Canadian Coast Guard | Garde côtière canadienne

Canadian Coast Guard
Maritimes Region

CCGS EARL GREY

VLE SUPPLEMENTAL REFIT SPECIFICATION

Version – 1

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1A 3N0090 FM200 FIRE SYSTEM TCMSB INSPECTION

1A.1.
The vessel's fixed fire detection systems are to be inspected and serviced by certified personnel. System is a Kidde Marine FM200.

1A.2.
Prior to the commencement of any and all work, the contractor shall lock out the equipment. The contractor shall install /remove locks and tags accordingly during the scope of work. The contractor shall supply and install their own locking devices and retain all keys during the scope of this work.

1A.3.
The galley ANSUL R 102 system is to be inspected and serviced by certified personnel.

1A.4.
The vessel's FM200 system components are listed below:

Main Engine Room
- pull station located at entrance to engine room
- pull station located in the aft cargo hold
- 2 x 1010 ADS main engine room space
- 2 x 225 lbs ADS engine room bilge
- 2 x 225 lbs ADS exhaust casing
- 200 lbs ECS machinery control room
- 125 lbs ECS sewage compartment
- 125 lbs ECS workshop

Emergency Generator room

- pull station located directly outside the space
- 125 lbs ECS

Incinerator Room - pull station located directly outside the space

- 40 lbs ECS

Bowthruster Compartment

- pull station located directly above the space at bottom of stairs
- 350 lbs ECS

Electronic and Battery Room

- pull station located directly outside the space
- 40 lbs ECS electronics room
- 20 lbs ECS battery room

Crawl Space Under Bridge

- pull station located at the top of the bridge of stairs
- 4 x 40 lbs ECS

Paint Locker and Bosun's Stores

- pull station located directly outside the space
- 70 lbs ECS
-

Steering Gear

- pull station located directly outside the space (bulkhead access)
- 200 lbs ECS

Fore Peak Stores

- pull station located at the space
- 200 lbs ECS

1A.5.
All weights, levels, and pressures of cylinders to be measured and recorded.

1A.6.
All rotating beacons and flashing lights are to be tested and proven in good working order.

1A.7.
All audible alarms are to be tested and proven in good working order.

1A.8.
All wires and cables to be proven in good working order.

1A.9.
All piping and nozzles to be proven clear.

1A.10.
Any defects found are to be corrected by submitting a PWGSC Form 1379.

1A.11.
Certification in two (2) copies to be passed to TA on completion of work.

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2A 3N0090 Fire Detection System TCMSB Survey

2A.1.
The vessel's fixed fire detection system shall be inspected and certified by a Class approved, certified marine systems inspection agency. System is a Notifier NFS-640, list of components are in the Technical Data Package.

2A.2.
The contractor shall install /remove locks and tags accordingly during the scope of work. The contractor shall supply and install their own locking devices and retain all keys during the scope of this work.

2A.3.
The vessel's fire detection system consists of the following:

70 Smoke Detectors
7 Heat Detectors (rate of rise)
15 Heat Detector (fixed)
13 Pull Station
9 Monitor
8 Bells
1 General Alarm Activation
1 Fire Door Activation

Refer below for component locations.

2A.4.
All the above components shall be tested including a power supply inspection and emergency power supply inspection, Annunciation test and Inspection, control unit test and inspection.

2A.5.
All rotating beacons and flashing lights are to be tested and proven in good working order.

2A.6.
All audible alarms are to be tested and proven in good working order.

2A.7.

Any defects found are to be corrected by submitting a PWGSC Form 1379.

2A.8.
Certification in two paper copies to be passed to TA on completion of work.

NOTE: Powering down the system: Turn DC power off first and AC off last.
Powering up the system: AC power first and DC last.

All Current Detectors

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SLC Loop	Device Address	Type Code Label	Custom Label	Extended Label	Pre-Alarm Sensitivity	Fire Alarm	Cooperative Detector Mode	Alarm Verification Participation	Control-By-Event
1	1	Smoke(Photo)	WHEELHOUSE AFT	WHEELHOUSE	1	9	None(N)	No	Z1
1	2	Smoke(Photo)	WHEELHOUSE FWD	WHEELHOUSE	1	9	None(N)	No	Z1
1	3	Smoke(Photo)	CRAWLSPACE STBD	WHEELHOUSE	1	9	None(N)	No	Z1
1	4	Smoke(Photo)	CRAWLSPACE FWD	WHEELHOUSE	1	9	None(N)	No	Z1
1	5	Smoke(Photo)	CRAWLSPACE PORT	WHEELHOUSE	1	9	None(N)	No	Z1
1	7	Smoke(Photo)	CRAWLSPACE AFT	WHEELHOUSE	1	9	None(N)	No	Z1
1	8	Smoke(Photo)	ELECTRONIC RM	FOCSLE DK	1	9	None(N)	No	Z1
1	9	Smoke(Photo)	STAIRS	FOCSLE DK	1	9	None(N)	No	Z1
1	10	Smoke(Photo)	UPPER FAN ROOM	FOCSLE DK	1	9	None(N)	No	Z1
1	11	Smoke(Photo)	DECK LOCKER	FOCSLE DK	1	9	None(N)	No	Z1
1	12	Smoke(Photo)	CHIEF OFFICER	FOCSLE DK	1	9	None(N)	No	Z1
1	13	Smoke(Photo)	PASSAGE FWD	FOCSLE DK	1	9	None(N)	No	Z1
1	14	Smoke(Photo)	CHIEF ENGINEER DAYRM	FOCSLE DK	1	9	None(N)	No	Z1
1	15	Smoke(Photo)	CHIEF ENGINEER BEDRM	FOCSLE DK	1	9	None(N)	No	Z1
1	16	Smoke(Photo)	CAPTAIN BEDRM	FOCSLE DK	1	9	None(N)	No	Z1
1	17	Smoke(Photo)	CAPTAIN DAYRM	FOCSLE DK	1	9	None(N)	No	Z1
1	18	Smoke(Photo)	SEN ENGINEER CABIN	FOCSLE DK	1	9	None(N)	No	Z1
1	19	Smoke(Photo)	LOG OFFICER CABIN	FOCSLE DK	1	9	None(N)	No	Z1

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SLC Loop	Device Address	Type Code Label	Custom Label	Extended Label	Pre-Alarm Sensitivity	Fire Alarm	Cooperative Detector Mode	Alarm Verification Participation	Control-By-Event
1	20	Smoke(Photo)	PASSAGE AFT	FOCSLE DK	1	9	None(N)	No	Z1
1	21	Smoke(Photo)	PORT PASSAGE AFT	BOAT DECK	1	9	None(N)	No	Z1
1	22	Smoke(Photo)	2ND OFFICER CABIN	BOAT DECK	1	9	None(N)	No	Z1
1	23	Smoke(Photo)	3RD OFFICER CABIN	BOAT DECK	1	9	None(N)	No	Z1
1	24	Smoke(Photo)	QUARTERMASTERS CABIN	BOAT DECK	1	9	None(N)	No	Z1
1	25	Smoke(Photo)	WINCHMENS CABIN	BOAT DECK	1	9	None(N)	No	Z1
1	26	Smoke(Photo)	PORT PASSAGE FWD	BOAT DECK	1	9	None(N)	No	Z1
1	27	Smoke(Photo)	SEAMENS CABIN PORT	BOAT DECK	1	9	None(N)	No	Z1
1	28	Smoke(Photo)	SHIPS OFFICE FWD	BOAT DECK	1	9	None(N)	No	Z1
1	29	Smoke(Photo)	GYM/FWD STORES STBD	BOAT DECK	1	9	None(N)	No	Z1
1	30	Smoke(Photo)	GYM/FWD STORES PORT	BOAT DECK	1	9	None(N)	No	Z1
1	31	Smoke(Photo)	ENG TECHNICIAN CAB	BOAT DECK	1	9	None(N)	No	Z1
1	32	Smoke(Photo)	STBD PASSAGE FWD	BOAT DECK	1	9	None(N)	No	Z1
1	33	Smoke(Photo)	2ND ENGINEER CABIN	BOAT DECK	1	9	None(N)	No	Z1
1	34	Smoke(Photo)	3RD ENGINEER CABIN	BOAT DECK	1	9	None(N)	No	Z1
1	35	Smoke(Photo)	COOKS CABIN	BOAT DECK	1	9	None(N)	No	Z1
1	36	Smoke(Photo)	BOSUN CABIN	BOAT DECK	1	9	None(N)	No	Z1
1	37	Smoke(Photo)	STBD PASSAGE AFT	BOAT DECK	1	9	None(N)	No	Z1
1	38	Smoke(Photo)	FWD STAIRS	BOAT DECK	1	9	None(N)	No	Z1
1	39	Smoke(Photo)	SEAMEN CABIN CENTRE	BOAT DECK	1	9	None(N)	No	Z1

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SLC Loop	Device Address	Type Code Label	Custom Label	Extended Label	Pre-Alarm Sensitivity	Fire Alarm	Cooperative Detector Mode	Alarm Verification Participation	Control-By-Event
1	40	Smoke(Photo)	ENGINEERING OFFICE	BOAT DECK	1	9	None(N)	No	Z1
1	41	Smoke(Photo)	STEWARDS LOCKER	BOAT DECK	1	9	None(N)	No	Z1
1	42	Smoke(Photo)	MAIN STAIRS	BOAT DECK	1	9	None(N)	No	Z1
1	44	Heat(Rate of Rise)	OFFICERS DINING FWD	MAIN DECK	Fixed	Fixed	None(N)	No	Z2
1	45	Heat(Rate of Rise)	OFFICERS DINING AFT	MAIN DECK	Fixed	Fixed	None(N)	No	Z2
1	46	Smoke(Photo)	CENTRAL STORE	MAIN DECK	1	9	None(N)	No	Z1
1	47	Heat(Fixed)	LAUNDRY RM	MAIN DECK	Fixed	Fixed	None(N)	No	Z2
1	48	Smoke(Photo)	BOSUN STORES	MAIN DECK	1	9	None(N)	No	Z1
1	49	Smoke(Photo)	PORT AFT PASSAGE	MAIN DECK	1	9	None(N)	No	Z1
1	51	Smoke(Photo)	MAIN STAIRS	MAIN DECK	1	9	None(N)	No	Z1
1	52	Heat(Fixed)	BOSUNS WORKSHOP	MAIN DECK	Fixed	Fixed	None(N)	No	Z2
1	53	Smoke(Photo)	EMERG GEN SWBD PORT	MAIN DECK	1	9	None(N)	No	Z1
1	56	Heat(Rate of Rise)	CREW MESS	MAIN DECK	Fixed	Fixed	None(N)	No	Z2
1	57	Heat(Rate of Rise)	CREW LOUNGE	MAIN DECK	Fixed	Fixed	None(N)	No	Z2
1	58	Smoke(Photo)	CANTEEN	MAIN DECK	1	9	None(N)	No	Z1
1	59	Smoke(Photo)	DAY WORKING OILER	MAIN DECK	1	9	None(N)	No	Z1
1	60	Smoke(Photo)	STBD FWD PASSAGE	MAIN DECK	1	9	None(N)	No	Z1
1	61	Smoke(Photo)	2 CADETS CABIN	MAIN DECK	1	9	None(N)	No	Z1
1	62	Smoke(Photo)	SEAMAN CABIN PORT	MAIN DECK	1	9	None(N)	No	Z1
1	63	Smoke(Photo)	STOREKEEPER CABIN	MAIN DECK	1	9	None(N)	No	Z1

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SLC Loop	Device Address	Type Code Label	Custom Label	Extended Label	Pre-Alarm Sensitivity	Fire Alarm	Cooperative Detector Mode	Alarm Verification Participation	Control-By-Event
1	64	Smoke(Photo)	2ND COOK & STEWARD	MAIN DECK	1	9	None(N)	No	Z1
1	65	Smoke(Photo)	PORT PASSAGE FWD	MAIN DECK	1	9	None(N)	No	Z1
1	66	Smoke(Photo)	FWD STAIRS	MAIN DECK	1	9	None(N)	No	Z1
1	67	Heat(Fixed)	GALLEY COOKING AREA	MAIN DECK	Fixed	Fixed	None(N)	No	Z2
1	70	Heat(Rate of Rise)	GALLEY PREP AREA	MAIN DECK	Fixed	Fixed	None(N)	No	Z2
1	75	Smoke(Photo)	FIRST AID LOCKER	MAIN DECK	1	9	None(N)	No	Z1
1	76	Smoke(Photo)	MEDICAL LOCKER	MAIN DECK	1	9	None(N)	No	Z1
1	77	Smoke(Photo)	CLEAN LINEN LOCKER	BOAT DECK	1	9	None(N)	No	Z1
1	78	Smoke(Photo)	FAN ROOM FWD	BOAT DECK	1	9	None(N)	No	Z1
1	79	Smoke(Photo)	OFFICE STORES	BOAT DECK	1	9	None(N)	No	Z1
2	1	Smoke(Photo)	ENGINE CONTROL RM	ENGINE RM	1	9	None(N)	No	Z1
2	2	Smoke(Photo)	SWB SECTION 4	ENGINE RM	1	9	None(N)	No	Z1
2	3	Smoke(Photo)	SWB SECTION 3	ENGINE RM	1	9	None(N)	No	Z1
2	4	Smoke(Photo)	SWB SECTION 2	ENGINE RM	1	9	None(N)	No	Z1
2	5	Smoke(Photo)	SWBD SECTION 1	ENGINE RM	1	9	None(N)	No	Z1
2	6	Heat(Rate of Rise)	SEWAGE COMPARTMENT	ENGINE RM	Fixed	Fixed	None(N)	No	Z2
2	7	Heat(Fixed)	GEN #1 PORT	ENGINE RM	Fixed	Fixed	None(N)	No	Z2
2	8	Heat(Fixed)	MAIN ENGINE #1 PORT	ENGINE RM	Fixed	Fixed	None(N)	No	Z2
2	11	Heat(Fixed)	CARGO HOLD PORT	ENGINE ROOM	0	9	None(N)	No	Z2
2	13	Heat(Rate of Rise)	STEERING GEAR	ENGINE ROOM	0	9	None(N)	No	Z2

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SLC Loop	Device Address	Type Code Label	Custom Label	Extended Label	Pre-Alarm Sensitivity	Fire Alarm	Cooperative Detector Mode	Alarm Verification Participation	Control-By-Event
2	14	Heat(Fixed)	CARGO HOLD STBD	ENGINE ROOM	0	9	None(N)	No	Z2
2	15	Heat(Fixed)	TWEEN DK PORT	ENGINE RM	Fixed	Fixed	None(N)	No	Z2
2	17	Heat(Fixed)	TWEEN DK STBD	ENGINE RM	Fixed	Fixed	None(N)	No	Z2
2	18	Heat(Fixed)	AT GEARBOX STBD	BELOW TWEEN	0	9	None(N)	No	Z2
2	19	Heat(Fixed)	AT GEARBOX PORT	BELOW TWEEN	0	9	None(N)	No	Z2
2	20	Heat(Fixed)	MAIN ENGINE #2 STBD	ENGINE RM	Fixed	Fixed	None(N)	No	Z2
2	21	Heat(Fixed)	GEN #2 STBD	ENGINE RM	Fixed	Fixed	None(N)	No	Z2
2	22	Heat(Fixed)	WORKSHOP STBD	ENGINE RM	Fixed	Fixed	None(N)	No	Z2
2	23	Smoke(Photo)	DRY STORES STBD	BELOW MAIN	1	9	None(N)	No	Z1
2	24	Smoke(Photo)	DRY STORES PORT	BELOW MAIN	1	9	None(N)	No	Z1
2	25	Heat(Fixed)	BOWTHRUSTER COMP	BOWTHRUSTER	Fixed	Fixed	None(N)	No	Z2
2	40	Smoke(Photo)	PORT GEN SWBD FWD	ENGINE RM	1	9	None(N)	Yes	Z1
2	41	Smoke(Photo)	PORT GEN SWBD AFT	ENGINE RM	1	9	None(N)	Yes	Z1
2	42	Smoke(Photo)	STBD GEN SWBD FWD	ENGINE RM	1	9	None(N)	Yes	Z1
2	43	Smoke(Photo)	STBD GEN SWBD AFT	ENGINE RM	1	9	None(N)	Yes	Z1

FIRE

All Current Modules

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Modules

SLC Loop/ Panel	Device Address/ Point	Type Code Label	Flash Scan Type	Custom Label	Extended Label	Switch Inhibit	Silenceable	Walk Test Participation	Control-By-Event
1	1	Pull Station		WHEELHOUSE STAIR TWR	WHEELHOUSE	No	No	No	ZZ
1	2	Pull Station		MAIN STAIRS	FOCSLE DECK	No	No	No	ZZ
1	3	Pull Station		PORT PASSAGE EXIT	BOAT DECK	No	No	No	ZZ
1	4	Pull Station		BOSUN STORE EXIT	BOAT DECK	No	No	No	ZZ
1	5	Pull Station		STBD PASSAGE EXIT	BOAT DECK	No	No	No	ZZ
1	6	Pull Station		FWD PORT PASS EXIT	MAIN DECK	No	No	No	ZZ
1	7	Pull Station		AFT PORT PASS EXIT	MAIN DECK	No	No	No	ZZ
1	8	Pull Station		CREW MESS EXIT	MAIN DECK	No	No	No	ZZ
1	40	Monitor		GALLEY HOOD SYSTEM	MAIN DECK	No	No	No	ZZ
1	45	Heat Detect	MINI/DUAL	FWD VOID SPACE	MAIN DECK	N/A	N/A	No	ZZ
1	50	Heat Detect		BATTERY LOCKER	FOCSLE DECK	No	No	No	ZZ
1	55	Heat Detect		EMERGENCY GEN ROOM	MAIN DECK	No	No	No	ZZ
1	92	Monitor		MAIN ENGINE RM HALON	ENGINE ROOM	No	No	No	ZZ
1	93	Monitor		INCINERATOR RM HALON	MAIN DECK	No	No	No	ZZ
1	94	Heat Detect		INCINERATOR RM	MAIN DECK	No	No	No	ZZ
1	95	Monitor		EMERG GEN RM HALON	MAIN DECK	No	No	No	ZZ

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SLC Loop/ Panel	Device Address/ Point	Type Code Label	Flash Scan Type	Custom Label	Extended Label	Switch Inhibit	Silenceable	Walk Test Participation	Control-By-Event
1	96	Heat Detect		PAINT LOCKER	MAIN DECK	No	No	No	Z2
1	97	Monitor		CONTROL RM HALON	MAIN DECK	No	No	No	Z2
1	98	Monitor		PAINT LOCKER HALON	MAIN DECK	No	No	No	Z2
1	99	Monitor		ELECTRONIC RM HALON	FOCSLE DECK	No	No	No	Z2
2	2	Pull Station		TWEEN DK E/R STAIRS	ENGINE RM	No	No	No	Z2
2	3	Pull Station	MINI/DUAL	CARGO HOLD EXIT	ENGINE ROOM	N/A	N/A	N/A	Z2
2	5	Pull Station	MINI/DUAL	GALLEY STORES EXIT	BELOW MAIN	N/A	N/A	N/A	Z2
2	8	Pull Station		CONTORL ROOM	ENGINE RM	No	No	No	Z2
2	9	Pull Station		BOW THRUSTER EXIT		No	No	No	Z2
2	30	Heat Detect		STERN THRUSTER	ENGINE ROOM	No	No	No	Z2

Bell Circuits

1	Bell Circuit	No	Yes - Fire	Yes	Z1,Z2	
2	Bell Circuit	No	No	No	Z1,Z2	
3	Bell Circuit	FIRE DOOR ACTIVATE	No	No	No	Z1,Z2
4	Bell Circuit	GENERAL ALARM RELAY	ACTIVATE	No	Yes - Fire	Yes	Z2,Z1

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3A 3N0090 Portable Fire Extinguishers TCMSB Survey

3A.1.

The extinguishers are to be weighed, inspected, and tagged for re-certification by a qualified service agency.

3A.2.

Type and quantity of extinguishers are listed below:

#	Location	Type (lbs)	S/N	Hydro due	Date MFG.	Min lbs
1	Bridge, forward of stairs	5 CO2	X703890	08/2016	2001	**11.7**
2	Bridge, forward of flag locker	5 CO2	X589922	10/2016	2006	**12.6**
3	Foc'sle Deck, Fire Stn #2	10 ABC	286633		2008	-
4	Boat Deck, Fire Stn #4	20 ABC	482371		1979	-
5	Boat Deck, Fire Stn #5	10 ABC	539795		2006	-
6	Main Deck, Fire Stn #6	10 ABC	547523		2006	-
7	Main Deck, Fire Stn #7	10 ABC	839111		2006	-
8	Main Deck, Galley	6L K Class	950	10/2017	2002	-
9	Fridge Compressor Flat	10 ABC	513004		2005	-
10	Bow Thruster Compartment	10 ABC	285113		2008	-
11	Main Deck, outside Laundry Room	10 ABC	838959		2006	-
12	Main Deck, Deck Workshop	10 ABC	970008		2008	-
13	Main Deck, Fire Stn #9	10 CO2	154403	06/2018	1984	**28.8**
14	Main Deck, Emergency Gen. Room	10 ABC	539798	10/2016	2006	-
15	Main Deck, Emergency Gen. Room	5 CO2	590667	11/2016	2001	**12.6**
16	Liebherr Crane, Upper Level	10 ABC	543776		2006	-
17	Liebherr Crane, Lower Level	10 ABC	547638		2006	-
18	Liebherr Crane, Lower Level	10 CO2	942058		2009	**23**
19	Liebherr Crane, Crane Base above door	10 CO2	381351	10/2017	1998	**23.4**
20	Main Deck, Entrance to Engine Room	20 ABC	580685		2008	-
21	Main Deck, Entrance to Engine Room	10 CO2	42060		2009	**23.4**
22	E/R Forward, bottom of stairs on bulkhead	10 ABC	45131		2001	-
23	MCR Port	5 CO2	590893	11/2016	2001	**12.6**
24	MCR Starboard	5 CO2	X672574	04/2016	2001	**11.7**
25	Engine Rm Workshop Aft	20 ABC	580694		2008	-
26	Firewatch, ER Workshop	10 CO2	20708	10-2017	-	**38.7**
27	Firewatch, ER Fwd Fuel Purifier	10 CO2	73593	11/2016	-	**23**
28	ER Stbd, Fire Stn#11, Outboard of	20 ABC	580695		2008	-

	S/S Gen.					
29	ER Port by F/W Distiller	20 ABC	580676		2008	-
30	ER Port, inboard of RO Unit	10 CO2	10-552	11/2016	-	33.3
31	ER between ME2 & ME3	20 ABC	580675		2008	-
32	ER Aft of ME 3, Fire Station #12	20 ABC	580678		2008	-
33	ER Auxiliary Flat, Top of Stairs	15 CO2	124711	10/2017	1982	**36.9**
34	ER Auxiliary Flat, Starboard	5 CO2	590903	11/2016	2001	**12.6**
35	Cargo Hold, Fwd.	10 ABC	663931		2007	-
36	Cargo Hold Aft	10 ABC	997240		2009	-
37	Steering Gear Compartment	20 ABC	580686		2008	-
38	Electronic Equipment Room	15 CO2	24458	10/2017	-	**41.4**
39	Incinerator Room	2.5 ABC	939287		2007	-
40	Sewage System Room	10 CO2	751428	11/2016	2001	**21.7**
SP41	Emergency Locker	10 CO2	535	01/2015		**32.4**
SP4	Deck Workshop	15 CO2	5742	02/2014	2009	**32.4**
FRC2	Workboat Aft Locker	10 ABC	950768		2010	-
FRC2	Workboat Aft Locker	5 ABC	17203			-
FRC1	Rescue Boat – Aft Storage Locker	10 ABC	764391		2010	-
FRC1	Rescue Boat – Aft Storage Locker	5 ABC	303448			-
SPB	SP Barge - Emerg. Gen. Rm.	10 ABC	56383		2008	-
SP1	Emergency Locker	10 ABC	539771		2006	-
SP2	Emergency Locker	10 ABC	15163		2006	-
SP3	Emergency Locker	10 ABC	217547		2008	-
SP42	Emergency Locker	15 CO2	74364	01/2015	1987	**32.4**
SP5	Emergency Locker	20 ABC	BM-754080		2007	-
SP5A	Emergency Locker	20 ABC	374971		2013	-
SP6	Emergency Locker	10 ABC	898803		2008	-
SP7	Emergency Locker	10 ABC	15191		2006	-
SP8	Emergency Locker	20 CO2	554302	10/2017	2006	**41.4**
SP9	Emergency Locker	2.5 ABC	343026		2008	-
SP10	Emergency Locker	20 CO2	438534	10/2017	2005	**41.4**
SP11	Emergency Locker	10 ABC	221822		2012	-

3A.3.
The portable extinguishers in the lifeboat and FRC's shall be inspected and certified at this time.

3A.4.
Two copies of certificates of inspection and tests are to be turned over to TA.

3A.5.
Portable extinguishers shall remain operational and onboard the vessel at all times, except when being serviced. Any extinguishers that are required to be sent out for the purpose of recharging, repairs or testing, are to be replaced with temporary extinguishers of the same type and size provided by Contractor. Time required to carry out this work is to be kept to a minimum.

3A.6.
Any additional service work shall be performed after submitting a PWGSC Form 1379 for approval.

3A.7.
All work shall be completed to satisfaction of TA.

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4A 3L030, 3L031 BALLAST TANKS TCMSB SURVEY

4A.1
The following ballast tanks are to be opened up, cleaned, inspected and tested for TCMSB survey. Contractor shall arrange with TCMSB for the witnessing of hydrostatic test and inspections.

Tank Designator	Location	Capacity
No. 5 Port Ballast Tank	Fr. 10-17	38.89 m^3
No. 5 Stbd Ballast Tank	Fr. 10-17	38.89 m^3

4A.2
Contractor to note that these tanks are fitted with PSM icT1000 tank level sensors which are not functioning. Contractor must replace these sensors. Functioning condition of these sensors to be recorded before and the new ones to be commissioned and checked for manufacturer's performance after completion of work.

4A.3
Tanks shall be filled with water by the Contractor and then subjected to a hydrostatic test to TCMSB requirements. Any removal or modification of vents that is required to carry out these hydrostatic tests shall be contractor responsibility. Following the completion of all hydrostatic tests, Contractor must dispose of tank contents in accordance with all Federal, Provincial and Municipal regulations. Disposal certificates must be provided to the TA.

4A.4
Prior to entry, each tank is to have its cover removed and is to have suction ventilation applied from as low a point in the tank as is practical. Prior to any entry, tanks are to be certified "Safe for Workers" or "Safe for Hot Work". Copies of gas-free certificates are to be posted at each tank entrance, the access gangway, and one copy to be provided to TA.

4A.5
Tanks are to be high pressure water washed (3,000 psi fresh water) with a mixture of 50:1 Holdtight 102® Solution from Vapcor Inc.(contractor supplied).

This action will de-salinate all surfaces and prevent flash rusting, while removing all loose deposits to allow viewing of tank/coating condition. Contractor responsible for removal and disposal of all cleaning water, sludge and debris generated by cleaning process in accordance with all Federal, Provincial and Municipal regulations. Disposal certificates must be provided to the TA. Contractor, TA, and TCMS will perform tank inspections.

Recommended VAPCOR INC. representative is:
Barry Schnare
55 Akerley Blvd, Dartmouth, NS
Direct: 902-480-3011
Email: barry.schnare@kdpratt.com

4A.6
Contractor is to ensure that all sounding and suction pipes are free and clear as well as all limber holes in the floors, stringers and webs so as to allow for proper drainage.

4A.7
For bidding purposes, an allowance of 4.0 cubic meters of waste product to be removed from these tanks shall be included. Contractor is to quote a cost per 100 liters of waste fluid removal for adjustment purposes.

4A.8
Each tank is to be inspected by TA after cleaning, prior to and after any coating application. Tanks to be inspected by TA and TCMS**,** and TCMS documentation provided to record the successful inspection of the tanks.

4A.9
Following accepted visual inspections, all areas of coating loss, breakdown, or blistering as identified by TA, are to be scaled and mechanically cleaned to SSPC-SP2 and SSPC-SP3 standards. All areas so prepared are to extend out to sound, intact coating tightly adhered to steelwork. Intact coating around perimeter edges of prepared areas are to be generously feathered. Tanks are then to be thoroughly cleaned and wiped down to remove any and all grit, dirt, debris, and any other solid or liquid contamination that may be present, prior to coating application. TA to perform an additional inspection of affected tanks prior to application of repair coatings.

Contractor to quote on preparation and coating of 100m^2 of tank surface area and to quote a rate per square meter for adjustment purposes.

4A.10
Contractor shall supply all coating products. All prepared areas of steel to have coating system applied, as follows, according to the coating manufacturers instructions.

Recommended WASSER coatings representative is:
Barry Schnare
55 Akerley Blvd, Dartmouth, NS
Direct: 902-480-3011
Email: barry.schnare@kdpratt.com

a) Spot prime of all prepared steel areas with WASSER MC-Miozinc 100, 3mil DFT
b) Intermediate coat of WASSER MC-Tar 100 Black, 6mil DFT
c) Topcoat of WASSER MC-Tar 100 Red, 6mil DFT
d) See Appendix F for product data sheets

4A.11
Contractor shall supply and maintain good ventilation during all stages of this work in compliance with the manufacturer's requirements.

4A.12
Upon completion and curing of the coating system, and inspection by TA, the tanks are to be sealed using new ¼" neoprene manhole gaskets with center removed (contractor supply) and marine grade anti-seize compound applied to all fasteners. **No use of power tools shall be permitted to tighten the fasteners.** Any disturbed vent lines shall be re-installed with new gasket material suitable for the liquid contents of the tanks.

4A.13
All work to be to the satisfaction of the TA and TCMS.

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5A 3L033 FUEL TANKS TCMSB SURVEY

5A.1
The following fuel tank is to be opened up by the Contractor for cleaning, survey and testing to TCMSB requirements. Contractor is responsible for obtaining and posting the "gas free" certificates.

Tank Designator	Location	Capacity
#3 F/O Tank Center	Fr 10 - 16	74.58 m3

5A.2
Tank will have approximately two cubic meters of residual fuel oil in the tank which is to be removed and disposed of by the Contractor in accordance with all Federal, Provincial and Municipal regulations. Disposal certificates must be provided to the TA. Contractor is to quote a cost per unit price per 100 liters for adjustment purposes.

5A.3
Prior to entry, the tank is to have the man hole covers removed and is to have suction ventilation applied from as low a point in the tank as is practical. Prior to any entry, tanks are to be certified "Safe for Workers" or "Safe for Hot Work". Copies of gas-free certificates are to be posted at each tank entrance, the access gangway, and one copy to be provided to the TA.

5A.4
Tanks are to be high pressure washed (3000 psi) with hot water (70 degrees C minimum). Contractor is to arrange own supply of hot water. Hot water will not available from the vessel. Tanks are to be thoroughly cleaned of all grit, dirt, residual fuel and other solid or liquid contamination that may be present. Contractor to remove and dispose of all liquids, sludge and debris produced by cleaning operation. Copies of disposal certificates are to be provided to the TA.

5A.5
After initial cleaning, a visual inspection of tank internals is to be performed by Contractor, TA and TCMS.

5A.6
Testing requirement will be determined by TCMSB inspector upon completion of inspection at Article 5A5. Contractor to quote separately unit cost of both hydrostatically testing and air testing these tanks and include in his bid the highest cost of both and will be subject to an adjustment by submitting a PWGSC 1379 Form for approval.

5A.7
Quoted cost of hydrostatic test is to include all necessary requirements of such a test including, but not limited to, closing and sealing of tank, filling, removal and disposal of test water (fresh water), re-opening, ventilating and re-certifying the tank safe for entry, renewal of any disturbed jointing etc. for blanking purposes and return of the tank to a serviceable condition in all respects.

5A.8
Quote for air test is to assume a test pressure of 3 psi and is to include, but not be limited to, all necessary requirements to close and seal tank, supply and connection of suitable pressure monitoring instrument, supply and connection of air supply, removal of test equipment, re-opening, ventilating and re-certifying the tank safe for entry, renewal of any disturbed joining for blanking purposes and returning the tank to a serviceable condition in all respects.

5A.9
Contractor to note that fuel tanks have a common vent/overflow system. Any blanking off of vent/overflow line connections, or modification to the vent lines, is to be the contractor's responsibility.

5A.10
Testing the fuel tanks with a head of fuel oil will not be acceptable.

5A.11 After completion of initial cleaning operation and any test requirements, all tank internal areas are to be sprayed with a dilute, 10/90 solution of 5.25% sodium hypochlorite (Javex or equivalent) in water. This solution is to be allowed to sit on tank surfaces for a minimum of 30 minutes after which tanks are to be once again hosed down with fresh water. Contractor to remove and dispose of all cleaning solution and rinse water in accordance with all Federal, Provincial and Municipal regulations. Disposal certificates must be provided to the TA.

5A.12

After completion of disinfection all tank internal areas are to be thoroughly dried by hand wiping and/or the use of dry air, forced ventilation.

5A.13
A final tank inspection is to be carried out by TA, TCMS and the Contractor before closure.

5A.14
Upon completion of all specified work and inspections, all tanks are to be closed up in good order using new neoprene gaskets on manhole covers and anti-seize compound on fasteners (Contractor supply). Any disturbed connections to the tanks are to be returned to an in service state with new jointing.

5A.15
All work to be completed to the satisfaction of the TA .and TCMS.

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6A 3N0050 LIFE RAFT ANNUAL INSPECTION AND CERTIFICATION

6A.1.
The following inflatable liferafts are to be removed from vessel within the first 7 days and delivered to the service depots certified by each applicable raft manufacturer for inspection, repair and re-certification of the rafts. Suggested Service depot is Spartan Industrial Marine – Dartmouth. Contractor shall include an allowance of $10,000.00 for the inspection service of all rafts. On completion of the work, the rafts are to be re-installed onboard the vessel in their designated rack positions.

Liferaft No.1	20 person	Surviva	S/N P7649	(Stbd)
Liferaft No.2	20 person	Surviva	S/N P3246	(Stbd)
Liferaft No.3	20 person	Surviva	S/N P3233	(Stbd)
Liferaft No.1	20 person	Surviva	S/N P7620	(Port)
Liferaft No.2	20 person	Surviva	S/N P7605	(Port)
Liferaft No.3	20 person	Surviva	S/N P7604	(Port)
Liferaft SAR	12 person	Surviva	S/N B01466	(Port)
Liferaft Barge	6 person	Surviva T/O	S/N B01476	(Towing Compt)

6A.2.
Contractor is responsible for removal, transportation, re-install and crane services for the operations described in line 6A.1.

6A.3.
TA to inspect the condition of all fiberglass shells for each raft prior to re-install on the vessel. TA to inspect all securing hardware upon final re-install of all rafts onboard the vessel.

6A.4.
Certificates to be given to the TA on completion of the inspections and testing.

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7A 3JJ030 AIR SAFETY VALVES

7A.1
Contractor is to remove the following eight (8) valves and send out for inspection and testing to API Standard 527 by technicians qualified to do such testing. Please refer to Section 21 of the Technical Data Package for Compressed Air System drawings.

Air to S/S Gens	6010DC01	½"	145 PSI	339 scfm	MVU26261-5
Service Air	19MDCK102	½"	102 psi	246 scfm	41271
Main System Air Receiver	913BEDM03	¾"	400 psi	1579 scfm	650500101
Main Air Receiver #1	961100MD	½"	400 psi	894 scfm	06/54404
Main Air Receiver #2	961100MD	½"	400 psi	894 scfm	06/54405
Main Air Receiver #3	961100MD	½"	400 psi	894 scfm	06/50350
Emergency Generator Receiver	523DDKMA A0400	¾"	400 psi	928 scfm	41270
Air to Emergency Generator	6010ED	¾"	147 psi	610 scfm	MVU26261-7

7A.2
The Contractor, supervised by the IA, must isolate and apply all required lock-outs for the compressed air system while safety valves are removed from service. Contractor shall notify TA 12 hours prior to scheduled removal of valves.

7A.3
The TA is to be notified of any valves that do not test successfully. Any additional work must be identified after submitting a PWGSC Form 1379 for approval.

7A.4
On completion of recertification, the valves are to be re-installed in their original locations.

7A.5
Test certificates to be provided for each valve. One copy of certificates shall be supplied to TA prior to re-install of each valve into its respective system location.

7A.6
All work is to be completed to the satisfaction of the TA.

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8A 3EE010 ANNUAL MEGGER TESTING

8A.1
The Contractor must perform the inspections and tests required by Sections 34.5 and 34.6, 33.7, 33.8, and 33.13 under the latest revision of TP 127E Ships Electrical Standards and present a written report to TCMS for approval**.** Inspections and tests must be done on all essential equipment and circuits required by TCMS as well as those other items of equipment and circuits identified in the referenced list of Earl Grey Megger Tables after Article 8A.5.

8A.2
The Contractor must perform mega-ohm insulation examinations of the electrical distribution system, machines and equipment to all the requirements of TCMS and for TCMS survey credit.

8A.3
Circuits not to be megger are those with either navigation equipment or electronic components. The generator breakers are to have their electronic components isolated before they are megger.

Any low readings or defects are to be brought immediately to the attention of the TA. Any repairs will be carried out after submitting a PWGSC Form 1379**.**

8A.4
The Contractor must submit to TCMS, the Inspection Authority, and the Technical Authority a complete preliminary report of the insulation resistances found in MS-Excel format at least 4 weeks prior to the end of work period to permit time for any repairs required. The report must be presented in electronic formats in a new version of the Table 8-1 supplied, 1 copy in PDF format on separate CD-ROM media, and 3 copies on paper.

8A.5
All work to be carried out to the satisfaction of the TA.

TABLE 8-1

C.C.G.S. Earl Grey Meggar Readings Date:

Panel: Navigation Light Panel 115 Volt
Location: Bridge

Steering Light		Aft Anchor Light	
Forward Anchor Light		Aft Towing Light	
Lower NUC Light		Restricted Maneuver Light	
Upper NUC Light		Lower Fwd Towing Light	
Upper Fwd Towing Light		Stern Light	
After Mast Light		Starboard Side Light	
Port Side Light		Fwd Mast Light	

Panel: Distribution Panel 1M3 115 Volt
Location: Bridge

Port Search Light Heater		Coffee Maker	
Starboard Search Light		Receptacles Telephone	
W/H Recept Starboard		WheelHouse	
W/H Recept Port Fwd		Recept W/H Top	
Lights W/H Crawlspace		Lights Bridge deck	
Boat Deck Lights		Lights Focsle Deck	
Spare		Heli Bcon Tuner	
Main Deck Lights Port Aft		Focsle Deck Mast Floods	
Main Deck Lights Starboard Aft		Focsle Deck W/h Top	

Panel: Distribution Panel 1E3 115 Volt
Location: Bridge

Gyro Compass		Navigation Radar #2	
Int. Comm System		VHF-FM R/T Set #1 Wing	
VHF-AM R/T Set #1 & #2		Helicopter Beacon	
R/T Alarm Signal		Echo Sounder Starboard	
LF/MF/OF, Rudder Angle		VHF/DF Doppler Log	
2181 Watch Rec, Wind Spd		GPS	
Ice Breaking Siren		Air Whistle	
Tele Exchange Pbex		Eco Sounder Port	
S Band Scanner		Deckhead Digital Gyro	
Cell Phone Recep		Aux Chart Table Recept	

Panel: Navigation Aids Panel 1M10 115 Volt
Location: Bridge

Ships Enter System		Spare	
Prop Sys Rem Con TO Sys		Aft Radar Main Display	
Nav Radar #1		Spare	
TV/AM Antenna System		Loran C	
Aft Looking Radar		VHF-FM R/T Set #2	
W/H Console Recept		Spare	
Spare		HF-SSB R/T Set #2	
Comm Antenna		GRS R/T Set	
Fax System Time Signal		Bow Thruster Control	
Stern Thruster Control		Electric Clock	

Panel: Distribution Panel 1E4 115 Volt
Location: Bridge

W/H Emer Lights		Boat Deck 2nd Eng.	
Bridge Deck Compass		Foc Deck Pass Stair	
Bridge Deck Compass		Bridge Deck Starboard	

Bridge Deck Compass		Bridge Deck Starboard	
Focsle Deck Work Boat		Bridge Deck Port Aft	
Boat Deck Work Boat		Life Boat Foc Deck	
Sat Tranceiver		Life Boat Boat Deck Port	
PBX UPS		Battery Charger	
Sat C PS		HF PS	

Panel: Distribution Panel 2M5 230 Volt
Location: Bridge

Win Wiper De-icer Port		Win Wiper De-icer Starboard	
Win Wiper De-icer Mid		Win Wiper De-icer Mid	
Win Heaters Port For		Win Heaters Port Aft	
Win Heaters Starboard		Win Heaters Starboard	
Win Heaters Mid For		Heaters W/H Port For	
Heaters W/H Port Wing		Heaters W/H Starboard	
Heaters W/H Starboard		Heaters W/H Aft	
Spare		Ctl Pnl Mimic Pnl	
Spare		Dryer Off Washroom	
HVAC W/H Top Aft		HVAC W/H Top For	

Panel: Distribution Panel 1M4 115 Volt
Location: Focsle Deck

Supply Off Senior Eng		Chief Eng Comm Off	
Supply Off Senior Eng		Chief Eng Comm Off	
Chief Off AC Room		Corridor Passage	
Elec Equip Room Batt Rm		Corridor Passage	
Water Cooler		W/H Front Port &	
Laundry Room Focsle Deck		Am Amplifier Elec Equip	

Panel: 24 volt Distribution
Location: Electronic Equipment Room

Fire Detection System		Tow Winch Abort	
General Alarm		Fire Door Release	
W/T Door Ind. Panel		Master Clock	
Emer Gen Control Panel		Light on Binnacle	
Quick Close V/V Mimic Pnl		Anschutz Gyro System	

Panel: Distribution Panel 2M1 230 Volt
Location: Boat Deck Starboard.

Elec Rm & Foc Dk Passage		Ch Eng Dayroom	
Foc Dk Chief Off W C		C O Dayroom	
Cadets 2nd & 3rd Eng		Supply Off & Sen Eng	
2 Seamen Winchman		2nd Off Passageway	
2 Q/M Seamen & Q/M		Eng & Log Off Stew Lkr	
Cook/Bosun 2nd 3rd Off		Spare	

Panel: Distribution Panel 1M5 115 Volt
Location: Boat Deck Port

Life Boat Davit Heater		Bosun & Cook	
Corridor & Passage		Bosun & Cook	
Corridor & Passage		2nd Eng & 2nd Off	
Wman 2 Seaman 2 Q/M		2nd Eng & 2nd Off	
Wman 2 Seaman 2 Q/M		2 Cadets 3rd Eng 3rd Off	
Stew Lkr Eng & Ship Off		2 Cadets 3rd Eng 3rd Off	
Stew Lkr Eng & Ship Off		Gen Strs Void Spt Sys JB	
Open Deck Port &		Photocopier Recept	
UPS for Computers		Ships Office Computer	

Panel: Distribution Panel 1M9 115 Volt
Location: Galley

Coffee Maker		Food Slicer & Mixer	
Reach In Refer		Heater Mess	
Cold Pan		Garbage Compactor	
Spare		Canteen Refer	
Hot Plate Crews Refer		2 Slice Toaster Crews	
Hot Water Dispensor Off		2 Slice Toaster Off	
Hot Plate Off		D/F Crew/Off Mess	
Coffee maker Off		Milk & Juice Dispensers	
Hot Water Dis Crews Mess		Galley Exhaust Hood	

Panel: Distribution Panel 1M6 115 Volt
Location: Main Deck Port

2 stew 2nd Cook/Clerk		Off Mess & Lounge	
2 stew 2nd Cook/Clerk		Off Mess & Lounge	
2 E/R Watch For W C		Off Mess Projector	
Day Wrk 2 E/R Watch Lkr		Crews Mess Projector	
Winch Laundry Stores		Passage & Corridors	
Aft Dk P QM Port Bosuns		Passage & Corridors	
Aft Dk S QM Starboard Crews		Workshop	
Workshop Canteen		Workshop	

Panel: Distribution Panel 2M2 230 Volt
Location: Main Deck Port

Paint Locker		Off Mess & Central Stairs	
Bosun Stores		Officiers Lounge	
Laundry Cleanup		Fem WC 2 Stew 2 Sea 2nd	
Q/M Station Starboard		Cadets Cabin 2 Oilers	
Workshop		Galley	
Crews Lounge		Lavatory Forward	

Panel: Distribution Panel 1E0 115 Volt
Location: Emergency Generator Room

Emer Gen Heaters		Nav Lights Alt Supply	
1E3 to Nav Aids Panel #2		VHF Q/M Station	
E/R Lighting Panel 1E5		Asea battery Charger	
Fire Detection System		1E8 to 24 VDC Distribution	
Spare		W/H Lighting Panel 1E4	

Panel: Emergency Switchboard Main Distribution 600 Volt Location: Emergency Generator Room

3-15 kva 600/120 Transform		Steering Gear Pump #2	
Spare		Emergency MCC	
Steering Gear Pump #2		Spare	

Panel: Distribution Panel 1M11 115 Volt
Location: Engine Room Auxiliary Flat

Aft Deck Power Pack		For Deck PP Heaters	
Stern Thruster Heaters		Con Power Aft Deck PP	
Cont Power Aft Deck		Con Power Tow Winch	
Tow Winch Heaters		Starboard Shaft Alt	
Port Shaft Alt Heaters		C2000 Seachest Cath Pro	
For Deck PP Heaters		Con Power For Deck PP	
Therm Fld Trans PP		E/R Gray Water Drains	

Panel: Distribution Panel 1M7 115 Volt
Location: Control Room

Fan Compartments		S/G Copt Hold Aux Flat	
Lights Boat & Main Deck		S/G Copt Hold Aux Flat	

E/R Port Sewage Com		Feul V/V E/R Starboard Ics Rot	
E/R Port Sew Comp E/R Aft		Under Aux Flat E/r Starboard	
Workshop Recept		Control Room	
Workshop Recept		Mcr Workshop Recept	
Recept Open Deck Starboard		Mcr Recept Under Window	
Recept Open Deck Port		B/T Comp Gen Store	
Asea Console Illum		B/T Comp Stair Pass P & S	
Paint Locker Ex Fan		Spare	

Panel: Distribution Panel 1E5
Location: Control Room

Main Deck Lights		Lower Deck Machinery	
Main Deck Forward		Hold Stern Thr P & S	
Sound Powered Phone		M/C SP E/R Casing W/S	
Steering Gear FARV		Asea Control Console	
Asea Console Receptacles		Asea Control Console	

Panel: Distribution Panel 1M0 115 Volt
Location: Control Room

Nav Lights Main Supply		Dist Panel 1M2 Con Rm	
Lighting Panel W/H 1M3		Lighting Panel Foc Dk 1M4	
Lighting Panel Boat Dk 1M5		Lighting Panel Main Dk	
Lighting Panel E/R 1M7		Spare	
Galley Equipment Panel 1M9		Nav Aids Panel 1M10 W/H	
E/R Dist 1M11 E/R Flat		Spare	

Panel: Distribution Panel 1M2 115 Volt
Location: Control Room

Washer Laundry M/D		Cloths Iron M/D	
Coffee Maker MCR		Hand Dryer Main Deck	
Asea Battery Charger		Control Rm Con 115V Sup	
Control Room Cons		Bow Thr Heater	
Spare		UV Sterilizer and Clourine	
S/S Gen Port Heaters		Washer Laundry	
E/R Space Heater Port		Laundry Cleanup Area Fan	
E/R Space Heater Starboard		Workshop Exh Fan M/D	
Spare		Spare	

Panel: Distribution Panel 2M0 230 Volt
Location: Control Room

Reheat Panel 2M1		Reheat Panel 2M2 M/D	
Sewage Unit		Old A/C Unit MCR	
Heated Windows Wipers		Bouy Crane Heaters	
SSDG #1 Heater		SSDG #2 Heater	
Emer Gen Block Heater		Incinerator	
Dry Ships Laundry		Electric Heat Tracing	
Crane Base Heater		Sewage Sys Trans PP	
Spare		New A/C MCR	

Panel: Main Distribution Panel 600 Volt
Location: Control Room

M5 3 75 kva Trans		M6 Semi Ess Mcc #1	
M12 Non Ess Mcc #2		M3 Semi Ess Mcc #2	
M13 Ess Mcc #1		Spare	
M14 Ess Mcc #2		M2 Non Ess Mcc #2	

M4 3 37,5 kva Trans		M8 Non Ess Mcc #3	
M11 galley Distribution		M10 Steering Gear #1	
M9 Steering Gear Pump #2		Spare	

Motors
Panel: Motor Control Center
Location: Control Room

#3 M/E Prelube Pump		#3 M/E F/O Boost Pump	
Lower F/O Trans Pump		Out Domestic F/W Pump	
Fresh Water Pump		Upper A/C Cooling Pump	
B/D Accom Fan Slow		B/D Accom Fan Fast	
F/D Accom Fan Slow		F/D Accom Fan Fast	
#4 M/E Prelube Pump		#1 M/E F/O Boost Pump	
Upper F/O Trans Pump		E/G F/O Trans Pump	
Washroom Exh Fan		Lower A/C Cooloing Pump	
M/D Accom Fan Slow		M/D Accom Fan Fast	
Galley Exh Fan Slow		Galley Exh Fan Fast	
#1 M/E Prelube Pump		Bildge Pump	
In Domestic F/W Pump		Port Sterntube L/O Pump	
Aft Gearbox Cooling Pump		E/R Exh Fan Port Slow	
E/R Exh Fan Port Fast		#4 M/E F/O Boost Pump	
Port Gearbox Stby L/O		M/E Supply Fan Starboard Slow	
M/E Supply Fan Starboard Fast		E/R Supply Fan Starboard Slow	
E/R Supply Fan Starboard Fast			
#2 Main Air Comp		#2 M/E Prelube Pump	

General Service Pump		L/O Transfer Pump	
Starboard Sterntube L/O		Foam Pump	
Fwd Gearbox Cooling PP		E/R Exh Fan Starboard Slow	
E/R Exh Fan Starboard		#2 M/E F/O Boost Pump	
Starboard Gearbox L/O		M/E Supply Fan Port Slow	
M/E Supply Fan Port Fast		E/R Supply Fan Port Slow	
E/R Supply Fan Port Fast			
Shaft Turning Gear Port		Sewage Trans Pump	
Sewage Exh Fan Slow		Sewage Exh Fan Fast	
MCR Supply Fan Slow		MCR Supply Fan	
B/T Comp Exh Fan		Chain Locker Bilge Pump	
Jacket Water Trans Pump		Out Sanitary Water Pump	
Starboard Shaft Turning		#1 Hot Water Circ Pump	
#2 Hot Water Circ Pump		In Sanitary Water Pump	
Waste Oil Trans Pump			

Panel: Motor Control Center Location:
Engine Room Auxiliary Flat

#1 Hyd Pump Fwd PP		#2 Hyd Pump Fwd PP	
Hiab Fwd PP		Control Oil Pump Tow	
#1 Hyd Pump Aft PP		#2 Hyd Pump Aft PP	
Stern Thruster Servo #1		Stern Thruster Servo #2	
# 1 Hyd Pump Tow Winch		Bow Thruster Servo Pump	
# 2 Hyd Pump Tow Winch			

Panel: Motor Control Center
Location: Emergency Generator Room

Emer Gen Rad Cooling fan		Emer Fire Pump	
Electric Whistle		Aux Landing Craft	
#1 Main Air Compressor			

Various Motors Throughout Ship

#1 Ship Service Alternator		#2 Ship Service Alternator	
#1 F/O Pur feed Pump		#1 F/O Purifier Motor	
#2 F/O Pur Feed Pump		#2 F/O Purifier Motor	
Thermal Fl Boiler Blower		Thermo Fl Circ Pump #1	
Thermo Fl Circ Pump #2		F/W Dist Pump	
Oily Water Sep Pump		#1 M/E Jcket Water Circ PP	
#2 M/E Jcket Water Circ PP		#3 M/E Jcket Water Circ PP	
#4 M/E Jcket Water Circ PP		L/O Purifier Feed Pump	
L/O Purifier Motor		Port Shaft Generator	
Starboard Shaft Generator		Port CPP System Servo #1	
Port CPP System Servo #2		Starboard CPP System Servo	
Starboard CPP System Servo		Stern Thruster	
Port Fwd Steering Pump		Port Aft Steering Pump	
Starboard Fwd Steering Pump		Starboard Aft Steering Pump	

Incinerator Sludge Pump		Lifeboat Davit Winch	
M/D A/C Unit Fan		M/D A/C Unit Compressor	
Refer Comp #1		Refer Comp #2	
Condensor Fan #1		Condensor Fan #1	
Remote Valve Hyd Pump 1		Remote Valve Hyd Pump 2	
Bow Thruster Motor		Bow Thruster Cooling Pump	
Emergency Generator		Bouy Crane Aggr Motor #1	
Bouy Crane Aggr Motor #2		B/D A/C Unit Fan	
B/D A/C unit Compressor		F/D A/C Unit Fan	
F/D A/C unit Compressor		Ice Siren	

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9A 3E001, 3H001 #1 SHIP SERVICE GENERATOR AND DIESEL ENGINE OVERHUAUL TCMSB SURVEY

9A.1
The intent of this specification is to perform the 5 Year Survey of the #1 Port Ship Service Diesel Engine and Generator. This unit is a D16 Volvo Diesel with a Stamford HCM534D2 generator.

9A.2
The Contractor shall be responsible for obtaining the services of a qualified Volvo Canada Service Technician to complete the survey, required for TCMSB.

9A.3
Contractor shall include an allowance to cover expenses of a Volvo Canada FSR. The FSR will be reimbursed for his services, travel and living expenses incurred in the performance of the work. The Allowance shall form part of the overall bid and shall be adjusted after submitting a PWGSC Form 1379 upon proof of final invoice.

FSR:
Wajax Power Systems
70 Raddall Ave.
Dartmouth, NS
B3B 1T7

Contact: Stan Murphy
Tel: +1 (902) 468-6200 ext 236
E-mail: SMurphy@wajax.com

9A.4
All manufacturer's procedures and recommendations shall be followed during the scope of all work with all technical specifications being adhered to as a minimum by the Contractor. Contractor shall arrange for scheduling the on-site presence of a Marine Safety Inspector as required for inspections/testing.

9A.5
Contractor is to provide the service of one (1) labourer Contractor is to allot 24 labour hours to assist the FSR, as required, for the duration of the FSR onsite. Contractor is to quote separately for this, and it shall be part of the evaluated bid.

9A.6
Contractor shall supply all the necessary staging and cranage as required to work on, remove, transport, inspect and re-install the various components during this Specification Item.

9A.7
The FSR will complete a 5 Year Survey/12000 hr overhaul on both the Diesel engine and generator, as per the manufacturers' instructions/requirements. All parts required for the overhaul shall be Contractor supplied and shall only be certified OEM parts. An allowance of 75,000.00 will be allotted for the purchase of the required overhaul parts. Any defects found requiring repairs will be completed by submitting PWGSC Form 1379.

9A.8
Upon completion of the annual inspections, two (2) copies (one (1) paper and one (1) electronic? of the report are to be provided to the TA and TCMS.

9A.9
All work to be carried out to the satisfaction of the TA.

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10A 2Q0190 MIRANDA DAVIT 5 YEAR SURVEY FOR TCMSB

10A.1
Vessel's Miranda Davit used in launching, storage, and recovery of ship's Fast Rescue Craft (FRC) shall be overhauled for survey by TCMS Inspector.

Miranda: Type MRT 3900.
The winch is a Type BHY 5300

Manufacturer Contact Info:
Harding Safety Canada Inc.
#120 - 20575 Langley By-Pass Langley,
British Columbia V3A 5E8
Canada

Tel: 1-604-530-0814
Fax: 1-604-530-0812

e-mail: glenn.francis@harding.no
Contact: Glenn Francis

10A.2
The davit is located on the port side of the Boat Deck between frames 25 - 32.

10A.3
FRC will be in davit when the vessel arrives for refit. Contractor shall remove of FRC boat from davit. Contractor will store the FRC in Contractor fabricated chocks suitable for the boat and considered Category "B" property. FRC will be protected against the weather, damage, paint and dirt/debris during the refit period.

10A.4
The contractor shall obtain the services of a qualified Harding Field Service Representative. The contractor shall provide all equipment, hardware, personnel, etc. to carry out the required work under the direction and guidance of the FSR. The contractor shall obtain certification for the FSR from Harding.

10A.5
Contractor shall include an allowance to cover expenses of a Harding FSR. The FSR will be reimbursed for any necessary parts, his services, authorized travel and living expenses reasonably and properly incurred in the performance of the work. The Allowance shall form part of the overall bid and shall be adjusted by by submitting PWGSC Form 1379 upon proof of final invoice.

10A.6
All manufacturer's procedures and recommendations shall be followed during the scope of all work with all technical specifications being adhered to as a minimum by the contractor. The contractor shall arrange for scheduling the on-site presence of a Marine Safety Inspector as required for inspections/testing during the course of all work.

10A.7
The contractor shall supply all the necessary staging and cranage as required to work on, remove, transport, and install the various components during this overhaul. All personnel working on the davit system shall be suitably trained in fall restraint and all fall restraint equipment shall be certified and current.

10A.8
Prior to the commencement of any and all work, the contractor shall lock out the power pack unit, associated 110 volt condensation heaters, and the oil reservoir immersion heater . The contractor shall install /remove locks and tags accordingly during the scope of work. The contractor shall supply and install their own locking devices and retain all keys during the scope of this work.

10A.9
All documentation shall be provided to demonstrate OEM compliance. No materials substations shall be undertaken without the expressed written consent of Harding.

10A.10 Not used
10A.11
The cradle is to be disconnected from its winch cables and gripes and removed ashore. The removed wires will be disposed of by the contractor.

10A.12 The twenty (20) roller assemblies on the cradle are to be checked for their ability to turn without binding. Any rollers having difficulty turning are to

be brought to the attention of the TA prior to disassembly. Roller assemblies fitted to cradle shall be identified as to location and removed from cradle. Rollers, pins and bushings are to be solvent cleaned. Greaseways shall be proven clear. All components shall be inspected for wear and damage. Rollers shall be checked for ovality. Once all required work is completed they shall be safely secured against damage, ingress of foreign material and loss.

10A.13
Cradle shall be cleaned and grit-blasted to SSPC-SP3 standard. Care is to be taken to protect the internal threads used to secure roller pins. Once grit-blasting is complete, sixteen (16) weld joints shall be checked for cracks using the "dye penetrant" method. Typewritten report of all findings shall be turned over to TA.

10A.14
Any repairs to cradle structure will be done by submitting PWGSC Form 1379**.**

10A.15
Once any required repairs are completed, the cradle shall be painted as per below schedule.

> First coat: INTERSHIELD 300, Abrasion Resistant Aluminium Pure epoxy, Colour = bronze, 150 microns D.F.T. (0.0055")
> Second Coat: INTERFINE 979, Polsiloxane Finish, Colour = white + CGSB #504, 125 microns D.F.T. (0.0046")

10A.16
Cradle shall be reassembled and all roller grease fittings shall be lubricated with UNIREX EP2 grease. All rollers are again to be witnessed by TA as to their ability to turn freely.

10A.17
All eleven (11) sheaves and the sprung sheave unit (1) are to be removed along with their associated pins. The pins and sheaves are to be solvent cleaned and inspected for wear and defects. All running surfaces are to be checked for wear and ovality. All greaseways are to be proven clear and all components are to be reassembled.

10A.18

The sheaves and pins are to be reassembled with the running surfaces pre-lubricated. Grease is to be applied through the grease fittings until its passage through the pins to the bushings is evident. UNIREX EP2 grease will be used.

10A.19

New wires, Contractor supplied, and gripes are to be attached according to the manufacturer's instructions. The Contractor shall adjust the wire ropes in accordance with the manufacturer's instructions. The following notes are to be taken into account when the wires are installed:

The center wire connection that attached to the cradle is not a standard fitting and it is not to be used for any other location.

The center wire is a guide wire and it must not take the load of the cradle.

The shortest wire is located at the winch end.

The location of the Rotary Limit Valve (over hoist protection) will need to be adjusted after the wires are fitted.

10A.20

The cradle travel and upper stopping position shall be adjusted in accordance with the manufacturer's instructions.

10A.21

The centrifugal brake, disc brake, and sprag clutch are to be removed from the winch arrangement for survey. They are to be disassembled, cleaned, and laid out for inspection. Following inspection the units are to be reassembled and re-installed in the winch. Details of the brakes and clutch are shown on drawing # 21249 "SECTIONAL ARRANGEMENT OF BRAKE UNIT".

10A.22

The winch gearbox is to be drained and the oil disposed of according to regulations. Approximately 8.5 L of gear oil is to be drained from the winch gearbox. The gearbox is to be cleaned after the components requiring inspection have been removed. The gear train is to be removed from the gearbox. Each sub assembly is to be cleaned and examined for wear and defects. Details of the winch's gearbox are shown on drawing # 31111 "SECTIONAL ARRANGEMENT OF WINCH TYPE BHY 5300". The internals are to be solvent sprayed to remove any deposits. Only lint free clothes are to be used in any wiping within the gearbox. After all cleaning is complete and subassemblies are reinstalled the gearbox shall be refilled with 8.5 L of Traxon XL 75W90 gear oil. Oil is to be contractor supply. All gaskets are to be contractor supply and are

to be suitable for the application. All parts for brakes and clutch will be addressed by submitting PWGSC Form 1379, excluding gaskets and oil.

10A.23
The hydraulic motor and pumps are to be removed and serviced by an FSR approved hydraulic service center. The units are to be opened up for cleaning and inspection. Upon completion of any required repairs they are to be reassembled and bench tested. The bench tests are to be witnessed by the TA, FSR and TCMS Inspector. Type written results of the inspection and testing are to be turned over to the CE. Any parts required for the hydraulic component inspection are to be covered by submitting PWGSC Form 1379.

10A.24
The hydraulic reservoir is to be drained and the oil disposed of according to regulations. Approximately 320 L of hydraulic oil is to be removed from the reservoir. The tank internals are to be solvent sprayed and wiped down with lint free rags only. The reservoir will be boxed up after inspections are completed and refilled with 320 L of Tellus 32 Hydraulic new oil. Oil is to be contractor supply. All gaskets are to be contractor supply and are to be suitable for the application.

10A.25
After all work is completed the davit system is to be load tested for TCMS to provide documentation of successful testing**.** The SWL of the davit is 3900 Kg. The proof load will be at 110% or 4290 Kg (9457.7 lbs).

10A.26
The contractor shall supply 4 typewritten reports upon completion of all work from the FSR. All drawings and measurements taken shall not be given to TA in hand written form. The report shall at a minimum list all work undertaken, repairs, parts used, measurements, readings, etc.

10A.27
The contractor shall supply all materials, equipment and parts required to perform the specified work unless otherwise stated. A list of known parts required is below. Contractor shall be responsible for ordering these parts from Harding Canada, to ensure they are on site for the FSR to install during the 5 year Survey.

Fall Wires.
V seal, adaptor, cover plate and shaft for centrifugal brake.

Center pin with copper pin for the center fall wire and tapper sleeve. Keeper plates, axle bolts, 16 large rollers and 4 small rollers for the cradle.

10A.28
Contractor is responsible for the identification of any interference items, their temporary removal and storage and refitting to the vessel.

10A.29
Contractor is responsible for protecting surrounding area and equipment while carrying out this work.

10A.30
All work to be carried out to the satisfaction of the FSR, TCMS and TA.

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11A UNDERWATER HULL INSPECTION/BUTTS AND SEAMS

11A.1
Any requirement to repair welded joints in hull plating will be identified at the time of the hull survey by TCMS and the IA.

11A.2
Joints selected for repair will be marked and are to be cleaned to sound metal by air arc gouging and / or grinding. Joint welds are then to be built up to the original level by TCMS approved welding techniques with approved materials. Electrodes for repair build-up of corroded welds in the shells of icebreaking ships should be as follows: Grade D, E and EH Steels E8016 or E8018 electrodes (ESAB 73:08) are suitable for Shielded Metal Arc Welding (SMAW). Contractor to ensure that last pass or "hard cap" over any welded seam is done using 7018 RCR welding rods. All work to be to the approval of TCMS and the IA.

11A.3
For bidding purposes, Contractor to include in their bid price the cost of 400 feet of air arc gouging and 1200 feet of bead weld. Contractor is also to include cost per foot for each of air arc gouging and bead welding for adjusting purposes.

11A.4
Butts and seams falling in way of any fuel tanks will require the fuel tank to be pumped down by the vessel’s crew and to be gas freed and certified safe for hot work after the Contractor removes and disposes of any remaining fuel in accordance with all Federal, Provincial and Municipal regulations. Disposal certificates must be provided to the TA. Butts and seams falling in way of ballast/void tanks with coated internals will require interior paint work to be touched up in way of heat damaged. The foregoing gas freeing and paint work will be handled by submitting PWGSC Form 1379.

11A.5
Contractor to quote on the services of a person lift and operator for 8 hours for survey and inspection purposes. Contractor to quote hourly rate for this work.

11A.6
All work to be carried out to the approval of the TA and TCMS.

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12A HULL IDENTITY MARKINGS

12A.1
The Contractor shall bid on remarking fifty (50) square meters of the existing hull identity markings due to the wear of hull coating in areas where buoy work is carried out and other areas as determined by the IA.

12A.2
The contractor shall provide a unit cost per square meter for adjustment purposes. The paint will be compatible with the coatings being applied to the underwater hull and will be contractor supplied (references?)

12A.3
This amount shall be adjusted upward or downward by submitting PWGSC Form 1379 depending on the actual amount of work to be done.

12A.4
The areas requiring remarking shall be remarked in accordance with the Department of Fisheries and Oceans Corporate Identity Program and will include black or white color stripes, letters and symbols as noted in the document in Section 52 of the Technical Data Package.

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13A UNDERWATER HULL ANODES

13A.1
The contractor is to supply and replace forty-six (46) 10 kilogram zinc anodes. The work in this section must be coordinated with the work in Section

13A.2
All existing anodes are to be removed including all strapping. All old strapping welds to be ground flush. Any and all excessively deep gouges resulting from strap removal to be filled with weld and ground smooth. Areas where any anodes are found to be missing are to be dealt with similarly.

13A.3
New anodes are to be welded to the hull with any paint in way of installation being cleaned to bare metal.

13A.4
The contractor is to give a unit price per one (1) anode for adjustment purposes. Unit price to include all preparatory work and installation as defined above.

13A.5
Welding in way of any fuel tanks will require the fuel tank to be pumped down by the vessel's crew and to be gas freed and certified safe for hot work after the Contractor removes and disposes of any remaining fuel in accordance with all Federal, Provincial and Municipal regulations. Disposal certificates must be provided to the TA. Welding in way of ballast/void tanks with coated internals will require interior paint work to be touched up in way of heat damaged. The foregoing gas freeing and paint work will be handled by submitting PWGSC Form 1379.

13A.6
All materials are to be Contractor supply

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14A 3L021, 3L022, 3L023, 3L043, 3L044 SEA BAYS

14A.1
The sea bays and sea chests are to be opened up for cleaning and inspection.

14A.2
Contractor will note that access to the sea chests may be required via removable shell grids . Contractor will note the location of shell grids when planning blocking arrangements for dry docking.

14A.3
The following sea bays and sea chests are to be dealt with:

Identity	Location	Volume	Total Surface Area
(a) Port Main Sea Chests	Fr. 25 - 27	20.1 m^3	125.5 m^2
(b) Stbd Main Sea Chest	Fr. 25 - 27	20.1 m^3	125.5 m^2
(c) Main Sea Bay	Fr. 25 - 27	23.0 m^3	236.0 m^2
(d) Port Fire Monitor S/B	Fr. 16 - 18	1.8 m^3	16.5 m^2
(e) Stbd Fire Monitor S/B	Fr. 16 - 18	1.8 m^3	16.5 m^2
(f) Bow Thruster Sea Bay	Fr. 39 - 41	15.5 m^3	95.5 m^2

14A.4
All of the above noted spaces are to be opened up and certified gas free and safe for personnel to enter. Contractor is responsible for arranging for a certified Marine Chemist to visit the vessel and to carry out the necessary testing to obtain safe entry and safe for hot work certificates. A copy of a gas free/safe for hot work certificate shall be given to the TA prior to men entering the tank and a copy of each certificate shall be posted in a conspicuous location in close proximity to the manhole cover for each tank. Spaces shall be tested each day that personnel shall be in the tanks.

14A.5
Contractor shall provide the spaces with a mechanical ventilation/extraction system, vented to the outside of the ship. Good ventilation must be provided by contractor and any blowers/extractors must ensure good air movement and solvent vapour removal from the lowest point in the tanks. Vapours as well as airborne dust and debris shall not be allowed to enter the vessel.

14A.6
The sea bays and sea chests are to be drained of any remaining water, and have all sand, mud, and assorted debris removed ashore in accordance with all Federal, Provincial and Municipal regulations, and disposal certificates must be provided to the TA. A docking plug is available for removal in the main sea bay to assist drainage. Should it be found necessary to drain the sea bay for the purposes of hull coating or touch-up, the docking plug shall be removed and on completion of all work, the docking plug shall be installed with the locking bar welded over as per original. Contractor shall quote on the unit cost per additional removal/installation.

14A.7
The grids shall be removed from all sea chests for cleaning and inspection. The grid and inlet areas shall be high pressure washed and grid holes shall be mechanically reamed to their original diameter. The grids are to be thoroughly cleaned of all growth and encrustations. All inlet holes into sea bays are to be hydro-blasted and proven clear of all sea growth.

14A.8 All interior wetted surfaces of the sea bays and sea chests shall be scaled and cleaned to bare metal. Contractor shall use hydro-blasting at 5,000 psi minimum and mechanical means (power brushing) for the cleaning of the areas in this specification item.

14A.9
High pressure water washing (fresh water) shall be a mixture of 50:1 Holdtight 102® Solution from Vapcor Inc.(contractor supplied). This action will de-salinate all surfaces and prevent flash rusting, while removing all loose deposits to allow viewing of tank/coating condition. Contractor responsible for removal and disposal of all cleaning water, sludge and debris generated by cleaning process. Copies of invoices detailing disposal of the debris shall be given to the TA. Contractor, TA, and TCMS will perform tank inspections.

Recommended VAPCOR INC. representative is:
Barry Schnare
55 Akerley Blvd, Dartmouth, NS
Direct: 902-480-3011
Email: barry.schnare@kdpratt.com

14A.10

Contractor shall supply all coating products. All prepared areas of steel to have coating system applied, as follows, according to the coating manufacturers instructions.

Recommended WASSER coatings representative is:
Barry Schnare
55 Akerley Blvd, Dartmouth, NS
Direct: 902-480-3011
Email: barry.schnare@kdpratt.com

a) Spot prime of all prepared steel areas with WASSER MC-Miozinc 100, 3mil DFT
b) Intermediate coat of WASSER MC-Tar 100 Black, 6mil DFT
c) Topcoat of WASSER MC-Tar 100 Red, 6mil DFT

14A.11
Estimate on a total of 620 square meters of surface to bare metal. A unit price per square meter will also be quoted for adjustment purposes.

14A.12
The completion of all work, the sea bays and sea chests are to be inspected and closed up in good order. New neoprene gaskets are to be used on all manhole door joints.

14A.13
Contractor and TA shall examine the zinc anodes for wastage. Contractor shall quote on the replacement of 24 x M24 zinc anodes. Contractor shall also quote the unit price for renewal. Pricing to be given separately for supply the anodes and for fitting them. Actual requirements will be decided after inspection and adjusted after submitting a PWGSC Form 1379. All anodes shall be protected during cleaning and painting activities. Contractor shall not coat anodes with any form of grease or mastic. All protective wraps shall be removed prior to closing the sea bay.

14A.14
Stainless securing bolts (details) on fire monitor sea bay removable grids are to be secured using stainless steel locking bars welded across them. Docking plugs for the sea bay shall be securely re-installed, locking bars welded back in place.

14A.15

The Sea bay shall be hydrostatically tested (filled to overflow the vent for a static head test) on dock with the test being witnessed by the TA and a Marine Safety Inspector. Contractor shall remove and replace the vent head to carry out the test. During vent head installation, Contractor shall use a new gasket and stainless fasteners.

14A.16
The contractor shall coordinate this work with the application of underwater hull coating.

14A.17
All work is to be completed to the satisfaction of the TA.

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15A C-2000 SYSTEM ANODES

15A.1
Contractor to renew twenty marine growth (MG) and corrosion control (TG) anodes in the ships sea water cooling system. This work is to be carried out on completion of Sea Bays Work under Article 14A.

15A.2
The following anodes are to be renewed:

Port Sea Chest	2-MG Anodes
	2-TC Anodes
Stbd Sea Chest	2-MG Anodes
	2-TC Anodes
Port Fire Monitor Sea Chest	1-MG Anode
	1-TC Anode
Bow Thruster Sea Chest	1-MG Anode
	1-TC Anode
Stbd Fire Monitor Sea Chest	1-MG Anode
	1-TC Anode
Port Sea Bay	3-TC Anodes
Stbd Sea Bay	3-TC Anodes

MG-Marine Growth Control-Copper-Red Safety Cap
TC-Corrosion Control-Aluminum-White Safety Cap

15A.3
Existing anodes are to be electrically disconnected at safety cap, securing nuts released, and spent anode lowered from mounting flange in respective compartments. Old anodes to be removed from the ship and disposed of by the contractor.

15A.4
New anodes (Contractor supplied) of the correct type for each location are to be installed in way of removed units with new neoprene gaskets used. Once anodes are in place, they shall be tightened with securing nuts as required. Care is to be exercised to ensure units are not over tightened. The electrical connection at the top of the anode is to be megger tested to ensure the anode is isolated electrically from the ships hull. The conductor is to then to be reconnected to the anode as

required and made secure from the possibility of short circuits and/or grounds. The safety cap is to be filled with a non-hardening dielectric compound before installation, it is then to be restored and secured in place using a new gasket.

15A.5
This work is to be overseen by Corrpro field service representative. Contractor is to include in bid cost for Corrpro representative and this will be adjusted after submission of a PWGSC Form 1379**.**

15A.6
Contractor will be responsible for all handling and transportation of anodes once units are delivered to the yard. This will include unloading of delivery transport.

15A.7
System information will be available on board the vessel. Copies of the calibration and test results are to be given to the TA.

15A.8
All work is to be done to satisfaction of the TA.

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16A AQUAMATIC SYSTEM ANODES

16A.1
Repairs to be carried out to the four "Aquamatic" system impressed current anodes on the ships hull to preserve their dielectric separation from the ships hull. The extent of the repairs will be determined after the vessel is dry-docked and a thorough examination is conducted on the four anodes.

16A.2
Any work associated with the "Aquamatic" system anodes will be carried out under the general direction of a CORRPRO field service representative. The contractor is to include in his bid services of a Corrpro field service representative**.** Any adjustments will be by submitting PWGSC Form 1379**.**

16A.3
Any holes in the dielectric shield between the anode bodies and the ships hull shall be cleaned of any growth and encrustation and be thoroughly dried. The edges of the holes shall be roughened in preparation of the filler coat. The holes shall be filled with International Paints "Red Hand" compound. The contractor is responsible for the supply of this compound and if an alternative product is used, Contractor is to supply data sheets to TA for equivalency. Contractor is to quote on repairing an area of 80 square feet. The contractor is to provide a unit cost per square foot including preparation and all materials for adjustment purposes.

16A.4
Upon completion and drying of the compound repairs, in the area of the hull adjacent to the hull coating care should be taken to ensure that the hull coating overlaps the outer edges of the anode dielectric shields to preclude an electrical short circuit from the anodes to the hull. At the same time, however, the hull coating is not allowed to contact the anode face.

16A.5
Work is to be carried out to the satisfaction of the TA.(TCMS?)

16A.6
CORRPRO Representative:

Yves Girouard
1985 55th avenue
Dorval Que.
H9P 1G9
1-800-367-0085 ext,222

This work item to be performed in conjunction with C2000 Anodes.

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17A GALLEY EXHAUST DUCT CLEANING

17A.1
Contractor is to open up and clean the galley exhaust trunking.

17A.2
Contractor is responsible for the removal and re-installation to the condition of Section 1.10 of all coverings in the galley to gain access to the trunking. The length of trunking runs from the galley (center line of the ship at frame 38 to outboard on the boat deck port frame 34) being approximately 35 feet.

17A.3
Contractor is responsible for any rigging or scaffolding.

17A.4
Contractor is responsible for the cleanliness of the immediate area during and after the work is complete. Contractor is responsible for the removal of all cleaning materials and debris in accordance with all Federal, Provincial and Municipal regulations. Disposal certificates must be provided to the TA. All materials to be contractor supplied.

17A.5
Contractor shall arrange the time to complete this specification item in conjunction with Section 34 of the VLE Specification.

17A.6
Contractor is responsible for closing and resealing air tight all access covers disturbed during ducting cleaning and inspection, upon completion of work.

17A.7
All work is to be completed to the satisfaction of the TA.

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18A VENTILATION DUCT CLEANING

18A.1.
The intent of this item shall be to access and clean the air ducting for accommodations (Main Deck, Boat Deck, Focsle Deck), the exhaust air ducting for the washrooms, the supply ducting to the wheelhouse, as well as the return air ducting for the accommodations and wheelhouse systems and the Main Deck Laundry Room/Changeroom Exhaust. Contractor is requested not to commence work until late as possible in Work period, after most of the work is completed, including the work in Section 36.

18A.2.
Ductwork layout and system definition is shown on drawing #218-761-014 Sheets 1&2, included in the Technical Data Package.

18A.3.
Contractor shall provide the services of a qualified HVAC representative to mechanically clean the vessel's ducting. All ducting is to be cleaned thoroughly of dust, dirt, debris, scale, rust, etc. Contractor shall be responsible for making penetrations for the cleaning equipment and the subsequent sealing of such access points upon completion of all work, with approved fire rated materials and sealant. Contractor shall co-ordinate the cleaning of this trunking with the TA.

18A.4.
Since this task has been carried out in previous maintenance periods, existing access points maybe reused by contractor.
Note: Plastic plugs are not to be used to seal access points. All access points shall be sealed with contractor supply metal plugs.

18A.5.
It will be necessary to remove ceiling panels and diffusers on all decks in order to access the applicable ventilation trunking, ducting, and tubes. All items are to be replaced in good order upon completion of all work. Any wiring, piping, lighting, fixtures, fasteners, metal work, etc. that has been removed or repositioned to carry out this work is to be reinstalled in good order in its original location and condition. All insulation removed is to be reinstalled accordingly and all taped seams are to be retaped with new approved tape for HVAC systems.

18A.6.

Prior to commencing any work, Contractor shall tag and lock out each system supply/exhaust fan set. Contractor shall supply and install their own locking devices and keep possession of all keys during the scope of this work. Ship's personnel will assist in pointing out the various air movement equipment.

18A.7.
Contractor is responsible for all materials, coverings, and equipment required to perform this task. All labor required completing the cleaning, including that required for removals, reinstallation, opening, and closing up of equipment and ducting is Contractor's responsibility. Contractor will remove all materials used in the project from the vessel**.**

18A.8.
Contractor is responsible for the cleaning of all spaces, furniture, equipment, etc. that is contaminated or soiled during the project.

18A.9.
All systems shall be closed up as per original upon completion of the cleaning process.

18A.10.
Diffusers may have been physically blocked with stuffing or other means in various cabins and spaces. This has been carried out by various personnel without approval or knowledge. Contractor is to remove and dispose all blanks or plugs as they are encountered. These blanks are not to be put back such that all spaces will be served by ventilation and exhaust flow asintended by the original design.

Accommodation Ventilation Cleaning

18A.11.
The accommodation HVAC supply and return air system is to be mechanically cleaned of dust, dirt, oil, grease and other debris. Focsle deck, boat deck and main deck supply trunking is to be cleaned from discharge side of main supply fans on focsle deck to all discharge outlet fittings. All outlet fittings to be removed and cleaned. All air trunking in each associated heating/air conditioning unit to be cleaned.

18A.12.
Contractor responsible to determine access plan to trunking and to remove ceiling panels for accessibility of ventilation trunking, ducting, and tubes. All items are to be replaced in good order upon completion of all work to the conditions of Section 1.10. Any wiring, piping, lighting, fixtures, fasteners, metal work, etc. that has been removed or repositioned to carry out this work is to be reinstalled in good order in its original location and condition. All insulation removed is to be reinstalled accordingly and all taped seams are to be retaped with new approved tape for HVAC systems

18A.13.
All equipment exposed to the possibility of contamination is to be protected with taped down polyethylene film. Contractor is responsible for removal from the vessel of all dirt and debris removed from the air handling system.**Note:**
During the cleaning of ductwork, care is to be taken not to allow the ingress of contaminants into the accommodations and work areas serviced by the air outlets

Main Deck Laundry/Change Room Exhaust

18A.14.
Main Deck Laundry/Change Room Exhaust is to be cleaned from all intake screens through to point of fan discharge and is to include connection to both laundry units in the Laundry/Change room. All intake screens to be removed and cleaned. Dryers associated with these laundry units are to be cleaned internally to remove any and all accumulated lint build up. Fan blower and housing are to be cleaned internally.

18A.15.
If it is necessary, in order to access the combination washer/dryer ducting, for Contractor to unbolt the units and pull it forward to access the ducting behind each unit, the units shall be fastened in place upon completion of all work.

Washroom Exhaust

18A.16.

Washroom exhaust trunking is to be cleaned from all intake screens through to point of fan discharge outlet and is to include connection to laundry unit in forward washroom on main deck and connection to laundry unit in washroom on focsle deck. All intake screens to be removed and cleaned. Dryer associated with these laundry units are to be cleaned internally to remove any and all accumulated lint build up. Fan blower and housing are to be cleaned internally.

Wheelhouse HVAC System

18A.17.
Wheelhouse ductwork is to be cleaned from air handling units (on wheelhouse top) through to all discharge fittings. All discharge fittings are to be removed and cleaned. All internal air trunking and fans in air handling units are to be cleaned. All return air ducts and intake screens to be cleaned. This work to be done in coordination with Section 36.0 of the VLE Specification.

18A.18.
All materials, equipment, and personnel shall be Contractor supply.

18A.19
All work to be performed to the satisfaction of TA.

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19A WINTEB VENTHEAD INSTALLATION

Contracor reference

Air and Sounding Diagram (as fitted) 218-361/000
Air and sounding piping arrgt 218-361/002

Fuel Bay vent heads that require replacement

Position Item	Vent Name	Size in Inches	Frame Location	Colour	Type
1.	Main Fuel Vent Port Tanks - (Port Fuelling Bay)	5	24	White	W2T1B, 30 mesh
2.	Main Fuel Vent Port Tanks - (Port Fuelling Bay)	5	24	White	W2T1B, 30 mesh

19A.1
The existing ball head screen vents are in an advanced state of corrosion due to the age of the vessel. It's no longer feasible to keep these units in a good state of repair. The intent of this spec is to remove the existing vents and retrofit new units. There are 2 vent heads in total that must be modified to attach a WINTEB 2000 – TYPE1B – Standard ANSI 150 flange fit, vent head.

19A.2
The tank vents listed in the above table shall have modifications made to suit the new vent head style. These two vents form the common ventilation connection for all fuel tanks on the vessel. Bearing this in mind, the contractor shall only isolate and make modifications to one single vent head line at a time. Modifications to be fully completed and vent placed back into service prior to commencing any isolation of the next vent head.

19A.3
Contractor shall commence with the Port Vent head and break the below deck Five (5) inch flange and insert a steel spade (14 gauge) with gasket to prevent all communication of the vent head line with the common system. This will require the use of staging erection in the engine room space. Tanks will still be able to communicate with atmosphere through the cross connection at the #1 centre fuel

tank. Marine Chemist to approve the port vent head area safe for Hotwork. **Vent Head to be removed by use of reciprocating saw** so that weld slag is prevented from entering vent system. Both new vent heads shall be installed with Contractor supplied fibre gaskets and 316 grade stainless steel fasteners. All gasket material shall be suitable for use with fuel. (recommend Durlon 8500).

19A.4
The Port side vent head to be removed at the level of the welded connection seam for the fitted ball head. The stainless label attached on the old vent head shall be removed and secured in a visible location to the pipe securing bracket just below the vent head location. The label shall be secured to vent bracket with Contractor Supplied Material (CSM) 10-32 stainless steel machine screws.

19A.5
Contractor to install the GSM supplied ANSI 5 inch flange to the prepared vent line of the Port side common fuel vent. Contractor to insert fire blanket material into the vent line to prevent weld slag/debris ingress to the vent line. Full penetration, seal welding to be implemented for inside and outside welds. The welds for the flange to receive Magnetic Particle testing by a certified Non-Destructive Testing company. All weld defects to be repaired by Contractor.

19A.6
See below for fitting instructions of the vent head with Isolation washers for the bolts that are supplied with the vent head kit. Contractor shall supply all new stainless bolts and nuts of proper size (8 @ ¾ inch diameter).

Contractor shall provide services of a bore scope camera to allow TA to fully inspect the vent pipe for debris down to the level of the steel spade, prior to fitting of the vent head.

19A.7
Contractor shall now place the port side Winteb vent into position and secure. The vent line spade to be removed and a new fibre gasket of fuel rated material to be installed (recommend Durlon 8500 gasket material).

19A.8 Contractor shall now repeat steps H-XX.3 to H-XX.7 for the Starboard Main Fuel vent head located at Frame 24 of the Starboard Fuelling Bay.

19A.9
Contractor shall follow all Safe for Hotwork policies of the vessel. General notes of this contract to be observed. Contractor to protect other workers in the area by erecting welding screens and security barriers.

19A.10
Contractor shall take necessary precautions to minimize ingress of dirt and welding debris into exposed vent pipe during this work item. Any fire blanket material inserted into the fuel vents to be fully removed before securing the vent head to the new flange.

19A.11
Once the welded flange has been inspected and repaired as necessary, contractor shall apply two (2) coats of Wasser MC-MIOZINC primer (3mil DFT) to all bare and disturbed steel coatings that are prepared to SSPC-SP3 standard. Contractor shall apply a Topcoat of WASSER MC Luster –RAL 9003 paint to colour match the existing colour scheme of the work area. Topcoat paint and primer shall be CSM.

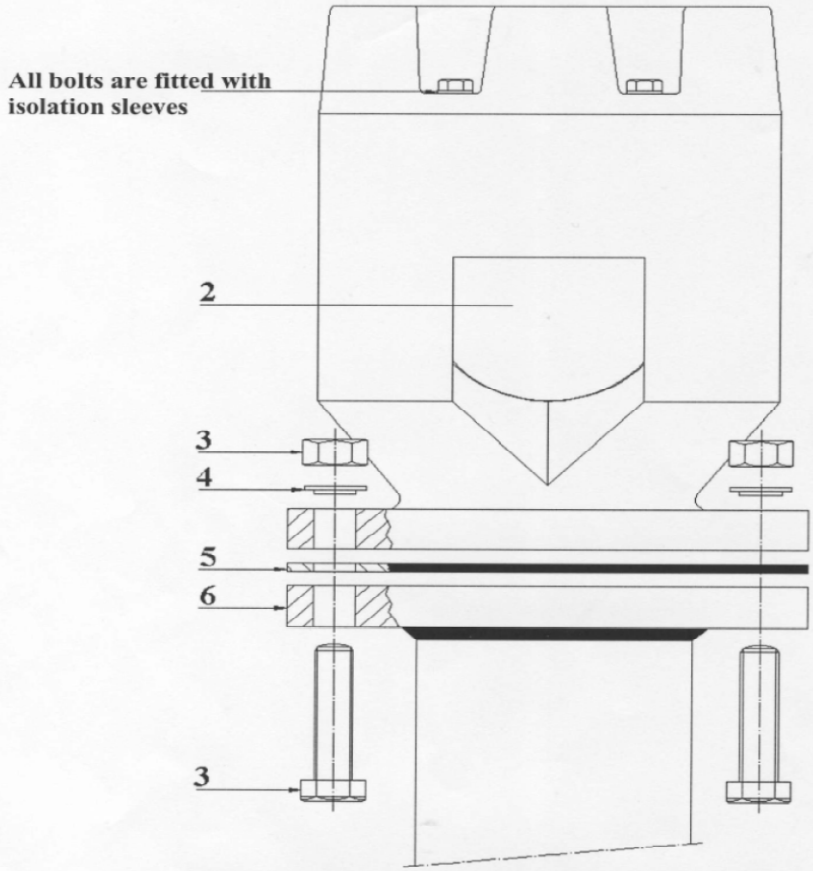
19A.12
All debris generated as a result of this work to be collected and disposed of by contractor. Work site to be cleared and cleaned of all contractor material once TA has approved of the final vent head installs and re-filling of the tanks.

19A.13
All work to be performed to the satisfaction of TA

winteb usa Inc

Fitting Instructions

WIN2000 & WIKO5000 air pipe heads (all types and sizes)



1. Do not paint flame screen (if fitted)
   Check classification rules if a flame screen is needed when the air pipe head is fitted on a ballast tank. If not, remove the flame screen when the air pipe head is fitted on ballast tanks.
2. Remove ball protection cover after painting, do not paint the float ball
3. Use galvanised or stainless steel bolts and nuts (available at WINTEB)
4. Use isolation sleeves (supplied by WINTEB)
5. Use full size gasket (available at WINTEB)
6. Use flat face counter flanges (available at WINTEB)
7. Use threaded air pipe heads only on aluminium pipes.

If you have any questions please contact us Tel. 985 290 4591 Fax. 888 664 8219
e-mail info@wintebusa.com

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20A EMERGENCY AIR COMPRESSOR INSTALLATION

20A.1
The intent of this specification is for the Contractor to remove and replace the Emergency Air Compressor.

20A.2
The new Emergency Air Compressor will have two (2) possibilities for starting the diesel engine: a hand crank (as required by TC) and electric starter, C/W appropriate battery and battery charger.

20A.3
Drawings and Documents Supplied in Technical Data Package
a) C14-40-551-01 rev1, Emergency Air Compressor Report
b) C14-40-551-02, Emergency Air Compressor Installation Drawing
c) 218-382/003 Compressed Air Arrangement (original)
d) 218-362 004 Compressed Air Diagram (original)

20A.4
The following regulations must be used in carrying out this work. Current edition of documents, at time of contract implementation, must be used.
a) Canada Shipping Act, 2001 – Marine Machinery Regulation
b) Transport Canada, TP 127, Part 1, Section 1.8
c) Lloyd's Rules and Regulation for the Classification of Ships, Part 5, Chapter 2, Section 9, Starting Arrangement

20A.5 The Contractor must supply all material, equipment & parts handling, include lifting and crane required to perform the specified work, unless otherwise stated.

20A.6
The Contractor must supply the make and model Deno L2-15HD/LRS unit (or equivalent). The equivalent may be approved for use if the Contractor is able to confirm that all engineering aspects are equal to the recommended unit with regards to performance, physical size, orientation of components, and serviceability as considered in the attached Emergency Air Compressor Report.

20A.7
The actual Emergency Air Compressor, Hamworthy Engineering Ltd, Distair 413-11 Compressor Unit, is situated in Emergency Generator room, on main deck, starboard side, at approximately frame 23½. The replacement unit is of similar design as the present model, and will fit into the same area on the vessel but will need a new seat.

20A.8
The compressor is connected to the emergency air receiver trough a single distribution line.

20A.9
The compressor diesel engine is fed by a built-in diesel tank (directly on unit). The exhaust is connected to a 1¼" line fitted with a silencer.

Removal Preparation Work

20A.10
The Contractor must empty the diesel fuel tank and dispose of any remaining fuel in accordance with all Federal, Provincial and Municipal regulations. Disposal certificates must be provided to the TA.

20A.11
The Contractor must empty the lube oil in diesel engine and dispose of the oil in accordance with all Federal, Provincial and Municipal regulations. Disposal certificates must be provided to the TA.

20A.12
The Contractor must empty the lube oil in compressor and dispose of the oil in accordance with all Federal, Provincial and Municipal regulations. Disposal certificates must be provided to the TA.

20A.13
The Contractor must isolate inlet from emergency compressor at air receiver, and air to main air receivers in engine room.

20A.14
The Contractor must disconnect air outlet line from old compressor, ¾-inch line.

20A.15
The Contractor must remove insulation cushion on exhaust pipe and silencer.

20A.16
Disconnect exhaust pipe from diesel exhaust manifold.

20A.17
The Contractor must remove old exhaust piping, including section outdoors, on main deck starboard, just below boat deck (frame 22-23).

20A.18
The Contractor must unbolt emergency air compressor unit from seating: 4 bolts.

20A.19
Once unbolted, removal of old equipment from vessel will be through access door to emergency generator room, giving access to towing winch compartment. The compressor unit will then be moved aft towards access door to compartment at frame 22, and shipped out to open main deck. Once on buoy deck, old compressor unit can be lifted ashore and disposed of. This unit weighs approx. 200 kilograms.

20A.20
The Contractor must remove the actual compressor seat and dispose of as Category “C” property.

20A.21
The Contractor must temporarily remove the emergency generator fresh water cooling piping to suit the new seating installation, store and refit in place before air compressor installation.

20A.22
The Contractor must supply and install the new seating accordingly to drawing C14-40-551-02.

20A.23
The Contractor must insert the new equipment following the same routing as for removal.

20A.24

Lift aboard on buoy deck, near towing winch compartment access door, starboard side. Move through door opening to emergency generator room door, at approx. frame 25. Move through emergency generator room access door to new seating in same compartment.

20A.25

The Contractor must install the new compressor unit and its ancillary as per drawing C14-40-551-02; Emergency air compressor unit c/w electric starter, approx. 340 kilograms, Battery charger and battery.

20A.26

The Contractor must remove the old compressor accessories. Refer to drawing VNEA2-362-006. The compressor is installed with flexible hose, ¾-inch female screwed, and an oil-water separator to be removed with its piping.

20A.27

The Contractor must connect supplied compressor unit to ship's compressed air piping system. Refer to drawing C14-40-551-02. The compressor is supplied with flexible hose, 1-inch, and BSP male connection. The oil-water separator is supplied pre-mounted on compressor.

20A.28

The Contractor must connect the diesel engine exhaust as per drawing C14-40-551-02.

20A.29

The Contractor must install supplied battery charger + 55 ah heavy duty battery.

20A.30

Charger to be fed from wall outlet (fed from panel 1E0-A no.1 breaker) in compartment, as per drawing C14-40-551-02.

20A.31

The Contractor must be responsible to have a manufacturer FSR on site to perform commissioning function tests on the emergency diesel air compressor unit.

20A.32

The Contractor must supply the TA with the Class Approval certificates for the new emergency air compressor.

20A.33

The Contractor must make reference to Section 6 for the documentation requirements for the maintenance and operation manual requirements and for the installation drawings.

20A.34

The Contractor is responsible to give all necessary training to the Chief Engineer and engineering crew to permit them to properly operate the new Emergency Air Compressor.

20A.35

All work must be subject to be witnessed by the TA and IA and the attending TCMS Inspector.

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21A CRANE FALL ARREST

21A.1
Contractor shall remove the existing safety line and posts and install an approved horizontal safety line system, on the Liebherr crane top. Contractors proposal shall be a certified engineered design, complete with commissioning certificates. Contractor's proposal must be discussed with and approved by the TA prior to installation.

21A.2
Contractor shall ensure the proposed system meets all current standards for safety lines and can be inspected and certified, annually, by an accredited Safety System Company.

21A.3
Contractor is to note the crane is fabricated from St 52-3 steel. Special welding procedures (Engineered weld procedure) must be performed prior to any welding being performed. Material certificates must be provided for all steel to be welded to the crane.

21A.4
Position of the posts must be agreed upon by both TA & Safety Line Contractor. Currently the crane is fitted with two end posts and one intermediate post and is approximately 60 feet in overall length. The position of the wire must not interfere with any of the cranes operations and wire ropes. Contractor shall ensure the deflection of the proposed cable is kept to an acceptable amount for the application.

21A.5
Contractor is to arrange to have NDT Testing performed on all welds, both Mag-particle and dye penetrant. All repairs/re-welds required are the Contractor's responsibility to correct.

21A.6
Safety Line Contractor is to install the safety line, with the assistance of the Contractor.

21A.7
Contractor shall apply two (2) coats of Wasser MC-MIOZINC primer (3mil DFT) to all bare and disturbed steel coatings that are prepared to SSPC-SP3 standard. Contractor shall apply a Topcoat of WASSER MC Luster –RAL 9003 paint to colour match the existing colour scheme of the work area. Topcoat paint and primer shall be CSM. The contractor shall allow sufficient curing time between coats as per the manufacturer's recommendations and instructions.

21A.8
Contractor shall provide the TA with as fitted drawings, final certificates and engineering documentation, prior to acceptance by the TA.

21A.9
All work is to the satisfaction of TA.

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22A UNDERWATER HULL COATINGS

22A.1
The existing low friction coating shall be repaired and/or replaced utilizing Contractor Supplied Coatings as specified below.

22A.2
The contractor shall prepare the underwater hull and apply the coating system in strict accordance with the manufacturer's instructions. In conjunction with any other functional quality assurance procedure as may be specified by the manufacturer, the following points will be carried out:

- Provide a list of batch numbers with correspondent dates of manufacture.
- Record the quantity and type of any solvent added.
- Measure and record the ambient conditions.
- Record details of spray tips and pressures used.
- WFT gauge readings to be taken on a regular basis during application.
- Using a calibrated DFT gauge, fifteen (15) measurements per 100 square ft. are to be taken and recorded. Upon agreement of consistency with the TA, fifteen (15) measurements per 1000 square ft. are then to be taken and recorded over the entire underwater hull area.
- All recorded information is to be typewritten and three (3) copies are to be given to the TA.

22A.3
Once the vessel has been dry-docked, the entire hull from the keel to the freeboard deck aft and a level in line with the boat deck rubbing strake forward, is to be hydro-blasted (5000 psi) to remove any accumulated growth salt deposition and loose paint. This shall include all underwater appendages such as rudders, kort nozzles, bow thruster tubes, stern thruster etc. The sea inlet grids for the bow thruster, sea chests, sea bays and underwater overboard discharge valves are also to be hydro-blasted as far as practical to remove any accumulated growth.

22A.4
Upon completion of high pressure wash, the hull is to be inspected for paint damage by the TA and the Contractor. Areas to be inspected for damage will

include all plating and appendages from the keel to 30.5 cm. (12") above the load line, the section of bow plating from the stem bar at bottom of the anchor pocket to Frame 44 and the section of plating in way of the buoy deck steel rubbing strakes up to the bottom horizontal rubbing strake (where the buoy work is normally carried out). The “underwater” hull coating system is to be extended above the water line in these areas of high abrasion.

22A.5
Painting is to be carried out only after any tank repairs (Section 23A), Bow thruster installation (Section 24.0) and hull inspections (Section 11A) are complete.

22A.6
Intact epoxy hull coating is to be sandblasted to a surface profile of 3 mils to allow adhesion of additional coats. In hull areas where only small amounts or sections of existing epoxy coating exist, removal of coating to bare steel is to be accomplished. All bare areas of hull steel and areas where existing coating is damaged, loose, blistered, missing or otherwise compromised, are to be blasted to near white standard, SSPC-SP-10.

22A.7
The dielectric shield, a heavier epoxy coating circle of approximately 3m (10') radius around impressed current cathodic protection anodes (four in number), is to be smoothed by mechanical means of all drips, peaks, ripples etc. The Epoxy to be used will be “International”, this will be contractor supplied.

22A.8
Where existing hull coating is intact and well adhered, coating edges around periphery of bare steel areas are to be generously feathered.

22A.9
Immediately on completion of sandblasting, bare areas are to be given one (1) coat of “Amercoat 238 Black”. Paint application to hull steel affected by "flash" rusting will not be acceptable. Coating shall be applied to a dry film thickness of 10 mils (single coating) and is to be free of runs and sags. The contractor shall provide a coating data sheet to the TA.

22A.10
Following the proper curing time for the Amercoat 238 Black, the following coatings are to be applied, in the order presented, allowing proper drying time between coats. The entire underwater hull plus the ice band is to be treated. The contractor shall provide the relevant data sheets on the coatings to the TA

Amercoat 238 Red to a minimum DFT of 10 mils (single coat).
Amercoat 339 C.G. Red to a minimum DFT of 8-10 mils per coat, two (2) coats.

All coatings to be applied to the manufacture's specifications.

22A.11
Transition line between epoxy coatings and remaining hull paint is to be neatly cut in during coating application.

22A.12
All hull plate openings including overboard discharges, suctions, grids, etc. are to be plugged to prevent the ingress of sand during sandblasting operations. In addition, deck mounted/fitted equipment, including but not limited to those listed below are to be protected during any and all sandblasting operations. The contractor will be responsible for repair/replacement of any damaged items to the satisfaction of the TA. Where suitably fitted closure arrangements are not available for use, protection will be made by complete coverage with heavy gauge poly-wrap and/or canvass suitably secured against environmental elements. All applied coverings are to be removed upon completion of blasting.

-Liebherr crane pedestal bearing, winches and exposed rams.
-After and forward tugger deck winches.
-All fan intakes and discharges.
-All natural ventilation intakes and/or discharges.
-Main Engine crankcase vents.
-All machinery exhaust pipe ends.
-Fwd deck crane.
-Anchor windlass.
-Lifeboat cables and blocks.
-Navigation Equip, (radars' etc.)

22A.13
During sandblasting and painting operations, the "Aquamatic" system anodes (4 each) are to be protected from damage and paint over spray as are all fitted sacrificial anodes. The CP propellers, stern thruster and all echo transducers are also to be suitably protected during blasting and painting operations.

22A.14
Total hull area to be dealt with is approximately 1675 square meters (18,030 square feet). Contractor to quote on blasting approximately 837 square meters (9,000 square feet) to bare steel and coating as specified, the remainder of the hull to be sand-swept. Contractor is to quote unit cost per square meter for sandblasting to bare steel and a unit cost per square meter for coating application as specified. Actual area dealt with to be agreed upon and to be adjusted by PWGSC action.

22A.15
The existing load lines and draft marks, port and starboard, forward and aft are to be painted upon completion of the hull coating application. These markings are to be painted with two coats of Amercoat 229 Finish White. Application of this paint to be completed within 24 to 48 hours of the primary hull coating initial set up time.

22A.16
Contractor to plug all deck scuppers and discharges, or take whatever means required to prevent water and other liquids from contaminating hull areas being coated or prepared for coating application. Contractor shall be responsible for removing these plugs upon completion of underwater hull work.

22A.17
All work to be carried out to the satisfaction of the TA.

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23A MUSHROOM VENT HEAD AND DAMPER INSPECTION

23A.1
Contractor shall determine the condition and verify the correct operation of the fire dampers which are fitted to the following fans and vents: the Laundry Room exhaust fan, located on the boat deck, port side, at frame 24, and the following six vents and fans located on the focsle deck forward of the superstructure: the Boat Deck Accommodation Supply vent, the Bow Thruster & Stores Supply vent, the Bow Thruster & Stores Exhaust fan, the vent for the Lavatories Exhaust fan, the vent for the Forward Stores Shaft, the vent for Main Deck Accommodation Supply, and the Focsle Deck Supply vent.
Note: Lavatories Exhaust fan is located on the boat deck level and need not be accessed for this specification; however, the vent for this fan shall be dealt with, as indicated above.

23A.2
Contractor shall electrically lock-out the Bow Thruster & Stores Exhaust fan, the Lavatories Exhaust fan, and the Laundry Room Exhaust fan prior to commencing the work. TA shall assist with identifying the correct breakers.

23A.3
Contractor shall separate the mushroom head of the Bow Thruster & Stores Exhaust fan and the Laundry Room Exhaust fan, at the flange between the fan motor and the damper below it. Contractor shall consult with the TA before commencing this step, to confirm which flanges are to be separated.

23A.4
Contractor shall separate the mushroom heads from the remaining vents at the flange immediately above the fire damper on each vent. Contractor shall consult with the TA before commencing this step in order to confirm which flanges are to be separated. Contractor shall note that the flanges are attached using stainless steel bolts. Suggested method of removal of these bolts is by zip disc cutter.

23A.5 All lifting devices and labour shall be provided by the Contractor.

23A.6
All moving parts and sealing surfaces are to be cleaned by the Contractor. Contractor shall ensure that all resulting debris is removed from the ventilation trunking. New Contractor furnished grease nipples shall be fitted, and proven clear.

23A.7
The dampers are to be inspected by the TA and a representative of TCMS. Any deficiencies in the operation, or sealing ability, of the dampers shall be addressed by submitting a PWGSC Form 1379.

23A.8
Any deficiencies in the vent heads, air trunking, or with the mesh screen on the underside of each vent head shall be addressed by submitting a PWGSC Form 1379.

23A.9
Upon completion of repair work, the proper operation of each damper is to be demonstrated to the TCMS inspector.

23A.10
After TCMS has approved each damper, the vent heads are to be installed using new rubber gaskets and new stainless steel fasteners and washers, all Contractor furnished materials.

23A.11
Proper operation of the damper and operating lever to be verified by the TA, after the vent heads have been installed. Any action to correct the operation of the damper and lever is to be carried out at Contractor expense.

23A.12
All disturbed steel surfaces must be prepared to SSPC-SP-3 standard. Contractor shall supply all coating products. All prepared areas of steel to have coating system applied, as follows, according to the coating manufacturer's instructions.

All coatings shall be Wasser Paints. One (1) coat of Wasser primer – MC MIOZINC (DFT 3mil) to be applied to all prepared steel followed by an intermediate coat of MC-Ferrox B (DFT 3mil). Topcoat of MC Luster Semi-

Gloss – White RAL 9003 (DFT 3mil) shall be applied after sufficient curing time is allowed for the previous coats.

23A.13

All work shall be completed to the satisfaction of the TA.

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