

CCGS Vakta

Refit 2019

Specification No: F1782-19C024

Version 1.0

Work Period: Nov 13th 2019 to April 15th 2020

Mandatory Viewing Date and Location:

0900 August 15th 2019

Prepared by:
Marine Engineering Western Region
P.O. Box 6000
9860 W. Saanich Rd.
Victoria BC
V8L 4B2

TABLE OF CONTENTS

G 1.0	GENERAL NOTES	4
G 1.1	Vessel Particulars	4
G 1.2	References	4
G 1.3	Conditions and Definitions	9
G 1.4	Miscellaneous Information	11
G 1.5	Documentation.....	19
G 1.6	Drawings.....	21
G 1.7	Manuals	23
G 1.8	Identification.....	25
S 1.0	SERVICES.....	29
S 1.1	General.....	29
S 1.2	Electrical Power.....	30
S 1.3	Accommodation/Machinery Area Deck Protection	30
S 1.4	Heating.....	31
S 1.5	Worksite Inspections	31
S 1.6	Fire Protection	32
S 1.7	Canada’s Facility	33
S 1.8	Security	33
S 1.9	Contractor COMPETENCY	33
11.0	HULL AND RELATED STRUCTURES	34
11.1	Regulatory Organization.....	35
11.2	Painting Requirements.....	37
11.3	Vakta Endurance Betterment.....	38
12.0	ELECTRICAL DISTRIBUTION SYSTEMS	55
12.1	Annual Megger Survey.....	56

CCGS Vakta
Refit 2018

Specification No: F1782-18C938

G1.0 GENERAL

Prepared by:
Marine Engineering Western Region
P.O. Box 6000
9860 W. Saanich Rd.
Victoria BC
V8L 4B2

G 1.0 GENERAL NOTES

G 1.1 Vessel Particulars

G 1.1.1 Details

Name:	Vakta
Type:	Multi-Task Cutter
Year Built:	2003
Principal Dimensions	
Length Overall:	16.76 meters, 55 ft
Width Extreme	4.65 meters, 15.25 ft
Height (Mast down)	5.65 meters, 18.5 ft
Tonnage, displ:	25.88 MT
Estimated Weight	65,000 lbs
Propulsion	Caterpillar C12 x2
Propeller Type	Fixed

G 1.1.2 Equipment - Not Used

Equipment	Make	Model	Serial#

G 1.2 References

G 1.2.1 Regulations

G 1.2.1.1 All current editions of regulations, standards, publications, and procedures listed below must be used as reference. The Contractor must ensure all work completed in the specification is done to all pertinent federal and provincial regulations and standards. CCG procedures must be used as a guide if no other regulation takes precedence.

G 1.2.1.2 In the following table “Included – Yes” means that the document will be provided by CCG to the contractor. “Included – No” means that the contractor must obtain the document separately. “Included – N/A” means that the document is not relevant to this specification.

FSM Procedures	Title	Included Yes/No
FSM	Fleet Safety Manual (Latest Edition)	Yes
Publications		
TP 127	Ships Electrical Standards	No
TP 3669	Standards for Navigating Appliances and Equipment	No
TP3177	Standard for the Control of Gas Hazards in Vessels to be Repaired or Altered	No
TP 11469	Guide to Structural Fire Protection	No
TP 14231	Marine Occupational Health and Safety Program	No
TP 14612	Procedures for approval of Life-saving appliances and fire safety systems, Equipment and Products	No

Standards		
CSA W47.1	Certification of Companies for Fusion Welding of Steel Structures Division 2 Certification	No
CSA W47.2	Certification of Companies for Fusion Welding of Aluminum	No
CSA W59	Welded Steel Construction – Metal Arc Welding	No
CSA W59.2	Welded Aluminum Construction	No
ISO 9712:2005	International Standards for NDT	No
CT-043-EQ-EG-001-E	Welding Specification Canadian Coast Guard	Yes
SSPC	The Society for Protective Coatings	No
ISO 8501-1:2007	Preparation of steel substrates before application of paints and related products	No
ISO 10816-1:1995	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 1: General guidelines	No
	CAD standard	
Technical Documents		
	International Paint InterSpec.	Yes
	Canadian Coast Guard Specifications for the Installation of Shipboard Electronic Equipment	Yes
Regulations		
MOHS	Maritime Occupational Health and Safety	No
CSA	Canada Shipping Act 2001	No
Machinery Regs.	Marine Machinery Regulations	No
Hull Regs.	Hull Inspection Regulations	No
Canada Labour Code	Canada Labour Code	No
WorkSafe BC.	Occupational Health and Safety (OHS) Regulation http://www2.worksafebc.com/publications/OHSRegulation/Home.asp?_ga=1.6448368.352535453.1408987357	No

G 1.2.2 Guidance Drawings

G 1.2.2.1 The following Drawings must be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

G 1.2.2.2 Additional Drawings are listed in Annex A

Drawing Number	REFERENCE DRAWING TITLE
V11-CMV11-146 DE	Docking Plan
V11-CMV11-101, V11-146-2	General Arrangement sheet 1 and 2
V11-CMV11-140	Accommodation Arrangement
V11-CMV11-143	Tank Capacity Plan
V11-CMV11-144 1&2	Tank Vent and Sounding sheet 1 and 2
V11-CMV11-112	Electric Power Distribution AC and DC
V11-CMV11-112	Electric Three Line Power Dist. System
V11-CMV11-107	Domestic Fresh Water System
V11-CMV11-108	Sewage and Sanitary Drains
V11-CMV11-119	Shell Expansion

G 1.2.3 Abbreviations

ACM	Asbestos Containing Material
CA	Contract Authority (PSPC)
CCG	Canadian Coast Guard
CFM	Contractor Furnished Material and/or equipment
CLC	Canada Labour Code
CSA	Canadian Standards Association
CWB	Canadian Welding Bureau
DFO/CCG	Department of Fisheries and Oceans, Canadian Coast Guard
DFT	Dry Film Thickness
FSM	Fleet Safety Manual (CCG)
FSR	Manufacturer's Field Service Representative
GSM	Government Supplied Material and/or equipment
HC	Health Canada
IACS	International Association of Classification Societies
IEEE	The Institute of Electrical & Electronic Engineers Inc.
ITS – ME	Integrated Technical Services, Marine Engineering
ITS – E&I	Integrated Technical Services, Electronics & Informatics
LOA	Length Overall
MSDS	Material Safety Data Sheet
NDT	Non Destructive Testing
OHS	Occupational Health and Safety
PSPC	Public Service and Procurement Canada
PWGSC	Public Works and Government Services Canada
SSMS	Safety & Security Management System
RO	Recognized Organization as defined by Canada Shipping Act.
TA	Technical Authority -CCG Superintendent, Marine Engineering Western Region, or her delegated Representative.
TBS	Treasury Board of Canada Secretariat
TCMS	Transport Canada Marine Safety
TI	Technical Inspector – CCG delegated.
VCA	Vessel Condition Survey
VLE	Vessel Life Extension
WCB	WorkSafe BC

G 1.3 Conditions and Definitions

G 1.3.1 The following conditions and definitions are applicable to all work contained in the Specifications and are intended to outline the quality of workmanship and practice that is the minimum acceptable level:

- a) the word "install" means that the Contractor must connect mechanically and electrically and provide the labour and materiel to complete the installation;
- b) the word "reinstall" means a piece of equipment that the Contractor has affected repairs on and is to be returned/installed in its original location and be mechanically and electrically connected. The Contractor must provide the labour and materiel to complete the reinstallation;
- c) the word "disconnect" means the Contractor must mechanically and electrically disconnect the piece of equipment of all piping, wiring, seatings and other attachments permitting the removal of the unit as a whole;
- d) the word "remove" means that the Contractor must provide all labour and materiel to disconnect mechanically and electrically and remove the unit, equipment, materiel, or system in its entirety. Part of the removal process is to blank openings, restore disturbed insulation and paint;
- e) the word "relocate" means that the Contractor must provide all labour and material to remove the unit, piece of equipment, or system and to install the same unit, piece of equipment, or system in the new location;
- f) the term "or equivalent" means a substitute which has equal characteristics i.e. (size, materiel type, life, weight, input, and output) as approved by the TA. A comparison of the general specifications must be provided to the TA for the equipment specified and the "or equivalent" (i.e. old compared to the new);
- g) the term "overhaul" as applied to any mechanical equipment, structure or system comprises: disassembly into component parts, cleaning, examination of parts for defects, gauging of parts for wear, reporting of parts worn beyond specification limits or otherwise defective and reassembly followed by specification adjustments, tests, and functional trials;
- h) the word "disassemble" means that the Contractor must provide all labour to take apart, piece by piece, the equipment, machinery or system to be examined or repaired;

- i) the word "reassemble" means that the Contractor must provide all labour and material to put together, piece by piece, the equipment, machinery or system on completion of examination or repair
- j) the words "Additional Work Procedures" means the procedures as defined in ANNEX G - PROCEDURE FOR PROCESSING UNSCHEDULED WORK and includes any additional work required on a system, sub-system or equipment which the original specification did not specify;
- k) the word "calibrate" means the adjustment of readings and measurements to a known standard;
- l) the word "check" means that the Contractor must provide labour to find faults by sighting, feeling or listening. The checking of any equipment does not involve the disturbance or removal of parts, components or sub-assemblies;
- m) the word "examine" means that the Contractor must provide labour for the process of systematically examining, checking and testing equipment, records or administrative procedures to detect actual or potential defects or errors;
- n) the word "test" means that the Contractor must provide labour to conduct the operation of a unit in relation to a stated standard or procedure;
- o) the words "set-to-work" means the tuning, alignment and adjustment of equipment/systems after a satisfactory installation And the inspection to make the equipment/systems ready for technical acceptance trials;
- p) the word "trials" is an element of QA that means an action(s) by which the Contractor proves by a visual or instrumental presentation that the equipment or system satisfies the requirements of the specified trials agenda; and
- q) the term "functional test" means operation of a piece of equipment in all its normal operating modes and throughout its operating range to establish that it will perform its designed function within normal operating parameters as indicated in the manufacturer's documentation. It may be conducted before and after disassembly.

G 1.4 Miscellaneous Information

G 1.4.1 Occupational Health and Safety

- G 1.4.1.1 The Contractor and all sub-contractors must follow Occupational Health and Safety (OHS) procedures in accordance with applicable federal and provincial OHS regulations ensuring that Contractor activities are carried out in a safe manner and do not endanger the safety of any personnel. The Contractor and Contractor's employees will not have access to the vessel's washrooms and mess facilities. The Contractor must provide the necessary amenities as required.
- G 1.4.1.2 Where "Safety Management System" is referenced in this document, it is referring to the Contractor's Safety Management System, which must be in effect while in the Contractor's Care and Custody and must be in accordance with the applicable OHS regulations and procedures.
- G 1.4.1.3 When the Contractor works on the vessel while in the Care and Custody of the Canadian Coast Guard, the Safety Management System of CCG must be followed.
- G 1.4.1.4 The Contractor must identify a specified person that is responsible for the safety management of the work site. The Safety Manager must insure that daily safety rounds are carried out and that safety issues are identified and safety precautions are maintained.
- G 1.4.1.5 Areas that pose a hazard as a result of the specification work must be secured and clearly identified by the Contractor with signage to advise and protect all personnel from the hazard in accordance with applicable regulations.

G 1.4.2 Lead Paint and Paint Coatings

- G 1.4.2.1 The Contractor must not use lead based paints.
- G 1.4.2.2 CCG ships have been painted with lead based paints in the past and as a result some of the Contractor's processes such as grinding, welding and burning may release this lead from the coatings.

G 1.4.3 Asbestos Containing Materials (ACM)

- G 1.4.3.1 The Contractor must use insulation and brake material that contains 0% ACM.
- G 1.4.3.2 The Contractor will be supplied the most recent Asbestos Risk Assessment Report and Asbestos Management Plan by CCG prior to Assumption of Custody.
- G 1.4.3.3 Handling of any asbestos containing materials must be performed by trained personnel and/or a company certified in the removal of asbestos in accordance with Federal, Provincial and Municipal regulations.
- G 1.4.3.4 The Contractor must provide the TA with disposal certificates for all asbestos containing material removed from the vessel indicating that the disposal was in accordance with Federal, Provincial and Municipal regulations in effect.
- G 1.4.3.5 The Contractor must provide an “Observation Report (OR)” with reference to any concerns or intentions in regards to asbestos containing materials not already specified. The Contractor is to identify any materials that are suspected to contain asbestos prior to any work being initiated. Any approved work resulting from the OR will follow the Additional Work Procedures.

G 1.4.4 Confined Spaces

- G 1.4.4.1 Prior to commencing work in any confined space, the Contractor must ensure that a qualified person issues a “Gas Free Certificate” for that space. Certificates must specify, "Safe for persons" or "safe for hot work" as appropriate. Contractor must adhere to the safety management system requirements as determined in the Pre-Work Meeting. All copies of certificates generated are to be provided to the TA in accordance with the Documentation section of the General Notes.
- G 1.4.4.2 Any entry into confined spaces onboard the vessel during the contract period must be conducted in accordance with the safety management system as determined in the Pre-Work Meeting.

G 1.4.5 Hot Work

G 1.4.5.1 The Contractor must, as a minimum, ensure the following items are followed when conducting hot work while the vessel is in their care and custody:

- a) The compartment(s) affected must be certified gas free by a qualified person. The Contractor must provide all certificates to the TA in accordance with the Documentation section of the General Notes. Certificates must specify, "Safe for persons" or "safe for hot work" as appropriate. The Contractor must post a copy of all certificates at the entrance to the affected spaces;
- b) All portable combustible materials within 2m of hot work must be removed from the vicinity;
- c) Protective material must be used to prevent the spread of sparks, protecting electrical cables and other services;
- d) Fire sentries must be provided in each space and in the adjacent space where welding, grinding, or burning is being carried out on bulkheads, deck-heads or decks. Fire sentries must be provided with an appropriate fire extinguisher (Contractor supplied) and must be trained in its use. The fire sentry must maintain a watch in his designated area for at least thirty (30) minutes after any hot work has been completed.

G 1.4.5.2 Any hot work carried out onboard the vessel during the contract period must be conducted in accordance with the safety management system. A copy of the site generated hot work permits must be provided to the TA in accordance with the Documentation section of the General Notes in accordance with the specification item generating the required work.

G 1.4.6 Work Aloft

G 1.4.6.1 Any work aloft onboard the vessel during the maintenance/refit period must be conducted in accordance with the safety management system. Notices must be placed to prevent operation of Radars while personnel are working aloft on the mast or on the wheelhouse top.

G 1.4.7 Electrical Equipment

- G 1.4.7.1 When working on electrically operated equipment, the following precautions must be taken at a minimum:
- a) All electrical equipment undergoing work must be isolated at the main power and alternate distribution panel;
 - b) Electrical lock-outs must be used to isolate the equipment and electrical caution tags posted at the main power and distribution panel on those switches supplying equipment under maintenance and verification made at the terminals to ensure power is not present.
 - c) Only after completion of the work must the lock-outs and electrical caution tags be removed and the switches engaged.
- G 1.4.7.2 Any lock-out requirements onboard the vessel during the contract period must be conducted in accordance with the safety management system.
- G 1.4.7.3 The TA must be notified of all such ongoing work.

G 1.4.8 Workplace Hazardous Materials Information System (WHIMS)

- G 1.4.8.1 The Contractor must provide the TA with Material Safety Data Sheets (MSDS) for all Contractor and sub-contractor supplied WHIMS controlled products. MSDS sheets are to be the formats requested in the Documentation section of the General Notes.
- G 1.4.8.2 All MSDS sheets must be maintained in accordance with OHS procedures.
- G 1.4.8.3 The TA will provide the Contractor with access to MSD sheets for all controlled products on the ship for all specified work items on request.

G 1.4.9 Smoking in the Work Space

- G 1.4.9.1 The Contractor must ensure compliance with the Non- Smokers' Health Act. The Contractor must ensure that there is absolutely no smoking onboard the vessel by their employees, sub-contractors, including the employees of any sub-contractors.

G 1.4.10 Touch-up / Disturbed Paint

G 1.4.10.1 The Contractor must prepare and coat all touch-up work in accordance with the paint specification provided for the particular area involved in accordance with - PAINT SPECIFICATIONS - CCGS Vakta INTERSPEC.

G 1.4.11 Contractor Furnished Materials (CFM) and Tools

G 1.4.11.1 The Contractor must ensure replacement material such as jointing, packing, insulation, small hardware, oils, lubricants, cleaning solvents, preservatives, paints, coatings etc. are in accordance with the equipment manufacturer's drawings, manuals and/or instructions.

G 1.4.11.2 Where no particular item is specified or where substitution must be made, the Contractor must submit an Observation Report indicating the substitution or item not specified to the TA. The Contractor must provide information about materials used, certificate of grade and quality of various materials to the TA prior to use.

G 1.4.11.3 The Contractor must provide all equipment, devices, tools and machinery such as crane, staging, scaffolding, hoarding, man-lift and rigging necessary for the completion of the work in this specification.

G 1.4.11.4 The Contractor must deliver and store all new CFM equipment at their facility. The CFM must be stored in a secure, environmentally controlled space in accordance with the equipment storage section of this specification.

G 1.4.12 Government Supplied Materials (GSM) & Tools

G 1.4.12.1 All tools are Contractor supplied unless otherwise stated in the technical specifications.

G 1.4.12.2 Where tools are supplied by the TA they must be returned by the Contractor in the same condition as when they were borrowed. Borrowed tools must be inventoried and signed for by the Contractor on receipt and return to the TA.

G 1.4.12.3 Any GSM not specifically stated in the Technical Specification must be received by the Contractor and stored in a humidity controlled heated space of sufficient size. These activities are to be covered by the Procedures for Design Change or Additional Work. (PSPC 1379).

G 1.4.13 Storage

- G 1.4.13.1 Equipment (i.e. covers, cowling and other items that may need to be removed and stored) must be stored in a humidity controlled heated space of sufficient size.
- G 1.4.13.2 All equipment and items must be stored in such a manner so as to be easily accessible for inspection. No items are to be stored directly on floors.

G 1.4.14 Regulatory Inspections and/or Class Surveys

- G 1.4.14.1 The Contractor must contact, coordinate, schedule, and be completely prepared for all regulatory inspections and surveys by The American Bureau of Shipping (ABS). ABS will provide the Contractor hold points prior to the start of the contract. The Contractor must provide ABS and the TA a schedule of these hold points. If the schedule is required to be updated the Contractor must inform ABS and the TA 5 working days prior to the schedule change to allow for change of travel.
- G 1.4.14.2 Documentation generated by the above inspections and/or surveys indicating that the inspections and/or surveys were conducted (i.e. original signed and dated certificates) must be provided to the TA in accordance with the “Documentation” Section of these General Notes.
- G 1.4.14.3 The Contractor must not substitute inspection by the TA for the required regulatory inspections.
- G 1.4.14.4 The Contractor must provide timely advance notification (minimum of 2 working days) of scheduled regulatory inspections to the TA so they may witness the inspection.
- G 1.4.14.5 The Contractor must pay all costs and fees associated with TCMS, HC, Environment Canada, or any other Inspection required by the specification unless otherwise indicated.

G 1.4.15 Contractor Inspections

- G 1.4.15.1 The Contractor must afford the opportunity for the TA to conduct an inspection with the contractor on the condition and location of items to be removed prior to either carrying out the specified work or gaining access to a location to carry out the work.

G 1.4.15.2 The Contractor must take a before picture of conditions prior to removing any items. These photographs must be in accordance with the Documentation section of the General note, named according to the applicable specification section.

G 1.4.15.3 Prior to the close out of any item, the Contractor must afford the TA the opportunity to verify that the work has been completed in accordance with the specification. At that time the contractor must have available all photographs, documents, reports, and trials in relation to the item being closed out as completed.

G 1.4.16 Recording of Work in Progress

G 1.4.16.1 The TA may record any work in progress using various means including, but not limited to photography and video, digital or film.

G 1.4.17 Access for Maintenance, Installation, and Removal.

G 1.4.17.1 The layout of newly installed machinery and equipment must be designed and constructed to permit ready access for routine maintenance, operational checks and operational inspections without disturbance of other machinery, equipment or structure.

G 1.4.17.2 The Contractor must determine best routes for installing and removing equipment. All lifting points currently fitted on the ship must be treated as uncertified, and must be certified before use by the Contractor unless marked otherwise

G 1.4.17.3 Temporary lifting points installed by the contractor must be removed prior to transfer of custody with welds ground flush, and paint coatings applied in accordance with the Interspec paint specification.

G 1.4.17.4 Manufacturer's recommended removal clearances must be allowed for.

G 1.4.17.5 After equipment installation and/or removal, the Contractor must make good all equipment relocations, blemishes, and penetrations and must return the affected areas of the ship to the As-Started working condition.

G 1.4.18 Assembly of Components

- G 1.4.18.1 The Contractor must ensure that during installation of specified equipment, that parts and assembled equipment are cleaned of smudges, spatter or excess solder, weld metal and metal chips or any other foreign material which might detract from the intended operation, function, or appearance of the equipment. (This would include any particles that could loosen or become dislodged during the normal expected life of the equipment). All corrosive material must be removed. This cleaning must take place before the parts are assembled into the equipment.
- G 1.4.18.2 Covers, cowlings and components damaged by the Contractor must be replaced with a new CFM cover, cowling, or component.
- G 1.4.18.3 Where torque specifications are not provided by the manufacturer, standard SAE nut and bolt torques must be used.

G 1.4.19 Protection of Equipment

- G 1.4.19.1 The Contractor must take measures to ensure that surfaces and components of equipment installed on the vessel are protected against damage, soiling, and contamination as a result of contracted work.
- G 1.4.19.2 All electrical and electronic equipment and components must be protected during the contract against physical damage, internal damage, and by the effects of adverse temperatures or other environmental conditions.
- G 1.4.19.3 The Contractor must protect equipment that could be damaged as a result of movement of materials and equipment nearby. The Contractor must also protect equipment from nearby sources of contamination including but not limited to burning, welding, grinding and painting.
- G 1.4.19.4 Any damage to surfaces, equipment, furnishings or decor incurred prior to acceptance must be returned to As Delivered condition by the Contractor.
- G 1.4.19.5 All openings in machinery and/or systems prior to connections being made must be kept covered by suitable inserts or covers at all times.
- G 1.4.19.6 The Contractor must obtain and follow instructions from its sub-Contractors for any special protection required for their equipment during the project work. Such instructions must be made available to the TA.
- G 1.4.19.7 Physical protection including but not limited to plastic sheets, fireproof covers, heavy weight material covers, wood plugs, wood encasements and heaters must be used as required.

G 1.4.19.8 The Contractor must protect the Boat house / Workshop for the Vakta from damage during the work period.

G 1.4.19.9 The Contractor is to walk thru and photo graph the boat house at the commencement of the work period with the TI/TA. These photo graphs are to become part of the Data book.

G 1.4.19.10 The Contractor must keep the work shop in a clean and orderly fashion during the work period.

G 1.4.19.11 The Contractor must leave the shop in the same condition in which they found it at the start of the work period.

G 1.5 Documentation

G 1.5.1 Documentation is identified as a deliverable in the specification item requesting it.

G 1.5.2 Data Book

G 1.5.2.1 The Contractor must provide all specified deliverables in both electronic and paper formats. There must be 2 paper copies of each document, in two separate binders, as part of the contractor's QA program. An electronic copy of all documentation must also be provided to the TA in accordance with the formats described below.

G 1.5.2.2 All copies of documents generated as a result of specified deliverables will be referred to as the "Data Book".

G 1.5.2.3 The Contractor must provide the TA all the files generated as part of the Data Book. These must be received prior to the contract being considered complete. The files must be in hard format (CD-ROM, DVD-ROM, Flash Drive / Memory Stick). Each specification item must have its own folder named according to the specification item. For example "G1.0 General Notes".

G 1.5.2.4 Any documentation, media, and reports, that are the result of Additional Work, must also be included as part of the Data Book.

G 1.5.3 File Naming

G 1.5.3.1 File naming must be in the following format: *Specification#.# – Date (yyyy-mm-dd) – File Name Describing Information*. For Example: "G1.0 – 2013-12-01 – Details of file naming.pdf".

G 1.5.4 E-mails

G 1.5.4.1 Any files sent to the CA/TA by e-mail must be named as per the “File Naming” section of this specification. All files that are e-mailed must have in the subject name: “Contract# - DATA BOOK – Date – Specification #”. For Example: **F1782-15C730 – DATA BOOK – 2014-11-30 – G1.0 General Notes** . Files sent by e-mail must also be included in the “Data Book”.

G 1.5.5 File Formatting

G 1.5.5.1 All documentation, reports, test results, certificates, or data obtained by the contractor in paper form must be scanned into unprotected (preferably searchable) Adobe PDF formatted files and named according to the File Naming section of this specification.

G 1.5.5.2 All reports, test results, certificates, or raw data obtained by the contractor in electronic format must be converted to unprotected Adobe PDF formatted files and named according to the “File Naming” section of this specification. Both the original and the converted copy are to be provided as part of the Data Book.

G 1.5.6 Photographs

G 1.5.6.1 All photographs obtained by the contractor as requested in the specification must be provided in .JPG formatted files at a resolution of at least 640 x 480 and named according to the “File Naming” section of this specification.

G 1.5.7 Measurements, Calibrations, and Readings.

G 1.5.7.1 All measurements, calibrations and readings recorded, must be signed by the person taking the measurements, dated and scanned into electronic format as part of the Data Book.

G 1.5.7.2 Recorded dimensions must be to a precision of three decimal places (unless otherwise stated) in the measuring system currently in use on the vessel.

G 1.5.7.3 The Contractor must provide to the TA current and valid calibration certificates for all instrumentation used in the Test and Trials Plan showing that the instruments have been calibrated in accordance with the manufacturer’s instructions. These copies are to be provided as part of the Data Book under any specification where measurements are required.

G 1.5.8 Test Inspection Records and Certificates

- G 1.5.8.1 Test Inspection Records and Certificates are identified as a deliverable in the individual specification item requesting them.
- G 1.5.8.2 Test Inspection Records and Certificates must be included as a separate section in the DATA BOOK and indexed/arranged in numeric order by specification number.
- G 1.5.8.3 The Contractor is responsible for maintaining a complete and accurate record of all tests and trials conducted on the vessel and on each piece of equipment. Prior to the commencement of a trial, all relevant documentation and associated test sheets, including shop test data, must be complete and attached to the trials agenda.
- G 1.5.8.4 All tests and trials data must be legible both in hard copy and electronic format. If necessary, handwritten records may require transcription into electronic format in order to be acceptable. The original must be signed by TCM, the TA, the Contractor and where necessary by the sub-Contractors and/or FSRs who witnessed the tests. All the Data must be submitted to the TA in accordance with the “Documentation” section of these General Notes.

G 1.6 Drawings

- G 1.6.1 This section, to be referred to as the Drawings section of the General Notes, is intended to be used as the minimum standards when specified deliverables are drawings.
- G 1.6.2 The contractor must have on staff or through a sub-contractor a person qualified and experienced in the use of AutoCAD who will create or modify drawings that result from the work.
- G 1.6.3 The Contractor must comply with the Canadian Coast Guard National CAD Standards titled “*Computer Aided Design (CAD) using AUTOCAD*” provided.
- G 1.6.4 Drawing disks must be clearly labeled with the Contract Number, file names and drawing numbers. If a complete listing exceeds the label size, a “readme.txt” file in ASCII format must be provided with each disk. A printed copy of the Readme file must accompany each disk. Disks must be labeled As-Fitted drawings for those drawings that have been approved and finalized.
- G 1.6.5 Final As-Fitted prints/plots must not contain markings or corrections by hand (i.e. marker, pen, pencil, etc.). Drawings containing mark-ups must be revised and re-printed/plotted.
- G 1.6.6 The Contractor must prepare all the working drawings necessary for the project requirements and modernization work.

G 1.6.7 The Contractor must furnish all drawings required by sub-Contractors, trades and other consultants.

G 1.6.8 Schematic drawings of systems must include all pertinent system information, including sizes, dimensions, labeling, equipment locations, and all information relating to system fittings.

G 1.6.9 The Contractor must have in place a complete system of documenting and controlling all drawing revisions affected by the work. Drawing numbering system and titles must match the original drawings for clarity and include a revision number with date.

G 1.6.10 Guidance Drawings

G 1.6.10.1 All technical guidance drawings are issued to the Contractor for guidance purposes only. It is the responsibility of the Contractor to develop working drawings and to ensure that all such drawings receive applicable regulatory approval. The Contractor is to note that not all technical guidance drawings supplied are As-Fitted drawings. It is the responsibility of the Contractor to physically verify all affected items.

G 1.6.10.2 All departures from the provided guidance drawings and project specifications must be clearly indicated by the Contractor and written approval obtained from the TA before carrying out such alterations or departures.

G 1.6.10.3 Specification deviations must be documented using an Observation Report.

G 1.6.11 As Fitted Drawings

G 1.6.11.1 As-Fitted Drawings are identified as a deliverable in the specification item requesting them.

G 1.6.11.2 Upon completion of specified work, the Contractor must transfer the mark-ups from any working drawings. These drawings become the As-Fitted drawings for the project work. The Contractor is responsible for providing as-fitted drawings affected by the project work to the TA prior to completion of the contract. The drawings must be submitted in the following formats:

a) One (1) electronic copy of the latest revision of each As-Fitted drawing.

G 1.6.11.3 Marked up drawings are to be AutoCAD drawings where original AutoCAD drawings are provided. If no AutoCAD drawings were provided then scanned files (raster format) must be supplied to CCG in one of the following formats:

a) DXF format;

- b) TIFF format;
- c) PDF format.

G 1.7 Manuals

G 1.7.1 This section, to be referred to as the Manuals section of the General Notes, is intended to be used as the minimum standards when specified deliverables are manuals.

G 1.7.2 General

G 1.7.2.1 Instruction Manuals must be individually bound in a hard cover 3 ring book format with a page size of 8 1/2" x 11". Drawings of a larger size must be concertina folded to suit. The covers must have the following information printed thereon:

- a) CCGS Vakta;
- b) Equipment Identification;
- c) Equipment Manufacturer;
- d) Date.

G 1.7.2.2 Plastic tabbed indices must be provided for all sections of the manuals. Major equipment components must be subdivided into separate sections of the manuals.

G 1.7.2.3 A master index must be provided at the beginning of each binder indicating all items included in each section.

G 1.7.2.4 A list of names, addresses and telephone numbers of contacts associated with the equipment manufacturers must be provided that can be used after the project completion for maintenance and information data purposes.

G 1.7.2.5 A copy of the final reviewed and approved As-Fitted drawing(s) must be provided within the maintenance manual.

G 1.7.2.6 One (1) electronic copy of each manual must be provided in accordance with the Data Book section of this specification.

G 1.7.2.7 Two (2) paper copies of manuals and data sheets must be supplied in English for all Contractor Furnished Equipment items.

G 1.7.3 Operation Manuals – As-Fitted

G 1.7.3.1 Operation manuals must include the following items:

- a) General description of equipment operating sequence;
- b) Step by step procedure to follow in commissioning the equipment;
- c) Schematic wiring diagram for the fitted equipment; and
- d) All pertinent equipment performance criteria.

G 1.7.3.2 Where software/hardware systems are fitted, the operation manual must include the full software documentation manual in paper form for the system and an electronic copy in accordance with the Documentation Section. The minimum software documentation must include:

- a) System level diagrams describing the overall scheme of the software/hardware system;
- b) The functional specifications, which must describe in detail the functional capabilities of the system and each software components; and
- c) Project specific program listings including all comments describing the details of the code functions.

G 1.7.4 Maintenance Manuals – As-Fitted

G 1.7.4.1 Maintenance manuals must include:

- a) Manufacturer's maintenance instructions for each item of the equipment requiring maintenance activity;
- b) Instructions must include installation instructions, part numbers, part lists, master drawings and exploded views with part identification for all mechanical, electrical and electronic parts, name of suppliers;
- c) Summary list of each item of the equipment requiring lubrication, indicating the name of the equipment item, location of all points of lubrication, type of lubricant recommended, and frequency of lubrication; and
- d) Troubleshooting sections must be included for all equipment in the maintenance manual under a separate heading.

G 1.8 Identification

G 1.8.1 Nameplates

- G 1.8.1.1 Nameplates are identified as a deliverable in the individual specification item requesting them.
- G 1.8.1.2 All nameplates must be in English, except where required in English and French by TCM for reasons of emergency operation.
- G 1.8.1.3 Lettering must be clear and concise with the minimum use of abbreviations. Primary information must be given in larger size lettering than secondary information.
- G 1.8.1.4 The type of nameplates must suit the location in the vessel as specified below:

G 1.8.1.5 Plastic:

- a) Laminated plastic nameplates, black with white core engraved through to the center core, must be provided for all devices located on the exterior surfaces of switchboards, MCC's, or local control panels. Nameplates must be secured to the equipment with machine screws.
- b) New nameplates to be fitted on the existing equipment must be consistent in size and lettering with those already fitted or those being replaced.
- c) Nameplates indicating feeder circuits must identify each circuit by name and number and the fuse size or trip element rating.
- d) The Following Labels must be of laminated plastic, red with white core engraved through to the center core:
 - i) Safe Working Loads,
 - ii) Warning/Caution labels,
 - iii) Circuit Breakers with shunt trips requiring completion of remote circuits prior to being operated,
 - iv) Equipment with multiple power sources,
 - v) Circuit breaks having a potential power source connected to both sides
 - vi) Indication of any other potentially hazardous condition.

G 1.8.1.6 Engraved on Metal:

- a) Must be used in machinery spaces and where exposed to the weather or susceptible to covering by paint, oil or grease. Nameplates exposed to weather must be stainless steel or brass. Engraved metal nameplates must be of stainless steel or brass with lettering accentuated by means of black wax unless otherwise noted, and secured with stainless steel or brass machine screws.

G 1.8.1.7 A complete list of nameplates, detailing size of plate, size of lettering and inscription must be submitted to the TA for review prior to ordering and/or manufacturing.

G 1.8.2 Wire Labelling

- G 1.8.2.1 Wire Labelling is identified as a deliverable in the individual specification item requesting them.
- G 1.8.2.2 All wiring in panels specified to be labelled must be labeled with the Cable Number and their conductor # unless otherwise specified in equipment installation drawings. Wire labels must be installed on wire end terminations and on the entry and exit thru bulkheads, on glands or on junction boxes.

CCGS Vakta
Refit 2018

Specification No: F1782-18C938

S1.0 SERVICES

Prepared by:

Marine Engineering Western Region
P.O. Box 6000
9860 W. Saanich Rd.
Victoria BC
V8L 4B2

S 1.0 SERVICES

S 1.1 GENERAL

- S 1.1.1 The Contractor must supply the following services to the vessel for the entire work period and disconnect upon completion of the work period. The Contractor must re-establish all services if the vessel is moved during the work period.
- S 1.1.2 The Contractor must supply all material, hoses, cables, etc. and labour required to connect and disconnect the services to the vessel. Unless otherwise stated these services must be available 24 hours a day 7 days a week for the entire contract period.
- S 1.1.3 All staging, crantage, screens, lighting, and any other support service, equipment, and material necessary to carry out the work identified in these specifications must be Contractor supplied.

S 1.2 ELECTRICAL POWER

- S 1.2.1 Canada will supply 120 Volt Alternating Current, 60 hertz, Single Phase, 60 Ampere electrical power, through the vessel's shore power system, for the duration of the contract.
- S 1.2.2 The Vessel's shore power cable and associated plug connection may be used by the Contractor. However, the Contractor is responsible to replace the entire length of cable with an equal quality, size, and length of cable should the shore power cable be damaged during the contract period. Damage to the shore power cable also includes damage to the plug-in connections which must be replaced if damaged. Splicing any section of the cable is not acceptable.
- S 1.2.3 The Cable condition must be inspected at the start and completion of the work period. The Contractor and the TA must record in writing all defects prior to the start of the contract period and all parties must sign the original document. Photographs must be taken of general condition and close-ups of existing damage. All photographs and documents are to be provided to the TA in accordance with the Documentation section of the General Notes.
- S 1.2.4 Temporary lighting and power must meet provincial regulations for safe work conditions and there must be sufficient number of lights set up to provide safe passage through the accommodation and machinery spaces.
- S 1.2.5 Canada will supply a 60 amp 230 volt service to the Vakta. Canada will also supply electricity for six 15 amp 120 volt outlets and two 50 amp 230 volt outlet to the contactor. Additional power if required by the Contractor must be supplied by the Contractor and included in their bid. Canada will consider temporary modifications to their electrical system within the work shop.

S 1.3 ACCOMMODATION/MACHINERY AREA DECK PROTECTION

- S 1.3.1 The Contractor must supply and install after strip out and installation of new accommodation space a minimum ¼" hard board deck covering protection on all accommodation decks that workers will access during this work period. Hard board edges and joints must be taped and damaged protection must be repaired within 24 hours of receiving damage. Cardboard is not acceptable for temporary protection of decks.
- S 1.3.2 The Contractor must protect decks in machinery spaces from damage to structure and coating systems during the process of specified work. Damage to the coating systems

or structure of machinery spaces decks must be repaired by the Contractor. Any coatings must be applied according to manufacturer's specifications.

- S 1.3.3 Removal and storage of components that may be subject to damage during the work period, grating, etc. is the responsibility of the Contractor. The Contractor must protect all engine room checker plate aluminum deck plates by removing them and placing them in storage until all hot work is done within the engine room

S 1.4 HEATING

- S 1.4.1 Canada will supply the heating required onboard and around the vessel to facilitate specified work. The temperature in the facility may be controlled by the contractor however the contractor must not set the temperature to less than 5°C for the duration of the work period.

S 1.5 WORKSITE INSPECTIONS

- S 1.5.1 Before the Contractor starts any work on the vessel, the Contractor's Quality Assurance Representative and the TA must walk through each space and area where work is to take place, including access and removal routes and areas adjacent to those where the work is to be done as a result of this specification.
- S 1.5.2 The Contractor's Quality Assurance Representative must take digital pictures of each area showing the outfit therein. Each picture must be dated and named as to the location on the vessel and that it represents As-Completed conditions. These photographs must be in the format; as well as named, in accordance with the Documentation section of the General Notes. A Copy of these photographs must be provided to the TA within 48 hours of the start of contract on a memory stick, CD, or DVD.
- S 1.5.3 Before the Contractor starts any work on the vessel, the Contractor's Quality Assurance Representative and the TA must walk through the work shop where the work is to take place.
- S 1.5.4 The Contractor's Quality Assurance Representative must take digital pictures of each area of the work shop showing the outfit therein. Each picture must be dated and named as to the location in the workshop and that it represents As-Started conditions. These photographs must be in the format; as well as named, in accordance with the Documentation section of the General Notes. A Copy of these photographs must be provided to the TA within 48 hours of the start of contract on a memory stick, CD, or DVD.

- S 1.5.5 During the work period, the Contractor must maintain work areas in the vessel and work shop, in a clean condition, free from debris and remove garbage daily. The Contractor must supply their own garbage and recycling containers and dispose of the contents.
- S 1.5.6 During the work period, the Contractor is responsible for snow removal as required to safely access the work shop.
- S 1.5.7 Upon completion of the contract, the Contractor must return the vessel to the As-Started state of cleanliness.
- S 1.5.8 Upon completion of the contract, the Contractor must return the work shop to the As-Started state of cleanliness.
- S 1.5.9 Prior to the completion of the Acceptance Document, the Contractor's QA Representative, and the TA must perform an inspection of the vessel to view all areas where work was performed by the Contractor.
- S 1.5.10 Copies of all photographs, documentation, and inspection sign off sheets must be provided in accordance with the Documentation section of the General Notes.

S 1.6 FIRE PROTECTION

- S 1.6.1 The Contractor must ensure the isolation, removal, installation and reactivation of the shipboard fire detection and suppression systems or any components thereof, is performed by a qualified technician. When the shipboard fire detection or fire suppression system is deactivated or disabled by the Contractor during the contract period, the system must be recertified by a qualified technician prior to the end of the work period, as fully functional. A signed and dated original copy of the certificate must be delivered according to the Documentation section of the General Notes.
- S 1.6.2 The Contractor must have a certified fire contractor disable the fixed fire system at the start of the work period and the contractor must have a certified fire contractor enable the fixed fire system at the completion of work.
- S 1.6.3 The Contractor must note that failure to take the necessary precautions while performing work on the vessel's fire suppression system(s) could result in the accidental discharge of the fire suppression agent(s). The Contractor must recharge and certify at their cost, container(s) or systems that are discharged as a result of the contractor's or subcontractor's activities.

S 1.7 CANADA'S FACILITY

- S 1.7.1 All work describe within this work specification must take place at the Canadian Coast Guard Station located in Gimli Mb.
- S 1.7.2 The working hours that workers are able to access the work shop are Monday to Friday from 0700 until 1900. If the Contractor requires hours outside these times they must seek permission from the TA 24 hours in advance.
- S 1.7.3 The Contractor must provide their own portable washroom facility or use public washroom facilities nearby.
- S 1.7.4 Canada will allow the Contractor to use the main work shop area.
- S 1.7.5 Part of the work shop will be restricted for CCG usage only and will be very clearly delineated. The Contractor must not use this space.
- S 1.7.6 The Contractor hoard the vessel inside the workshop to protect workshop walls and ceiling from dust, paint and damage.
- S 1.7.7 The Contractor must protect the floor from damage. Canada will install Coverguard 10 mil temporary surface protection (flame resistant) or equivalent over the entire work shop floor space to help protect the floor from traffic and light work. Additionally the Contractor must protect the floor in areas subject to dropping damage with minimum ½” thick plywood sheets supplied by the Contractor. Canada will photograph the floor prior to putting down the Coverguard any damage found after protection is removed must be repaired by the Contractor.
- S 1.7.8 The Contractor must be a CWB W47.2 approved company.
- S 1.7.9 The Contractor must notify Canada if the temperature in the workshop falls below 5°C during work hours.
- S 1.7.10 Canada will provide its own office space and washroom space.

S 1.8 SECURITY

- S 1.8.1 Canada will unlock the door at the start of the work shift and secure the facility at the end of the work day.

S 1.9 CONTRACTOR COMPETENCY

Detailed in the Contract.

CCGS Vakta

Refit 2018

Specification No: F1782-18C938

11.0 HULL AND RELATED STRUCTURES

Prepared by:
Marine Engineering Western Region
P.O. Box 6000
9860 W. Saanich Rd.
Victoria BC
V8L 4B2

11.1 REGULATORY ORGANIZATION

11.1.A Scope

- A.1** The American Bureau of Shipping (ABS) is the regulatory organization and will require access to the vessel for the purpose of inspection throughout the work period.

11.1.B References

B.1 Equipment Data – Not Used

B.2 Drawings

Drawing Number	Description

B.3 Regulations

FSM Procedures	Title	Included Yes/No
Publications		
Standards		
Regulations		

11.1.C Statement of Work

- C.1** The Contractor must allow ABS full access to the vessel during any site visits.

11.1.D Proof of Performance

D.1 Inspections

D.1.1 ABS will inspect the vessel on behalf of Transport Canada.

D.2 Testing/Trials – Not Used

D.3 Certification -

D.3.1 Not Used

D.4 Documentation (Reports/Drawings/Manuals)

D.4.1 The Canadian Coast Guard has directly contracted with ABS and ABS will be forwarding the Canadian Coast Guard a report.

D.5 Training – Not Used

11.2 PAINTING REQUIREMENTS

11.2.A Identification

- A.1** The Canadian Coast Guard will be contracting International Paint contact - Mr. Keegan Gemmil, Account Executive, International Paint, cell 604 315 4347, Keegan.Gemmill@akzonobel.com directly as its technical inspector for all coating system work. International Paint will be given full authority by The Canadian Coast Guard to perform technical inspections. The contractor must present International Paint a coating time line and update International Paint of any changes.
- A.2** Keegan Gemmill may designate another NACE Level 3 inspector within International Paint to act as technical inspector if agreed to by the TA

11.2.B References

B.1 Equipment Data

- B.1.1 Canadian Coast Guard will furnish the contractor with a coating plan.

B.2 Reports

- B.2.1 A full paint specification is included named Interspec

B.3 Regulations and Standards

- B.1.2 Not Used

B.4 Technical Documents

- B.4.1 The following Technical Documents apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Technical Documents as well as any other pertinent Federal/Territorial Regulation or Standard:

Number	Title	Included Yes/No
	International Paint Interspec	Yes

11.2.C Statement of Work

- C.1** The vessel must be inside the work shop for all coating work.
- C.2** The propeller, shaft, stern tube, rudder bearings, sounders, transducers, and all other fittings must be properly protected during all refit operations.
- C.3** All electronics or lights on the bridge top, open wheel house and mast must be protected from mechanical damage.
- C.4** The Contractor is responsible for recoating any areas disturbed during work as per Interspec.
- C.5** For bidding purposes Contractor to bid on repair and coating of:
- Spot repair of 10, 0.5m2 random areas on Underwater hull.
 - Spot repair of 10, 0.5m2 random areas on Decks.
 - Spot repair of 5, 0.5m2 random areas on Superstructure.
- Actual area of paint work to be pro-rated and actioned thru PSPC 1379.
- C.6** The application of paint will be detailed in the Interspec.

11.2.D Proof of Performance

D.1 Inspections

- D.1.1 The Contractor must follow the quality control requirements identified in the Paint Specification and Product Data Sheets

D.2 Testing/Trials – Not Used

D.3 Certification -

- D.3.1 Not Used

D.4 Documentation (Reports/Drawings/Manuals)

- D.4.1 Not used.

D.5 Training – Not Used

11.3 VAKTA ENDURANCE BETTERMENT

11.3.A Identification

- A.1.1 Structural refit refers to all aluminum repairs and modifications.
- A.1.2 The main intent of the refit is to increase the fuel capacity by extending the existing fuel tanks and adding an additional two berths to accommodate extra crew.

11.3.B References

B.1 Drawings

- B.1.1 All Drawings are listed in the General Notes.

Drawing Number	DRAWING TITLE	Number of Sheets
1178	General Arrangement R1	3
1178	Refit Overview R2	4
1178	Refit Structural R0	5
1178-2	Fresh Water R0	1
1178-2	Grey and Black Water R0	1
1178-2	Refit Electrical AC R0	1
1178-2	Refit Electrical DC R0	5
1178-2	Refit Electrical Layout R1	2
1178	Refit HVAC Systems R2	2
1178	Interior Refit (includes cabinet detail)	25
1178-600	General Arrangement	1
1178-601	Reflected Ceiling Plan	1
1178-602	Elevations	3
1178-603	Finishing Schedule	3

B.2 Regulations and Standards

B.2.1 The following Standards and Regulations apply to the work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

FSSM Procedures	Title	Included Yes/No
7.E.3	Handling and Discharge of Black and Grey Water	Yes
7.E.5	Handling, Storage, and Disposal of Hazardous Materials	Yes
7.B.5	Lockout and Tagout	Yes
7.B.6	Electrical Safety - Energized Circuits	Yes
Publications		
	Guidelines for Canadian Drinking Water Quality - Summary Table (2014)	No
TP 14231	Marine Occupational Health and Safety Program	No
ISSN 1497-2956	Safe Work Practices for Handling Asbestos, WorkSafe BC, 2012 Edition.	No
Standards		
	Colour Coding Standard for Piping Systems	No
CSA W59.2-91	Welded Aluminum Construction	No
	Paint and Coatings for Ships/Boats, Standard	No
IEEE 45	Recommended Practice for Electrical Installations on Shipboard	No
IMO Resolution A.468(XII)	Code on Noise Levels on Board Ships	No
ISO 9712:2005	International Standards for NDT	No
IESNA RP-12-97	(Illumination Engineering Society of North America)– Recommended Practice for Marine Lighting	No
ISO 8501-1:2007	Preparation of steel substrates before application of paints and related products	No
Regulations		
TP 127 E	Ships Electrical Standards	No
C.R.C., c.1418	Crew Accommodation Regulations	No
TP 11469	Guide to Structural Fire Protection	No

TP 14231	Marine Occupational Health and Safety Program	No
SOR/86-304	Canada Occupational Health and Safety Regulation	No
SOR/2010-120	Maritime Occupational Health and Safety Regulations	No
B.C. Reg. 296/97	Occupational Health and Safety Regulation, WorkSafe BC	No
SOR/2008-34	Transportation of Dangerous Goods Regulations, Transportation of Dangerous Goods Act	No

11.3.C Materials and Workmanship

C.1 General

- C.1.1 All materials, equipment, and outfit is to be CFM unless otherwise noted.
- C.1.2 All materials, equipment, and outfit must be as shown in the drawing package. It must be of commercial marine quality, in full compliance with the specifications and suitable for the intended use. Unless explicitly stated otherwise, all machinery and equipment must be new and unused (except for factory testing), of current manufacture and currently be supported by readily available spare parts. Where specific class society material specifications are required, the requirements must be clearly indicated on purchase orders.
- C.1.3 All materials must be free from imperfections of manufacture and from defects that adversely affect appearance and/or serviceability.
- C.1.4 Nuts, bolts, fasteners and fittings used in exterior locations must be type 316 stainless steel, unless otherwise approved by CCG.
- C.1.5 All materials and equipment must be stored, installed and tested in accordance with the manufacturer's guidelines, recommendations and requirements.
- C.1.6 All equipment must be accessible for use, inspection, cleaning and maintenance. The Contractor must ensure there is an adequate maintenance envelope for access for maintenance behind toilets and other plumbing fixtures. There must be enough room to remove valves and components without requiring cutting tools to remove interference items. All valves must be able to be opened and closed in place.
- C.1.7 Equipment subject to freezing must be kept drained. Equipment must be kept clean and protected from the environment.
- C.1.8 The contractor is to assume the drawing package is correct for pricing purpose any changes required after strip out will be thru PSPC 1379 action.
- C.1.9 All materials must be corrosion resistant and suitable for use in a marine environment. All materials normally subjected to sunlight must resist degradation caused by ultraviolet radiation.
- C.1.10 Where nuts can become inaccessible after assembly, nuts must be captured to allow reassembly and prevent backing off. Unless otherwise specified, self-locking nut must be installed to prevent loosening of fasteners due to shock and vibration.
- C.1.11 Instruments, equipment, fittings, paint, insulation, adhesives, or other items containing material or components that would produce or generate noxious fumes at

its operating temperature or at any temperature below 90 degrees C must not be installed or applied. For paint and adhesives, this requirement must apply after drying or curing is complete.

- C.1.12 Any dissimilar metals must be insulated from each other.
- C.1.13 Stainless steel type 316L or 316 must be used for all stainless-steel applications.
- C.1.14 Aluminum alloy types 5083, H116 must be used for plate; aluminum alloy 6061-T6 (anodized grade), suitable for type 5356 filler alloy, must be used for extruded shapes and welded tubing and pipe.
- C.1.15 Magnesium and its alloys must not be used.
- C.1.16 Lead must not be used without prior written approval.
- C.1.17 Any copper pipe used in the hot and cold-water piping system must be of seamless copper and certified as lead free. Lead bearing solder is not acceptable for domestic water systems.
- C.1.18 The Contractor must maintain the existing fire rating and watertight integrity of all decks and bulkheads. Including the watertight bulkhead at frame 17/18 and the watertight integrity of the deck above.
- C.1.19 All dust from grinding and any material that becomes airborne during strip-out and cleaning must be kept contained.
- C.1.20 Removal and disposal of all hazardous wastes must be in accordance with local and provincial environmental regulations.
- C.1.21 The Contractor is responsible for all disposal arrangements and associated costs.

C.2 Cables

- C.2.1 Cable sizes must be determined by the Contractor and be suitable for the intended service as per TP127e.
- C.2.2 All cables for existing equipment that is to be installed must re used if possible. Any new cabling found required due to size, length or condition is to be actioned thru PSPC 1379 action.
- C.2.3 Cables for all power and lighting must be complaint with TP127e.
- C.2.4 Cables must be grouped into wiring harnesses where possible.

- C.2.5 Cable runs must be run in a neat and orderly manner presenting a tight, straight run. The runs must be tightly fitted close to the overhead or bulkhead. Whenever cables are concealed behind panels, sheathing or other surface material, access panels to cable connections must be provided. Access panels must be labeled to identify the concealed cable connections. Accesses must be large enough to accommodate service to the cable's connections. Cables must not be installed behind nor embedded in insulation.
- C.2.6 Cabling/conductors passing through structures without watertight glands, must be protected against chafing using abrasive resistant grommets.
- C.2.7 Cables and conductors are to be installed in wire races of a sufficient size to pass 4 other 14/2 wires without obstruction. The wires that are to be run through a wireways if possible or with stainless steel clamps and straps spaced at least every 18 inches on horizontal runs and every 14 inches on vertical runs. Tie wraps are not acceptable.
- C.2.8 All terminations must be made using solderless crimped type lugs. Control conductors and communication conductors shall have crimp on ferrules. Twist on connections must not be used. Coast Guard does not the require the crimping tool.
- C.2.9 Identify every control conductor with shrink-on type cable markers with numbers corresponding to wire numbers on the equipment certified drawings. Provide clearly marked terminal strips inside panels and similar equipment.
- C.2.10 All transits thru water tight compartments that are disturbed during the betterment work must be inspected by the Contractor and TA. Additional work required on the transits are subject to PSpC 1379 action.
- C.2.11 All cables must be marked at each termination and on either side of a transit as per general notes.
- C.2.12 Terminate conductors in terminals with no more than two conductors connected to the input or output of any terminal.

C.3 Painting

- C.3.1 All hardware, windows, light fixtures, placards and signs, and adjacent equipment and structure must be properly masked off when the surrounding areas are being painted. Items and surfaces to be protected may be removed, moved, or otherwise protected, at the preference of the Contractor, but must be restored to their pre-removal form, appearance, and function at completion of the paintwork.

- C.3.2 All plates and shapes used in construction and all areas in way of new paint must have surface preparation performed according to the paint manufacturer's specifications to completely remove scale, rust, and other surface contaminants.
- C.3.3 All surfaces must be coated in accordance with Interspec paint specifications. The Contractor must not thin or alter coatings without approval by CCG and the manufacturer.
- C.3.4 The colour scheme for all painted components must be as per the finishing schedule.

C.4 Outfit and Furnishings

- C.4.1 All new cabinets, consoles, and furniture that are shown in the drawing package must be fabricated or purchased and installed by the Contractor. All surfaces are to be finished as shown on the drawing package and according to the finishing schedule.
- C.4.2 The Contractor must use ProNautic of Victoria at (250) 655-6388 or equivalent for manufacture of all cabinets. Contractor is responsible for shipping and installation.
- C.4.3 The new furniture is designed to have square bases that must sit level on a base or plinth as shown in the design drawings. The plinths are to be supplied and adapted by the Contractor to follow the contour of the deck and must provide level surfaces at even keel. Contractor to ensure they quote on leveling the plinths.
- C.4.4 Drawers and cupboard doors must be latched to prevent opening in rough weather.
- C.4.5 Items such as light switches must be located between 46 and 50 inches of the deck in the locations noted on the drawings.
- C.4.6 All outfit and furnishings are to be as per the drawing package. No alternate equipment or materials are acceptable without consultation with the TI/TA.

C.5 Deck Covering

- C.5.1 Decks must be prepped prior to coating as per manufacturer's recommendations. Deck coverings (carpet) must be installed in accordance with the manufacturer's recommendations. Colours and pattern of interior deck carpeting must be as shown on the drawing package and finishing schedule. Carpet must pass the British Hot Nut Test.
- C.5.2 Carpet underlay must be provided. The underlay shall be a class-approved product recognized by TC compatible with the rest of the flooring system.

- C.5.3 Deck covering must be laid under furniture except where the furniture is built-in to the vessel structure. Cove base must be installed around boundaries, including built-in furniture as shown on the drawing package.

C.6 Insulation

- C.6.1 The Contractor must maintain all structural fire insulation in accordance with Transport Canada Marine Safety – Structural Fire Protection Regulations.
- C.6.2 Surfaces must be prepared per manufacturer’s recommendations before the installation of thermal insulation.

C.7 Sheathing & Lining

- C.7.1 The Contractor must lay out and install new linings in the bridge and lower accommodations as per the drawing package for all exposed interior bulkheads and shell plating on the main deck and the hull deck area. All ducts, pipes, etc. must be installed behind linings except as agreed to by the TA.
- C.7.2 Bulkhead linings must be as per the drawing package and finishing schedule. They must integrate mechanically and aesthetically with the joiner and partition system. The Contractor must fully compartmentalize and arrange the accommodation with a joiner and partition panel system.
- C.7.3 The Contractor must finish the interior of the vessel, with each compartment trimmed, finished and furnished to suit its function. Ceilings must have vibration dampers fitted.
- C.7.4 New deckhead and linings must be installed as per the Design Drawings and according to manufactures instructions.
- C.7.5 Linings in way of stiffeners and ceilings must be supported by a system of metal furring.
- C.7.6 Contractor must ensure openings are installed and labelled to access any controls such as valves or power supplies located behind the linings.

C.8 Crane and Tow Reel

- C.8.1 Contractor must purchase for installation a CFM FASSI M4OA.1.14 or equivalent davit crane with local control station and single-hand held remote control.
- C.8.2 The Contractor must supply hold down fasteners as specified by FASSI or equivalent.

- C.8.3 The Contractor must purchase for installation a new Anchor Winch (model TBD during bid solicitation) with aluminum tow reel and 200 meters of 30mm double Samson braided nylon rope.

11.3.D Statement of Work

D.1 General

- D.1.1 The Contractor must make a written record of all weights on and weights off.
- D.1.2 The ship's crew will take a set of vessel drafts prior too and after the work period and record them into their log.
- D.1.3 The Contractor must lock out electrical power, domestic water, and sewage during construction and then must re-establish operational power, water, and sewage upon completion of the work.
- D.1.4 The Contractor must remove up to 1000 litres of diesel fuel and sludge from the vessel. Canada does not wish this fuel back and it is up to the contractor to dispose of in accordance with regulations.

D.2 The Contractor must retain and relocate or strip-out and dispose of the following -

- D.2.1 The towline reel and associated wiring mounted in the aft cabin bulkhead to be stripped out and disposed.
- D.2.2 The lights on the aft cabin bulkhead, these are to be retained and relocated.
- D.2.3 The Heila HLM 2-2S marine crane and associated crane base seating, crane base is to be cropped at deck level, all associated hydraulic fittings are to be retained and relocated. Crane to be disposed by Contractor.
- D.2.4 The windlass located on the fore deck, this item is to be inspected and retained if in good order and relocated 800mm forward.
- D.2.5 The HVAC controller system, this item is to be retained and relocated.
- D.2.6 The fore deck hatch and rope locker, these items are to be retained and relocated.
- D.2.7 The existing cabin heaters stripped out and disposed.

- D.2.8 All machinery, equipment, insulation, and interferences IWO of the fuel tank extension, these items are to be removed for hot work purposes and reinstalled when hot work is complete.
- D.2.9 The aft cabin window, door, and all associated mounting hardware to be stripped out and disposed.
- D.2.10 All existing interior outfit in the main deck accommodation and hull deck accommodation spaces is to be stripped out and disposed. This includes joiner bulkheads, doors, linings, bunks, cabinetry, flooring, and insulation. While on site the Contractor will determine exactly what is required be stripped out to complete the work.
- D.2.11 The existing main deck accommodation and galley electrical circuits stripped out and disposed.
- D.2.12 Anchors supports on the fore deck stripped out and disposed.
- D.2.13 The existing deck screed IWO the fore deck hatch stripped out and disposed.
- D.2.14 Fuel cut-off switches, these switches are to be retained and relocated.
- D.2.15 The existing black water outlet valve, this item shall be retained and relocated.
- D.2.16 The DC panel board in the machinery space, this item is to be retained and relocated.
- D.2.17 The bilge pipe IWO the new fuel tank cross over valves, this item is to be retained and relocated.
- D.2.18 The hot water tank in the forward machinery space, this item is to be retained and relocated. This will be described in detail at viewing.
- D.2.19 Controllers and electrical components located in the forward machinery space, these items are to be retained and relocated.
- D.2.20 Structure IWO the bump out in the forward machinery space bulkhead (located on frame 12) stripped out and disposed.
- D.2.21 Structure IWO the bump out in the collision bulkhead (located on frame 17) stripped out and disposed.
- D.2.22 All plumbing in the head stripped out and disposed.
- D.2.23 Air conditioning compressors, these items are to be pumped down and refrigerant recovered. Air conditioners to be relocated as described at viewing, re-piped, sitting on new seats, and recharged.

D.3 Hot Work

- D.3.1 The Contractor is to fabricate a new seat and enclosure for the new towline reel. Exact size is to be determined on site by the Contractor. New tow reel to be installed as per manufactures recommendations. (see ref. drawing 1178-Structure Sheet #1)
- D.3.2 Contractor must fabricate a new crane foundation to suit the FASSI M40A.1.14 or equivalent marine crane. (see ref. drawing 1178-Structure Sheet #5)
- D.3.3 The Contractor must fabricate a new cabin extension with an integrated wet locker to the starboard side. (see ref. drawing 1178-Structure Sheet #1)
- D.3.4 Contractor must relocate the existing rope locker 800mm forward of its current position. (see ref. drawing 1178-Structure Sheet #2) to be clarified at viewing.
- D.3.5 The Contractor is to modify and extend the existing fuel tanks two frame spaces (~1.4m) on both the port and starboard sides of the vessel. (see ref. drawing 1178-Structure Sheet #3)
- D.3.6 The Contractor is to move the existing aft cabin door cut-out 188mm to starboard and plate over the old door cut-out (see ref. drawing 1178-Structure Sheet #1)
- D.3.7 The Contractor is to fabricate new anchor supports. (see ref. drawing 1178-Structure Sheet #1)
- D.3.8 The Contractor is to bump out the structure of the watertight bulkhead located on frame 12. The bump out will extend 286mm aft and 1138 mm in the transverse direction. (see ref. drawing 1178-Structure Sheets 1 & 2)
- D.3.9 Contractor is to cut a new hatch opening on the starboard side between frames 18 and 19, frame with new structure as needed. Install the existing hatch in location of new opening. (see ref. drawing 1178-Structure Sheet #2)
- D.3.10 The Contractor must plate over the old hatch opening between frames 17 and 18, replace stiffening. (see ref. drawing 1178-Structure Sheet #2)
- D.3.11 The Contractor is to bump out the structure of the collision bulkhead on frame 17. The bump out will move the existing structure 800mm forward and extend 2400 mm in the transverse direction. (see ref. drawing 1178-Structure Sheets 1 & 2)
- D.3.12 The Contractor must plate over the existing window and tow line reel opening in the aft bulkhead. (see ref. drawing 1178-Structure Sheet #2)

D.4 Insulation

- D.4.1 The Contractor must inspect existing insulation once the vessel has been striped out. Any areas found to be damaged or not properly insulated will be repaired by PSPC 1379 action.

D.5 Piping

- D.5.1 Contractor is to install a new aft hatch gutter drain on the port side, the gutter drain must match the existing on the starboard side.
- D.5.2 The Contractor is to relocate the black water outlet valve aft of the wet locker. (see ref. drawing 11782- Grey / Black Water System and 1178- Refit Overview Sheet 3) and to be clarified at viewing.
- D.5.3 The Contractor is to tee a new fuel oil tank vent into the existing fuel oil tank vent line (both port and starboard tanks).
- D.5.4 Relocate the existing bilge water piping IWO of the new fuel tank cross over valve.
- D.5.5 The Contractor is to remove the hot water tank and reconnect all associated piping upon completion of hot work.
- D.5.6 The Contractor is to replace all plumbing in the head, all piping is to be replaced with the same material as exiting. (see ref. drawing 1178-2 Fresh Water System Sheet #1) and to be clarified at viewing.
- D.5.7 The Contractor is to install new cross over valves, these valves are to be located under the floor plates in the machinery space.
- D.5.8 The Contractor is to cap the old galley sink drain at the sump, install new piping and sewage tank fitting for the relocated galley sink. Pipe sizing to be the same as existing. (see ref. drawing 1178-2 Grey/Black Water) and to be clarified at viewing.

D.6 HVAC

- D.6.1 The Contractor must fabricate a machinery room exhaust vent; exhaust fan-mounting box and install as per the design drawing. (see ref. drawing 1178-3 HVAC Systems Sheet #1)
- D.6.2 Contractor must install a minimum of two return air vents on the top and bottom of the outboard settee in the main deck accommodation space.
- D.6.3 Contractor must fabricate and install new return air grilles with manual dampers (minimum flow area of 0.15 meters squared). The air grilles shall be integrated into

the steps as shown on the design drawings. (see ref. drawing 1178-3 HVAC Systems Sheet #1)

- D.6.4 Contractor must relocate AC duct #1, the grille shall be integrated into the starboard side cupboards. (see ref. drawing 1178-3 HVAC Systems Sheet #1) and clarified at viewing.
- D.6.5 The Contractor must install an extraction duct behind the microwave. It will consist of a 6" duct, EBM Papst 7114N or equal fan and variable speed control duct outlet fitted in the deckhouse side plate and fitted with a damper. (see ref. drawing 1178-3 HVAC Systems Sheet #2)
- D.6.6 The Contractor must relocate the existing air conditioning compressors within the existing space, add new ducting to connect to the existing distribution and extend cooling water pipes and associated piping the new location. (see ref. drawing 11778-HVAC Systems) and to be clarified at viewing.
- D.6.7 Contractor must install a new air plenum that will connect to the existing ductwork of both air-conditioning units (see ref. drawing 11778-HVAC Systems) and to be clarified at viewing .
- D.6.8 Contractor must relocate the air conditioning thermostat in the hull deck accommodation area. (see ref. drawing 11778-HVAC Systems Sheet #2)
- D.6.9 Contractor must relocate existing March LC-3P-MD pumps (see ref. drawing 11778-HVAC Systems) into existing space.

D.7 Electrical

- D.7.1 The Contractor is to install a new exhaust fan in the machinery space (EBM Papst 7114N or equal) to be controlled using a local thermostat (see ref. 1178-2 HVAC Systems and Electrical Layout).
- D.7.2 Contractor is to remove the existing aft deck lights and reinstall into the aft face of the new structural addition (see ref. drawing 1178 – Structure Sheet #5) and to be clarified at viewing.
- D.7.3 Contractor is to pull back and re use existing wire on windlass on the foredeck. If the wire is found to be too short or unsuitable, a PSPC 1379 will be raised.
- D.7.4 Contractor must relocate and rewire the existing thermostat for the air conditioning as per location shown on the design drawing. (see ref. drawing 1178-2 HVAC Systems) and clarified at viewing.

- D.7.5 Contractor must integrate three (3) new cabin heaters into the kick of furniture. Two are to be in the hull deck accommodation and one in the galley. (see ref. 1178-2 Electrical Layout Sheet 2)
- D.7.6 The Contractor must rewire the main deck accommodation and galley electrical circuits to accommodate the new layout. (see ref. 1178-2 Electrical Layout) to be clarified at viewing.
- D.7.7 The Contractor is to relocate the fuel cut-off handles as required to suit interior modifications. This will be clarified at the viewing.
- D.7.8 The Contractor must add new smoke and gas detectors in the galley (see ref. 1178 Refit Overview sheet 3). This will be clarified at the viewing.
- D.7.9 The Contractor must move the DC-1 panel board (see ref. 1178-Refit Overview Sheet #4) , the Contractor must use existing wire. Any wires found too short will be rewired thru PSPC 1379 action. This will be clarified at the viewing.
- D.7.10 The Contractor may need to rewire the fire panel due to moving of the DC panel and relocating the galley. This will be clarified at the viewing.

D.8 Arrangement and Outfit

- D.8.1 Contractor must relocate the existing windlass 800mm forward of its current location (ref. drawing 1178-Refit Overview sheet3 and 1178-Structure sheet 2) as necessary, it can be clarified at viewing.
- D.8.2 The Contractor shall construct and install new bunks, cabinetry, linings, joinery panels, deck heads, flooring, bathroom fittings, and other furnishings on the main deck, galley, and in the hull deck accommodation as per the design drawings.
- D.8.3 The Contractor is to finish the passageway and all cabins on the main deck and in the hull deck accommodation space in accordance with the design drawings.
- D.8.4 The Contractor must install a tempered glass divider for the shower.
- D.8.5 The Contractor must install a new CFM Wallas 87 D stove/oven associated wiring, fuel line from main fuel tank, and 28mm exhaust hose per manufacturers recommendations found in attached technical documents

D.9 Crane and Tow Reel

- D.9.1 Contractor must install new **CFM FASSI M40A.1.14** or equivalent davit crane with local control station and handy remote control.

- D.9.2 The Contractor must torqued down the foundation bolts in the presence of the TA.
- D.9.3 The Contractor must hook up existing to the existing hydraulic deck fittings. Any modifications required are to be PSPC 1379 action.
- D.9.4 The Contractor must install the new CFM tow reel on top of extension of deckhouse top (see ref. drawing 1178-Structure) and to be clarified at viewing.

11.3.E Proof of Performance

E.1 Inspection Points

- E.1.1 Canada will be contracting the American Bureau of Shipping directly and pay all inspection cost directly to them as our Regulatory Organization (RO)
- E.1.2 Hold before any installation for inspection of structure, bulkheads and decks for corrosion and damage.
- E.1.3
- E.1.4 Hold before obstructing vertical wire and pipe transits of all decks.
- E.1.5 Hold before unsealing the accommodations duct work. If the seal is broken before installation is started the Contractor must vacuum out the accommodations duct work.

E.2 Testing/Trials

- E.2.1 The Contractor must test water supplies, water drains and sewage lines and demonstrate that the piping is functional and there are no signs of leakage. The fresh water lines must be pressurized to 80 psi and pressure held for 1 hour. Drains and sewage lines to be tested by pouring 10 litres of water in each line. Tests to be in the presence of the TA.
- E.2.2 The Contractor must function test the main deck and hull deck public address system for the TA. Deficiencies to be addressed through 1379 action.
- E.2.3 The Contractor must function test the main deck and hull deck fire detection system for the TA. Deficiencies to be addressed through 1379 action.
- E.2.4 The Contract must hire a third party CWB qualified weld inspector (suggest Blake Penner at Canadian Quality Inspections Ltd, 204-663-7775) to inspect fuel tank and structural welds including crane base. Weld testing to be done in the presence of the

TA. The third party must furnish a report with photos of each test to the Contractor and the Contractor must attach the third party report to their QA document. Deficiencies to be addressed through 1379 action.

E.2.5 The Contractor must hydrostatically test the two fuel tanks post modification. The Contractor must extend the sounding pipes by 4 feet and have the water sit in the tanks for a period of 6 hours. 5 days prior to performing this test, the Contractor must ask the TA if the RO is required to be present. Deficiencies found through non-Contractor work to be addressed through PSPC 1379 action.

E.2.6 The Contractor must hydrostatically test the forepeak. The Contractor must put additional keel blocks at frame 17 and 19 prior to the test. The Contractor must remove the vent and fill the forepeak full of fresh water and have the water sit in the forepeak for a period of 6 hours. 5 days prior to performing this test, the Contractor must ask the TA if the RO is required to be present. Deficiencies found through non-Contractor work to be addressed through PSPC 1379 action.

E.3 Documentation

E.3.1 Upon completion of constructor the Contractor shall produce the following as-built drawings in AutoCad –

- a) General Arrangement
- b) Domestic Fresh Water
- c) Fuel System
- d) Electrical One Line AC
- e) Electrical One Line DC
- f) Safety Pan
- g) Fire Plan

E.4 Training – Not Used

CCGS Vakta
Refit 2018

Specification No: F1782-18C938

12.0 ELECTRICAL DISTRIBUTION SYSTEMS

Prepared by:
Marine Engineering Western Region
P.O. Box 6000
9860 W. Saanich Rd.
Victoria BC
V8L 4B2

12.1 ANNUAL MEGGER SURVEY

12.1.A Identification

- A.1.1 The contractor must perform the annual Megger survey on the vessel before and after completion of work using the template Megger Survey Vakta.

12.1.B References

B.1 Equipment Data

B.2 Drawings – Not Used

B.3 Regulations and Standards

- B.3.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

FSSM Procedures	Title	Included Yes/No
Publications		
TP 127	Ships Electrical Standards	No
IEEE 45	Recommended practice for Electrical Installations on Shipboard	No
Standards		
Regulations		
	Canada Shipping Act 2001	No

12.1.C Statement of Work

- C.1 The Contractor must ensure with the TA that all sensitive electronic equipment is disconnected prior to conducting the Meggar Test.
- C.2 The Contractor must conduct the annual Meggar survey on all circuits greater than 55 volts in accordance with TP127e on the vessel using the attached template at the beginning of the work period. Any circuits to have resistance of <100k ohms shall be noted on the Meggar survey.
- C.3 The Contractor must conduct the annual Meggar survey on all circuits greater than 55 volts in accordance with TP127e on the vessel using the attached template upon completion of the work. Any circuits to have resistance of <100k ohms shall be noted on the Meggar survey.
- C.4 The technician performing the Meggar survey must be a Red Seal electrician with a minimum of 3 years marine experience who has performed a minimum of 2 previous Meggar survey of a vessel.
- C.5 Any deficiencies found during the survey will be actioned by PSPC 1379 or as a warranty claim as appropriate.

12.1.D Proof of Performance

D.1 Inspection Points

- D.1.1 The contractor is to allow the TA to inspect any deficiencies found.

D.2 Testing/Trials – Not Used

D.3 Certification

- D.3.1 Not used.

D.4 Documentation

- D.4.1 The contractor must include a report which includes results after any repairs have been actioned.

D.5 Training – Not Used