Enclosure 2 - Work Item (WI) 525 Cargo Reefer Compressor Overhaul (20KHRS)

T-AKE CLASS

MACHINERY, AUXILIARY SYSTEMS

ITEM NO. 525 **Category "A"**

1.0 ABSTRACT:

1.1 This item requires disassembly, restoration to new condition and reassembly of Cargo Reefer Compressors.

2.0 REFERENCES:

2.1 T9516-A8-MMC-01; Technical Manual for Refrigeration Plant, Cargo for USNS AKE 1 Class

3.0 ITEM LOCATION/DESCRIPTION:

3.1 Location/Quantity:

3.1.1 Location: AMR 5-58-01

3.1.2 Quantity: XX Compressors

3.2 Item Description/Manufacturer's Data:

3.2.1 Bill of Materials:

PART NO	DESCRIPTION	QTY (per compressor)
534M0602G06	JACK SHAFT KIT INCL SHAFT SEAL	1
534M0602G03	BEARINGS SET	1
534M0602G01	O-RING GASKETS	1
98A0012B91	O-RING SUCTION FILTER COVER	1
959A0057H09	GASKET DISCHARGE LINE	1
3921 5201 125	GASKET SUCTION LINE	2
OR43.69x3xNBR	O-RING ECO SUCTION	1
OR23.47x2.95xNBR	O-RING OIL PIPE	1
3952 6453 025	OIL FILTER CARTRIDGE	1
1331.175	O-RING COVER	2
1912 144-5	FILTER BAG	1
9479 0002 000	DISSECANT	1
1517.061	FILTER ELEMENT	1
534B102H01	ROD INDICATOR	1
534A0883H01	SPRING	1
1926 185-1	LINEAR TRANSMITTER CAPACITY	1
2417.232	POV 40D111	1

3.3 Description of Equipment/Systems

3.3.1 York Marine AB VSB 151 L

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4.0 GOVERNMENT FURNISHED EQUIPMENT/MATERIAL/SERVICES:

4.1 Government Furnished Equipment (GFE): None.

4.2 Government Furnished Material (GFM):

4.2.1 Oil for compressors

a. For TAKE 1 through 5: 160 liters of Stal/Sabroe K Oil, CPI Solest 180 per unit

b. For TAKE 6 and later: 160 liters of York H, CPI Solest 68 per unit

4.2.2 Heat Exchanger tubes:

PART NO	DESCRIPTION	QTY (per compressor)
1916 893-1	Condenser Tube	33 per unit, 99 total
1914 630-2	Evaporator Tube	25 per unit, 75 total

4.3 Government Furnished Services (GFS): None.

4.4 Government Furnished Information (GFI): None.

5.0 NOTES:

5.1 The contractor and all subcontractors, regardless of tier, must consult the General Technical Requirements (GTR) to determine applicability to this work item. In performance of this work item, the contractor and all subcontractors regardless of tier must comply with the requirements of all applicable GTRs.

5.2 The contractor and all subcontractors regardless of tier are advised to review the other work items under this contract to determine their effect on the work required under this work item.

5.3 THIS SHIP CONTAINS HIGH VOLTAGE (HV) ELECTRICAL SYSTEMS. OBEY ALL POSTED AND VERBAL INSTRUCTIONS REGARDING SAFETY AND EXCLUSION FROM HIGH VOLTAGE AREAS. AT NO TIME APPROACH, WORK ON, OR ENTER A HIGH VOLTAGE AREA WITHOUT PROPER AUTHORIZATION.

5.4 **THE T-AKE CLASS ELECTRICAL COLOR CODING DOES NOT FOLLOW CONSISTENT COLOR SCHEME. THE SHIP IS KNOWN TO HAVE**

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CURRENT CARRYING CONDUCTORS COLORED GREEN, BLUE, BLACK, AND WHITE. ASSUME ALL ELECTRICAL CABLES ARE ENERGIZED UNTIL TESTED AND PROVEN OTHERWISE. TEST ALL ELECTRICAL CABLES TO ENSURE THEY ARE DE-ENERGIZED PRIOR TO WORKING ON THE ITEM.

6.0 QUALITY ASSURANCE REQUIREMENTS: None additional.

7.0 STATEMENT OF WORK REQUIRED:

7.1 Tag-Out all required systems and equipment. Drain and dispose of any liquid in accordance with all federal, state, and local regulations.

7.2 Provide the services of the Original Equipment Manufacturer (OEM) representatives identified in paragraph 7.19.

7.3 Move the refrigerant associated with each compressor to be overhauled to an external receiver in accordance with reference 2.1 document number GB00532; “Service Instructions - General”

7.3.1 Save refrigerant for re-use using appropriate gas cylinders.

7.4 Remove interferences and reinstall upon completion.

7.4.1 Each refrigeration compressor removal is interfered by ventilation ductwork.

7.5 Remove each compressor to be overhauled.

7.6 Complete an overhaul of each compressor identified in paragraph 3 using reference 2.1 for guidance.

7.6.1 Perform all compressor overhauls in a “Frick by Johnson Controls” authorized shop. Effort is not to be completed onboard ship.

7.6.2 Overhaul of each compressor includes the following for each:

a. Measure current clearances

b. Check internal wear and tear on Gear set, rotors, slide valve, housing

c. Submit report of conditions found

d. clean of all internal parts

e. Replace items listed in paragraph 3.2.1

f. Change the oil using "Service Instructions – General", Document number GB00532 as guidance (included in reference 2.1). Oil is provided as GFM per paragraph 4.2.1.

g. Clean the refrigerant Level Indicator

h. Replace safety valves

i. Replace pressure overflow valves

j. Check modulation and tightness of expansion valve

k. Replace Motor Bearings

l. Check clearances against factory standard

7.7 Reassemble each compressor identified in paragraph 3 using reference 2.1 for guidance

7.8 Install compressor back on unit.

7.9 Properly align compressor and motor using reference 2.1 as guidance.

7.10 Clean the evaporator using "Service Instructions – Heat Exchangers", Document number GB00172 as guidance (included in reference 2.1)

7.11 Clean the condenser using "Service Instructions – Heat Exchangers", Document number GB00172 as guidance (included in reference 2.1)

7.12 Clean the suction filter using "Service Instructions – Suction Filter", Document number GB00533 as guidance (included in reference 2.1)

7.13 Complete the requirements of reference 2.1 document number GB00478 "Service Instructions - Heat Exchangers, Finding leaks" for each unit's condenser and evaporator.

7.13.1 Submit report of conditions found

7.14 Verify the wall thickness of each tube in each Condenser.

7.14.1 Either Ultrasonic Internal Rotating Inspection or Eddy current tube inspection methods for determining wall tube wall thickness is required.

7.14.2 Submit report of findings within three days of completion of each cooler. Each cooler is expected to be the subject of its own individual report.

7.15 Complete the requirements of reference 2.1 document number GB00478 "Service Instructions - Heat Exchangers, Repairing Leaks" for each unit's condenser and evaporator.

7.16 Inspection/Test:

7.16.1 All tests at overhaul facility are to be witnessed by local area ABS surveyor, at contractor's expense.

7.16.2 All tests and inspections, regardless of location, are to be offered to MSCREP and ABS for witnessing.

7.16.3 Initial tests:

a. Check chiller unit for readiness

b. Pressure test at 8 bar. No leaks allowed

c. Vacuum test at < 700 microns. No leaks allowed

d. Verify operation of each compressors safety shutdowns and alarm monitoring system

7.16.4 Operationally test

7.17 Paint/Lagging:

7.17.1 Renew lagging where old lagging was removed. Paint all new and disturbed surfaces to match surrounding surfaces.

7.18 Preparation of Drawings/Documents:

7.18.1 Provide a service report of maintenance actions performed, measurements recorded, and future recommendations.

7.19 Manufacturer's Representative: Work included in this item shall be completed by an authorized representative of Frick by Johnson Controls

8.0 GENERAL REQUIREMENTS: None additional.