

**VESSEL PARTICULARS (FORM C)**

**LPG/C GAS NEMESIS II**

LAST UPDATE : 13/01/20

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

**(A) VESSEL'S CHARACTERISTICS PREAMBLE**

Name : **GAS NEMESIS II**  
 Owner : **INTERNATIONAL GASES INC.**  
 Flag : **LIBERIA**  
 Build : **HIGAKI SHIPBUILDING CO. LTD**  
 Date on Service : **29 AUG. 2001**  
 Class : **LR ( 100A1 Liquefied Gas Carrier, LPG in independent type C tanks, Ship type 2PG, Max. pressure 17.7 bar, Min. Temp ' 0' LMC )**

GRT International : **3678** Suez : **4101.24 T**  
 LIBERIA : **18534**

NRT International : **1104** Suez : **3308.74**  
 Panama : **3148**

Is vessel build according to USCG regulations? : **N/A**  
 RINA regulations? : **NA**  
 Japanese regulation? : **NA**

Has vessel received USCG approval? : **N/A**  
 RINA approval? : **NA**

**HULL**

LOA : **99.59 M**  
 LBP : **93.68 M**  
 Breadth : **17.5 M**  
 Depth : **7.5 M**  
 Summer Draft : **5.50 M corresponding to Summer DWT = 3408.63**  
 Multiple Draft : **NA M corresponding to Multiple DWT = NA**

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

Product	Draft Fore' (m)	Draft Aft' (m)	Draft Mean (m)	Corresponding Deadweight (t)
<b>Propane (98%)</b>	<b>4.78</b>	<b>5.44</b>	<b>4.96</b>	<b>2720.81</b>
<b>Butadiene (98%)</b>	<b>5.05</b>	<b>5.80</b>	<b>5.424</b>	<b>3321</b>
<b>VCM (98%)</b>	<b>5.27</b>	<b>5.73</b>	<b>5.50</b>	<b>3408.4</b>

**Propeller immersion :**

At draft At 5.44 m correspond. 91 : %  
 At draft At 5.80 m correspond. 98 : %  
 At draft At 5.73 m correspond. 98 : %

**COMMUNICATION EQUIPMENT**

Call letter	:	<b>D5QD3</b>
Radio Station normally watched	:	<b>YES, JRC NCH-802MF/HF)</b>
Radio MF/HF NBDP	:	<b>YES , JRC NCH-802MF/HF)</b>
Radio MF/HFTEL/DSC	:	<b>YES , JRC NCH-802MF/HF)</b>
VHF	:	<b>YES , JHS 32A X 2 SET</b>
Satellite Communication		
<b>Inmarsat 'C'</b>	:	Inm. C: 463724847
	:	FBB Voice: +870773256972
<b>E mail</b>	:	gasnemesi2@stealth.gr.

**MACHINERY**

<b>Main Engine x 1</b>	.	Type and make	:	<b>2 – CYCLE DIESEL ENGINE 6UEC37LA, AKASAKA</b>
	.	Service power	:	<b>MCR :3120 KW x 210 / min , CSR : 2808 KW</b>
		No of Cylinders		<b>6 Nos.</b>
		Cyl Bore x Stroke		<b>370 mm X 880 mm</b>
	.	Grade of fuel used	:	<b>IFO 380 CST</b>
<b>Auxiliaries</b>		Type and make (Electrical)		<b>4 CYCLE DIESEL ENGINE /6NY16L-UN/ YANMAR 440 V X 400 KVA</b>
		(Mechanical)		<b>355 KW at 1200 RPM</b>
		Grade of fuel used		<b>MDO</b>
		No off		<b>02 SETS</b>
<b>Emergency Gen</b>		Type		<b>MODEL : NFD 150 K</b>
		No off		<b>01 SET</b>
<b>Bow Thruster</b>		Type : Power:		<b>MODEL: KT 43131 , POWER : 315 KW</b>
<b>Boiler</b>		Type		<b>VERTICAL WATER TUBE COMPOSITE TYPE / 6K-1428</b>
		Evaporation		<b>500/400 KG/h (OIL SIDE / EXH.GAS SIDE @ 90% CSR</b>
		Max Design Pressure		<b>0.8 MPA ( MAX )</b>
		Feed Water Temp		<b>60 – 70 C</b>
		No off		<b>01 SET</b>
<b>Exhaust Economiser</b>		Type		<b>NA</b>
		Evaporation		<b>NA</b>
		No off		<b>NA</b>
<b>Air Compressors (Main)</b>		Type / Capacity		<b>VERTICAL TWO STAGE WATER COOLED/ PRESSURE 2.45 MPA</b>
		No off		<b>02 SETS</b>
<b>Air Compressors (Emergency)</b>		Type		<b>KSC3N – V</b>
		No off		<b>01 SET</b>
<b>Fuel Oil Purifier</b>		Type		<b>MITSUBISHI SELFJECTOR TYPE, MODEL : SJ15F</b>

	No off	<b>02</b>
	Capacity	<b>4500 L/H</b>
<b>Lub Oil Purifier</b>	Type	<b>MITSUBISHI SELFJECTOR TYPE, MODEL : SJ15F</b>
	No off	<b>01</b>
	Capacity	<b>4500 L/H</b>
<b>Evaporator</b>	Type	<b>WM-10 M</b>
	Capacity	<b>10 T/D</b>
<b>Fresh Water Sterilizer</b>	Type	<b>USC – 500</b>
	Capacity	<b>500 L/H</b>
<b>Fresh Water Mineraliser</b>	Type / Capacity	<b>NA</b>
<b>Waste Oil Incinerator (IMO MEPC 76 (40))</b>	Type	<b>BGW – 20N</b>
	Capacity	<b>25 L/h , WASTE OIL</b>
<b>Oily Water Separator</b>	Type	<b>USC – 20</b>
	Capacity	<b>2.0 m3 / h</b>
<b>Sewage Treatment plant</b>	Type	<b>SBT – 25</b>
	Capacity	<b>25 PERSON / DAY</b>
<b>Hot Water Set (Calorifier unit)</b>	No off	<b>01 SET</b>
<b>Steering Gear</b>	Type	<b>MODEL : RV 21 – 013</b>
	Duty Capacity	<b>WORKING PRESSURE : 22 MPA</b>
	Hydraulic pump unit	<b>02 SETS</b>

### Speed

Upto Beaufort scale 4 and max significant wave height of 1.25m  
(all details "about" defined as 0.5knot less and +/-5% consumption respectively)

**About 12.0 KNS Laden/Ballast**

### CONSUMPTION/DAY

#### At Sea

Main Engine	HFO	<b>About 10.0 MT/Day +/-5%</b>	<b>Laden/Ballast</b>
Auxiliary Engine	MGO	<b>About 1.2 MT/Day</b>	
<b>In Port</b>	MGO	<b>About 0.8 MT/Day</b>	<b>Idle</b>
	MGO	<b>About 2.5 MT/Day</b>	<b>Discharging</b>
	MGO	<b>About 0.8 MT/Day Additional</b>	<b>Using N2 Generator</b>

Permanent bunker capacity (100%)

HFO	:	<b>533.26 M3</b>
Diesel	:	<b>124.00 M3</b>
Fresh Water	:	<b>118.32 MT</b>

**(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	2055.565	2014.454		
NO.2 CARGO TANK	2055.673	2014.560		
<b>TOTAL</b>	<b>4111.238</b>	<b>4029.014</b>		
	SPSV (barg)	Ref. Temp. (deg. C.)	Density at (Ref. Temp.)	Corresponding Quantity (MT)
Propane	17.65	45.0	0.459	1849.311
Propylene	17.65	45.0	0.470	1893.630
B/P Mixture	17.65	45.0	0.487	1962.123
I-Butane	17.65	45.0	0.526	2119.254
N-Butane	17.65	45.0	0.548	2207.892
Butylene	17.65	45.0	0.565	2276.385
Butadiene	17.65	45.0	0.588	2369.052
V.C.M.	17.65	45.0	0.872	2800.00
Isoprene	17.65	45.0	0.656	2643.024
Pentane	17.65	45.0	0.600	2417.400
Pentene	17.65	45.0	0.611	2461.719

**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/cm<sup>2</sup> @ 45 °C

**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%**

**Note (3):** VCM quantity calculated basis 50% bunkers and FW, Due to Draft Restriction.

**2. Other transportable products N/A**

	SPSV	Ref. Temp. (°C.)	Density at Ref. Temp.	Corresponding Quantity (MT)
Raffinate 1	1.77	45	0.571	2300.559
Raffinate 2	1.77	45	0.548	2207.892
C4				

**3. TANKS**

- 3.1 Design pressure (Vapour) – BV-IGC : **17.70 bar g (1.77 MPag)**  
 - USCG : **12.70 bar g (1.27 MPag)**
- 3.2 Valve setting : **17.70 bar g (1.77 MPag) / 12.70 bar g (1.27 MPag) , 6.30 bar g ( 0.62 MPag )**
- 3.3 Maximum vacuum obtainable : **Atmospheric**
- 3.5 Maximum temperature acceptable : **45 °C**
- 3.6 Minimum temperature acceptable : **0 °C**

3.7 Hydrostatic Test Pressure : **27.0 bar g (2.66 MPag)**

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

Ex-atmospheric storage with gas : 1 tank : **450 m<sup>3</sup> / h**

Return : 2 tanks : **790 m<sup>3</sup>/ h**

Remarks:

\* Based on maximum velocity of 6.5 metres/sec except VCM, and 4.0 meters/sec for VCM in the liquid piping.

\* If cargo temperature is less than 0 °C, shore heater to be used. If ship heater used, max rate is **250 m<sup>3</sup>** per hour.

\* Loading by shore pump only, proper size gas return line to be connected

\* Subject to both ship and shore tanks being under favourable conditions

#### 5. CARGO PUMPS

5.1 Type : **DEEPWELL VERTICAL CENTRIFUGAL  
MULTI STAGE DESIGN**  
Make : **TEIKOKU MACHINERY WORKS, LTD**  
How many : **2**  
Maximum specific gravity : **0.948**

5.2 Capacity (CMB/Hour) : **300 m<sup>3</sup>/h X 110 m ( 0.647 )  
250 m<sup>3</sup>/h X 120 m ( 0.948 )**  
Two speed or variable speed : **Single speed**  
Rated kW (each) : **120 kw**  
Working pressure maximum : **17.7 Bar g**

5.3 Location : **CARGO TANK TOP**  
Removable : **YES**

5.4 Booster pumps : **NA**  
Type : **NA**  
Maker : **NA**

5.5 Capacity (CMB/Hour) : **NA**  
Working pressure : **NA**

5.6 Location : **NA**

5.7 Time to discharge a full liquid cargo using all pumps against back pressure at pump  
1 bar : **about 13 hours for LPG**  
5 bars : **About 16.8 hours for LPG**  
10 bars : **-----**

5.8 Nominal back pressure when working : **about 1 bar**  
In series corresponding head : **N/A**  
Maximum back pressure : **about 3 bar**  
Nominal pressure at rail (propane) : **about 8 bar at 20 degree C of cargo temperature**

5.9 What amount of cargo remains in tanks after completion pumping before stripping:  
- liquid : **No liquid remains in the tank**  
- vapour : **about 20 ton per one tank for LPG**

#### 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 : 45 min

## 7. CARGO COMPRESSORS

7.1 Type : VERTICAL 01 STAGE WATER COOLED DOUBLE ACTING  
Make : TANABE PNEUMATIC MACHINERY CO. LTD  
How many : 2  
Piston displacement : 460 m3/h  
Rated Kw : 75 KW  
Stroke : 177.8 mm  
Max discharge pressure : 20 Bar  
Pressure differential : Normal 7.0 Bar / Maximum 7.0 Bar at single action  
  
No of Revolutions : 540 rpm

7.2 Are compressors oil free : YES

7.3 Can they reliquify VCM without risk : NO

7.4 State time to bring full cargo of butane to atmospheric pressure from :

## 8. ~~INERT GAS SYSTEM~~ / NITROGEN PLANT

8.1 Does the vessel use inert gas? : N/A  
If so, state utilization and quantities : N/A

8.2 Can the vessel produce inert gas? : N/A  
If so, state type and composition of gas produce: :

Discharge Capacity : N/A

8.3 Maximum production obtainable : N/A

NOTE:- Above quantities obtained at engine room temperature 45° C

8.4 State if there are storage facilities for inert gas onboard: N/A  
- Size : N/A  
- Pressure : N/A

8.5 State if any shore supply of nitrogen may be required: : NO  
- for what purpose : N/A  
- what quantities : N/A

## 9. GAS FREEING

9.1 State method used giving all details : Nitrogen supplied by shore

9.2 State time required including stripping : TBA

## 10. CHANGING GRADE

10.1 From completion discharge of cargo Propane, time required in hours and inert gas in CBM required to reach a tank and gas installation atmosphere of less than 100 ppm of Propane in Vapour phase.  
**Time required: ABOUT 66 HRS / N2 12300 m3 per tank.**

10.2 Can this operation be carried out at sea? : **NO**

10.3 Can the ship measure the number of ppm in vapour phase? : **YES**

10.4 Has vessel deck tank for changing grade/cooling operations? : **NO**

10.5 Deck tanks : **NIL**

Capacity : **NA**

Purpose : **NA**

11. **COOLING BEFORE LOADING** : **NA**

## 12. CARGO HEATER

12.1 Type : **SHELL & TUBE**

12.2 Inside Diameter **668 mm**

12.3 Overall length **6742 mm**

12.4 Cargo flow rate **200 m3/ h ( Propane )**

12.5 Min Inlet Temp **-48 deg. C**

12.6 Min Outlet Temp **0 deg. C**

12.7 Required Sea water Capacity **420 m3/ h with 16 deg C**

12.8 Design Pressure **1.96 MPA**

12.9 Hydrostatic Test Pressure **2.94 MPA**

12.10 Tightness Test Pressure **1.96 MPA**

12.0 State discharging rate for propane to be brought from atmospheric pressure: **300 m3/h basis pump**  
Loading rate for Propane – **42 ° C / 0° C: about 200 m3/hr : ( as per manual )**

## 13. CARGO VAPORIZER

In case vapour gas is needed to feed compressors, can vessel produce its own if no shore available:

**No**

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? **Float type level gauge with HHL & HL alarm switch**

Type : **SP- 3511 S , intrinsically safe type**

Location : **At each cargo tank dome**

## 16. SAMPLES

16.1 State how tank atmosphere samples can be taken and where from?  
**From slip tubes at tank dome.**

- Standard of fitting? : **LOOP SAMPLING 3/8**
- 16.2 Same question for cargo : **LOOP SAMPLING 3/8**
- 16.3 Are sample bottles available on board? : **NO**

**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) : **52.84 M**
  - distance form stem (FP) (S / P) : **47.75 M**
  - height above deck : **1.20 m for Liquid manifold**
  - distance from ship's rail : **2.50 M**
  - underside keel to manifold : **8.73 M**
- 17.3 Liquid line
- flange-size : **8 inch.**
  - type : **300 ANSI 300 lb**
- Gas line
- flange-size : **5 inch.**
  - type : **150 ANSI 300 lb**
- 17.4 What reducers on board? :

- 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 :  
Length : **NA**  
Diameter : **NA**  
Flange-size : **NA**  
Type : **NA**  
Bending radius : **NA**

18.2 Minimum temperature acceptable : **NA**  
Maximum pressure acceptable : **NA**

18.3 For what products are hoses suitable? : **NA**

## 19. DERRICKS

- Hose cranes : **01**  
- Where situated : **CENTRE BETWEEN 1 & 2 CARGO TKS.**  
- Lifting capacity : **3.5 MT**  
- Working radius : **360 DEG**

## 20. SPECIAL FACILITIES

20.1 How many grades can be segregated? : **NO SEGREGATION POSSIBLE**

20.2 How many cooled? : **N/A**

20.3 Can vessel sail with slack cargo tanks? : **Yes**