

**NGCC Martha L. Black**

**Annex A**

**Contract # F3012-12BM821**

Supply material, labour, scaffoldings, cranes, dumpsters, containers for the work described below.

For Hot work, all precautions will be taken in order to protect all surfaces and surrounding spaces to avoid any damage. A hot work permit will be issued by the chief engineer or it's representative before hot work begins. The contractor will supply and keep a fire watch for all involved spaces.

The work zones will be cleaned after the works, and brought back to their original state for cleanliness. Any damage will be repaired and corrected at the contractor's own expense. The paint system will be supplied by the CCG.

Exterior white

Primer: Intergard 264, RAL 9003, white ; Top coat Interthane 990, RAL 9003, white

Winch control stations

Primer : Intergard 264, RAL 9003, white; Top coat Interthane 990, RAL 070 7040, buff

**ITEM 01 : WQP system installation**

Reference DWG # TG-23222

The contractor will install a lubrication water treatment system for the stern tubes, also known as the Water Quality Package (WQP). The unit will be supplied by the CCG. Electrical connect / disconnect operations will be done by a CCG electrician. The unit will be supplied without frame.

The contractor will supply material and accessories (pipes, fittings, elbows, tees, reducers, fasteners, flanges, brackets, supports and gaskets) for all piping involved in the present item. That includes the piping that will have to be made and the existing piping that will have to be modified. Each connection point to an existing system will be done with a welded, flanged joint. All piping involved in this system will be hot galvanized. The piping will be routed and designed to use as less space as possible. All bolts, nuts and washers that will be in contact with the WQP will be made of 316 stainless steel.

All joints will be welded or flanged, using ASME B16.5, 150 class flanges if not specified otherwise. No NPT fitting will be accepted. The contractor will supply all bolts, nuts, washers and gaskets. Assembly will be done using anti-seize compound on all threads.

All piping to be hot galvanized will be pressure tested at 100psi before galvanizing, and in presence of the CCG representative. All welds will be also inspected and accepted by the CCG representative before the pressure test. The contractor is in charge for communications for inspection advice.

All piping, bases, brackets, supports, existing elements to be modified will be prepared and painted with one coat of Intergard 264 primer, then 2 coats of Interlac 665 white paint for finish. All paint will be supplied by the CCG.

Remove the existing stern tube feed pump and the attached piping up to the suction valve. Remove also the discharge piping up to the duplex strainer. Give the pump assembly to the chief engineer.

Remove the duplex strainer and reinstall it as the suction strainer that will be used for the WQP. Modify the support base for proper installation.

Remove the stern tube emergency cooling line, modify and reconnect it after the WQP feed line once the WQP is installed.

Remove also the fire line and the two valves in order to save some space during the works. Overhaul the two fire line valves, grind the seats, reassemble using new gaskets and packings.

Modify the existing constant pressure fire lines (2) in order to:

- Redirect the emergency cooling water at the WQP feed water discharge (supply and install a 2" bronze check valve, door type).
- Redirect the sea water to the fire line
- Use new victaulic joints and fittings

Lower the tail shafts brake air line.

Remove and reinstall the potable water pump pressure gauges, as per WQP installation. Fabricate and install new brackets for the gauges.

Modify the actual pump base : Cut, lower the base about 10 inches and modify it to receive the new WQP base.

### **Unit installation**

The WQP unit will be moved down in the propulsion motor room and installed in the center, in order to replace the existing pump. The chief engineer will confirm the final position of the system. The contractor will supply material and labour to fabricate and install a base that will be able to support 1200lbs and resist in typical Icebreaking vibration conditions.

The base will be prepared with sandblast and painted with one coat of Intergard 264 primer, before final installation on board. The contractor will install the WQP on it, with the pump suction facing forward of the ship, using stainless steel supports and brackets. The WQP will be supplied disassembled and the contractor will assemble all components together. The contractor will supply and install the necessary frame and brackets to support the WQP unit on the proper points and to install the control panel. The contractor will make sure that the unit will be supported enough, in order to resist to the typical icebreaker operation conditions. All brackets, supports and fasteners will be made of stainless steel 316. Threaded holes will be done in the base to bolt the WQP support and brackets.

### **Sea water suction**

The suction piping will be made of SCH80, 2" pipes. Fabricate and install a suction manifold between the WQP pump suction and the 2" suction piping. The two flanges that will be coupled at the pump suction will be DIN 50mm (PN16) type. Two (2) butterfly valves (CCG supplied) will be installed between the manifold and the pumps. The flanged joints at the pump suction will be done with stainless steel 316 fasteners. Total length of the suction piping is approx. 12 ft.

### **Stern tubes feed water**

Install two (2) 2" butterfly valves (CCG supplied) at the WQP feed water outlets, using stainless steel 316 fasteners.

Fabricate and install a 2", "H" shaped manifold, in order to allow feeding the two stern tubes with only one pump of the WQP. This manifold will be installed right next to the two above mentioned butterfly valves.

The 2" stern tube feed line that will be connected to the above mentioned manifold will be then connected to each existing stern tube feed line.

The piping will be 2", SCH80. The connexion points to the existing system will be done on each feed line of each stern tube feed line. The existing piping will be modified with the necessary fittings to be connected with the new 2" feed line. Total length of the feed line to be made is 35ft.

### **Mud discharge overboard**

The mud discharge piping will be connected to the two (2) WQP mud discharge outlets, then connected to the existing overboard discharge line that is used for the OWS, located in the ceiling, near the engine room aft bulkhead.

Supply and install a door type, 2" bronze check valve on the WQP purge line, just before the connexion with the existing overboard discharge line. Modify the existing discharge line with the installation of another 2" door type, bronze check valve, upstream the junction with the WQP purge line check valve. The piping will be 2" SCH80. Fabricate and install a manifold to adapt the two 1" purges outlets of the WQP to a single 2" outlet. Install two (2) 1" butterfly valves (CCG supplied) between the WQP and the manifold, using stainless steel 316 fasteners. The 2" mud discharge line to be fabricated will be connected to it.

### **Dock trials**

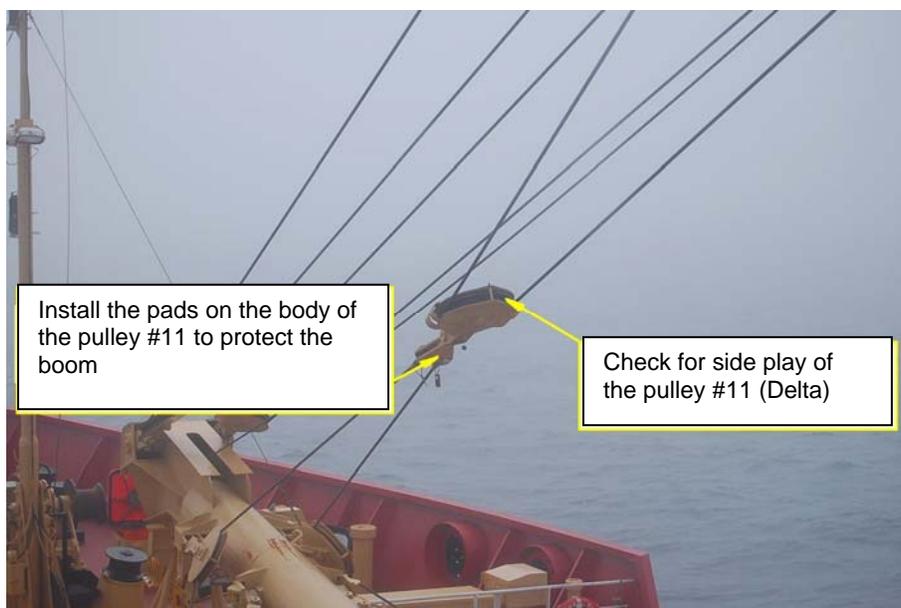
Once the system installed and electrically connected, proceed to a 30 minutes run test, with the presence of the chief engineer and the CCG representative. Do the necessary adjustments to confirm the good operation of the system, to the chief engineer and the CCG representative's entire satisfaction.

### **ITEM 02 : Speed crane pulleys**

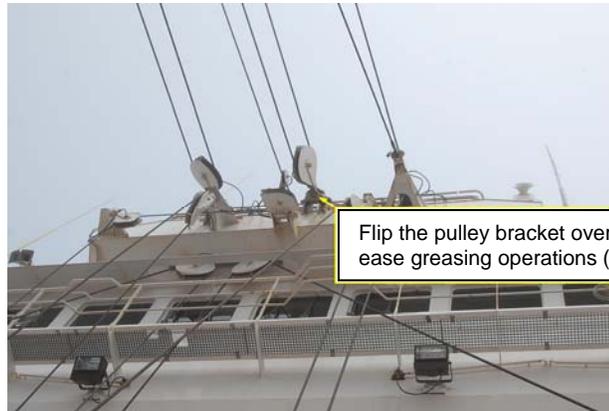
1. Install reinforcement pads on the pulley #11 (DELTA) in order to avoid contact of the pulley with the boom's upper section. These pads will resist the weight of the pulley blocks when the cables will not be tensioned.

2. Remove cables from the intermediate pulleys. Store the cables on the deck with proper protection to avoid any contamination and damage.

Measure and check the side play of the pulley #11 (DELTA), which seems excessive. Check the grease ways and parts wear. Test and certify the pulley (supply a load test certificate). All parts replaced will be extra work.



3. Revert the support bracket of the pulley #10C in order to gain access to the grease nipples. See pulley #10A for reference.

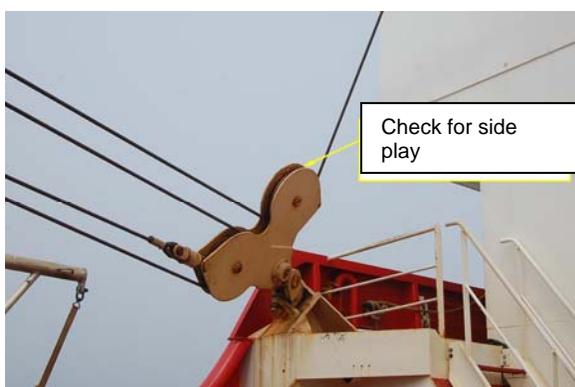


4. Revert the support bracket position and also the pulley #10B in order to have the grease nipples on top and facing up.



5. Remove compensation cables. Store the cables on the deck with proper protection to avoid any contamination and damage.

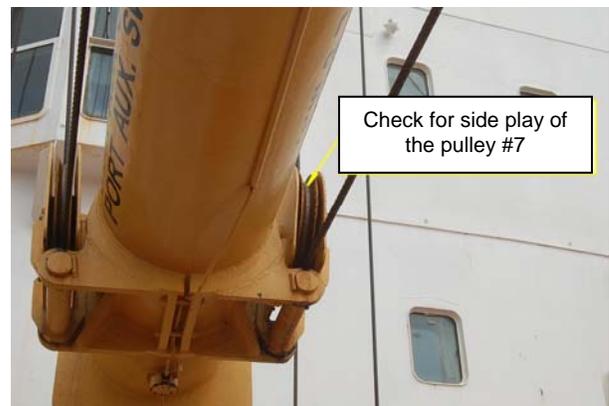
Measure and check the side play of pulley assemblies #17 (mickey mouse) that seems excessive. Check grease ways and wear of all parts. Test the pulley (supply a load test certificate). All parts that will be replaced will be extra.



6. Replace the pin (supply the pin) of the 8T hook. Carry a load test and supply a load test certificate.



7. Check the side play of pulleys #7 (8 tons) and #20 (5 tons) that seems excessive. Check the grease ways, measure and check the wear of all parts. Carry a load test and supply a load test certificate. Replacement parts will be extra work.



8. Reinstall all pulleys and make sure all grease nipples are easily accessible. The reinstallation and full greasing will be done with the presence of the crane operator, bosun and/or chief officer. Pump grease until it slightly overflows out of the pulleys

Submit a report of all measurements and observations to the CCG representative. Reinstall the steel cables, prepare and paint any surface that was damaged during the works (Primer : Intergard 264, RAL 9003, white; Top coat Interthane 990, RAL 070 7040, buff). The paint will be supplied by the CCG. A final inspection will be carried with the contractor and the chief officer.

### **ITEM 03 : Steam pipe section**

Supply and replace a condensate line that is corroded on a length of 8ft. Supply and replace the calcium silicate insulation, with a canvas and proper coating. The pipe is located on the starboard side of the forward engine room, over the overboard discharge of the fire pump. Material will be: Steel A.S.T.M. A-53, grade A, sch. 40 black., 2". All flanges will be 150 class. Supply new bolts, gaskets and assemble with anti-seize compound.

### **ITEM 04 : Forward starboard winch control console**

Dismantle the actual winch control console, fabricate and install a new upper section of the forward port side winch console, based on the actual console measurements.

Unhook hydraulic hoses and install steel plugs to avoid any leak or contamination.

Mark and identify each electrical cable BEFORE disassembly.

Remove the cover and control panel.

Unbolt the control console.

Fabricate a new console made of welded steel. The console will be built to obtain the same measurements as the old console, including a bolted access door. A new bolted access door will be installed on the port side and a handle will be welded on the door. The console section where the access doors are bolted will be made of 5/16" thick steel at least. All bolts, nuts, washers will be stainless steel 316. All gaskets will be bonded on one side.

Replace all indicator lights, switches, connexion blocks, electrical cables, pressure gauges, indicators, heaters and relays. Supply an updated electrical diagram. The contractor will submit to the chief engineer a list of all components brand, model and serial numbers. This material will be supplied as extra. All indicator lights and switches will be the following :

Schneider Electric, 22 mm (standard on this vessel) model:

*XB4BVG3*, 120 volts, for lighted push-buttons.

*XB4BVG1* or 3 or 4 depending of the color of the indicator lights

*XB4BD25*, for switches

*XB4BP21* or 31 or 42 depending of the color of the non-lighted push-buttons

The electrical cables will be long enough to allow access to the internal components when the console control panel is lifted open.

Replace all hydraulic hoses inside the console and allow enough length to permit easy service when the console panel is lifted open.

The new console will be sandblasted to commercial grade and spray painted with one coat of intergard 264 primer, then two coats of interthane 990 RAL 070 7040 buff, before the assembly of the console.

Assemble all components, identify all electrical cables with proper tagging, install the console and proceed to operational tests, as per chief engineer entire satisfaction.

### **ITEM 05 : Fire hydrant #13**

Supply material and labour to replace four (4) sections of piping located in the starboard side bunkering compartment at the fire hydrant #13. The four (4) sections totals approx.. 8ft. Long. Dismantle and rebuild the valve (disassembly, grinding, renew packing and gaskets. Reinstall the new pipes with new gaskets, elbows, adapters (flanges) all of the Victaulic style 77, 2". The pipes will be ASTM A-53 steel, SCH 40, hot galvanized.

Victaulic joints count : 5 joints, 2 90deg. Elbows, 2 flanges for the valve.

Note : In order to do this work, a section of fuel pipe will be dismantled to gain access to the fire line. A blind flange will be installed at both ends of the fuel pipe. Reinstall the fuel pipe once all works completed using new gaskets that will be resistant to diesel fuel.

### **ITEM 06 : Scientific transducer support**

Transport the support in a workshop. Remove all sliding pads (keep them for further reinstallation). Unbolt and separate the lower section. Clean the inner and outer surfaces and the internal surfaces of the upper and lower sections. Remove all rust using sand blast inside/out to obtain a SA-2-1/2 surface. Repair all surfaces, repair the lifting points and framing, then apply Intershield 300ENA, bronze color, 12 mils thick dry, then apply two (2) coats of interspeed 640BRA, 4 mils per coat dry, black color.



For the lower section of the transducer support, protect the black section that is coated with Inerta 160 before sand blasting. The other surfaces will receive the same paint system as per the upper part of the transducer support. Once the paint work completed and fully cured, reinstall the sliding pads using new, stainless steel 316 fasteners. Reinstall the lower section of the transducer support using new stainless steel 316 bolts, nuts and washers. Mount all fasteners with anti-seize compound.



**ITEM 07: Starboard lower sea chest pipe**

**vent**

Replace a section of the vent pipe of the starboard lower sea chest which is corroded, located right after the 4" butterfly valve on top of the sea chest. Replace also the three (3) Victaulic joints and the two victaulic elbows 3".

The pipe section made of a 4" section which reduces to 3". Total length is 48". All pipes and elbows will be made of SCH80 pipes and will be hot galvanized before installation. Supply and install new bolts and assembled with anti-seize compound. A 50psi pressure test of the assembly will be done in presence of the CCG representative at the end of the works.

**Note: all Victaulic piping featuring a grooved end in the above mentioned works is to be rolled. No cut groove will be accepted.**