Training & Manning
for the
Expanding LNGC Fleet

by
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AN OCEAN OF QUALITY AND EXPERTISE
Modern Shipmanagement Solutions with a Long Tradition

Bernhard Schulte Shipmanagement was created in 2008 by integrating the four shipmanagement organisations already owned by the Schulte Group (www.schultegroup.com) into one powerful maritime services company. After years of excellence as autonomously managed companies

- Hanseatic Shipping (est. 1972)
- Dorchester Atlantic Marine (est. 1978)
- Eurasia Shipmanagement (est. 1981) and
- Vorsetzen Bereederungs- und Schiffahrtskontor (est. 1999)

combined forces to establish Bernhard Schulte Shipmanagement as a unified and extremely resourceful global platform providing an unparalleled range of maritime and engineering services.
How did the LNG trade begin?

“METHANE PIONEER” - first LNG cargo – Lake Charles to Canvey Island, Jan/Feb 1959
Where is the LNG industry now?

- Nearly 50 years proven safety record
- Well established operating procedures
- Limited number of high-quality operators (all Members of SIGTTO)
- Significant number of ships in service
- New technologies being introduced
- Training standards set by STCW & SIGTTO
- Potential growth using LNG for cargo ship fuel
How is the LNG fleet expected to grow?

Growing number of LNG carriers 2005-2016

2005 > 2016, 198 > 446 LNGCs = 248 extra LNGCs or 125% increase

Source: IHS CERA
Shipping Outlook
LNGC Fleet Expansion – the background

- General shortage of high-calibre ship’s Officers worldwide
- Requirement for “prior experience” from Charterers
- New technology introduced (e.g. cargo reliquefaction; gas-burning 4 stroke diesel-electric or 2 stroke direct propulsion) – limited experience available yet
- Steam propulsion – still used on many LNGC’s; serious limits for training opportunities
The Challenge:

To train and retain high-calibre sea staff for the rapidly expanding World LNGC fleet
Maritime Training Principles

Comprehensive education & training system

Maintain the supply of highly qualified, motivated & experienced seafarers

Safe operation of LNG carriers & assured LNG supply chain
Comprehensive Education & Training System

Master/Chief Engineer

Seafarer

Training on board supplemented by shore-based training

Cadet

Shore based training supplemented by training on board
# SIGTTO Matrix for LNG Officer Experience

## Navigating Officer Sea Time – All Vessels

<table>
<thead>
<tr>
<th>Role</th>
<th>Combined Sea Time</th>
<th>Individual Minimum Sea Time as Certificated Officer</th>
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</thead>
<tbody>
<tr>
<td>Master</td>
<td>4 Years at Chief Officer or above</td>
<td>4 Years</td>
</tr>
<tr>
<td>Chief Officer</td>
<td></td>
<td>2 Years</td>
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## Engineering Officer Sea Time – All Vessels

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<tr>
<th>Role</th>
<th>Combined Sea Time</th>
<th>Individual Minimum Sea Time as Certificated Engineer Officer</th>
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<tr>
<td>Chief Engineer</td>
<td>4 Years at Second Engineer or above</td>
<td>4 Years</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; Engineer</td>
<td></td>
<td>2 Years</td>
</tr>
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Source: SIGTTO (www.sigtto.org)
There is virtually no surplus of experienced LNGC Officers......

So there is a fundamental mis-match between Charterers’ requirements and the potential supply of sea-staff
The solutions to this “mis-match” include:

- Cross-training experienced sea-staff sailing aboard other types of gas carriers or oil/product tankers

- Additional time-on-board “Supernumerary” training and recognition for Simulator courses & other advanced training

- Increased education for Cadets & Trainees
SIGTTO Matrix footnote:

It is important to appreciate that the experience matrix is offered as a tool for evaluating and managing risk. When evaluating risk in the event of non-compliance with a particular element of the experience matrix, consideration should be given to other mitigating factors, including bespoke training, the manning scale in place, time with LNG/LPG ship owner/operator, the wider competence management systems employed........
Crewing & Training Challenges

- At least 1,200 additional LNGC officers needed
- Further LNGC orders placed/expected
- 10 – 12 years to train from Cadet to Senior Officer!

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</tr>
</thead>
<tbody>
<tr>
<td>No. of vessel</td>
<td>198</td>
<td>224</td>
<td>255</td>
<td>303</td>
<td>343</td>
<td>368</td>
<td>378</td>
<td>386</td>
<td>409</td>
<td>439</td>
<td>445</td>
<td>446</td>
</tr>
<tr>
<td>No. of vessel + previous year</td>
<td>26</td>
<td>31</td>
<td>48</td>
<td>40</td>
<td>25</td>
<td>10</td>
<td>8</td>
<td>23</td>
<td>30</td>
<td>6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>No. of officers pool + previous year</td>
<td>520</td>
<td>620</td>
<td>960</td>
<td>800</td>
<td>500</td>
<td>200</td>
<td>160</td>
<td>460</td>
<td>600</td>
<td>120</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

Source: IHS CERA Shipping Outlook
Alternative Sources for LNG Officers

Lead time for fresh recruits ranges from 2-12 years, depending on rank and number of training berths available – so just recruiting new entrants for the LNG fleet expansion will simply not work in the time available.

The most feasible plan is to cross train existing, experienced officers in accordance with STCW/SIGTTO standards – preferably those with gas or tanker backgrounds; lead time: 3-12 months.
How do we Train Seafarers for LNGC’s?

- Specialised STCW/SIGTTO Courses (ashore/onboard)
- Sea time on board an LNGC
- Deployment as part of newbuild construction team
- Attendance during drydocking/refit periods
- Training at Manufacturers locations
- Extended “handover periods”

In short, “training, training & more training”!
Fleet Expansion without Training – what can happen?

“Short-term” thinking – Operators may “poach” from each other rather than invest in training

“Poaching” = Wage escalation

Seafarers adopt a mercenary approach

Press & media hype about this “problem” become a “self-fulfilling prophesy” - when in reality it can be managed successfully

If charter rates fall, there will be pressure to lower standards and cut training budgets
Training Methodology

Competence Gaps
- Inadequate gas experience
- New to LNG industry
- Lack of knowledge of industry safety requirements
- Lack of understanding of procedures and operations

Method to Address Gaps
- Simulation
- Instruction
- Videos
- Group discussions
- Briefing and debriefings
- Hand outs
- Manuals

Learning Objectives
- LNG principles
- LNG hazards
- Procedures
- Regulatory knowledge
- Ship equipment knowledge
- Emergencies

Validation
- Exercises
- Tests
- Supervision
LNGC Staff Training Programmes

Objectives

Assess the specific design & equipment installed
Address knowledge gaps
Fill experience gaps
Verify satisfactory level of knowledge & experience – Competency Management System
Develop competence for the next level
LNGC Training - Commercial Awareness

- Ship shore interface management
- LNG Sale & Purchase terms – their implications on-board
- Economic impact of boil-off/heel management
- The implications of “Off-hire”
- Loss of LNG/Electric/Towns Gas production (in M US $/day)
Training of Shore and Sea Staff

Classroom Courses

- 1-day Introductory Course - for Senior Management
- 2-day Course - for Operational Management
- 5-day STCW Advanced course - required for those sailing on the ships, with additional training to SIGTTO Competency Standards as required

Simulator Courses

- LNG Cargo Simulator courses are conducted at our MTCs, or can be held on board an LNGC or at a client’s offices.
As part of our overall management of gas carriers, we draw on our experience of the full range of Gas Carrier operations for our training courses – and combine this with practical training.

BSM has the unique ability to carry out gas training to STCW Advanced Levels and SIGTTO Competency standards, and to issue recognised Certificates.

This facility enables us to carry out training in any location including on-board working gas carriers.

In addition we offer bespoke in-house management courses as well as training clients, suppliers and 3rd parties (e.g. Classification Societies, Flag States and Vetting Inspectors) in management and emergency response.

Special Steam courses are also available in Poland for our LNGC clients – endorsed by the Polish Administration and complying with SIGTTO standards.
BSM makes extensive use of cargo handling simulators cross-train Officers from LPG/ethylene or oil tankers to LNG, and for on-going monitoring/appraisals. These simulators provide real time replication of all possible cargo operations, including the facility to create equipment breakdowns and on-board system malfunctions to test the abilities of the trainees to cope with the unexpected.
Shiphandling - Manned Models

- LNGCs have specific handling characteristics
- BSM sponsored the construction of a 11 ton “ride on” scale model of an LNGC at the Ilawa Facility in Poland
- The model can be customised to match the manoeuvring characteristics of: single screw (steam or diesel-electric), twin screw (Q-Flex) or azipod propulsion
- The Course is designed for the senior deck officers who normally navigate smaller gas ships, but can also be used to train Pilots, tug masters and others involved in LNG port operations
Retention Of Sea Staff

- Terms & Conditions
- Currency adjustment factors
- Leave tenures
- Loyalty recognition
- Train above immediate requirement
- Long term career planning
- Improved amenities on board
- Involvement with developments ashore via Fleet Officers Meetings
- Spouse support
SIGTTO (Society of International Gas Tankers and Terminal Operators) is the key industry organisation established to oversee standards in the gas shipping industry.

BSM Group is a high profile and active SIGTTO members:
- Member of SIGTTO Board
- Chair of SIGTTO GPC
- Former Chair of SIGTTO Panel
- Members of many SIGTTO working groups, most recently on IGC Code Revision, LGHP review, LNG Ship-to-Ship transfers, LNG crew training (cargo & steam), application of vetting to LNG ships, Co-mingling of LPG, ESD systems for LNGC’s, LNG & LPG cargo valves and LNG for Bunker Fuel.
Continued expansion of the LNGC fleet will cause increased demand for seafarers with specialised LNGC operational knowledge.

Compliance with existing “Matrix” requirements may cause problems for new LNGC operators – and salary expectations will tend to increase.

In the longer term, the industry needs to recruit & train more high-calibre seafarers and to develop candidates from growing economies.

Update the philosophy of Training i.e. develop competency through experience & learning delivered by advanced simulators and practical training – not just rely on sea-time.

Emphasise training on board, and improve testing and competency profiling techniques by adopting e-learning methods.

Improve Training Manuals – to make the industry process driven.
Entrust the management of LNGCs to companies such as BSM that continuously recruit & training of cadets across the entire shipping industry.
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