Marine Services International(2008)Ltd.

CCGS Terry Fox
Port Side Shell Renewals
Between Main Deck and Foc'sle Deck
I.W.O Frames 132 - 138

Issued
June 2012

Completed By:

Marine Services International (2008) Ltd.
P.O. Box 29132
St. John's, NL
Canada A1A 5B5
Phone: 709 782 2700
Fax: 709 782 2707

Completed For:

DFO Vessel Support
P.O. Box 5667
St. John's, NL
Canada A1C 5X1
Phone: (709) 772 - 4146
Fax: (709) 772 - 3652

Project Number 2363 **Revision** 1

1.0 General Information

1.1 Introduction

The vessel “CCGS Terry Fox” has sustained limited side shell and internal damage in way of the port hull located aft of the collision bulkhead in the area of the Dairy Room and Dry Provisions Store. This renewal specification is intended to cover a like-for-like renewal where by the original scantlings are maintained and identified areas of the side shell are renewed.

After the renewal and inspection of the steel sections, the coatings and insulation are to be reinstated over the affected areas.

1.2 Extent of the Renewals:

The extents of the renewals are detailed in section two below, are identified on the supplied MSI drawings and are generally indicated on the accompanying photographs. In general, the renewals are limited to the port side shell and internals between frame 132 and 138. The renewals are above the main deck but below the foc’sle deck.

The renewals are in way of a void space outboard of the port galley stores between the dry provisions stores and dairy room. This area is accessed through the galley handling room located on the port side. The void outboard of the galley stores is accessed through a 1.0 m x 0.6 m access in the joinery bulkhead.

1.3 Supplied Drawings and Information:

Attached for use are the MSI drawings covering the renewal and are as follows:

- Drawing No. 2363-01-00 Renewal Area Port Side Hull Damage
  Sheets 1 – 3

The contractor is also encouraged to obtain the complete copies of the original shell expansion and framing plans.

1.4 Owner Supplied Materials:

The contractor shall supply all materials, equipment and parts required to perform the specified work unless otherwise stated. The shell plate is EH36 (modified). The contractor will be responsible to have the shell plating tested to confirm the chemical composition and will ensure that the proposed welding procedures are correct for the grades of steel to be welded.

2.0 Details of Repair

2.1 Scope of Steel Renewals:

The contractor will complete steel renewals to the damaged area as follows:

1) A section of the transverse bulkhead at frame 135 shall be renewed. The renewal shall start in the good plate just above the stringer and include the area up to the foc'sle deck. Transversely the renewal will start at the side shell and continue inboard to a location 25mm from the outboard vertical stiffener. The overall size is approximately 700mm x 2300mm high. The lower section of the bulkhead is 1750mm above the deck and has a plate thickness of 13mm while the remaining bulkhead plate is 6mm thick. Plate shall be renewed following the fitment of the shell plating.

2) The intermediate frame 133, 134, 136 and 137 shall be renewed completely from the top of the stringer to the underside of the Foc'sle Deck including the upper and lower brackets. The intermediate frames above the knuckle are 150 x 10mm flat bar and below the knuckle are 150 x 13mm flat bar. The lower brackets on top of the stringer are 350 x 200 x 10mm plate. The upper brackets located at the underside of the Foc'sle Deck are 300 x 550 x 10mm with 75mm flanges. The stringer and frames below shall remain intact. The frame spacing in this area is 400mm.

3) The side shell plating shall be cropped and renewed in the affected areas. The side shell includes two strakes; 9mm plate above the knuckle and 13mm plate below the knuckle. The 9 mm plate measures approximately 2600mm x 2600mm. The 13mm plate forms a trapezoid shape and is approximately 2450mm x 600mm x 150mm. The 9mm shell cutout shall be from the Foc'sle Deck at the horizontal welded seam on the bulwark to approximately 100mm above the deck. The aft vertical cutout shall be 100 mm aft of frame 132 and extend down to the welded seam at the 23mm plate seam at the knuckle. The cutout shall continue forward along the welded seam at the knuckle to 100mm forward of web frame 138 and the extend vertically up to the horizontal welded seam on the bulwark. The shell plate shall be cut clear of the welded seam at the Foc'sle Deck. The 13mm shell cutout shall extend from the knuckle and 150mm forward of frame 132 down along the 23mm seam plate 150mm. Continue forward along the 23mm seam plate to 100mm forward of frame 138 and then vertically up to the knuckle.

2.2 Scope of Insulation Repair:

The void space outboard of the galley dry provisions store is fully insulated on the side shell, side shell stiffeners, deckhead and forward side of the bulkhead located at frame 135. The insulation is to be generally 100 mm thick over all affected areas forward and including the bulkhead separating the dairy room from the dry provisions store. The insulation should be a rigid board type installed in two 50 mm layers. The insulation is to be tightly fitted into structural sections and over all internal stiffeners. The insulation is to be secured with pins and caps. The current pins out board of the damaged area may be damaged and require renewal. The completed insulation is to be covered by a reinforced foil vapor barrier. In addition, all seams are to be taped and sealed.

2.3 Scope of Coating for Steel:

All steel is to be wheel a braded and primed with a weldable primer prior to fabrication. Following the welding and testing of all work, the affected coatings and welding shall be power tool cleaned and feathered back to the intact coatings. The complete area, new steel and heat effected steel is then to be coated with two complete coats of Alkyd Primer Amercoat 5105. This process is to ensure that all steel in the repair area is completely primed. After priming, the complete area is to have two coats of Alkyd Gloss Top Coat Amercoat 5450 with sufficient feathering on the intact coatings. The exterior top coats to match the current vessel paint type and color. The interior void space coating is to be suitable marine enamel. All coatings shall be applied as specified by manufacturer data.

3.0 General Repair Information and Requirements

3.1 Materials:

The shell plating shall be EH 36 (Modified). All other steel material shall be new and clean Lloyds Grade ‘A’ plate and sections for all internals.

All plate and sections are to be clean and primed with a weldable primer prior to fabrication. Material certificates for the steel to be provided. Any substitution of imperial plate sizes for the specified metric plate is to be made by written request and must be accepted prior to fabrication.

3.2 Welding:

The welding details are to be as the current installation. All plate seams are to be full penetration. All stiffeners to plate connection are to be fillet welded with a 6 mm DCFW. All welding on interior and exterior structures is to be double continuous. All welding is to be as per existing. The contractor is to provide weld procedures for all intended welds. The existing 23 mm shell plate is an EH 36 low hydrogen plate and suitable consumables must be used.

All inserts are to have corners with a minimum radius of 100 mm. No parallel plate seams shall be closer than 300 mm apart. All rat holes are to be 25 mm radius unless noted.

Only CWB approved welders are to complete the welding. All welds shall be completed as per approved CWB weld procedures. Documentation to show welder qualifications and weld procedures will be supplied to the owner. The contractor's welding inspector will complete a visual inspection of all welds prior to arranging an inspection with TCMS or class.

The contractor shall remove weld splatter and smooth weld seams and sharp edges and remove grease, smoke, and soot marks as per SSPC-SP 1. All welds shall be power tool cleaned to SSPC-SP 3 and primer applied by hand brush.

3.3 Coatings and Paint Work:

The contractor will be responsible to prepare and coat the new and the heat effected steel in the repair area. The heat affected paint is to be hand tooled to a feathers edge and the current coating reapplied. The contractor is to supply all coatings. All coatings are to be in accordance with the ships painting system. The contractor is to complete the coating and all associated machine tooling to feather back the affected areas. All coatings, glues, and solvents must be supplied with acceptable WHIMS data sheets and correctly marked. The contractor is responsible to remove all containers of paint and solvents from the work place daily.

3.4 Inspection and Testing:

The work is to be completed to the satisfaction of the attending TCMS inspector and the owner's representative. The completed steel work is to be visually inspected after welding is completed. There is to be a 20% MPI testing completed on the welds by approved testing personnel. The contractor is to allow for 6 x-rays on the hull seam welding. This testing is to be carried out in the presence of the attending TCMS surveyor and owner's representative. All costs associated with the inspection to be included in the contractor's price for known steel work.

The contractor will complete a hose test on the remaining side shell insert.

The contractor is responsible for all air quality testing to ensure hot work and entry is permitted. The contractor shall issue and post hot work permits and shall maintain a fire watch.

After acceptance of the testing by the TCMS and owner's representatives, the area is to be inspected to ensure all debris have been removed, then the contractor will coat and insulate the areas.

3.5 Removals to Permit the Completion of the Work Scope:

The forward side of the transverse bulkhead at frame 135 is accessed from the dry stores room forward of the dairy room. The shelving on the aft bulkhead and outboard side shall be removed and laid aside for reuse. The deck head panels in way of the bulkhead linings on the aft and outboard side shall be removed and laid aside for reuse. The bulkhead linings on the aft and outboard side of the entrance door shall be removed to access the damaged transverse bulkhead. The bulkhead linings from the aft portside corner to approximately 3 meters forward shall be removed to access the ships side frames 135 -138. The insulation on the ships side and deck head in way of the transverse bulkhead and frames 136, 137 and 138 shall be removed and discarded of.

The refrigerated Dairy Room shall be disassembled by an authorized refrigeration representative to gain access to the ships side at frame 132 to frame 135 aft of the transverse bulkhead for repairs. The internal space measure 12 feet wide x 7 feet long x 9 feet high. Digital pictures shall be taken of the space and all equipment inside to ensure that the pars are all reassembled in their original location. Access on top of the Dairy Room is through manhole covers located above the deck panels in the passageway outside the refrigerated spaces. The Freon gas shall be reclaimed from the unit and isolated to allow the remaining refrigerated spaces to function. The evaporator and associated piping shall be removed. The internal shelving shall be removed and laid aside for reuse. The electrical circuits for the lights, solenoids and fans shall be isolated, removed and laid aside for reuse. The space is bounded by modular insulation. The linings shall be removed to access the Dairy Room panels, be separated from each other and laid aside for reuse. The deck is also fitted with insulated panels and a deck scupper consisting of a pipe outside, under the door. Upon completion of the steel renewals, the Dairy Room shall be reassembled and fitted with all the removed equipment as originally found. All seams shall be caulked with approved sealant for refrigerated spaces.

3.6 Documentation:

The contractor is to include the supply of a documentation package as a component of the complete project. This documentation package is to include the material data for the installed steel, the weld procedures used, a record of consumables and the certificates for the welders completing the work. In addition, the documentation package is to include a record of the MPI reports and the x-rays.

Three copies of the following documentation are to be supplied upon completion of the work scope:

- CWB Certificates for Welders
- CWB Certificates for Weld Supervisor
- CWB Weld Procedures
- CWB Weld Data Sheets
- Testing Documentation

3.7 Protection of Area from Environmental Damage:

It is also the contractor's responsibility to protect the vessel from damage due to cold temperatures and water while the steel repair is ongoing. The contractor is to effectively tarp and insulate the area, if required, so that other damages are not created. If other damages occur due to ineffective environmental protection, the contractor will repair at the contractor's cost.

3.8 Protection of Area from Additional Damage and Disruption:

The contractor is responsible to protect the vessel from physical damage and contamination due to the generated smoke. This will include the provision of suitable extraction fans.

3.9 Arising Work:

If, during the completion of this work, it is evident that additional work items are required to complete the general scope of work, the contractor is to immediately notify the owner's representative or the Chief Engineer.

The arising work will be defined and agreed to by the owners before such work is undertaken.

MSI Marine Services International Ltd.

Terry Fox Damage Survey
June 2012

Port Side Damage - Exterior View

Port Side Damage - Exterior View

Terry Fox Damage Survey
June 2012

View of damaged area looking aft

View of damaged area looking aft

Terry Fox Damage Survey
June 2012

Damaged frames, brackets

Damaged frames, brackets forward of bulkhead at frame 35

Terry Fox Damage Survey
June 2012

Typical tripped bracket

Damaged frames, brackets aft of bulkhead

Terry Fox Damage Survey
June 2012

Typical tripped bracket

Damaged frames, brackets aft of bulkhead