

Repairs of seasonal ships Sorel 2019-2020

N.G.C.C. CAPORAL KAEBLE (C 181)

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N.G.C.C. CONSTABLE CARRIÈRE (C 183)

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G 1.0 LIST OF ACRONYMS

ABS	American Bureau of Shipping
CT	Contract authority (PWGSC)
IA	Inspecting Authority – Inspecteur technique (GCC)
TA	Technical Authority – Représentant du propriétaire (GCC)
BCS	Bureau canadien du soudage
BV	Bureau Veritas
CCT/CLC	Code canadien du travail / Canadian labor code
CR	NGCC Constable Carrière
CSA	Association canadienne de normalisation - ACNOR
CWB	Bureau Canadien de soudage
FS	Fiche signalétique
GCC/CCG	Garde côtière canadienne/Canadian Coast Guard
IEEE	Institute of Electrical and Electronic Engineers
KB	NGCC Caporal Kaebler V.C.
LB	NGCC A. Leblanc
LHT	Longueur hors-tout
MFE	Matériel fourni par l'entrepreneur
MFG	Matériel fourni par le Gouvernement
MPO	Ministère des Pêches et des Océans
MSSF	Manuel de Sécurité et de Sureté de la Flotte
RD	Représentant détaché
RST	Représentant des services techniques
SC	Santé Canada
SCT	Secrétariat du Conseil du Trésor du Canada
SGSS	Système de gestion de la sécurité et de la sureté
SIMDUT	Système d'information sur les matières dangereuses utilisées au travail
SMTC	Sécurité Maritime de Transports Canada
SST	Santé et sécurité au travail
PWGSC	Public Works and Government Services Canada
TCMS	Transport Canada Marine

G 2.0 GENERAL NOTES

G 2.1 Identification

G 2.1.1 These General Notes specify the requirements of CCG that apply to all of the following technical specifications.

G 2.2 References

G 2.2.1 Applicable regulations and documentation:

Procédures MSSF	Titre	Ci-inclus Oui/Non
7.B.2.	Travail en hauteur et sur les murailles	Non
7.B.3	Entrée dans des espaces clos	Non
7.B.4	Travail à chaud	Oui
7.B.5	Verrouillage et identification	Oui
7.E.5	Manutention, entreposage et élimination des matières dangereuses	Non
10.A.6	Peinture et autres revêtements	Non
7.E.8	Contrôle de l'usage des halocarbures à bord des navires	Non
7.A.12	Qualité de l'eau potable	Non
10.A.7	Sécurité et sûreté de l'entrepreneur	Non
Particulier au navire	Particulier au navire - Plan de gestion de l'amiante	Non
Publications		
TP3177F	Normes pour la protection contre les dangers que présentent les gaz sur les navires devant être réparés ou modifiés	Non
T127F	Normes d'électricité régissant les navires	Non
IEEE 45	Pratique recommandée pour les installations électriques à bord des navires	Non
70-000-000-EU-JA-001	Spécification pour l'installation d'équipement électronique à bord des navires	Oui
CSA W47.1	Certification des compagnies de soudage par fusion de l'acier	Oui

CSA W47. 2	Certification des compagnies de soudage par fusion de l'aluminium	Non
CSA W59	Construction soudée en acier (soudage à l'arc)	Non
CSA W59.2	Construction soudée en aluminium	Non
LMMC	Loi sur la marine marchande du Canada	Non
CLC	Code canadien du travail	Non
Règlements		
SSTN	Règlement sur la sécurité et la santé au travail (navires)	

G 2.3 Occupational health and safety

G 2.3.1 The Contractor and all subcontractors must follow occupational health and safety (OHS) procedures in accordance with federal and provincial OSH regulations to ensure that the Contractor's activities are conducted in a safe manner and that do not compromise the safety of any staff member.

G 2.3.2 The Contractor and the Contractor's employees, including all subcontractors, must attend a ship safety orientation session prior to the commencement of any work to familiarize the Contractor's employees with particular hazards. the vessel and with its permit systems for working protocols and procedures for safety, risk prevention, hazard response and pre-work safety assessments. The Contractor will have access to an uncontrolled copy of the Fleet Safety and Security Manual.

G 2.3.3 The Contractor must comply with the Fleet Safety and Security Manual, DFO / 5737, and the Shipboard Work Instructions, in addition to the relevant requirements of the Canada Labor Code when performing the work on the following:

Hot work;

Work at Height;

Degassing before entering confined spaces and for hot work;

Lock out, tag out;

Pre-work safety assessment

G 2.3.4 For the purpose of the lockout and identification procedure, the Contractor shall provide locks and locks for the Contractor's employees in addition to those provided by the Chief Engineer for the ship's crew.

G 2.3.5 The Contractor and its employees will not have access to washrooms or crew lounges. The Contractor must provide the necessary facilities for its employees and subcontractors as required.

G 2.4 Access to the workplace

G 2.4.1 The Contractor must ensure that the TA and CCG personnel have unrestricted access to the work site at all times during the term of the Contract.

G 2.5 Workplace Hazardous Materials Information System (WHMIS)

G 2.5.1 The Contractor must provide the TA with the Material Safety Data Sheets (MSDS) for any product subject to WHMIS control that it has provided.

G 2.5.2 The TA will provide the Contractor with access to Material Safety Data Sheets (MSDS) for all controlled products on board the vessel that could be used in any work item of the specification.

G 2.6 Smoking in the workplace

G 2.6.1 The Contractor must ensure compliance with the Non-Smokers' Health Act. The Contractor will ensure that any employer or person acting on behalf of such an employer, shall ensure that all refrain from smoking in any workspace under the control of the Employer. The contractor must ensure that there is absolutely no smoking on board the vessel.

G 2.7 Clean and safe work place

G 2.7.1 During the work period, the Contractor shall maintain in a clean and debris-free state, the parts of the ship used by its personnel to access the places where they must perform work and remove the waste daily.

G 2.7.2 Hazardous areas due to work performed in accordance with the specification shall be secured and clearly identified by the Contractor, including the display used to warn and protect all personnel of the existing hazard in accordance with the requirements. of the Canada Labor Code.

G 2.7.3 At the end of the contract, the Contractor shall clear the vessel of any waste created by the work and return the vessel to a state of cleanliness equal to that which existed at the beginning of the contract period.

G 2.7.4 Once all pre-determined work is completed and a final cleaning has been completed, the Contractor's Quality Assurance (QA) representative, the TA will conduct an inspection tour together ship to visit all locations where work has been done by the contractor. Any deficiencies or damages so noted will be recorded and compared to previously captured

digital images. The Contractor must correct, at its own expense, all damages or deficiencies attributable to it as a result of the contract work that it undertakes; no portion of the fees will go to the CCG account.

G 2.8 Fire protection

G 2.8.1 The Contractor shall ensure that the isolation, removal and installation of fire detection and extinguishing systems, or any component thereof, is performed by a qualified technician. When a fire detection or extinguishing system is deactivated by the contractor during the contract, the contractor must then be re-certified as fully functional by a qualified technician. A copy of the original signed and dated certificate must be delivered to the TA and the IA before the end of the contract.

G 2.8.2 The Contractor must notify the TA and IA and obtain written approval from the TA prior to disturbing, isolating, disabling, interrupting or excluding any part of the fire detection and / or extinguishing systems, including smoke and heat detectors.

G 2.8.3 The Contractor must provide fire protection at all times, including when someone is working on the vessel's fire detection and / or extinguishing systems. This can be accomplished as suggested below and only with the written permission of the TA: by disabling only one part of a system at a time;

G 2.8.4 The Contractor shall note that if the Contractor fails to take the necessary precautions while performing work, either on or near the ship's fire suppression systems, it may cause an accidental discharge of the extinguishing agent. The Contractor must, at its expense, have the containers or systems thus emptied refilled and re-certified during this work.

G 2.9 Retouch / affected paint

G 2.9.1 Unless otherwise indicated, all new steel and/or steel affected shall receive two coats of marine primer consistent with the ship's paint coating scheme.

G 2.9.2 The Contractor shall prepare any new steel or steel affected to the standards of the paint manufacturer prior to painting.

G 2.10 CCG and Other Employees on the Vessel

G 2.10.1 CCG or DFO employees and other workers such as manufacturers' agents and / or TCMS experts or classification societies may perform work other than those included in these statements of work onboard the vessel during the duration of this contract. The TA will do everything to ensure that such work and / or the resulting inspections / examinations do not

interfere with the work of the Contractor. The Contractor is not responsible for arranging or paying for related inspections unless otherwise indicated.

G 2.11 Regulatory Inspections and / or Classification Reviews

G 2.11.1 The Contractor must make the calls and set the schedule for any regulatory inspection and / or classification visit by the responsible authority: that is, TCMS, HC, Environment Canada or other required persons by the specifications.

G 2.11.2 Any documentation generated by the aforementioned inspections / visits and demonstrating that they have occurred (ie original certificates, signed and dated) must be provided to the Contractor TA with copies to IA.

G 2.11.3 The Contractor must not substitute regulatory inspections or classification visits for inspections by the TA or IA.

G 2.11.4 The Contractor must provide timely (minimum 24 hours) notice of regulatory inspections / classification visits to the TA and IA to assist in the inspection / visit.

G 2.12 Test results and data collection

G 2.12.1 The Contractor shall develop a test and test plan that shall include, as a minimum, all the tests and tests specified in the specifications. This plan must be available to the TA and the IA for approval one week prior to the start of the tests and tests originally planned.

G 2.12.2 All tests, measurements, calibrations and readings must be recorded, signed by the person taking the measurements, dated and provided in a report format in electronic copy and on paper - at the TA , IA and TCMS.

G 2.12.3 The dimensions in the register shall be accurate to three decimal places (unless otherwise specified) in the measurement system commonly used on board the ship.

G 2.12.4 The Contractor must provide the TA and IA with current and recent calibration certificates for all instrumentation used in the test and test plan, demonstrating that the relevant measuring instruments have been calibrated in accordance with the manufacturer's instructions.

G 2.12.5 Printed reports shall be bound in standard three-ring binders, typewritten on letterhead and indexed according to the specification numbering. Electronic copies will be kept in "Adobe PDF" format without lock and provided as a CD-ROM. The contractor will provide three hard copies and one electronic copy of each report.

G 2.12.6 All documentation from the contract period must be incorporated into a data book that will be provided to the TA and IA at the end of the contract period.

G 2.13 Contractor Furnished Tools and Materials

G 2.13.1 The Contractor must ensure that all materials are new and have never been used.

G 2.13.2 The Contractor must ensure that replacement materials such as tows, packaging, insulation, small hardware, oils, lubricants, cleaning solvents, preservatives, paints , coatings, etc. conform to the manufacturer's drawings of the equipment, guides or instructions.

G 2.13.3 Where no particular item is specified or, where substitution is to be made, the TA must approve the substituted item in writing. The contractor must provide information on the materials used - certificate of grading and quality of various materials - to the TA prior to use.

G 2.13.4 The Contractor must provide all equipment, machinery, equipment and tools such as cranes, scaffolds, rigs and rigging required to complete the work specified in this specification.

G 2.13.5 The Contractor shall provide a waste disposal service for any oil, oily waste, other hazardous material, or any junk subject to control resulting from the work specified in this specification. It will also provide garbage disposal certificates for any waste listed above and these certificates must demonstrate that the disposal was made in accordance with current federal, provincial and municipal guidelines.

G 2.14 Government Furnished Tools and Materials

G 2.14.1 The Contractor must ensure that all materials are new and have never been used.

G 2.14.2 Where the tools are provided by the TA, they will be returned by the Contractor in the same condition as when they were borrowed. The borrowed tools must be inventoried and the contractor must sign an acknowledgment of receipt and return them to the TA.

G 2.14.3 Any Government Furnished Equipment (GSE) must be received by the Contractor and stored in a secure warehouse or warehouse with a controlled environment that is well suited to the equipment according to the manufacturer's instructions.

G 2.15 Familiarization with contractors

G 2.15.1 All personnel working at the Canadian Coast Guard Sorel must complete a familiarization session and sign Form 10.A.7. There will be two familiarization sessions. The first session will be held on the day of the start meeting and the second session will be held two weeks later. Familiarization sessions will be conducted by a Canadian Coast Guard employee. Each session will have a duration of two hours.

G 2.16 Restricted areas

G 2.16.1 Other than for safety or for the purposes of the work required by the specifications, the Contractor is prohibited from entering any of the following locations: all cabins, offices, workshops, office mechanics, the wheelhouse, the control room, all the toilets, the kitchen, the mess rooms, the lounges and any other sector whose access is restricted by signaling.

G 2.16.2 The Contractor must notify the TA at least 24 hours in advance of commencing work in the manned spaces or offices. These delays will provide the COW with the time necessary to evacuate its personnel and ensure security in these premises.

G 2.17 Contractor Inspections and Protection of Workplace and Equipment

G 2.17.1 The Contractor must coordinate an inspection of the condition and location of items to be removed with the TA and IA prior to performing the specified work or to access a location to perform this work.

G 2.17.2 The Contractor shall repair, at its expense, any damage resulting from its actions in the performance of its work and which may be attributed to its performance. Any equipment used in a replacement or repair must meet the criteria for the equipment provided by the Contractor as indicated above in the Tools and Equipment provided by the Contractor.

G 2.17.3 The Contractor must protect all equipment and all surrounding areas from damage. Work areas must be protected against flooding and water leakage, debris caused by sanding, welding, etc. Temporary tarps should be placed over work areas.

G 2.18 Recording of work in progress

G 2.18.1 The TA and IA may record work in progress using a variety of means including, but not limited to, photography and video.

G 2.19 List of confined spaces

G 2.19.1 The Contractor may request a list of the enclosed spaces of the vessel at the meeting preceding the refit.

G 2.20 Lead-based paints and paint coatings

G 2.20.1 The Contractor will not use lead-based paints.

G 2.20.2 CCG vessels have been coated with lead-based paint in the past, so some work done by the contractor such as grinding, welding, or hot work may remove the lead from the lead. these paintings. The Contractor must ensure that coatings in affected work areas are

examined for lead content and that work is performed in accordance with applicable federal and provincial regulations.

G 2.20.3 The Contractor must demonstrate product approval by HC for SC controlled hull paints and the Pest Management Regulatory Agency.

G 2.21 Materials containing asbestos

G 2.21.1 The Contractor will not use any materials that contain asbestos.

G 2.21.2 Handling of any asbestos-containing material will be done by persons trained and qualified in asbestos disposal in accordance with current federal, provincial and municipal regulations as well as in accordance with the MSSF. The Contractor must provide the TA with certificates showing that the removal of the vessel from any asbestos-containing material has been done in accordance with current federal, provincial or municipal regulations.

G 2.22 Material and equipment removed

G 2.22.1 All material removed as a result of this specification remains the property of GCC, unless otherwise instructed in the specification section.

G 2.23 Certification of welding

G 2.23.1 For all work requiring the application of fusion welding for steel constructions, the contractor and / or welders of the subcontractors must be certified by the Canadian Welding Bureau in accordance with CSA Standards W47.1- 03, latest revision - Certification of Companies for Fusion Welding of Steel, Division Certification Level 2 at a minimum. Copies of certifications (including those of welders) will be provided to the TA and IA. Any welding activity will be done in accordance with the Canadian Coast Guard Welding Document.

G 2.24 Electrical installations

G 2.24.1 All electrical installations and repairs shall be carried out in accordance with the latest revisions of TP127E - Marine Standards - Marine Safety of Transport Canada and Standard 45- Recommended Practice for Electrical Installation on Ships - of the IEEE.

G 2.25 Electricity supply

G 2.25.1 CCG shall permit the Contractor to use a limited number of 115 VAC, 1 phase, 15 amp electrical outlets for the duration of the contract based on the capacity of the system.

Kb10 SECURITY AND SAFETY EQUIPMENT

Kb10.1 CERTIFICATION OF FUEL HOSES

KB 10.1.A.1 Provide equipment and labor to perform the hydrostatic testing and testing of two casings, one Continental Contitech FLEXSTEEL FUTURA gasoline transfer mark, 1 inch in diameter, approximately forty feet long and the other Goodyear Flexsteel Futura H (559N) 1 inch in diameter and about twenty feet long.

KB 10.1.A.2 The Contractor will be responsible for decontaminating the two hoses and disposing of the water used for the hydrostatic tests, and will have to return the two hoses dry and free from residue.

KB 10.1.A.3 The operating pressure of the hoses is two bar.

KB 10.1.A.4 Each hose shall be provided with a stainless steel plate indicating the date of the test, the working pressure, the test pressure, the hose serial number, the name of the contractor.

KB 10.1.A.5 The Contractor shall provide the Chief Engineer, and a copy to the TA, with a certificate for each hose.

Kb10.2 PORTABLE EXTINGUISHER INSPECTION

KB10.2.A Scope of work

KB 10.2.A.1 The Contractor shall remove the portable fire extinguishers from the vessel and transport them to an authorized service center, where maintenance will be performed. These fire extinguishers must be replaced by temporarily equivalent extinguishers. The portable fire extinguishers will then be returned to the ship and relocated.

KB10.2.B References

KB 10.2.B.1 Reference drawings / data plate data.

10.2.B.1.1 NPA10 Standard for portable fire extinguishers.

KB10.2.C List of types of fire extinguishers of the ship to be inspected:

No. station	Année	Emplacement	Marque & Modèle	Type	No. Série	Poids min (lbs)	Dernière maintenance de 6 ans	Dernier test hydrostatique 5/12 ans
1		Local GRC	Amerex	Poudre ABC	AV92926	16lb10oz	10/2011	10/2011
3		Local GRC	Amerex	CO2 BC	AB881107	33lb6oz	02/2016	02/2016
4		Timonerie	Amerex	Poudre ABC	AV93258	16lb10z	10/2011	10/2011
33		Cmpt batterie bâbord	Amerex	Classe K	AD18417	20lb5oz	10/2012	10/2012
34		Cmpt batterie bâbord	Amerex	Mousse AB	AC641029	27lb9oz	03/2015	03/2015
		Cmpt avant timo bâbord	Amerex	Poudre ABC	AW41389	33lb11oz	09/2011	09/2011
		Cmpt avant timo bâbord	Amerex	Poudre ABC	BB421215	33lb11oz	02/2012	02/2012
		Cmpt avant timo bâbord	Amerex	Poudre ABC	12924993	8lb5oz	02/2016	02/2016
6		Coursive magasin aliments	Amerex	Mousse AB	AC790026	27lb9oz	02/2016	02/2016
8		Cuisine	Amerex	Classe K	AD18416	20lb5oz	10/2012	10/2012
9		Coursive Cmdt, C/M	Amerex	Mousse AB	AC641003	27lb9oz	03/2015	03/2015
12		Salle d'éqpt électronique	Amerex	CO2 BC	AB881069	33lb6oz	02/2016	02/2016
13		Génératrice d'urgence	Amerex	CO2 BC	AB881086	33lb6oz	02/2016	02/2016
14		Génératrice d'urgence	Amerex	Poudre ABC	AV92945	16lb10oz	10/2011	10/2011
31		Extérieur tribord	Amerex	Poudre ABC	AV93417	16lb10oz	10/2011	10/2011
		Station de ravitaillement arrière bâbord	Amerex	Mousse AB	AD16062	27lb9oz	03/2015	10/2012
15		Appareil à gouverner	Amerex	Mousse AB	AC641032	27lb9oz	03/2015	03/2015
18		Salle de contrôle	Amerex	Poudre ABC	AV93464	16lb10oz	10/2011	10/2011

20		Propulseur d'étrave	Amerex	Mousse AB	AC641028	27lb9oz	03/2015	03/2015
21		Coursive (toilettes)	Amerex	Mousse AB	AC641007	27lb9oz	03/2015	03/2015
22		S/M Principale bâbord	Amerex	CO2 BC	AB881104	33lb6oz	02/2016	02/2016
23		S/M Principale centre avant	Amerex	Mousse AB	AC790010	27lb9oz	03/2015	10/2012
24		S/M Principale tribord	Amerex	Poudre ABC	AW41395	33lb11oz	01/2013	09/2011
25		S/M Principale centre arrière	Amerex	CO2 BC	AC412736	25lb12oz	06/2013	06/2013
26		S/M Principale tribord	Amerex	Mousse AB	AC790022	27lb9oz	03/2015	10/2012
28		S/M Auxiliaire arrière	Amerex	Mousse AB	AC641033	27lb9oz	03/2015	03/2015
29		S/M Auxiliaire avant	Amerex	CO2 BC	AB881101	33lb6oz	02/2016	02/2016
30		Coursive (S/C)	Amerex	Mousse AB	AC641015	27lb9oz	03/2015	03/2015
		Kaeble 1	Strike First	Poudre ABC	BT918474	8lb3oz	12/2013	12/2013
		Kaeble 1	Pyrene	Poudre ABC	K543915	8lb3oz	03/2015	01/2009
		Kaeble 2	Pyrene	Poudre ABC	K543720	8lb3oz	02/2016	05/2010
		Kaeble 2	Pyrene	Poudre ABC	AE107660	8lb3oz	02/2016	02/2016
		Zodiac 420	Orfeo	Poudre 1kg	3916407		01-2010	01-2010

KB10.2.D Equipment provided by the owner

KB 10.2.D.1 Unless otherwise indicated, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications.

KB10.2.E TECHNICAL DESCRIPTION

KB 10.2.E.1 The contractor removes the fire extinguishers from the vessel and transports them to an authorized service center for maintenance and testing, then returns them to the vessel and re-installs them.

KB 10.2.E.2 Annual inspection of portable extinguishers is required. The inspection and maintenance of fire extinguishers will be entrusted to a certified representative.

KB 10.2.E.3 The Contractor shall for a three year inspection of a portable foam extinguisher replace the foam.

KB 10.2.E.4 The contractor removes fire extinguishers in a sequence that ensures that the number of extinguishers out of the ship never exceeds one-third of those on board. The chief engineer will determine the order of fire extinguishers.

KB10.2.F **Obstructions**

KB 10.2.F.1 The Contractor is responsible for identifying obstructions, temporarily removing and storing items, and reinstalling them on the vessel.

KB 10.2.F.2 Upon completion of the maintenance, the Contractor shall return all fire extinguishers to the vessel and re-install them in accordance with the Chief Engineer's instructions.

KB10.2.G **Annual Inspection**

KB 10.2.G.1 Fire extinguishers must be inspected visually at least once a year. This inspection consists of reversing the fire extinguishers and shaking them upside down in order to unpack the powder they contain.

KB10.2.H **Preventive Maintenance / Maintenance**

KB 10.2.H.1 Fire extinguisher: Every six years. Work done: Replacing the powder and checking the correct operation of the device. A check collar and a WHMIS label indicating the date of service must be affixed in accordance with NFPA10 or newer.

KB 10.2.H.2 Water extinguisher, Type K, Co2: Every five years.

KB10.2.I **Hydrostatic test**

KB 10.2.I.1 This test consists of ensuring that the container is in good condition by subjecting it to a pressure determined by the manufacturer.

KB 10.2.I.2 Powder extinguisher: Every 12 years.

KB 10.2.I.3 Water extinguisher, Type K, Co2: Every 5 years.

KB 10.2.I.4 Refill: When a fire extinguisher has been used, even partially, it must be recharged again without delay. Note that a refill does not constitute preventative maintenance.

KB10.2.J **PROOF OF PERFORMANCE**

KB 10.2.J.1 Inspection

10.2.J.1.1 All work must be completed to the satisfaction of the Commanding Officer, Chief Engineer or Vessel Maintenance Manager.

KB 10.2.J.2 Trials

10.2.J.2.1 Fire extinguisher tests shall be carried out in accordance with the rules of the classification society ABS.

KB 10.2.J.3 Certification

10.2.J.3.1 The Contractor shall provide the Chief Engineer with two hard copies of maintenance certificates along with their original copy. The Contractor will also send an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

KB10.2.K **DELIVERABLES**

KB 10.2.K.1 Drawings / reports

10.2.K.1.1 The Contractor shall provide the Chief Engineer with two hard copies of the reports and checklists that detail the work and any necessary modifications. The Contractor also sends an electronic copy of all reports to the Vessel Maintenance Manager.

Kb10.3 **FIRE DETECTION SYSTEM**

KB10.3.A **SCOPE**

KB 10.3.A.1 This specification is for the Contractor to retain the services of an accredited company to perform the annual inspection and certification of the fire detection system.

KB10.3.B **REFERENCES**

Document	Title	Included Yes/No
AF6095-55500-04_AF	FIRE CONTROL PLAN_Fr	yes
Manuel instruction	Système intégré de détection d'incendie	
Système de détection	Fire Notifier NFS-320	
Regulations	Loi sur la marine marchande du Canada, 2001	

KB10.3.C **Equipment provided by the owner**

KB 10.3.C.1 Unless otherwise indicated, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications.

KB10.3.D **TECHNICAL DESCRIPTION**

KB 10.3.D.1 General

10.3.D.1.1 The vessel is equipped with an integrated Techsol fire detection system with Fire Notifier NFS-320 panel. The Fire Notifier NFS-320 panel is connected to the integrated fire alarm system that is part of the vessel's surveillance and alarm system.

10.3.D.1.2 The Contractor must schedule an ABS Classification Society Inspector's visit prior to commencement of work and the fees will be paid by Canada.

10.3.D.1.3 The Contractor retains the services of an accredited company to perform the annual inspection and certification of the fire detection system.

KB 10.3.D.2 Location

10.3.D.2.1 The fire detection control panel is located on the port side of the wheelhouse.

KB 10.3.D.3 Obstructions

10.3.D.3.1 It is the responsibility of the Contractor to locate obstruction items, remove them temporarily and store them, and then reinstall them on the vessel.

KB10.3.E **PROOF OF PERFORMANCE**

KB 10.3.E.1 Inspection

10.3.E.1.1 All work must be completed to the satisfaction of the Chief Engineer.

KB 10.3.E.2 Certification

10.3.E.2.1 The Contractor shall provide the Chief Engineer with two hard copies of the annual maintenance and certification certificates with their original copy. The Contractor must also send an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

KB 10.3.E.3 **DELIVERABLES**

10.3.E.3.1 Drawings / reports

10.3.E.3.2 The Contractor shall provide the Chief Engineer with a hard copy of the typed report detailing the inspections, modifications and repairs made prior to acceptance of this item. The Contractor also sends an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

Kb10.4 ANNUAL INSPECTION OF THE FIXED FIRE FIGHTING SYSTEM

KB10.4.A Scope

KB 10.4.A.1 The purpose of this specification is to maintain and certify the fixed firefighting system.

KB 10.4.A.2 The Contractor will contact the Chief Engineer prior to commencing work on this item. This work must be done in parallel with the maintenance of the portable fire extinguishers without reducing the ability to fight fires aboard the ship.

KB 10.4.A.3 The fixed firefighting system is a FM200 system.

KB10.4.B References

Document	Title	Included Yes/No
AF6095-55500-04_AF	FIRE CONTROL PLAN_Fr	yes
Publications		
90-FM200M-21	Kidde Fenwal FM200 Marine ECS series Engineered Fire Suppression System, Design, installation, Operation and Maintenance Manual	no
Reglementations	Loi sur la marine marchande du Canada, 2001	

KB10.4.C Accreditation

KB 10.4.C.1 The contractor must be accredited for the certification of this system and by the ABS classification society that it will do in accordance with the latest regulations in force on maritime safety.

KB10.4.D Equipment provided by the owner

KB 10.4.D.1 Unless otherwise indicated, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications.

KB10.4.E Technical Description

KB 10.4.E.1 General

10.4.E.1.1 The Contractor shall retain an authorized representative who will perform testing and inspections of the FM200 system and the vessel's fire system as part of the annual inspection and certification. of this system. The chief engineer must attend all tests.

10.4.E.1.2 In addition to the following tests, the Contractor shall perform all tests required by the on-site ABS Inspector. The Contractor must provide in its estimate the cost for the testing of alarms (lights and sirens) of all devices, the testing of nitrogen trip cylinders, the testing of ventilation shutoff devices as well as testing release loops and cables.

10.4.E.1.3 The Contractor shall air-purge pneumatic hoses and actuators and ensure that they operate properly. Hoses and nozzles must be free of obstruction.

10.4.E.1.4 The Contractor must ensure that alarm displays and sirens are working properly. The contractor must weigh each cylinder and record its results. At the end of the refit, he must provide the Chief Engineer with copies of all certificates.

10.4.E.1.5 Upon completion of the tests and inspections, the Contractor shall reassemble the systems and return them to service.

10.4.E.1.6 For the FM200 system, a halocarbon leak detection test shall be performed by accredited personnel for halocarbons and shall be carried out with adequate detection equipment.

KB 10.4.E.2 Obstructions

10.4.E.2.1 The Contractor is responsible for identifying obstructions, temporarily removing and storing them, and reinstalling them on the vessel.

KB10.4.F **PROOF OF PERFORMANCE**

KB 10.4.F.1 Inspection

10.4.F.1.1 All work must be completed to the satisfaction of the Chief Engineer, the Vessel Maintenance Manager and the ABS Inspector.

KB 10.4.F.2 Tests

10.4.F.2.1 The Chief Engineer shall witness the inspection and testing of the system.

KB 10.4.F.3 Certification

10.4.F.3.1 The Contractor shall provide the Chief Engineer with two hard copies of maintenance certificates along with their original copy. The Contractor will also send an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

10.4.F.3.2 An independent certification for the leak detection test shall be issued for the FM200 system and shall also show the certificate number of the technician who performed the test.

KB 10.4.F.4 **DELIVERABLES**

10.4.F.4.1 Drawings / reports

10.4.F.4.2 The Contractor shall provide the Chief Engineer with a hard copy of his report detailing the inspections, modifications and repairs made prior to acceptance of this item. The Contractor will also send an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

Kb11 **HULL AND STRUCTURE**

Kb11.1 **TRANSOM**

KB11.1.A **Specifications for New Exhaust Exhaust Hero Class**

KB 11.1.A.1 Note: The prepared drawings are design drawings; manufacturers must use the drawings and instructions to create the implementation plan.

KB 11.1.A.2 The exhaust on the transom will have to be changed to stainless steel.

KB11.1.B **References**

KB 11.1.B.1 See drawing J15073-S01 for more information on abductions.

KB11.1.C **Technical Aspect**

KB11.1.D **PENETRATION AND EXHAUST PIPES OF EXISTING TRAITS**

KB 11.1.D.1 The existing penetration in the hull and the flange connection piece must be removed in their entirety. The part of the piping between the connection flange and the first set of pipe flanges on the horizontal exhaust path (which contains the flange connection for seawater injection) must also be removed.

KB 11.1.D.2 The existing seawater injection line with flanged connection to the exhaust pipe must be removed and reused in the new section of the exhaust pipe that will be installed there.

KB11.1.E **TRANSOM SHEETS AND TRANSOM CROSSING BRACKETS**

KB 11.1.E.1 The corroded weld zone surrounding the existing penetration part of the hull and any corroded transom sheet outside this weld zone shall be cut. Care must be taken to ensure that no additional sheet that remains in good condition is cut during the process. If the corroded area of the transom plating exceeds the area of the new penetration plating, then insertion plates of the original thickness and quality must be installed, in accordance with ABS (this varies by vessel and by port or starboard side of each vessel).

KB 11.1.E.2 Existing internal supports for the hull penetration part shall be cut and removed.

KB 11.1.E.3 The contractor will supply ABS certified steel to make repairs to the transom.

KB11.1.F **NEW TRANSOM SHEETS AND TRANSOM EXHAUST PIPE, MATERIAL AND WELDING**

KB11.1.G **Equipment Data**

KB 11.1.G.1 Transom / exhaust

KB11.1.H **Drawings**

KB 11.1.H.1 All drawings are indicated in the General remarks. The following drawings should be considered as reference drawings, as defined in the Drawings section of the General Notes.

Number of drawing	TITLE of DRAWING	Number of sheets
J15073-S01	Main engine exhaust outlets - disassembly	1
J15073-M01	New main engine exhaust outlet	1
J15073-M01	New main engine exhaust outlet	1

KB11.1.I **Regulations and Standards**

KB 11.1.I.1 The following regulations and standards apply to the work performed in this section; the Contractor must ensure that all work performed in this section complies with regulations and standards as well as federal and provincial regulations and standards.

KB11.1.J **Statement of Work**

KB 11.1.J.1 NEW PENETRATION OF TRANSOM AND TRANSOM EXHAUST PIPING, MATERIAL AND WELDING.

KB11.1.K **Description**

KB 11.1.K.1 The new transom crossings (2) will be made entirely of 316L stainless steel and will be welded directly into the transom plate. No carbon steel will be used in the penetration room as this appears to be the main problem with the existing installation. The combination of hot exhaust and seawater at the outlet strongly corroded the existing penetration piece to the transom plates.

KB11.1.L **References**

KB 11.1.L.1 The details of the new exhaust system can be found in drawing J15073-M01.

KB 11.1.L.2 All welding and weld inspection work must be in accordance with CCG's CT-043-eq-eg-001-E Welding Specification.

KB11.1.M **Technical Aspect**

KB 11.1.M.1 For all items requiring the application of fusion welding for steel structures, the Contractor and all subcontractors must be certified by the Canadian Welding Bureau in accordance with CSA \ ACNOR W47.1 - last edition, Division 1 or 2.

KB 11.1.M.2 For all articles requiring the application of fusion welding for stainless steel structures, the Contractor and all subcontractors must be certified by the Canadian Welding Bureau in accordance with CSA \ ACNOR W47.1 - latest edition, Division 1 or 2. Welders, welding operators and welding methods must meet the requirements of CSA W47.1 and AWS D1.6, as permitted by CSA W47.1.

KB 11.1.M.3 For all items requiring the application of fusion welding to aluminum structures, the Contractor and all subcontractors must be certified by the Canadian Welding Bureau in accordance with CSA \ ACNOR W47.2 - latest edition, Division 1 or 2.

KB 11.1.M.4 Before commencing any welding work, the Contractor must provide the TA with documentation clearly indicating compliance with the welding certification requirements specified in this document and in the CTG CT Welding Specification. -043-eg-eg-001. Typical documents include, but are not necessarily limited to: Validation Letter, Welding Procedures, Welding Performance Rating Cards, Inspection Staff Qualification Cards, Inspection Reports, etc.

KB 11.1.M.5 Standards for welding shall comply with the requirements of the CT-043-eg-eg-001 CCG Welding Specification.

KB 11.1.M.6 For structural steels > 3 mm thick, the weld shall meet the requirements of CSA W47.1 and W59, except for the modifications made by the CT-043-eg welding specification. -eq-001 of the CCG.

KB 11.1.M.7 For structural aluminum > 3 mm thick, the weld shall meet the requirements of CSA W47.2 and W59.2, except as modified by CT-043- eg-eg-001 of the CCG.

KB 11.1.M.8 For stainless steels > 3 mm thick, the weld shall meet the requirements of CSA W47.1 and AWS D1.6 and the CT-043-eg-eg- 001 of the CCG.

KB 11.1.M.9 316L stainless steel is easily welded using a higher alloy and a very low carbon load.

KB11.1.N **For dissimilar welded carbon steel (CS) fittings to 316L stainless steel, the following procedures must be followed:**

KB 11.1.N.1 Higher alloy, very low carbon weld input required (eg 309MoL).

KB 11.1.N.2 A low thermal welding process (eg GMAW-P process with 99.99% Ar shielding gas) should be used, with a maximum thermal input not exceeding 1.5 KJ / mm and a maximum contact temperature not exceeding 150 ° C.

KB 11.1.N.3 No preheating required above 10 C min. ambient temperature and no heat treatment is required after welding.

KB 11.1.N.4 The dissimilar metallic weld joint shall be designed to provide a gradual and smooth transition between thicker 316L stainless steel and thinner plain carbon steel transom plating, for example, chamfering a side with a minimum slope of 1: 4 and with the opposite side to the flush. Side 2 must be ground to obtain a sound metal at the end of welding on side 1 and before welding on side 2.

KB 11.1.N.5 Appropriate sequencing of welds to minimize deformations (eg alternating or simultaneous welding on diametrically opposed segments / quadrants).

KB 11.1.N.6 Previously qualified welding procedures in accordance with Section IX of the ASME may be accepted in lieu of the CSA / AWS test standards specified herein.

11.1.N.6.1 New supports for the penetration part, similar to those currently in place, must be installed and the appropriate welding procedures described above must be followed. In addition, the weld cap must be flush before soldering.

11.1.N.6.2 All areas where dissimilar metals have been welded shall be smooth and covered with heat-resistant epoxy before being painted to avoid exposure of the different weld zone to seawater. This coating system should be inspected and maintained regularly.

KB11.1.O **EXHAUST PIPING AND INJECTION OF SEA WATER**

KB 11.1.O.1 References

11.1.O.1.1 See drawing J15073-M01 for more details on the installation.

KB11.1.P **Technical aspect**

KB 11.1.P.1 A new exhaust pipe section will be installed to connect the new transom penetration piece to the existing exhaust pipe at the front of the withdrawal section. The new tailpipe will include a flanged seawater connection identical to the one currently installed and will be connected to existing seawater piping at this location.

KB 11.1.P.2 The existing seawater injection pipe section currently connected to the exhaust pipe flange must be removed from the old exhaust pipe section and reinstalled in the same

manner with the new exhaust piping. If the existing seawater injection nozzle is not in the center of the exhaust pipe when it is reinstalled, it must be modified accordingly.

11.1.P.2.1 The separation of materials shall be maintained between dissimilar metals.

KB11.1.Q **Proof of Performance**

KB11.1.R All welds completed under this contract will be subject to a 100% visual inspection and then a 100% PT inspection.

KB11.1.S **Inspection Points**

CR10.1.A.1 All inspections and examinations will be performed by the qualified third party inspection organization of the TA. Defective welding must be repaired at the expense of the contractor. The contractor will pay for the resumption of the tests of the welds that must be redone.

KB11.1.T **Tests and Trials**

KB 11.1.T.1 All inspections and examinations will be carried out by the qualified third party inspection body of the TA. Defective welding must be repaired at the expense of the contractor. The contractor will pay for the resumption of the welds that need to be redone.

Kb11.2**GENERAL WELDING REPAIRS**

KB11.2.A **SCOPE**

11.2.A.1.1 The purpose of this specification is for the Contractor to provide certified welding labor to be performed in order to perform aluminum and steel welding repairs outside ship.

KB11.2.B **REFERENCES**

Document	Title	Included Yes/No
Plan		
Publications		
Standards	W49	
	Standard de la garde côtière	
Reglementations	Building and Classing High-Speed Craft - 2019	
	Loi sur la marine marchande du Canada, 2001	

KB 11.2.B.1 Equipment provided by the owner

11.2.B.1.1 Unless otherwise specified, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications.

KB11.2.C **Technical Description**

KB 11.2.C.1 General

11.2.C.1.1 The Contractor must note that the majority of the work is on an aluminum structure.

Kb11.3 VENTS HEIGHTS TO BE ADJUSTED TO REGULATIONS

KB11.3.A **Scope**

KB 11.3.A.1 The height of the vents must be adjusted to regulations standards: 900 mm or more for ventilators and 760 mm or more for the air pipes. There is one Ventilator (Main Deck (s)/ 1 No, Goose neck) and twelve Air pipes to be adjusted (in yellow), for a total of thirteen. The table below shows the actual height.

KB 11.3.A.2 The contractor must unscrew the flange and temporarily blank the hole/flange on the ship while the vents are being worked on ashore. Once ashore the contractor must cut the vent and weld an extension piece, of the same material, to get to the regulation height.

	No & Deck fitted on	Closing Appliances	Remarks	Coaming Heights (mm)
Ventilators	Main Deck (s)/ 1 No, Goose neck	Hinged Cover 1 Latch	SG Flat exhaust	820
	Main Deck (s), 1 No, Goose neck	Hinged Cover 1 Latch	SG Intake	1022
	Main Deck (p), 1 No, Goose neck	Hinged Cover 1 Latch	SAR Medical Locker	990
Air pipes	Main deck Fr.1 +145 (P), 1 No	Automatic (float ball)	Ballast - tank 17	521
	Main deck Fr.1 +155 (S), 1 No	Automatic (float ball)	Ballast - tank 16	554
	Main deck Fr.9 -335 (P), 1 No	Automatic (float ball)	Fuel oil storage/overflow - tank 9	330
	Main deck Fr.9 +150 (P), 1 No	Automatic (float ball)	Tanks 6 & 7b	391

Main deck Fr.15 -295 (S), 1 No	Automatic (float ball)	Dirty oil & sludge - tank 15	375
Main deck Fr.15 -90 (S), 1 No	Automatic (float ball)	M.E. Lubrication oil -tank 5	402
Main deck Fr.17 -200 (P), 1 No	Automatic (float ball)	Bilge water -tank 4	349
Main deck Fr.30 +150 (P), 1 No	Automatic (float ball)	Fresh water -tank 11	516
Main deck Fr.30 +150 (S), 1 No	Automatic (float ball)	Fresh water -tank 12	505
Main deck Fr.9 -150 (P), 1 No	Automatic (float ball)	Grey water -tank 7a	327
Main deck Fr.8 +341 (S), 1 No, Goose neck		Air Receiver safety valve AMR	455
Main deck Fr.11 -410 (S), 1 No Goose neck		Air Receiver safety valve MMR	449

Please note where there is a float ball, the measurement is from the bottom of the float ball

Kb12 **PROPULSION SYSTEM AND MANEUVER**

Kb12.1 **INSPECTION CPP PUMP P3**

KB12.1.A **Scope**

KB 12.1.A.1 The Coast Guard has two Settima pumps approved Hero class per ship. These two pumps must be removed, taken to a hydraulic workshop, inspected for wear, tested at the hydraulic pressure and flow shop and returned and installed on the vessel. A report of these tests must be returned with the pump.

Kb13 **ELECTRICITY PRODUCTION**

Kb13.1 **ANNUAL MAINTENANCE OF GENERATOR ALTERNATORS**

KB13.1.A **Scope**

KB 13.1.A.1 Perform annual maintenance on alternators on port, starboard and emergency generators.

KB13.1.B **References**

Document	Title	Included Yes/No
Plan		
Publications	Magnaplug Generator, 280-430 Frame, Installation, Operation and Maintenance Manual Voltage Regulator AVC63-12 and AVC125-10 Manual	
Standards		
TP 127 F	Normes d'électricité régissant les navires	
Regulations	Building and Classing High-Speed Craft - 2019 Loi sur la marine marchande du Canada, 2001	

KB13.1.C Equipment provided by the owner

KB 13.1.C.1 Unless otherwise indicated, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications..

KB13.1.D TECHNICAL DESCRIPTION

KB 13.1.D.1 General

13.1.D.1.1 Check and record the insulation resistance with a five hundred mega-ohm voltmeter. The minimum acceptable reading is two mega-ohms. All electronic devices (controllers, diodes, capacitors, protection relays) must be disconnected from the winding circuit before checking the insulation. If the reading is less than the minimum, the generator must be cleaned and dried in place and if ever the contractor is unable to read infinitely, it must be taken to an authorized service center.

13.1.D.1.2 Check the DC excitation voltage without load and check the number of revolutions per minute. Record the unloaded excitation (DC voltage at the stator of excitation), the voltage of the generator terminal and the speed of the drive mechanism as future reference points for troubleshooting.

13.1.D.1.3 For bid submission, provide specialized electrical labor for a period of (10) ten hours to complete the work.

KB13.1.E Obstructions

KB 13.1.E.1 The Contractor is responsible for identifying obstructions, temporarily removing and storing them, and reinstalling them on the vessel.

KB13.1.F **PROOF OF PERFORMANCE**

KB 13.1.F.1 Inspection

13.1.F.1.1 The work must be performed to the satisfaction of the Chief Engineer.

13.1.F.1.2 Provide a report indicating the measured values and irregularities observed.

KB 13.1.F.2 **DELIVERABLES**

13.1.F.2.1 Drawings / reports

13.1.F.2.2 The Contractor shall provide the Chief Engineer with a hard copy of the typed report detailing the inspections, modifications and repairs made prior to acceptance of this item. The Contractor will also send an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

Kb14 ELECTRICAL DISTRIBUTION

Kb14.1 ADD VOLTAGE REGULATOR

KB14.1.A **Scope**

KB 14.1.A.1 Objective: The objective of this project is to install and commission the load control component for the synchronization operation with the terrestrial power supply.

KB 14.1.A.2 Background: The CCG has accepted nine new Mid-Shore Patrol Vessels (MSPVs) built by Irving Shipyards between 2012 and 2014 under "Lloyd's Rules and Regulations for the Classification of Special Service". Craft, 2009 ".

KB 14.1.A.3 Vessel datasheet

14.1.A.3.1 Overall length 42,8 m

14.1.A.3.2 Length at the waterline 39,9 m

14.1.A.3.3 Maximum width 7,0 m

14.1.A.3.4 Width at the waterline 6,8 m

14.1.A.3.5 Fwd Draft 2,8 m

14.1.A.3.6 Aft Draft 2,8 m

14.1.A.3.7 freeboard 1,7 m

14.1.A.3.8 Gross tonnage 253.0 t

14.1.A.3.9 Maximum cruising distance 2000 nm

14.1.A.3.10 Endurance 14 days

14.1.A.3.11 Cruising speed 14.0 kn

14.1.A.3.12 Maximum speed 25.0 kn

14.1.A.3.13 Hull notation: +100A1 SSC PATROL, MONO, HSC, HSC, G4, EP.

14.1.A.3.14 Descriptive notes: NOTE ABRÉGÉE GREEN PASSEPORT

KB 14.1.A.4 Hero-class ships have been delivered with a generator timing system that allows for automated or manual adjustment of the vessel's service generator speed and frequency, but does not allow adjustment of the voltage distribution. and charge. The two components necessary for a good synchronization of the generators are the adjustment of the speed and the voltage (resistive and reactive control of the load).

KB 14.1.A.5 This project will modernize the controls, alarm philosophy and interlocking devices required to automatically detect voltage and adapt voltage to provide a safer synchronization system and more reliable when transferring loads to and from the terrestrial power grid. With generator voltage adjustment capabilities, voltage / electrical degree / frequency windows in synchronization protection relays can be reset to industry standards. This upgrade will also harmonize the ground power synchronization philosophy of the Hero class with the rest of the fleet.

KB14.1.B **Part 2: REFERENCES**

KB 14.1.B.1 Orientation drawings / nameplate data.

KB 14.1.B.2 Techsol - Functional Design Specifications.

KB 14.1.B.3 Update / SB01CA - Main module for synchronization and automatic protection of the DC generator of the starboard distribution board.

KB 14.1.B.4 Update / SB01EA - Control of the main generator of the starboard distribution board.

KB 14.1.B.5 Update / SB02CA - Main module for synchronization and automatic protection of port panelboard generator.

KB 14.1.B.6 Update / SB02EA - Control of the main generator of the starboard distribution board.

KB 14.1.B.7 Update / SB05BA - manual synchronization main distribution board.

KB 14.1.B.8 Update / SB05CA - Automatic synchronization of the terrestrial power supply and E bus of the main switchgear.

KB 14.1.B.9 Update / SB10CA - Main module of the starboard distribution board PLC01-Module 02/16 Digital outputs.

KB 14.1.B.10 Update / SBZZAB - Main mechanical layout of the starboard distribution board Generator controls Door arrangement.

KB 14.1.B.11 Selco E7800 Motorized Potentiometer Data Sheet.

KB 14.1.B.12 9337200991E, Instructions for the automatic voltage controller AVC63-12 and AVC125-10.

KB 14.1.B.13 Techsol alarm system Binding (briefcase) _AM_AM_MSPV_AF.pdf

KB 14.1.B.14 Binder for Techsol switchboard - Power distribution and various Rev 8.pdf.

KB14.1.C **Standards**

KB 14.1.C.1 In case of conflict between the different normative documents listed below, preference will be given to the document which applies the most stringent requirements.

KB 14.1.C.2 TP127E, Ship Electrical Standards: <http://www.tc.gc.ca/eng/marinesafety/tp-tp127-menu-263.htm>.

KB 14.1.C.3 Rules and Regulations of the APA for the Classification of Special Duty Boats, (Latest Edition).

KB 14.1.C.4 IEEE45-2002 Recommended Practice for Electrical Installations on Ships.

KB14.1.D **Terminology**

14.1.D.1.1 **CCAM** - vessel alarm and monitoring system.

14.1.D.1.2 **Load** - in the context of this document means the consumption of electrical energy.

14.1.D.1.3 **Load transfer** - A term used to describe the limited process in load transfer time between the main switchboard of the ship and the shore power system or vice versa.

14.1.D.1.4 **Incoming Generator** - the generator that will be connected to the main switchboard.

14.1.D.1.5 **On-Line Generator** - The generator is currently connected to the main switchboard.

14.1.D.1.6 **Outgoing Generator** - the generator that will be disconnected from the main switchboard.

14.1.D.1.7 **Smooth Loading** - a manual or automatic process of closing the generator breaker and increasing the speed of the incoming generator until the load between the generators is equal.

14.1.D.1.8 **Smooth Unloading** - the process of decreasing the generator output speed / load until the load has been transferred to the spare power source and then opening the generator breaker.

14.1.D.1.9 **Synchronization** - the process of adapting the speed (frequency), rotor angle (phase), and voltage of the incoming generator to determine the proper timing of the generator breaker in order to avoid significant transient torque to the generator and disturbances to the power grid.

14.1.D.1.10 **Synchronism Check Relay** - The relay used to supervise the circuit breaker close command for manual and automatic synchronization operations. Most synchronism control relays verify that the phase angle between the input voltage and the operating voltage is in a +/- angle window and remains there for a certain time. The angle window and the time delay are a substitute for slip measurement (frequency difference). The relay also implements a window of maximum voltage difference between the input voltage and the bus voltage as well as a time parameter. Most microprocessor-based synchronism control relays slide directly, so the delay parameter may be redundant in some applications.

14.1.D.1.11 **TA** - Technical Authority

14.1.D.1.12 **Automatic Voltage Detection** - synchronization automation will detect incoming bus voltage.

14.1.D.1.13 **Automatic Voltage Matching** - Synchronization will automatically match the generator voltage to the ground supply voltage before sending a close command to the breaker.

KB14.1.E **Regulations**

KB 14.1.E.1 2.3.1 As required by the Classification Society (ABS).

KB14.1.F **Part 3: TECHNICAL DESCRIPTION:**

KB 14.1.F.1 Scope

14.1.F.1.1 The Contractor must install and complete the installation of the new equipment in accordance with the functional design specifications provided by the CCG. Once cabling and installation are complete, the authorized representative must be brought onsite to review the installation, perform programming / system updates, and finally commission and test the ground power synchronization system.

KB 14.1.F.2 Tasks

14.1.F.2.1 Installation of wiring and computer equipment.

14.1.F.2.2 The Contractor must review the functional design specification and complete the work identified in Section 2.1 of the document provided by CCG (10120832_001_EN_SOW MSPV SHore Power Modification Install REVIEWed).

14.1.F.2.3 The Contractor will be responsible for providing all necessary equipment to complete the installation, except the motorized potentiometer that will be provided by the CCG.

14.1.F.2.4 The contractor must use existing cable trays to install the new wiring.

14.1.F.2.5 The Contractor will be responsible for installing plastic ID Lamacoids next to or under any new equipment installed in each generator switchboard.

14.1.F.2.6 These new Lamacoids must use the same color scheme and must be similar in size and height to existing Lamacoids.

14.1.F.2.7 If the vessel has equipment at the location identified in the specification document to assemble the new equipment, the Contractor must contact the CCG Technical Authority to select and confirm a new location for the equipment mounting.

14.1.F.2.8 All new wire terminations shall be identified using PermaSleeve heat-shrinkable polyolefin wire markings, or equivalent. Shirts must have a white background with black lettering.

14.1.F.2.9 The Contractor must review and implement recommendations for type, size and wire identification as indicated in Section 2.3 of the CCG Functional Design Specification.

- 14.1.F.2.10 Whenever possible, the Contractor shall use a DIN rail mount for any new apparatus.
- 14.1.F.2.11 The Contractor must ensure that any new equipment installed in the Generator Booths does not interfere with access to existing equipment located behind or adjacent to the new facilities.
- 14.1.F.2.12 The Contractor shall not fasten bare copper conductors under screw terminals. Crimp ends should be used for terminations and these crimp connectors should be installed with the appropriate ratchet crimping tool. Crimping pliers without ratchet will not be accepted for this project.
- 14.1.F.2.13 All work must conform to the Building and Classing High-Speed Craft (2019) rules and specifications and IEEE45-2002 standards. In case of conflict between the two documents, preference will be given to the document that applies the most stringent requirements.
- 14.1.F.2.14 The CCG will provide the two motorized potentiometers that the Contractor will install on the first vessel.
- 14.1.F.2.15 Upon completion of the cabling and hardware installation, the Contractor must hire the authorized representative to complete sections 3.2.2 and 3.2.3 of the document: (10120832_001_EN_SOW MSPV SHore Power Modification Install REVIEWed).

KB14.1.G Synchronization settings

- KB 14.1.G.1 The authorized representative shall have the Crompton Synchroscope calibrated according to the settings given in section 2.2 of the functional design specification document (10120832_001_EN_SOW MSPV SHore Power Modification Install REVIEWed).
- KB 14.1.G.2 The authorized representative shall review and calibrate the DEIF PPU-3 automatic synchronization device. Since this new system will automatically adapt the generator voltage and frequency to ground power, the recommended settings will be reconfigured to 3%, 10 degrees, and 0.4 Hz respectively, and tests will be performed during the test period to determine if The strictest tolerances are acceptable for normal operation.
- KB 14.1.G.3 The authorized representative shall modify and test the improved functionality of the generator touch screen to confirm the correct operation of all synchronization combinations.

KB 14.1.G.4 Secondary injection should be used to test, validate and document both relay functions at the new settings.

KB14.1.H **Software Modification**

KB 14.1.H.1 The authorized representative will be contractually responsible for uploading and uploading any changes to DEIF PPU-3, DIF HAS-111DG and CCAM.

KB14.1.I **Part 4: PROOF OF PERFORMANCE:**

KB 14.1.I.1 Qualifications required

14.1.I.1.1 The electrical contractor who performs the wiring and installation of this project shall be a journeyman electrician, an electrical technologist or an electrical engineer with extensive marine experience.

14.1.I.1.2 If the Contractor uses subcontractors to perform the Work, they must have the same Marine Electrical Qualifications as the Prime Contractor.

14.1.I.1.3 Any subcontractor to be used in this project must be identified prior to the commencement of the work.

KB14.1.J **Tests and Trials**

14.1.J.1.1 The prime contractor shall give two days' notice to the CCG Technical Authority prior to commencing the test phase of the project.

14.1.J.1.2 The authorized representative shall implement the class approved test specifications and complete them to demonstrate that the system, its alarms and interlocks are functioning properly.

14.1.J.1.3 The updated synchronization system must be ready in all respects before the start of any test.

14.1.J.1.4 The ship shall have both ship service generators, emergency generator and shore power supply during the test period to proceed.

14.1.J.1.5 The CCG Technical Authority, the Classification Society Representative and the Chief Engineer of the Vessel must be present to witness the test and to sign the procedures.

14.1.J.1.6 The authorized representative shall be responsible for providing all test instruments required to perform the tests.

- 14.1.J.1.7 All instruments used for testing shall be provided with a calibration certificate. Certificates dated more than one year from the date of testing are not accepted for testing.
- 14.1.J.1.8 The Digital Multi Meter shall have Min / Max / Mean display capabilities to capture and record various readings during the test procedure.
- 14.1.J.1.9 The authorized representative shall test all functional combinations of the touch screen upgrade to ensure proper operation.
- 14.1.J.1.10 The authorized representative will provide a registration sheet that must include, but not be limited to, the following: Checklists for readings and observations during the test; parameterization of alarm thresholds - circuit breaker tripping functions - authorizations; signature space for staff listed in 4.2.d.
- 14.1.J.1.11 The test document must be submitted to the CCG TA at least one week prior to the test date for review and comment by CCG.
- 14.1.J.1.12 The authorized representative must provide a brief report to the CCG TA at the end of these tests outlining any concerns, observations or improvements that could improve the overall performance and performance of the system. The report must be submitted within one week of the completion of the tests.

KB14.1.K **Part 5: DELIVERIES:**

KB 14.1.K.1 Drawings / Reports

- 14.1.K.1.1 The prime contractor shall complete the cabling and installation of the equipment in accordance with section 3.2.1 of this Statement of Work (SOW).
- 14.1.K.1.2 At the end of the project installation phase, the prime contractor shall engage the authorized representative to complete sections 3.2.2 and 3.2.3.
- 14.1.K.1.3 Upon arrival on board, the authorized representative shall briefly review the wiring and installation of the equipment and provide the CCG with a brief report if there are any problems with compliance with the Technical Specifications document. The installation contractor must be on site during the inspection of the authorized representative to resolve any problems that may arise during installation.
- 14.1.K.1.4 The authorized representative shall perform synchronization device upgrades, PLC program upgrades, and generator touch screen modifications in accordance with section 3.2.2.2 of this scope.

14.1.K.1.5 The authorized representative shall develop a brief testing and testing program in accordance with section 4.2 which will test all aspects of the new synchronization system.

14.1.K.1.6 This test and test plan shall be provided to CCG at least one week prior to the actual test for review and comment.

14.1.K.1.7 The authorized representative will be responsible for ensuring that, at the end of the tests, the electronic design files (to be provided in Acad and PDF formats), as identified in the Techsol Marine file P17_0931_SB_DWG_R18_APP.pdf, be updated to reflect any changes made during the installation and commissioning process. The Contractor must provide these updated electronic files to the CCG TA within two weeks of completion of testing.

14.1.K.1.8 Upon successful completion of the tests, the authorized representative shall provide the CCG TA with an electronic copy of the final DEIF PPU-3 settings, additional parameters of the controller and the control relay. Crompton synchronization in an unprotected Microsoft Word document.

KB 14.1.K.2 Constraints

14.1.K.2.1 No vessel inspection without proper notice.

14.1.K.2.2 The CCG will not provide any reference standards or classification society documents.

KB 14.1.K.3 Training

14.1.K.3.1 The authorized representative shall provide a preliminary overview of the upgrades to the Chief Engineer so that crews understand the changes. From an operational point of view, there will be no change in the philosophy of synchronization, so no additional training will be necessary.

KB 14.1.K.4 Manuals

14.1.K.4.1 The prime contractor must provide all documentation that accompanies the new equipment installed.

Kb14.2 **ELECTRICAL INSULATION TEST (MEGGER)**

KB14.2.A **Scope**

KB 14.2.A.1 Verification of the insulation of the different electrical components (MEGGER TEST) of the various electrical components from the electrical generation (Generator) to the various components.

KB14.2.B **REFERENCES**

Document	Title	Included Yes/No
Plan		
Publications		
Standards		
TP 127 F	Normes d'électricité régissant les navires : https://www.tc.gc.ca/fra/securitemaritime/tp-tp127-menu-263.htm	
Regulations	Loi sur la marine marchande du Canada, 2001	

KB14.2.C **Equipment provided by the owner**

KB 14.2.C.1 Unless otherwise indicated, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications. The contractor must have an electrician with at least a C license to work on this inspection.

KB14.2.D **TECHNICAL DESCRIPTION**

KB 14.2.D.1 General

14.2.D.1.1 Perform the leakage test on the various components.

Port Generator

Starboard Generator

Emergency generator

Equipment Connected to 600v Main Distribution Panels

Equipment Connected to 240v Main Distribution Panels

Equipment Connected to 120v Main Distribution Panels

Equipment connected to 600v Emergency Distribution Panels

240v emergency switchboard equipment

Equipment Connected to 120v Emergency Distribution Panels

Equipment Connected to 24v Emergency Distribution Panels

KB 14.2.D.2 Obstructions

14.2.D.2.1 The Contractor is responsible for identifying obstruction items, temporarily removing and storing them, and reinstalling them on the vessel.

KB14.2.E **PROOF OF PERFORMANCE**

KB 14.2.E.1 Inspection

14.2.E.1.1 The work must be performed to the satisfaction of the Chief Engineer.

14.2.E.1.2 Provide a report indicating the irregularities observed and the values recorded.

KB 14.2.E.2 DELIVERABLES

14.2.E.2.1 Drawings / reports

14.2.E.2.2 The Contractor shall provide the Chief Engineer with a hard copy of his typed report detailing the inspections, modifications and repairs made prior to acceptance of this item. The Contractor will also send an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

Kb15 **AUXILIARY SYSTEMS (N/A)**

Kb16 **DOMESTIC SYSTEMS**

Kb16.1 **VENTILATION**

KB16.1.A **Scope**

KB 16.1.A.1 The Coast Guard wants to have a vibration analysis done on all six ventilation engines to decide which ones need preventive maintenance. The contractor should inspect the premises prior to bidding as access to some of these fans is restricted and requires the removal of insulation, grills, etc., at a few locations.

Kb16.2 **REFRIGERATION**

KB16.2.A **Preventive Maintenance**

KB 16.2.A.1 The contractor shall perform the annual preventative maintenance of the vessel's refrigeration and air conditioning systems.

16.2.A.1.1 Stop the compressor in service (put on standby).

16.2.A.1.2 Check the compressor on standby and put it into service.

16.2.A.1.3 Add manometers to the suction and discharge of the common refrigerant line.

16.2.A.1.4 Maintenance performed by a Refrigeration Company.

16.2.A.1.5 Leakage test refrigeration system, A / C and FM 200 and put in paper and electronic copy.

16.2.A.1.6 Tests of alarms and temperature limits.

Kb17 **DECK EQUIPEMENT(N/A)**

Kb18 **COMMUNICATION AND NAVIGATION SYSTEMS**

Kb18.1 **SHIP RADIO INSPECTION**

KB 18.1.A.1 Provide a fixed price for the radio inspection of the vessel. The price must include transportation costs, accommodation and food expenses. Provide your fee schedule for additional work.

KB 18.1.A.2 Provide material and labor to carry out the radio inspection to provide the checklist for obtaining the Radio Classification Inspection Certificate from the ABS Classification Society. Covered areas must be for the coasts of Canada and for the Great Lakes Basin, in accordance with the Ship Station Radio Regulations, 1999.

KB 18.1.A.3 The radio checklist must be provided to the crew and an electronic copy must be provided to the Technical Authority.

KB 18.1.A.4 The contractor must provide proof that it is authorized by ABS to perform the work.

Kb18.2 LIST OF RADIO TYPES OF THE VESSEL TO BE INSPECTED:

Radio	Model	Fabricant	Note
VHF Radiotelephone #1	RT-5022	Sailor	
VHF Radiotelephone #2	RT-5022	Sailor	
MF/HF control unit Radio #1	CU 5100	Sailor	
INMARSAT C	AP 5042	Sailor	
NAVTEX	NX-700	Furund	
SART #1	TRON SART20	Jotron	
SART #2	TRON SART20	Jotron	
EPIRB	SE 406-II	Sailor	Registration # : A78D44BE1C0028FD
VHF DF	OAR4400	Cubic	
VHF GMDSS #1 (portable)	SP3520	Sailor	
VHF GMDSS #2 (portable)	SP3520	Sailor	
VHF GMDSS #3 (portable)	SP3520	Sailor	
Radar #1	Visionmaster	Sperry	
Radar #2	Visionmaster	Sperry	
Receiver for global navigation satellite systems and terrestrial radionavigation systems	GPS SAAB R4	SAAB	
AIS	AIS R4	SAAB	

Lb10SECURITY AND SAFETY EQUIPMENT

LB10.1 ANNUAL CERTIFICATION OF THE RESCUE BOAT

LB10.1.A Scope

LB 10.1.A.1 The annual certification of the rescue boat by an authorized representative.

LB10.1.B Technical description

LB 10.1.B.1 Transportation of the rescue boat will be provided by the Coast Guard to an indoor location heated at our facility in Sorel, to allow the Contractor to perform its work during normal working hours.

LB10.1.C Rescue boat description :

Ribo 420 : XDCC210FB212

Fabrication date : 02-12

O/B motor Yamaha F25LEHB

Serial number : 6BPKL1016294

LB10.1.D Deliverables

LB 10.1.D.1 Provide the certificate, a complete report of the inspection and repairs.

LB10.2 CERTIFICATION OF FUEL HOSES

LB 10.2.A.1 Provide equipment and labor to perform the hydrostatic testing and testing of two casings, one Continental Contitech FLEXSTEEL FUTURA gasoline transfer mark, 1 inch in diameter, approximately 40 feet long and the other Goodyear Flexsteel Futura H (559N) 1 inch in diameter and about 20 feet long.

LB 10.2.A.2 The Contractor will be responsible for decontaminating the two (2) hoses and disposing of the water used for the hydrostatic tests, and will have to return the two (2) hoses dry and free from residue.

LB 10.2.A.3 The operating pressure of the hoses is 2 bar.

LB 10.2.A.4 Each hose shall be provided with a stainless steel plate indicating the date of the test, the working pressure, the test pressure, the hose serial number, the name of the contractor.

LB 10.2.A.5 The Contractor shall provide the Chief Engineer and a copy to the Technical Authority with a certificate for each hose.

LB10.3 PORTABLE EXTINGUISHER INSPECTION

LB10.3.A Scope of work

LB 10.3.A.1 The Contractor shall remove the portable fire extinguishers from the vessel and transport them to an authorized service center, where maintenance will be performed. These fire extinguishers must be replaced by temporarily equivalent extinguishers. The portable fire extinguishers will then be returned to the ship and relocated.

LB10.3.B References

LB 10.3.B.1 Reference drawings / data plate data.

10.3.B.1.1 NPA10 Standard for portable fire extinguishers.

LB10.3.C List of types of fire extinguishers of the ship to be inspected:

NO.	Emplacement	Marque	Type	Grosseur	NO. Série	Date de fabrication	Dernière recharge	Prochaine Recharge
1	Local GRC	Badger	Poudre ABC	10 lbs	D01832923	2018	2018	2024
3	Local GRC	Amerex	CO2	15 lbs	745770	2011	2016	2021
4	Timonerie	Badger	Poudre ABC	10 lbs	D01832932	2018	2018	2024
33	Cmpt batterie TB	Amerex	Classe K	6 L	AD18417	2012	2017	2022
34	Cmpt batterie BB	Badger	Mousse	9,46 L	000289C	2010	2018	2021
	Cmpt Timo avant bâbord	Badger	Poudre ABC	20 lbs	D03261136	2018	2018	2024
	Cmpt Timo avant bâbord	Badger	Poudre ABC	20 lbs	D03261137	2018	2018	2024
	Cmpt Timo avant bâbord	Badger	CO2	10lbs	B09367145	2017	2017	2022
	Cmpt Timo avant bâbord	Amerex	Poudre ABC	5 lbs	12924993	2016	2016	2022

6	Coursive magasin aliments	Amerex	Mousse	9 L	AC790026	2012	2017	2020
8	Cuisine	Amerex	Classe K	6 L	AD18416	2012	2017	2022
9	Coursive Cmdt, C/M	Badger	Mousse	9,46 L	000288C	2010	2018	2021
12	Salle d'équipements électronique	Amerex	CO2	15 lbs	747583	2011	2016	2021
13	Génératrice d'urgence	Amerex	CO2	15 lbs	745032	2011	2016	2021
14	Génératrice d'urgence	Badger	Poudre ABC	10 lbs	D01823709	2018	2018	2024
31	Extérieur tribord	Amerex	Poudre ABC	10 lbs	F-59085474	2019	2019	2025
31A	Station de ravitaillement	Amerex	Mousse	9 L	AD16062	2012	2017	2020
15	Appareil à gouverner	Badger	Mousse	9,46 L	000342C	2010	2018	2021
18	Salle de contrôle	Badger	Poudre ABC	10 lbs	D01832924	2018	2018	2024
20	Propulseur d'étrave	Badger	Mousse	9,46 L	000284C	2010	2018	2021
21	Coursive (Toilettes)	Badger	Mousse	9,46 L	000287C	2010	2018	2021
22	S/M Principale bâbord	Amerex	CO2	15 lbs	745711	2011	2016	2021
23	S/M Principale centre avant	Amerex	Mousse	9 L	AC790010	2012	2017	2020
24	S/M Principale tribord	Badger	Poudre ABC	20 lbs	D03261099	2018	2018	2024
25	S/M Principale centre arrière	Badger	CO2	15 lbs	929517	2016	2018	2023
26	S/M Principale tribord	Amerex	Mousse	9 L	AC790022	2012	2017	2020
28	S/M Auxiliaire arrière	Badger	Mousse	9,46 L	000282C	2010	2018	2021
29	S/M Auxiliaire avant	Amerex	CO2	15 lbs	745774	2011	2016	2021
30	Coursive (S/C)	Badger	Mousse	9,46 L	000279C	2010	2018	2021
	Kaeble 1	Amerex	Poudre ABC	5 lbs	F-47051816	2018	2018	2024
	Kaeble 1	Amerex	Poudre ABC	5 lbs	F-51159202	2018	2018	2024
	Kaeble 2	Amerex	Poudre ABC	5 lbs	F-51158120	2018	2018	2024
	Kaeble 2	Amerex	Poudre ABC	5 lbs	F-47051812	2018	2018	2024
	Kaeble 3	Badger	Poudre ABC	5,5 lbs	C31972386	2017	2017	2023
	Kaeble 3	Badger	Poudre ABC	5,5 lbs	C31976757	2017	2017	2023
	Zodiac 420	Badger	Poudre ABC	2,5 lbs	89299055	2017	2017	2023
	Remplacement 2019 pour #31	Amerex	Poudre ABC	10 lbs	AA-946719	2010	2019	2025

LB10.3.D Equipment provided by the owner

LB 10.3.D.1 Unless otherwise indicated, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications.

LB10.3.E TECHNICAL DESCRIPTION

LB 10.3.E.1 The contractor removes the fire extinguishers from the vessel and transports them to an authorized service center for maintenance and testing, then returns them to the vessel and re-installs them.

LB 10.3.E.2 Annual inspection of portable extinguishers is required. The inspection and maintenance of fire extinguishers will be entrusted to a certified representative.

LB 10.3.E.3 The Contractor shall for a 3 year inspection of a portable foam extinguisher replace the foam.

LB 10.3.E.4 The contractor removes fire extinguishers in a sequence that ensures that the number of extinguishers out of the ship never exceeds one-third of those on board. The chief engineer will determine the order of fire extinguishers.

LB10.3.F Obstructions

LB 10.3.F.1 The Contractor is responsible for identifying obstructions, temporarily removing and storing items, and reinstalling them on the vessel.

LB 10.3.F.2 Upon completion of the maintenance, the Contractor shall return all fire extinguishers to the vessel and re-install them in accordance with the Chief Engineer's instructions.

LB10.3.G Annual Inspection

LB 10.3.G.1 Fire extinguishers must be inspected visually at least once a year. This inspection consists of reversing the fire extinguishers and shaking them upside down in order to unpack the powder they contain.

LB10.3.H Preventive Maintenance / Maintenance

LB 10.3.H.1 Fire extinguisher: Every 6 years. Work done: Replacing the powder and checking the correct operation of the device. A check collar and a WHMIS label indicating the date of service must be affixed in accordance with NFPA10 or newer.

LB 10.3.H.2 Water extinguisher, Type K, Co2: Every 5 years.

LB10.3.I Hydrostatic test

LB 10.3.I.1 This test consists of ensuring that the container is in good condition by subjecting it to a pressure determined by the manufacturer.

LB 10.3.I.2 Powder extinguisher: Every 12 years.

LB 10.3.I.3 Water extinguisher, Type K, Co2: Every 5 years.

LB 10.3.I.4 Refill: When a fire extinguisher has been used, even partially, it must be recharged again without delay. Note that a refill does not constitute preventative maintenance.

LB10.3.J PROOF OF PERFORMANCE

LB 10.3.J.1 Inspection

10.3.J.1.1 All work must be completed to the satisfaction of the Commanding Officer, Chief Engineer or Vessel Maintenance Manager.

LB 10.3.J.2 Trials

10.3.J.2.1 Fire extinguisher tests shall be carried out in accordance with the rules of the classification society ABS.

LB 10.3.J.3 Certification

10.3.J.3.1 The Contractor shall provide the Chief Engineer with two (2) hard copies of maintenance certificates along with their original copy. The Contractor will also send an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

LB10.3.K DELIVERABLES

LB 10.3.K.1 Drawings / reports

10.3.K.1.1 The Contractor shall provide the Chief Engineer with two (2) hard copies of the reports and checklists that detail the work and any necessary modifications. The Contractor also sends an electronic copy of all reports to the Vessel Maintenance Manager.

LB10.4 FIRE DETECTION SYSTEM

LB10.4.A Scope

LB 10.4.A.1 This specification is for the Contractor to retain the services of an accredited company to perform the annual inspection and certification of the fire detection system.

LB10.4.B References

Document	Title	Included Yes/No
AF6095-55500-04_AF	FIRE CONTROL PLAN_Fr	yes
Manuel instruction	Système intégré de détection d'incendie	
Système de détection	Fire Notifier NFS-320	
Regulations	Loi sur la marine marchande du Canada, 2001	

LB10.4.C Equipment provided by the owner

LB 10.4.C.1 Unless otherwise indicated, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications.

LB10.4.D Technical Description

LB 10.4.D.1 General

10.4.D.1.1 The vessel is equipped with an integrated Techsol fire detection system with Fire Notifier NFS-320 panel. The Fire Notifier NFS-320 panel is connected to the integrated fire alarm system that is part of the vessel's surveillance and alarm system.

10.4.D.1.2 The Contractor must schedule an ABS Classification Society Inspector's visit prior to commencement of work and the fees will be paid by Canada.

10.4.D.1.3 The Contractor retains the services of an accredited company to perform the annual inspection and certification of the fire detection system.

LB 10.4.D.2 Location

10.4.D.2.1 The fire detection control panel is located on the port side of the wheelhouse.

LB 10.4.D.3 Obstructions

10.4.D.3.1 It is the responsibility of the Contractor to locate obstruction items, remove them temporarily and store them, and then reinstall them on the vessel.

LB10.4.E Proof Of Performance

LB 10.4.E.1 Inspection

10.4.E.1.1 All work must be completed to the satisfaction of the Chief Engineer.

LB 10.4.E.2 Certification

10.4.E.2.1 The Contractor shall provide the Chief Engineer with two (2) hard copies of the annual maintenance and certification certificates with their original copy. The Contractor also sends an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

LB 10.4.E.3 DELIVERABLES

10.4.E.3.1 Drawings / reports

10.4.E.3.2 The Contractor shall provide the Chief Engineer with a hard copy of the typed report detailing the inspections, modifications and repairs made prior to acceptance of this item. The Contractor also sends an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

LB10.5 ANNUAL INSPECTION OF THE FIXED FIRE FIGHTING SYSTEM

LB10.5.A Scope

LB 10.5.A.1 The purpose of this specification is to maintain and certify the fixed firefighting system.

LB 10.5.A.2 The Contractor will contact the Chief Engineer prior to commencing work on this item. This work must be done in parallel with the maintenance of the portable fire extinguishers without reducing the ability to fight fires aboard the ship.

LB 10.5.A.3 The fixed firefighting system is a FM200 system.

LB10.5.B References

Document	Title	Included Yes/No
AF6095-55500-04_AF	FIRE CONTROL PLAN_Fr	yes
Publications		
90-FM200M-21	Kidde Fenwal FM200 Marine ECS series Engineered Fire Suppression System, Design, installation, Operation and Maintenance Manual	no
Reglementations	Loi sur la marine marchande du Canada, 2001	

LB10.5.C Accreditation

LB 10.5.C.1 The contractor must be accredited for the certification of this system and by the ABS classification society that it will do in accordance with the latest regulations in force on maritime safety.

LB10.5.D Equipment provided by the owner

LB 10.5.D.1 Unless otherwise indicated, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications.

LB10.5.E TECHNICAL DESCRIPTION

LB 10.5.E.1 General

10.5.E.1.1 The Contractor shall retain an authorized representative who will perform testing and inspections of the FM200 system and the vessel's fire system as part of the annual inspection and certification. of this system. The chief engineer must attend all tests.

10.5.E.1.2 In addition to the following tests, the Contractor shall perform all tests required by the on-site ABS Inspector. The Contractor must provide in its estimate the cost for the testing of alarms (lights and sirens) of all devices, the testing of nitrogen trip cylinders, the testing of ventilation shutoff devices as well as testing release loops and cables.

10.5.E.1.3 The Contractor shall air-purge pneumatic hoses and actuators and ensure that they operate properly. Hoses and nozzles must be free of obstruction.

10.5.E.1.4 The Contractor must ensure that alarm displays and sirens are working properly. The contractor must weigh each cylinder and record its results. At the end of the refit, he must provide the Chief Engineer with copies of all certificates.

10.5.E.1.5 Upon completion of the tests and inspections, the Contractor shall reassemble the systems and return them to service.

10.5.E.1.6 For the FM200 system, a halocarbon leak detection test shall be performed by accredited personnel for halocarbons and shall be carried out with adequate detection equipment.

LB 10.5.E.2 Obstructions

10.5.E.2.1 The Contractor is responsible for identifying obstructions, temporarily removing and storing them, and reinstalling them on the vessel.

LB10.5.F PROOF OF PERFORMANCE

LB 10.5.F.1 Inspection

10.5.F.1.1 All work must be completed to the satisfaction of the Chief Engineer, the Vessel Maintenance Manager and the ABS Inspector.

LB 10.5.F.2 Tests

10.5.F.2.1 The Chief Engineer shall witness the inspection and testing of the system.

LB 10.5.F.3 Certification

10.5.F.3.1 The Contractor shall provide the Chief Engineer with two (2) hard copies of maintenance certificates along with their original copy. The Contractor will also send an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

10.5.F.3.2 An independent certification for the leak detection test shall be issued for the FM200 system and shall also show the certificate number of the technician who performed the test.

LB 10.5.F.4 DELIVERABLES

10.5.F.4.1 Drawings / reports

10.5.F.4.2 The Contractor must provide the Chief Engineer with a hard copy of his typed report detailing the inspections, modifications and repairs made prior to acceptance of this item. The Contractor will also send an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

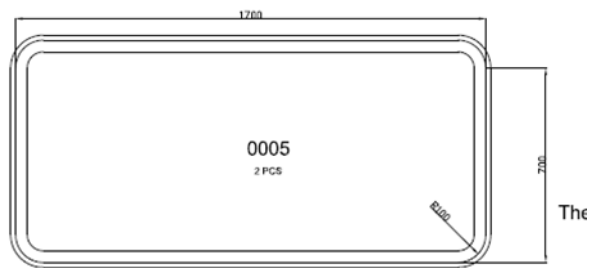
Lb11HULL AND STRUCTURE

LB11.1 INSTALLATION OF WHEELHOUSE WINDOW

LB11.1.A Scope

LB 11.1.A.1 A heating window at the wheelhouse shall be changed as defective (grounded). The window is provided by the Canadian Coast Guard.

LB 11.1.A.2 The installed heating window shall be tested/functional and without ground alarms.



LB11.2 GENERAL WELDING REPAIRS

LB11.2.A SCOPE

11.2.A.1.1 The purpose of this specification is for the Contractor to provide certified welding labor to be performed in order to perform aluminum and steel welding repairs outside ship.

LB11.2.B REFERENCES

Document	Title	Included Yes/No
Plan		
Publications		
Standards	W49 Standard de la garde côtière	
Reglementations	Building and Classing High-Speed Craft - 2019 Loi sur la marine marchande du Canada, 2001	

LB 11.2.B.1 Equipment provided by the owner

11.2.B.1.1 Unless otherwise specified, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications.

LB11.2.C TECHNICAL DESCRIPTION

LB 11.2.C.1 General

11.2.C.1.1 The Contractor must note that the majority of the work is on an aluminum structure.

LB11.3 VENTS HEIGHTS TO BE ADJUSTED TO REGULATIONS

LB11.3.A Scope

LB 11.3.A.1 The height of the vents must be adjusted to regulations standards: 900 mm or more for ventilators and 760 mm or more for the air pipes. There is two Ventilators (yellow) and twelve Air pipes to be adjusted (yellow), for a total of fourteen. The table below shows the actual height.

	No & Deck fitted on	Closing Appliances	Remarks	Coaming Heights (mm)
Ventilators	Main Deck (s)/ 1 No, Goose neck	Hinged Cover 1 Latch	SG Flat exhaust	997
	Main Deck (s), 1 No, Goose neck	Hinged Cover 1 Latch	SG Intake	800
	Main Deck (p), 1 No, Goose neck	Hinged Cover 1 Latch	SAR Medical Locker	895
Air pipes	Main deck Fr.1 +145 (P), 1 No	Automatic (float ball)	Ballast - tank 17	633
	Main deck Fr.1 +155 (S), 1 No	Automatic (float ball)	Ballast - tank 16	625
	Main deck Fr.9 -335 (P), 1 No	Automatic (float ball)	Fuel oil storage/overflow - tank 9	479
	Main deck Fr.9 +150 (P), 1 No	Automatic (float ball)	Tanks 6 & 7b	510
	Main deck Fr.15 -295 (S), 1 No	Automatic (float ball)	Dirty oil & sludge - tank 15	440
	Main deck Fr.15 -90 (S), 1 No	Automatic (float ball)	M.E. Lubrication oil -tank 5	450
	Main deck Fr.17 -200 (P), 1 No	Automatic (float ball)	Bilge water -tank 4	440
	Main deck Fr.30 +150 (P), 1 No	Automatic (float ball)	Fresh water -tank 11	505
	Main deck Fr.30 +150 (S), 1 No	Automatic (float ball)	Fresh water -tank 12	505

Main deck Fr.9 -150 (P), 1 No	Automatic (float ball)	Grey water -tank 7a	440
Main deck Fr.8 +341 (S), 1 No, Goose neck		Air Receiver safety valve AMR	460
Main deck Fr.11 -410 (S),1 No Goose neck		Air Receiver safety valve MMR	538

Please note where there is a float ball, the measurement is from the bottom of the float ball

LB 11.3.A.2 The contractor must unscrew the flange and temporarily blank the hole/flange on the ship while the vents are being worked on ashore. Once ashore the contractor must cut the vent and weld an extension piece, of the same material, to get to the regulation height.

Lb12PROPULSION SYSTEM AND MANEUVER

LB12.1 INSPECTION/REPLACEMENT CPP PUMP P3

LB12.1.A Scope

LB 12.1.A.1 The Coast Guard has two Settima pumps approved Hero class per ship. These two pumps must be removed, taken to a hydraulic workshop, inspected for wear, tested at the hydraulic pressure and flow shop and returned and installed on the vessel. A report of these tests must be returned with the pump.

Lb13ELECTRICITY PRODUCTION

LB13.1 ANNUAL MAINTENANCE OF GENERATOR ALTERNATORS

LB13.1.A Scope

LB 13.1.A.1 Perform annual maintenance on alternators on port, starboard and emergency generators.

LB13.1.B References

Document	Title	Included Yes/No
Plan		
Publications		

	Magnaplug Generator, 280-430 Frame, Installation, Operation and Maintenance Manual
	Voltage Regulator AVC63-12 and AVC125-10 Manual
Standards	
TP 127 F	Normes d'électricité régissant les navires
Reglementations	Building and Classing High-Speed Craft - 2019 Loi sur la marine marchande du Canada, 2001

LB13.1.C Equipment provided by the owner

LB 13.1.C.1 Unless otherwise indicated, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications.

LB13.1.D Technical Description

LB 13.1.D.1 General

13.1.D.1.1 Check and record the insulation resistance with a five hundred mega-ohm voltmeter. The minimum acceptable reading is two mega-ohms. All electronic devices (controllers, diodes, capacitors, protection relays) must be disconnected from the winding circuit before checking the insulation. If the reading is less than the minimum, the generator must be cleaned and dried in place and if ever the contractor is unable to read infinitely, it must be taken to an authorized service center.

13.1.D.1.2 Check the DC excitation voltage without load and check the number of revolutions per minute. Record the unloaded excitation (DC voltage at the stator of excitation), the voltage of the generator terminal and the speed of the drive mechanism as future reference points for troubleshooting.

13.1.D.1.3 For bid submission, provide specialized electrical labor for a period of ten hours to complete the work.

LB13.1.E Obstructions

LB 13.1.E.1 The Contractor is responsible for identifying obstructions, temporarily removing and storing them, and reinstalling them on the vessel.

LB13.1.F Proof of Performance

LB 13.1.F.1 Inspection

13.1.F.1.1 The work must be performed to the satisfaction of the Chief Engineer.

13.1.F.1.2 Provide a report indicating the measured values and irregularities observed.

LB 13.1.F.2 DELIVERABLES

13.1.F.2.1 Drawings / reports

13.1.F.2.2 The Contractor shall provide the Chief Engineer with a hard copy of the typed report detailing the inspections, modifications and repairs made prior to acceptance of this item. The Contractor will also send an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

Lb14ELECTRICAL DISTRIBUTION

LB14.1 ADD VOLTAGE REGULATOR

LB14.1.A Scope

LB 14.1.A.1 Objective: The objective of this project is to install and commission the load control component for the synchronization operation with the terrestrial power supply.

LB 14.1.A.2 Background: The CCG has accepted nine new Mid-Shore Patrol Vessels (MSPVs) built by Irving Shipyards between 2012 and 2014 under "Lloyd's Rules and Regulations for the Classification of Special Service". Craft, 2009 ".

LB 14.1.A.3 Vessel datasheet

14.1.A.3.1 Overall length 42,8 m

14.1.A.3.2 Length at the waterline 39,9 m

14.1.A.3.3 Maximum width 7,0 m

14.1.A.3.4 Width at the waterline 6,8 m

14.1.A.3.5 Fwd Draft 2,8 m

14.1.A.3.6 Aft Draft 2,8 m

14.1.A.3.7 freeboard 1,7 m

14.1.A.3.8 Gross tonnage 253.0 t

14.1.A.3.9 Maximum cruising distance 2000 nm

14.1.A.3.10 Endurance 14 days

14.1.A.3.11 Cruising speed 14.0 kn

14.1.A.3.12 Maximum speed 25.0 kn

14.1.A.3.13 Hull notation: +100A1 SSC PATROL, MONO, HSC, HSC, G4, EP.

14.1.A.3.14 Descriptive notes: NOTE ABRÉGÉE GREEN PASSEPORT

LB 14.1.A.4 Hero-class ships have been delivered with a generator timing system that allows for automated or manual adjustment of the vessel's service generator speed and frequency, but does not allow adjustment of the voltage distribution. and charge. The two components necessary for a good synchronization of the generators are the adjustment of the speed and the voltage (resistive and reactive control of the load).

LB 14.1.A.5 This project will modernize the controls, alarm philosophy and interlocking devices required to automatically detect voltage and adapt voltage to provide a safer synchronization system and more reliable when transferring loads to and from the terrestrial power grid. With generator voltage adjustment capabilities, voltage / electrical degree / frequency windows in synchronization protection relays can be reset to industry standards. This upgrade will also harmonize the ground power synchronization philosophy of the Hero class with the rest of the fleet.

LB14.1.B Part 2: REFERENCES

LB 14.1.B.1 Orientation drawings / nameplate data.

LB 14.1.B.2 Techsol - Functional Design Specifications.

LB 14.1.B.3 Update / SB01CA - Main module for synchronization and automatic protection of the DC generator of the starboard distribution board.

LB 14.1.B.4 Update / SB01EA - Control of the main generator of the starboard distribution board.

LB 14.1.B.5 Update / SB02CA - Main module for synchronization and automatic protection of port panelboard generator.

LB 14.1.B.6 Update / SB02EA - Control of the main generator of the starboard distribution board.

LB 14.1.B.7 Update / SB05BA - manual synchronization main distribution board.

LB 14.1.B.8 Update / SB05CA - Automatic synchronization of the terrestrial power supply and E bus of the main switchgear.

LB 14.1.B.9 Update / SB10CA - Main module of the starboard distribution board PLC01-Module 02/16 Digital outputs.

LB 14.1.B.10 Update / SBZZAB - Main mechanical layout of the starboard distribution board Generator controls Door arrangement.

LB 14.1.B.11 Selco E7800 Motorized Potentiometer Data Sheet.

LB 14.1.B.12 9337200991E, Instructions for the automatic voltage controller AVC63-12 and AVC125-10.

LB 14.1.B.13 Techsol alarm system Binding (briefcase) _AM_AM_MSPV_AF.pdf

LB 14.1.B.14 Binder for Techsol switchboard - Power distribution and various Rev 8.pdf.

LB14.1.C Les normes

LB 14.1.C.1 En cas de conflit entre les différents documents normatifs énumérés ci-dessous, la préférence sera donnée au document qui applique les exigences les plus strictes.

LB 14.1.C.2 TP127F, Normes d'électricité des navires : <http://www.tc.gc.ca/eng/marinesafety/tp-tp127-menu-263.htm>.

LB 14.1.C.3 Règles et règlements de l'APA pour la classification des bateaux de service spécial, (dernière édition).

LB 14.1.C.4 IEEE45-2002 Pratique recommandée pour les installations électriques à bord des navires.

LB14.1.D Terminology

14.1.D.1.1 CCAM - vessel alarm and monitoring system.

14.1.D.1.2 Load - in the context of this document means the consumption of electrical energy.

14.1.D.1.3 Load transfer - A term used to describe the limited process in load transfer time between the main switchboard of the ship and the shore power system or vice versa.

- 14.1.D.1.4 Incoming Generator - the generator that will be connected to the main switchboard.
- 14.1.D.1.5 On-Line Generator - The generator is currently connected to the main switchboard.
- 14.1.D.1.6 Outgoing Generator - the generator that will be disconnected from the main switchboard.
- 14.1.D.1.7 Smooth Loading - a manual or automatic process of closing the generator breaker and increasing the speed of the incoming generator until the load between the generators is equal.
- 14.1.D.1.8 Smooth Unloading - the process of decreasing the generator output speed / load until the load has been transferred to the spare power source and then opening the generator breaker.
- 14.1.D.1.9 Synchronization - the process of adapting the speed (frequency), rotor angle (phase), and voltage of the incoming generator to determine the proper timing of the generator breaker in order to avoid significant transient torque to the generator and disturbances to the power grid.
- 14.1.D.1.10 synchronism Check Relay - The relay used to supervise the circuit breaker close command for manual and automatic synchronization operations. Most synchronism control relays verify that the phase angle between the input voltage and the operating voltage is in a +/- angle window and remains there for a certain time. The angle window and the time delay are a substitute for slip measurement (frequency difference). The relay also implements a window of maximum voltage difference between the input voltage and the bus voltage as well as a time parameter. Most microprocessor-based synchronism control relays slide directly, so the delay parameter may be redundant in some applications.
- 14.1.D.1.11 TA - Technical Authority
- 14.1.D.1.12 Automatic Voltage Detection - synchronization automation will detect incoming bus voltage.
- 14.1.D.1.13 Automatic Voltage Matching - Synchronization will automatically match the generator voltage to the ground supply voltage before sending a close command to the breaker.

LB14.1.E Regulations

LB 14.1.E.1 2.3.1 As required by the Classification Society (ABS).

LB14.1.F Part 3: TECHNICAL DESCRIPTION:

LB 14.1.F.1 Scope

14.1.F.1.1 The Contractor must install and complete the installation of the new equipment in accordance with the functional design specifications provided by the CCG. Once cabling and installation are complete, the authorized representative must be brought onsite to review the installation, perform programming / system updates, and finally commission and test the ground power synchronization system.

LB 14.1.F.2 Tasks

14.1.F.2.1 Installation of wiring and computer equipment.

14.1.F.2.2 The Contractor must review the functional design specification and complete the work identified in Section 2.1 of the document provided by CCG (10120832_001_EN_SOW MSPV SHore Power Modification Install REVIEWed).

14.1.F.2.3 The Contractor will be responsible for providing all necessary equipment to complete the installation, except the motorized potentiometer that will be provided by the CCG.

14.1.F.2.4 The contractor must use existing cable trays to install the new wiring.

14.1.F.2.5 The Contractor will be responsible for installing plastic ID Lamacoids next to or under any new equipment installed in each generator switchboard.

14.1.F.2.6 These new Lamacoids must use the same color scheme and must be similar in size and height to existing Lamacoids.

14.1.F.2.7 If the vessel has equipment at the location identified in the specification document to assemble the new equipment, the Contractor must contact the CCG Technical Authority to select and confirm a new location for the equipment mounting.

14.1.F.2.8 All new wire terminations shall be identified using PermaSleeve heat-shrinkable polyolefin wire markings, or equivalent. Shirts must have a white background with black lettering.

14.1.F.2.9 The Contractor must review and implement recommendations for type, size and wire identification as indicated in Section 2.3 of the CCG Functional Design Specification.

- 14.1.F.2.10 Whenever possible, the Contractor shall use a DIN rail mount for any new apparatus.
- 14.1.F.2.11 The Contractor must ensure that any new equipment installed in the Generator Booths does not interfere with access to existing equipment located behind or adjacent to the new facilities.
- 14.1.F.2.12 The Contractor shall not fasten bare copper conductors under screw terminals. Crimp ends should be used for terminations and these crimp connectors should be installed with the appropriate ratchet crimping tool. Crimping pliers without ratchet will not be accepted for this project.
- 14.1.F.2.13 All work must conform to the Building and Classing High-Speed Craft (2019) rules and specifications and IEEE45-2002 standards. In case of conflict between the two documents, preference will be given to the document that applies the most stringent requirements.
- 14.1.F.2.14 The CCG will provide the two motorized potentiometers that the Contractor will install on the first vessel.
- 14.1.F.2.15 Upon completion of the cabling and hardware installation, the Contractor must engage Techsol Marine to complete sections 3.2.2 and 3.2.3 of the document: (10120832_001_EN_SOW MSPV SHore Power Modification Install REVIEWed).

LB14.1.G Synchronization settings

- LB 14.1.G.1 The authorized representative shall have the Crompton Synchroscope calibrated according to the settings given in section 2.2 of the functional design specification document (10120832_001_EN_SOW MSPV SHore Power Modification Install REVIEWed).
- LB 14.1.G.2 The authorized representative shall review and calibrate the DEIF PPU-3 automatic synchronization device. Since this new system will automatically adapt the generator voltage and frequency to ground power, the recommended settings will be reconfigured to 3%, 10 degrees, and 0.4 Hz respectively, and tests will be performed during the test period to determine if The strictest tolerances are acceptable for normal operation.
- LB 14.1.G.3 The authorized representative shall modify and test the improved functionality of the generator touch screen to confirm the correct operation of all synchronization combinations.

LB 14.1.G.4 Secondary injection should be used to test, validate and document both relay functions at the new settings.

LB14.1.H Software Modification

LB 14.1.H.1 The authorized representative will be contractually responsible for uploading and uploading any changes to DEIF PPU-3, DIF HAS-111DG and CCAM.

LB 14.1.H.2 The CCG will provide the authorized Marine representative with two spare PPU-3 units to be programmed prior to arrival.

LB14.1.I Part 4: PROOF OF PERFORMANCE:

LB 14.1.I.1 Qualifications required

14.1.I.1.1 The electrical contractor who performs the wiring and installation of this project shall be a journeyman electrician, an electrical technologist or an electrical engineer with extensive marine experience.

14.1.I.1.2 If the Contractor uses subcontractors to perform the Work, they must have the same Marine Electrical Qualifications as the Prime Contractor.

14.1.I.1.3 Any subcontractor to be used in this project must be identified prior to the commencement of the work.

LB14.1.J Tests and Trials

14.1.J.1.1 The prime contractor shall give two days notice to the CCG Technical Authority prior to commencing the test phase of the project.

14.1.J.1.2 The authorized representative shall implement the class approved test specifications and complete them to demonstrate that the system, its alarms and interlocks are functioning properly.

14.1.J.1.3 The updated synchronization system must be ready in all respects before the start of any test.

14.1.J.1.4 The ship shall have both ship service generators, emergency generator and shore power supply during the test period to proceed.

14.1.J.1.5 The CCG Technical Authority, the Classification Society Representative and the Chief Engineer of the Vessel must be present to witness the test and to sign the procedures.

- 14.1.J.1.6 The authorized representative shall be responsible for providing all test instruments required to perform the tests.
- 14.1.J.1.7 All instruments used for testing shall be provided with a calibration certificate. Certificates dated more than one year from the date of testing are not accepted for testing.
- 14.1.J.1.8 The Digital Multi Meter shall have Min / Max / Mean display capabilities to capture and record various readings during the test procedure.
- 14.1.J.1.9 The authorized representative shall test all functional combinations of the touch screen upgrade to ensure proper operation.
- 14.1.J.1.10 The authorized representative will provide a registration sheet that must include, but not be limited to, the following: Checklists for readings and observations during the test; parameterization of alarm thresholds - circuit breaker tripping functions - authorizations; signature space for staff listed in 4.2.d.
- 14.1.J.1.11 The test document must be submitted to the CCG TA at least one week prior to the test date for review and comment by CCG.
- 14.1.J.1.12 The authorized representative must provide a brief report to the CCG TA at the end of these tests outlining any concerns, observations or improvements that could improve the overall performance and performance of the system. The report must be submitted within one week of the completion of the tests.

LB14.1.K Part 5: DELIVERABLES:

LB 14.1.K.1 Drawings / Reports

- 14.1.K.1.1 The prime contractor shall complete the cabling and installation of the equipment in accordance with section 3.2.1 of this Statement of Work (SOW).
- 14.1.K.1.2 At the end of the project installation phase, the prime contractor shall engage the authorized representative to complete sections 3.2.2 and 3.2.3.
- 14.1.K.1.3 Upon arrival on board, the authorized representative shall briefly review the wiring and installation of the equipment and provide the CCG with a brief report if there are any problems with compliance with the Technical Specifications document. The installation contractor must be on site during the inspection of the authorized representative to resolve any problems that may arise during installation.

14.1.K.1.4 The authorized representative shall perform synchronization device upgrades, PLC program upgrades, and generator touch screen modifications in accordance with section 3.2.2.2 of this scope.

14.1.K.1.5 The authorized representative shall develop a brief testing and testing program in accordance with section 4.2 which will test all aspects of the new synchronization system.

14.1.K.1.6 This test and test plan shall be provided to CCG at least one week prior to the actual test for review and comment.

14.1.K.1.7 The authorized representative will be responsible for ensuring that, at the end of the tests, the electronic design files (to be provided in Acad and PDF formats), as identified in the Techsol Marine file P17_0931_SB_DWG_R18_APP.pdf, be updated to reflect any changes made during the installation and commissioning process. The Contractor must provide these updated electronic files to the CCG TA within two weeks of completion of testing.

14.1.K.1.8 Upon successful completion of the tests, the authorized representative shall provide the CCG TA with an electronic copy of the final DEIF PPU-3 settings, additional parameters of the controller and the control relay. Crompton synchronization in an unprotected Microsoft Word document.

LB 14.1.K.2 Constraints

14.1.K.2.1 No vessel inspection without proper notice.

14.1.K.2.2 The CCG will not provide any reference standards or classification society documents.

LB 14.1.K.3 Training

14.1.K.3.1 The authorized representative shall provide a preliminary overview of the upgrades to the Chief Engineer so that crews understand the changes. From an operational point of view, there will be no change in the philosophy of synchronization, so no additional training will be necessary.

LB 14.1.K.4 Manuals

14.1.K.4.1 The prime contractor must provide all documentation that accompanies the new equipment installed.

LB14.2 **ELECTRICAL INSULATION TEST (MEGGER)**

LB14.2.A **Scope**

LB 14.2.A.1 Verification of the insulation of the different electrical components (MEGGER TEST) of the various electrical components from the electrical generation (Generator) to the various components.

LB14.2.B **REFERENCES**

Document	Title	Included Yes/No
Plan		
Publications		
Standards		
TP 127 F	Normes d'électricité régissant les navires : https://www.tc.gc.ca/fra/securitemaritime/tp-tp127-menu-263.htm	
Regulations	Building and Classing High-Speed Craft - 2019 Loi sur la marine marchande du Canada, 2001	

LB14.2.C **Equipment provided by the owner**

LB 14.2.C.1 Unless otherwise indicated, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications. The contractor must have an electrician with at least a C license to work on this inspection.

LB14.2.D **TECHNICAL DESCRIPTION**

LB 14.2.D.1 General

14.2.D.1.1 Perform the leakage test on the various components.

Port Generator

Starboard Generator

Emergency generator

Equipment Connected to 600v Main Distribution Panels

Equipment Connected to 240v Main Distribution Panels

Equipment Connected to 120v Main Distribution Panels

Equipment connected to 600v Emergency Distribution Panels

240v emergency switchboard equipment

Equipment Connected to 120v Emergency Distribution Panels

Equipment Connected to 24v Emergency Distribution Panels

LB 14.2.D.2 Obstructions

18.2.A.1.1 The Contractor is responsible for identifying obstruction items, temporarily removing and storing them, and reinstalling them on the vessel.

LB14.2.E PROOF OF PERFORMANCE

LB 14.2.E.1 Inspection

14.2.E.1.1 The work must be performed to the satisfaction of the Chief Engineer.

14.2.E.1.2 Provide a report indicating the irregularities observed and the values recorded.

LB 14.2.E.2 DELIVERABLES

14.2.E.2.1 Drawings / reports

14.2.E.2.2 The Contractor shall provide the Chief Engineer with a hard copy of his typed report detailing the inspections, modifications and repairs made prior to acceptance of this item. The Contractor will also send an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

Lb15 AUXILIARY SYSTEMS (N/A)

Lb16DOMESTIC SYSTEMS

LB16.1 VENTILATION

LB16.1.A Scope

LB 16.1.A.1 The Coast Guard wants to have a vibration analysis done on all six ventilation motors and fans to decide which ones will need preventive maintenance. The contractor must inspect the premises prior to bidding as access to some of these fans/motors is restricted and requires the removal of insulation, grilles, etc., at a few locations.

LB16.2 NETTOYAGE DE SYSTÈME DE VENTILATION

LB16.2.A Scope

LB 16.2.A.1 The contractor must clean and sterilize the ventilation ducts. A report must be provided to the chief engineer by the contractor.

LB16.3 REFRIGERATION

LB16.3.A Preventive Maintenance

LB 16.3.A.1 The contractor shall perform the annual preventative maintenance of the vessel's refrigeration and air conditioning systems.

16.3.A.1.1 Stop the compressor in service (put on standby).

16.3.A.1.2 Check the compressor on standby and put it into service.

16.3.A.1.3 Add manometers to the suction and discharge of the common refrigerant line.

16.3.A.1.4 Maintenance performed by a Refrigeration Company.

16.3.A.1.5 Leakage test refrigeration system, A / C and FM 200 and put in paper and electronic copy.

16.3.A.1.6 Tests of alarms and temperature limits.

Lb17DECK EQUIPEMENT(N/A)

Lb18 COMMUNICATION AND NAVIGATION SYSTEMS

LB18.1 SHIP RADIO INSPECTION

LB 18.1.A.1 Provide a fixed price for the radio inspection of the vessel. The price must include transportation costs, accommodation and food expenses. Provide your fee schedule for additional work.

LB 18.1.A.2 Provide material and labor to carry out the radio inspection to provide the checklist for obtaining the Radio Classification Inspection Certificate from the ABS Classification Society. Covered areas must be for the coasts of Canada and for the Great Lakes Basin, in accordance with the Ship Station Radio Regulations, 1999.

LB 18.1.A.3 The radio checklist must be provided to the crew and an electronic copy must be provided to the Technical Authority.

LB 18.1.A.4 The contractor must provide proof that it is authorized by ABS to perform the work.

LB18.2 LIST OF RADIO TYPES OF THE VESSEL TO BE INSPECTED:

Radio	Model	Manufacturer	Note
VHF Radiotéléphone #1	RT-5022	Sailor	
VHF Radiotéléphone #2	RT-5022	Sailor	
MF Radio #1	CU5100	Sailor	
INMARSAT SES	TT-3606E	Sailor	
NAVTEX	NX-700	Furund	
SART #1	TRON SART20	Jotron	
SART #2	TRON SART20	Jotron	
EPIRB	SE406-II	Sailor	Registration # : A78D44CEA00028D
VHF DF	OAR4400	Cubic	
VHF #1 (portable)	SP3520	Sailor	
VHF #2 (portable)	SP3520	Sailor	
VHF #3 (portable)	SP3520	Sailor	
Radar #1	Visionmaster	Sperry	
Radar #2	Visionmaster	Sperry	
Receiver for global navigation satellite systems and terrestrial radio-navigation systems	GPS SAAB R4	SAAB	

CR10 SECURITY AND SAFETY EQUIPMENT

CR10.1 CERTIFICATION OF FUEL HOSES

CR10.1.A.1 Provide equipment and labor to perform the hydrostatic testing and testing of two casings, one Continental Contitech FLEXSTEEL FUTURA gasoline transfer mark, 1 inch in diameter, approximately 40 feet long and the other Goodyear Flexsteel Futura H (559N) 1 inch in diameter and about 20 feet long.

CR10.1.A.2 The Contractor will be responsible for decontaminating the two (2) hoses and disposing of the water used for the hydrostatic tests, and will have to return the two (2) hoses dry and free from residue.

CR10.1.A.3 The operating pressure of the hoses is 2 bar.

CR10.1.A.4 Each hose shall be provided with a stainless steel plate indicating the date of the test, the working pressure, the test pressure, the hose serial number, the name of the contractor.

CR10.1.A.5 The Contractor shall provide the Chief Engineer and a copy to the Technical Authority with a certificate for each hose.

CR10.2 PORTABLE EXTINGUISHER INSPECTION

CR10.2.A Scope of work

CR10.2.A.1 The Contractor shall remove the portable fire extinguishers from the vessel and transport them to an authorized service center, where maintenance will be performed. These fire extinguishers must be replaced by temporarily equivalent extinguishers. The portable fire extinguishers will then be returned to the ship and relocated.

CR10.2.B References

CR10.2.B.1 Reference drawings / data plate data.

10.2.B.1.1 NPA10 Standard for portable fire extinguishers.

CR10.2.C List of types of fire extinguishers of the ship to be inspected:

	2019 Fire Extinguishers with Station Number							
	Location	Type	Weight (Lbs)	Serial No.	Manuf. Date	Hydro Exp	6 Year Ser.	3 year Ser.
	Day of inspection (1st, 2nd, 3rd, etc.)							
4	Bridge Deck, Command Centre	ABC Dry Chemical	17	83276073	2018	2030	2024	
3	Bridge Deck, Command Centre	CO2	34,9	763252	2012	2022		
1	Bridge Deck, Wheelhouse STBD	ABC Dry Chemical	16	83276604	2018	2030	2024	
	Bridge Deck, Fwd STBD, Immersion Suit Locker	ABC Dry Chemical	34	76807489	2018	2030	2024	
	Bridge Deck, Fwd STBD, Immersion Suit Locker	CO2	34,8	736405	2011	2021		
	Bridge Deck, Fwd STBD, Immersion Suit Locker	ABC Dry Chemical	16	83276072	2018	2030	2024	
	Bridge Deck, Fwd Battery Locker	Wet Chemical	20	18412	2012	2022		
	Bridge Deck, Fwd Battery Locker	AFFF	25	790007	2012	2022		2021
	Main Deck, FWD on STBD RHIB Cradle	AFFF	27	99351905	2018	2028		2021
6	Main Deck, Dry Store \ Pantry	AFFF	25	641004	2011	2022		2021
8	Main Deck, Galley, Port FWD	Wet Chemical	24	18414	2012	2022		
9	Main Deck, Hallway across from C/O Cabin	AFFF	25	641030	2011	2022		2021
12	Main Deck, STBD Electronics Room	CO2	34,9	747563	2011	2021		
13	Main Deck, STBD Emergency Generator Room	CO2	34,5	770583	2012	2022		
14	Main Deck, STBD Emergency Generator Room	ABC Dry Chemical	16	83276637	2018	2030	2024	
31	Main Deck, STBD Exterior Amidship	ABC Dry Chemical	16	83275965	2018	2030	2024	
15	Below Main Deck, Steering Gear Compartment	AFFF	15	790021	2012	2022		2021

18	Below Main Deck, Machinery Control Room	ABC Dry Chemical	16	83276071	2018	2030	2024	
20	Below Main Deck, Bow Thruster Compartment	AFFF	25	790018	2012	2022		2021
21	Below Main Deck, Fwd STBD Hallway	AFFF	25	40792741	2015	2020		2021
22	Below Main Deck, Main Machinery Room, Port Side	CO2	34,8	747543	2011	2021		
23	Below Main Deck, Main Machinery Room, Fwd	AFFF	35	790005	2012	2022		2021
24	Below Main Deck, Main Machinery Room, STBD Fwd	AFFF	34	99351906	2017	2022		2021
25	Below Main Deck, Main Machinery Room, Aft	CO2	34,8	736410	2012	2021		
	Location	Type	Weight (Lbs)	Serial No.	Manuf. Date	Hydro Date	6 Year inspection	3 year inspection
26	Below Main Deck, Main Machinery Room, Stbd	AFFF	25	790019	2012	2022		2021
28	Below Main Deck, Auxiliary Machinery Room, Aft	AFFF	25	790009	2012	2022		2021
29	Below Main Deck, Auxiliary Machinery Room, Fwd	CO2	34,5	737477	2011	2021		
30	Below Main Deck, Hallway by Main Machinery Room	AFFF	25	790031	2012	2022		2021
	Safety Boat Zodiac 420, STBD	ABC Dry Chemical	2,2	40056460	2014			
	Black RHIB C21659ON	ABC Dry Chemical	5	107176	2010	2022	2022	
	Black RHIB C21659ON	ABC Dry Chemical	5	16448	2014	2026	2020	
	Black RHIB C21658ON	ABC Dry Chemical	5	821552	2010	2022	2022	
	Black RHIB C21658ON	ABC Dry Chemical	5	827904	2010	2022	2022	

CR10.2.D Equipment provided by the owner

CR10.2.D.1 Unless otherwise indicated, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications.

CR10.2.E Technical Description

CR10.2.E.1 The contractor removes the fire extinguishers from the vessel and transports them to an authorized service center for maintenance and testing, then returns them to the vessel and re-installs them.

CR10.2.E.2 Annual inspection of portable extinguishers is required. The inspection and maintenance of fire extinguishers will be entrusted to a certified representative.

CR10.2.E.3 The Contractor shall for a three year inspection of a portable foam extinguisher replace the foam.

CR10.2.E.4 The contractor removes fire extinguishers in a sequence that ensures that the number of extinguishers out of the ship never exceeds one-third of those on board. The chief engineer will determine the order of fire extinguishers.

CR10.2.F **Obstructions**

CR10.2.F.1 The Contractor is responsible for identifying obstructions, temporarily removing and storing items, and reinstalling them on the vessel.

CR10.2.F.2 Upon completion of the maintenance, the Contractor shall return all fire extinguishers to the vessel and re-install them in accordance with the Chief Engineer's instructions.

CR10.2.G **Annual Inspection**

CR10.2.G.1 Fire extinguishers must be inspected visually at least once a year. This inspection consists of reversing the fire extinguishers and shaking them upside down in order to unpack the powder they contain.

CR10.2.H **Preventive Maintenance / Maintenance**

CR10.2.H.1 Fire extinguisher: Every 6 years. Work done: Replacing the powder and checking the correct operation of the device. A check collar and a WHMIS label indicating the date of service must be affixed in accordance with NFPA10 or newer.

CR10.2.H.2 Water extinguisher, Type K, Co2: Every 5 years.

CR10.2.I **Hydrostatic test**

CR10.2.I.1 This test consists of ensuring that the container is in good condition by subjecting it to a pressure determined by the manufacturer.

CR10.2.I.2 Powder extinguisher: Every 12 years.

CR10.2.I.3 Water extinguisher, Type K, Co2: Every 5 years.

CR10.2.I.4 Refill: When a fire extinguisher has been used, even partially, it must be recharged again without delay. Note that a refill does not constitute preventative maintenance.

CR10.2.J **Proof of Performance**

CR10.2.J.1 Inspection

10.2.J.1.1 All work must be completed to the satisfaction of the Commanding Officer, Chief Engineer or Vessel Maintenance Manager.

CR10.2.J.2 Trials

10.2.J.2.1 Fire extinguisher tests shall be carried out in accordance with the rules of the classification society ABS.

CR10.2.J.3 Certification

10.2.J.3.1 The Contractor shall provide the Chief Engineer with two hard copies of maintenance certificates along with their original copy. The Contractor will also send an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

CR10.2.K **Deliverables**

CR10.2.K.1 Drawings / reports

10.2.K.1.1 The Contractor shall provide the Chief Engineer with two hard copies of the reports and checklists that detail the work and any necessary modifications. The Contractor also sends an electronic copy of all reports to the Vessel Maintenance Manager.

CR10.3 FIRE DETECTION SYSTEM

CR10.3.A **Scope**

CR10.3.A.1 This specification is for the Contractor to retain the services of an accredited company to perform the annual inspection and certification of the fire detection system.

CR10.3.B **References**

Document	Title	Included Yes/No
Plan		
AF6095-55500-04_AF	FIRE CONTROL PLAN_Fr	yes
Publications		
Manuel instruction	Système intégré de détection d'incendie	
Système de détection	Fire Notifier NFS-320	
Standards		
Reglementations	Loi sur la marine marchande du Canada, 2001	

CR10.3.C **Equipment provided by the owner**

CR10.3.C.1 Unless otherwise indicated, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications.

CR10.3.D **Technical Description**

CR10.3.D.1 General

10.3.D.1.1 The vessel is equipped with an integrated Techsol fire detection system with Fire Notifier NFS-320 panel. The Fire Notifier NFS-320 panel is connected to the integrated fire alarm system that is part of the vessel's surveillance and alarm system.

10.3.D.1.2 The Contractor must schedule an ABS Classification Society Inspector's visit prior to commencement of work and the fees will be paid by Canada.

10.3.D.1.3 The Contractor retains the services of an accredited company to perform the annual inspection and certification of the fire detection system.

CR10.3.D.2 Location

10.3.D.2.1 The fire detection control panel is located on the port side of the wheelhouse.

CR10.3.D.3 Obstructions

10.3.D.3.1 It is the responsibility of the Contractor to locate obstruction items, remove them temporarily and store them, and then reinstall them on the vessel.

CR10.3.E **Proof of Performance**

CR10.3.E.1 Inspection

10.3.E.1.1 All work must be completed to the satisfaction of the Chief Engineer.

CR10.3.E.2 Certification

10.3.E.2.1 The Contractor shall provide the Chief Engineer with two hard copies of the annual maintenance and certification certificates with their original copy. The Contractor also sends an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

CR10.3.E.3 **DELIVERABLES**

10.3.E.3.1 Drawings / reports

10.3.E.3.2 The Contractor shall provide the Chief Engineer with a hard copy of the typed report detailing the inspections, modifications and repairs made prior to acceptance of this item. The Contractor also sends an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

CR10.4 ANNUAL INSPECTION OF THE FIXED FIRE FIGHTING SYSTEM

CR10.4.A Scope

CR10.4.A.1 The purpose of this specification is to maintain and certify the fixed firefighting system.

CR10.4.A.2 The Contractor will contact the Chief Engineer prior to commencing work on this item. This work must be done in parallel with the maintenance of the portable fire extinguishers without reducing the ability to fight fires aboard the ship.

CR10.4.A.3 The fixed firefighting system is a FM200 system.

CR10.4.B References

Document	Title	Included Yes/No
AF6095-55500-04_AF	FIRE CONTROL PLAN_Fr	yes
Publications		
90-FM200M-21	Kidde Fenwal FM200 Marine ECS series Engineered Fire Suppression System, Design, installation, Operation and Maintenance Manual	no
Reglementations	Loi sur la marine marchande du Canada, 2001	

CR10.4.C Accreditation

CR10.4.C.1 The contractor must be accredited for the certification of this system and by the ABS classification society that it will do in accordance with the latest regulations in force on maritime safety.

CR10.4.D Equipment provided by the owner

CR10.4.D.1 Unless otherwise indicated, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications.

CR10.4.E Technical Description

CR10.4.E.1 General

10.4.E.1.1 The Contractor shall retain an authorized representative who will perform testing and inspections of the FM200 system and the vessel's fire system as part of the annual inspection and certification. of this system. The chief engineer must attend all tests.

10.4.E.1.2 In addition to the following tests, the Contractor shall perform all tests required by the on-site ABS Inspector. The Contractor must provide in its estimate the cost for the testing of alarms (lights and sirens) of all devices, the testing of nitrogen trip cylinders, the testing of ventilation shutoff devices as well as testing release loops and cables.

10.4.E.1.3 The Contractor shall air-purge pneumatic hoses and actuators and ensure that they operate properly. Hoses and nozzles must be free of obstruction.

10.4.E.1.4 The Contractor must ensure that alarm displays and sirens are working properly. The contractor must weigh each cylinder and record its results. At the end of the refit, he must provide the Chief Engineer with copies of all certificates.

10.4.E.1.5 Upon completion of the tests and inspections, the Contractor shall reassemble the systems and return them to service.

10.4.E.1.6 For the FM200 system, a halocarbon leak detection test shall be performed by accredited personnel for halocarbons and shall be carried out with adequate detection equipment.

CR10.4.E.2 Obstructions

10.4.E.2.1 The Contractor is responsible for identifying obstructions, temporarily removing and storing them, and reinstalling them on the vessel.

CR10.4.F **Proof of Performance**

CR10.4.F.1 Inspection

10.4.F.1.1 All work must be completed to the satisfaction of the Chief Engineer, the Vessel Maintenance Manager and the ABS Inspector.

CR10.4.F.2 Tests

10.4.F.2.1 The Chief Engineer shall witness the inspection and testing of the system.

CR10.4.F.3 Certification

10.4.F.3.1 The Contractor shall provide the Chief Engineer with two (2) hard copies of maintenance certificates along with their original copy. The Contractor will also

send an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

10.4.F.3.2 An independent certification for the leak detection test shall be issued for the FM200 system and shall also show the certificate number of the technician who performed the test.

CR10.4.F.4 DELIVERABLES

10.4.F.4.1 Drawings / reports

10.4.F.4.2 The Contractor must provide the Chief Engineer with a hard copy of his typed report detailing the inspections, modifications and repairs made prior to acceptance of this item. The Contractor will also send an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

CR11 HULL AND STRUCTURE

CR11.1 TRANSOM

CR11.1.A **Specifications for New Exhaust Exhaust Hero Class**

CR11.1.A.1 Note: The prepared drawings are design drawings; manufacturers must use the drawings and instructions to create the implementation plan.

CR11.1.A.2 The exhaust on the transom will have to be changed to stainless steel.

CR11.1.B **References**

CR11.1.B.1 See drawing J15073-S01 for more information on abductions.

CR11.1.C **Technical Aspect**

CR11.1.D **Penetration And Exhaust Pipes Of Existing Traits**

CR11.1.D.1 The existing penetration in the hull and the flange connection piece must be removed in their entirety. The part of the piping between the connection flange and the first set of pipe flanges on the horizontal exhaust path (which contains the flange connection for seawater injection) must also be removed.

CR11.1.D.2 The existing seawater injection line with flanged connection to the exhaust pipe must be removed and reused in the new section of the exhaust pipe that will be installed there.

CR11.1.E **Transom Sheets and Transom Crossing Brackets**

CR11.1.E.1 The corroded weld zone surrounding the existing penetration part of the hull and any corroded transom sheet outside this weld zone shall be cut. Care must be taken to ensure that no additional sheet that remains in good condition is cut during the process. If the corroded area of the transom plating exceeds the area of the new penetration plating, then insertion plates of the original thickness and quality must be installed, in accordance with ABS (this varies by vessel and by port or starboard side of each vessel).

CR11.1.E.2 Existing internal supports for the hull penetration part shall be cut and removed.

CR11.1.E.3 Canada will supply ABS certified steel if necessary to make repairs to the transom. The contractor must advise the quantity and thickness required before the start of the repair.

CR11.1.F **New Transom Sheets and Transom Exhaust Pipe, Material and Welding**

CR11.1.G **Equipment Data**

CR11.1.G.1 Transom / exhaust

CR11.1.H **Drawings**

CR11.1.H.1 All drawings are indicated in the General remarks. The following drawings should be considered as reference drawings, as defined in the Drawings section of the General Notes.

Number of drawing	TITLE of DRAWING	Number of sheets
J15073-S01	Main engine exhaust outlets - disassembly	1
J15073-M01	New main engine exhaust outlet	1
J15073-M01	New main engine exhaust outlet	1

CR11.1.I **Regulations and Standards**

CR11.1.I.1 The following regulations and standards apply to the work performed in this section; the Contractor must ensure that all work performed in this section complies with regulations and standards as well as federal and provincial regulations and standards.

CR11.1.J **Statement of Work**

CR11.1.J.1 NEW PENETRATION OF TRANSOM AND TRANSOM EXHAUST PIPING, MATERIAL AND WELDING.

CR11.1.K **Description**

CR11.1.K.1 The new transom crossings (2) will be made entirely of 316L stainless steel and will be welded directly into the transom plate. No carbon steel will be used in the penetration room as this appears to be the main problem with the existing installation. The

combination of hot exhaust and seawater at the outlet strongly corroded the existing penetration piece to the transom plates.

CR11.1.L References

CR11.1.L.1 The details of the new exhaust system can be found in drawing J15073-M01.

CR11.1.L.2 All welding and weld inspection work must be in accordance with CCG's CT-043-eg-001-E.

CR11.1.M Technical Aspect

CR11.1.M.1 For all items requiring the application of fusion welding for steel structures, the Contractor and all subcontractors must be certified by the Canadian Welding Bureau in accordance with CSA \ ACNOR W47.1 - last edition, Division 1 or 2.

CR11.1.M.2 For all articles requiring the application of fusion welding for stainless steel structures, the Contractor and all subcontractors must be certified by the Canadian Welding Bureau in accordance with CSA \ ACNOR W47.1 - latest edition, Division 1 or 2. Welders, welding operators and welding methods must meet the requirements of CSA W47.1 and AWS D1.6, as permitted by CSA W47.1.

CR11.1.M.3 For all items requiring the application of fusion welding to aluminum structures, the Contractor and all subcontractors must be certified by the Canadian Welding Bureau in accordance with CSA \ ACNOR W47.2 - latest edition, Division 1 or 2.

CR11.1.M.4 Before commencing any welding work, the Contractor must provide the TA with documentation clearly indicating compliance with the welding certification requirements specified in this document and in the CTG CT Welding Specification. -043-eg-eg-001. Typical documents include, but are not necessarily limited to: Validation Letter, Welding Procedures, Welding Performance Rating Cards, Inspection Staff Qualification Cards, Inspection Reports, etc.

CR11.1.M.5 Standards for welding shall comply with the requirements of the CT-043-eg-eg-001 CCG Welding Specification.

CR11.1.M.6 For structural steels > 3 mm thick, the weld shall meet the requirements of CSA W47.1 and W59, except for the modifications made by the CT-043-eg welding specification. -eq-001 of the CCG.

CR11.1.M.7 For structural aluminum > 3 mm thick, the weld shall meet the requirements of CSA W47.2 and W59.2, except as modified by CT-043-eg-eg-001 of the CCG.

CR11.1.M.8 For stainless steels > 3 mm thick, the weld shall meet the requirements of CSA W47.1 and AWS D1.6 and the CT-043-eg-eg-001 of the CCG.

CR11.1.M.9 316L stainless steel is easily welded using a higher alloy and a very low carbon load.

CR11.1.N **For dissimilar welded carbon steel (CS) fittings to 316L stainless steel, the following procedures must be followed:**

CR11.1.N.1 Higher alloy, very low carbon weld input required (eg 309MoL).

CR11.1.N.2 A low thermal welding process (eg GMAW-P process with 99.99% Ar shielding gas) should be used, with a maximum thermal input not exceeding 1.5 KJ / mm and a maximum contact temperature not exceeding 150 ° C.

CR11.1.N.3 No preheating required above 10 C min. ambient temperature and no heat treatment is required after welding.

CR11.1.N.4 The dissimilar metallic weld joint shall be designed to provide a gradual and smooth transition between thicker 316L stainless steel and thinner plain carbon steel transom plating, for example, chamfering a side with a minimum slope of 1: 4 and with the opposite side to the flush. Side 2 must be ground to obtain a sound metal at the end of welding on side 1 and before welding on side 2.

CR11.1.N.5 Appropriate sequencing of welds to minimize deformations (eg alternating or simultaneous welding on diametrically opposed segments / quadrants).

CR11.1.N.6 Previously qualified welding procedures in accordance with Section IX of the ASME may be accepted in lieu of the CSA / AWS test standards specified herein.

11.1.N.6.1 New supports for the penetration part, similar to those currently in place, must be installed and the appropriate welding procedures described above must be followed. In addition, the weld cap must be flush before soldering.

11.1.N.6.2 All areas where dissimilar metals have been welded shall be smooth and covered with heat-resistant epoxy before being painted to avoid exposure of the different weld zone to seawater. This coating system should be inspected and maintained regularly.

CR11.1.O **Exhaust Piping and Injection of Sea Water**

CR11.1.O.1 References

11.1.O.1.1 See drawing J15073-M01 for more details on the installation.

CR11.1.P **Technical aspect**

CR11.1.P.1 A new exhaust pipe section will be installed to connect the new transom penetration piece to the existing exhaust pipe at the front of the withdrawal section. The new tailpipe

will include a flanged seawater connection identical to the one currently installed and will be connected to existing seawater piping at this location.

CR11.1.P.2 The existing seawater injection pipe section currently connected to the exhaust pipe flange must be removed from the old exhaust pipe section and reinstalled in the same manner with the new exhaust piping. If the existing seawater injection nozzle is not in the center of the exhaust pipe when it is reinstalled, it must be modified accordingly.

11.1.P.2.1 The separation of materials shall be maintained between dissimilar metals.

CR11.1.Q **Proof of Performance**

CR11.1.R All welds completed under this contract will be subject to a 100% visual inspection and then a 100% PT inspection.

CR11.1.S **Inspection points**

CR11.1.S.1 All inspections and examinations will be performed by the qualified third party inspection organization of the TA. Defective welding must be repaired at the expense of the contractor. The contractor will pay for the resumption of the tests of the welds that must be redone.

CR11.1.T **Tests and Trials**

CR11.1.T.1 All inspections and examinations will be carried out by the qualified third party inspection body of the TA. Defective welding must be repaired at the expense of the contractor. The contractor will pay for the resumption of the welds that need to be redone.

CR11.2 GENERAL WELDING REPAIRS

CR11.2.A **SCOPE**

11.2.A.1.1 The purpose of this specification is for the Contractor to provide certified welding labor to be performed in order to perform aluminum and steel welding repairs outside ship.

CR11.2.B **REFERENCES**

Document	Title	Included Yes/No
Plan		
Publications		
Standards	W49	
	Standard de la garde côtière	
Reglementations	Building and Classing High-Speed Craft - 2019	

CR11.2.B.1 Equipment provided by the owner

11.2.B.1.1 Unless otherwise specified, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications.

CR11.2.C Technical Description

CR11.2.C.1 General

11.2.C.1.1 The Contractor must note that the majority of the work is on an aluminum structure.

CR11.3 VENTS HEIGHTS TO BE ADJUSTED TO REGULATIONS

CR11.3.A Scope

CR11.3.A.1 The height of the vents must be adjusted to regulations standards: 900 mm or more for ventilators and 760 mm or more for the air pipes. There is one Ventilator (Main Deck (s)/ 1 No, Goose neck) and twelve Air pipes to be adjusted (in yellow), for a total of thirteen. The table below shows the actual height.

	No & Deck fitted on	Closing Appliances	Remarks	Coaming Heights (mm)
Ventilators	Main Deck (s)/ 1 No, Goose neck	Hinged Cover 1 Latch	SG Flat exhaust	810
	Main Deck (s), 1 No, Goose neck	Hinged Cover 1 Latch	SG Intake	1010
	Main Deck (p), 1 No, Goose neck	Hinged Cover 1 Latch	SAR Medical Locker	920
Air pipes	Main deck Fr.1 +145 (P), 1 No	Automatic (float ball)	Ballast - tank 17	620
	Main deck Fr.1 +155 (S), 1 No	Automatic (float ball)	Ballast - tank 16	650
	Main deck Fr.9 -335 (P), 1 No	Automatic (float ball)	Fuel oil storage/overflow - tank 9	480
	Main deck Fr.9 +150 (P), 1 No	Automatic (float ball)	Tanks 6 & 7b	490
	Main deck Fr.15 -295 (S), 1 No	Automatic (float ball)	Dirty oil & sludge - tank 15	460
	Main deck Fr.15 -90 (S), 1 No	Automatic (float ball)	M.E. Lubrication oil -tank 5	460
	Main deck Fr.17 -200 (P), 1 No	Automatic (float ball)	Bilge water -tank 4	430

Main deck Fr.30 +150 (P), 1 No	Automatic (float ball)	Fresh water -tank 11	510
Main deck Fr.30 +150 (S), 1 No	Automatic (float ball)	Fresh water -tank 12	510
Main deck Fr.9 -150 (P), 1 No	Automatic (float ball)	Grey water -tank 7a	450
Main deck Fr.8 +341 (S), 1 No, Goose neck		Air Receiver safety valve AMR	450
Main deck Fr.11 -410 (S), 1 No Goose neck		Air Receiver safety valve MMR	465

Please note where there is a float ball, the measurement is from the bottom of the float ball

CR11.3.A.2 The contractor must unscrew the flange and temporarily blank the hole/flange on the ship while the vents are being worked on ashore. Once ashore the contractor must cut the vent and weld an extension piece, of the same material, to get to the regulation height.

CR11.4 ADDING A HEATING VENT TO DRINKING WATER RESERVOIR

CR11.4.A Scope

CR11.4.A.1 In winter, the vents of drinking water tanks tend to freeze. The installation of a heating vent to remedy the problem is necessary. It is possible to look on the CCGS Corporal Kaible V.C. and the CCGS A. Leblanc to understand the necessary installation..

Document	Title	Inclus
Plan		
Publications		
	Winteb wiko 5000 gooseneck type 1	oui
Standards		
TP 127 F	Normes d'électricité régissant les navires	non
Reglementations	Building and Classing High-Speed Craft - 2019	
	Loi sur la marine marchande du Canada, 2001	

CR11.4.B Equipment provided by the owner

CR11.4.B.1 Unless otherwise indicated, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications.

CR11.4.C **TECHNICAL DESCRIPTION**

CR11.4.C.1 The contractor must pass wires to join the two heating modules..

CR11.4.C.2 The Contractor must protect the wire while on deck before joining the vent.

CR11.4.C.3 The Contractor must discuss with the Chief Engineer how to obtain electricity for the 150Watt vents.

CR11.4.C.4 The compartment adjacent to the potable water tank is the bow thruster compartment. From where it will be possible to mount the wire. There is currently no transit crossing the bridge.

CR11.4.C.5 The Contractor shall repair the insulated surfaces that are crossed.



Figure 2: Coin arrière bâbord
compartment propulseur d'étrave



Figure 1: Distance entre l'évent et la fin du
réservoir. tel que vu sur le pont principal

CR11.4.D **Proof of execution**

CR11.4.D.1 Inspection

11.4.D.1.1 The work shall be performed to the satisfaction of the Chief Engineer.

11.4.D.1.2 The Contractor must demonstrate that the vent heater is working.

11.4.D.1.3 Provide a report indicating the irregularities observed.

11.4.D.1.4 The Contractor must demonstrate that transits that have been opened are watertight when the work is finished.

11.4.D.1.5 The Contractor must demonstrate that the electrical outlet is functional.

CR11.4.E DELIVERABLES

CR11.4.E.1 Drawings / Reports

11.4.E.1.1 The Contractor shall provide the Chief Engineer with a hard copy of his typed report detailing the inspections, modifications and repairs made prior to acceptance of this item. The Contractor will also send an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

CR12 PROPULSION SYSTEM AND MANOEUVER

CR12.1 INSPECTION/REPLACEMENT CPP PUMP P3

CR12.1.A Scope

CR12.1.A.1 The Coast Guard has 2 Settima pumps approved Hero class per ship. These two pumps must be removed, taken to a hydraulic workshop, inspected for wear, tested at the hydraulic pressure and flow shop and returned and installed on the vessel. A report of these tests must be returned with the pump.

CR13 ELECTRICITY PRODUCTION

CR13.1 ANNUAL MAINTENANCE OF GENERATOR ALTERNATORS

CR13.1.A Scope

CR13.1.A.1 Perform annual maintenance on alternators on port, starboard and emergency generators.

CR13.1.B References

Document	Title	Included Yes/No
Plan		
Publications	Magnaplug Generator, 280-430 Frame, Installation, Operation and Maintenance Manual Voltage Regulator AVC63-12 and AVC125-10 Manual	

Standards

TP 127 F

Normes d'électricité régissant les navires

Regulations

Building and Classing High-Speed Craft - 2019

Loi sur la marine marchande du Canada, 2001

CR13.1.C **Equipment provided by the owner**

CR13.1.C.1 Unless otherwise indicated, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications.

CR13.1.D **Technical Description**

CR13.1.D.1 General

13.1.D.1.1 Check and record the insulation resistance with a 500 mega-ohm voltmeter. The minimum acceptable reading is 2 mega-ohms. All electronic devices (controllers, diodes, capacitors, protection relays) must be disconnected from the winding circuit before checking the insulation. If the reading is less than the minimum, the generator must be cleaned and dried in place and if ever the contractor is unable to read infinitely, it must be taken to an authorized service center.

13.1.D.1.2 Check the DC excitation voltage without load and check the number of revolutions per minute. Record the unloaded excitation (DC voltage at the stator of excitation), the voltage of the generator terminal and the speed of the drive mechanism as future reference points for troubleshooting.

13.1.D.1.3 For bid submission, provide specialized electrical labor for a period of ten hours to complete the work.

CR13.1.E **Obstructions**

CR13.1.E.1 The Contractor is responsible for identifying obstructions, temporarily removing and storing them, and reinstalling them on the vessel.

CR13.1.F **Proof Of Performance**

CR13.1.F.1 Inspection

13.1.F.1.1 The work must be performed to the satisfaction of the Chief Engineer.

13.1.F.1.2 Provide a report indicating the measured values and irregularities observed.

CR13.1.G Deliverables

13.1.G.1.1 Drawings / reports

13.1.G.1.2 The Contractor shall provide the Chief Engineer with a hard copy of the typed report detailing the inspections, modifications and repairs made prior to acceptance of this item. The Contractor will also send an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

CR14 ELECTRICAL DISTRIBUTION

CR14.1 ADD VOLTAGE REGULATOR

CR14.1.A Scope

CR14.1.A.1 Objective: The objective of this project is to install and commission the load control component for the synchronization operation with the terrestrial power supply.

CR14.1.A.2 Background: The Canadian Coast Guard (CCG) has accepted nine new Mid-Shore Patrol Vessels (NPSHs) built by Irving Shipyards between 2012 and 2014 under "Lloyd's Rules and Regulations for the Classification of Special Service". Craft, 2009 ".

CR14.1.A.3 Vessel datasheet

14.1.A.3.1 Overall length 42,8 m

14.1.A.3.2 Length at the waterline 39,9 m

14.1.A.3.3 Maximum width 7,0 m

14.1.A.3.4 Width at the waterline 6,8 m

14.1.A.3.5 Fwd Draft 2,8 m

14.1.A.3.6 Aft Draft 2,8 m

14.1.A.3.7 freeboard 1,7 m

14.1.A.3.8 Gross tonnage 253.0 t

14.1.A.3.9 Maximum cruising distance 2000 nm

14.1.A.3.10 Endurance 14 days

14.1.A.3.11 Cruising speed 14.0 kn

14.1.A.3.12 Maximum speed 25.0 kn

14.1.A.3.13 Hull notation: +100A1 SSC PATROL, MONO, HSC, HSC, G4, EP.

14.1.A.3.14 Descriptive notes: NOTE ABRÉGÉE GREEN PASSEPORT

CR14.1.A.4 Hero-class ships have been delivered with a generator timing system that allows for automated or manual adjustment of the vessel's service generator speed and frequency, but does not allow adjustment of the voltage distribution. and charge. The two components necessary for a good synchronization of the generators are the adjustment of the speed and the voltage (resistive and reactive control of the load).

CR14.1.A.5 This project will modernize the controls, alarm philosophy and interlocking devices required to automatically detect voltage and adapt voltage to provide a safer synchronization system and more reliable when transferring loads to and from the terrestrial power grid. With generator voltage adjustment capabilities, voltage / electrical degree / frequency windows in synchronization protection relays can be reset to industry standards. This upgrade will also harmonize the ground power synchronization philosophy of the Hero class with the rest of the fleet.

CR14.1.B **Part 2 : REFERENCES**

CR14.1.B.1 Orientation drawings / nameplate data.

CR14.1.B.2 Techsol - Functional Design Specifications.

CR14.1.B.3 Update / SB01CA - Main module for synchronization and automatic protection of the DC generator of the starboard distribution board.

CR14.1.B.4 Update / SB01EA - Control of the main generator of the starboard distribution board.

CR14.1.B.5 Update / SB02CA - Main module for synchronization and automatic protection of port panelboard generator.

CR14.1.B.6 Update / SB02EA - Control of the main generator of the starboard distribution board.

CR14.1.B.7 Update / SB05BA - manual synchronization main distribution board.

CR14.1.B.8 Update / SB05CA - Automatic synchronization of the terrestrial power supply and E bus of the main switchgear.

CR14.1.B.9 Update / SB10CA - Main module of the starboard distribution board PLC01-Module 02/16 Digital outputs.

CR14.1.B.10 Update / SBZZAB - Main mechanical layout of the starboard distribution board Generator controls Door arrangement.

CR14.1.B.11 Selco E7800 Motorized Potentiometer Data Sheet.

CR14.1.B.12 9337200991E, Instructions for the automatic voltage controller AVC63-12 and AVC125-10.

CR14.1.B.13 Techsol alarm system Binding (briefcase) _AM_AM_MSPV_AF.pdf

CR14.1.B.14 Binder for Techsol switchboard - Power distribution and various Rev 8.pdf.

CR14.1.C **Standards**

CR14.1.C.1 In case of conflict between the different normative documents listed below, preference will be given to the document which applies the most stringent requirements.

CR14.1.C.2 TP127E, Ship Electrical Standards: <http://www.tc.gc.ca/eng/marinesafety/tp-tp127-menu-263.htm>.

CR14.1.C.3 Rules and Regulations of the APA for the Classification of Special Duty Boats, (Latest Edition).

CR14.1.C.4 IEEE45-2002 Recommended Practice for Electrical Installations on Ships.

CR14.1.D **Terminology**

14.1.D.1.1 CCAM - vessel alarm and monitoring system.

14.1.D.1.2 Load - in the context of this document means the consumption of electrical energy.

14.1.D.1.3 Load transfer - A term used to describe the limited process in load transfer time between the main switchboard of the ship and the shore power system or vice versa.

14.1.D.1.4 Incoming Generator - the generator that will be connected to the main switchboard.

14.1.D.1.5 On-Line Generator - The generator is currently connected to the main switchboard.

14.1.D.1.6 Outgoing Generator - the generator that will be disconnected from the main switchboard.

14.1.D.1.7 Smooth Loading - a manual or automatic process of closing the generator breaker and increasing the speed of the incoming generator until the load between the generators is equal.

14.1.D.1.8 Smooth Unloading - the process of decreasing the generator output speed / load until the load has been transferred to the spare power source and then opening the generator breaker.

14.1.D.1.9 Synchronization - the process of adapting the speed (frequency), rotor angle (phase), and voltage of the incoming generator to determine the proper timing of

the generator breaker in order to avoid significant transient torque to the generator and disturbances to the power grid.

14.1.D.1.10 Synchronism Check Relay - The relay used to supervise the circuit breaker close command for manual and automatic synchronization operations. Most synchronism control relays verify that the phase angle between the input voltage and the operating voltage is in a +/- angle window and remains there for a certain time. The angle window and the time delay are a substitute for slip measurement (frequency difference). The relay also implements a window of maximum voltage difference between the input voltage and the bus voltage as well as a time parameter. Most microprocessor-based synchronism control relays slide directly, so the delay parameter may be redundant in some applications.

14.1.D.1.11 TA - Technical Authority

14.1.D.1.12 Automatic Voltage Detection - synchronization automation will detect incoming bus voltage.

14.1.D.1.13 Automatic Voltage Matching - Synchronization will automatically match the generator voltage to the ground supply voltage before sending a close command to the breaker.

CR14.1.E **Regulations**

CR14.1.E.1 2.3.1 As required by the Classification Society (ABS).

CR14.1.F **Part 3: TECHNICAL DESCRIPTION:**

CR14.1.F.1 Scope

14.1.F.1.1 The Contractor must install and complete the installation of the new equipment in accordance with the functional design specifications provided by the CCG. Once cabling and installation are complete, the authorized representative must be brought onsite to review the installation, perform programming / system updates, and finally commission and test the ground power synchronization system.

CR14.1.F.2 Tasks

14.1.F.2.1 Installation of wiring and computer equipment.

14.1.F.2.2 The Contractor must review the functional design specification and complete the work identified in Section 2.1 of the document provided by CCG (10120832_001_EN_SOW MSPV SHore Power Modification Install REVIEWed).

- 14.1.F.2.3 The Contractor will be responsible for providing all necessary equipment to complete the installation, except the motorized potentiometer that will be provided by the CCG.
- 14.1.F.2.4 The contractor must use existing cable trays to install the new wiring.
- 14.1.F.2.5 The Contractor will be responsible for installing plastic ID Lamacoids next to or under any new equipment installed in each generator switchboard.
- 14.1.F.2.6 These new Lamacoids must use the same color scheme and must be similar in size and height to existing Lamacoids.
- 14.1.F.2.7 If the vessel has equipment at the location identified in the specification document to assemble the new equipment, the Contractor must contact the CCG Technical Authority to select and confirm a new location for the equipment mounting.
- 14.1.F.2.8 All new wire terminations shall be identified using PermaSleeve heat-shrinkable polyolefin wire markings, or equivalent. Shirts must have a white background with black lettering.
- 14.1.F.2.9 The Contractor must review and implement recommendations for type, size and wire identification as indicated in Section 2.3 of the CCG Functional Design Specification.
- 14.1.F.2.10 Whenever possible, the Contractor shall use a DIN rail mount for any new apparatus.
- 14.1.F.2.11 The Contractor must ensure that any new equipment installed in the Generator Booths does not interfere with access to existing equipment located behind or adjacent to the new facilities.
- 14.1.F.2.12 The Contractor shall not fasten bare copper conductors under screw terminals. Crimp ends should be used for terminations and these crimp connectors should be installed with the appropriate ratchet crimping tool. Crimping pliers without ratchet will not be accepted for this project.
- 14.1.F.2.13 All work must conform to the Building and Classing High-Speed Craft (2019) rules and specifications and IEEE45-2002 standards. In case of conflict between the two documents, preference will be given to the document that applies the most stringent requirements.
- 14.1.F.2.14 The CCG will provide the two motorized potentiometers that the Contractor will install on the first vessel.

14.1.F.2.15 Upon completion of the cabling and hardware installation, the Contractor must engage Techsol Marine to complete sections 3.2.2 and 3.2.3 of the document: (10120832_001_EN_SOW MSPV SHore Power Modification Install REVIEWed).

CR14.1.G Synchronization settings

CR14.1.G.1 The authorized representative shall have the Crompton Synchroscope calibrated according to the settings given in section 2.2 of the functional design specification document (10120832_001_EN_SOW MSPV SHore Power Modification Install REVIEWed).

CR14.1.G.2 The authorized representative shall review and calibrate the DEIF PPU-3 automatic synchronization device. Since this new system will automatically adapt the generator voltage and frequency to ground power, the recommended settings will be reconfigured to 3%, 10 degrees, and 0.4 Hz respectively, and tests will be performed during the test period to determine if The strictest tolerances are acceptable for normal operation.

CR14.1.G.3 The authorized representative shall modify and test the improved functionality of the generator touch screen to confirm the correct operation of all synchronization combinations.

CR14.1.G.4 Secondary injection should be used to test, validate and document both relay functions at the new settings.

CR14.1.H Software Modification

CR14.1.H.1 The authorized representative will be contractually responsible for uploading and uploading any changes to DEIF PPU-3, DIEF HAS-111DG and CCAM.

CR14.1.H.2 The CCG will provide the authorized Marine representative with two spare PPU-3 units to be programmed prior to arrival..

CR14.1.I Part 4: PROOF OF PERFORMANCE:

CR14.1.I.1 Qualifications required

14.1.I.1.1 The electrical contractor who performs the wiring and installation of this project shall be a journeyman electrician, an electrical technologist or an electrical engineer with extensive marine experience.

14.1.I.1.2 If the Contractor uses subcontractors to perform the Work, they must have the same Marine Electrical Qualifications as the Prime Contractor.

14.1.I.1.3 Any subcontractor to be used in this project must be identified prior to the commencement of the work.

CR14.1.J **Tests and Trials**

- 14.1.J.1.1 The prime contractor shall give two days notice to the CCG Technical Authority prior to commencing the test phase of the project.
- 14.1.J.1.2 The authorized representative shall implement the class approved test specifications and complete them to demonstrate that the system, its alarms and interlocks are functioning properly.
- 14.1.J.1.3 The updated synchronization system must be ready in all respects before the start of any test.
- 14.1.J.1.4 The ship shall have both ship service generators, emergency generator and shore power supply during the test period to proceed.
- 14.1.J.1.5 The CCG Technical Authority, the Classification Society Representative and the Chief Engineer of the Vessel must be present to witness the test and to sign the procedures.
- 14.1.J.1.6 The authorized representative shall be responsible for providing all test instruments required to perform the tests.
- 14.1.J.1.7 All instruments used for testing shall be provided with a calibration certificate. Certificates dated more than one year from the date of testing are not accepted for testing.
- 14.1.J.1.8 The Digital Multi Meter shall have Min / Max / Mean display capabilities to capture and record various readings during the test procedure.
- 14.1.J.1.9 The authorized representative shall test all functional combinations of the touch screen upgrade to ensure proper operation.
- 14.1.J.1.10 The authorized representative will provide a registration sheet that must include, but not be limited to, the following: Checklists for readings and observations during the test; parameterization of alarm thresholds - circuit breaker tripping functions - authorizations; signature space for staff listed in 4.2.d.
- 14.1.J.1.11 The test document must be submitted to the CCG TA at least one week prior to the test date for review and comment by CCG.
- 14.1.J.1.12 The authorized representative must provide a brief report to the CCG TA at the end of these tests outlining any concerns, observations or improvements that could improve the overall performance and performance of the system. The report must be submitted within one week of the completion of the tests.

CR14.1.K **Part 5: DELIVERABLES:**

CR14.1.K.1 Drawings / Reports

- 14.1.K.1.1 The prime contractor shall complete the cabling and installation of the equipment in accordance with section 3.2.1 of this Statement of Work (SOW).
- 14.1.K.1.2 At the end of the project installation phase, the prime contractor shall engage the authorized representative to complete sections 3.2.2 and 3.2.3.
- 14.1.K.1.3 Upon arrival on board, the authorized representative shall briefly review the wiring and installation of the equipment and provide the CCG with a brief report if there are any problems with compliance with the Technical Specifications document. The installation contractor must be on site during the inspection of the authorized representative to resolve any problems that may arise during installation.
- 14.1.K.1.4 The authorized representative shall perform synchronization device upgrades, PLC program upgrades, and generator touch screen modifications in accordance with section 3.2.2.2 of this scope.
- 14.1.K.1.5 The authorized representative shall develop a brief testing and testing program in accordance with section 4.2 which will test all aspects of the new synchronization system.
- 14.1.K.1.6 This test and test plan shall be provided to CCG at least one week prior to the actual test for review and comment.
- 14.1.K.1.7 The authorized representative will be responsible for ensuring that, at the end of the tests, the electronic design files (to be provided in Acad and PDF formats), as identified in the Techsol Marine file P17_0931_SB_DWG_R18_APP.pdf, be updated to reflect any changes made during the installation and commissioning process. The Contractor must provide these updated electronic files to the TA within two weeks of completion of testing.
- 14.1.K.1.8 Upon successful completion of the tests, the authorized representative shall provide the TA with an electronic copy of the final DEIF PPU-3 settings, additional parameters of the controller and the control relay. Crompton synchronization in an unprotected Microsoft Word document.

CR14.1.K.2 Constraints

- 14.1.K.2.1 No vessel inspection without proper notice.

14.1.K.2.2 The CCG will not provide any reference standards or classification society documents.

CR14.1.K.3 Training

14.1.K.3.1 The authorized representative shall provide a preliminary overview of the upgrades to the Chief Engineer so that crews understand the changes. From an operational point of view, there will be no change in the philosophy of synchronization, so no additional training will be necessary.

CR14.1.K.4 Manuals

14.1.K.4.1 The prime contractor must provide all documentation that accompanies the new equipment installed.

CR14.2 ELECTRICAL INSULATION TEST (MEGGER)

CR14.2.A **Scope**

CR14.2.A.1 Verification of the insulation of the different electrical components (MEGGER TEST) of the various electrical components from the electrical generation (Generator) to the various components.

CR14.2.B **References**

Document	Title	Included Yes/No
Plan		
Publications		
Standards		
TP 127 F	Normes d'électricité régissant les navires : https://www.tc.gc.ca/fra/securitemaritime/tp-tp127-menu-263.htm	
Regulations	Building and Classing High-Speed Craft - 2019 Loi sur la marine marchande du Canada, 2001	

CR14.2.C **Equipment provided by the owner**

CR14.2.C.1 Unless otherwise indicated, the Contractor must provide all materials, equipment and parts required to perform the work of the specifications. The contractor must have an electrician with at least a C license to work on this inspection.

CR14.2.D **Technical description**

CR14.2.D.1 General

14.2.D.1.1 Perform the leakage test on the various components.

Port Generator

Starboard Generator

Emergency generator

Equipment Connected to 600v Main Distribution Panels

Equipment Connected to 240v Main Distribution Panels

Equipment Connected to 120v Main Distribution Panels

Equipment connected to 600v Emergency Distribution Panels

240v emergency switchboard equipment

Equipment Connected to 120v Emergency Distribution Panels

Equipment Connected to 24v Emergency Distribution Panel 24v

CR14.2.D.2 Obstructions

14.2.D.2.1 The Contractor is responsible for identifying obstruction items, temporarily removing and storing them, and reinstalling them on the vessel.

CR14.2.E **Proof Of Performance**

CR14.2.E.1 Inspection

14.2.E.1.1 The work must be performed to the satisfaction of the Chief Engineer.

14.2.E.1.2 Provide a report indicating the irregularities observed and the values recorded.

CR14.2.E.2 DELIVERABLES

14.2.E.2.1 Drawings / reports

14.2.E.2.2 The Contractor shall provide the Chief Engineer with a hard copy of his typed report detailing the inspections, modifications and repairs made prior to acceptance of this item. The Contractor will also send an electronic copy of all reports and certificates to the Vessel Maintenance Manager.

CR15 AUXILIARY SYSTEMS (N/A)

CR16 DOMESTIC SYSTEMS

CR16.1 VENTILATION

CR16.1.A Scope

CR16.1.A.1 The Coast Guard wants to have a vibration analysis done on all six ventilation engines to decide which ones need preventive maintenance. The contractor must inspect the premises prior to bidding as access to some of these fans is restricted and requires the removal of insulation, grilles, etc., at a few locations.

CR16.2 CLEANING OF VENTILATION SYSTEM

CR16.2.A Scope

CR16.2.A.1 The contractor must clean and sterilize the ventilation ducts. A report must be provided to the chief engineer by the contractor.

CR16.3 REFRIGERATION

CR16.3.A Preventative Maintenance

CR16.3.A.1 The contractor shall perform the annual preventative maintenance of the vessel's refrigeration and air conditioning systems.

16.3.A.1.1 Stop the compressor in service (put on standby).

16.3.A.1.2 Check the compressor on standby and put it into service.

16.3.A.1.3 Add manometers to the suction and discharge of the common refrigerant line.

16.3.A.1.4 Maintenance performed by a Refrigeration Company.

Leakage test refrigeration system, A / C and FM 200 and put in paper and electronic copy

CR17 DECK EQUIPEMENT(N/A)

CR18 COMMUNICATION AND NAVIGATION **SYSTEMS**

CR18.1 SHIP RADIO INSPECTION

CR18.1.A.1 Provide a fixed price for the radio inspection of the vessel. The price must include transportation costs, accommodation and food expenses. Provide your fee schedule for additional work.

CR18.1.A.2 Provide material and labor to carry out the radio inspection to provide the checklist for obtaining the Radio Classification Inspection Certificate from the ABS Classification Society. Covered areas must be for the coasts of Canada and for the Great Lakes Basin, in accordance with the Ship Station Radio Regulations, 1999.

CR18.1.A.3 The radio checklist must be provided to the crew and an electronic copy must be provided to the Technical Authority.

CR18.1.A.4 The contractor must provide proof that it is authorized by ABS to perform the work.

CR18.2 LIST OF RADIO TYPES OF THE VESSEL TO BE INSPECTED:

Radio	Model	Fabricant
VHF Radiotelephone #1, Port Fwd console	VHF DSC 6222	Sailor
VHF Radiotelephone #2, Stbd fwd console	VHF DSC 6222	Sailor
MF & HF Radio #2, AM Receiver (fwd console)	3T	MICOM
MF Radio #1, by aft port side window)	MF/HF 6301	Sailor
VHF Radio #3, by GMDSS station	tt-6204	Sailor
VHF Radio #4, by GMDSS station	tt-6204	Sailor
VHF Radio #5, Above chart table	O5	Motorola
Airband VHF Radio (118.0 to 137.0 MHz), chart table		Icom
IRIDIUM	SC5150	Sailor
INMARSAT Fleet BroadBand	tt-3738A & tt-3672A	Sailor
NAVTEX	NX-700	Furund
SART #1	TRON SART20	Jotron
SART #2	TRON SART20	Jotron

EPIRB	TRON 40SMK11	Jotron
VHF DF	OAR4400	Cubic
VHF #1 (portable)	IC-M73	Icom
VHF #2 (portable)	IC-M73	Icom
VHF #3 (portable)	IC-M73	Icom
UHF #1 – Bridge (portable)	APX 4000	Motorola
UHF #3 – Bridge (portable)	APX 4000	Motorola
UHF #4 – Bridge (portable)	APX 4000	Motorola
UHF #5 – Control Room (portable)	APX 4000	Motorola
UHF #6 – Control Room (portable)	APX 4000	Motorola
Radar #1	Visionmaster FT PCM4	Sperry
Radar #2	Visionmaster FT PCM4	Sperry
Receiver for global navigation satellite systems and terrestrial radio-navigation systems		
(DGPS Receiver/Transmitter, Primary Unit)	R4	SAAB
(DGPS Receiver/Transmitter, Secondary Unit)	R4	SAAB
AIS – Included in the SAAB DGPS R4 unit??	AIS R4	SAAB