor Authority. The report ***shall*** include a copy of the completed test sheets (as per example provided in DID TE-03).

4.5.2 Factory Acceptance Test

4.5.2.1 The FAT ***shall*** be conducted for the HF-DSC/GMDSS System at the Contractor's facility. The test setup ***shall*** represent the complete System in operation with the equipment configured to emulate full operational capability.

4.5.2.2 Testing ***shall*** be conducted in accordance with the approved FAT Plan and Procedures.

4.5.2.3 Canada ***shall*** witness the FAT testing and approve the results prior to release for installation.

4.5.2.4 Any test failure ***shall*** be resolved by the Contractor and a re-test performed. Canada reserves the right to request re-start of the full FAT test in the event of test failure.

4.5.2.5 All test results ***shall*** be recorded in the FAT report and certified by the Contractor and Canada as an accurate record of the test results.

4.5.2.6 Five working days after test completion, the Contractor ***shall*** submit to Canada three printed copies, and one electronic copy of the FAT report for final approval and acceptance.

4.5.3 Post-Factory Acceptance Test Review

Following the Factory Acceptance Test (FAT), a review ***shall*** be held to ensure that any issues identified during the FAT are clearly defined and that any remedial activities required are clearly defined and agreed to by Canada. This may include a complete repeat of the FAT, a repeat of specific tests within the FAT, or certification by other means that the System is compliant with all requirements of the FAT.

4.6 TESTS AT SITE

4.6.1 Site Acceptance Test

4.6.1.1 The Contractor ***shall*** perform the following Site Acceptance Tests:

a) Iqaluit, NU HF-DSC/GMDSS System at the MCTS Centre;

b) Iqaluit, NU Transmitter Site;

c) Iqaluit, NU Receiver Site; and

d) Resolute Bay, NU Remote Receiver Site.

4.6.1.2 On completion of pre-SAT testing as required, the Contractor ***shall*** confirm readiness for SAT to Canada in writing.

4.6.1.3 The System SAT at the Iqaluit MCTS Centre ***shall*** include integrated system-level acceptance testing involving the Resolute and Iqaluit receiver sites.

4.6.1.4 Canada ***shall*** witness all SAT tests.

4.6.1.5 Prior to the System SAT, the System ***shall*** undergo burn-in[1] on site for 48 hours, with the last 18 hours failure-free. Failure to pass the burn-in ***shall*** require correction of the fault and a repeat of the 48 hour burn-in at the discretion of Canada.

4.6.1.6 Testing ***shall*** be conducted in accordance with the approved SAT Plan and Procedures.

4.6.1.7 Any test failure ***shall*** be resolved by the Contractor and a re-test performed. Canada reserves the right to request re-start of the full SAT test in the event of a test failure.

4.6.1.8 All test results ***shall*** be recorded in the SAT report and certified by the Contractor and Canada as an accurate record of the test results.

4.6.1.9 Ten working days after the completion of the test, the Contractor ***shall*** provide to Canada three printed copies and one electronic copy of the SAT report for final approval and acceptance.

[1] System continuously running in a nominal profile with periodic transmissions.

4.6.2 System Commissioning Test

4.6.2.1 The Contractor ***shall*** assist the CCG with the following:

a) Verification of Voltage Standing Wave Ratio (VSWR) is within acceptable limits;

b) Testing of transmission and reception at predicted coverage limits using all Modes of Operation.

Note that the Contractor's responsibility in terms of coverage is limited to the specified transmitter power and receiver sensitivity at the termination of the antenna cable within the building. The Contractor **is not** responsible for the system coverage. The CCG will provide test vessels and/or test sites for the purposes of coverage range testing. Availability of vessels will depend on operational responsibilities. The Contractor ***shall*** provide portable Digital Selective Calling equipped transceivers for purposes of System Testing at Canada's discretion.

4.7 SUPPORT AND MAINTAINABILITY

4.7.1 The CCG will maintain the HF-DSC/GMDSS to be operational for a period of at least 15 years.

4.7.2 The CCG will use a combination of on-hand spares and 3rd Line (factory) repairs or replacement.

4.7.3 The Contractor ***shall*** notify the CCG one year prior to discontinuing supply or support of the HF-DSCGMDSS System components to allow the CCG to purchase sufficient spares as determined by the CCG.

4.7.4 It is intended that the CCG will support the System as follows:

a) Preventive maintenance will consist primarily of local and remote performance monitoring from MCTS Iqaluit of key System parameters with a minimal requirement for on-site time-based maintenance; and

b) Restoration of out-of-tolerance sub-systems to within tolerance conditions will be primarily by adjustment and/or replacement of modules, major components or equipment.

4.7.5 The CCG uses the following Lines of Support:

a) Repair at the operational level (1st Line) will be performed by the CCG maintenance staff and limited to replacement of the Lowest Replaceable Unit (LRU)[2], a failed sub-assembly or cable;

b) The CCG Depot (2nd Line) repair will be limited to replacement of a failed sub-assembly or cable with a spare unit where such repairs can be accomplished in a cost-effective manner;

c) All repairs performed by the CCG staff ***should*** be accomplished using plug-in/modular assemblies and parts using common tools; and

d) Factory (3rd/4th Line) repair will be handled by the Contractor.

4.8 WARRANTY SUPPORT

4.8.1 RSPL Replenishment

Canada will allow the Contractor to use items held in the RSPL that are required for system maintenance. Replacement parts used during the warranty period ***shall*** be consumed from the RSPL and replenished thereto.

4.9 IN-SERVICE CONTRACTOR SUPPORT

4.9.1 In-Service Support Plan

The Contractor shall describe its planned approach for providing In-Service Support. The In-Service Support work activities shall include all work not covered by the warranty as well as the support required after the warranty has expired. This plan shall address the following:

a) The internal process for repair or replacement of failed units, sub-units, or system components;

b) The provision of software and firmware upgrades as they become available;

c) The turnaround time to repair or replace and ship to the CCG, any module or equipment sent to the Contractor by the CCG; and

d) Provision of a failure report as described in the warranty provisions of the Contract.

[2] LRU is defined as a modular component or sub-assembly that is designed to be replaced quickly at an operating location.

4.10 INSTALLATION

4.10.1 Site Inspection Visits

4.10.1.1 The Contractor ***shall*** conduct on-site inspections of the Iqaluit MCTS Centre, and the Iqaluit transmitter and receiver sites, to gather site-specific information necessary to prepare the Installation Plan and drawings.

4.10.1.2 The CCG will provide pictures, drawings, and schematics for the Resolute Bay receiver site in sufficient detail to enable the preparation of the Installation Plan and drawings for that site.

4.10.1.3 To arrange these site visits and any other liaison pertaining to System installation, the Contractor ***shall*** consult with the CCG PM.

4.10.1.4 The CCG will provide knowledgeable on-site representatives for site visits and will provide access to all appropriate operations and equipment areas.

4.11 INSTALLATION PLAN

4.11.1 The Contractor ***shall*** provide to Canada three printed copies and one electronic copy of the preliminary *Drawings and Associated Lists* (DID TDM-02) and *Equipment Installation Plan & Data Package* Installation Plan (DID TDM-03) as part of the CDR package.

4.11.2 The Contractor ***shall*** update the Installation Plan as required, including the appropriate drawings, and submit the final plan to the CCG three weeks before the IRR.

4.12 SITE ACCESS {TC \N "6.3.1 SITE ACCESS"}

4.12.1 {PRIVATE }{PRIVATE }The Contractor's personnel will be permitted access to the sites on a 24-hours per day, seven-days per week (24/7) basis.

4.12.2 {PRIVATE }The Contractor ***shall*** advise the CCG Project Manager of the expected working hours of its personnel and all Sub-Contractors before commencing on-site work.

4.12.3 It is the CCG's responsibility to arrange for the Contractor to have on-site access and to escort the Contractor's personnel at all times.

4.12.4 The CCG will provide adequate work space for work benches, tools, and equipment storage. The Contractor ***shall*** be responsible for maintaining these designated areas in a clean and orderly fashion.

4.12.5 The Contractor ***shall***:

a) Not disturb any habitat or sensitive ecology on-site; and

b) Remain at all times on established pathways, walking areas, driving, and parking areas.

4.13 INSTALLATION RESPONSIBILITIES {TC \N "6.3.3 INSTALLATION RESPONSIBILITIES"}

4.13.1 Installation Support

The CCG will make available a minimum of two, and a maximum of four, experienced field technicians to support the installation activities. This will allow the CCG to gain experience with the new System and provide continuity to the installation process, as the CCG Technicians are experienced with the existing facilities, equipment, and Arctic work conditions.

The Contractor ***shall*** maintain control and overall responsibility of the Installation activities.

Typical activities that the CCG personnel could be tasked with are:

- Wire termination at government-furnished equipment;
- Assistance with getting local contracted work done by providing local contractor contact information;
- Assistance with physical installations, excluding heavy lifting;
- Assistance with equipment interconnections;
- Assistance with power-up and checkout; and
- Performing miscellaneous installations tasks, as required.

The actual number of the CCG-provided resources will be determined after Contract Award and before the IRR by mutual agreement.

4.13.2 Canadian Coast Guard Responsibilities

4.13.2.1 {PRIVATE }{PRIVATE }The CCG will be responsible for:

a) Pre-installation access to sites and/or floor plan and equipment room drawings, as applicable;

b) Site access, servicing, fences, equipment storage;

c) Installation-ready buildings complete with cable ducting, troughs and conduit, primary power and distribution wiring, heating, ventilation and lighting;

d) Providing and installing junction boxes and inter-bay armoured power cabling;

e) MCTS Officer console space and furniture at the Iqaluit MCTS Centre;

f) Electrical, space, and ventilation requirements for all MCTS Officer console-mounted equipment;

g) Installation of all antennas and transmission lines;

h) Providing a dummy load capable of withstanding a continuous 5 kW load and a VSWR of 1.2:1;

i) Providing two RF modems for the satellite link;

j) Connecting the System to government-furnished equipment;

k) Assisting with the installation for training purposes; and

l) Disassembly and removal of old equipment.

4.13.3 {PRIVATE }Contractor Responsibilities

4.13.3.1 {PRIVATE }The Contractor ***shall*** be responsible for:

a) On-site installation of all Contractor-supplied equipment and all associated mechanical and electrical installation. including auxiliary rack support and interior cable trays;

b) Providing mounting hardware and fittings and installing all rack-mounted equipment, including fitting of blank panels in unused space;

c) Providing any special tools and test equipment;

d) Conducting site clean-up prior to System integration and on-site testing;

e) Providing final "as-built" drawings prior to the SAT; and

f) Providing any unspecified item required for the complete System.

4.14 TRAINING

4.14.1 {PRIVATE }The Contractor ***shall*** prepare training materials and courseware that identify all necessary data and procedures in sufficient detail for normal operation and maintenance of the System in accordance with DID TT-03 *Training Manuals*.

4.14.2 The Contractor ***shall*** provide separate courses as follows:

a) An Operational Training Course(s), including training materials; and

b) A Maintenance Training Course(s), including training materials.

4.14.3 {PRIVATE }Training ***shall*** be provided in English and French for operational training and in English for maintenance training.

4.14.4 Canada reserves the right to copy and use this material to conduct subsequent training.

4.14.5 Training Plan

4.14.5.1 {PRIVATE }The Training Plan ***shall*** include the following:

a) A detailed description of the training requirements, objectives and approach;

b) Complete course outlines for both the Operational and Maintenance courses, indicating the information to be provided during the courses; and

c) A list of any operational or test equipment required to conduct the training.

4.14.5.2 Three weeks prior to the IRR, the Contractor ***shall*** provide to Canada the draft {PRIVATE }Training Plan, including drafts of the training courseware and instructor package in accordance with requirements of DID TT-03. The Plan will be reviewed at the IRR.

4.14.5.3 Two weeks after the IRR, the Contractor ***shall*** provide to Canada one electronic copy of the final Training Plan.

4.14.5.4 Following approval by Canada of the Training Plan, the Contractor ***shall*** also:

a) Develop the final training courseware and instructor package in accordance with requirements of DID TT-03;

b) Supply two instructor packages for each of the Operational and Maintenance training courses;

c) Supply one student package for each student, plus one spare, for each of the Operational and Maintenance training courses; and

d) Supply all training courseware and all supporting documentation in bound printed and electronic formats two weeks prior to training.

4.14.6 Maintenance Training Requirements

4.14.6.1 {PRIVATE }Maintenance training ***shall*** be in sufficient detail (in accordance with DID TT-03) so as to enable the CCG technicians to efficiently and knowledgeably diagnose, repair, and maintain the System in an operational environment.

4.14.6.2 {PRIVATE }Maintenance courseware ***shall*** include hands-on, practical training on fully functional equipment. The use of computer-based training to allow technicians to undertake self-training is also desirable.

4.14.6.3 Maintenance training ***shall*** include details to permit maintenance to the lowest replaceable assembly of the System consistent with the maintenance plans contained in DID TDM-05 *System Manuals*.

4.14.6.4 Three weeks prior to the IRR, the Contractor ***shall*** provide to Canada one electronic copy of the draft Maintenance Training courseware. The courseware will be reviewed at the IRR.

4.14.6.5 Three weeks after the IRR, the Contractor ***shall*** provide to Canada one electronic copy and one printed copy of {PRIVATE }the finalized courseware.

4.14.6.6 Two courses ***shall*** be scheduled, one pre-season and one post-season. The pre-season is defined as prior to June 10 and post-season is after November 15. Each course will have three to four students. The students will have a technical background and will have knowledge of transmitter and receiver fundamentals and repair.

4.14.6.7 The maintenance training ***shall*** be scheduled during normal business hours (8 a.m. to 5 p.m.) with a maximum of six hours of class time per day, seven days per week.

4.14.6.8 The maintenance training course will be held in Iqaluit. The first course could be coincident with the System installation and the second will be held in Iqaluit post-season. (The bidder may also propose alternative locations for training as an option).

4.14.7 Operational Training Requirements

4.14.7.1 Operational training ***shall*** be in sufficient detail (in accordance with DID TT-03) so as to enable the MCTS Officer to efficiently and knowledgeably use the System in an operational environment. The use of computer-based training to allow operators to undertake self-training is also desirable.

4.14.7.2 Three weeks prior to the IRR, the Contractor ***shall*** provide to Canada one electronic copy of the draft Operational Training courseware. The courseware will be reviewed at the IRR.

4.14.7.3 Three weeks after the IRR, the Contractor ***shall*** provide to Canada one electronic copy and one printed copy of {PRIVATE }the finalized courseware.

4.14.7.4 Operator training ***shall*** consist of two courses scheduled pre-season and conducted serially. Each course will have three to five students.

4.14.7.5 The operational training courses ***shall*** be conducted at the Iqaluit MCTS Centre during normal business hours (8 a.m. to 5 p.m.) with a maximum of six hours of class time per day, seven days per week.

4.14.7.6 Operational training will be conducted on the actual equipment following successful SATs.

4.15 TECHNICAL PUBLICATIONS

4.15.1 The Contractor ***shall*** produce System Operations and System Maintenance Manuals in both French and English in accordance with DID TDM-05 *System Manuals*.

4.15.2 System Operations Manual

4.15.2.1 The System Operations Manual ***shall*** provide a complete description of the System from an operational point of view, provide a basic description of the functions of each sub-system, and identify and describe the controls that are used to control the operation in accordance with DID TDM-05.

4.15.3 System Maintenance Manual

4.15.3.1 The System Maintenance Manual ***shall*** provide a complete description of the System from the technical point of view as well as a description of the functions of each sub-system, and the hardware and software that are part of each sub-system, in accordance with DID TDM-05. This manual ***shall*** cover preventive and corrective maintenance instructions.

4.15.4 Submission of Manuals

4.15.4.1 Three weeks prior to the IRR, the Contractor ***shall*** provide to Canada one electronic copy of the final System Operational and System Maintenance Manuals.

4.15.4.2 The documentation will be reviewed and agreed to at the IRR.

4.15.5 Software Documentation

4.15.5.1 The Contractor ***shall*** provide documentation on the operational software and firmware used in the System including instructions for upgrading or installing patches should this be necessary. This documentation may be incorporated into the Operational and Maintenance Manuals, as appropriate.

4.15.6 Asset Management System

4.15.6.1 The Asset Management System (AMS) has been implemented in the CCG. The AMS provides users with a tool to plan, execute, track, and analyze activities such as procurement, preventive and corrective maintenance, inventory, and maintenance history, etc. The AMS also provides access to an electronic documentation system including technical manuals, diagrams and schematics, system documentation, and maintenance service agreements. For data entry purposes, the Contractor ***shall*** supply all required information in accordance with the following:

a) Data down to the smallest removable sub-assembly level (LRU);

b) Data ***shall be*** submitted in electronic format (Microsoft Excel®);

c) Data supplied ***shall*** follow the conventions and standards for descriptions of AMS; and

e) The contents of the data submission ***shall*** be discussed during an early Progress Project Review meeting.

4.15.6.2 An electronic copy of Microsoft Excel® template file will be provided to the Contractor during the early Project Review meeting. The Excel file ***shall*** be completed and populated by the Contractor and returned to Canada.

4.16 CONFIGURATION MANAGEMENT

4.16.1 The Contractor ***shall*** propose, as part of the PMP, a configuration management approach commensurate with the scope and complexity of this project.

4.16.2 The Contractor's approach ***shall*** be consistent with guidance provided in the Document and Data Control provisions of ISO 9001 and ISO 10007:2003, Quality Management – Guidelines for Configuration Management.

4.16.3 Document revisions shall be controlled as per the instructions at Appendix B.1.5.

5 QUALITY ASSURANCE PROVISIONS

5.1 The Contractor ***shall*** propose, as part of the PMP, a Quality Assurance / Quality Control approach commensurate with the scope and complexity of this project.

5.2 The Contractor's Quality Assurance / Quality Control Program for:

a) Hardware Quality Assurance ***should*** adhere to ISO 9001; and

b) Software Quality Assurance ***should*** adhere to ISO 9000-3.

APPENDIX A LIST OF ACRONYMS

AMS	Asset Management System
CA	Contract Authority
CCG	Canadian Coast Guard
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CD-ROM	Compact Diskette, Read Only Memory
COTS	Commercial-off-the-shelf
DID	Data Item Deliverable
FAT	Factory Acceptance Test
GMDSS	Global Maritime Distress and Safety System
HF-DSC	High Frequency-Digital Selective Calling
IRR	Installation Readiness Review
LRU	Lowest Replaceable Unit
MCTS	Marine Communications and Traffic Services
MPPR	Monthly Project Progress Review
NBDP	Narrow Band Direct Printing
NU	Nunavut
OEM	Original Equipment Manufacturer
PDF	Portable Document Format
PDR	Preliminary Design Review
PM	Project Manager
PMBOK®	Project Management Body of Knowledge Guide
PMP	Project Management Plan
RMA	Return Material Authorization
RSPL	Recommended Spare Parts List
SAT	Site Acceptance Test
SOW	Statement of Work
SPM	Spares Provisioning Meeting
SSB	Single Side Band (J3E modulation mode)

DO NOT MODIFY

TA	Technical Authority
VSWR	Voltage Standing Wave Ratio
WBS	Work Breakdown Structure

DO NOT MODIFY

APPENDIX B DOCUMENTATION REQUIREMENTS

A.1 GENERAL REQUIREMENTS

As a minimum, all documents delivered in electronic form by the Contractor ***shall*** be in accordance with Table B-1, unless otherwise agreed by Canada. Manuals (other than Original Equipment Manufacturer (OEM) manuals) and training material that are intended to be used during the in-service phase, ***shall*** be delivered both as a reproducible hard copy and in an electronic format that allows updates by Canada (that is, not as a locked portable document format (PDF) file). OEM manuals that are not available in electronic format ***shall*** be delivered in reproducible hard copies.

Type	Application / Reader	File Ext
Project-produced Text Documents	MS Word	.docx
Project-produced Presentations	MS PowerPoint	.pptx
Project-produced Manuals	MS Word, Adobe Reader[3]	.docx, .pdf
Project-produced Spreadsheets	MS Excel	.xls
Project-produced Work Networks and Schedules	MS Project 2010	.msp
Project Databases	MS Access	.mdb
Drawings	AutoCAD v13, Adobe Reader	.dwg, .pdf

Table B-1 – Document Electronic Formats

A.1.1 Quality of Documents

For existing documentation to be acceptable to Canada, it ***shall*** be of commercial printing standard of quality for reproducibility. Canada reserves the right to require the Contractor to upgrade any existing documentation which is inadequate for Canada's use. It is preferred that any manual upgrades be integrated into the manual; however, the upgrades may take the form of manual addenda.

A.1.2 Language

All project documentation ***shall*** be provided in English. Direction regarding French submissions of DIDs is provided in the CDRL at Appendix C.

[3] Pdf text must be in native format (i.e. not scanned) with the exception of text embedded in images.

A.1.3 Data Rights

The Contractor ***shall*** provide data rights, including the right to make copies for all manuals, drawings, software documentation, and training material required to support operations, maintenance, and training during the System's in-service phase. The Contractor ***shall*** also mark proprietary technical documents and drawings to clearly identify any proprietary rights. Copy protection ***shall*** not be used on electronic files. Canada reserves the right to be able to amend and/or update documents, as required.

A.1.4 Format

All drawings ***shall*** be produced with AutoCAD with a file format and version in accordance with *Table B-1 – Document Electronic Formats*.

A.1.5 Revision Control

Once approved, all submitted documents are to be considered baselined and ***shall*** be maintained under strict revision control. Revisions to approved documents ***shall*** be approved by Canada in writing, and a Change Request ***shall*** be used for any significant revisions.

APPENDIX C CONTRACT DATA REQUIREMENTS LIST AND DATA ITEM DELIVERABLES

Contractor (after contract award):	**RFP/Contract:**	**Original/Amendment:** Original
CCG Project / Technical Authority:	**Asset:**	**Dated:**

DID #	Title	SOW Ref.	How Often	Lang	Submissions		R or I	Remarks
					Initial	Later		
Project Management								
PM-01	Project Management Plan	3.2.1	Twice + updates	Eng	With bid	Kick-Off + 2 weeks	R	Maintained on ongoing basis
PM-02	Contractor Progress and Status Report	3.2.8.3 3.2.13.1 3.2.13.3	M	Eng			I	Submitted two days prior to Monthly Project Progress Review meeting
PM-03	Risk Management Plan	3.2.1.2	Twice + updates	Eng	With bid	Kick-Off + 2 weeks	R	Maintained on ongoing basis
Technical Data Management								
TDM-02	Drawings and Associated Lists	3.2.6.5 3.2.7.5 4.11.1	See remarks	Eng	PDR -3 weeks	CDR -3 weeks, IRR -3 weeks	R	Successive submissions ***shall*** document the: • preliminary design; • critical design; • as fitted configuration.

TDM-03	Equipment Installation Plan & Data Package	3.2.7.5 3.2.10.2 4.11.1	Twice	Eng	CDR -3 weeks	IRR -3 weeks	R	A data package is required for each different equipment installation.
TDM-05	System Manuals	3.2.7.5 4.14.6.3 4.15.1 4.15.2	Twice	B	CDR -3 weeks	IRR -3 weeks	R	Only the final submission ***shall*** be in both English and French.
Configuration Management								
CM-03	Request for Clarification	3.2.1.6	AR	Eng			R	
Engineering								
SE-09	Reliability Data	3.2.7.2 3.2.7.5	Once	Eng	CDR -3 weeks		R	Data set for each equipment
Test and Evaluation								
TE-02	Test Plan and Report	3.2.6.5 3.2.7.5 4.1.2 4.2.1	Twice	Eng	PDR -3 weeks,	CDR -3 weeks	R	In accordance with 4.5.2.5 and 4.6.1.9, Test Report is due Test +10 days
TE-03	Acceptance Test Procedures	3.2.7.2 3.2.7.5 4.2.2 4.2.5 4.5.1.3 4.5.1.4	Twice	Eng	CDR – 3 weeks	Test -2 weeks	I	
Supply Chain Management								
SC-01	Recommended Spare Parts List	3.2.7.5 3.2.9.2	Twice	Eng	CDR -3 weeks		R	

					SPM -2 weeks			
Training								
TT-03	Training Manuals	3.2.10.2 4.14 4.14.1 4.14.5.2 4.14.5.4 4.14.6.1 4.14.7.1	Twice	B*	IRR -3 weeks	Training - 2 weeks	R	*Only the final submission of the *Operational Training manual* ***shall*** be in both English and French.
Nil	Training Plan	4.14.2	Twice	B*	IRR -3 weeks	IRR + 2 weeks	R	*Contractor format IAW 4.14.2 – no associated DID
Maintenance								
Nil	Maintenance Concept	3.2.6.5, 4.7	Once	B*	PDR -3 weeks		R	*Contractor format IAW 4.7 – no associated DID

A = Annually	CA = Contract Award	P/C = Start of Production/Construction
AR = As Required	CDR = Critical Design Review	PDR = Preliminary Design Review
B = Final version ***shall*** be provided in both English and French language	I = Submitted for Information	Q = Quarterly
	IRR = Installation Readiness Review	R = Review and Acceptance Required
Eng / Fre = English only or French only	M = Monthly	S = Semi-annually
Lang. = Language	**Note:** Frequency requirements do not include post-meeting revision requirements.	

NOTE: Submission requirements in this table do not include the revised submissions that may be required after submissions have been reviewed.

PM-01 PROJECT MANAGEMENT PLAN

DATA ITEM DESCRIPTION	
1. TITLE Project Management Plan	**2. IDENTIFICATION NUMBER** PM-01
3. PURPOSE To describe the Contractor's project management methods and resources in accordance with PMBOK® Guide practices (or equivalent). This DID is to be used in conjunction with DIDs PM-02 and PM-03.	
4. DATA PREPARATION INSTRUCTIONS **4.1** This DID is not meant to be restrictive, and may be tailored by the Contractor. **4.2** The resulting document may be prepared in the Contractor's format and ***shall*** contain sufficient detail to fully address the information requirements herein. **4.3** The Project Management Plan ***shall*** include the following information ***as a minimum***: **4.3.1 Introduction**, including purpose, scope, references, definitions, acronyms, and plan update process. **4.3.1.2** List of project deliverables **4.3.2 Project Organization** **4.3.2.1** Project Manager **4.3.2.2** Team Organization Chart, along with roles and responsibilities **4.3.2.3** Coordination, with the CCG Project Authority and PWGSC CA (ensuring an effective working relationship) **4.3.2.4** Project Sub-Contract Management Plan **4.3.3 Work Plan** **4.3.3.1** Work Breakdown Structure (WBS) **4.3.3.2** Master Schedule, including milestones and summary level modified Gantt chart, with all task dependencies **Note:** Once the baseline schedule is submitted it ***shall*** be retained intact with all subsequent amendments sequentially numbered **4.3.4 Project Control Methods** **4.3.4.1** Scope Control **4.3.4.2** Integrated Change Control	

DATA ITEM DESCRIPTION	
1. TITLE Project Management Plan	**2. IDENTIFICATION NUMBER** PM-01
4.3.4.3 Work Progress Monitoring and Control **4.3.4.4** Schedule Control **4.3.4.5** Quality Management, including description of Integration and Test Plan **4.3.4.6** Risk Management Plan (in accordance with DID PM-03) **4.3.4.7** Project Document Control **4.3.5 Issue Management**, including escalation process (See DID PM-02) **4.3.6 Project Close Out** **4.3.6.1** Final Project Review	

PM-02 CONTRACTOR PROGRESS AND STATUS REPORT

DATA ITEM DESCRIPTION	
1. TITLE Contractor Progress and Status Report	**2. IDENTIFICATION NUMBER** PM-02

3. PURPOSE

To evaluate progress and remain cognizant of the project's status. This report ***shall*** be used as an input to regular Project Progress Review meetings.

4. DATA PREPARATION INSTRUCTIONS

4.1 This DID is not meant to be restrictive and, with prior written agreement from Canada, may be tailored by the Contractor.

4.2 The resulting document may be prepared in a format acceptable to Canada and ***shall*** contain sufficient detail to fully address the information requirements. Any parts that are not relevant to the current reporting period may be left blank.

4.3 The report ***shall*** include the following information:

4.3.1 Report Identification

4.3.1.1 Report title, sequence number, date, Contractor

4.3.2 Project Status

4.3.2.1 Period covered

4.3.2.2 Status with respect to schedule

4.3.2.3 Significant events during the reporting period

4.3.2.4 Reporting period Project Risk Update (attach current Risk Matrix)

4.3.3 Project Changes

4.3.3.1 Changes (if any) in project scope (since the previous report)

4.3.3.2 Authorized changes (if any) to agreed schedule, technical objectives or deliverables

4.3.3.3 Significant changes (if any) to the Contractor's organization or method of operation

Note: Change Requests and status ***shall*** be tracked in the Issue Log/Action Items List

4.3.4 Planned Next Period Activities

4.3.4.1 Plans for activities during the following period (review Master Schedule)

Note: If the Master Schedule has been amended since last report it ***shall*** be attached to this report

DATA ITEM DESCRIPTION	
1. TITLE Contractor Progress and Status Report	**2. IDENTIFICATION NUMBER** PM-02
4.3.5 Issue Log/Action Items List (Spreadsheet) **4.3.5.1** Significant problems encountered, including recommendations (if any) for CCG action **4.3.5.2** Status of previously identified problems (not previously reported resolved) **4.3.5.3** Any other action items arising from reviews, meetings, or correspondence between Canada and the Contractor **4.3.5.4** Change Request Tracking **Note:** This list ***shall*** retain any closed items as an ongoing historical record. Action responsibility and due date are to be included as appropriate	

PM-03 RISK MANAGEMENT PLAN

DATA ITEM DESCRIPTION	
1. TITLE Risk Management Plan	**2. IDENTIFICATION NUMBER** PM-03

3. PURPOSE

To establish a risk management methodology, organizational responsibility, and reporting requirements in accordance with PMBOK® Guide practices. This plan may be incorporated into DID PM-01 *Project Management Plan.*

4. DATA PREPARATION INSTRUCTIONS

4.1 This DID is not meant to be restrictive, and may be tailored by the Contractor.

4.2 The resulting document may be prepared in the Contractor's format and ***shall*** contain sufficient detail to fully address the information requirements.

4.3 The report ***shall*** include the following information:

4.3.1 **Introduction**, including purpose, scope, related plans, references, definitions, acronyms, and plan update process.

4.3.2 **Risk Management Policy**

4.3.2.1 Overall Approach to Risk Management

4.3.3 **Organizational Responsibility**

4.3.3.1 Risk Management Responsibilities

4.3.3.2 Risk Management Meetings

4.3.4 **Scheduled Milestones and Reviews**

4.3.4.1 Project Review Meetings, including Risk Management

4.3.4.2 Technical Reviews and Audits, including Risk Management

4.3.5 **Risk Management System**

4.3.5.1 Risk Register

4.3.6 **Risk Management Process**

4.3.6.1 Risk Identification, including number and description.

4.3.6.2 Risk Analysis, including domain, impact/severity, probability, timeframe, and priority

4.3.6.3 Risk Mitigation Plan, including risk "owner"

4.3.6.4 Risk Tracking, including reporting back date and risk status

DATA ITEM DESCRIPTION	
1. TITLE Risk Management Plan	**2. IDENTIFICATION NUMBER** PM-03
4.3.6.5 Risk Resolution/Control **4.3.6.6** Risk Communication **4.3.7 Risk Mitigation Matrix (Note: to be appended to DID PM-02)** **4.3.7.1** Management Risks **4.3.7.2** Technical Risks **4.3.7.3** Schedule Risks **4.3.7.4** Cost Risks **4.3.7.5** Logistic Support Risks	

TDM-02 DRAWINGS AND ASSOCIATED LISTS

DATA ITEM DESCRIPTION	
1. TITLE Drawings and Associated Lists	**2. IDENTIFICATION NUMBER** TDM-02
3. PURPOSE To prescribe the format, content and requirements relating to preparation and submission of Drawings and Associated Lists.	
4. DATA PREPARATION INSTRUCTIONS **4.1** Drawings and associated lists ***shall*** be compliant with the CCG Specification for Electronic Technical Data Deliverables[4], Chapter 2. This Chapter prescribes: • Raster Format • Vector Format • Folder and File Names • Metadata • Medium of Delivery • Data Rights (Unlimited and Limited) **4.2** A family tree or equipment block diagram drawing ***shall*** be provided that depicts, in a top-down breakdown block diagram, the parent–child relationships of the items in the drawing package. **4.3** Equipment drawings ***shall*** include, ***but not be limited to***, the following: • Mechanical drawings • Equipment rack layouts • Signal and connection block diagrams • Schematic drawings, except as otherwise included in the equipment technical manuals • Cable layouts • Assembly drawings • System interconnection diagrams • Wire lists **4.4** Parts Lists / Bills of Material ***shall*** be provided in accordance with ASME Y14.34M-2008. **4.5** The drawing package ***shall*** provide full design disclosure and ***shall*** include the drawing types as prescribed in the attached Drawing Types List example below. **4.6** Floor plan (may be marked up copies of the CCG-supplied floor	

[4] Note. Reference (CA-014-000-NU-TD-001).

plan).

Drawing Types List

Item Description	Preliminary Design	Detailed Design	Final Design	As Fitted
-- to be completed for the particular acquisition --	- adapt columns as necessary			
Example:				
General Arrangement – Including floor plan and rack location	X	X	X	X

TDM-03 EQUIPMENT INSTALLATION PLAN & DATA PACKAGE

DATA ITEM DESCRIPTION	
1. TITLE Equipment Installation Data Package	**2. IDENTIFICATION NUMBER** TDM-03

3. PURPOSE

To provide sufficient data to enable proper planning and installation of equipment at Iqaluit MCTS, Iqaluit RX/TX sites and the Resolute Bay RX Site. Information provided in this DID ***shall*** be in accordance with the TSOR.

4. DATA PREPARATION INSTRUCTIONS

4.1 This DID is not meant to be restrictive and, with prior written agreement from Canada , may be tailored by the Contractor.

4.2 The submission may be prepared in the Contractor's format, and ***shall*** contain sufficient detail to fully address the information requirements.

4.3 The Installation Plan ***shall*** include, *as a minimum*, the following**:**

4.3.1 Overall work plan and method of procedure;

4.3.2 Installation tasks and schedule;

4.3.3 Identification of special requirements needed from the CCG;

4.3.4 The agreed responsibility assignment matrix relating to use of CCG personnel; and

4.3.5 Equipment transport and travel logistics to all sites.

4.4 The Equipment Installation Data Package ***shall*** include the following:

4.4.1 **Equipment Identification**, including nomenclature, make, and model

4.4.2 **Purpose of the equipment**

4.4.3 **Equipment dimensions**, including length, width, and height (metric)

4.4.4 **Equipment weight** in kilograms

4.4.5 **Utility specifications**

- Power requirements including size and type of cabling, fusing and distribution, voltage requirements and tolerances

4.4.6 **Mounting specifications and requirements**

- Floor plan and rack locations;
- Placement limitations between sub-systems;
- Physical description of all equipment including mounting details, clearance requirements, cable entries, etc.;
- Overhead cable support and cable ducting requirements,

DATA ITEM DESCRIPTION	
1. TITLE Equipment Installation Data Package	**2. IDENTIFICATION NUMBER** TDM-03
including interconnection cable requirements, types of cable, lengths, etc.; and • Equipment separation and recommended maintenance envelope. **4.4.7** **Environmental controls (storage and operational)**, including temperature, humidity, and dust. **4.4.8** **Safety provisions** (as applicable) • Site and equipment grounding requirements • Areas of potential danger • Exhaust ventilation • Fire detection and suppression	

TDM-05 SYSTEM MANUALS

DATA ITEM DESCRIPTION	
1. TITLE System Manuals	**2. IDENTIFICATION NUMBER** TDM-05

3. PURPOSE

To provide manuals at the system level that provides an overview, performance characteristics, and operations and maintenance instructions.

4. PREPARATION INSTRUCTIONS

4.1 This DID is not meant to be restrictive, and with prior written agreement from Canada, may be tailored by the Contractor.

4.2 The data submission may be prepared in the Contractor's format, and ***shall*** contain sufficient detail to fully address the information requirements. The System Operations Manual and System Maintenance Manual may be included in a single publication.

4.3 The System Maintenance Manual ***shall*** be augmented with OEM equipment manuals.

4.4 **System Operations and System Maintenance Manuals *shall* not be generic in nature, but be specifically written for the HF-DSC/GMDSS System being installed in the Arctic.**

4.5 The System Manual ***shall*** include the following information:

4.5.1 GENERAL INFORMATION

- **About This Manual**, including its purpose and structure.
- **System Overview**, including a description of the overall system with supporting diagrams.
- **Performance Characteristics**, including system capabilities and characteristics.

4.5.2 Provide a separate chapter for each system including:

- **System Description**. including narrative description, system block diagram, equipment breakdown structure, and supporting data (for example, line drawings, photographs, data tables, etc.), as well as the theory of operation for the system.
- **System Operation information *shall*** be provided for each and every piece of equipment that requires MCTS Officer action.
- Describe control layouts and menus and how the performance can be changed and optimized through the use of operator controls and the actions to be taken when an error has been detected by the System or an operator.
- **System Maintenance information *shall*** be provided for all equipment units and sub-systems and ***shall***, ***as a minimum***:

  a) Include equipment-level OEM manuals with direct reference to the applicable section. Conceptually the Maintenance Manual and OEM

DATA ITEM DESCRIPTION	
1. TITLE System Manuals	**2. IDENTIFICATION NUMBER** TDM-05

manuals are to used in tandem with direct references from the Maintenance Manual;

b) Describe the theory of operation of each type of equipment to the level needed for the maintenance and troubleshooting of the equipment by technical staff;

c) Provide functional block diagrams, mechanical drawings, and electrical schematics;

d) Include equipment rack layouts, system interconnect diagrams, wire lists and cable layouts;

e) Contain maintenance instructions and fault diagnostic information, including:

- Fault trees and diagnostic data, including possible malfunctions, causes, effects, fault isolation techniques and solutions.
- Safety considerations.
- Disassembling, repairing/replacing sub-assemblies and re-assembling the equipment.
- Use of special tools and test equipment.
- Preventive maintenance schedules.
- Test and adjustment (including test sheets, as applicable).
- Allowable service limits, wear limits for replacement, end play limits, balance data, torque values, cleaning information, etc.

f) Include illustrated Parts List:

- Line drawing of the system/equipment (schematic or exploded view), with parts assigned sequence numbers to provide a link to the parts list.
- Indented parts list, identifying every component which may be replaced, in accordance with the planned depth of maintenance.

g) Describe how the performance of the equipment can be changed and optimized through the use of all controls and describe, in detail, the procedures for the maintenance and repair of the equipment; and

h) Include a section in which all changes to original equipment manufacturer manuals are identified and documented.

CM-03 REQUEST FOR CLARIFICATION

DATA ITEM DESCRIPTION	
1. TITLE Request for Clarification	**2. IDENTIFICATION NUMBER** CM-03
3. PURPOSE To recommend clarification in the wording of project documentation including TSOR or SOW.	
4. DATA PREPARATION INSTRUCTIONS **4.1** The Request for Clarification may be prepared in the Contractor's format and ***shall*** contain sufficient detail to fully address the following information requirements: **4.1.1** Identification of affected document **4.1.2** Identification of affected Configuration Item **4.1.3** Existing Wording **4.1.4** Proposed Wording **4.1.5** Reason For Change **4.1.6** Record of Decision (to be completed by the CCG)	

SE-09 RELIABILITY DATA

DATA ITEM DESCRIPTION	
1. TITLE Reliability Data	**2. IDENTIFICATION NUMBER** SE-09
3. PURPOSE To describe the Contractor's approach to achieving TSOR requirements and ensuring adequate asset reliability and availability.	
4. DATA PREPARATION INSTRUCTIONS **4.1** This DID is not meant to be restrictive, and with prior written agreement from Canada, may be tailored by the Contractor. **4.2** The data submission may be prepared in Contractor's format, and ***shall*** contain sufficient detail to fully address the information requirements. **4.3** The Reliability Data ***shall*** include the following information: 4.3.1 **General Guidance** 4.3.1.1 The reliability analysis ***shall*** be to the module level, showing how the System Availability and Mean-time-between-Failures is derived. 4.3.1.2 A detailed availability and reliability model ***shall*** be developed for the complete System including the remote site sub-systems and the MCTS Officer Workstation. 4.3.1.3 The model ***shall*** identify critical items or paths whose failure will cause System or sub-system failure, major performance degradation or marginal operation. 4.3.1.4 The model ***shall*** be included in the availability and reliability predictions. 4.3.1.5 The Mean-time-between-Failures and the Mean-time-to-Repair for each module in the System ***shall*** be presented with the analysis. 4.3.1.6 Reliability and Maintainability Data ***shall*** be provided. 4.3.1.7 This will include gathering and Assessment of Sub-Contractor / Supplier R&M Data.	

TE-02 TEST PLAN AND REPORT

DATA ITEM DESCRIPTION	
1. TITLE Test Plan and Report	**2. IDENTIFICATION NUMBER** TE-02
3. PURPOSE To provide a plan for system testing.	

4. DATA PREPARATION INSTRUCTIONS

4.1 This DID is not meant to be restrictive, and with prior written agreement from Canada, may be tailored by the Contractor.

4.2 The data submission may be prepared in Contractor's format, and ***shall*** contain sufficient detail to fully address the information requirements.

4.3 The Test Plan ***shall*** include, but not be limited to, the following information:

4.3.1 Introduction, including purpose, scope, references, definitions, and acronyms.

4.3.2 Organization and Management

4.3.2.1 Organization, including key personnel.

4.3.2.2 Terms of Reference, including responsibilities for preparation, internal/external test permissions, development of acceptance tests, conduct of the tests, witnessing, report preparation, and results follow-up.

4.3.2.3 Methodology for the equipment and system level FATs and SATs.

4.3.3 Test Report

4.3.3.1 The report ***shall*** include a complete overview of the results covering ***as a minimum***:

4.3.3.2 General problems Encountered and action taken

4.3.3.3 Test Results, including details of all of the test data. Reference in this section can be made to attached appendices (which ***shall*** include TE-03 test sheets).

4.3.3.4 Conclusions, including:

- Identify the pass/fail result and provide a brief analysis of the test results in narrative form; and
- Identify the action plan to resolve any outstanding issues.

TE-03 ACCEPTANCE TEST PROCEDURES

DATA ITEM DESCRIPTION	
1. TITLE Acceptance Test Procedures	**2. IDENTIFICATION NUMBER** TE-03
3. PURPOSE To provide the procedures to be followed for the Factory Acceptance Test and Site Acceptance Test.	

4. DATA PREPARATION INSTRUCTIONS

4.1 This DID is not meant to be restrictive and, with prior written agreement from Canada, may be tailored by the Contractor.

4.2 The data submission may be prepared in Contractor's format, and ***shall*** contain sufficient detail to fully address the information requirements. The Tests ***shall*** capture all requirements in the TSOR and SOW, and ***shall*** provide the appropriate contract reference (see example Test Sheet below)

4.3 The Test Procedure ***shall*** include the following information as applicable:

4.3.1 Test Purpose

- Asset / item to be tested
- Test objective
- Test witnessing
- Schedule of Events

4.3.2 Testing Conditions

- Test Facility
- Environmental Conditions
- Test Equipment, Recording Equipment
- Set-up, Calibration, Pre-test Checks
- Operating Conditions of Test Item
- Safety Precautions and Warnings

4.3.3 Test Procedure

- Description of requirement to be tested;
- Reference to the section(s) in TSOR, SOW and/or other applicable documents;
- Test Configuration;
- Test method to be used to test the requirement;
- Expected result;
- Obtained result; and
- Passed/Failed Condition(s).

DATA ITEM DESCRIPTION	
1. TITLE Acceptance Test Procedures	**2. IDENTIFICATION NUMBER** TE-03
4.3.4 Recording and Reporting • Format for Recording Test Results (see example Test Sheet below) • Data Collection and Analysis • Quality Assurance Certification **4.3.5 Signature of Participating Organizations on Test Results**	

TE-03 Example Test Sheet

Test #	Ref	Aim/Description	VM	Procedure/Pass-Fail Criteria	Result	Init
1	T 3.1.6.2.1	All the transmitters ***shall*** be configured such that in the event of a failure of any one transmitter, the standby transmitter can take the place of either failed unit.	D	Step: Two transmitters transmitting, introduce fault into one Expected result: the cold-standby transmitter is immediately available	P/F	

Test Completion Signatures	
CCG Signatory Name: Signature: Date:	**Contractor Engineering Signatory** Name: Signature: Date:

Verification Method (VM): I – Inspection, D – Demonstration, A – Analysis, T – Test

Reference: T – TSOR, S – Statement of Work

SC-01 RECOMMENDED SPARE PARTS LIST

DATA ITEM DESCRIPTION	
1. TITLE Recommended Spare Parts List	**2. IDENTIFICATION NUMBER** SC-01

3. PURPOSE

To identify the spares and repair parts needed to support operations for the expected system life, which is 15-years .

4. DATA PREPARATION INSTRUCTIONS

4.1 The data submission may be prepared in Contractor's format, and ***shall*** contain sufficient detail to fully address the information requirements. The format ***shall*** include a column identifying RSPL items that are expected to be consumed and replenished during the two year warranty period. Any items consumed during that period will come from CCG spares and be replenished when consmed.

4.2 **Item Data**: The RSPL ***should*** provide the following data for each recommended item:

- Provisioning List Line Item Sequence Number
- Item Description
- Manufacturer
- Manufacturer's Part Number – see 4.3
- CAGE Code (Manufacturer) – see 4.4
- Vendor (if different from manufacturer)
- Vendor's Catalogue Number (if different from the Manufacturer's Part Number)
- Fitted quantity (number installed in the asset)
- Repairable (Y,N)
- Unit of Issue (each, box of 100, etc.)
- Contractor turn-around time (if subject to Contractor repair and overhaul)
- Procurement Lead Time (weeks)
- Shelf Life (in months, if applicable)
- Installed life (maximum allowable operating time)
- Usage Rate (forecast demands per year)
- Provisioning for 15 years of operation
- Material Safety Data Sheet Number (if applicable)
- Storage Location Data (if applicable) – see 4.6
- Unit Price – see 4.5
- Recommended Quantity (in same units as Unit of Issue) – see 4.6

4.3 **Drawing**: If the item does not have a manufacturer's part number, then provide a drawing that identifies and defines the part (or refer to specific drawing submitted with TDM-03).

4.4 **Manufacturer Contact Data**: If the plant where the item is made does not have a CAGE code, then provide the manufacturer's address, telephone number and

DATA ITEM DESCRIPTION	
1. TITLE Recommended Spare Parts List	**2. IDENTIFICATION NUMBER** SC-01

email address in an associated company Contact Data List. Include vendor contact data in the list, if applicable.

Note: The CAGE Code is known by several acronyms: CAGE, NCAGE, FSCM, NSCM

4.5 **Unit Price** is the price in effect when the RSPL was submitted, consistent with the Recommended Buy Quantity. This data will be used for budgeting and inventory management purposes. It is understood that a future price quote for the item will reflect circumstances at the time.

4.6 **Recommended Quantity**: If the item is repairable, then the Recommended Quantity should be based on the failure rate and the repair turn-around time. If the item is non-repairable, then the Recommended Quantity should be based on the usage rate and the provisioning period. The need for a life-time buy is an over-riding consideration.

4.7 Special Test Tools and Equipment and software for use in support and diagnostics ***shall*** be included in this list.

TT-03 TRAINING MANUALS

DATA ITEM DESCRIPTION	
1. TITLE Training Manuals	**2. IDENTIFICATION NUMBER** TT-03

3. PURPOSE

To provide manuals to be used in training the CCG personnel. These include student manuals and instructor manuals.

4. PREPARATION INSTRUCTIONS

4.1 This DID is not meant to be restrictive, and with prior written agreement from Canada, may be tailored by the Contractor.

4.2 The data submission may be prepared in the Contractor's format, and ***shall*** contain sufficient detail to fully address the information requirements.

4.3 The Maintenance Student Manual ***shall***, ***as a minimum***, include the following information:

a) Theory of operation of overall system and all sub-systems;

b) Fault locating and diagnostic techniques using fault trees, built-in testing features and/or the use of external test and measurement equipment;

c) Complete assembly and disassembly procedures applicable to level of maintenance, including any adjustments or set-up procedures required to establish full operational performance of the equipment;

d) All Preventive/Periodic Maintenance routines, such as cleaning, health testing or component replacement such as filters or batteries;

e) Procedures to back-up and restore the HF-DSC computer application software using external non-volatile storage media, including saved presets and configuration data; and

f) Procedures to load and configure new updates to the HF-DSC computer application software.

4.4 The Operational Student Manual ***shall***, ***as a minimum***, include the following information:

a) A working knowledge of the purpose, functions and capabilities of each device and sub-system comprising the overall system;

b) The ability to demonstrate the correct operation of each system function;

c) The ability to recognize equipment faults and take appropriate action to protect the equipment involved and to reconfigure remaining equipment to minimize the effect on overall System availability; and

d) A quick reference fault finding check list ***shall*** be provided as part of the training package.

4.4.1 The operational controls and functions which should be emphasized in the course include the Workstation display, menus, graphics, controls, alarms,

as well as information logging, storage, retrieval, processing and printing.

4.5 **Training Documentation**: A standardized approach for the development of key training documentation to support formal training is essential to ensure effective and efficient Training Management. Key documents required to conduct formal training are outlined below.

4.5.1 Training Objectives: set tasks in context and describe learning outcomes in observable and measurable terms. It is a behavioural statement of the task to be performed in the operational environment, the standard or performance desired, and the constraints or conditions under which the student is expected to complete the activity. Each training objective ***should*** include the following components:

a) The skill or activity to be learned;

b) The constraints or conditions under which the learner is expected to complete the activity;

c) The standard or performance desired; and

d) Related references.

4.5.1.1 Training Objectives are further broken down into terminal and enabling objectives:

a) **Terminal Objectives**, the action, knowledge, or skills the learner is expected to have acquired at the end of instruction;

b) **Enabling Objectives**, the experiences, ways and means of achieving the Terminal Objective.

4.5.2 **Course Syllabus**: an outline or summary of the details of a course for students including training objectives, target and enabling objectives, course duration, language of training, course schedule, classroom facilities, course material and student evaluation. A course syllabus ***should*** including the following:

a) General information;

b) Scope of training;

c) Course management;

d) Training objectives; and

e) Schedule.

4.5.3 **Lesson Plans**: the development and use of a lesson plan will assist the instructor in providing an effective learning experience. The lesson plan ensures that the instructor follows a specific, training objective plan. Each lesson will begin on a new page and follow the same format:

a) Lesson number and title;

b) Date prepared;

c) Total training time;

d) Methodology;

e) Terminal and enabling objectives;
f) Relevance;
g) Aim;
h) Lesson content;
i) Equipment and training aids; and
j) References.

4.5.4 **Training Aids**: provide a list of all training equipment that must be supplied to support the training, including reference material, training simulators, training systems or test equipment. These aids also include the installation, maintenance, and training plan for the equipment. Training aids and equipment for the entire course (and where they can be found) are the following:

a) Projectors;
b) Videos;
c) Block diagrams;
d) Flipcharts;
e) Whiteboards;
f) Simulators;
g) Tools;
h) Computers;
i) Test equipment; and
j) Laboratory or workshop equipment

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EKME# 2469823
DO NOT MODIFY

HF-DSC/GMDSS System Replacement

F7048-130065

SALUTI PRIMUM AUXILIO SEMPER

Canadian Coast Guard

Technical Statement of Requirements

Canada

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Document template :	English
Print Format:	Double Sided
Last revision:	Sept 01, 2004
Compatibility:	Word 97 & 2002 (XP)

Published under the Authority of:

Integrated Technical Services Directorate
Fisheries and Oceans Canada
Canadian Coast Guard
Ottawa, Ontario

K1A 0E6

EKME# 2469823
HF-DSC/GMDSS TECHNICAL STATEMENT OF REQUIREMENTS

Cat. No. FsXX-XXXX/YYYY
ISBN X-XXX-XXXXX-X

Available on CCG Intranet site at:
http://ccg-gcc.ncr.dfo-mpo.gc.ca

Disponible en français : **[Écrire le titre ici]**

Printed on recycled paper

Document Control

Record of Amendments

#	Date	Description	Initials
1	02 August 2013	First Release	LHG/GF
2	25 March 2014	Final Version	GF

Approvals

Technical Authority	Jean Harvey	Approved: Date:	
Project Manager Service Delivery	Garret Furlong	Approved: Date:	
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		Approved: Date:	

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Document Management

1. Authority

This document is issued by the Director General (DG), Integrated Technical Services (ITS), the Canadian Coast Guard's (CCG) National Technical Authority under delegation from the Deputy Minister, Department of Fisheries and Oceans (DFO), and the Commissioner of CCG.

2. Responsibility

Responsibility for the development and maintenance of this document resides with the Director, Engineering Services (ES) under direction from the Director General, Integrated Technical Services.

3. Inquiries and/or Revision Requests

Please address all inquiries regarding this document, including suggestions for revision and requests for interpretation to:

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Foreword

1. Purpose

Canada has a life cycle replacement requirement to replace the existing High Frequency-Digital Selective Calling Global Maritime Distress and Safety System (HF-DSC/GMDSS) system located in the Central & Arctic (C&A) Region of the Canadian Coast Guard. The system has transmitters located in Iqaluit, NU and receivers located in Iqaluit, NU and Resolute Bay, NU. This is part of the NAVAREAS project and is primarily intended to provide Narrow Band Direct Printing (NBDP) using HF-DSC frequencies in the high Arctic where the satellite coverage is marginal.

2. Scope

This Technical Statement of Requirements (TSOR) establishes the technical requirements for the replacement HF-DSC/GMDSS System.

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Chapter 1 INTRODUCTION

1.1 IDENTIFICATION

This TSOR establishes the performance, environmental, logistics and inspection characteristics for the HF-DSC/GMDSS System. The HF-DSC/GMDSS is referred to as 'the System' or 'the Equipment' throughout this document.

1.2 SYSTEM OVERVIEW

The HF-DSC/GMDSS component of the NAVAREAS project is primarily intended to provide Narrow Band Direct Printing (NBDP) using HF-DSC frequencies in the high Arctic where the satellite coverage is marginal. The existing system consists of a Marine Communications and Traffic Services (MCTS) Centre in Iqaluit, NU, a local transmitter and receiver site (also in Iqaluit, NU) and a remote receiving site located at the Coast Guard receiver site in Resolute Bay, NU. The local transmitter and receiver sites communicate with the MCTS Centre using dedicated 4-wire lines. The dedicated lines will be converted to UHF links prior to the installation of the new System. The remote receiving site in Resolute Bay, NU communicates with the MCTS Centre using channel space on an existing satellite link.

1.3 BACKGROUND

The System, installed and commissioned in 1999, has been in operation for approximately 12 years and many of the elements composing the System are obsolete and require replacement. To ensure that Canada can continue to meet its international obligations by providing reliable NBDP and other Maritime Safety Information (MSI) communication in the A4 Zone north of 70° in the area approximately 60°W to 141°W and up to 80°N this system is scheduled for replacement as part of the NAVAREAS project (See Appendix A)

1.4 DOCUMENT OVERVIEW

This TSOR contains the following:

a) Chapter 1, Introduction, identifies the system and the layout of this document.

b) Chapter 2, Applicable Documents, identifies the documents referenced herein.

c) Chapter 3, Requirements, defines the functional and performance requirements of the system.

d) Appendices

Chapter 2 APPLICABLE DOCUMENTS

2.1 GENERAL

The following documents are applicable to this TSOR. In the case of a conflict between the wording elsewhere in this TSOR and the applicable documents, the CCG specification wording ***shall*** take precedence. The following documents are applicable to the extent specified herein:

a) ITU Recommendation 493 "Digital Selective Calling System for Use in the Maritime Mobile Service;" This document is available at:

http://www.gmdss.com.au/ITU%20DSC%20tech%20spec.pdf

b) ITU Recommendation ITU-R M.541 "Operational Procedures for use of Digital Selective Calling in the Maritime Mobile Services;" This document is available at:

http://www.gmdss.com.au/ITU%20DSC%20op%20spec.pdf

c) ITU Recommendation ITU-R M.821 "Option expansion of the DSC System for use in the Maritime Mobile Service."

d) Health and Welfare Canada – Safety Code 6 (2009) "Limits of Human Exposure to Radio Frequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz. ;" This document is available at:

http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/radio_guide-lignes_direct-eng.php

e) Industry Canada – RSS-181 Certification "Coast and Ship Station Single Sideband Radiotelephone Transmitters and Receivers Operating in the 1,605 – 28,000 kHz band." This document is available at:

http://www.ic.gc.ca/epic/site/smt-gst.nsf/en/sf01357e.html

f) Department of Defense – MIL-HDBK-217F "Reliability Prediction of Electronic Equipment." This document is available at:

http://www.sre.org/pubs/ HF-DSC/GMDSS Statement of Work, EKME #2469819

g) Canadian Environmental Protection Act, Toxic substances.

h) Transportation of Dangerous Goods Act and Regulations, Transport Canada, 199 c34." This document is available at:

http://laws.justice.gc.ca/en/showtdm/cs/T-19.01

i) Hazardous Products Act and all applicable Regulations, Health Canada, R.S., 1985, c.H-3." This document is available at:

http://laws.justice.gc.ca/en/showtdm/cs/H-3.

j) IARC Monographs on the Evaluation of the Carcinogenic Risk in Humans.

Chapter 3 REQUIREMENTS

3.1 SYSTEM DEFINITION

3.1.1 Overview and Intended Use

The current system consists of a Marine Communications and Traffic Services (MCTS) Centre in Iqaluit, NU, a local transmitter and receiver site (also in Iqaluit, NU) and a remote receiving site located at the Coast Guard receiver site in Resolute Bay, NU. System coverage maps are provided in Appendix B.

The local transmitter and receiver sites communicate with the MCTS Centre using dedicated 4-wire lines. The dedicated lines will be converted to UHF links prior to the installation of the new System. The remote receiving site in Resolute Bay, NU communicates with the MCTS Centre using channel space on an existing satellite link. See Figure 3-1

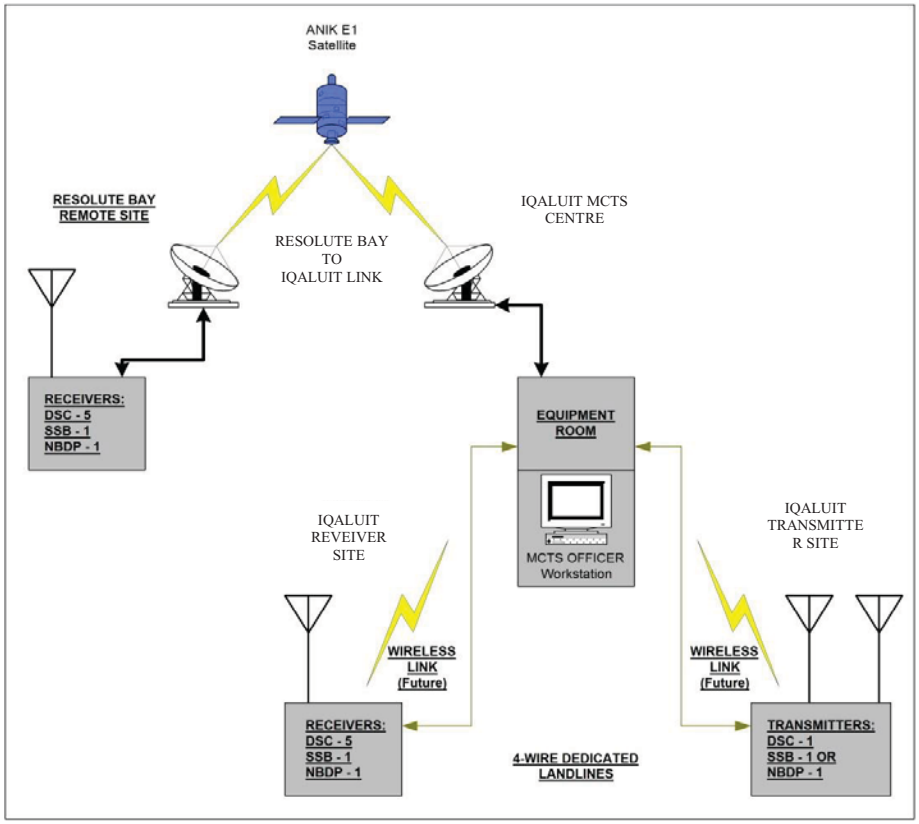

Figure 3-1: System Block Diagram

For a more detailed System Block Diagram, see Appendix D.

3.1.2 Statute Requirements

3.1.2.1 Canadian Requirements

The System ***shall*** meet the most recent version following Canadian Government requirements:

a) Industry Canada – RSS-181.

b) Health and Welfare Canada – Safety Code 6 (2009).

3.1.2.2 International Requirements

The System ***shall*** meet the most recent[1] version following international requirements:

a) ITU Recommendation ITU-R M.493-13.

b) ITU Recommendation ITU-R M.541-9.

c) ITU Recommendation ITU-R M.821-1.

3.1.2.3 Electrical Safety Authority

The Electrical Safety Authority recognizes certification bodies and field evaluation agencies, accredited by the Standards Council of Canada, to certify or evaluate electrical products or devices. Only equipment bearing a recognized mark or label is deemed to be approved for use in Canada.

Note: *Information regarding recognized marks and labels approved for use in Canada can be found at:*

http://www.esasafe.com/GeneralPublic/epa_002.php?s=19

3.1.3 Certification of Equipment

3.1.3.1 Industry Canada Certification

At the time of delivery, the contractor ***shall*** demonstrate transmitter compliance with Industry Canada RSS-181 performance standard.

3.1.3.2 Electrical Certification

All equipment ***shall*** bear the appropriate certifying organization's mark at the time of delivery in accordance with the Electrical Safety Authority.

3.1.4 Quality Assurance

The system ***shall*** meet the Quality Assurance provisions of the SOW.

3.1.5 Functional Description

3.1.5.1 Basic Operation

3.1.5.1.1 *General*

The following is a summary of the basic operational requirements for the System and their uses by the MCTS Officers. The detailed requirements are defined in ITU-R M.493-12 and ITU-R M.541-9

[1] Review for updates at time of contract.

3.1.5.1.2 *Protocols*

The System ***shall*** be configured to handle Distress, Urgency, Safety and Routine protocols and allow the MCTS Officer to create, edit and send messages.

3.1.5.1.3 *Multiple Distress Signals*

The System ***shall*** be designed to have the capability of receiving and responding to multiple distress signals according to the following:

a) The System ***shall*** have the capability of receiving new DSC distress signals while the MCTS Officer is engaged in acknowledging a current DSC distress signal.

b) The System ***shall*** have the capability of allowing the MCTS Officer to acknowledge a DSC distress signal while a Radio Telephony transmission is taking place.

c) The System ***shall*** have the capability of allowing the MCTS Officer to make voice or NBDP transmissions.

3.1.5.2 Operational Frequencies

The system ***shall*** have the following operational frequency channels, provided in Table 3-1, as indicated in applicable sections below.

Table 3-1 – Radio Distress and MSI Communication Frequencies

Channel	DSC	Radiotelephony	NBDP
MF (Note 1)	-	-	-
HF4	4 207.5 kHz	4 125.0 kHz	4 177.5 kHz
HF6	6 312.0 kHz	6 215.0 kHz	6 268.0 kHz
HF8 (Note 2)	8 414.5 kHz	8 291.0 kHz	8 376.5 kHz
	-	-	8 416.5 kHz
HF12	12 577.0 kHz	12 290.0 kHz	12 520.0 kHz
HF16	16 804.5 kHz	16 420.0 kHz	16 695.0 kHz

NOTES: 1) This system does NOT utilize the MF-DSC/GMDSS frequencies.
2) To comply with international MSI NBDP broadcast frequency regulations.
3) See Paragraphs 4.4.1 and 4.5.1

3.1.6 Major System Components

3.1.6.1 General

The System is composed of the following major components:

- Transmitters.
- Switching Matrix.
- Receivers.

- Antennas.
- Workstation / Fileservers

The characteristics of these components are described below.

3.1.6.2 Transmitters

3.1.6.2.1 *General*

In order to provide maximum flexibility and transmitter redundancy, three (3) separate all solid state 5 kW transmitters ***shall*** be used, as follows:

a) One transmitter ***shall*** be dedicated to the DSC transmission mode.

b) The second transmitter ***shall*** be used for Radiotelephony or NBDP.

c) The third transmitter ***shall*** be a cold-standby remotely configurable spare.

d) All the transmitters ***shall*** be configured such that in the event of a failure of any one transmitter, the standby transmitter can take the place of either failed unit.

e) All transmitters ***shall*** be capable of remote turn on/off.

3.1.6.2.2 *Transmitter Characteristics*

The transmitters ***shall*** meet or exceed the following basic requirements:

a) Frequency Range: 1 605 kHz to 28 000 kHz synthesized

b) Frequency Resolution: 10 Hz Increments.

c) Common Modulation Modes:

   1) J3E (USB/LSB).
   2) H3E.
   3) F1B.
   4) J2B.
   5) A1A.

d) Frequency Stability: $\leq$ 2 ppm per year from 0°C to 50°C

e) Channel Memory: > 50 channels; locally or remotely programmable

f) Power Output, with the following characteristics:

   1) 5 kW PEP and Average for 100% duty cycle.
   2) Full power in a 2:1 VSWR load.
   3) Adjustment Range: -3 dB to approximately -20 dB in increments.
   4) Failure of a single PA module will allow continuous operation at reduced power.

g) VSWR Protection: Full protection for VSWR loads greater than 2:1;

h) Antenna Tuning: The built-in antenna tuner (if applicable) ***shall not*** be affected by the presence of extraneous or induced RF signals on the antenna output port.

i) Tuning Time: < 1 sec for a preset channel.

j) Intermodulation Distortion: ≥ 34 dB below PEP.

k) Harmonic Suppression: ≥ 55 dB.

l) Spurious Suppression: ≥ 60 dB.

m) Sideband Suppression: ≥ 60 dB.

n) Transmitter Interface: RS-232 or RS-422, as well, an optional IEEE 802.3 Ethernet data interface is desirable.

o) Transmitter Local Control:

1) Transmitter ON/Off/Standby/Ready selection.
2) Mode Selection.
3) Frequency/channel selection.
4) Transmitter power level selection.
5) BIST for module testing and display results.
6) Press-to-talk (PTT) and keyline.
7) FSK shift mode.
8) Local microphone with PTT.
9) Local/Remote control mode selection.
10) Forward/Reflected power.
11) Fault alarm indicators/fault messages.

p) MTBF: >=3200 hours based on 24/7 operation.

q) Transmitter Remote Control/Read-back:

1) Transmitter ON/Off/Standby/Ready selection.
2) Mode Selection.
3) Frequency/channel selections.
4) Transmitter power level selection.
5) BIST for module testing and display results.
6) Press-to-talk (PTT) and keyline.
7) FSK shift mode.
8) Local microphone with PTT.
9) Local/Remote control mode selection.
10) Forward/Reflected power.
11) Fault alarm indicators/fault messages.

r) Mechanical characteristics:

1) Transmitter ***shall*** be supplied in an enclosed rack/cabinet

2) Dimensions:

- Width: 1200 mm (47 inches) max
- Depth: 870 mm (34 inches) max
- Height: 2100 mm (73 inches) max

s) All equipment drawers ***shall*** have equipment slide rails and cable retractors installed inside the equipment rack where applicable.

t) Power Supply: 208 VAC (± 10 %) 3-phase, 60 Hz (± 3 Hz)

3.1.6.3 Antenna Switching Matrix

a) Under the default configuration two of the three transmitters ***shall*** be connected to two (2) separate transmitting antennas through a remotely controllable Antenna Switching Matrix.

b) The Antenna Switching Matrix ***shall*** have at least a 3 x 3 switching capacity to allow the connection of any of the three transmitters to any of the two antennas or the dummy load.

c) The transmitters ***shall*** be capable of operating on the frequencies and modes shown in Table 3-1 above.

Note: *A dummy load capable of withstanding a continuous 5 kW load and a VSWR of 1.2:1 will be supplied by CCG.*

3.1.6.4 Receivers

3.1.6.4.1 *DSC Receiver*

a) The DSC receivers (watchkeeping receivers) can be either scanning or dedicated. The DSC system ***shall*** be able to access all six dedicated MF/HF DSC channels in two seconds or less. The receivers ***shall*** meet the operational requirements of ITU Recommendation M.493

b) Whether scanning or dedicated receivers are used, they ***shall*** be configured to allow redundant operation.

c) If required by the System design, the receivers ***shall*** be connected to a single receiving antenna through existing CCG Raven Research multicouplers (Model RR1110HF + RR265HF BP Filter).

d) If separate DSC receivers and DSC modems are used, they ***shall*** be dedicated to each of the DSC frequencies shown in Table 3-1.

3.1.6.4.2 *MF/HF Communications Receivers*

MF/HF Communications Receiver characteristics are described below:

a) The receiver sub-system ***shall*** be designed to allow reception of SSB and NBDP transmission on the HF frequency band shown in Table 3-1 (above).

b) If MF/HF Communications Receivers are used, they ***shall*** meet or exceed the following basic receiver requirements:

1) Frequency Range: Compatible with Table 3-1 (above).
2) Frequency Resolution: 10 Hz increments.
3) Input Impedance: 50 ohms.
4) Input Connector: (To be specified).
5) Tuning: Continuous / Pre-set Ranges / Keypad Entry.
6) Frequency Stability: $\leq$ 2 ppm per year from -10°C to +50°C.
7) Channel Memory: > 10 loaded with receiver parameters.
8) Readout/Display:
   - Receive frequency.
   - Clarifier frequency.
   - Channel assignment.
   - Mode.
   - IF BW/filters.
   - AGC.
   - BIST Status
9) Clarifier: (Frequency Offset): ± 2.00 kHz.
10) Signal Input Protection: > 100 Volts RMS.
11) Modes of Operation Compatible with system:
12) Squelch RF Level, or Syllabic, or a combination of both.
13) Sensitivity (10 dB SINAD): 0.5 µV (2.8 kHz BW, J3E Mode)
14) 3 dB IF Bandwidth: $\leq$ 0.3 to $\geq$ 2.8 kHz
15) 3rd Order Intercept: $\geq$ 28 dBm.
16) Spurious Rejection: $\geq$ 80 dB
17) AGC: $\geq$ 100 dB range, Time Constants/Delay Time: compatible with operating modes
18) MTBF: $\geq$ 14,000 hours of operation minimum.
19) Audio Outputs: 600 ohm balanced output. Audio line levels for receive audio adjustable from -10 dBm to +10 dBm.
20) RS-232 or RS-422, as well, an optional IEEE 802.3 Ethernet data interface is desirable. Remote Functions: Frequency, Channel Select, IF BW, Mode, AGC, Squelch, Frequency Offset, Fault-BIST Status, RF/IF Gain.
21) Remote Read-back: Frequency, Channel Select, IF BW, Mode, AGC, Frequency Offset, BIST Status, RF/IF Gain.

3.1.6.5 Antennas

3.1.6.5.1 *General*

Transmitting and Receiving antennas that are installed and in use, were selected for this system based on a detailed propagation analysis. The transmitting and receiving antennas are described below.

3.1.6.5.2 *Transmitting Antennas*

The transmitting antenna characteristics are as follows:

a) There are two transmitting antennas to allow for simultaneous transmissions using different modes.

b) The transmitting antennas are multi-band transmitting dipoles.

c) The two transmitting antennas are located at the Iqaluit Transmitter site.

d) The transmitting antennas have the following electrical characteristics:

- Polarization: Horizontal.
- Impedance: 50 ohms.
- VSWR: 2.5:1 maximum (Typically < 2:1).
- Frequency Range: 3.4 – 30 MHz.
- Power: 5 kW Average, 10 kW PEP.

3.1.6.5.3 *Receiving Antennas*

The receiving antenna characteristics are as follows:

a) There are two receiving antennas.

b) One located at the Iqaluit Receiver site and at the other located at the Resolute Bay Receiver Site.

c) The receiving antennas are omnidirectional active magnetic loop antennas.

d) The receiving antennas have the following electrical characteristics:

- Polarization: Vertical.
- Impedance: 50 ohms.
- VSWR: 1.2:1 maximum.
- Frequency Range: 2 – 30 MHz.

3.1.6.6 Workstation / Fileserver

While the system workstation / fileserver requirements are ultimately dependent upon the overall system design, as a minimum, they ***shall*** have the following minimum characteristics:

a) Intel based processors with a speed of at least 2.4 GHz.

b) System memory at least 3 GB.

c) A solid state hard drive with a storage capacity of at least 256 GB.

d) Built-in Audio and Graphics.

e) Minimum of one 16x DVD+/-R/RW optical drive.

f) At least 4 USB slots.

g) I/O Port types ***shall*** be, as a minimum:

- USB Keyboard and Mouse.
- Headphone/speaker line-out.
- Microphone-in, line-in.
- RJ-45.
- VGA.

h) Connectivity to include a 10/100/1000 LAN.

i) Supplied with USB Keyboard and optical mouse.

j) The operating system ***shall*** be specified by the Contractor.

3.1.6.7 Workstation / Fileserver Display

The workstation / fileserver display requirements are ultimately dependent upon the overall system design. However, they ***shall*** have the following characteristics:

a) Display type: High Definition, LCD display with LED backlighting.

b) Screen size: Between 19” and 22” (measured diagonally).

c) Minimum resolution: 1280 x 800.

3.1.7 Interfaces

3.1.7.1 Operator Console

The System is intended to interface with the user utilizing a small stand-alone console. This console ***shall*** be complete, including but not necessarily limited to built-in speakers, communications headset, PTT footswitch, alarm transducers, narrow band printer, to meet the overall Operational and Technical requirements in the TSOR. The Operator’s Console ***shall*** also house the dual workstation/fileservers required by the System.

3.1.7.2 User Interfaces

a) The System ***shall*** interface with the MCTS Officer using an interactive Control Screen (or Control Panel), or a keyboard, mouse and high resolution LED colour monitor, or touchscreen. (Note: A mouse may not be required if a touchscreen is used.)

b) The Control Screen ***shall*** provide the MCTS Officer access to all of the operational functions such as: control of transmitters and receivers; DSC Control Windows and received messages; and Built-In Self Test (BIST).

3.1.7.3 Electrical Interfaces

The System ***shall*** be capable of normal operation with one of the following electrical power capabilities that are available at CCG Sites:

a) 120/240 Volt AC, +10%/-15%, 60 Hz, single-phase service including entrance and distribution panels and distribution wiring as required.

b) 208 Volt AC, ± 10%, 60 Hz, three-phase, power for the transmitter equipment.

c) 120 Volt AC, +10% / -15%, 60 Hz, single-phase UPS power at the MCTS Centre.

3.1.7.4 Communication Interfaces

The System ***shall*** be designed to interface with existing CCG systems as follows:

a) Communication lines: 600 ohm balanced TX/RX audio and signaling required by the Contractor, to carry control signals, DSC, AFSK and voice information to the transmitter and receiver site located in Iqaluit, NU.

b) Satellite 56 kbps Digital Channel Capacity: a satellite digital channel capacity to carry control signals, DSC, NBDP data and digitized voice information to/from the Remote Watch Keeping site located in Resolute Bay, NU.

3.1.7.5 Network Interfaces

The System ***shall*** be designed to be networked using standard TCP/IP protocol such that it can interface directly with other systems and provide received message data if required. Specific network interface characteristics are provided with the particular subsystem description.

3.1.7.6 Audio Interfaces

In addition to the requirements provided with the specific subsystem descriptions, the system audio interface(s) ***shall*** have the following characteristics:

a) The capability of providing an audio interface to the CCE (Communications Control Equipment) bus:

3.1.7.6.1 This interface shall present a balanced termination to a nominal 600 ohm line.

3.1.7.6.2 Audio line levels for both transmit and receive audio shall be adjustable from -10 dBm to +10 dBm.

3.1.7.7 System Security Interfaces

The following apply:

a) The System ***shall*** have built-in security measures that permit operation only by authorised operational and maintenance personnel, and that guard against the inadvertent destruction of data and operating software programs.

b) System access security ***shall*** be provided in the form of log-on passwords, passwords for the exchange of data, and passwords for the installation of software upgrades.

3.2 CHARACTERISTICS

3.2.1 Functional & Performance Characteristics

3.2.1.1 Operational Functions

3.2.1.1.1 *General*

The System ***shall*** have the following capabilities:

a) The MCTS Officer can respond to Urgent, Safety and Routine calls.

b) The MCTS Officer can create or compose messages for all the call types listed.

c) The MCTS Officer can respond to these calls by opening a call details window.

d) The MCTS Officer can acknowledge action or print from within the details window.

e) To MCTS Officer can select the DSC mode to send a message.

3.2.1.1.2 *Operator Call Details Window*

As a minimum the System ***shall*** have a Details Window displaying the following fields:

a) Date and Time (call received in UTC);

b) DSC Call Category (i.e., Distress, Urgency, Safety, Routine or Test Call);

c) Format (i.e., All Ships).

d) Caller Identifier (MMSI).

e) DSC Carrier frequency.

f) Tele-command (i.e., J3E Simplex).

g) Response Channel and/or frequencies.

h) Additional Information.

3.2.1.1.3 *Types of Calls*

As a minimum the System ***shall*** be capable of handling the following types of calls:

a) All Ships.

b) Individual Ships.

c) Group Calling.

d) Geographic Area.

e) Distress Relay.

f) Distress Acknowledge

3.2.1.1.4 *DSC Received and Sent Call Windows*

As a minimum the System ***shall*** have DSC Received and Sent Call Windows. These ***should*** be separate windows with the ability of toggling between them. The windows ***shall*** display the following fields as required:

a) Sent to/from (i.e., MMSI);

b) Date and Time Received;

c) Date and Time Acknowledged (as applicable);

d) DSC Call Category (i.e., Distress, Urgency, Safety, Routine or test call);

e) DSC Carrier (i.e. frequency);

f) Station (Name);

g) Tele-command (i.e., J3E Simplex);

h) Additional Information.

3.2.1.1.5 *Narrow Band Direct Printing*

The System ***shall*** have the capability to send and receive messages utilizing NBDP on any one of the pre-assigned distress frequencies or NBDP MSI frequencies (See Table 3-1 above).

3.2.1.1.6 *Test Calls*

The System ***shall*** have the following characteristics:

a) The System ***shall*** be configured to respond to incoming test calls.

b) The MCTS Officer ***shall*** have the capability to enable or disable this function.

3.2.1.2 Call Handling Function

The System Call Handling function has the following characteristics:

a) The System is capable of the following:

1) All received calls ***shall*** be displayed in a log (window), along with a software programmable audio alarm.

2) The alarm for Distress and Urgency ***shall*** be different than for all other calls.

3) An alarm ***shall*** be cancelled only when the call is acknowledged or acted upon by an MCTS Officer.

4) A continuous audio tone alarm ***is not*** acceptable.

b) The System ***shall*** keep continuous watch of distress calls transmitted from ships in distress, using the DSC function, on one of the pre-assigned distress frequencies (See Table 3-1 above).

c) Call Log handling: The following apply:

1) Any call displayed in the log ***shall*** be viewable in a pop up window by selection by the operator.

2) The call details of the original call ***shall*** be displayed and the call may be acknowledged, acted upon and/or printed from this window.

3) All calls not requiring acknowledgment ***shall*** be acted upon to confirm that it has been dealt with.

d) The System is capable of the following:

1) All calls sent and received by the System ***shall*** be printable and stored on the hard drives of the workstation / fileserver.

2) The program ***shall*** maintain statistics of all DSC calls and system availability.

3) A continuous log of calls ***shall*** be available for instant viewing at all workstations.

4) This log ***shall*** be capable of being sorted by any workstation / fileserver.

5) Options ***shall*** be available to allow viewing of all calls sent, received, by individual workstation / fileserver , and by all calls combined.

6) The archived log information ***shall*** be saved in a text delimited format.

e) The continuous log ***shall*** display the time of all calls, in UTC, applicable site identification, type of call, and indicate the current status (acknowledged, acted upon, outstanding, etc.) Outstanding calls ***should*** be displayed in a different colour or highlighted to indicate their presence in the list.

f) Calls can be generated by editing the last Call or from a default Call which has been previously programmed.

g) Acknowledging calls ***shall*** be kept as simple as possible, limited to a maximum of one or two mouse clicks or other action by the operator.

h) All remote sites ***should*** be pre-programmed and accessible from the DSC Window to speed up responses and to eliminate typing as much as possible.

i) It ***shall*** require one or two mouse clicks or other definite action to cancel an Acknowledgment process.

j) After frequency selection, it ***shall*** require one or two mouse clicks or other definite action to perform Distress Relay Calls.

k) All received and sent calls are handled as follows:

1) Calls ***shall*** be put in a list showing the Call type and time of receipt.

2) Calls ***shall*** be grouped according to priority i.e. all Distress Calls would be at the top of the list in chronological order.

3) Calls ***shall*** be removed from the initial call list after an Acknowledgment is sent.

4) The user ***shall*** be capable of manually re-locating calls to an archive list.

5) Simultaneous, readable displays of the initial call list and the archive list ***shall*** be available.

l) Workstation / fileserver call handling capabilities are as follows:

1) All calls or status messages ***shall*** be accessible by any workstation / fileserver.

2) It ***shall*** be possible to view these messages by type, status, or priority etc.

3) All workstations ***shall*** be capable of acknowledging or acting upon these calls or messages. In other words, any workstation / fileserver ***shall*** be able to perform all DSC functions and duties as necessary.

3.2.1.3 Distress Call Function

The System ***shall*** have a Distress Call Handling function.

a) The Distress Call Handling function ***shall*** be capable of:

1) Initiating a unique audible alarm upon reception of a distress call.

2) Providing a continuous alarm until the call is acknowledged or acted upon by an MCTS Officer.

b) A Distress Acknowledgment window ***shall*** be opened for each distress call received. This window cannot be closed until the distress procedure is completed (i.e., an acknowledgment or other action by the MCTS Officer). A status is to be assigned to the distress call before it is stored in the log.

c) The System automatically selects the best frequency to respond on. This feature ***shall*** have a manual override and the MCTS Officer will have the option of selecting another frequency to respond to the call. Once acknowledged, the coast station has the immediate option of relaying the distress message in a separate window.

3.2.1.4 Distress Call Relay Capability

The System ***shall*** have a Distress Call relay capability.

a) The Distress Call Relay capability ***shall*** permit :

1) An MCTS Officer to initiate and transmit a distress relay call manually. This method would be utilized when the coast station receives the original distress call by other means (i.e. radio, phone, etc.).

2) The relay call to be addressed to all ships or to ships within a specific geographical area.

b) The Distress Call relay call functions ***should*** have the following characteristics:

1) The call can be repeated as many times as deemed necessary (i.e. no limitation).

2) Since the message text is the same, the procedure ***should*** require only one or two mouse clicks or other definite action by the operator to initiate.

3.2.1.5 System and Software Control Functions

The System and software control functions have the following characteristics:

a) The software ***shall*** be capable of setting up user preferences with at least three levels of security access.

b) Colours and fonts ***should*** be selectable by a system administrator and password protected.

c) All program functions ***shall*** be accessible from the Main Menu bar.

d) The Tool bar ***shall*** have a status line displayed describing its function when the cursor is placed over a button.

e) On-line Help ***shall*** be available for all system features.

f) The DSC software ***shall*** allow for the mouse and keyboard to be used for all functions.

g) All Menu commands ***shall*** have an underlined letter for direct Menu access by using the [ALT], [TAB] and cursor keys (standard Microsoft Windows features).

h) The following self test characteristics apply:

1) The System status ***shall*** be monitored continuously (local and remote sites, including landlines).

2) Any fault ***shall*** be displayed immediately in a window (preferably in red), describing the fault, along with an audible alarm and logged appropriately.

3) The alarm ***should*** be different than that of received DSC calls.

4) To cancel an alarm, the fault ***shall*** be acknowledged or acted upon by an MCTS Officer.

i) A means ***shall*** be provided to test the radio modem by issuing a software command from any workstation / fileserver .

3.2.2 Physical Characteristics

3.2.2.1 General

The equipment ***shall*** be of modular construction to facilitate field replacement of faulty sub-assemblies. Examples of modules are, as a minimum: transmitter solid-state plug-in power amplifier modules, power supply assemblies, exciter assembly, RF combiners, and DSC Channel receiver modules (if applicable).

3.2.2.2 Form Factor

The System and its equipment ***shall*** be designed to fit standard EIA 19" rack assemblies.

3.2.3 Environmental Characteristics

3.2.3.1 General

The System ***shall*** be wear and damage resistant to the operation, handling and environmental conditions specified herein.

3.2.3.2 Standard Conditions

The following ranges of parameters ***shall*** be considered standard conditions when performing laboratory bench tests of systems and components:

a) Temperature: Room Ambient, 18° to 27° C.

b) Humidity: 35 – 55% Relative.

c) Altitude: Local Ground Pressure.

3.2.3.3 Remote Site Equipment

The remote site equipment ***shall*** be able to operate in a continuous unattended mode under the following sheltered environmental conditions:

a) Ambient Temperature (Operational): -10° C to + 50° C.

b) Relative Humidity (Operational): 80% maximum (non-condensing).

c) Ambient Temperature (Storage): -30° C to + 70° C.

d) Relative Humidity (Storage): 85% maximum (non-condensing).

3.2.3.4 MCTS Centre Equipment

The MCTS equipment consists mainly of servers, workstations, monitors, and network and telecom devices. This equipment ***shall*** be able to operate in a continuous mode under the following heated and cooled environmental conditions:

a) Ambient Temperature (Operational): 15° C to + 35° C.

3.2.3.4.1 *Storage*

The MCTS equipment ***shall*** be able to operate normally (i.e. as per required reliability) under the heated and cooled environmental conditions in 3.2.3.4(a) above after being in storage under conditions in 3.2.3.3(c) above.

3.2.4 Supportability Characteristics

3.2.4.1 Operational Performance

3.2.4.1.1 *Operating Time*

The System ***shall*** be designed to operate for 24hr/day, 365.25 days/year (8766 Hours/year).

3.2.4.1.2 *Reliability*

The following characteristics apply:

a) The System (hardware and software) ***shall*** exhibit mean-time-between-failures (MTBF) of **800** hours or greater, while operating under the operational and environmental conditions specified herein.

b) The System ***shall*** have a combination of redundancy and maintenance plans with procedures and repair times that ensure the system availability requirements are met.

c) The MTBF calculations ***shall*** be based on MIL-HDBK-217F for a Ground Benign environment at 25°C.

3.2.4.1.3 *Availability*

The following characteristics apply:

a) The System ***shall*** exhibit an operational availability of no less than 99.7%

b) The operational availability ***shall*** be based on a daily utilisation of 24 hours a day for seven days a week (24/7) utilizing the applicable contractor recommended logistics support methods and resources, including documentation, spares, support equipment and tools.

c) The availability of the individual DSC receivers (including dedicated DSC modems) ***shall*** be no less than 99.99%.

d) The availability of the individual transmitters ***shall*** be no less than 99.95%.

3.2.4.1.4 *System Redundancy*

The System redundancy characteristics are defined below:

a) Dual Workstations / fileservers configured such that a failure of a fileserver or workstation function ***shall*** be automatically taken over by the back-up units.

b) The overall System design ***shall*** have sufficient built in redundancy to allow continuous operation of one transmitter for DSC, one transmitter for NBDP/SSB, and five (5) DSC receive channels.

c) In the event of a receiver failure, one of the DSC receivers ***shall*** be capable of being remotely configured to any of the designated DSC monitoring frequencies.

d) In the event of a transmitter failure, the standby transmitter ***shall*** be remotely configured to take the place of the failed transmitter.

3.2.4.1.5 *System Failure Characteristics*

a) The System ***shall*** be designed so that the failure of any single component will not cause failure of the entire System.

b) The System ***shall*** be designed so that the failure of any single component, with the exception of the satellite multiplexer and satellite link, will not cause the interface to any radio site to fail.

3.2.4.1.6 *Degraded Operation*

The system ***shall*** be designed so that the operation or failure of any System function will not degrade or limit the use of any other unrelated system or system function.

3.2.4.2 Maintainability

3.2.4.2.1 *Operational Service Life*

The system ***shall*** have a design service life of ***15*** years while under continuous operation.

3.2.4.2.2 *Storage Life*

The System and its equipment, excepting batteries, ***shall*** meet the performance characteristics specified herein after 24 months storage, without part replacement, adjustment or maintenance, when packaged for delivery.

3.2.4.2.3 *Mean Time to Repair (MTTR)*

The following apply:

a) The system ***shall*** exhibit a Mean-Time-To-Repair (MTTR) no greater than ***60*** minutes using the contractor recommended support methodology and resources including documentation, spares, support equipment and tools as specified herein.

b) The MTTR for all repairs at first line ***shall*** be in accordance with and support system availability requirements.

3.2.4.2.4 *Accessibility*

For System accessibility, the following apply:

a) The system ***shall*** exhibit a means of access to replaceable components which precludes major disassembly of the system.

b) Hinged doors ***shall*** be provided where appropriate to gain access.

c) Where required, captive screws or fasteners ***shall*** secure access panels or covers. The number and diversity of fasteners ***shall*** be minimised commensurate with stress, bonding, pressurisation, shielding, and thermal and safety requirements.

d) A minimum of standard tools ***shall*** be required to gain access.

e) To the extent practicable, disassembly or the removal of replaceable parts ***shall not*** require the use of specialized tools.

f) For ease of replacement, and wherever cost effective and where reliable operation is assured, active components subject to upgrade, such RAM, ROM, CPU integrated circuits or SIMM modules, ***shall*** be mounted on sockets.

3.2.4.2.5 *Inter-Changeability*

Components of the System, having the same part number, ***shall*** be interchangeable with respect to form, fit and function.

3.2.4.2.6 *Resource Allocation and Reserve*

The System's computing equipment ***shall*** have reserve of memories, input/output channels, and processing throughput. To the extent practicable the following is desirable:

a) Have a 50 % reserve of resources, including all memories, input/output channels, and processing throughput.

Note: *1, All processors and input/output channels should have 50 % idle time), at the time of acceptance;*

Note: *2. Memory devices include program load and database storage devices such as ROM or EPROM's.*

b) Have expansion slots to provide the capability to expand fitted memory by 100 %.

c) Have expansion slots to provide the capability to add at least two additional interfaces or processing devices.

3.2.4.2.7 *Expansion Capabilities*

The System ***shall*** have the capability of being expanded to allow additional workstations if required.

3.2.5 Site Particulars

Locations of the current operational sites are provided in Appendix A

3.3 DESIGN AND CONSTRUCTION CHARACTERISTICS

3.3.1 Safety

3.3.1.1 General

The following provisions apply:

a) The System ***shall*** be designed for safe operation.

b) All safety hazards ***shall*** be clearly marked and appropriately displayed.

3.3.1.2 Personnel Safety

The Equipment ***shall*** incorporate designed-in features to provide for the safety of personnel engaged in installing, operating, and maintaining the System. This includes the following safety measures:

a) All protruding edges ***shall*** be eliminated or suitably protected.

b) The Equipment ***shall*** be designed to protect personnel from accidental contact with voltages in excess of 30 Volts, RMS or DC, during Equipment operation.

c) The Equipment ***shall*** be designed that all external parts, surfaces and shields are at ground potential during normal operation.

d) Safety interlocks ***shall*** be used in transmitting equipment cabinets that employ doors or cover plates to protect areas where lethal voltages, in excess of 300 Volts RMS or high amperage DC, are widely used or where the risk of exposure to high levels of non-ionizing radiation is present.

e) The Equipment assemblies operating at potentials in excess of 300 Volts RMS or DC ***shall*** be completely enclosed.

f) All areas of potential danger ***shall*** be identified and clearly marked.

3.3.1.3 Equipment Safety

3.3.1.3.1 *Fail-Safe*

Fuses, circuit, breakers and/or current limiting circuitry ***shall*** be incorporated to protect the System from damage as a result of a failure of external connected equipment or as a result of a failure in the system itself.

3.3.1.3.2 *Over Temperature*

The following apply:

a) The maximum permitted temperature of exposed portions of the Equipment ***shall*** be +60°C with an ambient temperature of 25°C.

b) The maximum permitted temperature of front panels and operating controls ***shall*** be +43°C.

c) A temperature monitor ***shall*** be provided within the Equipment to notify the operator of over-temperature conditions in all components with heat generating circuitry.

d) The System ***shall*:**

1) Generate an alarm when an out-of tolerance condition occurs.

2) Shut down the equipment in an orderly manner, to prevent damage to the system.

3.3.1.3.3 *Electrostatic Discharge (ESD) Warnings*

All Equipment containing ESD sensitive items ***shall*** have appropriate warnings and cautions displayed.

3.3.1.3.4 *Module/Subassembly Installation*

Circuit cards and modules, within the Equipment, with the same type of connectors, ***shall*** be keyed to prevent incorrect insertion.

3.3.1.3.5 *External Connectors*

All Equipment external interfaces ***shall***, when not in use, be provided with proper covers to ensure protection against dust and/or corrosion build-up.

3.3.2 Electromagnetic Radiation

The contractor ***shall*** demonstrate that transmitting equipment radiation emissions do not exceed the field strength limit levels specified in Safety Code 6 (2009), Table 5 “Exposure Limits for Controlled Environments” for a 1 MHz to 30 MHz frequency range.

3.3.3 Electrical Design

3.3.3.1 Power Transients and Interruptions

The Equipment ***shall***:

a) Be capable of withstanding voltage transients of ± 25 % of nominal line voltage for duration of 500 milliseconds.

b) Be capable of withstanding voltage spikes of 1,000 Volts Peak for 10 µseconds.

c) Auto-return to the operator-selected configuration upon AC power restoration after an interruption.

3.3.3.2 Grounding

The Equipment grounding requirements ***shall*** be supplied in accordance with the Electrical Safety Council and associated references, prior to delivery.

3.3.3.3 Guards and Barriers

The Equipment contacts, terminals, and similar devices having voltages in excess of 70 Volts AC RMS or DC, with respect to ground, ***shall*** have barrier guards to minimize accidental contact by personnel.

3.3.3.4 Built-In-Test and Testability

3.3.3.4.1 *Testability*

The System ***shall*** be testable and ***shall*** incorporate a test capability to the extent necessary to meet the mean time to repair(MTTR) requirements stated herein.

3.3.3.4.2 *Built-In Self Test (BIST)*

The following apply:

a) The System ***shall*** incorporate a Built-in Self Test (BIST) capability to minimise repair time due to fault isolation to the maximum extent possible, to allow quick diagnosis and replacement of faulty assemblies.

b) The BIST results ***shall*** be transmitted back to the MCTS Officer's Workstation / fileserver at the MCTS Centre.

c) All displayed BIST results ***shall*** made accessible to an operator both locally and remotely.

3.3.4 Mechanical Design

3.3.4.1 Construction

The following apply:

a) The System ***shall*** be of modular construction to facilitate installation in operational and equipment spaces, where space is at a premium.

b) As a minimum the System ***shall*** consist of a mix of equipment racks, consoles and modules which will permit installation of equipment that does not require normal user intervention in equipment spaces.

3.3.4.2 Cooling Design

The following apply:

a) Free convection and radiation to the extent practical ***shall*** provide cooling for the System.

b) When cooling is required to meet the environmental conditions, the Equipment ***shall*** be designed for indirect forced-air cooling.

3.3.5 Materials, Processes and Parts

3.3.5.1 General

The following apply:

a) All materials and parts ***shall*** be of proven design, such that performance, reliability and accuracy are readily verifiable, are in accordance with the safety provisions.

b) Spare parts ***shall*** be commercially available.

c) Use of proprietary parts and materials ***shall*** be approved by the Technical Authority.

3.3.5.2 Restricted Materials

3.3.5.2.1 *Combustibles*

No materials capable of supporting combustion or causing an explosion ***shall*** be used.

3.3.5.2.2 *Lubricants*

The following apply:

a) Lubricants used in the System ***shall*** be suitable for the purpose intended and ***shall*** be chemically inert with regard to the material they contact.

b) The use of graphite lubricants ***shall*** require Technical Authority approval.

3.3.5.2.3 *Radioactive Materials*

No radioactive materials ***shall*** be used without Technical Authority approval.

3.3.5.2.4 *Toxic Formulations*

No toxic or carcinogenic substances, as defined below, ***shall*** be used without the approval of the Technical Authority:

a) Toxic substances as defined by the Canadian Environmental Act.

b) Carcinogenic substances and processes as defined by Groups 1 and 2 in "IARC Monographs on the Evaluation of the Carcinogenic Risk in Humans".

3.3.6 Workmanship

The construction, including all parts and accessories, ***shall*** be performed in a manner that reflects meticulous workmanship and quality such that the Systems, equipment and accessories are free of physical defects.

APPENDIX A SITE LOCATIONS

Iqaluit - Marine Communication and Traffic Services Centre

Location:

- Latitude: 63° 44’ 45” N
- Longitude 68° 31’ 40” W

Iqaluit - Transmitter Site

Location:

- Latitude: 63° 43’ 42” N
- Longitude 68° 33’ 00” W

Iqaluit - Receiver Site

Location:

- Latitude: 63° 46’ 06” N
- Longitude 68° 31’ 52” W

Resolute Bay - Receiver Site

Location:

- Latitude: 74° 43’ 17” N
- Longitude 95° 00’ 00” W

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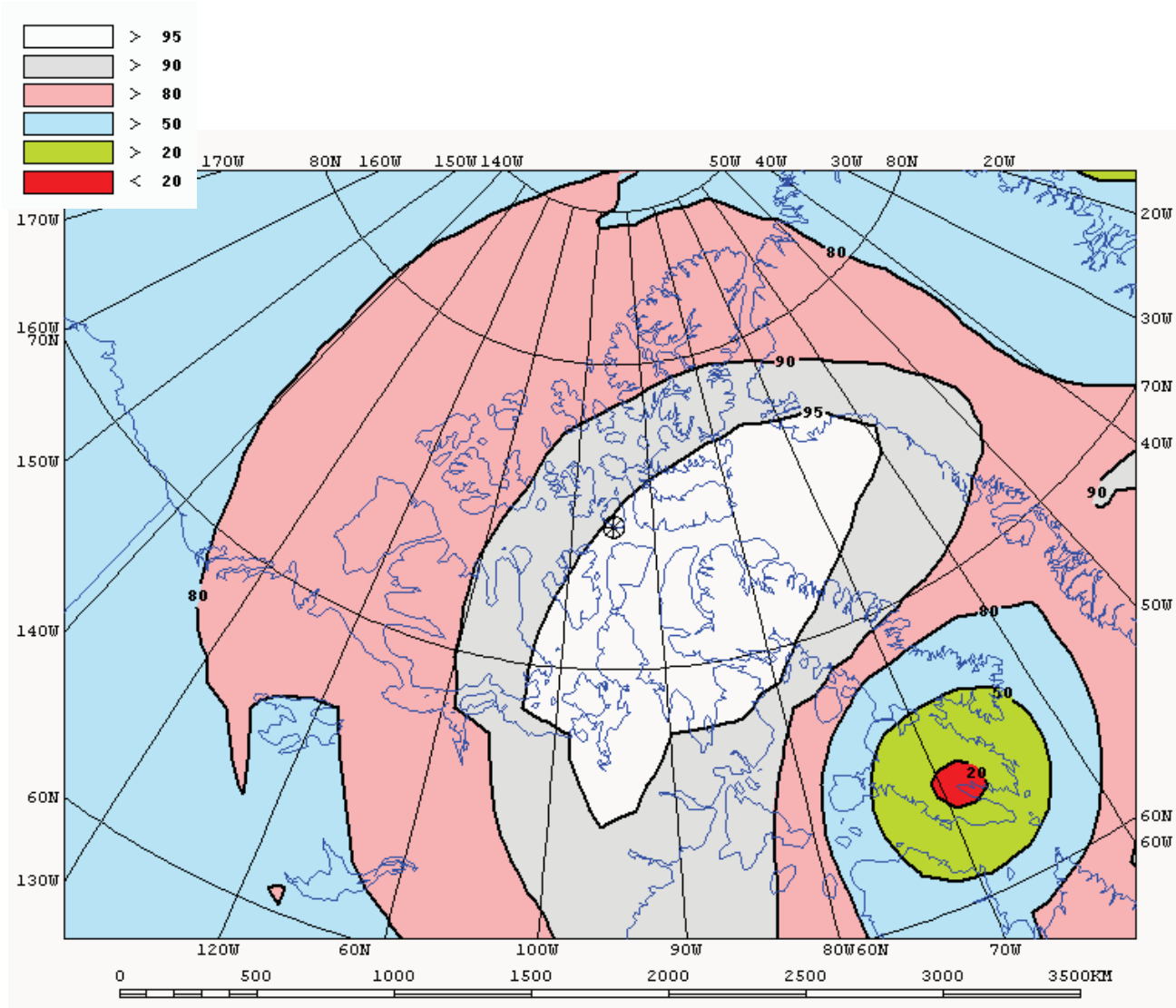
APPENDIX B COVERAGE DIAGRAMS

NBDP Reception coverage for the HF8 and HF12 frequencies per Table 3-1

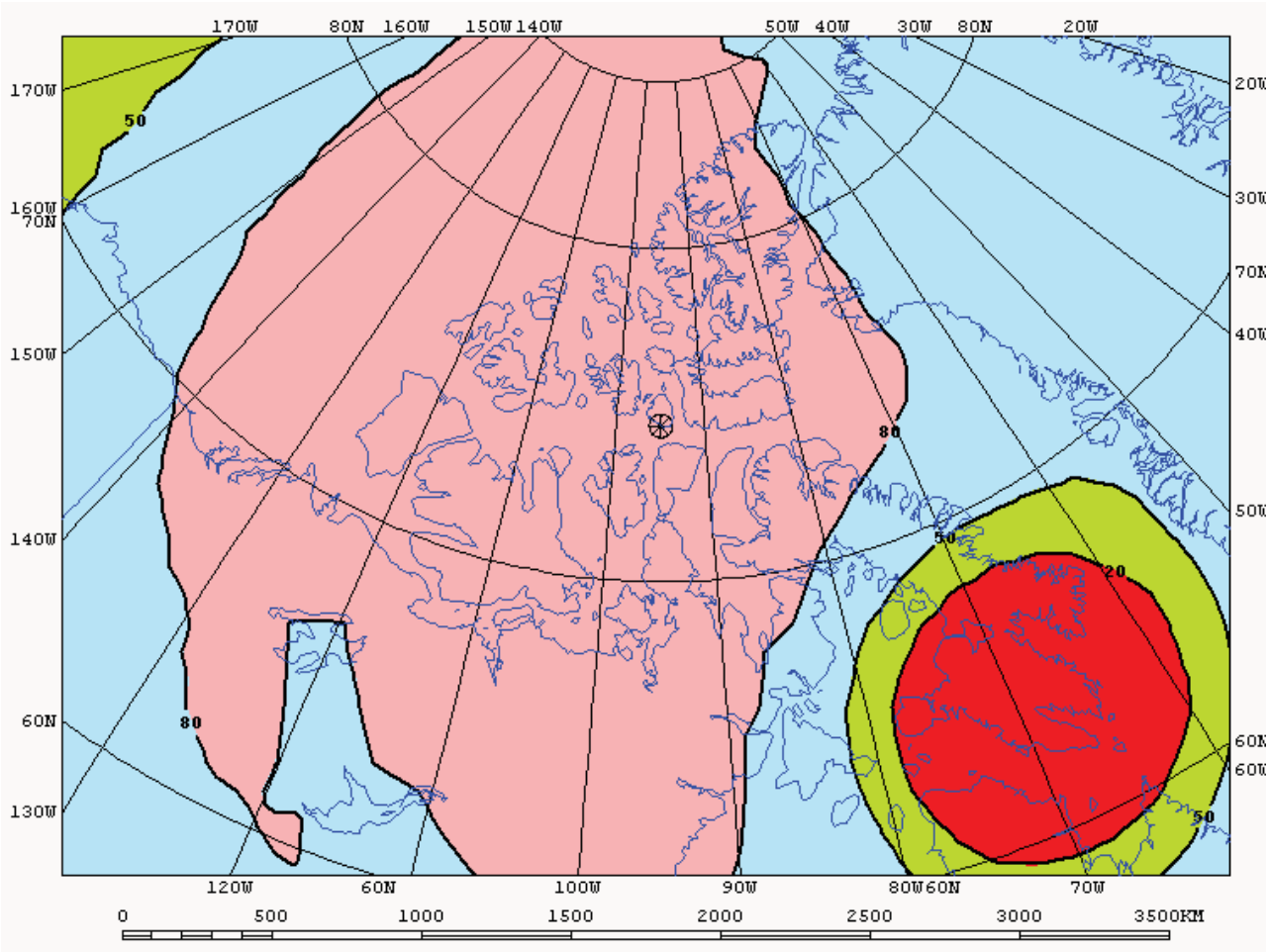
Iqaluit Transmitter Site: Frequency 8376.5 kHz

Coverage Code:



Iqaluit Transmitter Site: Frequency 12520 kHz

Coverage Code



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APPENDIX C LIST OF ACRONYMS

AFSK	Audio Frequency Shift Keying
AGC	Automatic Gain Control (radio receivers)
AM	Amplitude Modulation
BFO	Beat Frequency Oscillator
BIST	Built-In Self Test
BNC	Bayonet Neill-Concelman, a common RF connector for coaxial cable
BW	Bandwidth
C&A	Central & Arctic (region)
CCE	Communications Control Equipment
CCG	Canadian Coast Guard
CSCI	Computer Software Configuration Item
CW	Continuous Wave
dB	Decibel (relative power measurement)
dBm	Decibel (relative power measurement referenced to one milliwatt)
DC	Direct Current
DFO	Department of Fisheries & Oceans
DG	Director General
DSC	Digital Selective Calling
DSP	Digital Signal Processing
DVD	Digital Versatile/Video Disk, an optical disc storage media
EIA	Electronic Industries Alliance
ES	Engineering Services
ESD	Electrostatic Discharge
FM	Frequency Oscillator
FSK	Frequency Shift Keying
GB	GigabyteGMDSS Global Maritime Distress and Safety System
GMDSS	Global Maritime Distress and Safety System
HDD	Hard disk drive, a non-volatile, random access digital data storage device
HF-DSC	High Frequency – Digital Selective Calling
Hz	Hertz
IARC	International Agency for Research on Cancer (WHO)
IF	Intermediate Frequency (radio receivers)
I/O	Input/Output
ITS	Integrated Technical Services
ITU	International Telecommunications Union

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kHz	Kilohertz, (1 000 Hz)
kW	Kilowatt (1 000 Watts)
LAN	Local Area Network
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LSB	Lower Sideband (SSB radio mode)
MCTS	Marine Communications and Traffic Services
MHz	Megahertz (1 x 10^6 Hz)
mm	Millimeter (0.001 m)
MMSI	Maritime Mobile Service Identity
mSec	Millisecond (0.001 second)
MSI	Maritime Safety Information
MTBF	Mean Time Between Failures
MTTR	Mean Time to Repair
NBDP	Narrow Band Direct Printing
PC	Personal Computer
PEP	Peak Envelope Power
PHST	Packaging, Handling, Storage, and Transportation
ppm	Parts per million, a way of quantifying small concentrations or stability
PTT	Push-to-Talk
QA	Quality Assurance
QC	Quality Control
RF	Radio Frequency
RMS	Route Mean Square
SINAD	Signal-to-noise and distortion ratio
SSB	Single Sideband
UTC	Universal Time, Coordinated (also Zulu or Greenwich Mean Time)
USB	Upper Sideband (SSB radio mode)
USB	Universal Serial Bus, a communication specification for electronic equipment
µs	Microseconds (1 x 10^{-6} seconds)
VAC	Voltage, Alternating Current
VGA	Video Graphics Array, a computer video output specification
VSWR	Voltage Standing Wave Ratio
W	Watt (power measurement)

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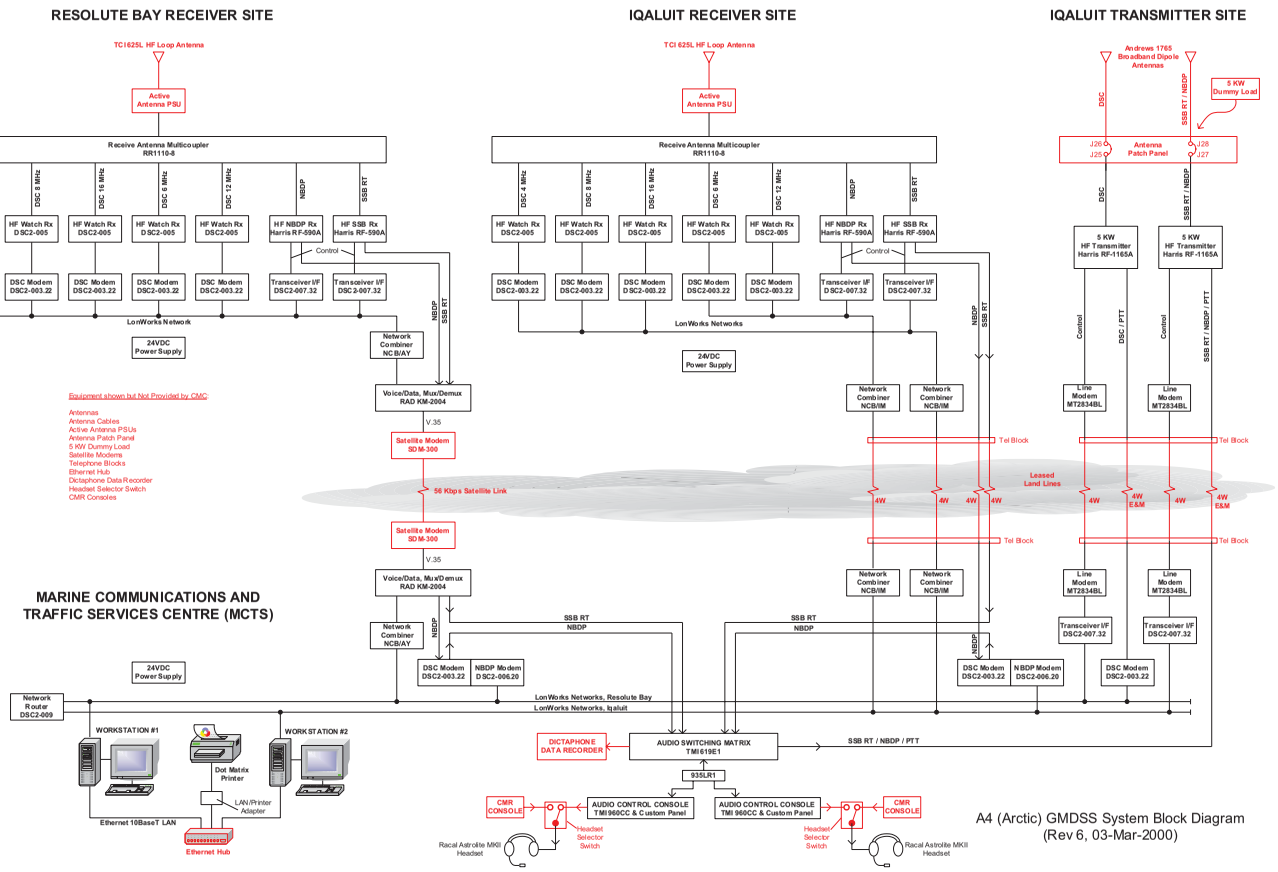
APPENDIX D DETAILED SYSTEM BLOCK DIAGRAM



Detailed System Block Diagram

ANNEX “C”

FEDERAL CONTRACTORS PROGRAM FOR EMPLOYMENT EQUITY – CERTIFICATION

High Frequency-Digital Selective Calling/Global Maritimes Distress and Safety System

F7048-130065

ANNEX "C" to PART 5 - BID SOLICITATION
FEDERAL CONTRACTORS PROGRAM FOR EMPLOYMENT EQUITY - CERTIFICATION

I, the Bidder, by submitting the present information to the Contracting Authority, certify that the information provided is true as of the date indicated below. The certifications provided to Canada are subject to verification at all times. I understand that Canada will declare a bid non-responsive, or will declare a contractor in default, if a certification is found to be untrue, whether during the bid evaluation period or during the contract period. Canada will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply with any request or requirement imposed by Canada may render the bid non-responsive or constitute a default under the Contract.

For further information on the Federal Contractors Program for Employment Equity visit Employment and Social Development Canada (ESDC)-Labour's website.

Date:_____(YYYY/MM/DD) (If left blank, the date will be deemed to be the bid solicitation closing date.)

Complete both A and B.

A. Check only one of the following:

( ) A1. The Bidder certifies having no work force in Canada.

( ) A2. The Bidder certifies being a public sector employer.

( ) A3. The Bidder certifies being a federally regulated employer being subject to the *Employment Equity Act.*

( ) A4. The Bidder certifies having a combined work force in Canada of less than 100 employees (combined work force includes: permanent full-time, permanent part-time and temporary employees [temporary employees only includes those who have worked 12 weeks or more during a calendar year and who are not full-time students]).

A5. The Bidder has a combined workforce in Canada of 100 or more employees; and

( ) A5.1. The Bidder certifies already having a valid and current Agreement to Implement Employment Equity (AIEE) in place with ESDC-Labour.

OR

( ) A5.2. The Bidder certifies having submitted the Agreement to Implement Employment Equity (LAB1168) to ESDC-Labour. As this is a condition to contract award, proceed to completing the form Agreement to Implement Employment Equity (LAB1168), duly signing it, and transmit it to ESDC-Labour.

B. Check only one of the following:

( ) B1. The Bidder is not a Joint Venture.

OR

( ) B2. The Bidder is a Joint venture and each member of the Joint Venture must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification. (Refer to the Joint Venture section of the Standard Instructions)

ANNEX “D”

Task Authorization Process
In-Service Support

High Frequency-Digital Selective Calling/Global Maritimes Distress and Safety System

F7048-130065

Task Authorization Process – In-Service Support

A Task Authorization Form PWGSC-TPSGC 572 shall be the work authorization mechanism for items on this contract.

Tasks shall be issued and authorized using the following process:

(a) The Technical Authority (TA) will contact the Contractor and request a Return Material Authorization (RMA) number;
(b) Upon receipt of the equipment the Contractor will conduct their inspection and provide the PWGSC Contracting Authority (CA) and the TA with a quote on the level of effort (LOE) to complete the task using the rates established in the Contract. The quote shall include the estimated list of repairable assemblies, sub-units and major system components and the cost to repair or replace;
(c) The TA and CA will review the proposal and decide whether or not to proceed with the repairs;
(d) If Canada does not wish to proceed with the repairs, the Contractor will return the part(s) to CCG (address to be determined by the TA) for disposal. The Contractor will provide an invoice for the Initial Inspection Cost (as per Schedule 2 – Table 5 of the Contract) and the shipping and handling charges;
(e) If the proposal is found to be fair and reasonable and Canada wishes to proceed with the work, the TA will complete a PWGSC-TPSGC 572 Task Authorization Form;
(f) The threshold for each tasking is $25,000.00 CAD including amendments. Tasks over this limit will be submitted to the CA for review and approval prior to release to the Contractor. The CA will forward the completed Task Authorization Form to the Contractor with a c.c. to the TA;
(g) If the quote is within the TA's delegation under the Contract, the TA signs the Task Authorization (572) and forwards copies to the Contractor and the CA;
(h) An amendment to the Task Authorization requires a revision to the Task Authorization Form PWGSC-TPSGC 572.
(i) If the amendment/revision is within the TA's delegation under the Contract, the TA signs the amended Task Authorization Form and forwards copies to the Contractor and the CA;
(j) If the amendment exceeds the TA's delegation under this Contract, the amended Task Authorization must be sent to the CA to be signed in accordance with the PWGSC delegation of authorities.
(k) The Contractor may not begin work before receiving the approved Task Authorization Form. Canada shall not be liable for any Work performed without a written and approved Task Authorization.

Fisheries and Oceans Canada | Pêches et Océans Canada

Canadian Coast Guard | Garde côtière canadienne

EKME #2873649
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HF-DSC/GMDSS System Replacement

ANNEX "E" - F7048-130065

SALUTI PRIMUM AUXILIO SEMPER

Canadian Coast Guard

Evaluation Criteria

Canada

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Document Control

Record of Amendments

#	Date	Description	Initials
1	25 March 2014	Final Version	GF

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Published under the Authority of:

Integrated Technical Services Directorate
Fisheries and Oceans Canada
Canadian Coast Guard
Ottawa, Ontario

K1A 0E6

EKME #2873649
HF-DSC/GMDSS BID EVALUATION PLAN

Cat. No. FsXX-XXXX/YYYY
ISBN X-XXX-XXXXX-X

Disponible en français : Remplacement du système ASN-HF/SMDSM – Critère d'èvaluation

Printed on recycled paper

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1 INTRODUCTION

1.1 GENERAL

This evaluation process is designed to select the best High Frequency-Digital Selective Calling Global Maritime Distress and Safety System (HF-DSC/GMDSS) replacement System for the best value, while also ensuring equitable and impartial treatment of all Bidders submitting a proposal to this RFP. Proposals submitted in response to the solicitation will be evaluated as detailed herein. This document defines the criteria and the scoring system that will be used to determine the winning bid for this procurement.

The evaluation process is composed of three elements:

- Technical Proposal;
- Management Proposal; and
- Financial Proposal.

Bids will be evaluated in the following order:

- Evaluation of proposal – All Terms and Conditions have been met;
- Evaluation of the mandatory technical and management requirements as detailed in Appendices A and B;
- Evaluation of the rated technical and management requirements as detailed in Appendices C and E; and
- Financial evaluation of bids.

2 TECHNICAL AND MANAGEMENT EVALUATION STRATEGY

The HF-DSC/GMDSS Replacement System proposals ***shall*** be evaluated on the basis of two types of requirements:

a) Mandatory Requirements (Appendices A and B); and

b) Rated Requirements (Appendices C and D), subject to point rating.

Some requirements in this Evaluation Plan are both Mandatory and Rated. The purpose of these dual categorizations is to solicit additional information.

2.1 TECHNICAL AND MANAGEMENT MANDATORY REQUIREMENTS

Proposals will be evaluated to confirm compliance with selected mandatory requirements of the Statement of Work (SOW), and the Technical Statement of Requirements (TSOR). Mandatory requirements will be assessed as compliant or non-compliant prior to evaluation of the point rated requirements.

Certain mandatory requirements are detailed in the Evaluation Matrices for the TSOR and SOW found in Appendices A and B respectively. Notwithstanding theses matrices, Bidders are required to confirm compliance to ***all*** mandatory requirements of the SOW and TSOR contained in those documents. For the purposes of this solicitation, mandatory requirements are those identified in the SOW and TSOR with the words '***shall***', '**must**' or '**will**'.

Failure to meet any of the mandatory requirements will result in the bid being declared non–compliant and no further evaluation will be conducted.

2.2 TECHNICAL AND MANAGEMENT RATED REQUIREMENTS

All rated requirements will be evaluated using the scoring scales and associated evaluation criteria defined in the Compliance Matrices at Appendices C and D. Details of the evaluation criterion are provided for each listed requirement. The Bidder ***shall*** provide a response as described in the "Deliverable" column with a reference that clearly explains how the requirement is met. Descriptions are to be in diagram and/or text format (e.g. menu hierarchy or description of functionality) with user interface screen captures where appropriate.

A proposal requirement ***shall*** be declared nonresponsive if it fails to provide proper and adequate details or supporting evidence required by the evaluation team to allow for an evaluation against the stated criteria.

Canada reserves the right to determine if presented functionality is useable and/or meets the stated requirements criteria.

2.3 MATRICES COMPLETION

The Bidder shall complete the compliance matrices in the appendices in full and shall confirm compliance (to mandatory requirements) and indicate down to the lowest level (e.g. paragraph number and sub paragraph number) of the supporting documentation where the compliance can be clearly identified and proven to the satisfaction of the evaluation team.

2.4 BEST-VALUE DETERMINATION METHODOLOGY

Best overall value is determined by the highest compliant combined rating of technical merit, management merit and price. The Contract Award will be made on the basis of best overall value to Canada.

2.5 POINT SCORING

Proposals that are deemed to be compliant to all mandatory requirements will be further evaluated to determine those that provide best over-all technical, management and price to the Canadian Coast Guard.

Proposals will be assigned scores out of a possible 270 points total between Technical (maximum 177 points) and Management (maximum 93 points).

Among the compliant bids, the evaluation team will make their selection using the requirements outlined in the accompanying rated evaluation matrices and the following criteria:

a) A 50% weighting factor will be used for calculating the Bidder's Technical Score (rated criteria).

b) A 30% weighting factor will be used for calculating the Bidder's Management Score (rated criteria).

c) A 20% weighting factor will be used for calculating the Bidder's Cost Score awarded for price.

d) The successful Bidder will be selected on the basis of the assessed "best value" to the Crown. The "best value" will be the proposal with the highest Total Score.

e) The Total Score is calculated from the Bidder's evaluated responses as follows:

$$\textbf{Technical Score} = \frac{\textbf{Bidders Rated Score}}{\textbf{Highest Possible Score}} \times 50$$

$$\textbf{Management Score} = \frac{\textbf{Bidders Rated Score}}{\textbf{Highest Possible Score}} \times 30$$

$$\textbf{Cost Score} = \frac{\textbf{Lowest Cost}}{\textbf{Bidders Cost}} \times 20$$

$$\textbf{Total Score} = \textbf{Technical Score} + \textbf{Management Score} + \textbf{Cost Score}$$

The successful Bidder will be the company with the highest Total Score. A fictitious example of a Best-Value Determination follows:

Table 2-1 – Best-Value Determination Example

Evaluation	Bidder 1	Bidder 2	Bidder 3
Rated Tech	144	133	148
Rated Mngmt	77	70	78
Total Cost	$130,300.00	$122,500.00	$145,500.00

SCORE CALCULATION

Bidders	Technical Score	Management Score	Cost Score	Total Score
Bidder 1	144/177 x 50 = 40.68	77/93 x 30 = 24.84	122,500/130,300 x 20 = 18.8	84.32
Bidder 2	133/177 x 50 = 37.57	70/93 x 30 = 22.58	122,500/122,500 x 20 = 20.0	80.15
Bidder 3	148/177 x 50 = 41.81	78/93 x 30 = 25.16	122,500/145,500 x 20 = 16.84	83.81

Notes:177 = highest technical score possible; 93 = the highest management score possible; and $122,500 = lowest priced proposal

Contract would be awarded to Bid #1 with the highest total score taking into consideration Technical, Management and Price components.

Note: The prices indicated are just examples and DO NOT represent an estimate of costs associated with this particular requirement. This sample exhibits how the relationship using this ratio between technical, management and price will be calculated.

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Appendix A MANDATORY TECHNICAL COMPLIANCE MATRIX

***Each mandatory requirement shall state "Compliant" in this matrix, followed by the appropriate reference in accordance with paragraph 2.3 above.**

#	TSOR Ref	Requirement Description	Evaluation	Deliverable	Proposal Ref*
1	3.1.2.	International Requirements	Review certification statement	Contractor copy of certification of compliance	
2	3.1.5.2	Operational Frequencies	System capable of all frequencies	Supporting technical documentation which demonstrates compliance	
3	3.1.6.2.2a 3.1.6.2.2c 3.1.6.2.2d 3.1.6.2.2f 3.1.6.2.2g 3.1.6.2.2n 3.1.6.2.2o.5 3.1.6.2.2p 3.1.6.2.2q.5 3.1.6.2.2r 3.1.6.2.2t	Transmitter Characteristics	Review each specific sub-paragraph in accordance with reference	Supporting technical documentation which demonstrates compliance for each sub-paragraph	
4	3.1.6.3b.	Antenna Switching Matrix	The Antenna Switching Matrix has at least a 3 x 3 switching capacity	Supporting technical documentation which demonstrates compliance	
5	3.1.6.4.1a	DSC Receiver	Able to access all six dedicated MF/HF DSC channels in two seconds or less	Supporting technical documentation which demonstrates compliance	
6	3.1.6.4.2a 3.1.6.4.2b.18 & 20	MF/HF Communications Receiver	Review in accordance with reference	Supporting technical documentation which demonstrates compliance	
7	3.1.7.2b	User Interfaces	Control Screen access to operational functions	Supporting technical documentation which demonstrates compliance	

#	TSOR Ref	Requirement Description	Evaluation	Deliverable	Proposal Ref*
8	3.1.7.4	Communication Interfaces	Review in accordance with reference	Supporting technical documentation which demonstrates compliance	
9	3.1.7.6	Audio Interfaces	Review in accordance with reference	Supporting technical documentation which demonstrates compliance	
10	3.2.1.1.1	Operational Functions General	Review in accordance with reference	Description (e.g. menu hierarchy) with graphics (e.g. screen shots)	
11	3.2.2.1	Physical Characteristics General	Modular	Supporting technical documentation which demonstrates compliance	
12	3.2.2.2	Form Factor	Fit 19" rack	Supporting technical documentation which demonstrates compliance	
13	3.2.3.2	Standard Conditions	Review in accordance with reference	Supporting technical documentation which demonstrates compliance	
14	3.2.3.3	Remote Site Equipment	Review in accordance with reference	Supporting technical documentation which demonstrates compliance	
15	3.2.3.4	MCTS Centre Equipment	Review in accordance with reference	Supporting technical documentation which demonstrates compliance	
16	3.2.4.1.2	Supportability Characteristics Reliability	Review calculations to confirm conformance	Calculation IAW TSOR and DID SE-09	
17	3.2.4.1.3	Supportability Characteristics Availability	Review calculations to confirm conformance	Calculation IAW TSOR and DID SE-09	
18	3.2.4.1.4	System Redundancy	Review design	Supporting technical documentation which demonstrates compliance	
19	3.2.4.1.5	Failure Characteristics	Review design	Supporting technical documentation which demonstrates compliance. (If the system design includes non-COTS components, these are to be included)	

#	TSOR Ref	Requirement Description	Evaluation	Deliverable	Proposal Ref*
20	3.3.3.4.2a 3.3.3.4.2b	Built-In Self Test	Review design	Supporting technical documentation which demonstrates compliance	

#	SOW Ref	Requirement Description	Evaluation	Deliverable	Proposal Ref
21	2.1.1	Significant components 100% COTS (i.e. transmitters, antenna switching matrix and receivers). COTS to mean: in production and currently in operational use	Review of reference of operational use equivalent to equipment proposed.	Reference of fielded equipment equivalent to equipment proposed.	

Appendix B MANDATORY MANAGEMENT COMPLIANCE MATRIX

***Each mandatory requirement shall state "Compliant" in this matrix, followed by the appropriate reference in accordance with paragraph 2.3 above.**

#	SOW Ref	Requirement Description	Evaluation	Deliverable	Proposal Ref*
22	3.2.1.1	Draft Project Management Plan (PMP) using DID PM-01 as a guideline	Review PMP	Management Proposal	
23	3.2.1.2	Draft Risk Management Plan using DID PM-03 as a guideline	Review Risk Management Plan	Management Proposal	
24	3.2.1.3	Draft Master Schedule included in PMP	Review Gantt chart (including logical task dependencies)	Management Proposal	
25		Project Manager must have experience in Project Management in leading the delivery of a project involving systems integration	Confirm the proposed candidate's experience meets stated requirement	Resume of the proposed Project Manager with detailed project description	

Appendix C RATED TECHNICAL REQUIREMENTS COMPLIANCE MATRIX

#	Max Score	TSOR Ref	Requirement Description	Evaluation	Deliverable	Proposal Ref
	PART 1 – TSOR REQUIREMENTS					
26	15	3.1.6.2.2.f	Transmitter Characteristics	Full power into a 2.5:1 VSWR load = 7 points Full power into a 3:1 VSWR load = 15 points	Supporting technical documentation which demonstrates compliance	
27	5	3.1.6.2.2.n	Transmitter Characteristics	Includes an IEEE 802.3 Ethernet data interface = 5 points	Supporting technical documentation which demonstrates compliance	
28	15	3.1.6.2.2.p	Transmitter Characteristics	MTBF ≥ 3,600 hours = 8 points MTBF ≥ 4,000 hours = 15 points	Supporting technical documentation which demonstrates compliance	
29	30	3.1.6.2.2.p	Transmitter Characteristics – Fielded equipment reliability	Historical MTBF data from fielded high power (≥ 1kW) transmitter supported by client references to those fielded systems. Satisfactory data/reference would be in relation to the MTBF requirements of the fielded system referred to (i.e., not necessarily those specified in 3.1.6.2.2.p of the TSOR). Experience in last 10 years: 30 pts = 3+ satisfactory MTBF data & references 20 pts = 2 satisfactory MTBF data & references 10 pts = 1 satisfactory MTBF data & references 0 pts = no references demonstrating fielded equipment reliability	Supporting historical data and reference contacts for listed projects. To include contact name, position, email and phone #	

#	Max Score	TSOR Ref	Requirement Description	Evaluation	Deliverable	Proposal Ref
30	5	3.1.6.4.2.b	MF/HF Receiver	Syllabic squelch = 5 points	Supporting technical documentation which demonstrates compliance	
31	5	3.1.6.4.2.b	MF/HF Receiver	Includes an IEEE 802.3 Ethernet data interface = 5 points	Supporting technical documentation which demonstrates compliance	
32	5	3.2.1.1.2h	Operator (Call) Details Window	Window presents information in a well organized so that any one of the stated information elements can be readily ascertained by an experienced operator untrained on specific system proposed = 1 point. Additional Information available on same window: Quality %, Station Freq and Vessel Freq clearly identified, Receiving station (Iqaluit or Resolute) identified. 1 Point each = 3 points Ability to manipulate message as required (e.g. file, print, copy) = 1 point	Supporting technical documentation with graphics (e.g. screen shots) which demonstrates compliance	
33	5	3.2.1.1.4h	DSC Window	Window presents information in well organized so that any one of the stated information elements can be readily ascertained by an experienced operator untrained on specific system proposed = 1 point Ability to “toggle” back and forth between sent/received calls = 3 pts. Additional info: Lat/long = 1 point	Supporting technical documentation with graphics (e.g. screen shots) which demonstrates compliance	

#	Max Score	TSOR Ref	Requirement Description	Evaluation	Deliverable	Proposal Ref
34	5	3.2.1.2	Call Handling Function	Outstanding calls are displayed in a different colour or highlighted to indicate their presence in the list = 5 points.	Supporting technical documentation with graphics (e.g. screen shots) which demonstrates compliance	
35	5	3.2.1.2e	Call Handling Function	All remote sites can be pre-programmed and accessible from the primary DSC Window = 5 points	Supporting technical documentation with graphics (e.g. screen shots) which demonstrates compliance	
36	10	3.2.1.4b	Distress Call Relay Capability	1. The call can be repeated as many times as deemed necessary (i.e. no limitation) = 3 points 2. Since the message text is the same, the procedure should require only one or two mouse clicks or other definite steps by the operator to initiate. Two or less mouse clicks/steps or equivalent simple interface = 7 points	Supporting technical documentation which demonstrates compliance	
37	10	3.2.1.5b 3.2.1.5h.3	System and Software Control Functions	1. Colours and fonts are selectable= 5 points. 2. The audio alarm is different than that of a received DSC calls = 5 points	Supporting technical documentation which demonstrates compliance	
38	15	3.2.4.1.2a	Reliability	System mean-time-between-failures (MTBF) ≥900 hours. = 5 points, ≥1,000 hours. = 10 points, ≥1,200 hours. = 15 points	Calculation IAW TSOR. Supporting technical documentation which demonstrates compliance	

#	Max Score	TSOR Ref	Requirement Description	Evaluation	Deliverable	Proposal Ref
39	15	3.2.4.2.6	Resource Allocation and Reserve	1. System has reserve of resources, including all memories, input/output channels, and processing throughput: 50% reserve = 5 points. 25% reserve = 2.5 points 2. System has expansion slots to provide the capability to expand fitted memory by 100 % expansion = 5 points 50% expansion = 2.5 points 3. System has expansion slots to provide the capability to add at least two additional interfaces or processing devices = 5 points	Supporting technical documentation which demonstrates compliance	

#	PART 2 - SOW REQUIREMENTS					
	Max Score	SOW Ref	Requirement Description	Evaluation	Deliverable	Proposal Ref
40	10	4.7.5.c	Most repairs performed by CCG staff can be accomplished using plug-in/modular assemblies.	Less than 50% = 0 points More than 50% = 5 points More than 90% = 10 points	Supporting technical documentation, pictures and calculation method which demonstrates compliance	
41	4	4.7.5.c	Most repairs performed by CCG staff can be accomplished using common tools.	Most = 2 points All = 4 points	Supporting technical documentation and calculation method which demonstrates compliance	

42	9	5.2.a	Hardware Quality Assurance.	9 pts = Is certified ISO 9001 5 pts = other well documented equivalent system	Proof of certification/documented equivalent	
43	9	5.2b	Software Quality Assurance.	9 pts = Is certified ISO 9000-3 5 pts = other well documented equivalent system	Proof of certification/documented equivalent	
	177	**SUB TOTAL**				

Appendix D RATED MANAGEMENT REQUIREMENTS COMPLIANCE MATRIX

#	Max Score	SOW Ref	Requirement Description	Evaluation	Deliverable	Proposal Ref
44	10		Proposal is coherent, clear, and concise.	The extent to which the proposal is well organized and clear; particularly, in addressing both the mandatory and rated requirements, without excess content that is not directly relevant. The proposal demonstrated a complete understanding of the requirement and clearly linked compliance to references for all mandatory and almost all (≥ 90%) rated requirements in a concise manner, such that compliance and scoring criteria could be readily applied with minimal searching of the proposal. = 10 points. The proposal demonstrated a good understanding of the requirement and clearly linked compliance to references for all mandatory and most (≥ 75%) rated requirements in a concise manner, such that compliance and scoring criteria could be readily applied without requiring undue searching of the proposal. = 5 points. The proposal demonstrated an incomplete understanding of the requirement and clearly linked compliance to references for less than all mandatory and 75% or less of the rated requirements in a concise manner such that compliance and scoring criteria could not be readily applied without requiring searching of the proposal. = 0 points.	Management Proposal and Technical Proposal	

#	Max Score	SOW Ref	Requirement Description	Evaluation	Deliverable	Proposal Ref
45	10		Bidder Experience – System Integration: The extent to which the bidder has experience with the integration of similar systems.	At least one high power (≥ 1kW), shore based, MF/HF Comms system implementation and integration within the last 10 years = 10 pts No high power, shore based, MF/HF Comms system within the last 10 years = 0 pts	Management Proposal with detailed synopsis of reference project	
46	5		Bidder Experience – Marine: The extent to which the bidder has experience providing IMO-compliant communications equipment systems to maritime clients.	In last 5 years: 5 pts = 2 projects including a GMDSS project 3 pts = 2 projects 2 pts = 1 project 0 pts = no IMO project	Management Proposal with detailed synopsis of reference projects	
47	5		Bidder Experience – Arctic: The extent to which the bidder has experience installing communications or related systems in the Arctic environment.	In last 10 years: 5 pts = 3+ comms projects 4 pts = 2 comms projects 3 pts = 1 comms project 2 pts = 1 + related project 0 pts = no Arctic project	Management Proposal with detailed synopsis of reference projects	

#	Max Score	SOW Ref	Requirement Description	Evaluation	Deliverable	Proposal Ref
48	5		Bidder Experience – Training Development: The extent to which the bidder has experience developing training material for communicatio ns systems operations and maintenance.	In last 5 years: 5 pts = 3+ courses 4 pts = 2 courses 2 pts = 1 course 0 pts = no training project	Management Proposal with detailed synopsis of training component reference projects	
49	5		Bidder Experience – Training Delivery: The extent to which the bidder has experience delivering training courses for communicatio ns systems operators and maintainers.	In last 5 years: 5 pts = 3+ courses 4 pts = 2 courses 2 pts = 1 course 0 pts = no training project	Management Proposal with description of project(s) and representative examples of training material	
50	10		Assessment of the proposed Project Manager's experience in Project Management in leading the delivery of multi site radio communicatio ns systems in the past five years.	In last 5 years: 10 pts = 4+ projects 7 pts = 3 projects 3 pts = 2 projects 0 pts = no relevant project	Resume of the proposed Project Manager with detailed synopsis of reference projects, including PM's role description	

#	Max Score	SOW Ref	Requirement Description	Evaluation	Deliverable	Proposal Ref
51	18	3.2.1	Assess the Bidder's preliminary Project Management Plan that details project delivery as defined in the SOW and TSOR. The PMP shall also include the bidder's approach to project management in the areas of: Risk Management Project Communications Schedule Management Quality Assurance	PM methodology and approach clearly covers the following elements: - Preliminary Risk Management plan (tailored to CCG, i.e., addresses at least one risk item in the area of: design, implementation, installation or project scheduling which are specific to this project.) = 0 - 5 points - Preliminary Communications plan (internal and external to: sub-contractors and CCG) = 0 - 5 points: Clarity and feasibility internal = 0 - 2.5 points Clarity and feasibility external = 0 - 2.5 points - Preliminary Master Schedule with critical path items (logic, completeness and feasibility) = 0-3 points	Preliminary PMP in the required format provided in the SOW with the content stated in the Evaluation	
52	5	4.9	Post-Warranty Contractor Support.	The procedure and feasibility for arranging maintenance support on equipment in a way that supports the following equipment repair turn around: 5 points = ≤ 30 days 3 points = < 40 days 1 point = ≤ 50 days 0 points = no feasible timeline established	Management Proposal with the end-to-end process and timeline described	

#	Max Score	SOW Ref	Requirement Description	Evaluation	Deliverable	Proposal Ref
53	15	4.9	Post-Warranty Contractor Support. Bidder Experience – The extent to which the bidder has experience providing satisfactory engineering and maintenance support, including an equipment repair capability for comparable communicatio ns equipment.	Bidder's experience in last 10 years: 15 pts = 3+ satisfactory references 10 pts = 2 satisfactory references 5 pts = 1 satisfactory reference 0 pts = no references establishing this experience	Management Proposal that clearly demonstrates successful support experience for both hardware and software. Relevant client references	
54	5	4.14.6.2 & 4.14.7.1	Operational Training. Provision of computer based self-training courseware.	Computer based training available = 5 points	Management Proposal demonstrating requirement compliance, with sample of previously provided training	
	93	**SUB TOTAL**				