

## **Draft standards of competence for liquefied natural gas (LNG) experts**

### Communication from the Secretariat

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The CESNI working programme adopted on 2 June 2016<sup>1</sup> foresees the drafting of standards for competence for boatmasters of craft using LNG as fuel and crew members involved in the bunkering procedure of vessels using LNG as fuel (CESNI-2016-40). The working programme refers to the proposal of the EU directive on professional qualifications (COM (2016) 82 final) and to the CCNR resolution 2015-I-7.

Article 3(12) of Directive (EU) 2017/2397 defines a “liquefied natural gas expert” as a “person who is qualified to be involved in the bunkering procedure of a craft using liquefied natural gas as fuel or to be the boatmaster sailing such a craft”.

Annex I 4.2 defines the minimum age of an LNG expert to be 18 years and requires applicants to meet the standards of competence set out in Annex II.

Essential competence requirements for an LNG expert according to Annex II 4.2 are that the applicant shall be able to

- “ensure compliance with legislation and standards applicable to craft that use LNG as fuel, as well as with other relevant health and safety regulations;
- be aware of specific points of attention related to LNG, recognise the risks and manage them;
- operate the systems specific to LNG in a safe way;
- ensure regular checking of the LNG system;
- know how to perform LNG bunkering operations in a safe and controlled manner;
- prepare the LNG system for craft maintenance;
- handle emergency situations related to LNG”.

The Temporary Working Group on professional competence confirmed the agreement reached on the annexed draft of a standard for the LNG expert during its meeting on 5 September 2017.

The text of directive (EU) 2017/2397 on professional qualifications in inland navigation and proposals to improve the draft as agreed on by the Working Group on professional qualification have been taken into account.

The Working Group has invited the Secretariat to submit the revised draft standard to the CESNI meeting on 10 April 2018.

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<sup>1</sup> CESNI (16) 21 final

CESNI experts examined the draft and decided to put it on the agenda of the CESNI meeting on 8 November 2018 for adoption.

## **Annex**

**Draft standards of competence for liquefied natural gas (LNG) experts**

- 1. The expert shall be able to ensure compliance with legislation and standards applicable to craft that use LNG as fuel, as well as with other relevant health and safety regulations.**

**The expert shall be able to:**

<b>COLUMN 1 COMPETENCE</b>	<b>COLUMN 2 KNOWLEDGE AND SKILLS</b>
1. ensure compliance with relevant legislation and standards applicable to craft using LNG as fuel;	<ol style="list-style-type: none"><li>1. Knowledge of regulations relating to craft using LNG as a fuel such as relevant police regulations, relevant regulations on technical requirements and ADN.</li><li>2. Knowledge of classification society rules.</li><li>3. Ability to instruct and monitor crew member operations in order to ensure compliance with legislation and standards applicable to craft using LNG as a fuel on board the craft and in particular with the bunkering procedure.</li></ol>
2. ensure compliance with other relevant health and safety regulations when sailing and moored.	<ol style="list-style-type: none"><li>1. Knowledge of relevant health and safety regulations including relevant local requirements and authorizations in particular in port areas.</li><li>2. Ability to instruct and monitor crew member operations in order to ensure compliance with other relevant health and safety regulations.</li></ol>

2. The expert shall be able to be aware of specific points of attention related to LNG, recognise the risks and manage them.

The expert shall be able to:

<b>COLUMN 1 COMPETENCE</b>	<b>COLUMN 2 KNOWLEDGE AND SKILLS</b>
1. recognise specific points of attention related to the specific characteristics of LNG;	<ol style="list-style-type: none"><li>1. Knowledge of definition, composition and quality attributes of LNG, Safety Data Sheet (SDS): physical properties and characteristics of the product and environmental characteristics.</li><li>2. Knowledge of the adequate storage temperature, flashpoint, explosion limits and pressure characteristics, critical temperatures, related hazards, atmospheric conditions, cryogenic properties, the behaviour of LNG in air, boil-off and inert gas e.g. nitrogen.</li></ol>
2. recognise risks and manage them.	<ol style="list-style-type: none"><li>1. Knowledge of safety plans, hazards and risk, including knowledge of muster list and its related safety tasks.</li><li>2. Ability to conduct risks management, to document on-board safety (including safety plan and safety instructions), to assess and control dangerous areas, fire safety and to use personal protective equipment.</li></ol>

**3. The expert shall be able to operate the systems specific to LNG in a safe way.**

The expert shall be able to:

<b>COLUMN 1 COMPETENCE</b>	<b>COLUMN 2 KNOWLEDGE AND SKILLS</b>
1. operate the systems specific to LNG on-board and connected to on-board systems in a safe way.	1. Knowledge of technical aspects of the LNG system such as <ul style="list-style-type: none"><li>• general configuration and operating manual,</li><li>• LNG bunkering system,</li><li>• spill control equipment,</li><li>• LNG containment system,</li><li>• gas preparation system,</li><li>• LNG pipe system,</li><li>• gas supply system,</li><li>• engine room concept,</li><li>• ventilation system,</li><li>• temperature and pressure (how to read a pressure and temperature distribution chart),</li><li>• valves (in particular, the main gas fuel valve), pressure relief valves,</li><li>• control, surveillance and safety systems, alarms, gas detection and dry breakaway couplings.</li></ul> 2. Ability to present the mode of action of LNG, read pressure and temperature, operate stripping, containment, gas supply, ventilation, pipe and safety systems, valves and to manage boil-off of LNG.

**4. The expert shall be able to ensure regular checking of the LNG system.**

**The expert shall be able to:**

<b>COLUMN 1 COMPETENCE</b>	<b>COLUMN 2 KNOWLEDGE AND SKILLS</b>
1. perform and monitor regular checks of the LNG system.	1. Knowledge of maintenance and monitoring of the LNG system. 2. Knowledge of possible malfunction and alarms. 3. Ability to perform daily maintenance, weekly maintenance, regular periodic maintenance, to correct malfunctions and to document maintenance work.

5. The expert shall be able to know how to perform LNG bunkering operations in a safe and controlled manner.

The expert shall be able to:

<b>COLUMN 1 COMPETENCE</b>	<b>COLUMN 2 KNOWLEDGE AND SKILLS</b>
1. perform and monitor bunkering procedures in a safe way.	<ol style="list-style-type: none"><li>1. Knowledge of<ul style="list-style-type: none"><li>• identification marking in line with relevant police and port regulation,</li><li>• conditions for berthing and moorage for bunkering purposes,</li><li>• LNG bunkering procedure,</li><li>• purging of the LNG system,</li><li>• relevant checklists and delivery certificate,</li><li>• bunkering safety measures and evacuation procedures.</li></ul></li><li>2. Ability to start and monitor bunkering procedures including measures to guarantee safe mooring, correct position of cables and pipes in order to avoid leakage and to take measures to safely disconnect LNG and bunkering connection if needed at any time.</li><li>3. Ability to ensure compliance with relevant safety zone regulations.</li><li>4. Ability to report start of bunkering procedure and to perform safe bunkering according to manual including ability to monitor pressure, temperature and LNG level in tanks.</li><li>5. Ability to purge pipe systems, to close valves and disconnect craft from bunkering installation and to report end of procedure after bunkering.</li></ol>

6. **The expert shall be able to prepare the LNG system for craft maintenance.**

**The expert shall be able to:**

<b>COLUMN 1 COMPETENCE</b>	<b>COLUMN 2 KNOWLEDGE AND SKILLS</b>
1. prepare the LNG system for craft maintenance and for renewed use.	1. Knowledge of correct purging procedures such as use of drainage of gas and flushing of LNG system prior to shipyard stay.  2. Ability to perform <ul style="list-style-type: none"><li>• inerting of the LNG system,</li><li>• LNG fuel tank drainage procedure,</li><li>• first filling of LNG fuel tank (drying and cooldown) and</li><li>• entry into service following a shipyard stay.</li></ul>



7. **The expert shall be able to handle emergency situations related to LNG.**

**The expert shall be able to:**

<b>COLUMN 1 COMPETENCE</b>	<b>COLUMN 2 KNOWLEDGE AND SKILLS</b>
1. react appropriately in emergency situations (such as LNG spills and leaks, skin contact with low temperature substance, fire, incidents related to transport of dangerous goods with specific hazards or craft running aground).	1. Knowledge of emergency measures and on-board safety documentation (including the safety plan and safety instructions). 2. Ability to react appropriately in case of emergencies such as <ul style="list-style-type: none"><li>• on-deck LNG spills,</li><li>• skin contact with LNG,</li><li>• LNG spills in closed spaces (e.g. in engine rooms),</li><li>• LNG spills or natural gas leaks in inter-barrier spaces (e.g. double-walled fuel tanks, double-walled pipes),</li><li>• fire in the vicinity of LNG fuel tanks or in the engine rooms and</li><li>• pressure built up in pipe systems after Emergency Shut Down activation in case of imminent release or venting.</li></ul> 3. Knowledge of specific hazards related to the transport of dangerous goods and craft running aground or colliding. 4. Ability to take emergency measures and remote surveillance emergency measures e.g. to properly control LNG fire, pool, jet and flash fire.

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