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SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

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

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

Comments - Commentaires

Title - Sujet LEONARD J COWLEY VLE REFIT- 2015	
Solicitation No. - N° de l'invitation F7049-140286/A	**Amendment No. - N° modif.** 008
Client Reference No. - N° de référence du client F7049-140286	**Date** 2015-01-26
GETS Reference No. - N° de référence de SEAG PW-$$MD-021-24828	
File No. - N° de dossier 021md.F7049-140286	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin **at - à 02:00 PM** **on - le 2015-02-09**	**Time Zone** **Fuseau horaire** Eastern Standard Time EST
F.O.B. - F.A.B. **Plant-Usine:** ☐ **Destination:** ☐ **Other-Autre:** ☐	
Address Enquiries to: - Adresser toutes questions à: Byron, Dan	**Buyer Id - Id de l'acheteur** 021md
Telephone No. - N° de téléphone (819) 956-0691 ( )	**FAX No. - N° de FAX** (819) 956-7725
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Canada

Solicitation Amendment #8 is issued to:
1) Replace specification H-11: Avgas Dispenser Unit Replacement in the technical specification package included in the Invitation to Tender
2) Replace specification E-01: Generator Engine Overhaul in the technical specification package included in the Invitation to Tender,
3)Replace specification L-02: Auxiliary Generators Electronic governor upgrade in the technical specification package included in the Invitation to Tender

1) Replace specification H-11: Avgas Dispenser Unit Replacement in the technical specification package included in the Invitation to Tender

DELETE: specification H-11: Avgas Dispenser Unit Replacement from Annex A - Statement of work, CCGS Leonard J. Cowley VLE Refit 2015 (Rev 7) in its entirety.

INSERT: specification **H-11 (rev 1): Avgas Dispenser Unit Replacement** into the technical specifications, Annex A - Statement of Work**,** CCGS Leonard J. Cowley VLE Refit 2015 (Rev 7)

2) Replace specification E-01: Generator Engine Overhaul in the technical specification package included in the Invitation to Tender

DELETE: specification **E-01: Generator Engine Overhaul** from Annex A - Statement of work, CCGS Leonard J. Cowley VLE Refit 2015 (Rev 7) in its entirety.

INSERT: specification **E-01 (rev 1): Generator Engine Overhaul** into the technical specifications, Annex A - Statement of Work**,** CCGS Leonard J. Cowley VLE Refit 2015 (Rev 7)

3) Replace specification L-02: Auxiliary Generators Electronic governor upgrade in the technical specification package included in the Invitation to Tender

DELETE: specification **L-02: Auxiliary Generators Electronic governor upgrade** from Annex A - Statement of work, CCGS Leonard J. Cowley VLE Refit 2015 (Rev 7) in its entirety.

INSERT: specification **E-01 (rev 1): Generator Engine Overhaul** into the technical specifications, Annex A - Statement of Work**,**CCGS Leonard J. Cowley VLE Refit 2015 (Rev 7)**.**

End of solicitation amendment 8

Spec item #: H-11 (rev 1)	**SPECIFICATION**	TCMSB Field #: N/A

H – 11 (rev 1) : Avgas Dispenser Unit Replacement

Part: 1 SCOPE:

1.1 The intent of this specification shall be to remove existing Avgas Fuel dispenser and associate piping and relocate it with a new avgas fuel dispenser complete with cabinet to be installed on the Upper Deck Aft on the stbd side.

1.2 Contractor has to also put a fueling access hatch in the Foc'scle deck on the aft end stbd helicopter landing deck. This hatch will be flush with the deck.

1.3 This work shall be carried out in Conjunction with the following: H-27 Aviation Avgas Damper Renewal and HD- 18 Stbd Miranda Davit Installation

Part: 2 REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1 102-08-01 Avgas Fuel Dispenser Cabinet.

2.1.2 102-08-02 Helicopter Refueling System Access Hatch

2.2 Standards

2.2.1

2.3 Regulations

2.3.1 Contractor to follow Transport Canada and Lloyd's Regulations.

2.4 Owner Furnished Equipment

2.4.1 The contractor shall supply all materials, equipment, and parts required to perform the specified work unless otherwise stated.

2.4.2 Owner will supply new avgas fuel dispencer.

Part: 3 TECHNICAL DESCRIPTION

3.1 General

3.1.1 Contractor prior to starting any work must contact the Chief Engineer.

3.1.2 Contractor must drain all piping back to the drain sump tank and prove that no liquid is left in the system prior to dismantling.

3.1.3 Contractor must empty avgas storage tank and drain sump tank and gas free both. Contractor must also gas free avgas cofferdam. Each compartment by a chemist or a qualified person.

3.1.4 Contractor bid on removing and disposing 10 m3 of AVGAS and quote a unit price to remove/dispose per 1m3 of AVGAS for adjustment purposes

3.1.5 The following precautions shall be taken where hot work is to be conducted:

3.1.5.1 The compartment(s) affected shall be certified gas free by a certified marine chemist or other qualified person. The Contractor shall keep copies of all active and expired hot work certificates in a central location on the vessel for viewing. Certificates shall specify, "Safe for persons" and/or "safe for hot work" as appropriate. The Contractor shall post a copy of all certificates at the entrance to the affected spaces; Protective material shall be used to prevent the spread of sparks, protecting electrical cables and other services.

3.1.5.2 Fire sentries shall be provided in each space and in all adjacent spaces, if welding, grinding and burning is being carried out. Fire sentries shall be provided with an appropriate fire extinguisher and shall be trained in its use. The fire sentry shall maintain a watch in his designated area for at least thirty (30) minutes after any hot work has been completed.

3.1.6 Confined Space Entry: Contractor shall keep copies of all active and expired entry permits with certified marine chemist or other qualified person's “Gas Free Certificate” in a central location on the vessel for viewing. Certificates shall specify, "Safe for persons" and/or "safe for hot work".

3.1.6.1 Any entry into confined spaces during the contract period shall be conducted in accordance with the Provincial Regulations.

3.1.6.2 The contractor shall comply with the work requirements as outlined in the Canada Labor Code and applicable Provincial Regulations.

3.1.7 Contractor prior to any welding taking place has to submit to Lloyd’s Surveyor a welding procedure which has to be approved by Lloyd’s before any welding is started.

3.1.8 Contractor to carry out work as described in drawings referenced in section 2.1.

3.1.9 Contractor to fabricate or have it fabricated as per scope of work described.

3.1.9.1 The purpose of this tender is for the design and fabrication of a stainless steel refuelling cabinet which will be installed on the Upper Deck of the C.C.G.S. Leonard I. Cowley

3.1.9.2 All piping to be 316L Stainless Steel.

3.1.9.3 Cabinet to be constructed from 316L Stainless Steel and be continuously welded.

3.1.9.3.1 Cabinet to have a 100mm deep containment incorporated into the base.

3.1.9.3.2 Cabinet to have watertight access doors. Where needed to gain access to equipment for operation and maintenance.

3.1.9.3.3 Cabinet base shall have provisions to be welded to the ships deck which will leave a 50mm gap between the cabinet and the deck.

3.1.9.3.4 Cabinet to contain the following components:

(i) Hannay Stainless Steel SS38-23-24-LT Hose Reel Assy. c/w Air Operated Rewind Motor, 304SSt Internals and Swivel Joint and Assembly C2 Stainless Steel Roller.

(ii) Conti Low Temp API 1529 MXM Aircraft Fuelling Hose Size 1 1/2" x 100' c/w Brass Scovill Fittings Each End /w Test Certificate.

(iii) OPW Model 1712DL-AL 15 1-1/2" Kamvalok Coupler, Alum, Fluorocarbon Seal, FNPT OPW Model 1612AN-AL 15 1-1/2" Kamvalok Adapter, Alum, Fluorocarbon Seal, FNPT.

(iv) OPW Model 295SA-0138 Overwing Refuelling Nozzle c/w 100 Mesh Strainer, Built-in Swivel, Dry- Break Adapter Size 1 1 /2" x 1".

(v) TCS Model 700-15-SS Mechanical Registration Meter, Stainless Steel Construction, Viton Seals, 5- Digit Counter, Non-Resettable Totalizer, Stainless Steel Back Pressure Check Valve and Stainless Steel 1 1/2" NPT Flanges.

(vi) Facet Model HCS-D-222-1424 Horizontal Coalescing Separator Filter

(vii) Fluid: Jet A-1 Fuel Flow: 50 GPM Contaminants: Water & Solid Particulate EI Qualification: 1581 5th. Edition, Cat. C Type S Shell: 14" 00 x 41 1/2" Approx. Overall Horizontal Length Code: ASME Section VIII, Div. 1 Design: 150 PSIG @ 250Q F, -20Q F MDMT

1. - Grade 316 Stainless Steel Construction
2. - Swing Bolt Closure w/ Davit - Buna N O-Ring Seal
3. - 2" RFSO Inlet/Outlet
4. - 4" RFSO Flanged Cleanout/lnspection Port
5. - (4) 1/4" NPT DP Gauge Connections & Sample Ports
6. - 3/4" NPT Vent Port
7. - 3/4" NPT Pressure Relief Port
8. - (2) 3/4" NPT Liquid Level Gauge Port
9. - (1) 3/4" NPT Water Probe Connection
10. - 1" NPT Auxiliary (slow fill) Connection
11. - 3/4" NPT Inlet Chamber Drain
12. - 3/4" NPT Vessel Drain
13. - (2) CAA22-5SB Coalescing Elements
14. - (1) SS324FA-5 Separator Element
15. - Armstrong 11AV Air Eliminator, Check Valve and Tee Assy.
16. - Taylor 8200 Pressure Relief Valve
17. - Manual Drain Valves
18. - Schultz SC-5150 Differential Pressure Gauges
19. - Schultz Accusample Sample Probe Kits

(viii) Facet Model HFG-D-5210 Horizontal Fuel Guard Monitor Fluid: Jet A- 1 Fuel Flow: 50 GPM Contaminants: Water & Solid Particulate EI Qualification: 1581 6th. Edition

1. - Blind Flange Enclosure
2. - 2" RFSO Inlet/Outlet
3. - 6 5/8" 00 x 29" Approximate Overall Length
4. - ASME Section VIII, Div 1

5. 150 psig @ 2500 F, -20Q F MDMT
6. - 4" RFSO Flanged Cleanout/lnspection Port
7. - (2) 1/4" NPT DP Gauge Connections & Sample Ports
8. - 3/4" NPT Vent Port
9. - 3/4" NPT Pressure Relief Port
10. - (2) 3/4" NPT Drains
11. - Armstrong Air Eliminator, Check Valve and Tee Assy.
12. - Taylor Pressure Relief Valve
13. - Manual Drain Valves
14. - Differential Pressure Gauges
15. - Sample Probe Kit # 5
16. - Sample Probe Kit # 7
17. - FG-220-6 Monitor Fuses

(ix) Chromalax Explosion -proof Connection Air Heater Type FTEP-3

(x) An FM200 Fire Extinguishing Agent Nozzle

(xi) All Necessary Valving to Allow Fuelling & Drain Back Operations

3.1.9.4 All Vent Piping to be Piped to (1) Common Vent Output Flange on Top of Cabinet Which Will be Tied Into Existing Main Vent Piping on Ship.

3.1.9.5 Piping to be Arranged as to Allow Drain Back of All Components to Main Tank Below Deck.

3.2 Location

3.2.1 N/A

3.3 Interferences

3.3.1 N/A

Part: 4 PROOF OF PERFORMANCE:

4.1 Inspection

4.1.1 All fitting and welding has to be 100% visual inspected by Lloyd's Surveyor and the Chief Engineer.

4.2 Testing

4.2.1 The avgas dispenser has to be proven that all the piping is hooked up properly for pumping and recirculation. This has to be proven to the Lloyd's Surveyor and the Chief Engineer

4.3 Certification

4.3.1 New avgas dispenser has to be Lloyd's approved.

Part: 5 DELIVERABLES:

5.1 Drawings/Reports

5.1.1

5.2 Spares

N/A

5.3 Training

N/A

5.4 Manuals

N/A

Spec item #: E-01(rev 1)	SPECIFICATION	LLOYDS #
(M/E) E-01(rev 1) : Generator Engine Overhaul		

Part 1: SCOPE:

1.1 The intent of this specification is to carry out the **five year Lloyd's Survey inspection for this item, at the same time replace with new the cylinder block complete with new crankshaft, camshaft and gear train. This includes** entire engine overhaul as detailed in this specification including all tests and trials with the Chief Engineer in attendance. Contractor to supply the services of a Caterpillar Field Representative (F.S.R.). All work shall be surveyed by Lloyds attending surveyors. Contractor shall be responsible for contacting the surveyor's when they are ready for inspection. Contractor to bid on allowance of $60,000.00 for Caterpillar FSR to be adjusted on proof of invoice by PWGSC 1379 action. **Contractor to bid on 200 hrs assisting Caterpillar FSR, to be adjusted by PWGSC 1379 action. This is above work that is stated in this spec for Contractor to carry out.**

1.2 Contractor shall carry out a vibration test on the diesel engine and Generator at various loads before and after the overhaul for comparison. Vibration analysis report shall be type written and two copies supplied to the Chief Engineer.

1.3 The overhaul is to be performed in conjunction with spec item L-01 , overhaul of generator

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1. Caterpillar 3412 D.I.T.A.
12 cylinders

Serial Number 60M02057

Arrangement # 4W1146

2.2 Standards

2.2.1

2.3 Regulations

2.3.1

2.4 Owner Furnished Equipment

The **owner will supply parts new cylinder block complete with new crankshaft, camshaft and gear train,** contractor shall supply all materials **and** equipment, and parts required to perform the specified work unless otherwise stated to the point of connection.

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1 All work involved to dis-assemble, inspect re-assemble and any precautions to be observed during the overhaul shall be in accordance with the engine manufacturers instructions.

3.1.2 The alignment of the engine to generator is to be checked and recorded prior to work commencing as the generator is to be overhauled as part of spec L-01

3.1.3 Wear limits shall be those listed in the manufacturers instruction book.

3.1.4 The engine shall be disassembled in its entirety to meet the requirements of Lloyds inspectors. All components shall be inspected for wear and damage. **Replace existing cylinder block with new cylinder block complete with new crankshaft, camshaft and gear train.**

3.1.5 The following components will be exchanged for Re-man components:

Existing Cylinder Heads **with new type**

Cylinder Head spacer plates

Vibration Damper

Lube Oil Pump

Jacket Water Pump with gear

Sea Water pump complete with gear

Fuel Oil Lift Pump

Injectors

12 Power Pack assemblies

Turbo Cartridge P/N: OR-5889 S/N: 4MF-731 DO 405 2098 R9

Cylinder liner spray nozzles

Rocker arm assemblies

Lifters

Bridges

Cam followers

Valve rotators

Lifter clips (spring clips)

The following bearings and bushings shall be renewed:

Main Bearings

Thrust Bearings

Connecting rod bearings

Cam shaft bearings

Idler gear bushings

The following parts will be renewed:

High water temperature sensor

Exhaust bellows 5L-6297

Exhaust thermocouple

Temperature regulators

The engine shall be re-assembled using all new gaskets and seal including the following:

Front end gaskets

Aft end (Bell end) gaskets

Cylinder head gaskets

Bottom end gaskets (central and lower)

Lube Oil cooler gaskets

Charge air cooler gasket

3.1.6 The high pressure fuel injection pump assembly shall be removed from the engine and suitably crated and sent to an authorized Caterpillar fuel injection equipment service center, where it shall be completely overhauled, cleaned and calibrated to manufacturer's specifications using OME parts. Upon completion, the high pressure fuel pump shall be power tested. Returned back to the ship and installed in good order. A Caterpillar representative shall be on hand prior to and during trial run of the engine, to make any adjustments as required.

3.1.7 The Woodward mechanical governor and actuator shall be, removed from the engine and properly crated and sent to an authorized Woodward governor repair and testing facility where it shall be thoroughly cleaned, inspected, tested and calibrated to the manufacturer's specifications. Upon completion the mechanical governor and actuator shall be returned to the ship and installed on the engine. After the engine overhaul is completed, a governor technician shall be in attendance to make final adjustments as necessary.

3.1.8 The contractor shall ensure all rocker arm bushings are reamed to manufactures specifications providing the required clearance between bushing and rocker arm shafts.

3.1.9 The lubrication oil pump suction strainer shall be checked for damage and all lubrication piping shall be proven clear. The relief valve on the lubrication oil pump shall be set to manufactures specifications.

~~**3.1.10** Crankshaft shall be examined for scoring, cracking, and signs of overheating and gauged for wear on all journals. The crankshaft shall be properly crated and sent to a machine shop to be polished and tested for trueness. Crankshaft shall have all journals measured and recorded. All measurements shall be compared to manufacturer's specifications. Upon completion of inspection and testing, the crankshaft shall be returned to the ship and installed in the engine.~~

3.1.11 The charge air cooler, lube oil cooler and jacket water coolers shall be removed and cleaned. The coolers shall be pressure tested as per Lloyd's requirements. The Chief Engineer, Lloyd's inspector shall witness the pressure test on each cooler. After testing the coolers shall be-reassembled using new gaskets and seals.

3.1.12 Flywheel ring gear shall be examined for tightness and worn or damaged teeth. All oil passages shall be cleaned and proven clear. Contractor shall install new main and thrust bearings with Caterpillar wear in greased. Main bearing cap bolts shall have a torque applies as per manufactures specification. Contractor shall record all main bearing to crank journal clearances to ensure they are within the manufactures specifications. Contractor shall record crankshaft axial clearance after assembly of new bearings in engine.

3.1.13 Backlash shall be taken and recorded on the front gear group which includes the fuel pump drive gear and timing advance, camshaft gear, water pump drive gear, idler gear, crankshaft and oil pump idler gear. All measurements shall be given to Chief Engineer.

3.1.14 The Vibration Damper shall be removed and the wear marks checked for alignment. If the marks are not in alignment a new vibration damper shall be installed.

~~**3.1.15** Camshafts shall be examined for wear in way of cam lobes. Contractor shall gauge wear on all camshaft lobes to see if they are within tolerance of new limits. Camshaft shall be removed and inspected for wear and damage. New bearings shall be installed with camshafts.~~

3.1.16 The fuel pump control gear shall be examined for slackness and all wasted motion shall be removed. Fuel strainers and filter housings shall be cleaned and new elements installed on reassembly.

3.1.17 The engine shall be completely assembled using new gaskets and seals including the fore end and aft end gaskets as well as the crankshaft oil seals on the fore and aft end. The generator end has to be separated from the engine for the removal/installation of the rear crankshaft oil seal, Contractor is to support the generator end at all times when carrying out this procedure. Contractor to re-connect generator to engine using specified procedures and torque settings, alignment between generator and engine to be checked and adjusted so that it is within manufacturers specifications.

3.1.18 Contractor shall insure that cylinder liner spray nozzles are installed after power pack installation. After installation care must be taken so that the spray nozzles are not disturbed.

3.1.19 Contractor shall fill engine jacket water space with clean fresh water and apply pre-heat. All jacket water spaces shall be free of entrapped air, including turbo charger cooling space. The engine shall be checked for any sign of water leaks. All leaks shall be corrected.

3.1.20 Contractor shall clean the engine base prior to filling to the working level with new lubricating oil, vessel supply. New lube oil filters shall be fitted.

3.1.21 Before start-up of engine the valve clearances shall be adjusted as per manufactures specifications. Fuel pump timing shall be checked and set as per manufactures specifications. The engine shall be adjusted and tested at full speed and full load for four hours. Before attempting full load test, the engine shall be run at a reduced load as outlined by engine manufacture. The overspeed trip, low lube oil pressure and high jacket water temperature safety shutdowns shall be functionally tested and witnessed by Chief Engineer, and Lloyd's Inspector. Pressures and temperatures of engine shall be recorded at 15 minute intervals while testing engine. After initial start-up of engine the lube oil filters shall be opened up and checked for any sign of metal. An oil sample shall be taken after the trial period of four hours and sent to an oil analysis lab for testing, the results of the oil test shall be given to the Chief Engineer.

3.2 **Location:**

a. Harbour generator room.

3.3 **Interferences**

a. Contractor is responsible for the identification of interference items, their temporary removal, storage and refitting to vessel.

Part 4: PROOF OF PERFORMANCE:

4.1 **Inspection**

All work shall be inspected by Lloyds Technical Inspector and Chief Engineer.
All work shall be completed to the satisfaction of the Chief Engineer.

4.2 Testing

N/A

4.3 Certification

N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1 All wear measurements and clearances on engine components to be recorded, this will include the backlash on all gear transmissions. Three copies of all measurements shall be given to the Chief Engineer

5.2 Spares

N/A

5.3 Training

N/A

5.4 Manuals

N/A

Spec item #:L-02 (rev 1)	SPECIFICATION	
L – 02 (rev 1): Auxiliary Generators Electronic governor upgrade		

Part 1: SCOPE:

The intent of this specification is to upgrade the existing Woodward 2301a governor controls and SPM-A synchronizers with new Woodward 2300 and Easygen 3500 Controls on the 3 ship service generators located in the engine room while retaining the existing EGB reverse acting actuator/mechanical governor located on each engine.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

(3)G620 3-51015- L001 Main Switchboard Layout
(3)G62013-S1015- S135 Main switchboard drawings
(3)G62013-S1015- 5000 Switchboard Drawings
590-30 Machinery arrangement

2.2 Standards

2.2.1 The Contractor is to perform all of the following work and is to provide fully certified personnel acceptable to LLoyds in accordance to latest revision of the Lloyds Rules and Regulations for the Classification of Ships – Part 6, Chapter 2, Section 10

2.3 Regulations

2.3.1 All installations as per most recent version of Lloyds Rules and Regulations for the Classification of Ships – Part 6, Chapter 2, Section 10

2.3.2 All wiring to follow Lloyds rules. If not specifically mentioned, contractor to follow most recent revisions of TP-127E or IEEE-45

2.4 Owner Furnished Equipment

All equipment , wiring and materials responsibility of contractor unless otherwise noted

Part 3: TECHNICAL DESCRIPTION:

3.1 General

.1 All electrical circuits associated with the 3 governor controls to be isolated before any work is to proceed.

.2 Contractor responsible for all costs associated with parts, materials and labour of Woodward FSR's. Contractor to include in their bid an allowance of $80,000.00 for Woodward FSR to be adjusted on proof of invoice by PWGSC 1379 action.

.3 All work performed will be under the direct supervision of Authorized Woodward FSR and to the acceptance of the Chief Engineer and Lloyds Inspector

.4 The existing Woodward EGB reverse acting actuator/mechanical governor is to remain on each Ship service generator

.5 The existing Woodward 2301A, and SPM-a synchronizers located in the MCR switchboard are to be removed

.6 **All new wiring, controls and cabinets to be installed under direction of Woodward FSR.** All associated wiring is to be removed and replaced unless approved to remain after testing and agreement between Woodward FSR, Chief engineer and Lloyds. **Yard to be responsible for routing all cables from engine control room to each of three generators sets as detailed by Woodward FSR and vessel C/E. All bulkhead penetrations to be completed by yard . Woodward FSR's to complete terminations and final wiring at terminal strips, controls or enclosures. Cables included by FSR (per genset) : 30 meter length approximate included in kit. Contractor to bid on 25 meter install per cable to be adjusted by 1379. Cable runs out lined below are per generator:**

- **2 x shielded cables 14 gauge,**
- **2 x canbus cables**
- **2 x multiconductor cable (8 conducter)**

Contractor to attach enclosure mounting bracket to each engine skid as directed by Woodward FSR. Contractor to mount enclosure to engine as required by Woodward FSR

Cables for Gensets 1 & 2 will pass through one (1) bulkhead, existing transit may be re-used but contractor to bid on installing new to be adjusted by 1379

Cables for harbour genset pass through two (2) bulkheads, existing transit may be re-used but contractor to bid on installing new to be adjusted by 1379

- **Contractor to bid on 340 hours of assist time for 1 dockyard person. Time to be adjusted by proof of time sheet and adjusted as**

needed by 1379. This is extra to the contractor personnel used for running of cables.

~~**.7** All new wiring, controls and cabinets to be installed under direction of Woodward FSR~~

.8 The new Woodward 2300's and Easygen 3500 series controls to be installed as per FSR recommendations

.9 Local generator on-screen control panels to be included at all generators in new contractor supplied panels as detailed by FSR and approved by chief engineer and Lloyds inspector

.10 Remote screen for each generator to be installed in each respective generator section in the MCR

.11 Full control of start/stop and synchronization to be available at each control panel location and in the MCR

.12 Full manual control of start/stop and synchronization to be provided at each location.

.13 All labels that are to be replaced to reflect new equipment to be of similar type and securing arrangement to existing. Contractor responsible for the cost of fabrication and installation of all labelling. All labelling and installation locations to be approved by the chief engineer and attending Lloyds inspector

.14 Contractor responsible for retrofitting panels where equipment of different sizes or shapes to be mounted. Covering plates (Contractor responsibility) and mounting arrangements to be approved by the TA before installation. Any modifications to existing panel doors to be similar in standard, material, design, strength, mounting and coated with the same standard and color paint as per the existing access doors. **Contractor to assist with modifications to the doors asdirected by the Woodward FSR and assist with mounting controls in door panels.**

.15 Existing transits and cable hangers may be reused on approval of chief engineer and Lloyds inspector. Contractor responsible for any new cable hangers or transits needed

.16 All wiring to meet or exceed Lloyds rules.

.17 All equipment used to have Lloyds approval

.18 Contractor responsible for all new wiring, terminals, and enclosures as directed by Woodward FSR

.19 All programming and drawing modification the responsibility of Woodward FSR

.20 If programming/diagnostics of Easygen system must be done by laptop, contractor is to supply fully functioning laptop with full versions of software as needed for normal servicing, maintenance and reprogramming of replacements

.21 All new and disturbed steelwork is to be protected with 2 coats of primer.

.22 All cables shall be tagged with circuit identification at all points of connection and on both sides of bulkheads, decks and barriers. The tags will be metal, compatible with the cable sheath and shall have a circuit designation embossed thereon. Both ends of the tag shall be secured to the cable with metal tape or metal ty-raps. The wire Identification numbering philosophy for the new wiring shall be compatible with that utilized with the existing systems

3.1 Location

a. Port and Stbd Main Engine room, #3 generator room and MCR

3.2 Interferences

3.3.1 Any interference items that need to be removed are the responsibility of the contractor. Contractor is responsible for the temporary removal, storage and refitting to vessel of all equipment previously identified. No Equipment/wiring or interference items to be removed without prior approval from TA

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

1. All work to be completed to satisfaction of the Chief Engineer.
2. All cabling and installations to be to the acceptance of attending Lloyds inspector and Chief Engineer

Testing

Woodward FSR to test complete system to ensure proper start/stop and synchronization functions to the satisfaction of the Chief Engineer and attending Lloyds inspector. This to include all combinations of synchronization and loading from low load up to as much as possible full load. Generators are to be able to sync to shore power and emergency generator as well.

4.2 Certification

Proof of certification of authorized Woodward FSR to be provided

Proof of proper certification/training of all other personnel to be made available on request

Part 5: DELIVERABLES:

5.1 Drawings/Reports

3 hard copies and 1 Electronic copy of the following

i. All hardware manuals from as-fitted equipment
ii. All software programming manuals
iii. As fitted drawings in electronic Cad format as well as hard copy
iv. Copy of all as commissioned programming in electronic and hard copy
v. Recommended spare parts list from Woodward
vi. Copy of all training materials in hard and electronic copy

5.2 Spares

Contractor to provide a list of recommended spare with associated costs

5.3 Training

Contractor to allow for services of Woodward FSR to provide 2, ~~2 day sessions with 2 trainers~~ **1 day sessions with 1 trainer** for ships crew . Training materials to be supplied for 6 persons per shift with details of additional cost per person above the required 6 persons per shift.