VESSEL PARTICULARS (FORM C)
LPG/C GAS SHURIKEN

(Last updated 28 September 2019)

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

(A) VESSEL'S CHARACTERISTICS

PREAMBLE

Name	:	GAS SHURIKEN
Owner	:	FINANCIAL POWER INC.
Flag	:	MARSHALL ISLANDS
Build	:	Kanrei Shipbuilding Co. Ltd., Japan
Date on Service	:	OCTOBER 31, 2008
Class	:	BUREAU VERITAS (BV)
GRT International	:	4309 mt
Suez	:	4,752.00 mt
Panama	:	3,680.00 mt
NRT International	:	1374 mt
Suez	:	3,725.19 mt
Panama	:	3,680.00 mt

Is vessel built according to

USCG Regulations?	:	YES
RINA Regulations?	:	N/A
Japanese regulations?	:	JIS

Has vessel received

USCG approval?	:	YES (for foreign vessel in US water)
RINA approval?	:	N/A

HULL

LOA	:	99.90 M
LBP	:	93.50 M
Breadth	:	17.6267 M
Depth	:	8.00 M
Summer Draft	:	6.15 M corresponding to summer DWT = 5,024.66 tonnes
IMO	:	9359569
OFFICIAL NR	:	3359

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%)	4.17	5.97	5.07	3,466.13
Butadiene (98%)	4.84	6.18	5.51	4,080.54
VCM (98%)	5.59	6.70	6.15	5,014.82

Propeller immersion:

At draft 5.97 At m correspond : 108.18 %
At draft 6.18 At m correspond : 114.55 %
At draft 6.70 At m correspond : 130.30 %

COMMUNICATION EQUIPMENT

Call letter	:	V7QG7
Radio Station normally watched	:	Ch.16 and DSC Ch. 70
Radio MF/HF NBDP	:	FURUNO RC-1800F MMSI538003359
Radio MF/HFTEL/DSC	:	FURUNO FS-2571C MMSI538003359
VHF	:	FURONO FM-8800D
Satellite Communication Inmarsat 'C'	:	453833563
Phone (VSAT)	:	+30-211-198-9421
Phone (VSAT)	:	+30-211-198-9420
Phone (FBB)	:	+870-773 133 429
Email	:	gasshuriken@stealth.gr

MACHINERY

Main Engine x 1	Type and make :	MAKITA CORPORATION 5L35MC
	Service power No.:	2,925 Kw (3,960 ps) x 203 rpm (90%MCR)
	Of Cylinders	5
	Cyl Bore x Stroke	350 mm x 1050 mm
	Grade of fuel used:	HFO having a viscosity of not more than 380cst @ 50° C
Auxiliaries	Type and make	Yanmar (6NY16L-SN) - A.C. drip proof, self-vent
	(Electrical)	lated 360 Kw x 445V x 3 phase x 60 Hz
	(Mechanical)	4 stroke x 400 Kw x 1,200 rpm
	Grade of fuel used	Diesel Oil - 6 Cst at 40°C
	No off	2
Emergency Generator	Type	Yanmar diesel (NFD-150K) - 8Kw, AC 105V,1 phase, 60Hz
	No off	1
Bow Thruster	Type:	TCT-105
.	Power:	325 Kw; 435.6 BHP
.	Effective:	5 knots and below
Boiler	Type	Miura Z Boiler (VWH-600E) Fully automatic water-tube boiler of forced recalculating type
	Evaporation	538 Kg/Hr
	Max. Design Pressure	0.7 Mpa Saturated
	Feed Water Temp	60°C
	No off	1

Exhaust Economiser	Type	Miura (KF-91F)
	Evaporation	380Kg/Hr actual @ continues service output of M/E
	No off	1
Air Compressors (Main)	Type / Capacity	Matsubara (MH-108) - Vertical, EMD driven, 2-stage , F.W cooled type / 45.0 m3 / Hr
	No off	2
Air Compressors (Emergency)	Type / Capacity	Yanmar (NFC 602) - Horizontal, ENG driven, 2-stage, air cooled type 6.3 m3 / Hr
	No off	1
Fuel Oil Purifier	Type	Mitsubishi SJ20G – Centrifugal
	No off	2
	Capacity	800 Ltrs / Hr at 98°C
Lub Oil Purifier	Type	Mitsubishi SJ10G – Centrifugal
	No off	1
	Capacity	
Evaporator	Type	Miura Protec Co., Ltd (WM-10SS) – Waste heat recovery
	Capacity	1 x 10 t/day
Fresh Water Sterilizer	Type	Uzushio Electric Co., Ltd (USS-1K) – Electric Ultra Violet lamp with filter
	Capacity	1 x1,000 litre/h
Fresh Water Mineraliser	Type / Capacity	1 x 1000 litre/h / Nippon Controls Co Ltd (RF-1000S) – Vertical. Welded stainless steel
Waster Oil Incinerator (IMO MEPC 76 (40))	Type	Miura Protec Co Ltd (BGW-20N - Horizontal air atomizing type with aux burner
	Capacity	Oil @ 24.3 lit/h & Solids @ 20 Kg/h
Oily Water Separator	Type	Taiko Kikai Industries Co, Ltd (USM-10) – automatic oil discharge type
	Capacity	1 x 1.0 m3/h
Sewage Treatment	Type	Taiko Kikai Industries Co, Ltd (SBT-25) Activated plant sludge aeration (Biological) – USCG certified
	Capacity	1 x 25 persons per day
Hot Water Set (Calorifier unit)	No off	Harison Co Ltd (CFT-400-E) 400L tank with 2 x 10Kw heaters (1 Stby) / 1 set
Steering Gear	Type	Electro-Hydraulic system with 2-pump units (dual system) – (one pump to be able to supply full power)
	Duty Capacity	18.5 t-m
	Hydraulic pump unit	Electric motor driven, 2 x 5.5 Kw

SPEED in Ballast / Laden

(Up to Beaufort scale 4 and Douglas Sea 3)

1.Normal service speed	:	About 13.0 KTS
2.Eco speed (min RPM Blower will not start)	:	About 11.0 KTS

CONSUMPTION / DAY

1.NORMAL SERVICE SPEED	Ballast				Laden	
Main Engine	HFO	:	About 11.2 MT	/	HFO About	11.7MT (at 195 RPM)
Auxiliary Engine	MGO	:	About 0.9 MT	/	MGO	About 1.0 MT
2. ECO SPEED (min RPM Blower will not start)						
Main Engine	HFO	:	About 9.5 MT	/	HFO	About 9.5 MT
Auxiliary Engine	MGO	:	About 0.9 MT	/	MGO	About 1.0 MT
At Sea - with N2 Generator operation		:		/	MGO	About 1.5 MT
In port - idle/Loading (including Boiler)		:	HFO	About 0.8 MT/	MGO	About 1.0 MT
In port - discharging with 2 cargo pumps:			HFO	About 0.8 MT/	MGO	About 1.5 MT

Permanent bunker 10% expansion margin capacity (100%)	HFO - ABT 458MT bss SG 0.98	DO - ABT 100MT basis SG 0.86

Fresh Water	:	212.38 CBM
Sludge Tank Capacity	:	25.98 m³
Bilge Tank Capacity	:	13.10 m³

About 12.0 knots up to beaufort Scale 4 and max. significant wave height of 1.25 m.

Consumption / day

Main Engine	:	IFO:	about 11.7 m/tons per day - Loaded condition
Auxilliary Engine	:	MGO:	about 0.8 m/ton per day
In Port Discharging	:	MGO:	about 1.5 m/tons per day
In Port Idle / Loading	:	MGO:	about 1.2 m/tons per day
Use of N2 Generator	:	MGO:	about 1.5 m/tons per day
Use of Boiler	:	MGO:	about 0.6 m/ton per day
Use of Reliq. Plant	:	MGO:	not applicable

(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	**2509.023**	**2458.842**
NO.2 CARGO TANK	**2509.214**	**2459.029**
TOTAL	**5018.237**	**4917.871**

	SPSV (KG/CM2)	Ref. Temp. (deg.C)	Density at (Ref. Temp.)	Corresponding Quantity (MT)
Propane	**17.65**	**45**	**0.459**	**2257**
Propylene	**17.65**	**45**	**0.47**	**2302**
Butane/Propane Mixture	**17.65**	**45**	**0.487**	**2395**
I-Butane	**17.65**	**45**	**0.526**	**2586**
N-Butane	**17.65**	**45**	**0.548**	**2694**
Butylene	**17.65**	**45**	**0.565**	**2778**
Butadiene	**17.65**	**45**	**0.588**	**2891**
V.C.M.	**17.65**	**45**	**0.872**	**4278**
Isoprene	**17.65**	**45**	**0.656**	**3226**
Pentane	**17.65**	**45**	**0.6**	**2950**
Pentene	**17.65**	**45**	**0.611**	**3004**

Note(1): In case of USCG, propylene, propane and B/P mixtures are not to be carried except the vapor pressure of B/P mixtures is not more than 12.75 bar g, 13.0 kg/cm2 @ 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%

2. Other tranportable products

	SPSV (KG/CM2)	Ref. Temp. (deg.C)	Density at (Ref. Temp.)	Corresponding Quantity (MT)
Raffinate 1				
Raffinate 2				

3. TANKS

3.1	Design pressure (Vapour) - LR-IGC	:	18.0KG/CM2 or 17.65 bar/G
	- USCG	:	18.0KG/CM2 or 17.65 bar/G
3.2	Valve setting	:	18.0KG/CM2/13.0KG/CM2
3.3	Maximum vacuum obtainable	:	Atmospheric
3.4	Maximum temperature acceptable	:	45^{o}C
3.5	Minimum temperature acceptable	:	0^{o}C
3.6	Hydrostatic Test Pressure	:	26.48 bar g (2.648 Mpa)

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

Ex-atmospheric storage with gas Return	:	1 tank	: about 410 CBM/HR (LPG)
.	:		: about 250CBM/HR (VCM)
	:	2 tanks	: about 730 CBM/HR (LPG)
.			: about 450CBM/HR (VCM)

Remarks: SG AT 0 DEG C

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

* If cargo temperature is less than 0^{o}C, shore heater to be used.

* 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	:	Deep well type of vertical centrifugal multistage design
	Make	:	Niigata Worthington Co.,Ltd.
	How many	:	2 (1 EACH TANK)
	Maximum specific gravity	:	0. 601(LPG) / 0.948 (VCM)
5.2	Capacity (CBM/Hour)	:	300 m3/hr at 120 m (SG 0.601)
		:	250 m3/hr at 128 m (SG 0.948)
	Two speed or variable speed	:	Single Speed
	Rated kW (each)	:	120 Kw
	Working pressure maximum	:	20 bar g
5.3	Location	:	At each cargo tank
5.4	**Booster pumps**	:	N/A
	Type	:	N/A
	Maker	:	N/A
5.5	Capacity (CBM/Hour)	:	N/A
	Working pressure	:	N/A
5.6	Location	:	N/A

5.7 Time to discharge a full liquid cargo using all pumps against back pressure at pump

1 bar	:	about 19 hours for LPG
5 bars	:	about 53 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 5 bars
	Nominal pressure at rail (propane):		about 13 bar at 20 degree C of cargo temperature

5.9 What amount of cargo remains in tanks after completion pumping before stripping:

- liquid	:	about 1.5 m3 per one tank
- vapour	:	about 40 ton per one tank for LPG

NOTE: To reduce pressure by 1 bar/tank:- 3.8 hrs.

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	:	about 2 hours

7. CARGO COMPRESSORS

7.1	Type	:	Vertical water cooled 1 stage double acting
	Make	:	Tanabe pneumatic machinery Co Ltd
	How many	:	2 sets

	Piston displacement	:	460m3/h
	Rated Kw	:	75 kw
	Stroke	:	177.8 mm
	Max discharge pressure	:	20 bar g
	Pressure differential	:	4 bar
		:	Max 7 bar at single action
	No of Revolutions	:	540 RPM

7.2 Are compressors oil free : YES

7.3 Can they reliquefy VCM without risk: N/A

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

8. INERT GAS SYSTEM

8.1 Does the vessel use inert gas ? : Yes (N2 Generator)
If so, state utilization and quantities: TBA

8.2 Can the vessel produce inert gas ?: Yes (N2)
If so, state type and composition of gas produce Nitrogen: 99 % to 99.95%
: Capacity (discharge) @ 99.00% N2 is 290 Nm3/h
. : Capacity (discharge) @ 99.90% N2 is 180 Nm3/
: Capacity (discharge) @ 99.95% N2 is 140 Nm3/h
Oxygen: 1.0 % to 0.05% Discharge Capacity: as per above

8.3 Maximum production obtainable: 290Nm3/h @ 99.0%

8.4 NOTE: Above quantities obtained at engine room temperature 45^{o}C 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: N/A
- For what purpose : N/A
- what quantities : N/A

9. GAS FREEING

9.1 State method used giving all details: Nitrogen Plant / Fans

9.2 State time required including stripping: 77 hours

9.3 Aerating : 2 Water driven Fans

10. GHANGING 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: 48 hours

10.2 Can this operation be carried out at sea ?: YES

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	:	
	Purpose	:	

11. COOLING BEFORE LOADING :

12. CARGO HEATER

12.1	Type	:	Shell and Tube
12.2	Inside Diameter	:	700 mm
12.3	Overall length	:	7500 mm
12.4	Cargo flow rate	:	250 m3/h (Propane)
12.5	Min inlet temp	:	-48 °C
12.6	Min Outlet Temp	:	0 °C
12.7	Required Sea water capacity	:	450 m3/h (Min 16°C)
12.8	Design Pressure	:	20 bar g
12.9	Hydrostatic Test pressure	:	30 bar g
12.10	Tightness test pressure	:	20 bar g

12.11 State discharging rate for propane to be brought from atmospheric pressure: N/A
Loading rate for Propane – minus 42 ° C / 0° C: about 145 Mt/hr:

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

14.1	Is it independent of cargo ?	:	N/A
	If so, state cooling agents	:	N/A

14.2 What minimum temperature can be maintained : N/A

14.3 What time required at sea to lower by 1˚ C the full cargo of _ _ _: N/A

15. MEASURING APPARATUS

What gauges on board ?

	Type	:	Float type level gauge **(Closed type)**
.	Location	:	At each on cargo tank dome

What gauges on board ?

	Type	:	Slip tube gauge (Restricted type)
.	Location	:	At each on cargo tank dome

16. SAMPLES

State how tank atmosphere samples can be taken and where from ?
Sample points at tank bottom, mid and top

Standard of fitting ?		:	JIS PT1/2 thread
16.2	Same question for cargo	:	TBA

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

- bow to manifold no.1	:	45.15	M
- bow to manifold no.2	:	45.15	M
- bow to mid-point manifold	:	45.15	M
- stern to mid-point manifold	:	54.75	M
- main deck to center of manifold:		1.0	M
- main deck to top of rail	:	N/A	M
- manifold to ship's rail	:	2.5	M
- cargo manifold to cargo manifold:		N/A	M
- cargo manifold to vapour manifold:		1.5	M
- distance from ship side	:	2.5	M

17.3 Liquid line	- flange-size	:	8
	- Type	:	ANSI300LB RF
Gas line	- flange-size	:	5
	- Type	:	ANSI300LB RF

17.4 What reducers on board ? 20 carbon steel pieces supplied

For liquid line (low temperature):

8" ANSI 300LB to 10" ANSI 300LB, 6" ANSI 300LB, 5" ANSI 300LB
4" ANSI 300LB, 3"ANSI 300LB
8" ANSI 150LB, 6" ANSI 150LB, 4"ANSI 150LB
8" JIS20K, 6" JIS20K, 4" JIS20K

For vapour line (normal temperature):

5" ANSI 300LB to 4" ANSI 300LB, 3" ANSI 300LB, 2" ANSI 300LB
6" ANSI 150LB, 5" ANSI 150LB, 3" ANSI 150LB
2" ANSI 150LB
5" JIS20K, 4" JIS20K

17.5 Is ship fitted with stern discharge ?			NONE
- Liquid line - diameter		:	N/A
- Flange - size		:	N/A
- TYPE		:	N/A

18. HOSES

Are serviceable hoses available on board ? None

18.1 Length		:	TBA-Owners
Diameter		:	TBA-Owners
Flange-size		:	TBA-Owners
Type		:	TBA-Owners
Bending radius		:	TBA-Owners
18.2 Minimum temperature accepable		:	TBA-Owners
Maximum pressure acceptable		:	TBA-Owners

18.3 For what products are hoses suitable : TBA-Owners

19. DERRICKS

- Hose cranes : 1 set
- Where situated : Mid-ship (center)
- Lifting capacity : 4.0 tons @ 10m/min
- Working radius : 15m

20. SPECIAL FACILITIES

20.1 How many grades can be segregated : Single Grade
20.2 How many cooled : : N/A
20.3 Can vessel sail with slack cargo tanks : YES

21. Ballast System

Fire & G.S. Pump / Fire & Bilge Pump

Maker : Taiko Kikai Industries Co., Ltd.
Model : EMSO 150MD
Rated capacity : 190m3/hr.
Type : Vertical Electric M. Driven Centrifugal
Location : In engine room
Total ballast capacity : 2,101.56 m3

Ballast Water Management Method : Flow Through

note: Vessel is not fitted with Ballast Water Treatment plant. Vessel is using flow through method

Ballast tank data

Tank	Location (Frame Nos.)	Capacity (m3)	Pumps available
F.P.T. (C)	131 - 141	117.18	Both pumps available
No. 1 B.W.T. (P)	119 - 127	161.35	Both pumps available
No. 1 B.W.T. (P)	119 - 127	161.35	Both pumps available
No. 2 B.W.T. (P)	105 - 115	105.79	Both pumps available
No. 2 B.W.T. (S)	105 - 115	105.79	Both pumps available
No. 3 B.W.T. (P)	95 - 105	43.56	Both pumps available
No. 3 B.W.T. (S)	95 - 105	43.56	Both pumps available
No. 4 B.W.T. (P)	84 - 95	177.65	Both pumps available
No. 4 B.W.T. (S)	84 - 95	177.65	Both pumps available
No. 5 B.W.T. (C)	74 - 84	245.76	Both pumps available
No. 6 B.W.T. (P)	54 - 64	162.28	Both pumps available
No. 6 B.W.T. (S)	54 - 64	162.28	Both pumps available
No. 7 B.W.T. (P)	34 - 44	142.18	Both pumps available
No. 7 B.W.T. (S)	34 - 44	142.18	Both pumps available
A.P.T. (C)	.-6 - 8	144.02	Both pumps available

Pump data

Pump	Rated Capacity	Type	Location
Fire & General Sevice	190 m3/hr.	Vertical Electric Motor	In Engine Room

Pump		Driven Centrigugal	
Fire & Bilge Pump	190 m3/hr.	Vertical Electric Motor Driven Centrigugal	In Engine Room