Rapid Transformation of the World LNG Supply Chain

- A Possible Blind Spot at its Heart

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ABSTRACT

A dramatic expansion of the world’s LNG trades is underway. It is truly revolutionary as it has never happened so quickly before, in terms not only of geographical expansion, but also of quantity. This is directly reflected by the number of LNG carriers as LNG can only be transported by ships specifically build for that purpose. Therefore, shipping is the vital infrastructure of the LNG trade. In short, we are in the midst of a real transformation of the LNG supply chain.

What is now happening in the world’s LNG supply chain has far more serious implications than it appears. LNG shipping is the most sophisticated segment of international shipping. It therefore requires top notch seafarers, capable of ensuring the safe, secure and punctual ocean transportation of the product at all times. This rapid expansion has brought a corresponding demand for LNG qualified seafarers at the very time when the supply, not only of LNG qualified seafarers, but also of high quality seafarers in general, has been rapidly shrinking day by day, worldwide, at an unprecedented scale and speed. This is due partly to the retirements of existing LNG qualified seafarers, and partly to the decreasing capacity for seafarer education worldwide. In short, awareness among the world shipping community of the critical shortage of qualified LNG seafarers has recently been rapidly enhanced.

The true challenge, however, lies in planning for the long-term. The blind spot is not the present shortage of qualified LNG seafarers per se, but the present system of international shipping itself which has led to the shortage of supply of high quality seafarers including those qualified for LNG tankers. As the LNG trade is based on an efficient long term planning for 20 to 40 years, a corresponding long term planning of sustainable supply of highly qualified crew is essential. It is needless to say that careful and clear planning of the entire system in the area of ocean transportation is inevitable.

The chief characteristic of international shipping today is the Flag of Convenience (FOC). The vulnerability of this system has long been recognized as the root cause of the deterioration of the quality of shipping. This leads us to the need to examine if the FOC system is the best mode for LNG shipping. This analysis is especially important if the LNG industry is determined to maintain its prestigious safety record which, without doubt, has only been possible because of its highly regarded culture and ethics of the uncompromising pursuit of safety, which is summed up by their motto: “precaution, precaution, and precaution”.

Any system needs to be inspected regularly, and overhauled to keep the system running in good order. The existing system of international shipping today has not experienced any inspection and overhaul in the past 50 years. It was still the time of liberties. The notion of containerization served by specialized 10,000 TEU capacity ships, VLCC’s, and of course LNG tankers was unthinkable. Times have changed. It is high time for a careful and practical review.
1. INTRODUCTION

“In order to safely operate the growing LNG fleet, the demand for competent seafarers must be met without delay and I believe that it is incumbent upon us all to do our utmost to address proactively the need for appropriately qualified seafarers before any shortage of skills adversely affects the safety, security and efficiency of the sector and the industry in general.”[1]

This is a quotation from the opening address of Mr. Mitropoulos, the Secretary-General of IMO (International Maritime Organization) at the 37th Session of the Sub-Committee on Standards of Training and Watchkeeping on 23rd January, 2006. The shortage of seafarers in the international shipping industry is symbolic of the vulnerability of the international ocean transportation system. It is especially disturbing as the shortage of human resources, the most vital element in the service industry of shipping, is clearly demonstrated in the most official manner at the very time when the rapid expansion of world LNG trade, and thus the LNG fleet, is about to start.

LNG tankers are the most sophisticated commercial ships of all. The rapid expansion has been encouraging the shipbuilding and its related industries to continuously introduce high technologies into LNG tankers. Thus the need for higher competence for seafarers also expands significantly. The statement of the Secretary General of IMO can be construed as a vivid illustration that the current international shipping system does not have a spontaneous mechanism to coordinate the supply and demand of seafarers. LNG tankers have a long (40 years or more) life span of service. Hence, there should be a sound mechanism in place to supply competent LNG qualified seafarers in a stable and sustained manner as a vital part of the infrastructure of LNG ocean transportation.

It is essential to have a clear analytical understanding of the root of the weakness of the current mechanism of international shipping in order to properly address proactively, and as soon as possible, the challenge of the shortage of the qualified LNG seafarers.

2. FACTS AND FIGURES

A. The prestigious record of safety

According to International Gas Tanker and Terminal Operators (SIGTTO), the international industry body, there have been no fatalities directly related to cargo in the history of LNG carriage of more than 45,000 laden voyages of close to 100 million loaded miles in the past 40 years. [2]

B. The status of LNG fleet in the total commercial fleet of the world - A microcosm of the world shipping (As of 2003) : 

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[1] Available at: [source]
[2] Available at: [source]
Total merchant fleet: 46,918 ships (100%)
LNG tankers: 174 ships (0.37%)

C. The Club – The market of oligopoly

<table>
<thead>
<tr>
<th>A total of 35 companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>The biggest company; STASCO (Shell)</td>
</tr>
<tr>
<td>Top 5 companies</td>
</tr>
<tr>
<td>Top 10 companies</td>
</tr>
<tr>
<td>Top 15 companies</td>
</tr>
</tbody>
</table>

Table 1: World’s LNG Ship Operators (As of September, 2004)

D. The LNG fleet - rapid expansion

<table>
<thead>
<tr>
<th>Year</th>
<th>Delivery</th>
<th>Total Number of ships</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>176</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>20</td>
<td>196</td>
</tr>
<tr>
<td>2006</td>
<td>27</td>
<td>223</td>
</tr>
<tr>
<td>2007</td>
<td>30</td>
<td>253</td>
</tr>
<tr>
<td>2008 - 2009</td>
<td>86-101</td>
<td>341~354</td>
</tr>
<tr>
<td>Total</td>
<td>165-180</td>
<td>341~354</td>
</tr>
</tbody>
</table>

Table 2: Delivery schedule (As of end May, 2005)

E. The demand for seafarers - rapid increase

<table>
<thead>
<tr>
<th>Year</th>
<th>Deliveries</th>
<th>Newly required seafarers</th>
<th>Total</th>
<th>Officers</th>
<th>[Senior Officers]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004 (4th Qtr)</td>
<td>2</td>
<td>120</td>
<td>40</td>
<td>[24]</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>20</td>
<td>1,200</td>
<td>400</td>
<td>[240]</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>27</td>
<td>1,620</td>
<td>540</td>
<td>[324]</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>30</td>
<td>1,800</td>
<td>600</td>
<td>[360]</td>
<td></td>
</tr>
<tr>
<td>2008 -2010</td>
<td>86 - 101</td>
<td>5,160-6,060</td>
<td>1,722-2,020</td>
<td>[1,032-1,212]</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>165 – 180</td>
<td>9,900-10,800</td>
<td>3,300-3,600</td>
<td>[1,980-2,160]</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Estimated demand for Officers for the LNG ships on order

F. The bottlenecks for the supply of seafarers
Education and training takes time and energy. In the case of educating and training qualified LNG tanker seafarers, the following LNG specific points should be taken into account:

1. On board training and experience is essential for seafarers.
2. Minimum three (3) months on board experience is essential for instructors.
3. Both deck and engine officers at management level have more than 10 years LNG experience at the current best industry practice.
4. Education and training and a certain degree of experience can be provided by simulators. But this should not be a reason for seafarers to be exempted from on board training.
5. Simulator training has at least two important constraints: i.e. (a) a course can take only a small number of students at a time. This means that the more students, the more courses, and the more time necessary, and (b) more qualified instructors are required. Competent and qualified instructors are the most critical bottleneck at present.
6. On board training capacity is extremely limited. An LNG ship can take 2~3 students; either seafarer students or instructor candidates. Cabin space is another critical constraint.

G. No time left

To make the situation more dire, existing qualified seafarers in Western Europe and Japan are retiring in en masse (because they are baby boomers) by 2010, when the short term demand peaks. There is no panacea. There is no time to waste, either.

3. THE STRUCTURE OF INTERNATIONAL SHIPPING

What characterizes the mechanism of international shipping which tolerates the deterioration of the quality of shipping services supplied to the international shipping market, derives from its legal framework. The framework of international shipping today is based on two principle concepts, i.e. (1) prohibition of discrimination of flags, and (2) flag of convenience. The former relates to the OECD Code, and the latter mainly refers to the Geneva Convention on the High Seas 1958, the United Nations Convention on the Law of the Sea 1982 (UNCLOS 1982), and the United Nations Convention on Conditions for Registration of Ships 1986 (1986 UN Convention. This Convention has not taken effect yet).

Flag of convenience states are those countries which encourage registration of ships in terms favorable to owners in such areas as taxation on owning of ships, rules and regulations on the labor of seafarers assigned on board, safety requirements of ships, and so forth. Those Countries who offer these inducements are called Flag of Convenience States, (FOC states) and those ships who are registered in FOC states are called Flag of Convenience ships (FOC ships). The Organization of Economic Cooperation and Development (OECD) lists Liberia, Panama, Cyprus,
Bahamas, Honduras, Antigua and Barbuda, Bermuda, Cayman Islands, Gibraltar, Lebanon, Malta, Mauritius, Oman, St. Vincent, and Vanuatu as FOC countries. OECD material shows that the ratio of FOC ships in the total world merchant fleet in 1981 was 25%, whereas the ratio in 1999 was 48%. The theoretical controversy over FOC is the issue of a so called “genuine link” between a flag state and a ship who flies the flag of that state.

**A. OECD Code on invisible transaction**

The Organization of European Economic Council (OEEC), the predecessor of OECD which succeeded in 1961, established a principle of so called freedom of shipping in 1957. The focal point is the concept of the prohibition of discrimination of flags. [3] The implication of these clauses is that the nationality aspect in shipping services is unnecessary. It can be construed that the international shipping services was officially given a global nature.


As early as 1956, the United Nations set up the International Law Commission to deliberate the concept of genuine link. There were fierce discussions on the concept of genuine link between the traditional maritime countries of Europe and the flag of convenience states such as Panama and Liberia. The intention behind these discussions was to have the practice of the flag states be checked by the developed countries. The Geneva Convention on the High Seas took effect in 1958, in which genuine link was stipulated In Article 5. The genuine link was also contained in the United Nations Convention on the Law of the Sea which was adopted in 1982 (UNCLOS 1982). The Convention took effect in 1994. The following three articles relate to the matter of “genuine link”:

**Article 91 Nationality of ships**

1. Every state shall fix the conditions for the grant of its nationality to ships, for the registration of ships in its territory, and for the right to fly its flag. Ships have the nationality of the States whose flag they are entitled to fly. There must exist a genuine link between the State and the ship.

2. Every State shall issue to ships to which it has granted the right to fly its flag documents to that effect.

**Article 92 Status of Ships**

1. Ships shall sail under the flag of one State only and, save in exceptional cases expressly provided for in international treaties or in this Convention, shall be subject to its exclusive jurisdiction on the high seas. A ship may not change its flag during a voyage or while in a
port of call, save in the case of a real transfer of ownership or change of registry.

Article 94 Duties of the flag state
1. Every State shall effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag.

The Convention is still considered to be ineffective with regard to limitation of abuse of FOC, and reduction of sub-standard ships. In fact, Article 91 omits the wording in Article 5 of the Convention on the High Seas 1958, i.e. “in particular, the State must effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag”. There have been various efforts to follow up the controversy over genuine link including those at IMO. The controversy over genuine link, however, remains unresolved up to this day. It is to be noted that the controversy over genuine link is between the traditional maritime countries, above all those of Europe, and those of the flag of convenience states supported by the United States.

A. The heel of Achilles

The legal controversy and the real world of shipping is a different thing. The very core problem of Flag of convenience as an institutional establishment is that it has allowed so called sub-standard ships to freely trade in the international shipping market under exactly the same privilege and treatment as those ships of high quality. Common sense tells us that it is natural for sub-standard ships to worsen in the international shipping market under an environment that lacks firmly established principles and rules and regulations on who must responsibly and “effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag.” And this is the very real environment in which the rapidly expanding number of LNG tankers of today and tomorrow have been serving and will serve the trade with responsibility for the national energy security of the countries in the LNG supply chain.

B. The international seafarer labor market – a truly global market

The uniqueness of the international seafarer labor market lies in its truly cosmopolitan nature. The international seafarer labor market is the aggregate of the seafarer labor contractual relationships of seafarers serving on board each FOC ship trading in the international shipping market. The labor contractual relationship on board a FOC ship is unique. There is usually not a single seafarer of the flag state (FOC country) on board. Each of them is not a resident of the flag state, thus he/she is completely separated from the domestic labor contractual framework of the flag state as well. With regard to his/her mother country, he/she is also completely separated from the domestic labor contractual framework in his/her mother country. As a result, he/she becomes a constituent of the truly global
seafarer labor market. The term “global” is therefore synonymous with “stateless”. The aggregate of those “global” seafarers forms a truly global seafarer labor market. The international seafarer labor market today is the aggregate of the seafarer labor contractual relationships of seafarers on board FOC ships with a number of different flags of FOC countries. As it is estimated that FOC ships share more than half of the total merchant fleet of the world today, the international seafarer labor market is certainly at the center of international shipping today.

C. A distorted system

It is needless to say then that whether, how and by whom the globalized seafarer labor market is effectively and reliably administered and controlled is the most critical issue.

FOC countries have expressly been opposed to accepting the genuine link in the strict sense which European traditional shipping countries have long advocated. As stated in the preceding paragraph, the concept of genuine link is still left in controversy, leaving up in the air the essential issue of who is the responsible party for effective exercise of jurisdiction and control in administrative, technical and social matters of FOC flag ships, as well as the matter of assurance of competence and quality of each and every seafarers on board those ships including LNG tankers flying their flags.

Article 94 of UNCLOS 1982 clearly stipulates the principle that the obligation to effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flags falls on the flag state. The reality, however, is far from the text of the international convention, as the following quotation vividly illustrates: “Despite the express reference to flag State responsibility in international law, are all the flag States uniform in their determination or their ability to discharge this duty? In practice this is not the case. Some States are not very keen on fulfilling their obligations with regard to international obligations and sub-standard shipowners can transfer their ships to the flag of those States which ignore their international obligations. Here, flags of convenience assume prominence.” [4]

What is most disturbing is that the FOC has aggravated the delicate balance between quality orientation and profit orientation in international shipping in favor of the latter during the past half a century period. In terms of the economy of shipowners, it is the cost of seafarers that is usually the biggest cost item out of those items which shipowners can easily rationalize. This is the very reason why shipowners have rushed to FOC, and have been continuing to do so. After 50 years have we seen the sole dominance of profit orientation in the international shipping market where the delicate balance between the quality orientation and profit orientation should be the norm. It is no wonder why sub-standard ships are so persistently ubiquitous, and why the phrase “more than 85% of maritime accidents are due to human error” is so often heard.
International shipping is a delicate system. It has a number of sub-systems, such as terminal and port, pilot, tugs, insurance, and above all, maritime education and training for seafarer human capacity building. As FOC ships flourish, the traditional national flag ships declined. Then a vicious chain reaction started, i.e. the decline of seafarer capacity building in the traditional maritime countries in Europe, Scandinavia and Japan. Education and training of professional human resources is an art. In general, it is extremely difficult to transplant to where an appropriate soil is ready to receive the transplantation. European maritime education and training capacity has so far not been successful in such transplantation to those areas where the majority of the seafarers for FOC ships come from. Neither has Japan. As a result, what is seriously feared today is the aggregate decline of seafarer capacity building on a worldwide scale, in other words, the sound system for replication of top notch seafarers has already deteriorated to a most critical point worldwide. It is no wonder why shipowners, shipmanagers, and manning companies of LNG tankers are so frantic to produce LNG tanker qualified seafarers. An additional blow is the clear tendency of the following younger generation to show less and less interest in going to sea. This tendency is certainly a matter of concern as this will weaken the capacity for replication of seafarers of the next generation.

It may be the case that the LNG shipping sector has already strayed into dangerous waters. It is widely said that the terms of LNG shipping contracts (charter party) on seafarers (usually called Personnel Clause) have been getting stricter and stricter with regard to the qualifications of seafarers on board LNG tankers performing the contractual voyages. What should be clearly noted is that practical reality is different from stricter charter party terms. What needs to be seriously considered is how to achieve an effective and productive system to control and administer the production and reproduction of LNG qualified seafarers in a sustainable manner worldwide.

D. An optimum infrastructure for the LNG supply chain?

It is in this very environment where the unprecedented rapid expansion of LNG fleet, which requires the culture, ethics, and the practical competence, professional capacity and discipline, has now started on a massive scale. It may be the very last opportunity for all the parties concerned to take a careful and penetrating look into whether the current system of the international shipping industry itself is an optimum infrastructure for the LNG supply chain for the next 50 years.

It seems clear that the LNG industry can not expect a sustained reliable ocean transportation infrastructure based on the present FOC system, which lacks a responsible party for effective exercise of jurisdiction and control in administrative, technical and social matters including the education and training of seafarers.

4. A NEW FRAMEWORK FOR THE 21ST CENTURY TRANSPORTATION OF LNG
The challenge that ongoing expansion of the LNG fleet presents is also truly revolutionary in terms of institutional viewpoint. Assuming that the utmost due diligence of all the parties concerned, including administrations, will be required to assure the safe and uninterrupted supply of natural gas to the general public, the current infrastructure of ocean transportation of LNG is not adequate and has a fundamental flaw in its very mechanism. The very mechanism, however, has been in existence for more than half a century after an abundant volume of discussions by professionals and highest ranking officers at United Nations and many other highly regarded arenas. The challenge however should be squarely tackled, and immediately.

The requisites

As the world LNG shipping community is already experiencing the predicament of extreme scarcity of LNG qualified seafarers worldwide, the highest priority should be placed on how to maximize the supply of LNG qualified seafarers without compromising the existing standard of the best practice of the industry. In the next several years, there will be a massive delivery (in excess of 100 ships) of new LNG tankers. In view of this, there is little time to prepare for the expected need for qualified seafarers and special consideration should be given to this fact at an international level.

There are two key areas to be considered. These are (1) an entity which shall be responsible for education and training of LNG qualified seafarers, and (2) a global uniform assessment system (examination system) of competence of each and every seafarers serving on board LNG tankers.

A. A limited Introduction of the WTO principle only to the LNG shipping

Transportation has been on the agenda of the WTO. The basic principle of WTO is national economy, whereas the framework of shipping is international or global. It may be a practical idea to introduce a national principle strictly limited to LNG shipping sector only. This may be accomplished by altering the present majority interpretation of genuine link to those of traditional maritime countries of Europe, so that as an exception, only the LNG sector can be brought back to the national fleet of the country of registration. The responsible party for jurisdiction and control of administrative, technical and social matters would clearly be identified. This exceptional limited application of a principle and rules would only be to less than 1% of the world merchant fleet even after the anticipated expansion as shown in 2.B of this paper. Considering the truly grave importance of safe, secure and uninterrupted inflow of LNG in terms of the energy national security of each and every importing country, it would seem difficult to find a counter balancing value, judgment and argument.

As briefly stated in the preceding paragraph, flag of convenience has been supported by the United States. The system of flag of convenience has been playing a significant strategic role as a tool
in the “effectively U.S.-controlled” (EUSC) merchant fleet “to support most military requirements for delivering sustainment supplies. In a national emergency, the President could technically requisition U.S.-flag and EUSC ships to transport military cargo.” [5]

The proposed concept of excluding the LNG tankers sector from flag of convenience has several reasonable grounds, namely:

1. The background of the current rapid expansion of LNG fleet was determined by an expected significant growth of LNG imports by the United States. It means that dependency of the United States on the imported LNG by LNG tankers will also rise significantly and rapidly. The importance of imported LNG as the primary energy source by the United States will increase correspondingly. Security of LNG transportation by LNG tankers therefore becomes an issue directly related to the national energy security of the United States. It is imperative that the United States should do its utmost to set up a truly watertight system in all respects for the safe and sustained inflow of imported LNG to the country.

2. A sufficient number of LNG qualified American seafarers of all ranks should readily be available when or if EUSC LNG tankers designated for the carriage of imported LNG to the United States are requisitioned by the President in case of a national emergency. Because LNG tankers require seafarers of all ranks to be disciplined and trained in all respects specific to LNG tankers, it is impractical to maintain a significant number of LNG specifically readied American seafarers in a “reserve” situation.

3. The general public of the United States are more likely to be comfortable, and will even be supportive, if all the fully laden LNG tankers calling at U.S. ports are operated by seafarers of their own nationality.

4. American LNG specifically disciplined and trained seafarers will be able to keep their morale high with the patriotic pride and mental satisfaction that they are contributing to their country through the safe and responsible carriage of LNG to maintain intact their national energy security.

5. As the wage level of LNG qualified seafarers in the international seafarer labor market is, even at present, showing a steep increase to a level comparable to that of American seafarers, the actual financial burden to the shipowners and managers will be in the reasonably tolerable range.

6. LNG tankers are LNG trade specific types of ships, and they cannot be used for other cargoes at all, hence it will not contribute to the expansion of the transportation capacity of the United States at a time of a national emergency. In other words, the impact of putting LNG tankers in the EUSC category may be minimal.

7. As the recent report by the Congressional Budget Office (CBO) of the United States clearly states, the role and significance of EUSC has been remarkably diminished, hence the justification for keeping LNG tankers under EUSC seems to be weak. “But unless the United States faced two major regional contingencies at the same time, it would probably not need to requisition ships because the
Navy has set up contractual agreements with U.S.-flag carriers (similar to the Civil Reserve Air Fleet) so DoD can use commercial ships for national emergencies. And DoD might also approach allies for additional shipping capacity or charter foreign-flag vessels. [6]

(8) The synergy of significantly enhancing and strengthening the level and capacity of maritime education and training level of the U.S. maritime academies and colleges through their effort to meet the increased demand for LNG qualified seafarers especially in view of the fact that LNG tankers are the most sophisticated and high technology ships, requiring all the seafarers on board to have mental discipline and readiness. This quality is an express prerequisite for the captain and senior officers of LNG tankers.

The United States will be the world’s biggest importer of LNG by 2010. It is almost certain that the new U.S. LNG shipping policy will have a decisive impact on world LNG shipping. Should the direction of it be in line with the above, there would not be any party who would oppose it. Above all, it seems to be the very utmost due diligence necessary for the benefit of the people of the LNG importing country. The maintenance of the prestigious safety record of LNG tankers into the future, thereby maintaining trust in the reliability of safe and secure transportation of LNG, would also contribute to the national economic security of the LNG exporting countries.

It is sunset time for flags of convenience for the LNG tanker sector.

**B. An international collaboration in quality control for LNG seafarers**

Even under the demise of flag of convenience for the LNG tanker sector, it is absolutely vital to keep the competence standard of each and every LNG seafarer at the current level of premium industry best practice. In order to realize this among all nationalities of seafarers, it is also imperative to establish a truly revolutionary system of international assessment of competence of LNG seafarers on the international platform based on the principle of highest transparency. At present the issuance of a Certificate of Competence and other certificates concerning the mandatory courses under the international Convention (STCW78, as amended 95) on the competence of seafarers is under the national sovereignty of the issuing country. It should at least be agreed upon by all the members of STCW78, as amended 95 who have something to do with LNG transportation, and all other relevant parties such as the representatives of exporters, importers, terminal operators, institutions of maritime education and training, class societies, as well as IMO (International Maritime Organization). The scope of activities of this system will be synergized worldwide so that this new system would be applicable internationally.

**5. CONCLUSION**
A. Sunset time for the current system

Any legal framework needs to undergo a periodical review. It is especially so for international shipping where the changes in the past 50 years in almost all of its areas have been so extensive and significant. It is truly symbolic that the seafaring human resource which is the most critical element of all in the ocean transportation system is in such a critically short supply as stated by the Secretary General of IMO. The rapid expansion in the most sophisticated sector of international shipping has exposed the serious reality of seafarer human resources to the light of day.

The ongoing rapid expansion of the world LNG trade and fleet led by the U.S. import of LNG, is an ultimatum to the world maritime community to make a sunset review of the existing system of the international shipping.

A historical review shows that it was the United States who brought the dawn of flag of convenience some 50 years ago, and that it is the United States who is leading the way to a sunset review of the system, at least to the LNG sector of it.

B. Immediate action indispensable

The LNG fleet of the world will be almost doubled in the coming three to four year period. As a vital energy infrastructure, all the required elements for the LNG supply chain including skilled seafaring human resources need to be met in all respects, i.e. time, quality and quantity. Human capacity building takes time, and it is especially so for LNG qualified seafarers. There is no time to waste for all the stakeholders, as clearly stated by Mr. Mitropoulos, the Secretary General of IMO. It is also to be acknowledged by all the stakeholders that this solemn goal cannot be realized by any single party, but only through close and effective international collaboration among all the stakeholders of the LNG supply chain.

C. Manifest priority

The public interest standard should be the manifest priority.

The leading LNG pioneer of Japan clearly illustrates this. The high dependency on imported LNG as to the level of over 85% of the total primary source of urban gas supply means the potential for a devastating result should the smooth and steady flow of LNG be disrupted. Ocean transportation is critical for the national security of the country. It is obvious that the private interest standard should be secondary. As the competition becomes more intense in the process of the ongoing expansion, it may become more and more difficult to keep the delicate balance between the two standards. It is, however,
crystal clear that the predominance of private interest standard over public interest standard should not be permitted.

**D. Come back to the original principle – Precaution, precaution and precaution**

The original principle should be stubbornly maintained, because it is that principle which has been the foundation of the prestigious record of safety of the LNG shipping industry for the past forty one and a half years. It is useful to note that this record is exactly comparable with that of the bullet train of Japan. Their motto is to impress the Principle of Heinrich into the heart of each and every staff of the company in their day to day responsibilities. The rapidly expansion of the world LNG fleet should not be allowed to disrupt the maintenance of this divine golden rule of the industry.

It is the United States that is a the position to take the initiative for the new framework of the 21st century for the LNG ocean transportation industry. This initiative will assure all global participants, including the people of the United States a dawn of the new international maritime framework to sustain quality LNG shipping services based on the principle of national control and responsibility.

Then, the sun also rises.
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