

**VESSEL PARTICULARS (FORM C)
LPG/C GAS INSPIRATION
(last updated 05/08/2020)**

Specifications of the vessel and the gas installation which are representations by the Owners.

(A) VESSEL'S CHARACTERISTICS

PREAMBLE

Name : **LPG/C GAS INSPIRATION**
 Owner : EASTERN EXPLORATION INC.
 Flag : MARSHALL ISLANDS
 Build : Sasaki Shipbuilding Co. Ltd., Japan
 Date on Service : March 2006
 Class : BV I*Hull*Mach Liquefied Gas Carrier Unrestricted Navigation
 IMO Number : **9333137**
 GRT International : **4,253 T** Suez : **4,265 T**
 Panama : **4,253 T**

 NRT International : **1,374 T** Suez : **3,677 T**
 Panama : **3,634 T**

 Is vessel build according to USCG regulations? :
 RINA regulations? :
 Japanese regulation? : YES

 Has vessel received USCG approval? :
 RINA approval? :

HULL

LOA : **99.98 M**
 LBP : **93.5 M**
 Breadth(Moulded) : **17.20 M**
 Depth (Moulded) : **7.80 M**
 Summer Draft : **6.06 M** corresponding to Summer DWT = 4,990 T – TPC 17.64 MTS
 Multiple Draft : **M** corresponding to Multiple DWT = N/A
 Freeboard (summer) : **1.771 M**
 Light Draft : **2.34 M**
 Full load displacement : **7652.18**
 Light displacement : **2661.38 M**
 Parallel Length : **30.2 M (lightship) / 45 M (summer dwt)**

Estimated draft with full cargo and full bunkers are as follows.

| Product | Draft Fore' (m) | Draft Aft' (m) | Draft Mean (m) | Corresponding Deadweight (t) |
|------------------------|-----------------|----------------|----------------|------------------------------|
| Propane (98%) | 4.47 M | 5.63 M | 5.05 M | 3513.56 tons |
| Butadiene (98%) | 5.14 M | 5.58 M | 5.50 M | 4147.89 tons |
| VCM (98%) | 5.29 M | 6.75 M | 6.02 M | 4953.76 tons |

Propeller immersion :

COMMUNICATION EQUIPMENT

Call letter : **3EFX8**

| | | |
|------------------------------------|---|--|
| Radio Station normally watched | : | |
| Radio MF/HF NBDP | : | |
| Radio MF/HFTEL/DSC | : | MMSI 355 967 000 |
| VHF | : | |
| Satellite Communication | | |
| Inmarsat 'C' | : | TLX NR: 435 596 710 |
| Inmarsat 'F' | : | Fleet 77 |
| TELEPHONE NR | : | 764 622 485 |
| FAX NR | : | 764 622 487 |
| EMAIL | : | gasinspiration@ship.rydex.com.sg |
| MACHINERY | | |
| Main Engine x 1 | . | |
| Type and make | : | Man B&W 6L35MC, Two stroke single acting |
| Service power | : | 5,320 BHP @ 210 rpm |
| No of Cylinders | : | 6x180mmx1050mm |
| Cyl Bore x Stroke | : | |
| Grade of fuel used | : | 380 CST |
| Auxiliaries | | |
| Type and make | : | Yanmar Diesel Engine 6NY16L - UN |
| (Electrical) | : | 400 KVA |
| (Mechanical) | : | |
| Grade of fuel used | : | Marine Gasoil DMA |
| No off | : | 2 |
| Emergency Gen | | |
| Maker | : | Deutz AG Mitsui Zosen Mach. Inc. |
| Type | : | FL912 |
| No off | : | 1 |
| Bow Thruster | | |
| Maker: | : | Kamone Propeller Co. |
| Type: | : | TCB-55MN |
| Boiler | | |
| Type | : | MIURA CO., LTD - VWH – 800E Natural Circulation Vertical Water Tube Boiler |
| Evaporation | : | 800 kg/h |
| Max Design Pressure | : | 1.0 MPa |
| Feed Water Temp | : | 60 deg. c |
| No off | : | 1 |
| Exhaust Economiser | | |
| Type | : | MIURA CO., LTD. - KF95F Exhaust Gas Economizer |
| Evaporation | : | 500 kg/h |
| No off | : | 1 |
| Air Compressors (Main) | | |
| Type / Capacity | : | YANMAR SC12.5N, Vert. Single Cyl.,2 stage, Water cool |
| No off | : | 65 cu.m/h |
| No off | : | 2 |
| Air Compressors (Emergency) | | |
| Type | : | YANMAR KSC3N-T, Vert. Single cyl.,2stage.Air Cool |
| Capacity: | : | 7.7 cu.m./h(free air) |
| No off | : | 1 |
| Fuel Oil Purifier | | |
| Type | : | MITSUBISHI SELF EJECTOR MODEL SJ20G |
| No off | : | 2 |
| Capacity | : | 2100 cu.m/h |
| Diesel Oil Purifier | | |
| Type | : | MITSUBISHI SELF EJECTOR MODEL SJ700 |
| Capacity | : | 700 cu.m./h |
| No off | : | 1 |

| | | | |
|---|---------------------|---|---|
| Lub Oil Purifier | Type | : | mitsubishi SELF EJECTOR MODEL SJ20g |
| | Capacity | : | 2100 cu.m./h |
| | No off | : | 1 |
| | Capacity | : | 2100 cu.m/h |
| Evaporator | Type | : | Low Pressure Distillation with M/E Jacket Water Heating (Maker : Alfa Laval KK) Model : JWP-16-C50 |
| | Capacity | : | 10 tons / 24 hrs |
| Fresh Water Sterilizer | Type | : | Usushio Electric Co. VSS-1K |
| | Capacity | : | 1K L/H |
| Fresh Water Mineraliser | Type / Capacity | : | N/A |
| Waste Oil Incinerator (IMO MEPC 76 (40)) | Type | : | BGW-20N |
| | Capacity | : | 20kg/h(Solid waste) 24.3kg/h (Waste Oil) |
| Oily Water Separator | Type | : | USH-20 |
| | Capacity | : | 2.0 cu.m./h |
| Sewage Treatment plant | Type | : | SBT-25 |
| | Capacity | : | 1.5 cu.m./day |
| Hot Water Set (Calorifier unit) | No off | : | Harizon Co. Ltd. CFL-2000-S HR-15469 |
| Steering Gear | Type | : | V20-2F11F-1C11-JA-S47 |
| | Duty Capacity | : | |
| | Hydraulic pump unit | : | |

Speed

About 12,5 knots up to Beaufort scale 4
and max significant wave height of 1.25m

CONSUMPTION/ DAY

About 11,5 MT/DAY +/- 5%

| | | |
|------------------|-----|--|
| Main Engine | HFO | |
| Auxiliary Engine | MGO | LOAD 1,0 MT/DAY DISCH 2,3 MT/DAY AT SEA 1,0 MT/DAY IGS 2,3 MT/DAY |

All figures are about, defined as +/- 5% on consumption and speed respectively.

Notes:

1. Speed and consumption figures at sea, are best estimated basis daily weather conditions are up to Beaufort scale 4 – max.significant wave height 1.25 m, without effect of sea currents or swell, and vessel en route under a steady course, with a net sea passage duration of at least 24 hrs.
2. Consumption figures at port, are subject to port movements, port and/or harbour, terminal requirements, for the safe manoeuvring, approach, inland navigation, and port stay of the vessel throughout her call.

Permanent bunker
capacity (100%)

HFO : 503.7 m3
 Diesel : 107.4 m3
 Fresh Water : 182 MT

(B) CARGO INSTALLATIONS

1. Transportable products and respective quantities, calculated in accordance with IMO – maximum filling formula. (Tonnes)

| | 100% (CBM) | 98% (CBM) | | |
|-----------------|-----------------|-------------------------|----------------------------|--------------------------------|
| NO.1 CARGO TANK | 2509.041 | 2450.457 | | |
| NO.2 CARGO TANK | 2508.624 | 2450.927 | | |
| TOTAL | 5017.665 | 4901.384 | | |
| | SPSV (bar g) | Ref. Temp. (deg. C.) | Density at (Ref. Temp.) | Corresponding Quantity (MT) |
| Propane | 17.65 | 45.0 | 0.459 | 2249.7 |
| Propylene | 17.65 | 45.0 | 0.470 | 2303.4 |
| B/P Mixture | 17.65 | 45.0 | 0.487 | 2386.7 |
| I-Butane | 17.65 | 45.0 | 0.526 | 2577.9 |
| N-Butane | 17.65 | 45.0 | 0.548 | 2685.7 |
| Butylene | 17.65 | 45.0 | 0.565 | 2769.1 |
| Butadiene | 17.65 | 45.0 | 0.588 | 2881.8 |
| V.C.M. | 17.65 | 45.0 | 0.872 | 4273.6 |
| Isoprene | 17.65 | 45.0 | 0.656 | 3215.1 |
| Pentane | 17.65 | 45.0 | 0.600 | NA |
| Pentene | 17.65 | 45.0 | 0.611 | NA |
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Note(1): In case of USCG, propylene, propane and B/P mixtures are not to be carried except the vapour pressure of B/P mixtures is not more than 12.75 bar g, 13.0 kg/cm² @ 45 °C or to apply USCG for exemption.

Note(2): On and after, the pressure value in parentheses is shown as a conversion value

Mixing ratio of above mentioned B/P mixtures is as follows:

Butane 35 wt% and propane 65 wt%

2. Other transportable products N/A

| | SPSV | Ref. Temp. (°C.) | Density at Ref. Temp. | Corresponding Quantity (MT) |
|-------------|------|---------------------|--------------------------|--------------------------------|
| Raffinate 1 | TBA | TBA | TBA | TBA |
| Raffinate 2 | TBA | TBA | TBA | TBA |
| C4 | TBA | TBA | TBA | TBA |

3. TANKS

3.1 Design pressure (Vapour) – BV-IGC : 17.65 bar g
 - USCG : 12.75 bar g
 3.2 Valve setting : 18 cm²

- 3.3 Maximum vacuum obtainable : :
- 3.5 Maximum temperature acceptable : **45 °C**
- 3.6 Minimum temperature acceptable : **0 °C**
- 3.7 Hydrostatic Test Pressure : **26.48 bar g (27.0 kg/cm² g)**

4. LOADING RATE (TONS/HOUR) – For Full Cargo Parcels

- Ex-atmospheric storage with gas : 1 tank : **Butane – 320 Tons / h**
- Return : 2 tanks : **Propane – 570 Tons / h**

Remarks:

- * Based on the velocity of 7m/sec. in the Liquid Piping
- * In case of a cargo of minus (-) temperature, it shall be heated up with Shore Cargo Reheater
(In case the Ship's Cargo Reheater in used, please see item B-12 of this form-C)
- * Loading by shore pump only, proper size gas return line to be connected
- * Gas Return Line shall be of proper size (more than 4")
- * Subject to both ship and shore tanks being under favourable conditions

5. CARGO PUMPS

- 5.1 Type : Deepwell, motor driven, vertical centrifugal
- Make : Niigata Worthington, 14M-160-4-1
- How many : 2 sets in total
- Maximum specific gravity : 0.948
- 5.2 Capacity (CMB/Hour) : 250 CBM/ HR × 110 m l. c. (S.G. 0.640) or 300 CBM/ HR × 140 m l. c. (S.G. 0.948)
- Two speed or variable speed : :
- Rated kW (each) : :
- Working pressure maximum : 22.0 Kg/ cm²
- 5.3 Location : **Submerged in Each of the Cargo Tanks**
- Removable : **No**
- 5.4 Booster pumps : :
- Type : :
- Maker : :
- 5.5 Capacity (CMB/Hour) : :
- Working pressure : :
- 5.6 Location : :
- 5.7 Time to discharge a full liquid cargo using all pumps against back pressure at pump
- 1 bar : :
- 5 bars : :
- 10 bars : :
- Time will vary depending on shore tank condition
- 5.8 Nominal back pressure when working : :
- In series corresponding head : :
- Maximum back pressure : :
- Nominal pressure at rail (propane) : :
- 5.9 What amount of cargo remains in tanks after completion pumping before stripping:
- liquid : **about per one tank : 0.63 CBM**
- vapour : **about ton per one tank for LPG : Depends on tank press.**

6. STRIPPING

- 6.1 Stripping system, if any : **Nil**
- 6.2 Time required to remove all traces of liquid cargo as stated in 5.9 for:
 - LPG :

7. CARGO COMPRESSORS

- 7.1 Type : Tanabe Pneumatic Mach. LPGOS-97A
 - Make : Tanabe Pneumatic Mach.
 - How many : **2 sets**
 - Piston displacement : 460 CBM/ HR
 - Rated Kw : **75kw Power req'd max**
 - Stroke : **177mm (stroke) 228.6mm(bore)**
 - Max discharge pressure : 20.0 bar
 - Pressure differential(Suction pressure) : Maximum 7.0 bar
 - No of Revolutions : **540 rpm(speed)**
- 7.2 Are compressors oil free : **Yes**
- 7.3 Can they reliquefy VCM without risk : They can compress VCM vapor but cannot reliquify it
- 7.4 State time to bring full cargo of butane to atmospheric pressure from :

8. INERT GAS SYSTEM

- 8.1 Does the vessel use inert gas? :
 - If so, state utilization and quantities :
- 8.2 Can the vessel produce inert gas? :
 - If so, state type and composition of gas produce:
- 8.3 Discharge Capacity
 - Maximum production obtainable :
- 8.4 State if there are storage facilities for inert gas onboard:
 - Size :
 - Pressure :
- 8.5 State if any shore supply of nitrogen may be required:
 - for what purpose :
 - what quantities :

| | |
|--|---------------------------------|
| N2 GENERATOR | |
| TYPE: | PSA |
| MAKER: | Taiyo Nippon Sanso Corp., Japan |
| DEW POINT IN ATMOSPHERIC TEMPERATURE: | Minus (-) 60 deg.C. |
| NITROGEN DISCHARGE PRESSURE: | 0.6MPa |
| CAPACITY: | N2=165m3/hr, Dry air = 797m3/hr |
| EXPECTED TIME REQUIRED TO INERT TANKS FROM OPEN AIR | |
| TO OXYGEN CONTENTS 4.0 VOL. %: | about 48 HRS |
| TO OXYGEN CONTENTS 2.0 VOL. %: | about 72 HRS |
| Note: In order to reduce Oxygen Contents in cargo tanks less than 0.5% by volume or to save time for inerting, Shore Supply of Nitrogen is required. | |

9. GAS FREEING

- 9.1 State method used giving all details :
- 1) Discharge Remaining Cargo in cargo tanks as much as possible.
 - 2) Purging Remaining Cargo in cargo tanks with Inert Gas produced by Nitrogen Generator on board the vessel
 - 3) After the atmosphere inside cargo tanks being reached the area well lower than Critical Dilution Line, purge the atmosphere inside cargo tanks with Open air by using portable fan or Cargo Compressors.
- 9.2 State time required including stripping : about 2 or 3 days

10. CHANGING GRADE

- 10.1 Basically Changing Grade shall be performed with shore facilities. The vessel may assist to reduce contents of last cargo vapor by the following method.
- 1) Discharging Remaining Cargo in cargo tanks as much as possible.
 - 2) Purge Remaining Cargo in cargo tanks with Inert Gas produced by Nitrogen Generator on board the vessel
- 10.2 Can this operation be carried out at sea? : **No**
- 10.3 Can the ship measure the number of ppm in vapour phase? :
- 10.4 Has vessel deck tank for changing grade/cooling operations? :
- 10.5 Deck tanks : **NIL**
Capacity :
Purpose :

11. COOLING BEFORE LOADING : **N/A**

12. CARGO HEATER

- 12.1 Type : **Horizontal Shell and Tube**
- 12.2 Inside Diameter :
- 12.3 Overall length :
- 12.4 Cargo flow rate : **250 m3/H**
- 12.5 Min Inlet Temp : **Design temp 0 –45 deg C**
- 12.6 Min Outlet Temp : **0 deg C**
- 12.7 Required Sea water Capacity : **450 CBM/H**
- 12.8 Design Pressure : **5 bar G(tube) 20 bar G (shell)**
- 12.9 Hydrostatic Test Pressure : **7.5 bar G(tube) 30 bar G (shell)**

12.10 Tightness Test Pressure :
 Surface Area : **158 m²**

12.0 State discharging rate for propane to be brought from atmospheric pressure

Loading rate for Propane – ° C / 0° C:

| CARGO FLOW RATE DESIGNED | | | | | |
|--------------------------|-------------------|------------------------|-------------------------|-------------------------|-------------------------|
| PROPANE | | SEA WATER +5 deg.C. | SEA WATER +10 deg.C. | SEA WATER +15 deg.C. | SEA WATER +18 deg.C. |
| | -45 deg.C. | 80 | 150 | 240 | 330 |
| | -30 deg.C. | 110 | 180 | 290 | (350) |
| | -15 deg.C. | 130 | 200 | 315 | (350) |
| | -5deg.C. | 165 | 220 | 340 | (350) |

13. CARGO VAPORIZER

In case vapour gas is needed to feed compressors, can vessel produce its own if no shore available: No,
If vessel have cargo vapour onboard.

14. REFRIGERATING APPARATUS NA

14.1 Is it independent of cargo? : **NA**
 Is so, state cooling agents : **NA**

14.2 What minimum temperature can be maintained : **NA**

14.3 What time required at sea to lower by 1°C the full cargo of : **NA**

15. MEASURING APPARATUS

What gauges on board?

Type : **Float type level gauge; Musasino M-LD1 (M-LMZ)**
 Location : 1 Float Type gauge is fitted at tank Dome of each tank with remote reading in Ship's Cargo Office

16. SAMPLES

16.1 State how tank atmosphere samples can be taken and where from? From Slip tube and from drain line
 : **Top** (through Pressure Gauge Connection)
 : **Middle**
 : **Bottom** (through Sampling Connections)

Standard of fitting? :

16.2 Same question for cargo :

16.3 Are sample bottles available on board? : **Yes (1)**

17. CARGO LINES

17.1 Is ship fitted with a port and starboard cargo manifold? : **Yes**

17.2 Position of cargo manifold
 - distance from stern (AP) (S / P) : **53.36 M**
 - distance form stem (FP) (S / P) : **46.6 M**
 - height above deck : **0.90 M for Liquid manifold**
 - distance from ship's rail : **2.50 M**
 - underside keel to manifold : **8.24 M**

17.3 Liquid line - diameter : **8" inches ANSI 300 lbs**
 - flange-size : **Rise face (RF)**
 - type :

Gas line - diameter :
 - flange-size : **5 inches ANSI 300 lbs**
 - type : **Rise face ANSI 300 lbs**

17.4 What reducers on board?
 ANSI CLASS 300
 LIQUID = 150A (2pcs) , 125A (2pcs), 100A (1 pc), 80A (1 pc)
 VAPOR = 200A (1 pc), 150A (1 pc), 100A (1 pc), 80A (1 pc)
 ANSI CLASS 150
 LIQUID = 200A (1 pc), 150A (1 pc)
 VAPOR = 150A (1 pc), 80A (1 pc)
 JIS 20K
 LIQUID = 200A (1 pc), 150A (1 pc), 100A (1 pc)
 VAPOR = 80A (1 pc)
 JIS 10K
 VAPOR = 100A (1 pc), 80A (1 pc), 50A (1 pc)

17.5 Is ship fitted with stern discharge? **No**
 - Liquid line - diameter : **N/A**
 - flange – size : **N/A**
 - type : **N/A**

18. HOSES

Are serviceable hoses available on board? : **None**

18.1 Two pieces, each : **N/A**
 Length : **N/A**
 Diameter : **N/A**
 Flange-size : **N/A**
 Type : **N/A**
 Bending radius : **N/A**

18.2 Minimum temperature acceptable : **N/A**
 Maximum pressure acceptable : **N/A**

18.3 For what products are hoses suitable? : **N/A**

19. DERRICKS

- Cranes : One Crane is fitted on Upper Deck in transverse midship between no.1 Cargo tank and no. 2 Cargo tank
 : **5.0 Ton at max distance from ship's side : 4.5 meter**

20. SPECIAL FACILITIES

20.1 How many grades can be segregated? : **1 (one)**
 20.2 How many cooled? : **N/A**
 20.3 Can vessel sail with slack cargo tanks? : **Yes**