ANNEX A

SPECIFICATION FOR THE RENOVATION OF COMPARTMENTS DECKS & BULKHEADS ON BOAT AND OFF. DECKS

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For

CANADIAN COAST GUARD

Pêches et Océans Canada | Fisheries and Oceans Canada

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1 HISTORY

Canadian Coast Guard Integrated Technical Services, Central & Arctic Region, sent out a TIES contract to produce a specification for the repair of the interior hull plate surface for compartments on the boat and officer decks panels, and flooring. A faulty insulation of these hull surfaces caused important damage and inconvenient. Also, for many years, Ship's crew spent time repairing the bulkheads insulation as best they could, without ever replacing/repairing all the insulation to try eliminating frost, and consequently heavy damage to walls and floors/decks.

Indeed, during the winter season, ice will form at poorly insulated spots on the exterior bulkheads, especially around the sliding windows, and when this ice melts at springtime, the water will soak in the bottom of the walls, as well as in the decks of the cabins on both these decks. Damage is most important on Main & Upper decks, but has also been noticed on the 2 other higher decks, Boat deck & Officer's deck.

2 GENERAL NOTES

1. All the following work specified herein and all repairs, inspections and renewals shall be completed to the satisfaction of the Coast Guard Technical Authority (CGTA), who, unless otherwise advised, will be the Chief Engineer (C/E) of the ship. Upon completion of each item of the specification, the C/E shall be so notified so that he may inspect the work prior to final closing up and after complete closing up. Failure to give notification does not absolve Contractor of the responsibility of providing the C/E the opportunity to inspect any item. Inspection of any item by the C/E does not substitute for any required inspection by Transport Canada Marine Safety Branch (TCMSB).
2. Any item of work involving the use of heat in its execution requires that Contractor advises the C/E prior to starting such heating and upon its completion. Contractor shall be responsible for maintaining a competent and properly equipped fire watch during and for one full hour after all hot work. The fire watch shall be arranged such that all sides of surfaces being worked on are visible and accessible. Contractor shall provide sufficient suitable fire extinguishers and a fire watch during any such heating and until work has been cooled. Ship's extinguishers are not to be used except in an emergency. Contractor shall abide by the Coast Guard Hot Work policy that will be handed over to him before the beginning of work. Contractor shall be responsible to ensure that Contractor's personnel including all subcontractors shall follow the policy.
3. Contractor to include in quote the costs of any and all transportation, staging, rigging, slinging, cranage, removals, and installations of parts and equipment such as may be required to carry out work.
4. Any piping, manholes, parts and/or equipment requiring removal to carry out specified work and/or to gain access shall be replaced upon completion with new jointing, nuts, bolts,

anti-seize compound, clamps and brackets as applicable (Contractor supply), and secured in original condition. Any removals shall be jointly inspected by both Contractor and the C/E prior to removal.

5. Contractor to ensure that all spaces, compartments, and areas of the ship, both internal and external, are left in as clean a condition as found. The cost of removing dirt, debris, and associated material shall be included in the quote on each item of this specification
6. Contractor to supply the C/E with marine chemist's certificates in accordance with CGSSB TP 3177E before any cleaning, painting or hot work is commenced in confined spaces or machinery compartments. Certificates shall clearly state the type of work permitted, and shall be renewed as required by the regulations.
7. Whenever any work is being carried out involving a ship's firefighting or fire detecting system, it shall be done in such a way as to leave the vessel and any persons aboard with adequate protection against fire at all times. This may be so accomplished by removal or disarming of only a portion of the system at a time, by replacement with spares while work is in progress or by other reasonable means acceptable to the C/E.
8. Unless specified otherwise, any replacement and/or disturbed steel work to be given a minimum of two (2) coats of white marine primer immediately upon completion of work.
9. All materials, unless otherwise specified, shall be supplied by Contractor. Where a particular item is specified, or where substitution must be made, the Chief Engineer must approve all material offered.
10. Contractor to be responsible for calling in the services of American Bureau of Shipping ABS, when and as required for survey and inspection.
11. Public Service Smoking Policy forbids smoking in Government ships in all areas inside the ship were shipyard personnel will be working. Contractor shall inform shipyard workers of this policy and ensure that it is complied with in all cases.
12. Contractor shall use fully qualified, certified and competent tradesmen and supervision to ensure a uniform and high level of workmanship as judged by normally accepted shipbuilding standards to the C/E's satisfaction.
13. The overhaul and installation of all machinery and equipment specified herein shall be as per the Manufacturers' applicable instructions, drawings and specifications.
14. Contractor shall provide adequate temporary protection for any equipment or areas affected by this refit. Contractor shall take proper precautions to maintain in a proper state of preservation any machinery, equipment, fittings, stores or items of outfit which might become damaged by exposure, movement of materials, paint, sand grit or shot blasting, welding, airborne particles from sand grit or shot blasting, welding, grinding, burning, gouging, painting or airborne particles of paint. Any damage shall be the responsibility of Contractor.
15. Contractor must ensure that welding is performed by a welder certified by the Canadian Welding Bureau (CWB) in accordance with the requirements of the following Canadian Standards Association (CSA) standards:

a. CSA W47.1, Certification for Companies for Fusion Welding of Steel Structures (Minimum division level 2.0); and
b. CSA W47.2-M1987 (R2003), Certification for Companies for Fusion Welding of Aluminum (Minimum division level 2.1).

16. All electrical installations or renewals shall be in accordance with the latest editions of the following Marine Standards:
    a. TP 127 – Ship Safety Electrical Standards
    b. IEEE Standard 45 – Recommended Practice for Electrical Installation on Shipboard
17. All materials supplied and work carried out by Contractor shall be adequate to meet the following service conditions:
    a. outside air temperature of minus (-) 400 C to plus (+) 350 C;
    b. wind velocity of 50 knots;
    c. water temperature of minus (-) 20 C to plus (+) 300 C;
    d. Shock loading of 2.5g horizontal, 1.5g vertical.

18. The Contractor will conduct a complete photographic survey of all spaces, walls, ceilings, workstations, offices and cabin furniture, in consultation with CCG personnel, prior to any work as a reference for installation and sign of existing wear and breakage.

19. The Contractor must protect the deck of corridors and vertical walls up to 4 'high with protective material such as Masonite ¼" thick or equivalent type of protection equipment on deck of boats and officers, supply, install and remove all materials after works.

20. The work must be done in two step, the officer's deck must be done entirely as a first step with cleaning and then start with the second consecutive step on the boat deck.

3 BOAT and OFFICER'S DECK COMPARTMENTS

3.1 Inspection

A few lining wall panels on Boat and Officer's decks cabins were taken down so as to permit us to see firsthand the extent of the damage caused by the ice melt that had formed during winter, principally around the sliding pane window and frame in cabins (see figure no.1).

Figure 1: cabin typical sliding window

The compartments targeted by this work are as follows: two main entrances on boat deck, officer's mess # 305 with bathroom, winch control room # 302, official room # 300 & 304 with bathroom, data acquisition room # 312, electronic equipment room # 308. Officer's deck cabins, C/O 403 & 405 with bathroom, first and second off # 400 & 401 with bathroom, Chief Officer 404 & 408 with bathroom. Surface decks and exterior walls may vary, but the work to be carried out will be similar. The targeted spaces are all at the front of the boat and off. Decks, between the members 75 to 115.

3.2 Dismantling Work

Before undertaking any repairs to the insulation of the exterior bulkheads of these spaces, it will be necessary to disassemble the fixed furniture and store it on the front deck in a 20' container (contractor supply can be store on the helicopter pad). See General Arrangement drawing in annex B.

3.2.1 Furniture & Furnishings #305 with bathroom

Dismantle and put away, outside room #305, the following:

a. Bar fixed furniture and cabinet;
b. Armchair, seats and tables;
c. Wooden half wall molding on starboard side;

d. TV fixed cabinet;
e. Windows frame;
f. Electric convertair, fastened to wall lining panel (if necessary).

Figure 2: Off mess bar 305 *Fig. 3: 305 Starboard with ½ wall wood panel* *Fig: 4 Forward with TV cabinet and seats*

N.B It is to be noted that certain cabins have reheaters mounted on exterior lining panel, and others, on interior panel.

3.2.2 Furniture & Furnishings #300 & 304 with bathroom

Dismantle and put away, outside room #300 & 304, the following:

a. Fixed beds and night tables(2);
b. Fixed dresser and mirror;
c. Window frames;
d. Bathroom cabinet with light/mirror/pharmacy;
e. Fixed office furniture;
f. Electric reheater, fastened to wall lining panel (if necessary).

N.B It is to be noted that certain cabins have reheaters mounted on exterior lining panel, and others, on interior panel.

Figures 5, 6 and 7: Room 300 & 304 Official room, office and bath room

3.2.3 Furniture & Furnishings #308 & 312

Dismantle and put away, outside room #308 & 312 Server & equipment room, the following:

a. Office chair (6);
b. Computer tables and shelves;
c. Surface wire-tray and electrical outlet;
d. Window frames;
e. Book shelves, tool and parts locker, work bench;
f. Electric heater, fastened to wall lining panel (if necessary).
g. Steel plate wall-surface mounted system for back plate of electric and electronic equipment and electrical outlets (to be reinstalled after work)

N.B It is to be noted that certain cabins have heaters mounted on exterior lining panel, and others, on interior panel.

Figures 8 and 9: Room 308 Electronic equipment room

Figures 10 and 11: Room 312 Server room

3.2.4 Furniture & Furnishings boat deck entrances

Dismantle and put away, port and starboard main entrances, the following:

a. Outside door frame;

Figure 12 and 13: Boat deck port and starboard main entrances

3.2.5 Furniture & Furnishings #302 Crane control room

Dismantle and put away, outside room #302, the following:

a. Two door metal cabinet with material;
b. Stool;
c. Window frames and windows to be replace;
d. Electric heater, fastened to wall lining panel (if necessary).

N.B Control crane room will have a major refit, with windows and frames replacement, crane console replacement with bulkhead insulation and paneling refit. Insulation & paneling replacement on front windows wall and both side bulkheads are part of this contract.

Figures 14 and 15: Room 302 Crane control room

3.2.6 Furniture & Furnishings #400 & 401 with bathroom

Dismantle and put away, outside room #400 & 401, the following:

a. Fixed beds and night tables(2);
b. Fixed dresser and mirror;
c. Window frames;
d. Fixed wardrobe;
e. Electric heater, fastened to wall lining panel (if necessary).

N.B It is to be noted that certain cabins have heaters mounted on exterior lining panel, and others, on interior panel.

Figures 16, 17 and 18: Room 400 & 401 1st and 2nd officer rooms, with bath room

3.2.7 Furniture & Furnishings #403 & 405 with bathroom

Dismantle and put away, outside room #403 & 405, the following:

a. Fixed bed and night table;
b. Fixed dresser and mirror;
c. Window frames;
d. Fixed office furniture and desk;
e. Fixed TV cabinet;
f. Electric heater, fastened to wall lining panel (if necessary).

N.B It is to be noted that certain cabins have heaters mounted on exterior lining panel, and others, on interior panel.

Figures 19, 20, 21 and 22: Room 403 & 405 Commanding officer room, office and bath room

3.2.8 Furniture & Furnishings #404 & 408 with bathroom

Dismantle and put away, outside room #404 & 408, the following:

a. Fixed bed and night tables;
b. Fixed dresser and mirror;
c. Window frames;
d. Fixed office furniture and TV cabinet;
e. Electric heater, fastened to wall lining panel (if necessary).

N.B It is to be noted that certain cabins have heaters mounted on exterior lining panel, and others, on interior panel.

Figures 23, 24 and 25: Room 404 & 408 Chief Officer room, office and bath room

3.2.9 Five (5) Bathroom Furnishings 300 & 304, 305, 400 & 401, 403 & 405 and 404 & 408

Dismantle and put away, outside bathroom, the following:

a. Toilet bowl and flush control, make sure to blank off discharge pipe (vacuum system) and shut off water supply, figure 26. To be reinstalled at the end of the work;
b. Shower and faucets , the shower enclosure corner is fabricated using acrylic panels. Make sure to shut off hot & cold water supply;
c. While removing the panels against the terrazo flooring, it is a delicate operation not to break the vertical terrazo upraising.

Figure 26: Toilet and flushing control mecanism

3.2.10Wall Lining Panels & Suspension Ceiling Tiles

In order to gain access to the insulation material that blankets the exterior steel plating, as well as the ceiling assembly, it will be necessary to dismantle the following:

3.2.10.1 Sliding Window Frame

This frame will be reinstalled and the end of the prescribed work. See figure 26.

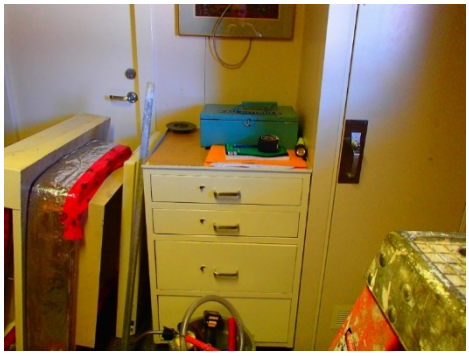

Figure 27: Sliding window frame + 4-drawer dresser cabin

3.2.10.2 Wall Lining Panels

There are approximately 46 meters on boat deck and 39.5 on officer deck of wall lining panels, Joiner B-15 or equivalent, 50mm X 600mm X 2250mm, in outside walls, plus 9 meters of paneling in inside transversal wall. The actual panels are deteriorated by corrosion on the lower end, as well as the positioning channels. These will be replaced by new paneling and tracks of the same type and color. Refer to sketch 1, walls dimensions are shown with circle readings in inches. See figures 28 & 29.

Figure 28: Corroded lower part of Joiner panel

Figure 29: Typical 50mm (2'') Joiner panel

3.2.10.3 Electrical Outlets

We must ensure to remove the electrical outlets from actual lining panels, as well as reheater thermostats. Reinstall on new panels at the completion of work.

3.2.10.4 Suspension Ceiling

Suspension ceiling will be removed, to facilitate access to exterior bulkhead insulation. This ceiling will need to be stored, as it will be reinstalled at the completion of work. See figure 30 and Annex B, C for longitudinal or transversal depending cabins/work place and salon.

Figure 30: Typical suspension ceiling

3.3 Insulation Removal

a. The insulation material on cabin and washroom exterior bulheads must be completely removed. There is a minimum of 50mm of insulation on walls.
b. The current insulation installed on vessel is CAFCO type C Spray on Insulation, 50mm thick & 25 mm over beams. This insulation is held in place using wire mesh and insulation pins, c/w spring washers over pins. These pins will be removed, as new insulation material will be thicker (twice as thick), which will require longer insulation pins.
c. In certain areas, especially towards portholes, other types of insulation material were used, ex. urethane, bubble-type insulation, etc. This insulation will need to be removed also.
d. An extra 75cm of insulation will need to be removed on ceiling, from outer shell plate towards center of vessel. This insulation is similar to the bulkhead insulation, CAFCO Type C Spray on Insulation, 50mm thick, A-60 fire rating. A clean cut of CAFCO ceiling insulation will need to be done, to permit a better blend between CAFCO and new insulating material.
e. All removed material to be taken off ship and Contractor will dispose of it in accordance with current regulations.

3.4 Installation Preparation Work

a. Once all the insulation has been removed, Contractor will mechanically grind off all rust on exterior bulkhead, ceiling and deck plating.
b. Special attention will be exercised on the deck beneath the windows, as water and humidity were particularly aggressive in that area. Also the lower lining track will be removed and replaced with new, as it is badly corroded. See figure 31.
c. Grinding to be performed all around sliding window (frame), if necessary.

d. Rusted surface to be grind and painted, 20% overall surface (350 ft² total to be grind), mostly 2 feet above deck, and around the sliding windows, applied on coat of white marine enamel primer and two white finishing coat.

Figure 31: Corroded tracking & deck below sliding window

3.5 Insulation Installation

All material to be supplied by Contractor.

3.5.1 Installation Criteria

a. Insulation to be fitted to bulkheads and decks by means of insulation pins spaced apart no more than 300mm max. Insulation pins to be 12mm longer than the insulation thickness.
b. All joints and edges of vapour barrier and heads of pins to be capped & taped after insulation and prior to fitting of sheeting or lining. Extreme care to be taken to maintain the integrity of the vapour barrier.
c. Unless noted otherwise, the last layer of insulation must be covered with a vapour barrier.
d. All exposed decks or bulkheads shall be thermally insulated in addition of their fire protection A-15, A-30 or A-60.
e. Installation of insulation shall conform to TP11469, of Transport Canada, and to specific details from insulation supplier (ISOVER or equivalent).
f. Refer to drawing 108-H-4410 – M.L. Black Insulation Plan.

3.5.2 Deck Head Insulation

a. Approximately 53 square meters of new insulation shall be installed on deck head of the compartments, at 0.5 meter from the outside bulkhead.

b. The insulation material is ISOVER ULTIMATE 50mm, A-60, with built in vapour barrier, or equivalent. Supply a valid type approval certificate from a marine classification society.
c. To blend in the actual CAFCO 75mm insulation to the new ISOVER 50mm sheet-type product, we will need to use the insulation pins already installed on the deck head. In effect, the CAFCO insulation is installed as follows: 25mm of CAFCO directly sprayed on the steel deck head, a wire mesh held in place by insulation pins and spring washers, and finally another 25mm of sprayed CAFCO that will mesh into the wire mesh and another coat of CAFCO under the wire mesh.
d. Care must be taken to make sure new insulation blanket can be held tight against CAFCO using insulation pins and spring washers. If pins are missing, Contractor to install new ones.
e. Again extra care to be taken to install adhesive aluminium vapour barrier tape to make sure vapour barrier is tight between new insulation and wire mesh already in place. If tape is pressed against CAFCO material, barrier will not be tight.

3.5.3 Exterior bulkhead plate Insulation

a. Approximately 85.5 meters wide of new insulation shall be installed on exterior bulhead plate in all compartments, on all vertical length of the outside bulkhead (total approx. 211 sq. meter). Supply a valid type approval certificate from a marine classification society.
b. The insulation material is ISOVER ULTIMATE 100 mm, with a minimum of 50mm over beams, with built in vapour barrier, or equivalent.
c. Make sure to insulate adequately (with vapour barrier) the sliding window frame, making sure that no ice will form again on the frame. Naturally, frame will then have been reinstalled.
d. Make sure to follow the criteria already stated in 3.5.1.

3.6 Modification of Sliding Windows

The sliding windows were installed with a stainless steel retention reservoir. This reservoir is too small (not high enough) and cannot prevent accidental overflowing of rain water or sea spray that can drip down to the reservoir when window is partially open or not well sealed. Contractor must proceed with the following modification on all 18 sliding windows:

a. The actual tank measures approximately 35cm high X 50cm wide. See figure 32.

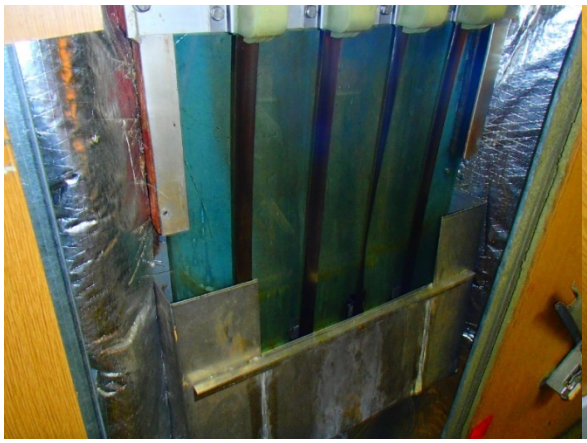

Figure 32: Retention reservoir cabin 245

Figure33: Flexible hose connection under reservoir

b. A new reservoir approximately 70cm high X 50cm wide will need to be fabricated and installed, as this new tank will allow rain water and sea spray to be more readily captured. The bottom of tank to be designed to permit water being channelled towards drain connection.
c. This new reservoir will be built using stainless steel 316 material.
d. The actual reservoir is fitted with a drain connection under, permitting rain water and sea spray to be drained on deck. The new arrangement will need to be fitted with a similar arrangement, c/w flexible drain hose. Make sure drainage connection in bulkhead is free flowing. See figure 33.
e. A leak tightness test to be performed before boxing up panels.

3.7 Boat deck weather door entrance

a. Supply and install new stainless steel cover all around both door entrance, port and starboard. After removing old cover, and renewing insulation and wall panel surrounding both entrance, install the new entrance ss cover, approx. size 1.1 m wide x 2.1 m high x .25 m deep. Figure 34

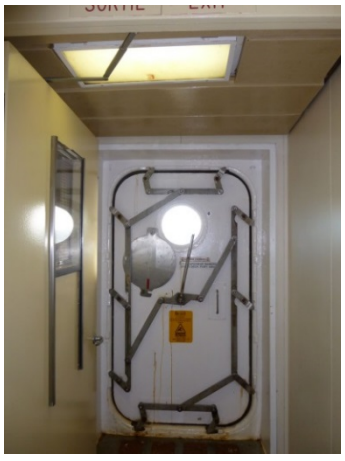

Figure 34: Boat deck entrance door

3.8 Bathroom installation

a. The toilet water supply must be modified. Remove the existing ½" steel galvanized piping as far as possible and then cap it tight, then supply the toilet flushing system using the adjacent fresh water supply with a new copper piping, silver soldered. All bathroom piping needs to insulated with new insulation, and all steel supports to the copper piping need to be replace with isolated plastic piping. A 20' x ½" copper piping with fittings with 8 supports per bathroom is requested.
b. The side wall paneling must be replaced up to the door frames.
c. Supply and install new acrylic, one piece molded walls in the shower, seal all ends, and reinstall faucets.
d. Re-Install the toilet and flushing valve.
e. Seal with a new polish stainless steel molding and sealant, the junction between the vertical terrazzo and new panels, supply all materials.

3.9 Installation of Joiner Lining Panels or equivalent.

1. All materials to be contractor supplies, identical or similar to be supplied, approximate quantity indicated, to be confirmed by contractor, supply a valid type approval certificate from a marine classification society:
2. Type A -PA33C50 B-15 Class 50mm thick Wall Panels PVC/Galv 600mm x 2250mm W80 Beige color E34 Joiners Isolamine Marine wall panel or equivalent; qty 49 approx.

3. Type B -PA33C50 B-15 Class 50mm thick Wall Panels PVC/PVC 600mm x 2250mm W80 Beige color E354 Joiners Isolamine Marine wall panel or equivalent; qty 10

4. Type C -PA33C50 B-15 Class 50mm thick Wall Panels PVC/Galv 600mm x 2250mm W80 Q63B color grain 096 Joiners Isolamine Marine wall panel or equivalent; qty 80 approx.

5. Type D -PA33C50 B-15 Class 50mm thick Wall Panels PVC/PVC 600mm x 2250mm W80 Beige color E354 one side and Q63B color grain 096 on other side Joiners Isolamine Marine wall panel or equivalent; qty 4

-Mounting accessories for 143 panels, top, bottom molding, and in between joining strip;

6. The old lining panels previously dismantled will be replaced by new Joiner B-15 panels, 50mm X 600mm X 2250mm or equivalent. These new panels will be installed using all new tracks (lower & upper), inside and outside corners, and end caps.
7. Once panels are installed, Contractor will then reinstall electronic/electrical outlets and reheater, and connect them in cabins.

8. Contractor to render lining panel under sliding window removable, as regular maintenance is often necessary in this area. The C/E will discuss with Contractor and convene with him in the best way to install such a panel.
9. Once all lining panels are installed, reinstall suspension ceiling and fixtures. Supply and install new lighting fixture marine LED type, such as the ceiling fixture 1' x 4' and 1' x 2', also the ceiling 4'' spot light, with LED light dimmer, reference Annex B and C.
10. Finally, replace tiles, carpet and underlay carpeting tiles using new linoleum product in all repaired spaces. Repair underlay surface over 20% of all deck (subkote ½''), with 3 thin coats of leveling marine magnabond or equivalent overall surfaces and install the deckcovering materials:
    a. For all cabins and rooms (except 302, 308 and 312) including boat and officer deck hallway Tarkett Johnsonite IQ Granite gray or equivalent without seam or invisible welded seam, supply a valid type approval certificate from a marine classification society, and install a matching black 4 '' vinyl baseboard;
    b. For local 302, 308 and 312 :American Biltrite, vinyl rubber # ABA36TAN - AB series pure natural ardoise or equivalent without seal or invisible welded seam, supply a valid type approval certificate from a marine classification society and install a 6 '' tan vinyl baseboard;
    c. For the C/E and senior engineer cabin (bedroom and office room in both unit), replace the existing linoleum with new Tarkett Johnsonite IQ Granite gray or equivalent, including 20% of underlay surface repair as per item 10 above.
    d. All furniture and furnishings removed previously will be reinstalled after installing linoleum.

3.10 Reinstallation of Cabin Furnishings

All furniture will be removed and stored in a container contractor on the flight deck before beginning work, and replace the furniture and fittings removed previously in 3.2.

In room 312, the data and servers, work tables shown in figures 10 and 11 on page 8 will not be reinstalled. New metal cabinets will to be provided and installed on the wall according to Annex D.

3.11 Cleaning

At the end of the work, a specialized cleaning team will fully clean cabins of both decks, decks, walls, ceilings and furniture as well as the corridors / passages adjacent to the work.