Public Works and Government Services Canada | Travaux publics et Services gouvernementaux Canada

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
Integrated AIS LED Lanterns

Solicitation No. - N° de l'invitation	**Date**
F7047-170046/A	2017-10-27

Client Reference No. - N° de référence du client
F7047-170046

GETS Reference No. - N° de référence de SEAG
PW-$$HN-329-73641

File No. - N° de dossier	**CCC No./N° CCC - FMS No./N° VME**
hn329.F7047-170046	

Solicitation Closes - L'invitation prend fin
at - à 02:00 PM
on - le 2017-12-11

Time Zone
Fuseau horaire
Eastern Standard Time
EST

F.O.B. - F.A.B.
Plant-Usine: ☐ **Destination:** ☑ **Other-Autre:** ☐

Address Enquiries to: - Adresser toutes questions à:	**Buyer Id - Id de l'acheteur**
Dumaresq, Steve	hn329

Telephone No. - N° de téléphone	**FAX No. - N° de FAX**
(819) 420-0341 ( )	(819) 953-4944

Destination - of Goods, Services, and Construction:
Destination - des biens, services et construction:
DEPARTMENT OF FISHERIES AND OCEANS
INTEGRATED TECHNICAL SERVICES
200 KENT ST - STN 7S036
OTTAWA
Ontario
K1A0E6
Canada

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address
Raison sociale et adresse du fournisseur/de l'entrepreneur

Delivery Required - Livraison exigée	**Delivery Offered - Livraison proposée**
See Herein	

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**

Issuing Office - Bureau de distribution
Electrical & Electronics Products Division
11 Laurier St./11, rue Laurier
7B3, Place du Portage, Phase III
Gatineau, Québec K1A 0S5

Canada

PART 1 - GENERAL INFORMATION

PART 2 - BIDDER INSTRUCTIONS

PART 3 - BID PREPARATION INSTRUCTIONS

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

PART 5 – CERTIFICATIONS

PART 6 - RESULTING CONTRACT CLAUSES

PART 1 - GENERAL INFORMATION

1. Requirement

The contractor must provide the goods in accordance with the technical requirements stated herein.

Integrated Automatic Identification System (AIS) Aids to Navigation (AtoN) Self-Contained LED Lantern (SCOLL). The purchase of up to three (3) lanterns from four (4) individual suppliers.

1.1 Delivery Requirement

Delivery and acceptance of the three (3) lantern units from each contractor is requested to be completed by no later than 31 March 2018.

2. 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 from receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

3. Trade Agreements

The requirement is subject to the provisions of the World Trade Organization Agreement on Government Procurement (WTO-AGP), the North American Free Trade Agreement (NAFTA), the Canada-European Union Comprehensive Economic and Trade Agreement (CETA), and the Canadian Free Trade Agreement (CFTA).

PART 2 - BIDDER INSTRUCTIONS

2.1 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 (2016-04-04) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

Subsection 5.4 of 2003, Standard Instructions - Goods or Services - Competitive Requirements, is amended as follows:

Delete: 60 days
Insert: 90 days

2.1.1 *SACC Manual* Clauses

SACC Reference	Section	Date
B1000T	Condition of Material	2014-06-26

2.2 Submission of Bids

Bids must be submitted ONLY TO THE BID RECEIVING UNIT by the date, time and place indicated on page 1 of the bid solicitation. Do not send proposal directly to the Contracting Officer. Emailed proposals are not accepted.

PWGSC Bids Receiving Unit
11 Laurier Street
Place du Portage, Phase 3, Core 0B2
Gatineau, Québec, K1A 0S5
Tel.: 819-420-7201
Fax : 819-997-9776

2.3 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.

Steve Dumaresq (steve.dumaresq@pwgsc-tpsgc.gc.ca)

2.4 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

3.1 Bid Preparation Instructions

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

Section I: Technical Bid (2 copies)

Section II: Financial Bid, Certifications and Additional Information (1 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 are encouraged to:

1) use paper containing fibre certified as originating from a sustainably-managed forest and/or 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 BID (2 copies)

In their technical bid, bidders should explain and demonstrate how they propose to meet the requirements and how they will carry out the Work.

SECTION II: FINANCIAL BID, CERTIFICATIONS AND ADDITIONAL INFORMATION (1 copy)

Bidders must submit their financial bid in accordance with the Basis of Payment. The total amount of Applicable Taxes must be shown separately.

3.2 Certifications

Bidders must submit the certifications required under Part 5 prior to contract award.

3.3 Additional Information

3.3.1 Procurement Business Number (PBN) (Canadian suppliers)
Https://buyandsell.gc.ca/for-businesses/register-as-a-supplier

The Procurement Business Number of the supplier is: _____
Note: Not mandatory at bid closing but required precedent to contract award.

3.3.2 Contractor Representatives

Name and telephone number of the person responsible for:

General enquiries

Name: _____

Telephone: _____

Facsimile: _____

E-mail: _____

Delivery follow-up

Name: _____

Telephone: _____

Facsimile: _____

E-mail: _____

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

4.1 Evaluation Procedures

Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria. All bids must be completed in full and provide all of the information requested in the bid solicitation to enable full and complete evaluation.

4.1.1 Technical Evaluation

Bidders must present a clearly organized proposal that includes all necessary technical and descriptive information, in order to clearly demonstrate their compliancy to the requirement presented in the Statement of Work. Responses will be evaluated on a simple, stringent pass/fail basis. Proposals not meeting each mandatory requirement will be considered non-responsive (non-compliant) and given no further consideration.

The technical bid should be structured in the same format as the Statement of Work and related specifications, through which the bidder will clearly explain and demonstrate how they propose to meet the requirements and how they will carry out the Work.

4.1.1.1 Mandatory Technical Criteria

Technical compliance to the Statement of Work and related specifications.

4.1.2 Financial Evaluation

Compliance with the pricing requirements presented herein;
Submission of a completed Annex B.

4.1.2.1 Pricing Basis

The bidder must quote firm prices in Canadian dollars, DDP Delivered Duty Paid (destination). Freight charges to destination and all applicable Custom duties and Excise taxes included. Goods and Services Tax (GST) and/or the Harmonized Sales Tax (HST) not included.

The total bid price is the sum of the items in Annex B.

4.2 Basis of Selection

A bid must comply with the requirements of the bid solicitation and meet all evaluation criteria to be declared responsive (compliant).

The four (4) lowest priced compliant bids will be recommended for award of a contract. Each contract will permit the purchase of up to three (3) lanterns.

PART 5 – CERTIFICATIONS AND ADDITIONAL INFORMATION

Bidders must provide the required certifications and additional 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 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 will render the bid non-responsive or constitute a default under the Contract.

5.1 Certifications Required with the Bid

5.1.1 Declaration of Convicted Offences

If applicable, in accordance with the *Ineligibility and Suspension Policy* (http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html), the Bidder must provide with its bid the required documentation to be given further consideration in the procurement process.

5.2 Certifications Precedent to Contract Award and Additional Information

The certifications and additional information listed below should be submitted with the bid, but may be submitted afterwards. If any of these required certifications or additional information is not completed and submitted as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Failure to provide the certifications or the additional information listed below within the time frame provided will render the bid non-responsive.

5.2.1 Integrity Provisions – List of Names

In accordance with the *Ineligibility and Suspension Policy* (http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html), the Bidder must provide the required documentation, if applicable, to be given further consideration in the procurement process.

5.2.2 General Environmental Criteria Certification

The Bidder must select and complete one of the following two certification statements.

A) The Bidder certifies that the Bidder is registered or meets ISO 14001.

_____ _____

Bidders' Authorized Representative Signature Date

or

B) The Bidder certifies that the Bidder meets and will continue to meet throughout the duration of the contract, a minimum of four (4) out of six (6) criteria identified in the table below.

The Bidder must indicate which four (4) criteria, as a minimum, are met.

Green Practices within the Bidders' organization	**Insert a checkmark for each criterion that is met**
Promotes a paperless environment through directives, procedures and/or programs	
All documents are printed double sided and in black and white for day to day business activity unless otherwise specified by your client	
Paper used for day to day business activity has a minimum of 30% recycled content and has a sustainable forestry management certification	
Utilizes environmentally preferable inks and purchase remanufactured ink cartridges or ink cartridges that can be returned to the manufacturer for reuse and recycling for day to day business activity.	
Recycling bins for paper, newsprint, plastic and aluminum containers available and emptied regularly in accordance with local recycling program.	
A minimum of 50% of office equipment has an energy efficient certification.	

_____ _____

Bidders' Authorized Representative Signature Date

5.2.3 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" list available at the bottom of the page of the Employment and Social Development Canada (ESDC) - Labour's website (http://www.esdc.gc.ca/en/jobs/workplace/human_rights/employment_equity/federal_contractor_program.page?&_ga=1.229006812.1158694905.1413548969).

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "FCP Limited Eligibility to Bid" list at the time of contract award.

PART 6 - RESULTING CONTRACT CLAUSES

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

1. Requirement

The contractor must provide the goods in accordance with the technical requirements stated herein. As presented at Solicitation F7047-170046/A.

Integrated Automatic Identification System (AIS) Aids to Navigation (AtoN) Self-Contained LED Lantern (SCOLL). The purchase of up to three (3) lanterns.

2. SACC Manual Clauses

SACC Reference	Section	Date
B1501C	Electrical Equipment	2006-06-16
B7500C	Excess Goods	2006-06-16
B6802C	Government Property	2007-11-30

2.1 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.

2.2 General Conditions

2030 (2016-04-04), General Conditions - Higher Complexity - Goods, apply to and form part of the Contract.

3. Term of Contract

3.1 Period of the Contract

The period of contract is from __date__ to __date__ inclusively, so as to permit the delivery of all units.

4. Authorities

4.1 Contracting Authority

Steve Dumaresq
Acquisitions Branch, Logistics, Electrical, Fuel and Transportation Directorate
"HN" Division, 7B3, Place du Portage, Phase III, 11 Laurier Street, Gatineau, QC, K1A 0S5
Telephone: (819) 420-0341 Facsimile: (819) 953-4944
E-mail address: steve.dumaresq@pwgsc-tpsgc.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.

4.2 Technical Authority

Name: will be inserted at contract
Telephone No. will be inserted at contract
Facsimile No. will be inserted at contract
E-mail address: will be inserted at contract

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.

4.3 Contractor Contacts

General Enquiries

Name: will be inserted at contract
Telephone No. will be inserted at contract
Facsimile No. will be inserted at contract
E-mail address: will be inserted at contract

Delivery Follow-up

Name: will be inserted at contract
Telephone No. will be inserted at contract
Facsimile No. will be inserted at contract
E-mail address: will be inserted at contract

5. Payment

5.1 Multiple Payments

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid the firm prices, as specified in the contract for a maximum total cost of $ __. Firm prices in Canadian dollars, DDP Delivered Duty Paid (destination). Freight charges to destination and all applicable Custom duties and Excise taxes included. Goods and Services Tax (GST) and/or the Harmonized Sales Tax (HST) extra.

1 unit to Atlantic region (Dartmouth, NS) $__
1 unit to Central/Arctic region (Québec, QC) $__
1 unit to West Coast region (Victoria, BC) $__

5.2 SACC Manual Clauses

SACC Reference	Section	Date
G1005C	Insurance	2008-05-12
H1001C	Multiple Payments	2008-05-12

5.3 Invoicing Instructions

1. The Contractor must submit invoices in accordance with the section entitled "Invoice Submission" of the general conditions. Invoices cannot be submitted until all work identified in the invoice is completed.

2. Invoices must be distributed as follows:
   (a) The original and one (1) copy must be forwarded to the address shown on page 1 of the Contract for certification and payment.
   (b) One (1) copy must be forwarded to the Contracting Authority identified under the section entitled "Authorities" of the Contract.

6. Certifications

Compliance with the certifications and related documentation 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, provide the related documentation or if 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.

7. 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.

8. Applicable Laws

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

9. Priority of Documents

If there is a discrepancy between the 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;
(b) 2030 (2016-04-04), General Conditions - Higher Complexity - Goods;
(c) Statement of Work and related appendices (As presented at Solicitation F7047-170046/A);
(d) the Contractor's bid dated __date__.

10. SACC Manual Clauses (Delivery)

SACC Reference	Section	Date
D9002C	Incomplete Assemblies	2007-11-30

11. Shipping Instructions - Delivery at Destination

Goods must be consigned to the destination specified in the Contract and delivered:
DDP (destination) Inco terms 2000 for shipments from a commercial contractor.

ANNEX A **STATEMENT OF WORK AND SPECIFICATIONS** (attached)

ANNEX B PRICING SCHEDULE

Firm prices in Canadian dollars, DDP Delivered Duty Paid (destination). Freight charges to destination and all applicable Custom duties and Excise taxes included. Goods and Services Tax (GST) and/or the Harmonized Sales Tax (HST) not included.

1.0	**One (1) lantern** **Destination: Atlantic region (Dartmouth, Nova Scotia)**	**$ _____**
2.0	**One (1) lantern** **Destination: Central/Arctic region (Ville de Québec, Québec)**	**$ _____**
3.0	**One (1) lantern** **Destination: West Coast region (Victoria, British Columbia)**	**$ _____**

TOTAL EVALUATED BID PRICE **Sum of all line items above**	**$ _____**

Fisheries and Oceans Canada | Pêches et Océans Canada

Canadian Coast Guard | Garde côtière canadienne

EKME# 3826015

Integrated Technical Services

Integrated Automatic Identification System (AIS) Aids to Navigation (AtoN) Self-Contained LED Lantern (SCOLL)

Statement of Work

Canada

Published under the Authority of:
Integrated Technical Services Directorate
Fisheries and Oceans Canada
Canadian Coast Guard
Ottawa Ontario, K1A 0E6
http://intra.coast-guard.ca/ITS/Home

Disponible en français (MGCE 3353141): Matériel d'amarrage pour les aides à la navigation – Énoncé des travaux

Record of Amendments

#	Date	Description	Initials
1			
2			
3			
4			

Approvals

Office of Primary Interest (OPI)	Patrick Hailstone	Approved:	
		Date:	
Manager, Maritime Civil Infrastructure	Jordan Lane-Beveridge	Approved:	
		Date:	
Director, Maritime and Civil Infrastructure (MCI) and Environmental Response (ER) Integrated Technical Services	Richard LeBlanc	Approved:	
		Date:	

Section 1 INTRODUCTION

The Canadian Coast Guard (CCG) has a requirement to test Automatic Identification System (AIS) Aids to Navigation. The CCG is currently testing stand-alone AIS AtoN units; however there is a desire to test self-contained LED lanterns (SCOLL) with integrated AIS transmitting capabilities. These will be used in the three CCG regions, Atlantic, Central and Arctic, and Western, to determine the suitability for use in the CCG AtoN program.

1.1 SPECIFICATIONS

The components shall meet the requirements of the following DFO-MPO documents and reference document as listed:

- Integrated Automatic Identification System Aids to Navigation Self-Contained LED Lantern, Technical Specification, EKME# 3826018.

Section 2 SCOPE OF WORK

2.1 REQUIREMENTS

The Bidders shall provide quote on providing three identical AIS AtoN SCOLL units that meet the technical specifications to each of the CCG regions.

The Bidders will provide technical support, via email, telephone, or web support, for a period of one year post delivery of the units.

The CCG expects to purchase up to 3 units from the top 4 qualified bidders.

2.2 DELIVERY

Location

The Bidder must include in its price the cost of shipping a unit to each of the following locations:

Atlantic	BIO - Bedford Institute of Oceanography 1 Challenger Dr., Burnside, Dartmouth, Nova Scotia, B2Y 4A2
Central and Arctic	Canadian Coast Guard 101 Boulevard Champlain, Ville de Québec Québec, G1K 4H9
West coast	Department of Fisheries and Oceans 25 Huron St, Victoria, British Columbia, V8V 4V9

2.3 QUALITY ASSURANCE

The Manufacturer shall maintain a Quality Assurance inspection system to ensure that only acceptable material or services are presented to Canada.

The Manufacturer shall have an existing, effective Quality Assurance (QA) system certified to ISO 9001:2000 or equivalent. The bidder shall submit a copy of their QA Registration Certificate or their Quality Assurance Manual(s) with the bid.

2.4 FINAL INSPECTION

All mooring components shall be presented for final visual inspection at destination. The preparation for inspection, the handling of materials and the carrying out of specified tests shall be the responsibility of CCG. The final inspection is not intended to limit or replace inspections or tests normally performed by the contractor and/or manufacturer to ensure product quality.

2.5 PACKAGING

The Integrated AIS AtoN SCOLL and all accompanying cabling and connections shall be suitably protected from damage during shipping. Bundling and shipping material shall become the property of the Canadian Coast Guard.

Boxes shall contain a bill of materials to ensure all contents have arrived.

2.6 MARKING

Shipping material shall indicate the name and address of the consignee, contract number, contract item number, item quantity, name of manufacturer/supplier.

Fisheries and Oceans Canada | Pêches et Océans Canada

Canadian Coast Guard | Garde côtière canadienne

EKME # 3826018

Integrated Technical Services

Safety First, Service Always

Integrated Automatic Identification System (AIS) Aids to Navigation (AtoN) Self-Contained LED Lantern (SCOLL)

Performance specification

Canada

Published under the Authority of:
Integrated Technical Services Directorate
Fisheries and Oceans Canada
Canadian Coast Guard
Ottawa Ontario, K1A 0E6

http://intra.garde-cotiere.ca/ITS/Home

2ND EDITION, JULY 2016

Record of Amendments

#	Date	Description	Initials

Approvals

Approval Signatures will be added here once scanned.
Les signatures d'approbation seront ajoutées ici une fois numérisées.

Table of Contents

List of Tables

Document Structure Management

In this document:

All segments are referred to as sections. Thus 3.4.1.1 is a section. Similarly, 3.4 is also a section. Section 3.4 includes sections 3.4.1.1 and 3.4.1.2, etc.

Shall or **must**: conveys a mandatory requirement

Should: conveys that which is advised but not required

Prefer: conveys a rated requirement

May: conveys a permission

Notes are used only to provide information and are thus informative.

1. Authority

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

2. Responsibility

The Director, Maritime and Civil Infrastructure and Environmental Response is responsible for:

i) the creation and promulgation of the document; and

ii) the identification of an Office of Primary Interest (OPI) who is responsible for the coordination and the content of the document.

The OPI is responsible for:

i) the validity and accuracy of the content;

ii) the availability of this information;

iii) the update as needed;

iv) the periodical revision; and

v) the follow-up of all requests, comments and/or suggestions received by the originator.

Section 1 INTRODUCTION

Automatic Identification System (AIS) is a marine transponder system that is capable of automatically sending information to ships and shore based stations. AIS is designed to improve marine safety and efficiency, and is a requirement for ships under the International Maritime Organization (IMO, Resolution A.1106 (29)).

When fitted on select Aids to Navigation (AtoN), AIS can improve marine safety by providing ships with real-time data such as the name of the aid, its advertised position, and it's actual position. Furthermore, AIS equipped buoys are designed to be displayed on complying AIS enabled electronic chart display information systems (ECDIS) on ships' bridges. Finally, the AIS AtoN unit allows the Canadian Coast Guard (CCG) to be kept informed at all times of the status of its AIS-equipped aids, and can be alerted in the event the aid is off-position.

The CCG is currently testing both Type 1 and Type 3 dedicated AIS AtoN units. Testing in real conditions allowed the CCG to conduct a preliminary evaluation of the AIS units, and through testing it has become clear that the current units being tested do not fully meet the CCG's requirements. Over the last decades, the CCG has evolved towards using self-contained equipment on buoys to protect it against water ingression and to minimize operational maintenance. In order to maintain this direction and to simplify the installation and deployment, the CCG will require an integrated AIS AtoN Self Contained LED Lantern (SCOLL).

This section is intended to describe the general manner in which the CCG expects to deploy AIS AtoNs. As such this section makes no obligations on the part of manufacturers or bidders.

Integrated AIS AtoN SCOLL units will be deployed in a harsh marine environment and will be exposed to a wide range of ambient temperatures and humidity. The unit will be exposed to significant wind speeds, salt air, seawater spray, and ice loads. The unit will have continuous exposure to ultraviolet (UV) levels that is typically encountered in the lower-to-mid Canadian latitudes. In heavy seas, the Integrated AIS AtoN SCOLL unit may occasionally be immersed in seawater. The unit may be exposed to electromagnetic interference from radiating devices such as marine radar, and static discharges and induced, transient voltages that may occur because of nearby lightning strikes.

Once deployed, the Integrated AIS AtoN SCOLL units will be left unattended for considerable periods of time. The CCG is looking for Integrated AIS AtoN SCOLL units that will operate under the specified conditions and have minimum specified service life. It is also expected that the Integrated AIS AtoN SCOLL will be self-powered throughout its lifespan and not require external means of power

The Integrated AIS AtoN SCOLL units will generally encounter shock and vibration when mounted on buoys, from wave action, as well as when they are transported on vessels to be deployed.

Section 2 APPLICABLE DOCUMENTS

2.1 REFERENCED PUBLICATIONS, SPECIFICATIONS AND STANDARDS

2.1.1 IEC (International Electrotechnical Commission) *61162-1:2016 Maritime Navigation and Radiocommunication Equipment and Systems – Digital Interfaces – Part 1: Single talker and multiple listeners*

2.1.2 IEC *62320-2:2016 Maritime Navigation and Radiocommunication Equipment and Systems – Automatic Identification System (AIS) – Part 2: AIS AtoN Stations – Operational and Performance Requirements, Methods of Testing and Required Test Results*

2.1.3 IEC *60945:2002 Maritime Navigation and Radiocommunication Equipment and Systems – General Requirements – Methods of Testing and Required Test Results*

2.1.4 IEC *60950-1:2005+AMD1:2009+AMD2:2013 Safety of Information Technology Equipment - Part 1: General Requirements*

2.1.5 IEC *61108-1:2003 Maritime Navigation and Radiocommunication Equipment and Systems – Global Navigation Satellite Systems (GNSS) – Part 1: Global Positioning System (GPS) – Receiver Equipment – Performance Standards, Methods of Testing and Required Test Results*

2.1.6 IEC 60529:1989+AMD1:1999+AMD2:2013 and CSV/COR2:2015 *Degrees of protection provided by enclosures (IP Code)*

2.1.7 MIL-STD-202H, *Department of Defense Test Method Standard: Electronic and Electrical Component Parts.*

2.1.8 MIL-STD-810G, *Environmental Engineering Considerations and Laboratory Tests.*

2.1.9 Industry Canada RSS-182 Issue 5 *Maritime Radio Transmitters and Receivers in the Band 156-162.5 MHz*

2.1.10 ASTM E-1038-10 (2015) *Standard Test Method for Determining Resistance of Photovoltaic Modules to Hail by Impact with Propelled Ice Balls*

2.2 OTHER REFERENCED DOCUMENTS

2.2.1 IALA (International Association of Marine Aids to Navigation and Lighthouse Authorities) *Recommendation A-126 - The Use of the Automatic Identification System (AIS) in Marine Aids to Navigation Service Edition 1.5 June 2011*

2.2.2 IALA (Internaltional Association of Marine Aids to Navigation and Lighthouse Authorities) *Recommendation E-200 – Marine Signal Lights Edition 1 December 2008*

2.2.3 ITU (International Telecommunication Union) *Recommendation ITU-R M.1371-1 – Technical Characteristics for a Universal Shipborne Automatic Identification System Using Time Division Multiple Access in the VHF Maritime Mobile Band*

2.2.4 Canadian Coast Guard, Notice to Mariners (NOTMAR) *List of Lights, Buoys and Fog Signals (4 Volumes) – latest editions*

2.3 ORDER OF PRECEDENCE

2.3.1 In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been made.

Section 3 PERFORMANCE SPECIFICATION

This section sets out the Canadian Coast Guard's performance specifications for the Integrated AIS AtoN SCOLL units.

3.1 GENERAL

3.1.1 Material

3.1.1.1 The Integrated AIS AtoN SCOLL shall be made of material which reduces the risk of corrosion.

3.1.1.2 The Integrated AIS AtoN SCOLL shall not contain any toxic, radioactive, or other materials which may be deemed harmful to sea-life.

3.1.2 Finish

3.1.2.1 When used, paint or coatings shall be selected to withstand the environmental conditions described in Section 3.4 of this performance specification.

3.1.2.2 Paint or coatings shall be lead free.

3.1.2.3 The unit shall not degrade due to UV exposure.

3.1.3 Mounting

3.1.3.1 The Integrated AIS AtoN SCOLL unit shall be compatible with the CCG's floating aid lantern mounting pattern as detailed in Appendix B. If required, a supplied adaptor plate can be used in order to interface with this mounting pattern.

3.1.3.2 Any external antenna shall be provided with a means to mounting to a floating aid using standard nuts and bolts.

3.1.4 Identification Nameplate

3.1.4.1 The Integrated AIS AtoN SCOLL unit shall have an identification nameplate with the following information:

- Name of manufacturer
- Model number
- Serial number

3.1.4.2 The identification nameplate shall be indelible.

3.1.4.3 The identification nameplate shall be located on the exterior of the unit.

3.1.5 Mass and External Dimensions

3.1.5.1 The Integrated AIS AtoN SCOLL unit, including any required ancillary equipment shall weigh no more than 40kg.

3.1.6 Design Considerations

3.1.6.1 The lantern, power system, and AIS components are to be connected without the need for CCG supplied cables.

3.1.6.2 If there is a need for an external antenna (GPS of VHF), this must be supplied with the integrated AIS AtoN SCOLL unit along with the connecting cables.

3.1.6.3 The Integrated AIS AtoN SCOLL unit shall be supplied with a bird deterrent.

3.2 ELECTRICAL REQUIREMENTS

3.2.1 Power and Energy Requirements

3.2.1.1 The Integrated AIS AtoN SCOLL shall be self-powered using integrated solar panels and batteries.

3.2.1.2 The Integrated AIS AtoN SCOLL shall not require external power sources.

3.2.1.3 The Integrated AIS AtoN SCOLL shall have user replaceable batteries.

3.2.1.4 Battery replacement shall not require special tools or unsoldering of connections.

3.2.1.5 The Integrated AIS AtoN SCOLL shall have a minimum autonomy of 14 days when meeting the optical requirements in 3.3.3 and the solar insolation as outline in Appendix C with a 12.5% duty cycle.

3.2.1.6 Vendors shall provide calculated autonomy values with the bid.

3.2.2 Protection Requirements

3.2.2.1 The Integrated AIS AtoN SCOLL unit shall be provided with a low voltage disconnect to protect the battery from damage.

3.2.2.2 The Integrated AIS AtoN SCOLL shall have reverse polarity protection and not experience damage if power is connected in reverse polarity.

3.2.2.3 The Integrated AIS AtoN SCOLL shall be provided with short-circuit protection.

3.2.2.4 The Integrated AIS AtoN SCOLL shall be fitted with a means to prevent the build-up of pressure within the lantern above a level that could jeopardize the safety of personnel.

3.3 PERFORMANCE REQUIREMENTS

3.3.1 VHF Output

3.3.1.1 The Integrated AIS AtoN SCOLL unit shall output AIS data using a Very High Frequency (VHF) antenna in accordance with Industry Canada RS-182.

3.3.1.2 The Integrated AIS AtoN SCOLL shall transmit on the Marine Band Channels 87B and 88B in accordance with Industry Canada RS-182.

3.3.1.3 The Integrated AIS AtoN SCOLL shall have selectable transmission output power of between 2-12.5 Watts.

3.3.2 AIS Functionality

3.3.2.1 The Integrated AIS AtoN SCOLL shall allow the selection of Fixed Access Time Division Multiple Access (FATDMA) and Random Access Time Division Multiple Access (RATDMA) configurations.

3.3.2.2 The Integrated AIS AtoN SCOLL unit shall transmit, at a minimum, AIS Messages 21 every 3 minutes.

3.3.2.3 The Integrated AIS AtoN SCOLL shall be capable of transmitting the lantern status using AIS message 6.

3.3.2.4 The Integrated AIS AtoN SCOLL shall be capable of interfacing with IMIS Mariweb which uses Zeni and General Lighthouse Authorities communication protocols. Examples of these message protocols can be seen in Appendix D.

3.3.2.5 The Integrated AIS AtoN SCOLL shall be capable of being remotely configured using AIS.

3.3.2.6 The Integrated AIS AtoN SCOLL unit messages shall be in accordance with Recommendation ITU-R M.1371-1.

3.3.2.7 The Integrated AIS AtoN SCOLL shall be certified in accordance with IEC 62320-2.

3.3.2.8 The Integrated AIS AtoN SCOLL shall have an off position indicator which is determined in accordance with IALA Recommendation A-126.

3.3.3 Optical Performance

3.3.3.1 The Integrated AIS AtoN SCOLL unit shall be compliant with IALA E-200.

3.3.3.2 The light signal provided by green, red, white, and yellow lanterns shall fall within the boundaries of the optimum regions and satisfy the chromaticity requirements of IALA E-200.

3.3.3.3 The lantern shall provide a vertical divergence of no less than 7.5° (3.5° above, 3.5° below the focal point).

Note, the vertical divergence is measured from the point where the peak intensity falls below 50%.

3.3.3.4 The lantern shall be capable of outputting the nominal ranges / effective peak intensities as detailed in Table 1.

Table 1: Nominal Range / Luminous Range

Nominal Range (nm)	Luminous Range (cd)
1.5	2.5
2	5
3	15
4	36

3.3.4 Control

3.3.4.1 The Integrated AIS AtoN SCOLL unit shall be capable of producing, as a minimum, the common light flash characters specified in the CCG List of Lights, Buoys, and Fog Signals.

3.3.4.2 The timing of the light signal shall be within 5% of the rates values, in all operational conditions.

3.3.4.3 The Integrated AIS AtoN SCOLL unit shall be provided with a communication port to allow configuration by the CCG.

3.3.4.4 The Integrated AIS AtoN SCOLL unit shall be supplied with a software program to allow for configuration of the unit.

3.3.4.5 The Integrated AIS AtoN SCOLL shall maintain its programmed settings, and will not switch to another setting until programmed to do so for no less than 12 months unpowered (storage conditions).

3.3.4.6 The lantern shall switch on whenever the ambient illuminance, measured on a horizontal plane, falls below 75± 25 lx. The lantern shall also turn off when the ambient illuminance rises above 75± 25 lx.

3.3.4.7 The AIS transmitting and receiving functions shall be unaffected by the ambient illuminance controls.

3.4 ENVIRONMENTAL REQUIREMENTS

3.4.1 Temperature

3.4.1.1 The Integrated AIS AtoN SCOLL unit shall be capable of operating when exposed to temperatures ranging from -20°C to +40°C.

3.4.2 Humidity

3.4.2.1 The Integrated AIS AtoN SCOLL unit shall be capable of operating when exposed to relative humidity from 0% to 100%.

3.4.3 Icing

3.4.3.1 The Integrated AIS AtoN SCOLL unit shall be capable of operating when exposed to ice loading up to 22kg/m^2.

3.4.4 Wind Speed

3.4.4.1 The Integrated AIS AtoN SCOLL unit shall be capable of operating when exposed to gusting up to 160 km/h.

3.4.5 Salt Air and Seawater Spray

3.4.5.1 The Integrated AIS AtoN SCOLL unit shall be capable of operating when under continuous exposure to salt air and seawater spray.

3.4.6 Shock and Vibration

3.4.6.1 The Integrated AIS AtoN SCOLL unit shall be capable of operating when under continuous exposure to shock and vibration as a marine aid to navigation. This includes handling on ships, and when mounting on buoys.

3.4.7 Electromagnetic Interference

3.4.7.1 Including signals from VHF radio and marine radar, the Integrated AIS AtoN SCOLL unit shall not be susceptible to interference from radiating devices normally found in the marine environment when tested in accordance with IEC 60945.

3.4.8 Static Discharge

3.4.8.1 The Integrated AIS AtoN SCOLL unit shall incorporate protection from static discharges and induced transient voltages on power leads that may occur due to nearby lightning.

3.4.9 Immersion Protection

3.4.9.1 The Integrated AIS AtoN SCOLL unit shall meet the ingress protection of a minimum of IP67.

3.4.10 Hail Impact

3.4.10.1 The photovoltaic panels on the Integrated AIS AtoN SCOLL unit shall remain operations after hail impact in accordance with ASTM E1038-10 or another testing method which will be supplied to CCG.

3.5 MAINTENANCE REQUIREMENTS

3.5.1 Service Life

3.5.1.1 The Integrated AIS AtoN SCOLL, excluding the battery, shall have a service life of no less than 12 years.

3.5.1.2 The batteries shall have a service life of no less than 6 years.

3.5.2 Warranty

3.5.2.1 The manufacturer shall warranty the Integrated AIS AtoN SCOLL unit against defects for a period of no less than 1 year.

3.5.3 Preventative Maintenance Requirements

3.5.3.1 The Integrated AIS AtoN SCOLL unit shall not require preventative maintenance, other than yearly cleaning of external surfaces.

3.5.3.2 The vendor shall supply a list of spares for the AIS AtoN SCOLL.

Section 4 VERIFICATION

4.1 INTRODUCTION

The Canadian Coast Guard (CCG) has initiated a competitive process for awarding Standing Offers for one or more qualified suppliers for AIS AtoN units.

Proposals will be evaluated in accordance with the evaluation framework described in this document.

4.2 OVERVIEW OF THE EVALUATION PROCESS

The following process has been established for evaluating proposals:

4.2.1.1 Public Services and Procurement Canada (PSPC) will examine proposals to determine whether the proposals are complete and meet the mandatory requirements of the Request for Proposal (RFP). Failure to meet any of the mandatory requirements of the RFP will result in the proposal being declared non-responsive, and PSPC will not give it any further consideration.

4.2.1.2 PSPC will forward the technical proposals to the technical authority for evaluation. PSPC will retain the price proposals, as they are responsible for the assessment of the financial data.

4.2.1.3 A technical evaluation team will review the technical proposals for compliance with the mandatory technical criteria of this performance specification and of the statement of work (SOW). Failure to meet any of the mandatory requirements of the performance specification or the SOW will result in the proposal being declared non-responsive, and the bid will not receive any further consideration.

4.2.1.4 Proposals which meet the technical requirements will be deemed compliant.

4.3 METHODS OF VERIFICATION

4.3.1.1 The CCG uses the definitions for methods of verification as outlined in Table 2.

Table 2: Methods of Verification

Method	Description
Data Submission	The Bidder shall submit data in the form of reports, drawings, schematics, and other documents sufficient to demonstrate that the requirements are met.
Test	The Bidder shall submit the results of tests of the bid product, previously performed in its own facility or by other accredited independent labs or agencies to demonstrate that the requirements are met.
Analysis	The Bidder shall perform a detailed technical or engineering analysis in sufficient detail to demonstrate the requirements are met.
Inspection	A visual inspection of the equipment demonstrates the requirement is met (e.g. photo of a serial port, or nameplate).

4.4 COMPLIANCE

4.4.1.1 The compliance with the Methods of Verification can be found in

Table 3: Compliance Method

Compliance Method	Description
Statement of Conformance (SOC)	Written acknowledgement that this requirement has been met. A certificate of compliance shall be provided when possible/applicable.
Submit Data (SD)	Provide Engineering Drawings/Documentation to validate that this requirement has been met.
Submit Test Data (STD)	Provide test data as dictated in the performance specification, test date from an independent laboratory via an Industry Standard Test to validate that this requirement has been met.

Appendix A REQUIREMENTS MATRIX

Reference	Requirement	Verification	Compliance	Results (pass/fail)
3.1	**General**			
3.1.1	**Material**			
3.1.1.1	The Integrated AIS AtoN SCOLL shall be made of material which reduces the risk of corrosion.	Data Submission	SD	
3.1.1.2	The Integrated AIS AtoN SCOLL shall not contain any toxic, radioactive, or other materials which may be deemed harmful to sea-life.	Data Submission	SD	
3.1.2	**Finish**			
3.1.2.1	When used, paint or coatings shall be selected to withstand the environmental conditions described in Section 3.4 of this performance specification.	Data Submission	SD	
3.1.2.2	Paint or coatings shall be lead free.	Data Submission	SD	
3.1.2.3	The unit shall not degrade due to UV exposure.	Data Submission	SD	
3.1.3	**Mounting**			
3.1.3.1	The Integrated AIS AtoN SCOLL unit shall be compatible with the CCG's floating aid lantern mounting pattern as detailed in Appendix B. If required, a supplied adaptor plate can be used in order to interface with this mounting pattern.	Data Submission	SD	
3.1.3.2	Any external antenna shall be provided with a means to mounting to a floating aid using standard nuts and bolts.	Data Submission	SD	
3.1.4	Identification Nameplate			
3.1.4.1	The AIS AtoN unit shall have an identification nameplate with the following information: • Name of manufacturer • Model number • Serial number	Inspection	SD	
3.1.4.2	The identification nameplate shall be indelible.	Data Submission	SD	
3.1.4.3	The identification nameplate shall be located on the exterior of the unit.	Inspection	SD	
3.1.5	**Mass and External Dimensions**			
3.1.5.1	The Integrated AIS AtoN SCOLL unit, including any required ancillary equipment	Data Submission	SD	

Reference	Requirement	Verification	Compliance	Results (pass/fail)
	shall weigh no more than 40kg.			
3.1.6	**Design Considerations**			
3.1.6.1	The lantern, power system, and AIS components are to be connected without the need for CCG supplied cables.	Data Submission	SD	
3.1.6.2	If there is a need for an external antenna (GPS of VHF), this must be supplied with the integrated AIS AtoN SCOLL unit along with the connecting cables.	Data Submission	SD	
3.1.6.3	The Integrated AIS AtoN SCOLL unit shall be supplied with a bird deterrent.	Data Submission	SD	
3.2	**Electrical Requirements**			
3.2.1	**Power and Energy Requirements**			
3.2.1.1	The Integrated AIS AtoN SCOLL shall be self-powered using integrated solar panels and batteries.	Data Submission	SD	
3.2.1.2	The Integrated AIS AtoN SCOLL shall not require external power sources.	Data Submission	SD	
3.2.1.3	The Integrated AIS AtoN SCOLL shall have user replaceable batteries.	Data Submission	SD	
3.2.1.4	Battery replacement shall not require special tools or unsoldering of connections.	Data Submission	SD	
3.2.1.5	The Integrated AIS AtoN SCOLL shall have a minimum autonomy of 14 days when meeting the optical requirements in 3.3.3 and the solar insolation as outline in Appendix C with a 12.5% duty cycle.	Data Submission	SD	
3.2.1.6	Vendors shall provide calculated autonomy values with the bid.	Data Submission	SD	
3.2.2	**Protection Requirements**	Data Submission	SD	
3.2.2.1	The Integrated AIS AtoN SCOLL unit shall be provided with a low voltage disconnect to protect the battery from damage.	Data Submission	SD	
3.2.2.2	The Integrated AIS AtoN SCOLL shall have reverse polarity protection and not experience damage if power is connected in reverse polarity.	Data Submission	SD	
3.2.2.3	The Integrated AIS AtoN SCOLL shall be provided with short-circuit protection.	Data Submission	SD	
3.2.2.4	The Integrated AIS AtoN SCOLL shall be fitted with a means to prevent the build-up of pressure within the lantern above a level that could jeopardize the safety of personnel.	Data Submission	SD	
3.3	**Performance Requirements**			
3.3.1	**VHF Output**			

Reference	Requirement	Verification	Compliance	Results (pass/fail)
3.3.1.1	The Integrated AIS AtoN SCOLL unit shall output AIS data using a Very High Frequency (VHF) antenna in accordance with Industry Canada RS-182.	Data Submission	SD	
3.3.1.2	The Integrated AIS AtoN SCOLL shall transmit on the Marine Band Channels 87B and 88B in accordance with Industry Canada RS-182.	Data Submission	SD	
3.3.1.3	The Integrated AIS AtoN SCOLL shall have selectable transmission output power of between 2-12.5 Watts.	Data Submission	SD	
3.3.2	**AIS Functionality**			
3.3.2.1	The Integrated AIS AtoN SCOLL shall allow the selection of Fixed Access Time Division Multiple Access (FATDMA) and Random Access Time Division Multiple Access (RATDMA) configurations.	Data Submission	SD	
3.3.2.2	The Integrated AIS AtoN SCOLL unit shall transmit, at a minimum, AIS Messages 21 every 3 minutes.	Data Submission	SD	
3.3.2.3	The Integrated AIS AtoN SCOLL shall be capable of transmitting the lantern status using AIS message 6.			
3.3.2.4	The Integrated AIS AtoN SCOLL shall be capable of interfacing with IMIS Mariweb which uses Zeni and General Lighthouse Authorities communication protocols. Examples of these message protocols can be seen in Appendix D.	Data Submission	SD	
3.3.2.5	The Integrated AIS AtoN SCOLL shall be capable of being remotely configured using AIS.	Data Submission	SOC	
3.3.2.6	The Integrated AIS AtoN SCOLL unit messages shall be in accordance with Recommendation ITU-R M.1371-1.	Data Submission	SOC	
3.3.2.7	The Integrated AIS AtoN SCOLL shall be certified in accordance with IEC 62320-2.	Data Submission	SOC	
3.3.2.8	The Integrated AIS AtoN SCOLL shall have an off position indicator which is determined in accordance with IALA Recommendation A-126.	Data Submission	SOC	
3.3.3	**Optical Performance**			
3.3.3.1	The Integrated AIS AtoN SCOLL unit shall be compliant with IALA E-200.	Data Submission	SOC	
3.3.3.2	The light signal provided by green, red, white, and yellow lanterns shall fall within the boundaries of the optimum regions and satisfy the chromaticity requirements of IALA E-200.	Data Submission	SOC	

Reference	Requirement	Verification	Compliance	Results (pass/fail)
3.3.3.3	The lantern shall provide a vertical divergence of no less than 7.5° (3.5° above, 3.5° below the focal point). Note, the vertical divergence is measured from the point where the peak intensity falls below 50%.	Data Submission	SOC	
3.3.3.4	The lantern shall be capable of outputting the nominal ranges / effective peak intensities as detailed in Table 1.	Data Submission	SOC	
3.3.4	**Control**			
3.3.4.1	The Integrated AIS AtoN SCOLL unit be capable of producing, as a minimum, the common light flash characters specified in the CCG List of Lights, Buoys, and Fog Signals.	Data Submission	SD	
3.3.4.2	The timing of the light signal shall be within 5% of the rates values, in all operational conditions.	Data Submission	SD	
3.3.4.3	The Integrated AIS AtoN SCOLL unit shall be provided with a communication port to allow configuration by the CCG.	Data Submission	SD	
3.3.4.4	The Integrated AIS AtoN SCOLL unit shall be supplied with a software program to allow for configuration of the unit.	Data Submission	SD	
3.3.4.5	The Integrated AIS AtoN SCOLL shall maintain its programmed settings, and will not switch to another setting until programmed to do so for no less than 12 months unpowered (storage conditions).	Data Submission	SD	
3.3.4.6	The lantern shall switch on whenever the ambient illuminance, measured on a horizontal plane, falls below 75± 25 lx. The lantern shall also turn off when the ambient illuminance rises above 75± 25 lx.	Data Submission	SD	
3.3.4.7	The AIS transmitting and receiving functions shall be unaffected by the ambient illuminance controls.	Data Submission	SD	
3.4	**ENVIRONMENTAL REQUIREMENTS**			
3.4.1	**Temperature**			
3.4.1.1	The Integrated AIS AtoN SCOLL unit shall be capable of operating when exposed to temperatures ranging from -20°C to +40°C.	Test	STD	
3.4.2	**Humidity**			

Reference	Requirement	Verification	Compliance	Results (pass/fail)
3.4.2.1	The Integrated AIS AtoN SCOLL unit shall be capable of operating when exposed to relative humidity from 0% to 100% condensing.	Test	STD	
3.4.3	**Icing**			
3.4.3.1	The Integrated AIS AtoN SCOLL unit shall be capable of operating when exposed to ice loading up to 22kg/m^2.	Data Submission / Test	SOC / STD	
3.4.4	**Wind Speed**			
3.4.4.1	The Integrated AIS AtoN SCOLL unit shall be capable of operating when exposed to gusting up to 160 km/h.	Data Submission / Test	SOC / STD	
3.4.5	**Salt Air and Seawater Spray**			
3.4.5.1	The Integrated AIS AtoN SCOLL unit shall be capable of operating when under continuous exposure to salt air and seawater spray.	Data Submission / Test	SOC / STD	
3.4.6	**Shock and Vibration**			
3.4.6.1	The Integrated AIS AtoN SCOLL unit shall be capable of operating when under continuous exposure to shock and vibration as a marine aid to navigation. This includes handling on ships, and when mounting on buoys.	Data Submission / Test	SOC / STD	
3.4.7	**Electromagnetic Interference**			
3.4.7.1	Including signals from VHF radio and marine radar, the Integrated AIS AtoN SCOLL unit shall not be susceptible to interference from radiating devices normally found in the marine environment when tested in accordance with IEC 60945.	Data Submission / Test	SOC / STD	
3.4.8	**Static Discharge**			
3.4.8.1	The AIS AtoN unit shall incorporate protection from static discharges and induced transient voltages on power leads that may occur due to nearby lightning.	Data Submission / Test	SOC / STD	
3.4.9	**Immersion Protection**			
3.4.9.1	The AIS AtoN unit shall meet the ingress protection of a minimum of IP67.	Data Submission / Test	SOC / STD	
3.4.10	**Hail Impact**			
3.4.10.1	The photovoltaic panels on the Integrated AIS AtoN SCOLL unit shall remain operations after hail impact in accordance with ASTM E1038-10 or another testing method which will be supplied to CCG.	Data Submission / Test	SOC / STD	

Reference	Requirement	Verification	Compliance	Results (pass/fail)
3.5	**MAINTENANCE REQUIREMENTS**			
3.5.1	**Service Life**			
3.5.1.1	The Integrated AIS AtoN SCOLL, excluding the battery, shall have a service life of no less than 12 years.	Data Submission	SD	
3.5.1.2	The batteries shall have a service life of no less than 6 years.	Data Submission	SD	
3.5.1	**Warranty**			
3.5.1.1	The manufacturer shall warranty the Integrated AIS AtoN SCOLL unit against defects for a period of no less than 1 year.	Data Submission	SD	
3.5.2	**Preventative Maintenance Requirements**			
3.5.2.1	The Integrated AIS AtoN SCOLL unit shall not require preventative maintenance, other than yearly cleaning of external surfaces.	Data Submission	SD	
3.5.2.2	The vendor shall supply a list of spares for the AIS AtoN SCOLL.	Data Submission	SD	

Appendix B FLOATING AIDS MOUNTING PATTERN

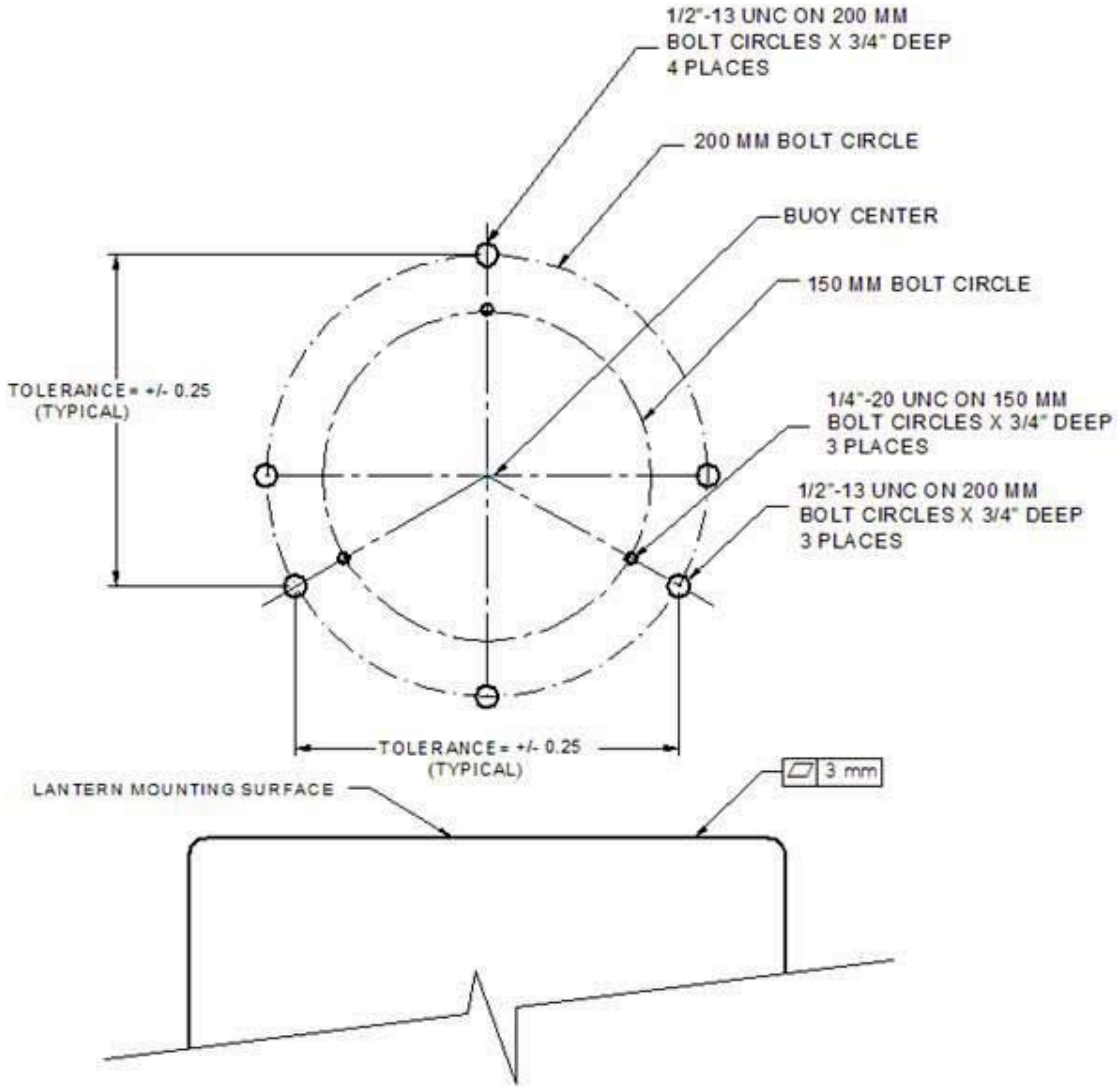

Figure 4-1: Floating Aid Lantern Mounting Pattern

Appendix C INSOLATION, LENGTH OF NIGHT AND AIR TEMPERATURE

This section presents the tabular data for two regions in Canada representing the CCG's typical insolation and limited insolation.

Avergage monthly insolation data for horizontal surfaces and for vertical surfaces oriented to the four cardinal points shown the tables below were obtained using the REDScreen program using NASA data. RETScreen has the ability to provide insolation data for surfaces at various inclinations and orientations. RETSCreen data for other inclinations and orientations may be used provided the RETScreen input parameters used are provided.

The Canadian Coast Guard is aware of other data sources and would accept them if clearly presented and referenced.

Air temperature data presented in the tables below were obtained with the RETScreen program using NASA data.

C.1 ST. ANTHONY – CCG TYPICAL INSOLATION

Table 4: Typical insolation (All values in kWh/m2/d.)

Month	Jan	Feb	Mar	Mar 21 Mar 31	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov 01 Nov 21	Nov	Dec
Horizontal	1.210	2.270	3.730	4.069	4.200	5.550	5.090	4.100	4.050	2.820	1.730	1.232	1.080	0.870
South Vertical	3.730	5.110	5.530	5.197	3.960	3.190	2.570	2.280	2.780	2.750	2.690	2.762	2.530	3.000
East vertical	1.370	2.460	3.600	3.706	3.460	3.510	3.130	2.490	2.580	1.910	1.310	1.084	0.980	1.030
North vertical	0.610	1.090	1.700	1.798	1.900	1.970	1.910	1.670	1.340	0.840	0.500	0.458	0.420	0.430
West vertical	1.370	2.460	3.600	3.706	3.460	3.510	3.130	2.490	2.580	1.910	1.310	1.084	0.980	1.030

Table 5: Length of night - St. Anthony

Duration (hh:mm)	Jan	Feb	Mar	Mar 21 Mar 31	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov 01 Nov 21	Nov	Dec
Day	8:25	9:59	11:54	12:38	13:53	15:37	16:31	16:03	14:31	12:37	10:39	8:45	8:53	7:56
AM 75 lx	0:19	0:17	0:16	0:17	0:17	0:20	0:23	0:21	0:18	0:16	0:16	0:19	0:18	0:19
PM 75 lx	0:19	0:17	0:16	0:17	0:17	0:20	0:23	0:21	0:18	0:16	0:16	0:19	0:18	0:19
75 lx dusk to 75 lx dawn	14:56	13:26	11:29	10:45	9:30	7:41	6:41	7:12	8:50	10:48	12:46	14:35	14:29	15:23

Table 6: Average monthly temperature - St. Anthony (°C)

Daily	Jan	Feb	Mar	Mar 21 Mar 31	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov 01 Nov 21	Nov	Dec
Average	-11.5	-13.7	-9.3	-5.24	-3.5	4.2	8.8	11.3	15.2	9.9	4.2	-0.88	-1.3	-6.8
Minimum	-23.3	-27.5	-22.9	-8.78	-15.6	-2.7	-0.5	4.5	6.5	1.7	-2.8	-2.78	-14.1	-19.5
Maximum	0.5	-0.3	0.2	-1.98	2.6	18.1	16.4	21.4	23.0	19.8	15.1	1.08	7.6	2.7

C.2 PRINCE RUPERT – CCG LIMITED INSOLATION

Table 7: Limited insolation (All values in kWh/m2/d)

Month	Jan	Feb	Mar	Mar 21 Mar 31	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Nov 01 Nov 21	Dec
Horizontal	0.36	1.27	2.24	2.766	3.50	5.54	5.46	4.66	3.62	2.38	1.42	0.72	0.733	0.37
South Vertical	1.22	2.46	2.76	2.988	2.86	3.40	2.96	2.63	2.59	2.44	2.43	1.79	1.626	1.28
East vertical	0.37	1.04	1.62	1.932	2.34	3.57	3.35	2.91	2.35	1.66	1.14	0.62	0.594	0.38
North vertical	0.10	0.38	0.67	0.836	1.14	2.07	2.15	1.80	1.26	0.73	0.41	0.24	0.256	0.13
West vertical	0.37	1.04	1.62	1.932	2.34	3.57	3.35	2.91	2.35	1.66	1.14	0.62	0.594	0.38

Table 8: Length of night - Prince Rupert

Duration (hh:mm)	Jan	Feb	Mar	Mar 21 Mar 31	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov 01 Nov 21	Nov	Dec
Day	7:59	9:45	11:54	12:38	14:06	16:03	17:06	16:33	14:48	12:40	10:29	8:45	8:30	7:25
AM 75 lx	0:20	0:18	0:17	0:17	0:19	0:23	0:27	0:25	0:20	0:18	0:18	0:19	0:20	0:21
PM 75 lx	0:20	0:18	0:17	0:17	0:19	0:23	0:27	0:25	0:20	0:18	0:18	0:19	0:20	0:21
75 lx dusk to 75 lx dawn	15:19	13:37	11:27	10:45	9:14	7:09	5:58	6:35	8:30	10:43	12:54	14:35	14:49	15:50

Table 9: Average monthly temperature - Prince Rupert (°C)

	Jan	Feb	Mar	Mar 21 Mar 31	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Nov 01 Nov 21	Dec
Daily Average	5.2	5.6	6.5	7.18	6.7	10.8	13.0	14.6	14.0	11.2	10.3	5.3	5.99	3.3
Daily Minimum	-5.8	0.4	2.0	5.50	2.6	5.1	8.5	11.1	10.3	7.7	5.2	0.4	7.10	-2.4
Daily Maximum	10.5	10.3	11.5	9.14	11.6	16.3	19.9	21.0	18.8	15.6	15.2	10.0	5.99	8.1

Appendix D ZENI AND GLA MESSAGE PROTOCOLS

June 2004 – Revised June 2011

3 EXAMPLE 2 – ADDRESSED BINARY MESSAGE 6 AS USED BY ZENI LITE BUOY CO., LTD

3.1 INTRODUCTION

Zeni Lite Buoy Co., Ltd, uses a proprietary message format for addressed binary message 6 for monitoring aids to navigation. The message format is as follows.

3.2 MESSAGE INTERVALS

The interval between transmissions of these messages should be synchronized with Message 21.

Table 5 Addressed Binary Message 6 as used by Zeni Lite Buoys Co., Ltd

Parameter	Number of bits	Description
Message ID	6	Identifier for this message 6; always 6.
Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 - 3; default = 0; 3 = do not repeat any more.
Source ID	30	MMSI number of source station.
Sequence Number	2	0 – 3
Destination ID	30	MMSI number of destination station.
Retransmit Flag	1	Retransmit Flag should be set upon retransmission: 0 = no retransmission = default 1 = retransmitted.
Spare	1	Not used. Should be zero.
DAC	10	Destination Area Code. Default: 0
FI	6	Function Identifier. Default: 0
Sub-application ID	16	Default: 1
Voltage Data	12	Lantern supply voltage data. Max 409.6V
Current Data	10	Lantern drain current data. Max 102.3A
Power Supply Type	1	AC or DC. 0: AC 1: DC
Light Status	1	Light On or Light Off. 0: Light Off 1: Light On
Battery Status	1	Good or Low voltage. 0: Good 1: Low voltage
Off Position Status	1	Off position or On position. 0: On position 1: Off position
Spare	6	For future use. Should be zero.
TOTAL OF BITS.	**136**	**Occupies 1 slot.**

Figure 4-2: Zeni Addressed Message Protocol

Recommendation A-126 – the use of the Automatic Identification Systems (AIS) in Marine Aids to Navigation Services
June 2004 – Revised June 2011

Table 4 GLA Format for AIS Aids to Navigation Monitoring Message

Parameter	Number of bits	Description
Message ID	6	Identifier for this message 6; always 6.
Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 – 3; default = 0; 3 = do not repeat any more.
Source ID	30	MMSI number of source Unit
Sequence Number	2	0 – 3
Destination ID	30	MMSI number of destination Unit.
Retransmit Flag	1	Retransmit Flag should be set upon retransmission: 0 = no retransmission = default 1 = retransmitted.
Spare	1	Not used. Should be zero.
DAC	10	Destination Area Code. Default: 235 (UK & NI) or 250 (ROI)
FI	6	Function Identifier Default: 10 for this GLA standard message
Analogue (internal)	10	0.05– 36V 0.05V step Supply voltage to AIS Unit 0 – Not Used
Analogue (external - from hardware analogue input No 1	10	0.05 – 36V 0.05V step 0 – Not Used
Analogue (external - from hardware analogue input No 2	10	0.05 – 36V 0.05V step 0 – Not Used
Status Bits 0 / 1 (internal – same as the 5 LSBs of status bits from Message type 21)	5	4 \/ 00 – no RACON installed; 01 – RACON not monitored 3 /\ 10 – RACON operational; 11 – RACON ERROR 2 \/ 00 – no light or no monitoring; 01 – Light ON 1 /\ 10 – Light OFF; 11 – Light ERROR 0 0 - Good Health, 1 - Alarm
Status Bits 0 / 1 (external - derived from hardware digital inputs)	8	7 Digital Input Off/ / On : : 0 Digital Input Off/ / On
Off Position Status	1	Off position or On position 0: On position 1: Off position
Spare	4	For future use. Should be zero.
TOTAL OF BITS.	**136**	**Occupies 1 slot.**

Figure 4-3: General Lighthouse Authorities Message Protocol