TMCC Refurbishment Standard

1. TMCCs returned to MSI-DS for refurbishment shall be completed following removal from service, with the full schedule of loose items defined in [redacted]

2. TMCCs that exhibit structural damage (ie damage to door ring sealing faces) or corrosion of the pressure vessel may not be suitable for refurbishment. A report shall detail the additional costs associated with the rectification of major damage outside the scope of a normal refurbishment if refurbishment is possible.

3. Refurbishment of a TMCC with sufficient service life remaining [redacted] to a serviceable standard shall include the following:

    3.1 All external pipework, valves, regulators and fittings are to be removed from the TMCC. Items to be re-used are to be surveyed to confirm serviceability prior to being cleaned. Some evidence of prior corrosion damage may be visible on reused pipework and fittings although the corrosion itself shall be removed and protective coatings reapplied. Defective or badly corroded pipework (Tungum or Copper) shall be replaced. Valves and regulators shall be refurbished to a serviceable (not new) standard with spares kits to replace lifed items where applicable.

    3.2 The external Service Lock Door is to be removed from the TMCC pressure vessel and returned to the OEM for refurbishment to a serviceable (not new) standard and re-certification.

    3.3 Gauges shall be either replaced (if BER) or refurbished to a serviceable (not new) standard and re-calibrated.

    3.4 All external metalwork (including roller shutter door) shall be removed from the TMCC and repainted whereby only cosmetic blemishes may be visible in isolated areas.

    3.5 All lifed items are to be removed from the TMCC and replaced with new. Items include shock mounts, hoses, viewports, dowty seals, o-rings and MC / ML door toroidal seals.

    3.6 External electrical units are to be removed from the TMCC and refurbished to a serviceable (not new) standard including; Power Distribution Unit, Power Supply Units (1 & 2), Input Enclosure and Communications boxes.

    3.7 The Environmental Conditioning Unit (ECU) is to be removed from the TMCC for refurbishment to a serviceable (not new) standard, including replacement of all external switches and indicator lamps, and repainting of external structure and removable covers to a standard whereby the surface is protected but blemishes/shade changes may be visible in areas. The ECU shall be degassed, o-ring seals in refrigerant lines replaced, remaining components in the refrigerant circuit replaced as required, subjected to an overpressure test and the refrigerant recharged.

    3.8 The AC/BS (external) and CCBS (internal) are to be removed from the TMCC for refurbishment to a serviceable (not new) standard and replacement of lifed items including gas sensors, cover seals, and mask hoses/seals.

    3.9 The armaflex insulation of the stripped pressure vessel shall be repaired or replaced as required prior to repainting of the entire external surface to an ‘as new’ standard

(Note: joints between sections of armaflex insulation are visible through the fibreglass matting). Door rings, bosses and brackets shall be repainted with a gloss finish.

3.10 Internal paintwork of the pressure vessel and associated fittings (ie floor plates) shall be touched up as required to a serviceable standard whereby the surface is protected but blemishes/shade changes may be visible in areas.

3.11 The TMCC shall be rebuilt with items that have been refurbished or replaced as detailed above.

3.12 Engraved labels shall be reused or replaced as required (if either broken or illegible). All vinyl labels shall be replaced with new.

3.13 All soft furnishings within the chamber such as bunk / seat cushions, sheets, pillows, duvets and covers shall be replaced with new.

3.14 Quantity 2 of new Hyperbaric Fire Extinguishers [redacted] shall be supplied with the refurbished TMCC.

4. Following completion of rebuild, the TMCC shall be subjected to a Factory Acceptance Test, to be witnessed by the contractor's Quality Assurance department. All pipework and associated components shall be leak tested to maximum working pressure, electrical circuits shall be tested for continuity, insulation and functionality. The acceptance report shall be signed by the contractor and copied to the Authority. The Authority's Quality Assurance Representative (MoD QAR) shall be invited to attend the customer witness TMCC FAT.

5. Refurbishment work detailed above shall be covered within the Firm Price subject to the findings of the 'on receipt' survey where missing items and major damage/un-serviceability shall be notified to the Authority. Replacement of missing items are excluded from the refurbishment price and shall be quoted individually or priced in accordance with the contract spares list where applicable. Additional costs associated with the rectification of major damage outside the scope of a normal refurbishment identified during the initial survey or preliminary independent verification examination shall be detailed within a written report. The Authority shall provide a response in accordance with the contractor's requested date to ensure adherence to the refurbishment schedule. The Authority's approval for additional costs shall be obtained prior to proceeding with the refurbishment.

6. The final independently verified examination and overpressure test that defines the service life of the refurbished TMCC shall be deferred until preparation for despatch in accordance with the Authority's delivery instructions. Gauges shall be re-calibrated to align with the overpressure test date. The Authority shall provide MSI-DS with a minimum 3 week notice period prior to the requested delivery date to enable these actions to be completed.

TMCC Transportation Container Refurbishment Standard

7. TMCC Transportation Containers returned to MSI-DS for refurbishment shall be complete following removal from service, with the full schedule of loose items defined in [redacted]

8. TMCC Transportation Containers that exhibit structural damage may not be suitable for refurbishment (ie if the damage prevents CSC re-certification). A report shall detail the additional costs associated with the rectification of major damage outside the scope of a normal refurbishment if refurbishment is possible.

9. Refurbishment of a TMCC Transportation Container to a serviceable standard shall include the following:

    9.1 All pipework, valves, regulators and fittings are to be removed from the Transportation Container. Items to be re-used are to be surveyed to confirm serviceability prior to being cleaned. Some evidence of prior corrosion damage may be visible on reused pipework and fittings although the corrosion itself shall be removed and protective coatings reapplied. Defective or badly corroded pipework (Tungum or Copper) shall be replaced. Valves and regulators shall be refurbished to a serviceable (not new) standard with spares kits to replace lifed items where applicable.

    9.2 All lifed items are to be removed from the Transportation Container and replaced with new. Items include hoses, dowty seals, o-rings and personnel/cargo door environmental seals.

    9.3 All internal metalwork shall be removed from the Transportation Container and repainted to a standard whereby the surface is protected but blemishes/shade changes may be visible in areas.

    9.4 Internal electrical galvanised trunking shall be cleaned, however surface blemishes may be visible in areas.

    9.5 The Air Conditioning Unit (ACU) is an obsolete item using R22 refrigerant which was banned on 1st January 2015 in accordance with the Montreal Protocol. The ACU shall be tested to establish serviceability however it is illegal to use additional R22 gas in maintenance and repairs. MSI-DS cannot therefore provide a guarantee for the serviceability of the ACU and recommend it should be replaced. The cost of replacing the ACU is not included within the Firm Price for the refurbishment of the TMCC Transportation Container.

    9.6 The external surfaces of the Transportation Container shall be grit blasted to remove the existing paint finish. The exposed steel structure shall be treated with an epoxy primer and finished with a 2 pack polyurethane top coat in cobalt blue for the walls and roof. The underside of the Transportation Container shall be finished with a black high solid epoxy. Painting shall be to a standard whereby only cosmetic blemishes may be visible in isolated areas (Note: previous structural repairs or allowable dents may be visible).

    9.7 The exposed internal steel surfaces of the Transportation Container (walls and ceiling) shall be finished in an off white anti-condensation paint. The internal wall lining shall be finished in colour ‘seafoam’. Painting shall be to a standard whereby

only cosmetic blemishes may be visible in isolated areas (Note: previous structural repairs or allowable dents may be visible).

9.8 The Transportation Container shall be re-certified in accordance with the Convention for Safe Containers (CSC) – validity period 30 months.

9.9 The Transportation Container shall be rebuilt with items that have been refurbished or replaced as detailed above.

9.10 Engraved labels shall be reused or replaced as required (if either broken or illegible). All vinyl labels shall be replaced with new.

10. Following completion of rebuild, the TMCC Transportation Container shall be subjected to a Factory Acceptance Test, to be witnessed by the contractor's Quality Assurance department. All pipework and associated components shall be leak tested to maximum working pressure, electrical circuits shall be tested for continuity, insulation and functionality. The acceptance report shall be signed by the contractor and copied to the Authority. The Authority's Quality Assurance Representative (MoD QAR) shall be invited to attend the customer witness TMCC FAT.

11. Refurbishment work detailed above shall be covered within the Firm Price subject to the findings of the 'on receipt' survey where missing items and major damage/un-serviceability shall be notified to the Authority. Replacement of missing items are excluded from the refurbishment price and shall be quoted individually or priced in accordance with the contract spares list where applicable. Additional costs associated with the rectification of major damage outside the scope of a normal refurbishment identified during the initial survey shall be detailed within a written report. The Authority shall provide a response in accordance with the contractor's requested date to ensure adherence to the refurbishment schedule. The Authority's approval for additional costs shall be obtained prior to proceeding with the refurbishment.

TMCC Support Unit Refurbishment Standard

12. TMCC Support Units returned to MSI-DS for refurbishment shall be complete following removal from service, with the full schedule of loose items defined in [redacted]

13. TMCC Support Units that exhibit structural damage may not be suitable for refurbishment (ie if the damage prevents CSC re-certification). A written report shall detail the additional costs associated with the rectification of major damage outside the scope of a normal refurbishment if refurbishment is possible.

14. Refurbishment of a TMCC Support Unit to a serviceable standard shall include the following:

    14.1 All pipework, valves, regulators and fittings are to be removed from the Support Unit. Items to be re-used are to be surveyed to confirm serviceability prior to being cleaned. Some evidence of prior corrosion damage may be visible on reused pipework and fittings although the corrosion itself shall be removed and protective coatings reapplied. Defective or badly corroded pipework (Tungum or Copper) shall be replaced. Valves and regulators shall be refurbished to a serviceable (not new) standard with spares kits to replace lifed items where applicable.

    14.2 Gauges shall be either replaced (if BER) or refurbished to a serviceable (not new) standard and re-calibrated.

    14.3 All lifed items are to be removed from the Support Unit and replaced with new. Items include air supply hoses to the TMCC Transport Container (main and reserve), compressor charging hose (2 off), dowty seals, o-rings and cargo door environmental seals.

    14.4 Air storage cylinders (22 off) shall be removed from the Support Unit, hydro-tested (re-certified) and repainted externally to a standard whereby the surface is protected but blemishes/shade changes may be visible in areas. Replacement of cylinders that fail hydro-test is not included within the Firm Price for the refurbishment of the TMCC Support Unit.

    14.5 All internal metalwork shall be removed from the Support Unit and repainted to a standard whereby the surface is protected but blemishes/shade changes may be visible in areas.

    14.6 Internal electrical galvanised trunking shall be cleaned, however surface blemishes may be visible in areas.

    14.7 The external surfaces of the Support Unit shall be grit blasted to remove the existing paint finish. The exposed steel structure shall be treated with an epoxy primer and finished with a 2 pack polyurethane top coat in cobalt blue for the walls and roof. The underside of the Support Unit shall be finished with a black high solid epoxy. Painting shall be to a standard whereby only cosmetic blemishes may be visible in isolated areas (Note: previous structural repairs or allowable dents may be visible).

    14.8 The internal surfaces of the Support Unit shall be grit blasted to remove the existing paint finish. The exposed steel structure shall be treated with an epoxy primer and finished with a 2 pack polyurethane top coat in ‘seafoam’ for the walls and roof. The internal floor shall be finished with a grey high solid epoxy. Painting shall be to a

standard whereby only cosmetic blemishes may be visible in isolated areas (Note: previous structural repairs or allowable dents may be visible).

14.9 The Support Unit shall be re-certified in accordance with the Convention for Safe Containers (CSC) – validity period 30 months.

14.10 The Support Unit shall be rebuilt with items that have been refurbished or replaced as detailed above.

14.11 Engraved labels shall be reused or replaced as required (if either broken or illegible). All vinyl labels shall be replaced with new.

15. Following completion of rebuild, the Support Unit shall be subjected to a Factory Acceptance Test, to be witnessed by the contractor's Quality Assurance department. All pipework and associated components shall be leak tested to maximum working pressure, electrical circuits shall be tested for continuity, insulation and functionality. The acceptance report shall be signed by the contractor and copied to the Authority. The Authority's Quality Assurance Representative (MoD QAR) shall be invited to attend the customer witness TMCC FAT.

16. Refurbishment work detailed above shall be covered within the Firm Price subject to the findings of the 'on receipt' survey where missing items and major damage/un-serviceability shall be notified to the Authority. Replacement of missing items are excluded from the refurbishment price and shall be quoted individually or priced in accordance with the contract spares list where applicable. Additional costs associated with the rectification of major damage outside the scope of a normal refurbishment identified during the initial survey shall be detailed within a written report. The Authority shall provide a response in accordance with the contractor's requested date to ensure adherence to the refurbishment schedule. The Authority's approval for additional costs shall be obtained prior to proceeding with the refurbishment.