



SMALL SCALE LNG: LNG CARRIERS

15th April 2013

Houston



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LNG VESSEL TYPES- BASICS



Heat In – Steam Out (atmospheric pressure)
Water Temperature 100°C
Water Density 958kg/m³



Heat In – Pressure 2bar
Water Temperature 120°C
Water Density 942kg/m³

LNG VESSEL TYPES



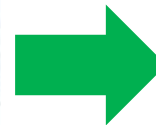
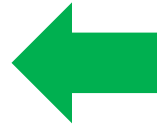
Heat In – Boil Off Out
LNG Temperature -162°C
Density $423\text{kg}/\text{m}^3$



Heat In – Boil Off Contained (max 9bar)
LNG Temperature -126°C
Density $363\text{kg}/\text{m}^3$



COMPATIBILITY WITH SHORE STORAGE TANKS



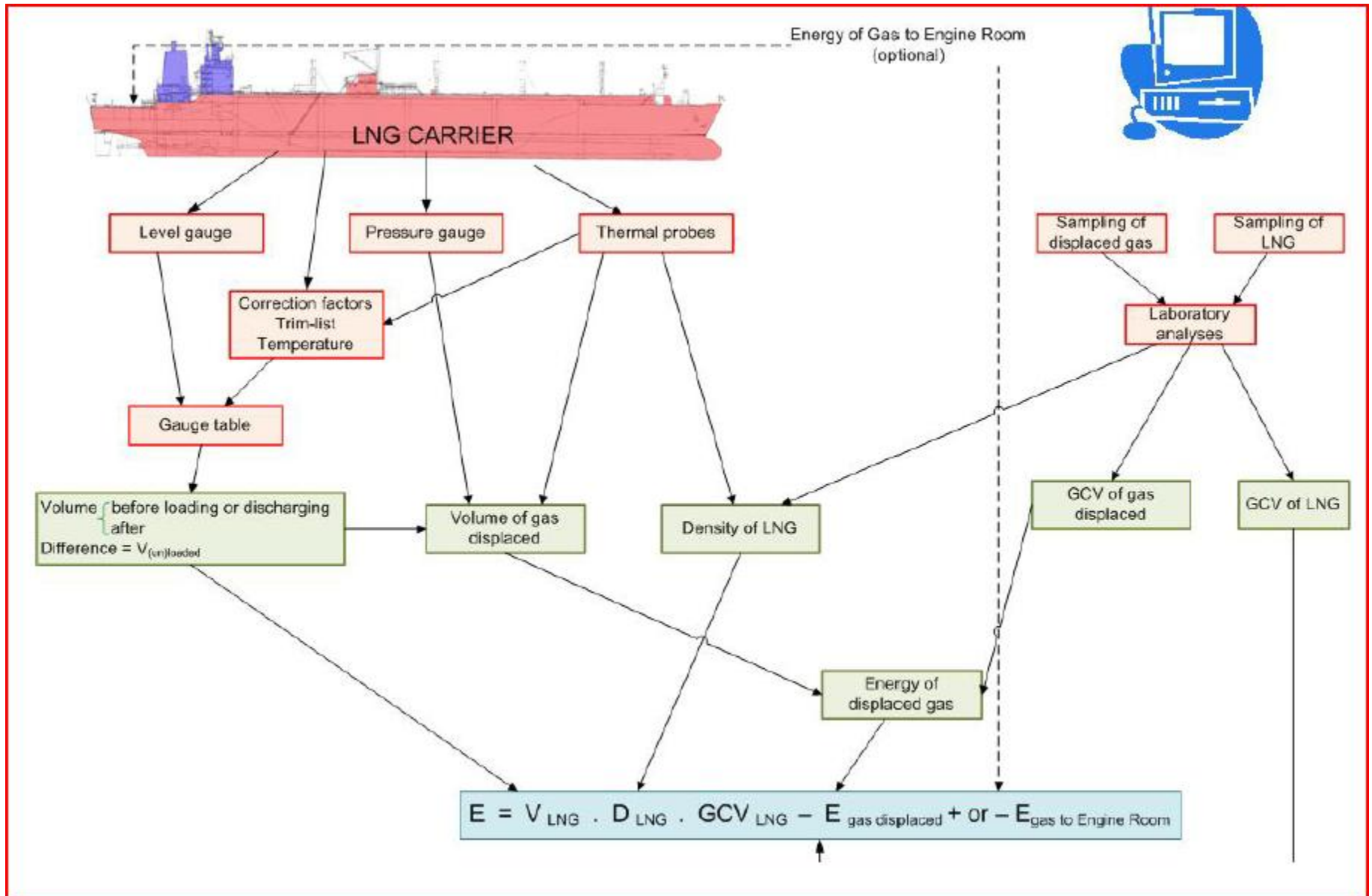
SMALL LNG CARRIERS : IN SERVICE

	M ³	Type	Built	Trading	Trading in LNG	A/P
1	3,556	LNG	2011	Japan	Yes	P
2	18,928	LNG	1993	Malaysia - Japan	Yes	A
3	18,800	LNG	1998	Malaysia - Japan	Yes	A
4	18,928	LNG	1997	Malaysia - Japan	Yes	A
5	12,000	LNG/LPG/Ethylene	2011	WW	No	P
6	15,600	LNG Ice Class 1A	2012	NWE / Baltic	Under Con	P
7	7,551	LNG/LPG/Ethylene	2009	NWE / Baltic	Yes, sometimes	P
8	2,536	LNG	2008	Japan	Yes	P
9	1,517	LNG	1988	Japan	Yes	P
10	10,000	LNG/LPG/Ethylene	2011	WW	No	P
11	10,000	LNG/LPG/Ethylene	2010	WW	No	P
12	10,000	LNG/LPG/Ethylene	2010	WW	No	P
13	10,000	LNG/LPG/Ethylene	2011	WW	No	P
14	12,000	LNG/LPG/Ethylene	2011	WW	No	P
15	12,000	LNG/LPG/Ethylene	2011	WW	No	P
16	2,500	LNG	2005	Japan	Yes	P
17	1,100	LNG	2003	Norway	Yes	P
18	2,540	LNG	2003	Japan	Yes	P
19	19,531	LNG	2007	Malaysia - Russia - Japan	Yes	A
20	19,475	LNG	1996	Indonesia - Japan	Yes	A

SMALL LNG CARRIERS : DESIGNS/PLANNED

M ³	Type	Built	Trading	Trading in LNG?	A/P
27,500	LNG	2015	US/Norway		P
12,000	LEG				P
12,000	LEG				P
800	LNG	late 2013	Germany	Yes	P
2,000	LNG	late 2013	Germany	Yes	P
4,700	LNG/LEG				P
6,500	LNG/LEG				P
4,000	LNG	late 2013	Germany	Yes	P
30,000	LNG	2015	WW		P

CUSTODY TRANSFER



CUSTODY TRANSFER ISSUES

Although this LNG Custody Transfer Handbook may contain much useful information, it is not specifically intended to work out procedures for ship-to-ship LNG transfer, custody transfer for LNG carriers with type C cargo tanks (IGC Code) or overland LNG custody transfer operations involving LNG trucks or trains.

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**LNG CUSTODY TRANSFER
HANDBOOK**

THIRD EDITION
version 3.01



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SHIP SHORE COMPATABILITY

Category (A)	less than 59,999m ³
Category (B)	60,000m - 149,999m ³
Category (C)	over 150,000m ³

SPACING AND PRINCIPAL FLANGE SIZE

Ship Volume	H*	Liquid Lines	Vapour Lines
		Flange size	Flange size
Category (A)	2.5 metres	12"	12"
Category (B)	3.0 metres	16"	16"
Category (C)	3.5 metres	20"	20"

H* = minimum distance recommended between the manifold flange centres. The distance should not be exceeded by more than half a metre.

