OBSERVATIONS ON THE LNG BUNKER DELIVERY NOTE PROPOSED BY THE ESSF AND THE IMO MSC

In recent meetings in Spain, in the framework of the preparation of the Spanish National Framework for implementation of Directive 2014/94, serious concerns have been expressed about the Bunker Delivery Note template which was agreed at the ESSF and subsequently proposed to IMO Maritime Safety Committee for inclusion in the IGF Code. I refer, in particular, to the Annex in page 130 of document MSC 95/3/4 (IGF Code), which is attached to this note for ease of reference.

In the mentioned meetings, several LNG gas supplier companies have reported that they would have difficulties to fill-in several of the data contained in the template:

1. **LNG Properties. Methane number:** the problems are mainly with the footnote (**): *"Preferably above 70 and referring to the used methane number calculation method in DIN EN 16726. This does not necessarily reflect the methane number that goes into the engine."* The supplier companies submit that this aspect that should be left to agreement between the commercial parties for two basic reasons:
   - The first is that each engine manufacturer has its own gas quality specifications, and depending on technology may be required different minimum methane number values.
   - Second: The methane number is not a thermodynamic property of the gas. This means that there are several and different calculation algorithms that try to simulate an actual test result of measuring methane number. There are even engine manufacturers who have his own algorithms.

   Therefore, there may be a situation where an engine manufacturer requires a minimum methane number different that 70, and that also applies a calculation method different from standard DIN EN 16726.

2. **LNG-Composition:** the LNG BDN requests specifying the composition of the various gases that make up the supplied natural gas, including hexane and heptane.

   The usual practice of gas suppliers in Spain (which is the first EU LNG importer) is the use of chromatographs for calculating the gas composition. These devices, of which there are not many suppliers, only measure up to the pentane fraction, putting the heavier hydrocarbons together in what is called "C6+ fraction" (including hexane, heptane, etc.). Measuring hexane and heptane as separated fractions will require the use of non-standard chromatographs that will make more expensive, while the concentration of these fractions is in most cases minimal, it not expected to have big impact in the calculation of PCS or Methane Number.

3. **Sulphur content:** The template also requests the sulphur concentration in the delivered LNG. In most Spanish LNG plants sulphur content is not measured because it is considered null. Measuring actual sulphur would imply bringing samples to laboratory, with the associated additional costs and time.

ANNEX

LNG-BUNKER DELIVERY NOTE*
LNG AS FUEL FOR

SHIP NAME:_____ IMO NO.:_____

Date of delivery:

1. LNG-Properties

Methane number **	--	
Lower calorific (heating) value	MJ/kg	
Higher calorific (heating) value	MJ/kg	
Wobbe Indices Ws / Wi	MJ/m³	
Density	kg/m³	
Pressure	bar (abs)	
LNG temperature delivered	°C	
LNG temperature in storage tank(s)	°C	
Pressure in storage tank(s)	bar (abs)	

2. LNG-Composition

Methane, CH_4	% (kg/kg)	
Ethane, C_2H_6	% (kg/kg)	
Propane, C_3H_8	% (kg/kg)	
Isobutane, i C_4H_{10}	% (kg/kg)	
N-Butane; n C_4H_{10}	% (kg/kg)	
Pentane; C_5H_{12}	% (kg/kg)	
Hexane; C_6H_{14}	% (kg/kg)	
Heptane; C_7H_{16}	% (kg/kg)	
Nitrogen, N_2	% (kg/kg)	
Sulphur, S	% (kg/kg)	
negligible<5ppm H2S, hydrogen, ammonia, chlorine, fluorine, water		

3. Net Total delivered: _____t, _____MJ _____m³

Net Liquid delivery:_____GJ

4. Signature(s):

Supplier Company Name, contact details:_____

Signature:_____Place/Port _____ date:_____

Receiver:_____

_____

* The LNG properties and composition allow the operator to act in accordance with the known properties of the gas and any operational limitations linked to that.

** Preferably above 70 and referring to the used methane number calculation method in DIN EN 16726. This does not necessarily reflect the methane number that goes into the engine.