

**RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:**

**Bid Receiving - PWGSC / Réception des
soumissions - TPSGC**

11 Laurier St. / 11, rue Laurier

Place du Portage , Phase III

Core 0B2 / Noyau 0B2

Gatineau

Québec

K1A 0S5

Bid Fax: (819) 997-9776

**REQUEST FOR PROPOSAL
DEMANDE DE PROPOSITION**

**Proposal To: Public Works and Government
Services Canada**

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

**Proposition aux: Travaux Publics et Services
Gouvernementaux Canada**

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici sur toute feuille ci-annexée, au(x) prix indiqué(s).

Comments - Commentaires

| | | |
|---|--|--|
| Title - Sujet HF-DSC/GMDSS SYSTEM | | |
| Solicitation No. - N° de l'invitation F7048-130065/B | | Date 2015-03-18 |
| Client Reference No. - N° de référence du client F7048-130065 | | |
| GETS Reference No. - N° de référence de SEAG PW-\$\$QF-103-25028 | | |
| 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 2015-04-09 | | Time Zone Fuseau horaire Eastern Daylight Saving Time EDT |
| F.O.B. - F.A.B. Specified Herein - Précisé dans les présentes Plant-Usine: <input type="checkbox"/> Destination: <input type="checkbox"/> Other-Autre: <input checked="" type="checkbox"/> | | |
| 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 |
| Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: Specified Herein Précisé dans les présentes | | |

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address

Raison sociale et adresse du

fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution

Electronics, Simulators and Defence Systems Div.

/Division des systèmes électroniques et des systèmes de
simulation et de défense

11 Laurier St. / 11, rue Laurier

8C2, Place du Portage

Gatineau

Québec

K1A 0S5

| | |
|--|--|
| Delivery Required - Livraison exigée See Herein | Delivery Offered - Livraison proposée |
| Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur | |
| Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur | |
| Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie) | |
| Signature | Date |

TABLE OF CONTENTS

PART 1 - GENERAL INFORMATION

1. Introduction
2. Summary
3. Debriefings

PART 2 - BIDDER INSTRUCTIONS

1. Standard Instructions, Clauses and Conditions
2. Submission of Bids
3. Enquiries - Bid Solicitation
4. Applicable Laws

PART 3 - BID PREPARATION INSTRUCTIONS

1. Bid Preparation Instructions
2. Proprietary Information
3. Exchange Rate Fluctuation

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

1. Evaluation Procedures

PART 5 - CERTIFICATIONS

1. Certifications Required Precedent to Contract Award
 - 1.1 Integrity Provisions - Associated Information
 - 1.2 Federal Contractors Program for Employment Equity - Bid Certification
 - 1.3 Education and Experience Certification

PART 6 - SECURITY, FINANCIAL AND OTHER REQUIREMENTS

1. Security Requirement
2. Financial Capability

PART 7 - RESULTING CONTRACT CLAUSES

1. Requirement
 - 1.1 Optional Goods and Services
 - 1.2 Task Authorization - In-Service Support
2. Standard Clauses and Conditions
 - 2.1 General Conditions
 - 2.2 Supplemental General Conditions
3. Security Requirement
4. Term of Contract
 - 4.1 Period of Contract
 - 4.2 Delivery Date
 - 4.3 Option to Extend the Contract - In-Service Support
5. Authorities

- 5.1 Contracting Authority
- 5.2 Project Authority
- 5.3 Technical Authority
- 5.4 Contractor's Representative - Project Manager
- 6. Payment
 - 6.1 Basis of Payment - Limitation
 - 6.2 Basis of Payment - Multiple Payments
 - 6.3 Basis of Payment - Limitation of Expenditure - Task Authorizations
 - 6.4 Method of Payment - Milestones
- 7. Invoicing Instructions
- 8. Certifications
 - 8.1 Compliance
 - 8.2 Federal Contractors Program for Employment Equity - Default by the Contractor
- 9. Applicable Laws
- 10. Priority of Documents
- 11. Foreign Nationals
 - 11.1 Foreign Nationals (Canadian Contractor)
 - 11.2 Foreign Nationals (Foreign Contractor)
- 12. Procedures for Design Change or Additional Work
 - 12.1 When Canada requests design change or additional work
 - 12.2 When the Contractor requests design change or additional work
 - 12.3 Approval
- 13. Insurance
- 14. Preparation for Delivery
- 15. Transportability & Portability
- 16. Transportation of Hazardous Materials
- 17. Shipping Instructions - Delivery at Destination
- 18. Inspection and Acceptance
- 19. Copyright
- 20. Translation of Documentation
- 21. Harrassment in the Workplace
- 22. Access to Information

List of Schedules and Annexes:

- Schedule 1 Line Item Pricing Schedule
- Schedule 2 Rates for In-Service Support (Optional)
- Annex "A" Statement of Work for HF-DSC/GMDSS System Replacement
- Annex "B" Technical Statement of Requirements for HF-DSC/GMDSS System Replacement
- Annex "C" Federal Contractors Program for Employment Equity - Certification
- Annex "D" Task Authorization Process - In-Service Support
- Annex "E" Evaluation Plan

HIGH FREQUENCY-DIGITAL SELECTIVE CALLING/GLOBAL MARITIMES DISTRESS AND SAFETY SYSTEM (HF-DSC/GMDSS)

This bid solicitation cancels and supersedes previous bid solicitation number F7048-130065/A dated 3 July 2014 with a closing of 31 October 2014 at 02:00pm. A debriefing or feedback session will be provided upon request to bidders/offerors/suppliers who bid on the previous solicitation.

PART 1 - GENERAL INFORMATION

1. Introduction

The bid solicitation is divided into seven parts plus attachments and annexes, as follows:

- Part 1 General Information: provides a general description of the requirement;
- Part 2 Bidder Instructions: provides the instructions, clauses and conditions applicable to the bid solicitation;
- Part 3 Bid Preparation Instructions: provides bidders with instructions on how to prepare their bid;
- Part 4 Evaluation Procedures and Basis of Selection: indicates how the evaluation will be conducted, the evaluation criteria that must be addressed in the bid, and the basis of selection;
- Part 5 Certifications: includes the certifications to be provided;
- Part 6 Security, Financial and Other Requirements: includes specific requirements that must be addressed by bidders; and
- Part 7 Resulting Contract Clauses: includes the clauses and conditions that will apply to any resulting contract.

The Annexes include the Statement of Work, the Technical Statement of Requirements, the Evaluation Plan, the Federal Contractors Program for Employment Equity - Certification, Task Authorization Process and Schedules.

2. Summary

The Canadian Coast Guard (CCG) has a 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 Regions of Canada.

A complete HF-DSC/GMDSS consists of:

- a) Quantity 1 – Remote Receiver Site System in Resolute Bay, NU;
- b) Quantity 1 – Transmitter Site System in Iqaluit, NU;
- c) Quantity 1 – Receiver Site System in Iqaluit, NU;
- d) Quantity 1 – MCTS Centre System in Iqaluit, NU.

In addition to the system, the Contractor will provide spare parts, specialized test equipment, tools and software, training courses and supply training documentation. The option for In-Service Support (ISS), for 3rd and 4th line repairs, will be available for an additional two (2), three (3) year periods after the

Solicitation No. - N° de l'invitation

F7048-130065/B

Amd. No. - N° de la modif.

Buyer ID - Id de l'acheteur

103qf

Client Ref. No. - N° de réf. du client

F7048-130065

File No. - N° du dossier

103qfF7048-130065

CCC No./N° CCC - FMS No/ N° VME

initial ISS is provided for by the two (2) year warranty period. This will total up to eight (8) years of ISS support that will be offered under the same terms and conditions of the Contract.

This procurement is reserved for beneficiaries of the following Comprehensive Land Claims Agreement (CLCA): Nunavut Land Claims Agreement.

There is a Federal Contractors Program (FCP) for employment equity requirement associated with this procurement; see Part 5 - Certifications, Part 7 - Resulting Contract Clauses and the Annex named Federal Contractors Program for Employment Equity - Certification.

3. Debriefings

Bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within 15 working days of receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

PART 2 - BIDDER INSTRUCTIONS

1. Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the *Standard Acquisition Clauses and Conditions Manual* (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The 2003 (2014-03-01) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

Subsection 05.4 of 2003, Standard Instructions - Goods or Services, is amended as follows:

Delete: sixty (60) days

Insert: one hundred and twenty (120) days

2. Submission of Bids

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit by the date, time and place indicated on page 1 of the bid solicitation.

3. Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than ten (10) calendar days before the bid closing date. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as "proprietary" will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the question(s) or may request that the Bidder do so, so that the proprietary nature of the question(s) is eliminated and the enquiry can be answered to all bidders. Enquiries not submitted in a form that can be distributed to all bidders may not be answered by Canada.

4. Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the bidders.

PART 3 - BID PREPARATION INSTRUCTIONS.

1. Bid Preparation Instructions

Canada requests that bidders provide their bid in separately bound sections as follows:

- Section I: Technical and Management Bid (3 hard copies and 2 soft copies on DVD or CD in MS Word Format);
 Section II: Financial Bid (2 hard copies and 1 soft copy on DVD or CD in MS Word Format);
 Section III: Certifications (2 hard copies).

If there is a discrepancy between the wording of the soft copy and the hard copy, the wording of the hard copy will have priority over the wording of the soft copy.

Prices must appear in the financial bid only. No prices must be indicated in any other section of the bid.

Canada requests that bidders follow the format instructions described below in the preparation of their bid:

- (a) use 8.5 x 11 inch (216 mm x 279 mm) paper;
- (b) use a numbering system that corresponds to the bid solicitation.

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process Policy on Green Procurement

(<http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html>). To assist Canada in reaching its objectives, bidders should:

- 1) use 8.5 x 11 inch (216 mm x 279 mm) paper containing fibre certified as originating from a sustainably-managed forest and containing minimum 30% recycled content; and
- 2) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

Section I: Technical and Management Bid

In their technical bid, bidders should demonstrate their understanding of the requirements contained in the bid solicitation and explain how they will meet these requirements. Bidders should demonstrate their capability and describe their approach in a thorough, concise and clear manner for carrying out the work.

The technical bid should address clearly and in sufficient depth the points that are subject to the evaluation criteria against which the bid will be evaluated. Simply repeating the statement contained in the bid solicitation is not sufficient. In order to facilitate the evaluation of the bid, Canada requests that bidders address and present topics in the order of the evaluation criteria under the same headings. To avoid duplication, bidders may refer to different sections of their bids by identifying the specific paragraph and page number where the subject topic has already been addressed.

The Bidder shall provide a management proposal summarizing the management organization that will be employed including any teaming arrangements and other companies that will be involved in the performance of the Work, if applicable.

Section II: Financial Bid

The maximum funding available for the Contract resulting from the bid solicitation is **\$4,000,000.00 CAD** (Applicable Taxes extra). Bids valued in excess of this amount will be considered non-responsive. This disclosure does not commit Canada to pay the maximum funding available.

Bidders must submit their financial bid in accordance with Schedule 1 - Line Item Pricing Schedule. The total amount of Applicable Taxes must be shown separately.

Bidders shall identify clearly any costs for deliverables not included in Schedule 1. For those items to be provided at no additional cost, it shall be indicated as \$0.00 or included in a specific line item.

Section III: Certifications

Bidders must submit the certifications required under Part 5.

2. Proprietary Information

All information regarding the terms and conditions, financial and technical aspects of the Bidder's proposal, which in its opinion, are of a proprietary or commercial in confidence nature should be clearly marked "PROPRIETARY" or "COMMERCIAL IN CONFIDENCE" at the relevant clause, page or section.

Cost or Pricing Information - All cost or pricing information should be addressed ONLY in Volume II - Contractual, Price and Financial Proposal and applicable portions of Part 7 - Resulting Contract Clauses.

3. Exchange Rate Fluctuation

The requirement does not offer exchange rate fluctuation risk mitigation. Requests for exchange rate fluctuation risk mitigation will not be considered. All bids including such provision will render the bid non-responsive.

Solicitation No. - N° de l'invitation

F7048-130065/B

Amd. No. - N° de la modif.

Buyer ID - Id de l'acheteur

103qf

Client Ref. No. - N° de réf. du client

File No. - N° du dossier

CCC No./N° CCC - FMS No/ N° VME

F7048-130065

103qfF7048-130065

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

1. Evaluation Procedures

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical, management and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.

Reference Annex "E" Evaluation Plan for details.

PART 5 - CERTIFICATIONS

Bidders must provide the required certifications and associated information to be awarded a contract.

The certifications provided by bidders to Canada are subject to verification by Canada at all times. Canada will declare a bid non-responsive, or will declare a contractor in default in carrying out any of its obligations under the Contract, if any certification made by the Bidder is found to be untrue, whether made knowingly or unknowingly, during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply and to cooperate with any request or requirement imposed by the Contracting Authority may render the bid non-responsive or constitute a default under the Contract.

1. Certifications Required Precedent to Contract Award

1.1 Integrity Provisions - Associated Information

By submitting a bid, the Bidder certifies that the Bidder and its Affiliates are in compliance with the provisions as stated in Section 01 Integrity Provisions - Bid of Standard Instructions 2003. The associated information required within the Integrity Provisions will assist Canada in confirming that the certifications are true.

1.2 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "[FCP Limited Eligibility to Bid](http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml)" list (http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml) available from Employment and Social Development Canada (ESDC) - Labour's website.

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder, is a Joint Venture, appears on the "[FCP Limited Eligibility to Bid](http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml)" list at the time of contract award.

Canada will also have the right to terminate the Contract for default if a Contractor, or any member of the Contractor if the Contractor is a Joint Venture, appears on the "[FCP Limited Eligibility to Bid](http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml)" list during the period of the Contract.

The Bidder must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification, before contract award. If the Bidder is a Joint Venture, the Bidder must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification, for each member of the Joint Venture.

Solicitation No. - N° de l'invitation

F7048-130065/B

Amd. No. - N° de la modif.

Buyer ID - Id de l'acheteur

103qf

Client Ref. No. - N° de réf. du client

F7048-130065

File No. - N° du dossier

103qfF7048-130065

CCC No./N° CCC - FMS No/ N° VME

1.3 Education and Experience Certification

The Bidder certifies that all statements made with regard to the education and the experience of individuals proposed for completing the subject Work are accurate and factual, and the Bidder is aware that Canada reserves the right to verify any information provided in this regard and that untrue statements may result in the Proposal being declared non-responsive or in other action which Canada may consider appropriate.

Name of Bidder

Per Signature & Title

PART 6 - SECURITY, FINANCIAL AND OTHER REQUIREMENTS

1. Security Requirements

There is no security associated with this requirement.

2. Financial Capability

2.1 Financial Capability Requirement: The Bidder must have the financial capability to fulfill this requirement. To determine the Bidder's financial capability, the Contracting Authority may, by written notice to the Bidder, require the submission of some or all of the financial information detailed below during the evaluation of bids. The Bidder must provide the following information to the Contracting Authority within fifteen (15) working days of the request or as specified by the Contracting Authority in the notice:

- a. Audited financial statements, if available, or the unaudited financial statements (prepared by the Bidder's outside accounting firm, if available, or prepared in-house if no external statements have been prepared) for the Bidder's last three fiscal years, or for the years that the Bidder has been in business if this is less than three years (including, as a minimum, the Balance Sheet, the Statement of Retained Earnings, the Income Statement and any notes to the statements).
- b. If the date of the financial statements in (a) above is more than five months before the date of the request for information by the Contracting Authority, the Bidder must also provide, unless this is prohibited by legislation for public companies, the last quarterly financial statements (consisting of a Balance Sheet and a year-to-date Income Statement), as of two months before the date on which the Contracting Authority requests this information.
- c. If the Bidder has not been in business for at least one full fiscal year, the following must be provided:
 - i. the opening Balance Sheet on commencement of business (in the case of a corporation, the date of incorporation); and
 - ii. the last quarterly financial statements (consisting of a Balance Sheet and a year-to-date Income Statement) as of two months before the date on which the Contracting Authority requests this information.
- d. A certification from the Chief Financial Officer or an authorized signing officer of the Bidder that the financial information provided is complete and accurate.
- e. A confirmation letter from all of the financial institution(s) that have provided short-term financing to the Bidder outlining the total of lines of credit granted to the Bidder and the amount of credit that remains available and not drawn upon as of one month prior to the date on which the Contracting Authority requests this information.
- f. A detailed monthly Cash Flow Statement covering all the Bidder's activities (including the requirement) for the first two years of the requirement that is the subject of the bid solicitation, unless this is prohibited by legislation. This statement must detail the Bidder's major sources and amounts of cash and the major items of cash expenditures on a monthly basis, for all the Bidder's activities. All assumptions made should be explained as well as details of how cash shortfalls will be financed.

- g. A detailed monthly Project Cash Flow Statement covering the first two years of the requirement that is the subject of the bid solicitation, unless this is prohibited by legislation. This statement must detail the Bidder's major sources and amounts of cash and the major items of cash expenditures, for the requirement, on a monthly basis. All assumptions made should be explained as well as details of how cash shortfalls will be financed.
- 2.2** If the Bidder is a joint venture, the financial information required by the Contracting Authority must be provided by each member of the joint venture.
- 2.3** If the Bidder is a subsidiary of another company, then any financial information in 1. (a) to (f) above required by the Contracting Authority must be provided by the ultimate parent company. Provision of parent company financial information does not by itself satisfy the requirement for the provision of the financial information of the Bidder, and the financial capability of a parent cannot be substituted for the financial capability of the Bidder itself unless an agreement by the parent company to sign a Parental Guarantee, as drawn up by Public Works and Government Services Canada (PWGSC), is provided with the required information.
- 2.4** Financial Information Already Provided to PWGSC: The Bidder is not required to resubmit any financial information requested by the Contracting Authority that is already on file at PWGSC with the Contract Cost Analysis, Audit and Policy Directorate of the Policy, Risk, Integrity and Strategic Management Sector, provided that within the above-noted time frame:
- a. the Bidder identifies to the Contracting Authority in writing the specific information that is on file and the requirement for which this information was provided; and
 - b. the Bidder authorizes the use of the information for this requirement.
- It is the Bidder's responsibility to confirm with the Contracting Authority that this information is still on file with PWGSC.
- 2.5** **Other Information:** Canada reserves the right to request from the Bidder any other information that Canada requires to conduct a complete financial capability assessment of the Bidder.
- 2.6** **Confidentiality:** If the Bidder provides the information required above to Canada in confidence while indicating that the disclosed information is confidential, then Canada will treat the information in a confidential manner as permitted by the Access to Information Act, R.S., 1985, c.c. A-1, Section 20(1) (b) and (c).
- 2.7** **Security:** In determining the Bidder's financial capability to fulfill this requirement, Canada may consider any security the Bidder is capable of providing, at the Bidder's sole expense (for example, an irrevocable letter of credit from a registered financial institution drawn in favour of Canada, a performance guarantee from a third party or some other form of security, as determined by Canada).

PART 7 - RESULTING CONTRACT CLAUSES

The following clauses and conditions apply to and form part of any contract resulting from the bid solicitation.

1. Requirement

This Contract is for the provision of a High Frequency-Digital Selective Calling/Global Maritimes Distress and Safety System (HF-DSC/GMDSS) in accordance with the Statement of Work and Technical Specifications as Annexes A and B attached hereto.

1.1 Optional Goods and Services

The Contractor grants to Canada the irrevocable option to acquire the goods, services or both described at Schedule 1 - Table 2 and Schedule 2 - Tables 3, 4, and 5 of the Contract under the same conditions and at the prices and/or rates stated in the Contract. The option may only be exercised by the Contracting Authority and will be evidenced, for administrative purposes only, through a contract amendment.

The pricing for the Recommended Spare Parts List described at Schedule 1 - Table 2 and the rates for the optional In-Service Support described at Schedule 2 - Table 3, 4 and 5 will be determined after Contract Award.

1.2 Task Authorization - In-Service Support

The In-Service Support Work to be performed under the Contract will be on an "as and when requested basis" using a Task Authorization (TA), PWGSC 572. The Work described in the Task Authorization must be in accordance with the scope of the Contract.

For administrative purposes, the formal Task Authorization process has been laid out at Annex D.

2. Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the Standard Acquisition Clauses and Conditions Manual (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

2.1 General Conditions

2030 (2014-03-01), General Conditions - Goods (Higher Complexity), as amended, applies to and forms part of the Contract:

(a) Section 22 - Warranty, Paragraph 1. - replace twelve "(12) months" with "twenty-four (24) months".

(b) Section 22 - Warranty, Paragraph 2. - delete in its entirety and replace with the following:

In the event of a defect or non-conformance in any part of the Work during the warranty period, the Contractor, at the request of Canada to do so, must as soon as possible repair, replace or otherwise make good at its own option and expense the part of the Work found to be defective or not in conformance with the requirements of the Contract. In furtherance of these obligations, the Contractor shall:

i. provide a single point of contact to handle all defective equipment returns;

ii. establish and provide the procedures for handling and returning defective equipment; and

iii. provide a failure report indicating what the failed unit, module, or component was. This report shall include: Return Material Authorization (RMA) number; part number, serial number; quantity (if applicable); site location (Iqaluit MCTS Centre, TX site, RX site or Resolute RX site); description of failure; most likely cause.

2.2 Supplemental General Conditions

2.2.1 4001 (2013-01-28), Hardware Purchase, Lease and Maintenance, as amended, applies to and forms part of the Contract:

(a) Part I - Section 01 - Interpretation, Paragraph 1. "User Time", replace with 24 hours a day, 7 days a week, including statutory holidays observed by Canada at the site(s) where the hardware is being used.

(b) Part III - Section 14 - Warranty for Purchased Hardware, Paragraph 1, - replace "twelve (12) months" with "twenty four (24) months".

All other provisions of the warranty section remain in effect.

2.2.2 4003 (2010-08-16), Licensed Software, as amended, applies to and forms part of the Contract:

(a) Section 15 - Warranty, Paragraph 1. - replace "90 days" with "24 months".

All other provisions of the warranty section remain in effect.

(b) Section 12 - Acceptance, Paragraph 3(b). - replace "30 days" with "90 days".

All other provisions of the acceptance section remain in effect.

2.2.3 4006 (2010-08-16), Contractor to Own Intellectual Property Rights in Foreground Information.

3. Security Requirement

There is no security requirement associated with this requirement.

4. Term of Contract

4.1 Period of Contract

The period of the Contract is from date of Contract Award to warranty expiration.

4.2 Delivery Date

The items shall be delivered in accordance with Annex A and Annex B of the Contract.

4.3 Option to Extend the Contract - In-Service Support

The Contractor grants to Canada the irrevocable option to extend the term of the Contract by up to two (2) additional three (3) year period(s) under the same conditions as described in Annex A - Statement of Work and Annex B - Technical Statement of Requirements. The Contractor agrees that, during the extended period of the Contract, it will be paid in accordance with the applicable provisions as set out in the Basis of Payment.

Canada may exercise this option at any time by sending a written notice to the Contractor at least sixty (60) calendar days before the expiry date of the Contract. The option may only be

exercised by the Contracting Authority, and will be evidenced for administrative purposes only, through a contract amendment.

5. Authorities

5.1 Contracting Authority

The Contracting Authority for the Contract is:

Kathie Eddy
Supply Specialist
Public Works and Government Services Canada
Acquisitions Branch, DMPS
11 Laurier St., PDP III, 8C2, Stn. 22
Gatineau, QC K1A 0S5
Telephone: 819-956-0768
Facsimile: 819-956-5650
E-mail address: kathie.eddy@pwgsc.gc.ca

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

5.2 Project Authority

The Project Authority for the Contract is (to be inserted after Contract award):

Name: _____
Title: _____
Organization: _____
Address: _____

Telephone: ____-____-_____
Facsimile: ____-____-_____
E-mail address: _____

The Project Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Project Authority; however, the Project Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

5.3 Technical Authority

The Technical Authority for the Contract is:

Name: _____
Title: _____
Organization: _____
Address: _____

Telephone: ____-____-____

Facsimile: ____-____-____

E-mail address: _____

The Technical Authority named above is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Technical Authority, however the Technical Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

5.4 Contractor's Representative - Project Manager

The Contractor shall assign a Project Manager (PM) on award of the Contract who will be the prime point of contact for the PWGSC Contracting Authority (CA), CCG Project Authority and CCG Technical Authority in Canada.

The PM shall have full responsibility for the operations of the Contractor and its subcontractors in the performance of the Work and shall be authorized to accept on behalf of the Contractor any notice, consent, order, direction, decision or other communication that may be given to the Contractor.

During any working hours that the PM is absent, another Contractor representative shall be designated to perform the PM duties, and such designation shall be made known to the Crown.

6. Payment

6.1 Basis of Payment - Limitation

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm price, as specified in Schedule 1 - Line Item Pricing - Table 1 for a cost of \$ _____ (*insert the amount at contract award*). Customs duties are included and Applicable Taxes are extra.

No increase in the total liability of Canada or in the price of the Work resulting from any design changes, modifications or interpretations of the Work, will be authorized or paid to the Contractor unless these design changes, modifications or interpretations have been approved, in writing, by the Contracting Authority before their incorporation into the Work. The Contractor must not perform any work or provide any service that would result in Canada's total liability being exceeded before obtaining the written approval of the Contracting Authority. The Contractor must notify the Contracting Authority in writing as to the adequacy of this sum:

- a. when it is 75 percent committed, or
- b. four (4) months before the contract expiry date, or
- c. as soon as the Contractor considers that the contract funds provided are inadequate for the completion of the Work, whichever comes first.

If the notification is for inadequate contract funds, the Contractor must provide to the Contracting Authority a written estimate for the additional funds required. Provision of such information by the Contractor does not increase Canada's liability.

6.2 Basis of Payment - Multiple Payments

Canada will pay the Contractor upon completion and delivery of units in accordance with the payment provisions of the Contract for Schedule 1 - Table 2 - Recommended Spare Parts List Pricing (Optional) if:

- a. an accurate and complete invoice and any other documents required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
- b. all such documents have been verified by Canada;
- c. the Work delivered has been accepted by Canada.

6.3 Basis of Payment - Limitation of Expenditure - Task Authorizations

The Contractor will be reimbursed for the costs reasonably and properly incurred in the performance of the Work specified in the authorized Task Authorization (TA), as determined in accordance with the rates specified in Schedule 2 - Tables 3, 4 and 5, to the limitation of expenditure specified in the authorized TA.

Canada's liability to the Contractor under the authorized TA must not exceed the limitation of expenditure specified in the authorized TA. Customs duties are included and Applicable Taxes are extra.

No increase in the liability of Canada or in the price of the Work specified in the authorized TA resulting from any design changes, modifications or interpretations of the Work will be authorized or paid to the Contractor unless these design changes, modifications or interpretations have been authorized, in writing, by the Contracting Authority before their incorporation into the Work.

6.4 Method of Payment - Milestones

Milestone payments are applicable to this requirement as described in Schedule 1 - Table 1 and payment will be made upon complete acceptance and approval by Canada of each milestone as follows:

| Milestone | | Percentage of Contract Value |
|---------------------------------|---|------------------------------|
| MS001 | Kick-off Meeting - Agenda Meeting Minutes Approved | 3% |
| MS002 | Preliminary Design Review Complete and All Documents Approved | 5% |
| MS003 | Critical Design Review Complete and All Documents Approved | 8% |
| MS004 | System Verification Test Complete and All Documents Approved | 4% |
| MS005 | Factory Acceptance Test Complete and All Documents Approved | 10% |
| <u>System Deliveries</u> | | |
| MS006 | Remote Receiver Site System in Resolute Bay, NU | 4% |
| MS007 | Receiver Site System in Iqaluit, NU | 3% |

| | | |
|--------------|--|------------------|
| MS008 | Transmitter Site System in Iqaluit, NU | |
| 10% | | |
| MS009 | MCTS Centre System in Iqaluit, NU | 3% |
| | <u>Site Acceptance Tests</u> | |
| MS010 | Site Acceptance Test, Resolute, NU, Complete and All Documents Approved | 5% |
| MS011 | Site Acceptance Test, Iqaluit, NU, Complete and All Documents Approved | 5% |
| MS012 | Site Acceptance Test, System, Complete and All Documents Approved | 20% |
| | <u>Completion of Training Sessions</u> | |
| MS013 | All Training Sessions Complete (Operator) | 5% |
| MS014 | All Training Sessions Complete (Maintenance) | 5% |
| MS015 | Delivery of Final Documentation | 3% |
| MS016 | Project Management and Administration Complete | 3% |
| MS017 | Project Close Out | <u>2%</u> |
| | Total | 100% |

6.4.1 Canada will make milestone payments in accordance with the Schedule of Milestones detailed in the Contract and the payment provisions of the Contract if:

- a. an accurate and complete claim for payment using PWGSC-TPSGC 1111, Claim for Progress Payment, and any other document required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
- b. all the certificates appearing on form PWGSC-TPSGC 1111 have been signed by the respective authorized representatives;
- c. all work associated with the milestone and as applicable any deliverable required has been completed and accepted by Canada.

7. Invoicing Instructions

1. The Contractor must submit a claim for payment using form PWGSC-TPSGC 1111, Claim for Progress Payment.

Each claim must show:

- a. all information required on form PWGSC-TPSGC 1111;
- b. all applicable information detailed under the section entitled "Invoice Submission" of the general conditions;
- c. the description and value of the milestone claimed as detailed in the Contract.

2. The Contractor must prepare and certify one original and two (2) copies of the claim on form PWGSC-TPSGC 1111, and forward it to the Contracting Authority identified under the section entitled "Authorities" of the Contract for appropriate certification after inspection and acceptance of the Work takes place.

The Contracting Authority will then forward the original and two (2) copies of the claim to the Project Authority for certification and onward submission to the Payment Office for the remaining certification and payment action.

3. The Contractor must not submit claims until all work identified in the claim is completed.

8. Certifications

8.1 Compliance

Compliance with the certifications provided by the Contractor in its bid is a condition of the Contract and subject to verification by Canada during the term of the Contract. If the Contractor does not comply with any certification or it is determined that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, pursuant to the default provision of the Contract, to terminate the Contract for default.

8.2 Federal Contractors Program for Employment Equity - Default by the Contractor

The Contractor understands and agrees that, when an Agreement to Implement Employment Equity (AIEE) exists between the Contractor and Employment and Social Development Canada (ESDC)-Labour, the AIEE must remain valid during the entire period of the Contract. If the AIEE becomes invalid, the name of the Contractor will be added to the "[FCP Limited Eligibility to Bid](#)" list. The imposition of such a sanction by ESDC will constitute the Contractor in default as per the terms of the Contract.

9. Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

10. Priority of Documents

If there is a discrepancy between wording of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

- (a) the Articles of Agreement and its schedules;
- (b) 2030 General Conditions - Goods - High Complexity (2014-03-01);
- (c) 4001 Hardware Purchase, Lease and Maintenance (2013-01-28);
- (d) 4003 Licensed Software (2010-08-16);
- (e) 4006 Contractor to Own Intellectual Property Rights in Foreground Information (2010-08-16);
- (f) Annex A - Statement of Work for the HF-DSC/GMDSS System Replacement;
- (g) Annex B - Technical Statement of Requirements for the HF-DSC/GMDSS System Replacement;
- (h) Annex C - Federal Contractors Program for Employment Equity - Certification;

- (i) Annex D - Task Authorization Process;
- (j) the Contractor's bid dated _____ (insert date of bid).

11. Foreign Nationals

11.1 Foreign Nationals (Canadian Contractor)

The Contractor must comply with Canadian immigration requirements applicable to foreign nationals entering Canada to work temporarily in fulfillment of the Contract. If the Contractor wishes to hire a foreign national to work in Canada to fulfill the Contract, the Contractor should immediately contact the nearest Service Canada regional office to enquire about Citizenship and Immigration Canada's requirements to issue a temporary work permit to a foreign national. The Contractor is responsible for all costs incurred as a result of non-compliance with immigration requirements.

11.2 Foreign Nationals (Foreign Contractor)

The Contractor must comply with Canadian immigration legislation applicable to foreign nationals entering Canada to work temporarily in fulfillment of the Contract. If the Contractor wishes to hire a foreign national to work in Canada to fulfill the Contract, the Contractor should immediately contact the nearest Canadian Embassy, Consulate or High Commission in the Contractor's country to obtain instructions, information on Citizenship and Immigration Canada's requirements and any required documents. The Contractor is responsible to ensure that foreign nationals have the required information, documents and authorizations before performing any work under the Contract in Canada. The Contractor is responsible for all costs incurred as a result of non-compliance with immigration requirements.

12. Procedures for Design Change or Additional Work

These procedures must be followed for any design change or additional work.

12.1 When Canada requests design change or additional work:

- a. The Technical Authority will provide the Contracting Authority with a description of the design change or additional work in sufficient detail to allow the Contractor to provide the following information:
 - i. any impact of the design change or additional work on the requirement of the Contract;
 - ii. a price breakdown of the cost (increase or decrease) associated with the implementation of the design change or the performance of the additional work using either the form [PWGSC-TPSGC 1686](#), Quotation for Design Change or Additional Work, or the form [PWGSC-TPSGC 1379](#) (PDF 56KB) - ([Help on File Formats](#)) Work Arising or New Work.
 - iii. a schedule to implement the design change or to perform the additional work and the impact on the contract delivery schedule.
- b. The Contracting Authority will then forward this information to the Contractor.
- c. The Contractor will return the completed form to the Contracting Authority for evaluation and negotiation. Once agreement has been reached, the form must be signed by all

parties in the appropriate signature blocks. This constitutes the written authorization for the Contractor to proceed with the work, and the Contract will be amended accordingly.

12.2 When the Contractor requests design change or additional work:

- a. The Contractor must provide the Contracting Authority with a request for design change or additional work in sufficient detail for review by Canada.
- b. The Contracting Authority will forward the request to the Technical Authority for review.
- c. If Canada agrees that a design change or additional work is required, then the procedures detailed in paragraph 1 are to be followed.
- d. The Contracting Authority will inform the Contractor in writing if Canada determines that the design change or additional work is not required.

12.3 Approval

The Contractor must not proceed with any design change or additional work without the written authorization of the Contracting Authority. Any work performed without the Contracting Authority's written authorization will be considered outside the scope of the Contract and no payment will be made for such work.

13. Insurance

The Contractor is responsible for deciding if insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any insurance acquired or maintained by the Contractor is at its own expense and for its own benefit and protection. It does not release the Contractor from or reduce its liability under the Contract.

14. Preparation for Delivery

The packaging, handling, storage and transportation specifications for the system and its equipment shall be by the most direct and economical means consistent with best commercial practices suitable for shipment to the Arctic. In addition:

- a) Packaging shall provide adequate protection, consistent with good economy, against damage, deterioration and loss of identification during storage, handling and shipment.
- b) All packages, shipping containers and consolidation containers shall be clearly marked including:
 - 1) The full Ship-To Address (name/address/phone number).
 - 2) The full Ship-From Address (name/address/phone number).
 - 3) Shipping company reference nomenclature.

15. Transportability & Portability

The following apply:

- a) When packaged for shipping, the System shall be capable of withstanding shipping and handling environments of vibration, shock, humidity and altitude while in transit, including transport in land vehicles, aboard ship or on-aircraft without deterioration, degradation or damage.

- b) The packaging shall be capable of being tied down.

16. Transportaion of Hazardous Materials

The Contractor must label and ship goods falling within the *Hazardous Products Act*, R.S.C. 1985, c. H-3 and regulation(s) in accordance with the said Act and regulation(s) accompanied by the required material safety data sheet(s) completed in either English or French. The label must clearly identify the contents of the hazardous material and the material safety data sheet must explain what those hazards are.

17. Shipping Instructions - Delivery at Destination

Goods must be consigned to the destination specified in the Contract and delivered:

Delivered Duty Paid (DDP), Incoterms 2000 for shipments from a commercial contractor.

18. Inspection and Acceptance

The Project Authority is the Inspection Authority. All reports, deliverable items, documents, goods and all services rendered under the Contract are subject to inspection by the Inspection Authority or representative. Should any report, document, good or service not be in accordance with the requirements of the Statement of Work and to the satisfaction of the Inspection Authority, as submitted, the Inspection Authority will have the right to reject it or require its correction at the sole expense of the Contractor before recommending payment.

19. Copyright

In this section, "Material" means anything that is created by the Contractor as part of the Work under the Contract, that is required by the Contract to be delivered to Canada and in which copyright subsists. "Material" does not include anything created by the Contractor before the date of the Contract.

Copyright in the Material belongs to Canada and the Contractor must include the copyright symbol and either of the following notice on the Material: © Her Majesty the Queen in right of Canada (year) or © Sa Majesté la Reine du chef du Canada (année).

The Contractor must not use, copy, divulge or publish any Material except as is necessary to perform the Contract. The Contractor must execute any conveyance and other documents relating to copyright in the Material as Canada may require.

The Contractor must provide at the request of Canada a written permanent waiver of moral rights, in a form acceptable to Canada, from every author that contributed to the Material. If the Contractor is the author of the Material, the Contractor permanently waives its moral rights in the Material.

20. Translation of Documentation

The Contractor agrees that Canada may translate in the other official language any documentation delivered to Canada by the Contractor that does not belong to Canada under section 20. The Contractor acknowledges that Canada owns the translation and that it is under no obligation to provide any translation to the Contractor. Canada agrees that any translation must include any copyright notice and any proprietary right notice that was part of the original. Canada acknowledges that the Contractor is not responsible for any technical errors or other problems that may arise as a result of the translation.

21. Harrassment in the Workplace

21.1 The Contractor acknowledges the responsibility of Canada to ensure, for its employees, a healthy work environment, free of harassment. A copy of the Policy on Harrassment Prevention and Resolution, which is also applicable to the Contractor, is available on the Treasury Board Web site.

21.2 The Contractor must not, either as an individual, or as a corporate or unincorporated entity, through its employees or subcontractors, harass, abuse, threaten, discriminate against or intimidate any employee, contractor or other individual employed by, or under contract with Canada. The Contractor will be advised in writing of any complaint and will have the right to respond in writing. Upon receipt of the Contractor's response, the Contracting Authority will, at its entire discretion, determine if the complaint is founded and decide on any action to be taken.

22. Access to Information

Records created by the Contractor, and under the control of Canada, are subject to the Access to Information Act. The Contractor acknowledges the responsibilities of Canada under the Access to Information Act and must, to the extent possible, assist Canada in discharging these responsibilities. Furthermore, the Contractor acknowledges that section 67.1 of the Access to Information Act provides that any person, who destroys, alters, falsifies or conceals a record, or directs anyone to do so, with the intent of obstructing the right of access that is provided by the Access to Information Act is guilty of an offence and is liable to imprisonment or a fine, or both.

Schedule 1 - Line Item Pricing Schedule

All prices included herein are provided in the following currency _____.

Table 1: Firm Price

| Item | Description | Quantity | Unit Issu e | Unit Price Excluding Tax (DDP Destination) | Extended Price Excl. Tax |
|-------------|--|-----------------|----------------------------|---|---|
| 001 | Remote Receiver Site System in Resolute Bay, NU | 1 | Each | | |
| 002 | Transmitter Site System in Iqaluit, NU | 1 | Each | | |
| 003 | Remote Receiver Site System in Iqaluit, NU | 1 | Each | | |
| 004 | MCTS Centre System in Iqaluit, NU | 1 | Each | | |
| 005 | Operator Console | 1 | LOT | | |
| 006 | Project Management and Administration | 1 | LOT | | |
| 007 | Operational Training Course(s) as per Annex A - Statement of Work | 1 | LOT | | |
| 008 | Maintenance Training Course(s) as per Annex A - Statement of Work | 1 | LOT | | |

Firm Price Subtotal: _____

Solicitation No. - N° de l'invitation

F7048-130065/B

Amd. No. - N° de la modif.

Buyer ID - Id de l'acheteur

103qf

Client Ref. No. - N° de réf. du client

File No. - N° du dossier

CCC No./N° CCC - FMS No/ N° VME

F7048-130065

103qfF7048-130065

Schedule 1 - Line Item Pricing Schedule - Continued**Table 2: Recommended Spare Parts List Pricing (Optional)**

| | | | | | |
|-----|-------------------------------------|---|-----|-----|-----|
| 001 | Recommended Spare Parts List (RSPL) | 1 | LOT | TBD | TBD |
| | as per Annex A | | | | |
| | | | | | |

NOTE: It is a mandatory requirement that the Bidder provide a RSPL in accordance with Annex A - Statement of Work - Appendix C - Contract Data Requirements List and Data Item Description Reference # SC-01.

NO RSPL or pricing should be given with the RFP as the RSPL will NOT be included in the evaluation.

Schedule 2 - Rates for In-Service Support (Optional)

Table 3: Labour Rates

For any duly authorized work to be provided under the Contract, the Contractor shall be paid the following Labour Rates:

| Category | Year 2015 | Year 2016 |
|--------------------|-----------|-----------|
| | | |
| Project Management | TBD | TBD |

Table 4: Material Handling Markup Rates

For any duly authorized work to be provided under the Contract, the Contractor shall be paid the following Markup rates:

| Description | Year 2015 | Year 2016 |
|--------------------------|-----------|-----------|
| | | |
| Material Handling Markup | TBD | TBD |

Table 5: Subcontract Markup

| Part Description | Year 2015 | Year 2016 |
|--------------------|-----------|-----------|
| | | |
| Subcontract Markup | TBD | TBD |

NOTE: The pricing for the Labour Rates for In-Service Support, Material Handling Markup and Subcontract Markup shall be negotiated after contract award. These rates shall NOT form part of the financial evaluation and, as such, shall NOT be included in the total bid price.



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

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

© Her Majesty the Queen in Right of Canada, 2015

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 |
| 4 | 20 February 2015 | Update for ISS | GA/GF |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Approvals

| | | |
|--|-------------------|--------------------------------|
| Project Manager, Electronics & Informatics | Garret Furlong | Approved: _____ Date: _____ |
| Technical Authority, Electronics & Informatic Services | Harold Farrenkopf | Approved: _____ Date: _____ |
| Asset Class Manager, Electronics & Informatics | Andrew McGregor | Approved: _____ Date: _____ |
| A/ Manager, Electronics & Informatics, Land | Jean Delisle | Approved: _____ Date: _____ |
| Director, Electronics & Informatics | Sam Ryan | Approved: _____ Date: _____ |

Table of Contents

INTRODUCTION 1

| | | |
|-----|-------------------------------|---|
| 1.1 | PURPOSE | 1 |
| 1.2 | SCOPE | 1 |
| 1.3 | OPERATIONAL REQUIREMENT | 1 |
| 1.4 | APPLICABLE DOCUMENTS | 1 |
| 1.5 | DOCUMENT CONSISTENCY | 2 |

2 CONTRACT DELIVERABLES..... 3

| | | |
|-------|----------------------------|---|
| 2.1 | PROJECT DELIVERABLES | 3 |
| 2.1.1 | Equipment | 3 |
| 2.1.2 | Spare Parts..... | 3 |
| 2.1.3 | Training | 3 |
| 2.1.4 | Documentation | 3 |

3 PROJECT MANAGEMENT..... 4

| | | |
|--------|--|----|
| 3.1 | PROJECT TEAM IDENTIFICATION | 5 |
| 3.1.1 | Contractor's Team..... | 5 |
| 3.1.2 | Use of Sub-Contractors | 5 |
| 3.2 | PROJECT REVIEW AND CONTROL | 5 |
| 3.2.1 | Project Management and Risk Management Plans | 5 |
| 3.2.2 | Not Allocated | 6 |
| 3.2.3 | Project Review and Meetings | 6 |
| 3.2.4 | Conduct of Meetings | 6 |
| 3.2.5 | Kick-Off Meeting..... | 7 |
| 3.2.6 | Preliminary Design Review..... | 8 |
| 3.2.7 | Critical Design Review | 9 |
| 3.2.8 | Project Progress Review..... | 10 |
| 3.2.9 | Spares Provisioning Meeting..... | 11 |
| 3.2.10 | Installation Readiness Review..... | 11 |
| 3.2.11 | Final Project Review Meeting | 11 |
| 3.2.12 | Additional Progress Review Meetings | 12 |
| 3.2.13 | Project Reporting and Communications..... | 12 |

4 TESTING..... 13

| | | |
|-------|--|----|
| 4.1 | GENERAL | 13 |
| 4.2 | TEST PLANS AND PROCEDURES | 13 |
| 4.3 | FAILURES DURING TESTING | 14 |
| 4.4 | TEST DIAGNOSTIC ROUTINES | 14 |
| 4.5 | TESTS AT FACTORY | 14 |
| 4.5.1 | System Verification Tests | 14 |
| 4.5.2 | Factory Acceptance Test | 15 |
| 4.5.3 | Post-Factory Acceptance Test Review..... | 15 |

| | | |
|----------|--|-----------|
| 4.6 | TESTS AT SITE | 16 |
| 4.6.1 | Site Acceptance Test | 16 |
| 4.6.2 | System Commissioning Test | 17 |
| 4.7 | SUPPORT AND MAINTAINABILITY | 17 |
| 4.8 | WARRANTY SUPPORT | 18 |
| 4.8.1 | RSPL Replenishment | 18 |
| 4.9 | IN-SERVICE CONTRACTOR SUPPORT | 18 |
| 4.9.1 | In-Service Support Plan | 18 |
| 4.10 | INSTALLATION | 19 |
| 4.10.1 | Site Inspection Visits | 19 |
| 4.11 | INSTALLATION PLAN | 19 |
| 4.12 | SITE ACCESS | 19 |
| 4.13 | INSTALLATION RESPONSIBILITIES | 20 |
| 4.13.1 | Installation Support | 20 |
| 4.13.2 | Canadian Coast Guard Responsibilities | 20 |
| 4.13.3 | Contractor Responsibilities | 21 |
| 4.14 | TRAINING | 21 |
| 4.14.5 | Training Plan | 22 |
| 4.14.6 | Maintenance Training Requirements | 23 |
| 4.14.7 | Operational Training Requirements | 23 |
| 4.15 | TECHNICAL PUBLICATIONS | 24 |
| 4.15.2 | System Operations Manual | 24 |
| 4.15.3 | System Maintenance Manual | 24 |
| 4.15.4 | Submission of Manuals | 24 |
| 4.15.5 | Software Documentation | 25 |
| 4.15.6 | Asset Management System | 25 |
| 4.16 | CONFIGURATION MANAGEMENT | 25 |
| 5 | QUALITY ASSURANCE PROVISIONS | 26 |
| | APPENDIX A LIST OF ACRONYMS | 27 |
| | APPENDIX B DOCUMENTATION REQUIREMENTS | 29 |
| A.1 | GENERAL REQUIREMENTS | 29 |
| A.1.1 | Quality of Documents | 29 |
| A.1.2 | Language | 29 |
| A.1.3 | Data Rights | 30 |
| A.1.4 | Format | 30 |
| A.1.5 | Revision Control | 30 |
| | APPENDIX C CONTRACT DATA REQUIREMENTS LIST AND DATA ITEM DELIVERABLES | 31 |
| PM-01 | PROJECT MANAGEMENT PLAN | 35 |
| PM-02 | CONTRACTOR PROGRESS AND STATUS REPORT | 37 |
| PM-03 | RISK MANAGEMENT PLAN | 39 |
| TDM-02 | DRAWINGS AND ASSOCIATED LISTS | 41 |
| TDM-03 | EQUIPMENT INSTALLATION PLAN & DATA PACKAGE | 44 |

| | | |
|--------|------------------------------------|----|
| TDM-05 | SYSTEM MANUALS..... | 46 |
| CM-03 | REQUEST FOR CLARIFICATION | 48 |
| SE-09 | RELIABILITY DATA | 49 |
| TE-02 | TEST PLAN AND REPORT | 50 |
| TE-03 | ACCEPTANCE TEST PROCEDURES..... | 51 |
| | TE-03 Example Test Sheet | 53 |
| SC-01 | RECOMMENDED SPARE PARTS LIST | 54 |
| TT-03 | TRAINING MANUALS | 56 |

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 one week 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-in¹ 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-DSC/GMDSS 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

In the System Maintenance Concept the Contractor *shall* include a description of 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

- 4.12.1 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 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

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 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 Contractor Responsibilities

- 4.13.3.1 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 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 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 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 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 (as per timings at 4.14.6. and 4.14.7.).

4.14.6 Maintenance Training Requirements

- 4.14.6.1 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 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 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 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) |

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

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 | | 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: <ul style="list-style-type: none">• 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 <i>shall</i> 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 Eng* | Training - 2 weeks | R | *Only the final submission of the <i>Operational Training and Maintenance Training manuals shall</i> be in both English and French. | | | | |
| Nil | Training Plan | 4.14.2 | Twice | Eng* | IRR -3 weeks | IRR + 2 weeks | R | *Contractor format IAW 4.14.2 – no associated DID | | | | |
| Maintenance | | | | | | | | | | | | |
| Nil | System Maintenance Concept (including In Service Support Plan) | 3.2.6.5, 4.7 | Twice | Eng* | With bid | 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 <i>shall</i> 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 <i>shall</i> contain sufficient detail to fully address the information requirements herein. 4.3 The Project Management Plan <i>shall</i> include the following information <i>as a minimum</i> : 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 <i>shall</i> 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 |
| <div><div>4.3.4.3 Work Progress Monitoring and Control</div><div>4.3.4.4 Schedule Control</div><div>4.3.4.5 Quality Management, including description of Integration and Test Plan</div><div>4.3.4.6 Risk Management Plan (in accordance with DID PM-03)</div><div>4.3.4.7 Project Document Control</div><div>4.3.5 Issue Management, including escalation process (See DID PM-02)</div><div>4.3.6 Project Close Out</div><div>4.3.6.1 Final Project Review</div></div> | |

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 <i>shall</i> be used as an input to regular Project Progress Review meetings. | |
| 4. DATA PREPARATION INSTRUCTIONS <p>4.1 This DID is not meant to be restrictive and, with prior written agreement from Canada, may be tailored by the Contractor.</p> <p>4.2 The resulting document may be prepared in a format acceptable to Canada and <i>shall</i> contain sufficient detail to fully address the information requirements. Any parts that are not relevant to the current reporting period may be left blank.</p> <p>4.3 The report <i>shall</i> include the following information:</p> <p>4.3.1 Report Identification</p> <p>4.3.1.1 Report title, sequence number, date, Contractor</p> <p>4.3.2 Project Status</p> <p>4.3.2.1 Period covered</p> <p>4.3.2.2 Status with respect to schedule</p> <p>4.3.2.3 Significant events during the reporting period</p> <p>4.3.2.4 Reporting period Project Risk Update (attach current Risk Matrix)</p> <p>4.3.3 Project Changes</p> <p>4.3.3.1 Changes (if any) in project scope (since the previous report)</p> <p>4.3.3.2 Authorized changes (if any) to agreed schedule, technical objectives or deliverables</p> <p>4.3.3.3 Significant changes (if any) to the Contractor's organization or method of operation</p> <p>Note: Change Requests and status <i>shall</i> be tracked in the Issue Log/Action Items List</p> <p>4.3.4 Planned Next Period Activities</p> <p>4.3.4.1 Plans for activities during the following period (review Master Schedule)</p> <p>Note: If the Master Schedule has been amended since last report it <i>shall</i> be attached to this report</p> | |

| 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 <i>shall</i> 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 <i>Project Management Plan</i> . | |
| 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 <i>shall</i> contain sufficient detail to fully address the information requirements. 4.3 The report <i>shall</i> 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 |
| <div>4.3.6.5 Risk Resolution/Control</div> <div>4.3.6.6 Risk Communication</div> <div>4.3.7 Risk Mitigation Matrix (Note: to be appended to DID PM-02)</div> <div>4.3.7.1 Management Risks</div> <div>4.3.7.2 Technical Risks</div> <div>4.3.7.3 Schedule Risks</div> <div>4.3.7.4 Cost Risks</div> <div>4.3.7.5 Logistic Support Risks</div> | |

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 <p>4.1 Drawings and associated lists <i>shall</i> be compliant with the CCG Specification for Electronic Technical Data Deliverables⁴, Chapter 2. This Chapter prescribes:</p> <ul style="list-style-type: none"> • Raster Format • Vector Format • Folder and File Names • Metadata • Medium of Delivery • Data Rights (Unlimited and Limited) <p>4.2 A family tree or equipment block diagram drawing <i>shall</i> be provided that depicts, in a top-down breakdown block diagram, the parent-child relationships of the items in the drawing package.</p> <p>4.3 Equipment drawings <i>shall</i> include, <i>but not be limited to</i>, the following:</p> <ul style="list-style-type: none"> • 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 <p>4.4 Parts Lists / Bills of Material <i>shall</i> be provided in accordance with ASME Y14.34M-2008.</p> <p>4.5 The drawing package <i>shall</i> provide full design disclosure and <i>shall</i> include the drawing types as prescribed in the attached Drawing Types List example below.</p> <p>4.6 Floor plan (may be marked up copies of the CCG-supplied floor</p> | |

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 <i>shall</i> 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 <i>shall</i> contain sufficient detail to fully address the information requirements. 4.3 The Installation Plan <i>shall</i> include, <i>as a minimum</i> , 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 <i>shall</i> 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 <ul style="list-style-type: none">• Power requirements including size and type of cabling, fusing and distribution, voltage requirements and tolerances 4.4.6 Mounting specifications and requirements <ul style="list-style-type: none">• 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 |
| <p>including interconnection cable requirements, types of cable, lengths, etc.; and</p> <ul style="list-style-type: none">• Equipment separation and recommended maintenance envelope. <p>4.4.7 Environmental controls (storage and operational), including temperature, humidity, and dust.</p> <p>4.4.8 Safety provisions (as applicable)</p> <ul style="list-style-type: none">• 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 <p>4.1 This DID is not meant to be restrictive, and with prior written agreement from Canada, may be tailored by the Contractor.</p> <p>4.2 The data submission may be prepared in the Contractor's format, and <i>shall</i> contain sufficient detail to fully address the information requirements. The System Operations Manual and System Maintenance Manual may be included in a single publication.</p> <p>4.3 The System Maintenance Manual <i>shall</i> be augmented with OEM equipment manuals.</p> <p>4.4 System Operations and System Maintenance Manuals <i>shall not be generic in nature, but be specifically written for the HF-DSC/GMDSS System being installed in the Arctic.</i></p> <p>4.5 The System Manual <i>shall</i> include the following information:</p> <p>4.5.1 GENERAL INFORMATION</p> <ul style="list-style-type: none"> • 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. <p>4.5.2 Provide a separate chapter for each system including:</p> <ul style="list-style-type: none"> • 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 <i>shall</i> 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 <i>shall</i> be provided for all equipment units and sub-systems and <i>shall, as a minimum:</i> <ul style="list-style-type: none"> 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 |
| <p>manuals are to used in tandem with direct references from the Maintenance Manual;</p> <p>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;</p> <p>c) Provide functional block diagrams, mechanical drawings, and electrical schematics;</p> <p>d) Include equipment rack layouts, system interconnect diagrams, wire lists and cable layouts;</p> <p>e) Contain maintenance instructions and fault diagnostic information, including:</p> <ul style="list-style-type: none">• 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. <p>f) Include illustrated Parts List:</p> <ul style="list-style-type: none">• 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. <p>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</p> <p>h) Include a section in which all changes to original equipment manufacturer manuals are identified and documented.</p> | |

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

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 <p>4.1 This DID is not meant to be restrictive, and with prior written agreement from Canada, may be tailored by the Contractor.</p> <p>4.2 The data submission may be prepared in Contractor's format, and <i>shall</i> contain sufficient detail to fully address the information requirements.</p> <p>4.3 The Test Plan <i>shall</i> include, but not be limited to, the following information:</p> <p>4.3.1 Introduction, including purpose, scope, references, definitions, and acronyms.</p> <p>4.3.2 Organization and Management</p> <p>4.3.2.1 Organization, including key personnel.</p> <p>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.</p> <p>4.3.2.3 Methodology for the equipment and system level FATs and SATs.</p> <p>4.3.3 Test Report</p> <p>4.3.3.1 The report <i>shall</i> include a complete overview of the results covering <i>as a minimum</i>:</p> <p>4.3.3.2 General problems Encountered and action taken</p> <p>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 <i>shall</i> include TE-03 test sheets).</p> <p>4.3.3.4 Conclusions, including:</p> <ul style="list-style-type: none"> • 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 <p>4.1 This DID is not meant to be restrictive and, with prior written agreement from Canada, may be tailored by the Contractor.</p> <p>4.2 The data submission may be prepared in Contractor's format, and <i>shall</i> contain sufficient detail to fully address the information requirements. The Tests <i>shall</i> capture all requirements in the TSOR and SOW, and <i>shall</i> provide the appropriate contract reference (see example Test Sheet below)</p> <p>4.3 The Test Procedure <i>shall</i> include the following information as applicable:</p> <p>4.3.1 Test Purpose</p> <ul style="list-style-type: none"> • Asset / item to be tested • Test objective • Test witnessing • Schedule of Events <p>4.3.2 Testing Conditions</p> <ul style="list-style-type: none"> • Test Facility • Environmental Conditions • Test Equipment, Recording Equipment • Set-up, Calibration, Pre-test Checks • Operating Conditions of Test Item • Safety Precautions and Warnings <p>4.3.3 Test Procedure</p> <ul style="list-style-type: none"> • 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 |
| <div>4.3.4 Recording and Reporting</div> <div><ul style="list-style-type: none">Format for Recording Test Results (see example Test Sheet below)Data Collection and AnalysisQuality Assurance Certification</div> <div>4.3.5 Signature of Participating Organizations on Test Results</div> | |

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 <i>shall</i> 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 | | Contractor Engineering Signatory | | | | |
| Name: | | Name: | | | | |
| Signature: | | Signature: | | | | |
| Date: | | 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 | |
| <p>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 consumed.</p> <p>4.2 Item Data: The RSPL should provide the following data for each recommended item:</p> <ul style="list-style-type: none"> • 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 <p>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).</p> <p>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</p> | |

| DATA ITEM DESCRIPTION | |
|---|--|
| 1. TITLE Recommended Spare Parts List | 2. IDENTIFICATION NUMBER SC-01 |
| <p>email address in an associated company Contact Data List. Include vendor contact data in the list, if applicable.</p> <p><i>Note: The CAGE Code is known by several acronyms: CAGE, NCAGE, FSCM, NSCM</i></p> <p>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.</p> <p>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.</p> <p>4.7 Special Test Tools and Equipment and software for use in support and diagnostics <i>shall</i> be included in this list.</p> | |

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 <p>4.1 This DID is not meant to be restrictive, and with prior written agreement from Canada, may be tailored by the Contractor.</p> <p>4.2 The data submission may be prepared in the Contractor's format, and <i>shall</i> contain sufficient detail to fully address the information requirements.</p> <p>4.3 The Maintenance Student Manual <i>shall, as a minimum</i>, include the following information:</p> <ul style="list-style-type: none"> 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. <p>4.4 The Operational Student Manual <i>shall, as a minimum</i>, include the following information:</p> <ul style="list-style-type: none"> 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 <i>shall</i> be provided as part of the training package. <p>4.4.1 The operational controls and functions which should be emphasized in the course include the Workstation display, menus, graphics, controls, alarms,</p> | |

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* include 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



Fisheries and Oceans
Canada

Pêches et Océans
Canada

Canadian
Coast Guard

Garde côtière
canadienne

EKME# 2469823

HF-DSC/GMDSS System Replacement

F7048-130065



Canadian Coast Guard

***Technical Statement of
Requirements***

Canada 

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

© Her Majesty the Queen in Right of Canada, 2015

Available on CCG Intranet site at:

<http://ccg-gcc.ncr.dfo-mpo.gc.ca>

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

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 |
| 3 | 3 November 2014 | RFP Addendums | GMA |
| 4 | 16 February 2015 | Continuous watch on Routine DSC Frequencies | LHG |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Approvals

| | | |
|---|-------------------|--------------------------------|
| Technical Authority Electronics & Informatic Services | Harold Farrenkopf | Approved: _____ Date: _____ |
| Project Manager Electronics & Informatics | Garret Furlong | Approved: _____ Date: _____ |
| A/ Manager, Electronics and Informatics, Land | Jean Delisle | Approved: _____ Date: _____ |
| Director, Electronics & Informatics | Sam Ryan | Approved: _____ Date: _____ |
| | | Approved: _____ Date: _____ |

Approvals

Copyright

This document is unpublished, and the following notice is affixed to protect the Canadian Coast Guard in the event of inadvertent publication.

Copyright © 2015, Integrated Technical Support Directorate Fisheries and Oceans Canada
Canadian Coast Guard All rights reserved

No part of this document may be reproduced in any form, including photocopying or transmission electronically to any computer, without prior written consent of the Canadian Coast Guard.

The information contained in this document is confidential and proprietary to the Canadian Coast Guard and may not be used or disclosed except as expressly authorized in writing by the Canadian Coast Guard.

Trademarks

Product names that are mentioned in this document may be trademarks or registered trademarks of their respective companies and are hereby acknowledged

Table of Contents

| | |
|--|-----------|
| DOCUMENT MANAGEMENT | IX |
| 1. AUTHORITY | IX |
| 2. RESPONSIBILITY | IX |
| 3. INQUIRIES AND/OR REVISION REQUESTS | IX |
| FOREWORD XI | |
| 1. PURPOSE | XI |
| 2. SCOPE | XI |
| Chapter 1 INTRODUCTION | 1 |
| 1.1 IDENTIFICATION | 1 |
| 1.2 SYSTEM OVERVIEW..... | 1 |
| 1.3 BACKGROUND | 1 |
| 1.4 DOCUMENT OVERVIEW | 1 |
| Chapter 2 APPLICABLE DOCUMENTS..... | 2 |
| 2.1 GENERAL | 2 |
| Chapter 3 REQUIREMENTS..... | 4 |
| 3.1 SYSTEM DEFINITION | 4 |
| 3.1.1 Overview and Intended Use | 4 |
| 3.1.2 Statute Requirements..... | 4 |
| 3.1.2.1 Canadian Requirements..... | 4 |
| 3.1.2.2 International Requirements..... | 5 |
| 3.1.2.3 Electrical Safety Authority..... | 5 |
| 3.1.3 Certification of Equipment | 5 |
| 3.1.3.1 Industry Canada Certification | 5 |
| 3.1.3.2 Electrical Certification | 5 |
| 3.1.4 Quality Assurance | 5 |
| 3.1.5 Functional Description | 6 |
| 3.1.5.1 Basic Operation | 6 |
| 3.1.5.2 Operational Frequencies | 6 |
| 3.1.6 Major System Components | 7 |
| 3.1.6.1 General | 7 |
| 3.1.6.2 Transmitters..... | 7 |
| 3.1.6.3 Antenna Switching Matrix..... | 9 |
| 3.1.6.4 Receivers..... | 9 |
| 3.1.6.5 Antennas | 11 |
| 3.1.6.6 Workstation / Fileserver..... | 12 |
| 3.1.6.7 Workstation / Fileserver Display | 13 |
| 3.1.7 Interfaces | 13 |
| 3.1.7.1 Operator Console..... | 13 |
| 3.1.7.2 User Interfaces..... | 13 |
| 3.1.7.3 Electrical Interfaces..... | 13 |

Table of Contents

| | | |
|--|---|-----------|
| 3.1.7.4 | <i>Communication Interfaces</i> | 13 |
| 3.1.7.5 | <i>Network Interfaces</i> | 14 |
| 3.1.7.6 | <i>Audio Interfaces</i> | 14 |
| 3.1.7.7 | <i>System Security Interfaces</i> | 14 |
| 3.2 | CHARACTERISTICS | 15 |
| 3.2.1 | Functional & Performance Characteristics | 15 |
| 3.2.1.1 | <i>Operational Functions</i> | 15 |
| 3.2.1.2 | <i>Call Handling Function</i> | 16 |
| 3.2.1.3 | <i>Distress Call Function</i> | 18 |
| 3.2.1.4 | <i>Distress Call Relay Capability</i> | 18 |
| 3.2.1.5 | <i>System and Software Control Functions</i> | 18 |
| 3.2.2 | Physical Characteristics | 19 |
| 3.2.2.1 | <i>General</i> | 19 |
| 3.2.2.2 | <i>Form Factor</i> | 19 |
| 3.2.3 | Environmental Characteristics | 19 |
| 3.2.3.1 | <i>General</i> | 19 |
| 3.2.3.2 | <i>Standard Conditions</i> | 20 |
| 3.2.3.3 | <i>Remote Site Equipment</i> | 20 |
| 3.2.3.4 | <i>MCTS Centre Equipment</i> | 20 |
| 3.2.4 | Supportability Characteristics | 20 |
| 3.2.4.1 | <i>Operational Performance</i> | 20 |
| 3.2.4.2 | <i>Maintainability</i> | 22 |
| 3.2.5 | Site Particulars | 23 |
| 3.3 | DESIGN AND CONSTRUCTION CHARACTERISTICS | 23 |
| 3.3.1 | Safety | 23 |
| 3.3.1.1 | <i>General</i> | 23 |
| 3.3.1.2 | <i>Personnel Safety</i> | 23 |
| 3.3.1.3 | <i>Equipment Safety</i> | 24 |
| 3.3.2 | Electromagnetic Radiation | 24 |
| 3.3.3 | Electrical Design | 24 |
| 3.3.3.1 | <i>Power Transients and Interruptions</i> | 24 |
| 3.3.3.2 | <i>Grounding</i> | 25 |
| 3.3.3.3 | <i>Guards and Barriers</i> | 25 |
| 3.3.3.4 | <i>Built-In-Test and Testability</i> | 25 |
| 3.3.4 | Mechanical Design | 25 |
| 3.3.4.1 | <i>Construction</i> | 25 |
| 3.3.4.2 | <i>Cooling Design</i> | 26 |
| 3.3.5 | Materials, Processes and Parts | 26 |
| 3.3.5.1 | <i>General</i> | 26 |
| 3.3.5.2 | <i>Restricted Materials</i> | 26 |
| 3.3.6 | Workmanship | 26 |
| APPENDIX A SITE LOCATIONS | | 28 |
| Iqaluit - Marine Communication and Traffic Services Centre | | 28 |
| Iqaluit - Transmitter Site | | 28 |
| Iqaluit - Receiver Site | | 28 |
| Resolute Bay - Receiver Site | | 28 |

APPENDIX B COVERAGE DIAGRAMS 30

APPENDIX C LIST OF ACRONYMS..... 33

APPENDIX D DETAILED SYSTEM BLOCK DIAGRAM 35

List of Figures

Figure 3-1: System Block Diagram 4

Detailed System Block Diagram..... 35

List of Tables

Table 3-1 – Radio Distress and MSI Communication Frequencies 6

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:

Engineering Services, Life Cycle Manager Radio Communications
Fisheries and Oceans Canada
Canadian Coast Guard
200 Kent Street
Ottawa, Ontario
K1A 0E6

This page left intentionally blank.

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.

This page left intentionally blank.

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) ITU Recommendation ITU-R M.822-1 “Calling-Channel Loading for Digital Selective-Calling (DSC) for the Maritime Mobile Service.” This document is available at: https://www.itu.int/dms_pubrec/itu-r/rec/m/R-REC-M.822-1-199409-I!!PDF-E.pdf

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

- e) 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

- f) 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>

- g) 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

- h) Canadian Environmental Protection Act, Toxic substances.

- i) 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>

- j) 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>.
- k) 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

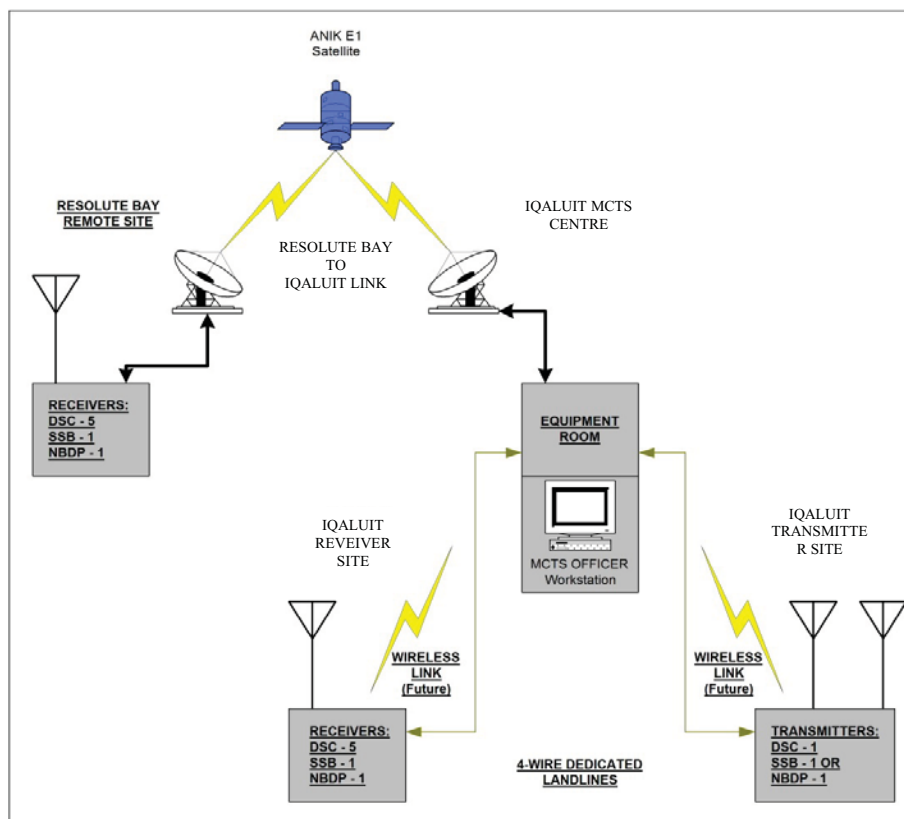


Figure 3-1: System Block Diagram

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 (This means that the equipment (i.e., the transmitters only) **shall** have obtained Industry Canada certification for RSS-181 prior to delivery to the Crown).
- b) Health and Welfare Canada – Safety Code 6 (2009).

3.1.2.2 International Requirements

The System **shall** meet the most recent¹ 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.
- d) ITU Recommendation ITU-R M.822-1.

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

Prior to 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.

¹ Review for updates at time of contract.

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.493-13.

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:

- 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.
- 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.
- 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. The MCTS Centre in Iqaluit currently uses the equipment to make test calls on the DSC frequencies listed in Table 3-1 to verify system operation and propagation conditions. The new system *shall* have the capability to place and receive Routine and test calls on the other sets of HF frequencies listed in ITU M.541-9, Annex 5, Paragraph 2.2, without interfering with the normal handling of Distress, Urgency and Safety calls.

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. | | | |

3.1.6 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: ≤ 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: The Transmitter **shall** have the capability of being configured to operate from 208 VAC ($\pm 10\%$), 3-phase, 4-wire "Y", 60 Hz (± 3 Hz). The Bidder **shall** explain, in detail, how their proposed transmitter shall meet this requirement.

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 for Distress, Urgency and Safety

- a) To guarantee the shortest possible response time to incoming DSC signals, separate receivers **shall** be employed for each of the DSC channels, for a total of five (5) active HF-DSC receivers per receiver site. Scanning receivers shall not be used;
- b) The DSC receiving functions shall meet the operational requirements of ITU Recommendation M.493;
- c) The DSC receivers **shall** be configured to allow redundant operation;

- d) The receivers **shall** be connected to a single receiving antenna through existing CCG Raven Research multicouplers (Model RR1110HF + RR265HF BP Filter); and
- e) The separate DSC receivers and associated DSC modems, **shall** be dedicated to each of the DSC frequencies shown in Table 3-1.

3.1.6.4.2 **DSC Receivers for Routine Channels**

- a) The DSC receivers used for monitoring Routine Channels, **shall** be configured to actively monitor five (5) International or National Routine DSC frequency pairs listed in ITU M.541-9, Annex 5, Paragraph 2.2, Note 2 and Note 3
- b) The DSC receiving functions shall meet the operational requirements of ITU Recommendation M.493;
- c) The DSC receivers **shall** be configured to allow redundant operation;
- d) The receivers **shall** be connected to a single receiving antenna through existing CCG Raven Research multicouplers (Model RR1110HF + RR265HF BP Filter); and
- e) The separate DSC receivers and associated DSC modems, **shall** be dedicated to each of the Routine DSC frequencies.

3.1.6.4.3 **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: ≤ 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): $0.5 \mu\text{V}$ (2.8 kHz BW, J3E Mode)
 - 14) 3 dB IF Bandwidth: ≤ 0.3 to ≥ 2.8 kHz
 - 15) 3rd Order Intercept: ≥ 28 dBm.
 - 16) Spurious Rejection: ≥ 80 dB
 - 17) AGC: ≥ 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. (Note: Dictaphone interface in Appendix D, Detailed System Block Diagram)
 - 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. The Contractor *shall* provide a complete console, 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, $\pm 10\%$, 60 Hz, three-phase, 4-wire "Y" 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. The satellite connection to Resolute is 128K Synchronous V.35 serial out of the C-Band satellite modems (Comtech SDM-300A). Latency is typical C-Band geostationary orbit using a dedicated linear transponder circuit. The V.35 is interfaced to a Rad multiplexer where the data and digitized audio *shall* be interfaced to. Bandwidth on the circuit is limited to the current bandwidths used. Currently, the individual data and audio is interfaced to discrete cards in a Rad KM2100 system. The Rad Kilomux KM2100 will be used to split the 128Kbps synchronous V.35 into 2 streams of V.35, one at 64kbps for the new Rad VMUX that is used for the Communications System and the other 56kbps V.35 synchronous serial circuit to the new HF DSC system.
- c) The UHF link will be 256kbps Synchronous V.35 serial interface. The V.35 is interfaced to a Rad multiplexer where the data is digitized with the audio. There will not be latency delays associated with this equipment as with a satellite link. The Iqaluit Receiver site will be linked at 64kbps and 56kbps for HF DSC and the Iqaluit Transmitter link will be at least 56kbps for HF DSC, but could be more since the UHF link will be 256kbps.
- d) If IP is used, there are IP cards available for the Kilomux KM2100 that can be utilized, but the bandwidth would be limited to the 56kbps limit for all of the HF DSC portion. This bandwidth would then be dedicated to the HF DSC system and QoS wouldn't be an issue because it wouldn't be shared bandwidth.

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) A Help function **shall** be available for all system features (i.e., some form of “Help” function available to the user, such as a desk-top shortcut to the user manual).
 - f) The DSC software **shall** allow for the mouse and keyboard to be used for all functions.
 - g) All menus **shall** be accessed by touch-screen and/or keyboard & mouse means.
 - 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): 0° 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 complete 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 complete System *shall* exhibit an operational availability of no less than 99.7%. The Bidder *shall* provide a preliminary system availability calculation for the complete system.
- 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 / file servers configured such that a failure of a file server 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; the 5 (five) DSC receive channels for Distress, Urgency, Safety calls; and the 5 (five) DSC channels for Routine calls.
- c) Network redundancy *shall* be provided up to the CCG single data connection at the remote sites.
- d) 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.
- e) 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, satellite link, UHF links and HF antennas 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 (only applicable when one equipment falls under the requirement stated in 3.3.1.3.2 c) *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

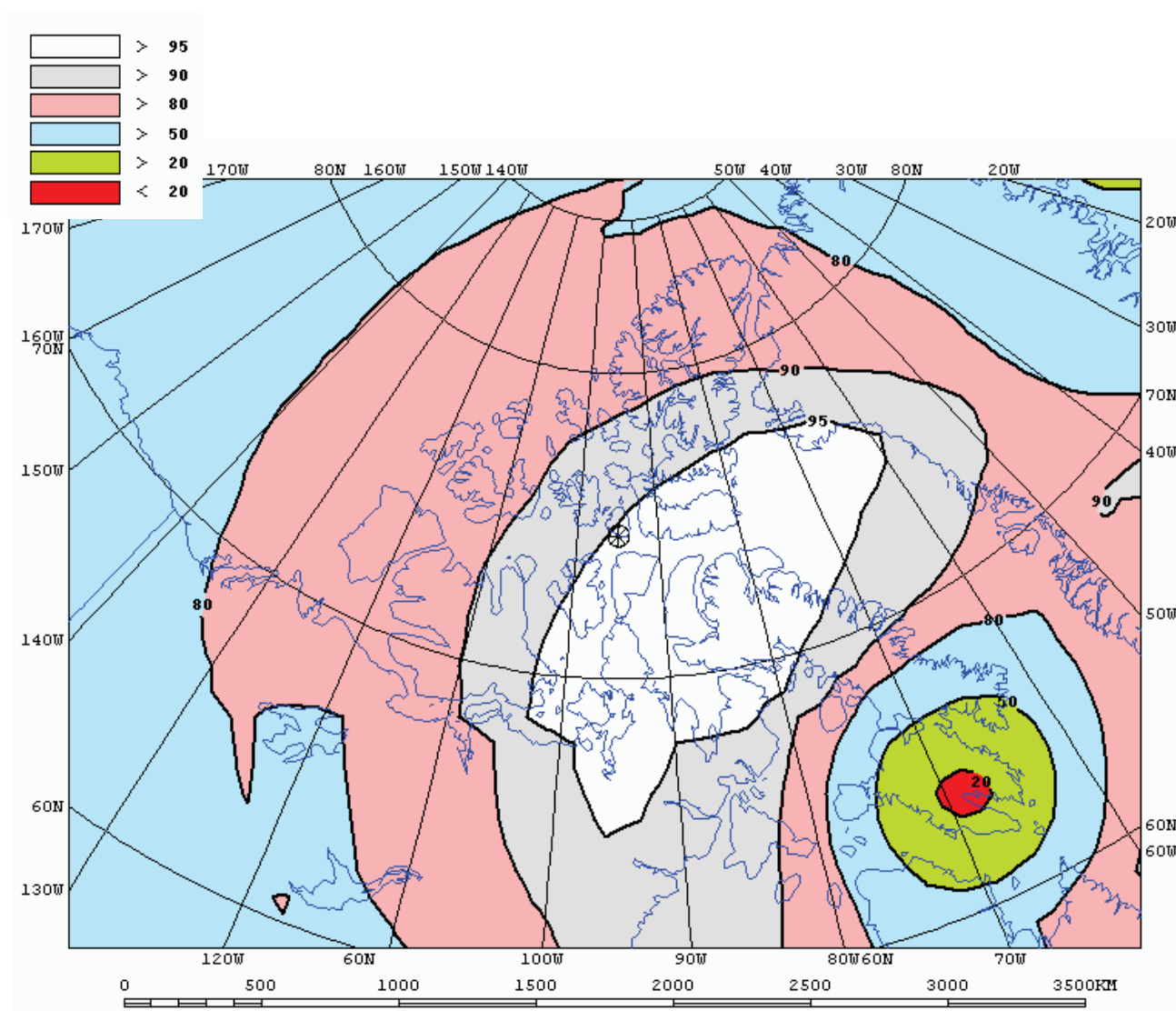
This page left intentionally blank.

APPENDIX B COVERAGE DIAGRAMS

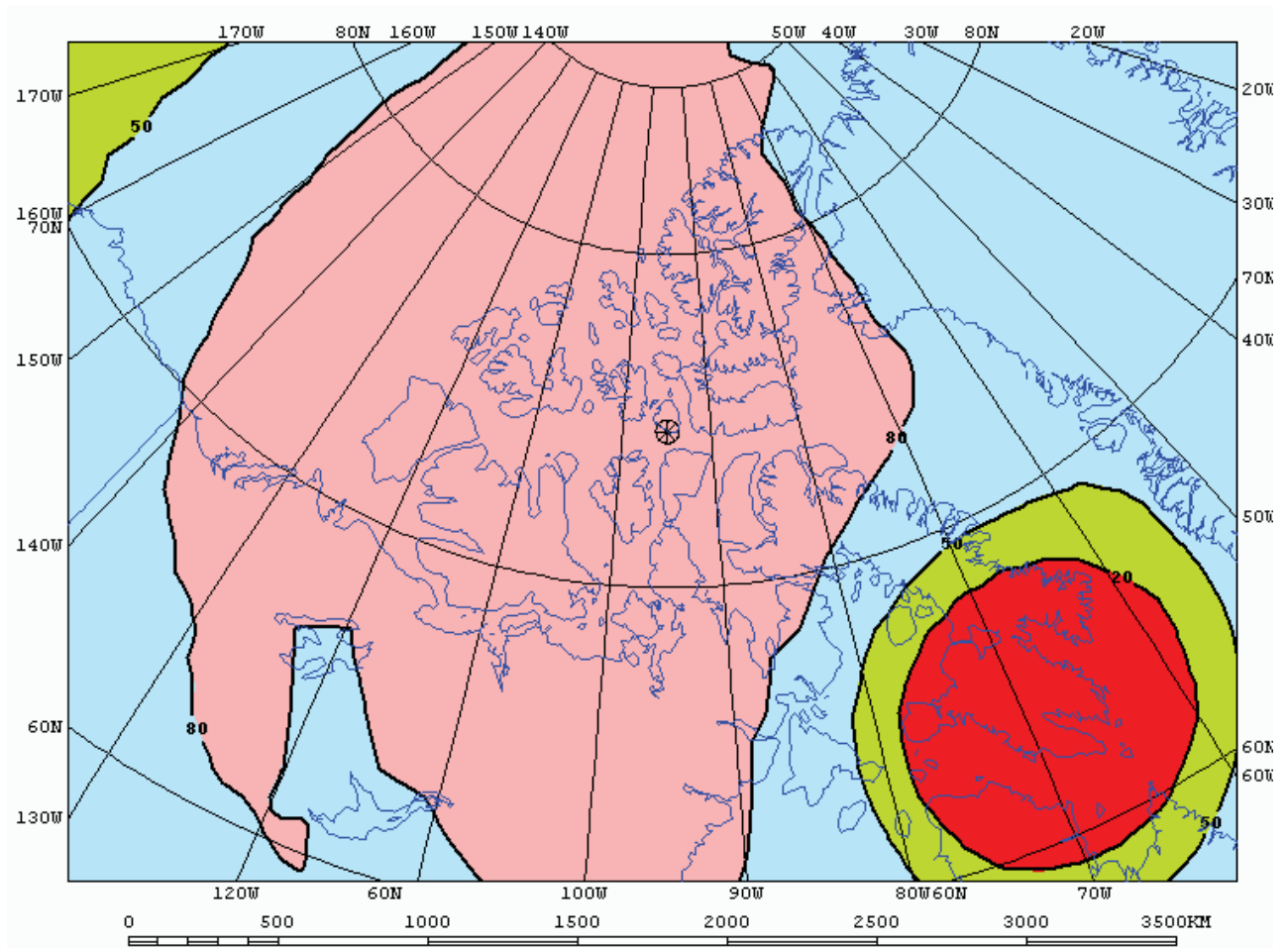
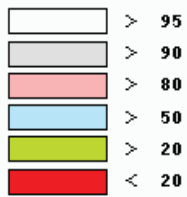
NBDP Reception coverage for the HF8 and HF12 frequencies per Table 3-1

Iqaluit Transmitter Site: Frequency 8376.5 kHz

Coverage Code:



Iqaluit Transmitter Site: Frequency 12520 kHz

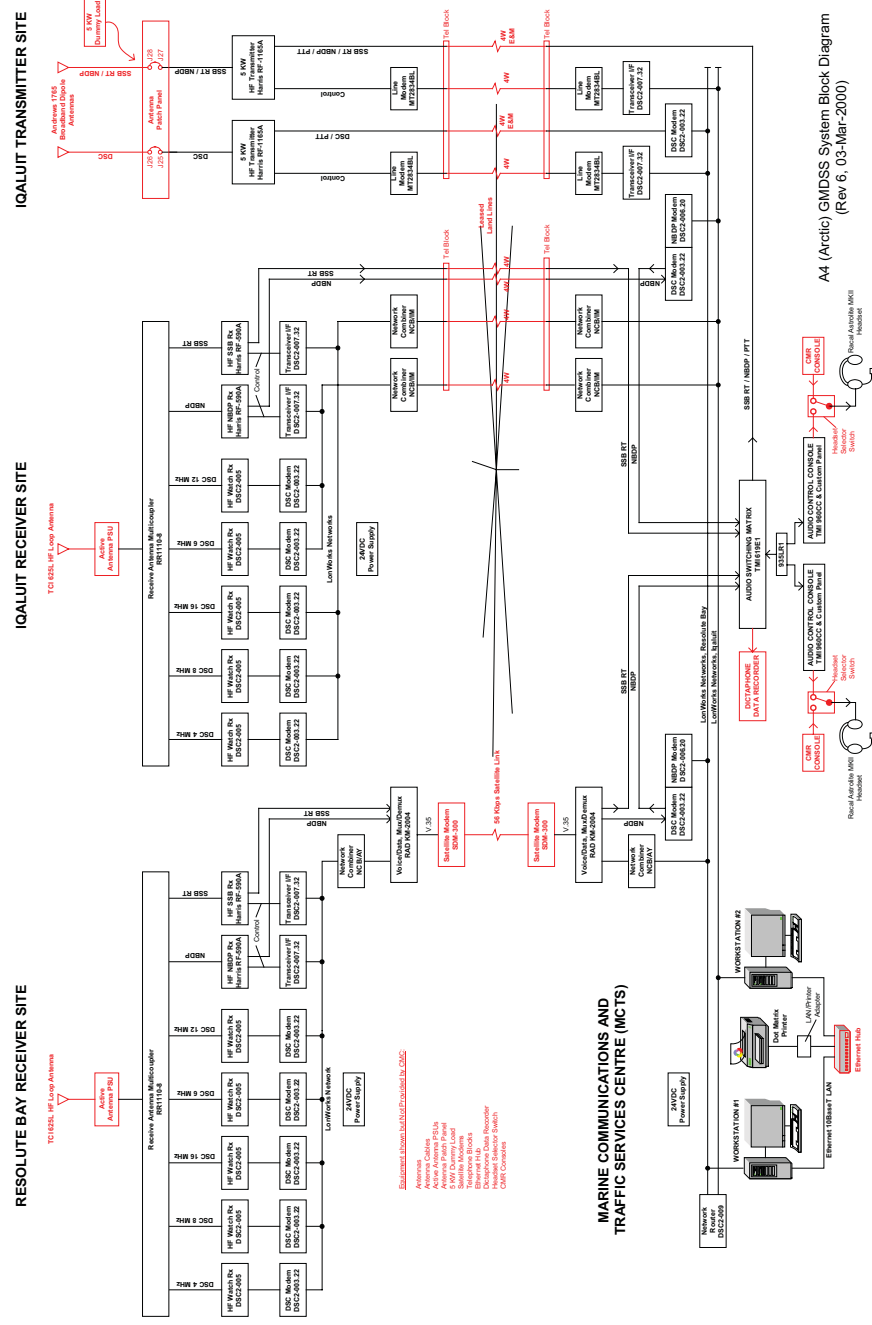
Coverage Code

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 | Gigabyte |
| GMDSS | 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 |

| | |
|---------|--|
| 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 (1×10^6 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 |
| μ s | Microseconds (1×10^{-6} seconds) |
| VAC | Voltage, Alternating Current |
| VGA | Video Graphics Array, a computer video output specification |
| VSWR | Voltage Standing Wave Ratio |
| W | Watt (power measurement) |

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.

Task Authorization Autorisation de tâche

Instruction for completing the form PWGSC - TPSGC 572 - Task Authorization
(Use form DND 626 for contracts for the Department of National Defence)

Instruction pour compléter le formulaire PWGSC - TPSGC 572 - Autorisation de tâche
(Utiliser le formulaire DND 626 pour les contrats pour le ministère de la Défense)

Contract Number

Enter the PWGSC contract number.

Numéro du contrat

Inscrire le numéro du contrat de TPSGC.

Contractor's Name and Address

Enter the applicable information

Nom et adresse de l'entrepreneur

Inscrire les informations pertinentes

Security Requirements

Enter the applicable requirements

Exigences relatives à la sécurité

Inscrire les exigences pertinentes

Total estimated cost of Task (Applicable taxes extra)

Enter the amount

Coût total estimatif de la tâche (Taxes applicables en sus)

Inscrire le montant

For revision only

Aux fins de révision seulement

TA Revision Number

Enter the revision number to the task, if applicable.

Numéro de la révision de l'AT

Inscrire le numéro de révision de la tâche, s'il y a lieu.

Total Estimated Cost of Task (Applicable taxes extra) before the revision

Enter the amount of the task indicated in the authorized TA or, if the task was previously revised, in the last TA revision.

Coût total estimatif de la tâche (Taxes applicables en sus) avant la révision

Inscrire le montant de la tâche indiquée dans l'AT autorisée ou, si la tâche a été révisée précédemment, dans la dernière révision de l'AT.

Increase or Decrease (Applicable taxes extra), as applicable

As applicable, enter the amount of the increase or decrease to the Total Estimated Cost of Task (Applicable taxes extra) before the revision.

Augmentation ou réduction (Taxes applicables en sus), s'il y a lieu

S'il y a lieu, inscrire le montant de l'augmentation ou de la réduction du Coût total estimatif de la tâche (Taxes applicables en sus) avant la révision.

1. Required Work: Complete sections A, B, C, and D, as required.

1. Travaux requis : Remplir les sections A, B, C et D, au besoin.

A. Task Description of the Work required:

Complete the following paragraphs, if applicable. Paragraph (a) applies only if there is a revision to an authorized task.

A. Description de tâche des travaux requis :

Remplir les alinéas suivants, s'il y a lieu : L'alinéa (a) s'applique seulement s'il y a révision à une tâche autorisée.

(a) Reason for revision of TA, if applicable: Include the reason for the revision; i.e. revised activities; delivery/completion dates; revised costs. Revisions to TAs must be in accordance with the conditions of the contract. See Supply Manual 3.35.1.50 or paragraph 6 of the Guide to Preparing and Administering Task Authorizations.

(a) Motif de la révision de l'AT, s'il y a lieu : Inclure le motif de la révision c.-à.-d., les activités révisées, les dates de livraison ou d'achèvement, les coûts révisés. Les révisions apportées aux AT doivent respecter les conditions du contrat. Voir l'article 3.35.1.50 du Guide des approvisionnements ou l'alinéa 6 du Guide sur la préparation et l'administration des autorisations de tâches.

(b) Details of the activities to be performed (include as an attachment, if applicable)

(b) Détails des activités à exécuter (joindre comme annexe, s'il y a lieu).

(c) Description of the deliverables to be submitted (include as an attachment, if applicable).

(c) Description des produits à livrer (joindre comme annexe, s'il y a lieu).

(d) Completion dates for the major activities and/or submission dates for the deliverables (include as an attachment, if applicable).

(d) Les dates d'achèvement des activités principales et (ou) les dates de livraison des produits (joindre comme annexe, s'il y a lieu).

B. Basis of Payment:

Insert the basis of payment or bases of payment that form part of the contract that are applicable to the task description of the work; e.g. firm lot price, limitation of expenditure, firm unit price

C. Cost of Task:

Insert Option 1 or 2:

Option 1:

Total estimated cost of Task (Applicable taxes extra): Insert the applicable cost elements for the task determined in accordance with the contract basis of payment; e.g. Labour categories and rates, level of effort, Travel and living expenses, and other direct costs.

Option 2:

Total cost of Task (Applicable taxes extra): Insert the firm unit price in accordance with the contract basis of payment and the total estimated cost of the task.

D. Method of Payment

Insert the method(s) of payment determined in accordance with the contract that are applicable to the task; i.e. single payment, multiple payments, progress payments or milestone payments. For milestone payments, include a schedule of milestones.

B. Base de paiement :

Insérer la base ou les bases de paiement qui font partie du contrat qui sont applicables à la description du travail à exécuter : p. ex., prix de lot ferme, limitation des dépenses et prix unitaire ferme.

C. Coût de la tâche :

Insérer l'option 1 ou 2

Option 1 :

Coût total estimatif de la tâche (Taxes applicables en sus) Insérer les éléments applicables du coût de la tâche établies conformément à la base de paiement du contrat. p. ex., les catégories de main d'œuvre, le niveau d'effort, les frais de déplacement et de séjour et autres coûts directs.

Option 2 :

Coût total de la tâche (Taxes applicables en sus) : Insérer le prix unitaire ferme conformément à la base de paiement du contrat et le coût estimatif de la tâche.

D. Méthode de paiement

Insérer la ou les méthode(s) de paiement établit conformément au contrat et qui sont applicable(s) à la tâche; c.-à.-d., paiement unique, paiements multiples, paiements progressifs ou paiements d'étape. Pour ces derniers, joindre un calendrier des étapes.

2. Authorization(s):

The client and/or PWGSC must authorize the task by signing the Task Authorization in accordance with the conditions of the contract. The applicable signatures and the date of the signatures is subject to the TA limits set in the contract. When the estimate of cost exceeds the client Task Authorization's limits, the task must be referred to PWGSC.

3. Contractor's Signature

The individual authorized to sign on behalf of the Contractor must sign and date the TA authorized by the client and/or PWGSC and provide the signed original and a copy as detailed in the contract.

2. Autorisation(s) :

Le client et (ou) TPSGC doivent autoriser la tâche en signant l'autorisation de tâche conformément aux conditions du contrat. Les signatures et la date des signatures appropriées sont assujetties aux limites d'autorisation de tâche établies dans le contrat. Lorsque l'estimation du coût dépasse les limites d'autorisation de tâches du client, la tâche doit être renvoyée à TPSGC.

3. Signature de l'entrepreneur

La personne autorisée à signer au nom de l'entrepreneur doit signer et dater l'AT, autorisée par le client et (ou) TPSGC et soumettre l'original signé de l'autorisation et une copie tel que décrit au contrat.



Task Authorization Autorisation de tâche

Contract Number - Numéro du contrat

| | |
|---|--|
| Contractor's Name and Address - Nom et l'adresse de l'entrepreneur | Task Authorization (TA) No. - N° de l'autorisation de tâche (AT) |
| | Title of the task, if applicable - Titre de la tâche, s'il y a lieu |
| | Total Estimated Cost of Task (Applicable taxes extra) Coût total estimatif de la tâche (Taxes applicables en sus) \$ |
| Security Requirements: This task includes security requirements Exigences relatives à la sécurité : Cette tâche comprend des exigences relatives à la sécurité <input type="checkbox"/> No - Non <input type="checkbox"/> Yes - Oui If YES, refer to the Security Requirements Checklist (SRCL) included in the Contract Si OUI, voir la Liste de vérification des exigences relative à la sécurité (LVERS) dans le contrat ▶ | |

For Revision only - Aux fins de révision seulement

| | | |
|--|--|---|
| TA Revision Number, if applicable Numéro de révision de l'AT, s'il y a lieu | Total Estimated Cost of Task (Applicable taxes extra) before the revision Coût total estimatif de la tâche (Taxes applicables en sus) avant la révision \$ | Increase or Decrease (Applicable taxes extra), as applicable Augmentation ou réduction (Taxes applicables en sus), s'il y a lieu \$ |
|--|--|---|

Start of the Work for a TA : Work cannot commence until a TA has been authorized in accordance with the conditions of the contract.

Début des travaux pour l'AT : Les travaux ne peuvent pas commencer avant que l'AT soit autorisée conformément au contrat.

1. Required Work: - Travaux requis :

| | |
|--|--|
| A. Task Description of the Work required - Description de tâche des travaux requis | See Attached - Ci-joint <input type="checkbox"/> |
| B. Basis of Payment - Base de paiement | See Attached - Ci-joint <input type="checkbox"/> |
| C. Cost of Task - Coût de la tâche | See Attached - Ci-joint <input type="checkbox"/> |
| D. Method of Payment - Méthode de paiement | See Attached - Ci-joint <input type="checkbox"/> |

Contract Number - Numéro du contrat

2. Authorization(s) - Autorisation(s)

By signing this TA, the authorized client and (or) the PWGSC Contracting Authority certify(ies) that the content of this TA is in accordance with the conditions of the contract.

The client's authorization limit is identified in the contract. When the value of a TA and its revisions is in excess of this limit, the TA must be forwarded to the PWGSC Contracting Authority for authorization.

En apposant sa signature sur l'AT, le client autorisé et (ou) l'autorité contractante de TPSGC atteste(nt) que le contenu de cette AT respecte les conditions du contrat.

La limite d'autorisation du client est précisée dans le contrat. Lorsque la valeur de l'AT et ses révisions dépasse cette limite, l'AT doit être transmise à l'autorité contractante de TPSGC pour autorisation.

Name and title of authorized client - Nom et titre du client autorisé à signer

Signature

Date

PWGSC Contracting Authority - Autorité contractante de TPSGC

Signature

Date

3. Contractor's Signature - Signature de l'entrepreneur

Name and title of individual authorized - to sign for the Contractor
Nom et titre de la personne autorisée à signer au nom de l'entrepreneur

Signature

Date



Fisheries and Oceans
Canada

Pêches et Océans
Canada

Canadian
Coast Guard

Garde côtière
canadienne

EKME #2873649

HF-DSC/GMDSS System Replacement

F7048-130065



Canadian Coast Guard
Evaluation Criteria

Canada 

Document Control

Record of Amendments

| # | Date | Description | Initials |
|---|---------------|---------------|----------|
| 1 | 06 March 2015 | Final Version | GF |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

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

© Her Majesty the Queen in Right of Canada, 2015

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



Printed on recycled paper

Table of Contents

| | | |
|-------------------|---|-----------|
| 1 | INTRODUCTION | 1 |
| 1.1 | GENERAL | 1 |
| 2 | TECHNICAL AND MANAGEMENT EVALUATION STRATEGY | 2 |
| 2.1 | TECHNICAL AND MANAGEMENT MANDATORY REQUIREMENTS | 2 |
| 2.2 | TECHNICAL AND MANAGEMENT RATED REQUIREMENTS..... | 2 |
| 2.3 | MATRICES COMPLETION | 2 |
| 2.4 | BEST-VALUE DETERMINATION METHODOLOGY | 3 |
| 2.5 | POINT SCORING..... | 3 |
| APPENDIX A | MANDATORY TECHNICAL COMPLIANCE MATRIX..... | 5 |
| APPENDIX B | MANDATORY MANAGEMENT COMPLIANCE MATRIX..... | 8 |
| APPENDIX C | RATED TECHNICAL REQUIREMENTS COMPLIANCE MATRIX..... | 9 |
| APPENDIX D | RATED MANAGEMENT REQUIREMENTS COMPLIANCE MATRIX..... | 14 |

List of Tables

| | |
|--|---|
| Table 2-1 – Best-Value Determination Example | 4 |
|--|---|

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 these 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 to their proposal 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 265 points total between Technical (maximum 177 points) and Management (maximum 88 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 weighting factor of 37.5 will be used for calculating the Bidder's Technical Score (rated criteria).
- b) A weighting factor of 22.5 will be used for calculating the Bidder's Management Score (rated criteria).
- c) A weighting factor of 40 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:

$$\text{Technical Score} = \frac{\text{Bidders Rated Score}}{\text{Highest Possible Score}} \times 37.5$$

$$\text{Management Score} = \frac{\text{Bidders Rated Score}}{\text{Highest Possible Score}} \times 22.5$$

$$\text{Cost Score} = \frac{\text{Lowest Cost}}{\text{Bidders Cost}} \times 40$$

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

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 | 153 | 133 | 160 | |
| Rated Mgmt | 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 | 153/177 x 37.5 = 32.42 | 77/88 x 22.5 = 19.69 | 122,500/130,300 x 40 = 37.61 | .89.72 |
| Bidder 2 | 133/177 x 37.5 = 28.18 | 70/88 x 22.5 = 17.9 | 122,500/122,500 x 40 = 40.0 | 86.08 |
| Bidder 3 | 160/177 x 37.5 = 31.36 | 78/88 x 22.5 = 19.94 | 122,500/145,500 x 40 = 33.68 | 84.98 |
| Notes:177 = highest technical score possible; 88 = 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.

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 | 3.1.2.2 | International Requirements | Review certification statement | Contractor copy of certification of compliance | |
| 2 | 3.1.5.2 | Operational Frequencies | System capable of all frequencies, including routine and test calls without interfering with distress and MSI calls | 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 Distress, Urgency & Safety Receivers | Five dedicated, compliant HF-DSC receivers | Supporting technical documentation which demonstrates compliance | |
| 5a | 3.1.6.4.2 | DSC Receivers for Routine Channels | Review in accordance with reference | Supporting technical documentation which demonstrates compliance | |
| 6 | 3.1.6.4.3a 3.1.6.4.3b.18 & 20 | MF/HF Communications Receiver | Review in accordance with reference | Supporting technical documentation which demonstrates compliance | |

| # | TSOR Ref | Requirement Description | Evaluation | Deliverable | Proposal Ref* |
|----|-----------|---|--|--|---------------|
| 7 | 3.1.7.2b | User Interfaces | Control Screen access to operational functions | Supporting technical documentation which demonstrates compliance | |
| 7a | 3.1.7.3b | Electrical Interfaces, 208V 3-Phase, "Y" for transmitters | Review in accordance with reference | Supporting technical documentation which demonstrates compliance | |
| 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 as per TSOR and DID SE-09 indicating how overall system MTBF number was calculated | |

| # | TSOR Ref | Requirement Description | Evaluation | Deliverable | Proposal Ref* |
|----|--------------------------|---|--|--|---------------|
| 17 | 3.2.4.1.3 | Supportability Characteristics Availability | Review calculations to confirm conformance | Preliminary system availability calculation as per TSOR and DID SE-09. Documentation which demonstrates DSC receiver/modem and transmitter availability compliance | |
| 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) | |
| 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 3:1 VSWR load = 15 points Full power into a 2.5:1 VSWR load = 7 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 \geq 4,000 hours = 15 points MTBF \geq 3,600 hours = 8 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 (\geq 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. <u>Must</u> include END USER contact name, position, email and phone # | |

| # | Max Score | TSOR Ref | Requirement Description | Evaluation | Deliverable | Proposal Ref |
|----|-----------|-------------|--------------------------------|---|--|--------------|
| 30 | 5 | 3.1.6.4.3.b | MF/HF Receiver | Syllabic squelch = 5 points | Supporting technical documentation which demonstrates compliance | |
| 31 | 5 | 3.1.6.4.3.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 | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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, $\geq 1,000$ hours. = 10 points, $\geq 1,200$ hours. = 15 points | Calculation as per 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 | <p>1. System has reserve of resources, including all memories, input/output channels, and processing throughput: 50% reserve = 5 points. 25% reserve = 2.5 points</p> <p>2. System has expansion slots to provide the capability to expand fitted memory by 100 % expansion = 5 points 50% expansion = 2.5 points</p> <p>3. System has expansion slots to provide the capability to add at least two additional interfaces or processing devices = 5 points</p> | 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. | <p>Less than 50% = 0 points More than 50% = 5 points More than 90% = 10 points</p> | 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. | <p>Most = 2 points All = 4 points</p> | 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/document ed 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/document ed 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. | <p>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.</p> <p>The proposal demonstrated a complete understanding of the requirement and clearly linked compliance to references for all mandatory and almost all ($\geq 90\%$) rated requirements in a concise manner, such that compliance and scoring criteria could be readily applied with minimal searching of the proposal. = 10 points.</p> <p>The proposal demonstrated a good understanding of the requirement and clearly linked compliance to references for all mandatory and most ($\geq 75\%$) 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.</p> <p>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.</p> | 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 (\geq 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 each 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 each reference project | |
| 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 each 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 communications 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 communications 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 communications 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 | 13 | 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 | <p>PM methodology and approach clearly covers the following elements:</p> <ul style="list-style-type: none"> - 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: <ul style="list-style-type: none"> 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. | <p>The procedure and feasibility for arranging maintenance support on equipment in a way that supports the following equipment repair turn around:</p> <p>5 points = \leq 30 days 3 points = $<$ 40 days 1 point = \leq 50 days 0 points = no feasible timeline established</p> | 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 communications 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 | |
| | 88 | SUB TOTAL | | | | |