Technological changes and emerging risks

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The Standard Club has been writing offshore risks for over 40 years and in this period has had to adapt to the constantly changing landscape of risk. Such risks have been affected by political, economic, geographic, environmental and technological factors. This article focuses on how new technologies such as FLNG are affecting risk and how the club is evolving to ensure we can continue to provide suitable solutions for our members and their operations.

A changing landscape

Over the last 40 years, technological change has had a huge impact on risk in the offshore industry. Average sizes and values of offshore craft have increased dramatically in this period. Offshore supply vessels, which were once mostly ex-fishing trawlers, are now over 100m in length with accommodation capacity for more than 100 people. The *Pioneering Spirit*, the world's largest platform installation/decommissioning and pipelay vessel, is in excess of 400,000gt. Shortly due to commence operations on the Ichthys LNG Project offshore northwest Australia, Inpex's central processing facility (CPF)[1] will become the world's largest semi-submersible platform, measuring around 150 metres by 110 metres[2]. FLNG units are set to be the largest floating structures ever built and these increased sizes have implications on P&I risk through their enhanced personnel, pollution and wreck removal exposures.

Not only have vessels increased in size but also in complexity. This has widened the range of activities they are able to perform. Lifting capacities have been increased, allowing for larger, more valuable equipment and cargo to be transported, constructed and deconstructed. Activities such as decommissioning and new techniques such as High Temperature, High Pressure (HTHP) drilling and Enhanced Oil Recovery (EOR), aimed at increasing efficiency, will have their own impacts on risk. Also, whilst automation, robotics and the use of drones may

1 http://www.inpex.com.au/our-projects/ichthys-lng-project/ichthys-in-detail/project-facilities/central-processing-facility/
2 http://www.inpex.co.jp/english/ir/library/pdf/annual_report/inpex_annualreport2013_en-4.pdf
3 http://www.inpex.com.au/our-projects/ichthys-lng-project/ichthys-in-detail/project-facilities/central-processing-facility/

SBM's mid-scale FLNG concept (courtesy of SBM)

remove the human element from risks, they may also increase the operator's exposure to more recent threats such as cyber terrorism.

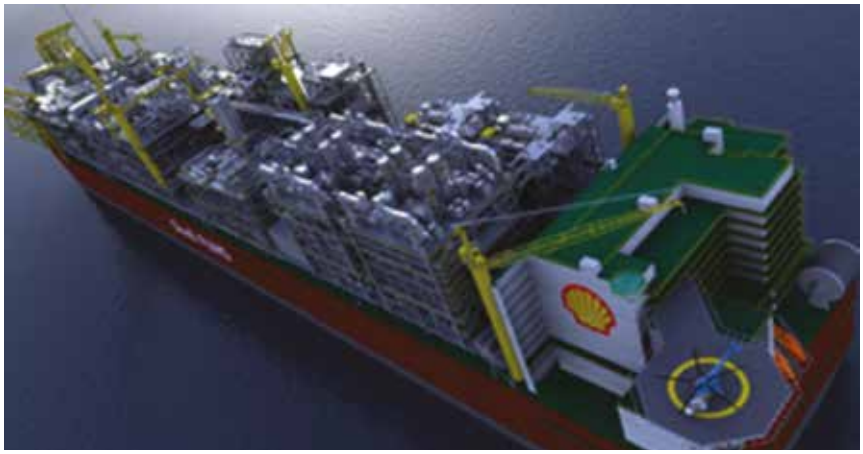
New designs

Technological advancements have enabled the creation of new and unproven ship types. Some of these designs have been driven by the need to reduce costs. With offshore structures being built further away from shore and a growing number of platforms operating unmanned, the market for specifically built 'walk-to-work' is growing. These vessels cut out the need for service and maintenance crews to be transported to and from shore every day, and thus are proving to be a cost-effective solution. Similarly, offshore wind turbines are being affected by the exhaustion of shore-side locations and are moving to deeper water, where floating wind turbines are becoming an increasingly suitable and economically sensible option. These come in a variety of designs including tension leg, spar buoy, semi-submersibles and even a 'Floating Power Plant', which combines wind and wave energy technology. Other new vessel designs include thermal energy conversion units, which harness energy through sea temperature differential, and Floating Nuclear plants, one of which, the *Akademik Lomonosov*, is currently under construction in Russia. With the Fukushima disaster still fresh in memory, there are obvious concerns about such concepts.

Floating Liquefied Natural Gas

Perhaps the most discussed new offshore design is that of Floating Liquefied Natural Gas (FLNG) vessels and the industry eagerly awaits the start-up of Petronas's PFLNG 1, known as the *PFLNG Satu*, which is expected to be the world's first operational FLNG unit when it begins production offshore Malaysia in the coming months. This will be closely followed by Shell's far larger vessel *Prelude*, which is the result of an estimated $11bn investment. In fact, the capital expenditure for FLNG vessels is expected to amount to $35.5bn over the period 2015-2021[3].

Leading LNG players including Woodside, Shell, Petronas, ExxonMobil and Inpex are attracted to floating LNG options for a number of reasons. Fundamentally, oil and gas reserves are beginning to diminish, therefore alternatives are becoming increasingly attractive. This, coupled with political factors, has increased demand for the supply of cleaner and more environmentally acceptable sources of energy. As natural gas is the cleanest of all fossil fuels, it is no wonder that operators are considering FLNG as a viable option and investing heavily in the technology. FLNG technology



Prelude FLNG artist's impression (courtesy of Shell)

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also enables LNG to be exported more directly to the market than current coastal facilities. This is because an FLNG unit will float above the offshore natural gas field and produce, liquefy and store the LNG until it is ready to be directly transferred to shuttle carriers, which will transport the produce straight to its required destination. This eradicates the need for long and costly pipelines that would otherwise be required to reach large reserves such as the Scarborough field and Brown basin, which sit 200km and 425km respectively offshore Australia. This also means that there is less marine and coastal environmental disturbance associated with the construction of coastal LNG facilities, and negates the steep costs associated with constructing infrastructure required for land-based projects.

Insuring the risks of FLNG

Notwithstanding the benefits of FLNG, as with any operation involving oil and gas, FLNG units are not without risk. The technology is new and unproven, which coupled with the immense size of some of these projects, represents new risks to insurers. However, many of the technical and operational challenges that FLNG units pose are akin to those associated with an FPSO, and with The Standard Club insuring over 40% of the world's active FPSOs, we are well placed to understand and rate the risk competently. Offloading oil/gas between two vessels on the high seas carries the risk of collision and pollution, storing LNG in tanks exposes the vessel to potential sloshing, which consequently may compromise the stability of the vessel, and of course there are risks of gas leaks and explosions associated with importing large quantities of high-pressure feed gas onto a floating facility. Perhaps the most notable P&I risk associated with FLNG is wreck removal due to the sheer size of such units. Shell's *Prelude* is wider than a Boeing 747, more than 500 metres long and will weigh 600,000 tonnes when fully loaded. We are yet to see how traditional salvors would be able to respond to a major casualty involving the wreck of a unit of this nature.

Although the Pooling Agreement does not specifically address the insurability of FLNG units, it has been determined by pooling partners (through the Production Operations and Specialist Craft Sub-committee) that FLNG units are akin to FPSOs in terms of risk and will be considered in the same light by the International Group. This means that they are capable of having poolable cover whilst navigating but are excluded by virtue of the drilling and production exclusion whilst engaged in operations in connection with gas production. As with FPSOs, The Standard Club is able to offer a poolable solution whilst navigating and a non-poolable solution under our Standard Offshore Rules (SOR) when the unit is in field and operating. This can be provided to a limit of $1bn, which is the highest available in the International Group. SOR cover responds to a member's liabilities in respect of personal injury, pollution from unit, removal of wreck, collision, fixed and floating objects, and fines.

The cover can also respond to a member's contractual assumptions of liability should these arise out of a covered risk (subject to prior approval of contract).

Conclusion

The Standard Club endeavours to stay one step ahead of technological advancements in the offshore industry and is enthused to be a part of the changes. We will ensure our technical understanding is second to none and that we offer cover solutions to members venturing into untried and tested areas of operation where possible.