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Research Article

A critical examination of risk management in offshore projects

Xiaowei Zhang[1] and Pengfei Zhang[2,*]

[1]*School of Koguan Law, Shanghai Jiao Tong University, Shanghai, China*
[2]*School of Law, Dalian Maritime University, Liaoning Sheng, China*

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Abstract

The shipbuilding industry, particularly in some Asian countries, is currently experiencing a difficult time resulting from a sluggish market situation and the increasing risk of buyers' repudiation. Offshore newbuilding projects in the maritime sector are usually capital-intensive. When the market is in downturn and the values of offshore vessels or rigs (OVORs) depreciate, the risk of OVORs orders being cancelled is significantly increased. Being unable to deal properly with this kind of situation may bring about huge losses to the parties of the contract, both to shipyards and to the owners of OVORs. Newbuilding of OVORs differ significantly from the newbuilding of conventional ships, although the existing risk management of OVORs is based on a system adopted to suit conventional ships. Based on existing knowledge and the scholarship available in the public domain, and on the primary data collected in several phases of fieldwork, this study intends to critically examine a number of major issues relating to risk management in offshore newbuilding projects. The paper concludes with a proposed risk management strategic framework and some practical suggestions for the builder.

1. Introduction

Recent years have been another challenging period for shipyards, especially for those that focus mostly on offshore business (WMN, 2017). Apart from an uncertain international environment characterised by slowing global growth and increasingly protectionist sentiments in several developed economies, the offshore and marine sector continues to be severely impacted by volatile and depressed oil prices (Paraskova, 2017). For example, crude oil price fell to $26.21 per barrel in June 2016 and is now at a level of about $50 per barrel (Macrotrends, 2020). Major oil companies responded by cutting back capital expenditure in exploration and production (E&P), thus resulting in the cancellation of OVORs charter contracts with offshore contractors. The offshore contractors, therefore, suffer from the weak utilization of the existing offshore fleet and a continuing oversupply of OVORs. The offshore contractors will also not take delivery of new-built

[*]*Corresponding author: School of Law, Dalian Maritime University, Liaoning Sheng, China*
E-mail address: shippinglaw@163.com

OVORs from offshore shipyards[1].

According to available statistics, there are more than one hundred offshore rigs whose construction have already been completed but are now remaining in the shipyards and will stay there for a long period to wait for future work engagement (SIN, 2017; Malterudbakken et al., 2017). In such cases, shipyards will continue owing large amount debts to banks and will have limited capabilities to obtain financial support from banks for intended new projects. Termination or cancellation is often caused by reasons such as non-performance, bankruptcy, war, breach of building contacts, etc.

As previously discussed, it has been found that, within recent years, the leading offshore shipyards include most of the world's capabilities in the offshore newbuilding industry; unfortunately, they are still facing various problems concerning offshore newbuilding projects, both those delivered and those non-delivered. For delivered projects, shipyards have lost large amounts of money, as they themselves have claimed, from cost overruns caused by the owners' changes of design, as well as from the paying back of liquidated damages, which are normally deducted from delivery instalments. For non-delivered projects, owners have cancelled offshore newbuilding contracts because they claimed late delivery, with the shipyards' achieved delivery date being beyond the permitted deadline under the contract for any delay, allowing the owner the right to terminate or cancel the contract as a consequence of such delay. In such cases, one of the consequences for the shipyard is that it has to pay back to the owner all the advanced instalment payments, plus the interest as calculated and stipulated under the terms of the contract. Another consequence is that the owner may claim for the damages he suffered due to such a termination or cancellation. More seriously, one of the further possible consequences is that some shipyards will go bankrupt.

How to resolve such problems currently faced by shipyards is a major issue, and the key objective of this research is to make some practical suggestions for shipyards to re-think their risk management strategic framework.

The aim of this research is to answer the following questions:

1) What kinds of lesson can be learned by shipyards from the current downturn in the offshore industry?

2) What kinds of risk-evaluation and management systems need the shipyards establish?

3) How can disputes, as well as arbitrations, between the shipyards and the owners of OVORs be dealt with and especially, what need shipyards do from a risk management perspective?

The offshore industry increasingly appreciates that the risk of its newbuilding is linked to the fact that oil itself is an extreme pollutant. As environmental concerns increase, so does the risk management associated. The nature of the offshore environment is harsh.

The research will seek answers to these questions by making relevant suggestions to the shipbuilding/maritime arbitration organizations and also to professionals working in this area, respectively.

2. Literature review

The offshore newbuilding and shipbuilding industry is a typical subsection of heavy industry. As shown in **Figure 1**, the processes and activities of the shipbuilding process include design, engineering, procurements of materials and equipment, manufacture, equipment and systems installation, mechanical completion, commissioning, delivery, and so on (Loots & Charrett, 2019).

[1]It is noteworthy that, in North America and Western Europe, most of the yards have been specialised offshore yards producing jack-up and semi-submersible rigs and various types of production platforms. However, in Asia, particularly China, conventional shipyard companies have become more involved in the offshore market.

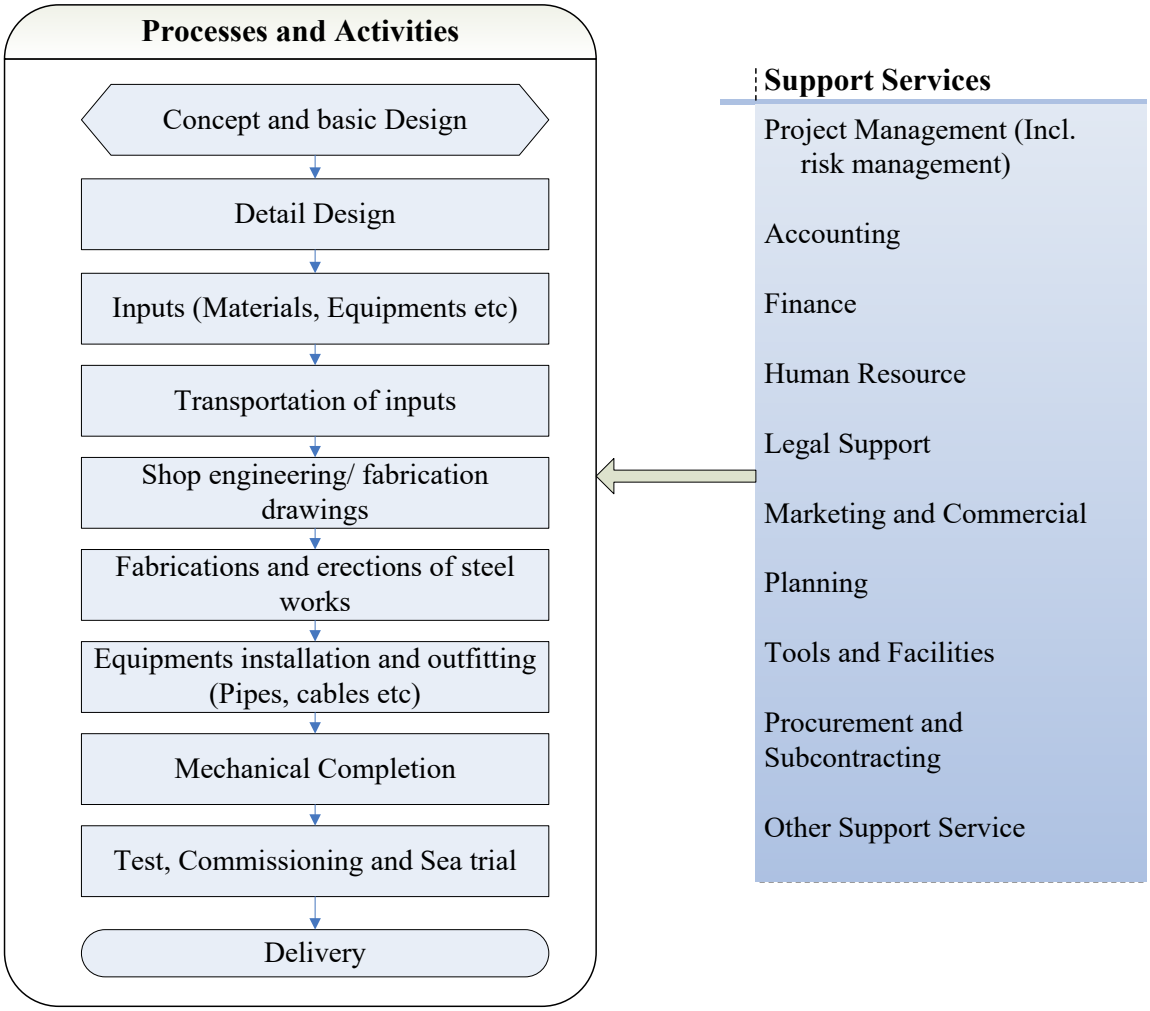


Figure 1 The newbuilding process of an OVORs project.
(Source: Created by the author in 2018)

The period of shipyard selection and contract negotiation for an offshore OVORs project may be up to 2 years and, for most of the projects, the delivery time is also more than 2 years. This means that an individual transaction for an offshore OVORs project will take several years. As illustrated in **Figure 2**, organizational buyer behaviour (OBB) by offshore OVORs project owners consists of a series of sequential activities through which these owners proceed when making purchasing decisions for offshore OVORs projects. Robinson et al. (1967) referred to these as buying stages or buy-phases (Robinson & Wind, 1967). The buy-phases of offshore projects consist of concept design, basic design, invitation for tender, bidding, evaluation, contract negotiation, project execution, and so on. The transaction process may include design, engineering, procurement, construction, mechanical completion, commissioning, transportation, and so on.

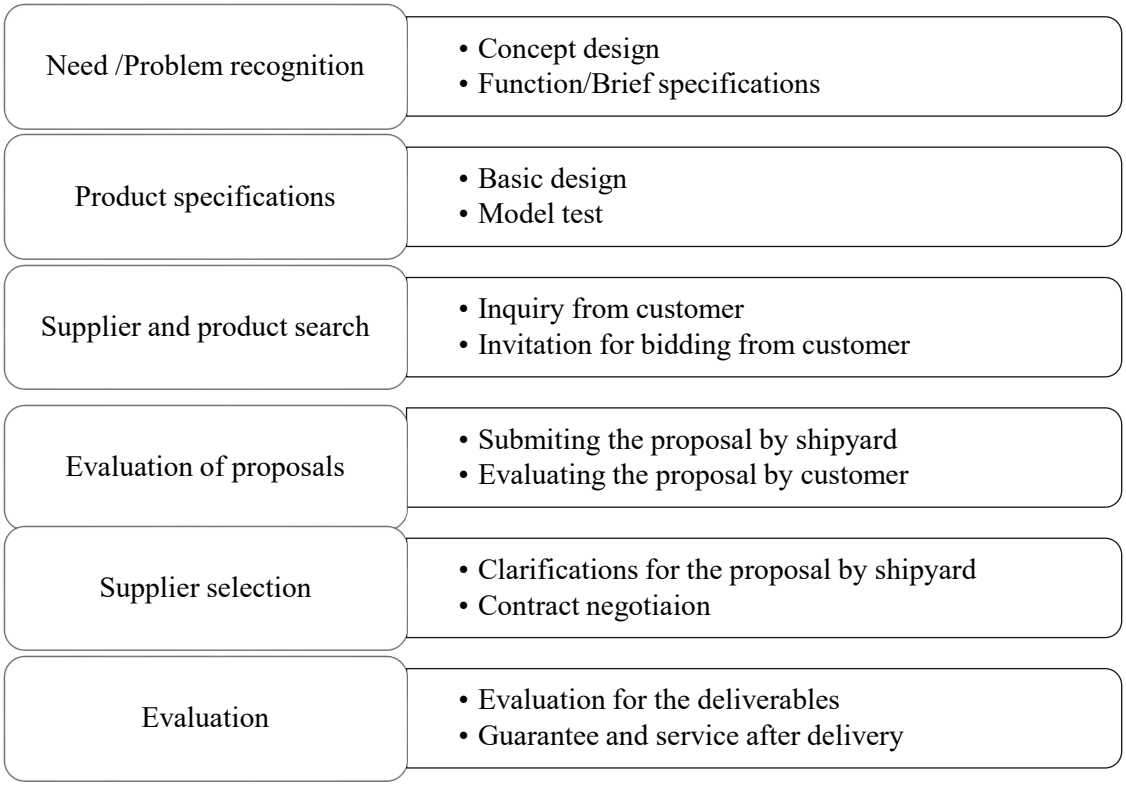


Figure 2 Buy-phases of offshore projects.
(Source: Created by the author in 2018, based on Baines et al., 2011)

Drawing from the latest risk management theory (Lee et al., 2009), the project risk management paradigm is depicted in **Figure 3**, giving the procedure for a particular project. The paradigm portrays the high-level steps of the risk management process, which include identifying, analysis, planning, implementation, communicating, tracking and control, and so on.

"Identify" here means searching and locating potential risks before they materialise or become real risks. "Analysis" is understood to be the processing of risk data into decision-making information. "Planning" refers to the translation of risk information into decisions and actions (mitigations). "Implementation" means executing the decisions and the mitigation action plans. "Tracking and control" play very important roles in the project risk management process, involving the monitoring of the risk indicators and actions (El-Sayegh, 2008), deviations from the planned risk action may then be identified and necessary correction taken. "Communication" is an essential part of risk management and occurs at every step of the process, among both the stakeholders and the contractors (Zhang et al., 2013). Moreover, as previously discussed, the risk management system needs to cover all the activities of the whole shipbuilding chain.

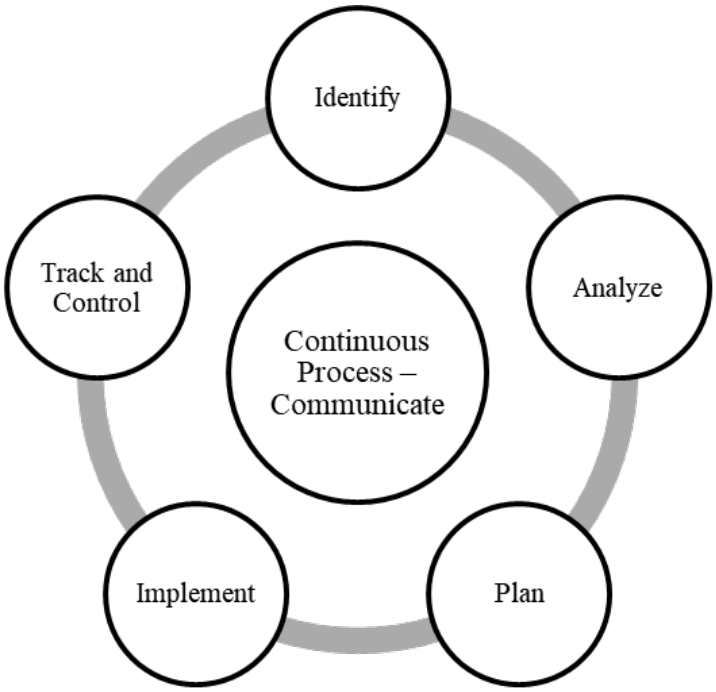


Figure 3 Processes of risk management system.
(Source: Created by the author in 2017)

All stakeholders should be involved at the very beginning of the project's risk analysis; the stakeholders should include the customer, designers, vendors, subcontractors, and the different internal stakeholders of the shipyard. If there are any actions or attitudes that hinder communication about project risk, these will reduce the effectiveness and implementation of project risk management being conducted by proactive approaches and effective decision-making. Project risk management cannot take place in isolation or with an asymmetry of information (Krishna & Morgan, 2004). Effective and honest communication from the project risk management process to the rest of the project team and other project stakeholders has to be maintained. Communication of the results of the project risk management process should be targeted to meet the specific needs of each stakeholder and should be reflected within the overall project communications strategy, with each stakeholder's responsibility and role in risk management identified and agreed (Raz & Michael, 2001).

The first priority of the risk management system should be risk response and control. This means that risk management needs to help shipyards to identify what kinds of risk to which they need to pay more attention and what kinds of measures they need to develop in order to manage these risks if they choose to accept offshore contracts. The research team argues that the most important point in shipyards' risk management systems is to take relevant measures to minimise or transfer the risks identified (Zou et al., 2007). The aim of the risk management system is not to set a target of zero risk, which is clearly not practicable. In order to minimise or transfer risk, the implementation of pre-scheduled measures should be given priority, and not only focus on identifying risk (Elkington & Smallman, 2002). Nothing might happen after that until the identified potential risk becomes a real risk, thus eventually leading to an unexpected result and even resulting in major disputes between the shipyard and the OVORs owner.

3. Materials and methods

In order to achieve these objectives, this research will start by investigating the basic factors that bring about failures suffered by shipyards in international offshore disputes and shipbuilding arbitration cases. The research will then report on the results of a semi-open interview survey of industry professionals and practitioners. After synthesizing the investigation's findings concerning the offshore disputes and arbitration cases and the results of the survey, the research will analyse further its findings and will develop suggestions to shipyards for adopting measures to establish a good risk management system.

3.1 Semi-open questionnaire survey and interviews

One of the available research methods is sample survey and interviewing. A survey questionnaire has been developed by the research team. The aim of this questionnaire is to ascertain exactly what the current status and the problems in shipyards concerning risk management are. The questions cover all aspects of risk management, as determined by the latest risk management theory and by best practice, and also from the strategic, operational, and project level. The industry experts were selected as a sample to include arbitrators, shipyard representatives, witnesses, lawyers, and others, especially those experts specializing in offshore industry (**Table 1**). Also, some visits were made to maritime arbitration organizations, legal firms, universities, research institutes, and others. Finally, more than 20 interviewees from among the respondents were selected from different levels for semi-open face-to-face discussions in order to add depth to the findings of the survey.

Table 1 List of Interviewees.

Stakeholders	Number	Officers concerned
Top shipyard management	3	Managing Directors of Shipyards
Shipyards' internal legal counsel	3	Internal Legal Counsel
Lawyers/Arbitrators	6	Maritime Lawyers
Shipyard technical experts	3	Technical Managers
Commercial experts on shipyards	3	Commercial Director Directors
Scholars concerned with shipbuilding	5	Academics, PhD Candidates

(Source: created by the authors in 2018)

3.2 Case study

Another approach taken by this research is collecting details of typical arbitration or court cases where one party is a shipyard and investigating why the shipyard won or lost the case, taking into account technical, legal, cultural, and project-management aspects. One of the crucial challenges this research method may face is that arbitration is normally confidential, and so it is difficult for an academic study to achieve a full picture of a case. Another challenge is that a party may feel they have lost out in the arbitration and may not like to disclose details to a third party. One solution has been found for coping with these challenges; collecting some cases where arbitration orders were appealed against.

3.3 Group discussions and brainstorming

During July 2017, a group discussion on these issues was held in Shanghai, and some of the interviewees living in Shanghai attended this group discussion meeting. During the meeting, the cases mentioned previously were presented as discussion material. The preliminary answers on the survey, and also the interview results, as well as some early findings of the research, were shared for discussion. The participants acknowledged that the survey results showed the reality of the challenges that the newbuilding industry of OVORs and the shipyards are now facing. In the second half of the meeting, a brainstorming session was held for suggestions about how to solve the problems, and this confirmed that the survey was contributing the fundamental outline for the upcoming discussion of the research.

Once the research was completed, a few of its findings were explored; these findings show what the actual problems are for the shipyards that are conducting offshore newbuilding business. These findings will also serve as the basis of later discussion.

4. Problems faced by offshore shipyards

A large number of offshore rigs cannot be delivered from offshore shipyards, as most of these rigs have no associated employees to do this. As illustrated by **Table 2** in more detail, there are in total 103 jack-up rigs and 47 semi-submersible rigs, but only 1 % of these jack-up rigs had charter contracts and only 34 % of semi-submersible rigs had secured charters. As discussed during the brainstorming session, one industry expert said:

These rigs may stay in the shipyards for quite a long period to wait for the work engagement upon, or they may have a shore period after the market recovery. The order book is, however, expected to be gradually delivered over the next 3 - 5 years and not in the coming 12 months.

This shows that rigs are nonetheless being completed in all the rig-building yards; how these rigs will eventually be delivered is a big present-day problem for these shipyards.

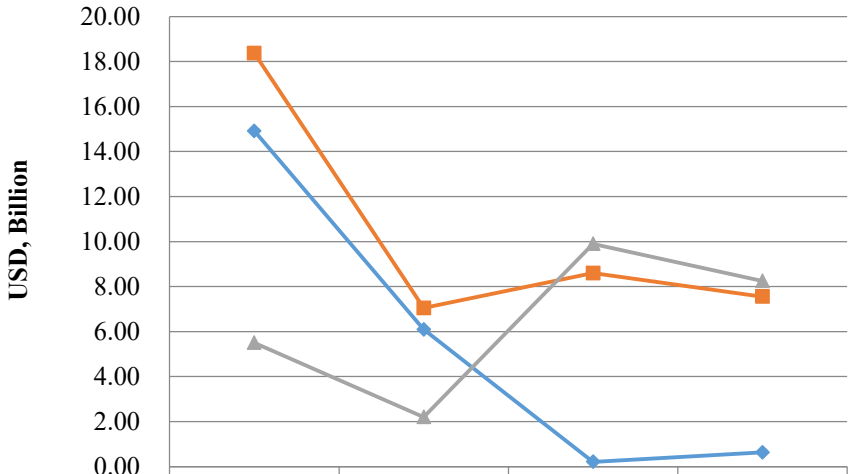
Most shipyards face huge pressures affecting whether they will be able to survive, especially from a financial perspective. According to the survey's findings, all these offshore rigs were constructed by shipyards based on EPCI turnkey contract terms. Most of these orders are owned by speculators or are built on a speculative basis by the owners or by the shipyard. The majority of the jack-up rigs especially have been ordered to be made in China with very heavy tail-end payment terms (90 to 99 % of price payable on delivery) and no parent or payment guarantee for the delivery instalment. The rigs are not generally being offered in tenders, but have been ordered with the intention of reselling prior to delivery. Given the current economic downturn, re-selling these jack-ups is proving very difficult. Yards are thus stuck with a considerable number of rigs that they are unlikely to be able to sell if based on the current market value, which is lower than the newbuilding price (Pareto, 2017). All of these issues together may bring systemic problems for shipyards; they owe too much debt to banks and have limited further capabilities of getting financial support for new projects.

Table 2 Worldwide offshore rig delivery schedule and contract status.

Jack-up								
Under construction	**Delivery**							
	Completed	**H2'17**	**H1'18**	**H2'18**	**H1'19**	**H2'19**	**Later**	**Total**
China	22	9	17	16	6	1	0	**71**
Singapore	8	6	4	2	3	3	3	**29**
South Korea	0	1	0	0	0	0	0	**1**
Other	3	0	0	0	0	0	0	**3**
Total	33	16	21	18	9	4	3	**104**
Contracted	0	1	0	0	0	0	0	**1**
Not contracted	33	15	21	18	9	4	3	**103**
% Contracted	**0 %**	**6 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**1 %**
Semi-submersible Drilling Rig and Drill Ship								
Under construction	**Delivery**							
	Completed	**H2'17**	**H1'18**	**H2'18**	**H1'19**	**H2'19**	**Later**	**Total**
China	1	4	3	1	1	0	0	10
Singapore	1	1	0	0	0	0	2	4
South Korea	5	3	5	0	3	1	1	18
Brazil	0	5	4	1	3	1	1	15
Total	7	13	12	2	7	2	4	**47**
Contracted	0	6	4	1	3	1	1	16
Not contracted	7	7	8	1	4	1	3	31
% Contracted	**0 %**	**46 %**	**33 %**	**50 %**	**43 %**	**50 %**	**25 %**	**34 %**

Source: created by the author in 2018 based on the information from SIN 2017; Malterudbakken et al., 2017

As shown in **Figure 4**, Chinese shipyards owe more than USD 18 billion to banks for offshore newbuilding projects, while the loan for Korean yards stands at more than USD 8 billion, and Singapore yards have been loaned more than USD 6 billion. In total, these shipyards have more than USD 40 billion relating to undelivered offshore newbuilding projects. In the current market, and with limited new orders, shipyards will have no earnings to pay back these loans to the banks. As a result, some shipyards will probably go bankrupt, and debt owned by the banks will become bad debt (Rush & Solandt, 2017). Thus, it is now very important that shipyards adopt a positive attitude towards future potential international contract disputes. Of course, shipyards also need to make themselves more prepared in order to be able to avoid becoming embroiled in the future in such kinds of arbitration (Levering et al., 2013). This means that, not only should it be studied how these shipyards may win in potential international arbitration situations, but 1 should also determine what measures should be taken to minimise such kinds of future risk.



	China	Singapore	South Korea	Other
JU Contract Value	14.91	6.09	0.21	0.63
Shipyard Loan	18.37	7.05	8.59	7.55
Floater Contract Value	5.50	2.20	9.90	8.25

Figure 4 Contract value and deferred payments for undelivered projects.
(Source: Created by the author in 2018)

5. Shipyards' systematic risk management for offshore projects

This section reviews why shipyards have faced such large losses from offshore newbuilding projects and have normally failed in previous international arbitrations, analyzing in more detail the basic reasons for these shipyards' failures. It shows that most shipyards lack a risk evaluation and management framework or system (Levering et al., 2013). This can also be shown from the data of the questionnaire survey. **Figure 5** shows the survey's results about the current status of the risk management capability of one leading Chinese offshore yard. It is to be noted that only the risk identity and qualitative risk analysis were conducted at a middle level, and few activities were implemented with respect to the processes of quantitative risk analysis and risk response.

This fieldwork also found an interesting point that most of the shipyards believe that risk management needs to focus only on health, safety, and the environment ('HSE') aspects; normally, only standards and procedures for an HSE management system have been established (Tsoukalas & Fragiadakis, 2016). One retired and experienced offshore newbuilding expert complained to the research team as follows:

The oil majors need to audit the HSE system before awarding any contracts to offshore shipyards, and so most offshore shipyards have in place a very good and strict HSE management system. I strongly recommend that, in all aspects of risk management, all shipyards should copy the well-established risk management practices and procedures of HSE in order fully to implement the best risk management practices and to cover all the activities of engineering, procurement, construction, testing, commissioning, and so on. These kinds of measures will help the shipyard to minimise the potential risk and to deliver offshore projects on time and within budget.

A Semi-submersible rig arbitration case between Songa Offshore and a Korean shipyard gives an example of a shipyard's low-risk management practice. The total claims by the Korean shipyard amounted to USD 373 million, including USD 329 million of cost overrun and USD 44 million in repayment of Liquidated Damages. Songa Offshore submitted a claims response and a counterclaim of USD 66 million (Songa, 2017). During the group discussion, the industry experts mentioned that, if there had been a well-operated systematic risk management practice, the Korean

shipyard might have avoided such a big cost overrun; during the contract bidding phase, the specifications could have been renegotiated after appropriate risk identification and the contract price could have been increased if the specifications remained unchanged. From another aspect, more detailed specifications could have been developed to stipulate the interfaces between the shipyard and the offshore contractors.

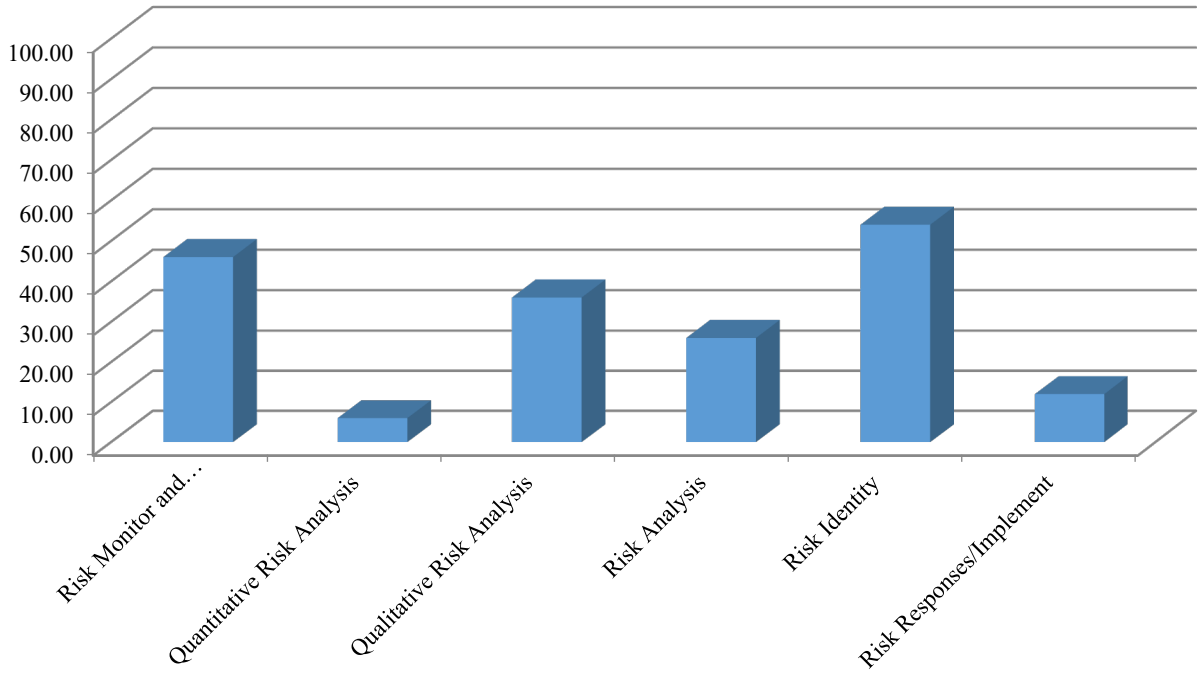


Figure 5 Current status of risk management capability of one leading Chinese offshore yard. (Source: Created by the author in 2018)

The project risk management system needs to cover the entire risk process. One offshore project manager explained to the research team as follows:

We have only a simple risk evaluation process or procedure during the contract negotiation phase, the main aim of this risk evaluation being one part of the feasibility study for the project in order to provide support for the shipyard's top management to decide whether or not to take offshore newbuilding orders. After the offshore newbuilding contract becomes effective, few risk management measures are normally taken, apart from the activities about HSE management.

All stakeholders should be fully committed to managing risks. The study found that information asymmetry among OVORs project stakeholders is quite normal (Jiang et al., 2013). For example, procurement personnel care only about risk about the supply chain, mostly caring about price and contract delivery time. They do not care about other risk factors that will affect later process of total project output. For example, the vendor's technical documents will be inputted into the details of engineering work, and any delay in receiving such documentation may result in postponement of delivery of engineering output drawings for the production process; this will delay the vessel's delivery if the production postponement is located in a critical path of the whole OVORs project (Ruuska et al., 2013). The quality of equipment provided by the vendor is also crucial (Park et al., 2011), and some experts told the researchers that:

Some contracts were cancelled just due to defects found in the critical equipment (such as thrusters, engines, and so on) within 6 months ahead the scheduled delivery date of the OVORs project. These kinds of equipment are made on the basis of unique specifications and the vendor

will have no identical one in stock. The delivery time of such kinds of equipment will normally be almost a year. This means that new equipment would be ready only around 12 months later, which will certainly be beyond the date when the owner has the right to terminate the contract.

Understanding the attitudes towards risk of stakeholders involved in all aspects of shipbuilding is therefore crucial in the planning of shipbuilding risk management that precedes risk identification and analysis; this is necessary in order to optimise both project success and stakeholder satisfaction with the project's results (Fernandes & Crispim, 2016). These attitudes should be identified and managed proactively and deliberately throughout the process of shipbuilding project risk management. It should also be recognised that a single stakeholder may adopt different risk attitudes at various stages in the same project.

The well-defined strategic risk tolerances of shipyards reflect what kinds of strategic risk the shipbuilding business should accept. The shipyards need, from time to time, to review and adjust their strategic risk tolerance; this will be based on different environmental factors, such as the marketing situation, banks' financing policy, technological development, and so on (Gui & Zhang, 2015). One of the shipyard commercial directors mentioned during the survey that the aims of the risk management system should not be to only help shipyards in evaluating shipbuilding project risk before shipyards conclude contracts with owners or clients; he felt that each shipyard could define its own level of risk acceptance, and this would be their criterion in deciding whether or not to take on the order. It was also necessary to develop the relevant measures of risk control and response in order to minimise or transfer any potential risks identified. He explained to us the process of his shipyard's risk management:

Before we sign and conclude a contract with an owner, consent is needed from the shipyard's contract approval committee; the top management team and the heads of most departments are normally the members of this committee. During the meeting, most members talk only about what kinds of risk may be involved in the particular new order under discussion, and they want to see it reduced from the shipyard's point of view to as close to zero as feasible. No one talks about what kinds of risk response need to be taken to deal with remaining uncertainties.

For example, the head of the engineering department only pointed out what kinds of engineering problem or uncertainties existed with the basic design of the OVORs project and did not mention what kind of measures had been taken or will be taken for these problems or uncertainties, even though resolving these problems is the responsibility of the engineering project team under his supervision.

6. Dispute resolution of offshore newbuilding contracts

As previously shown, shipyards are 'stuck' with a considerable number of rigs that they are unlikely to be able to sell for their contract value; the market value of these rigs remains at around USD 120 to 130 million (excluding, for example, OFEs and spares) and, for semi-submersible, at around USD 350 to 400 million (Pareto, 2017), which is much lower than the contract price and expected future newbuild price.

During the interview, one experienced maritime lawyer shared her thoughts and experiences:

With the current market situation, the owners of OVORs do not want to take delivery of these OVORs by raising their standards for approval during the drawing review, quality check, the sea trial, the final test, and so on, and these kinds of measures may result in the shipyard's delaying delivery of the OVORs and triggering the termination clauses in the contract of OVORs construction.

In such case, arbitration may be set up by owners if shipyards dispute with them about terminations of OVOR contracts and do not refund the advanced instalments plus the interest, as per the terms and conditions of the OVORs contracts. For example, in 1 offshore project case between Stena Drilling and a Korean shipyard, Stena cancelled a newbuild construction contract for a semi-

submersible rig. Under the contract's terms of this rig, Stena was entitled to a reimbursement of USD 215.4 million in pre-delivery instalments paid to the Korean shipyard, plus accrued interest if the contract was terminated. Stena was also intending to pursue claims for compensation in respect of its costs incurred in relation to the project. Also, in the Seadrill-Hyundai case, Seadrill cancelled the contracts of 2 semi-submersible rigs due to the market's downturn and delivery later than the scheduled delivery date agreed in their contracts.

6.1 Shipyards' fear of arbitration

The fieldwork showed that many Asian shipyards are fearful of arbitration and feel that it may impair their reputations. So, some shipyards normally try to avoid arbitration, even when real disputes exist with owners. From the semi-open questionnaire data and the interviews, we learned that most Asian shipyards' top managements do not normally like to take part in potential arbitrations in London or in any other international location. One interviewee claimed that:

I was once responsible in a dispute case, one where the shipyard may have had a chance to win a deal according to professional legal advice. In the end, the top shipyard management still chose to sign a settlement agreement and made a concession to the owner. The most important point is that such a concession will mean that the shipyard will lose the chance to win any of their current disputes.

In the case of Nanjing Tianshun Shipbuilding Co Ltd v Orchard Tankers PTE Ltd (2011), the shipyard responded that a failure to institute arbitration proceedings in time did not preclude its right to dispute the cancellation but merely barred obtaining remedy by means of an arbitration award. However, the shipyard's response was not upheld by the arbitrators or by the appellate court. If in this case, the yard had instituted arbitration proceedings within the time limit, the situation would have been different. The brief of this case is as follows:

The shipbuilding contract states that the Shipyard have the right to dispute the Buyers' cancellation and/or rescission by instituting arbitration in accordance with the shipbuilding contract, subject to such institution of arbitration being made within thirty (30) days after the Buyers' cancellation and/or rescission. But the fact is that although the shipyards have sought to dispute the buyers' entitlement to cancel, they failed to institute arbitration proceedings until shortly after the prescribed 30-days period. As a result, the buyers contended that the shipyard's claim was time-barred (Nanjing, 2011).

6.2 Shipyards' incomprehension of arbitration

We learned from this research that one of the most important reasons why shipyards do not normally want to institute arbitrations in the United Kingdom is the length of the arbitration period, as well as the cost spent on the process. Most arbitration cases will last more than 1 year, and some even longer, up to 3 years. As the whole process will be handled by lawyers on behalf of the shipyard, the fees to the arbitrators plus the costs of the lawyers will reach a considerable amount. Such costs can be seen as very high when compared to those of a domestic arbitration or to a court case. As per the advice given by shipbuilding arbitration experts and professionals during the research, shipyards in Asia may normally initially engage a local law firm and, after the local lawyers have become familiar with the case, they will then approach a British law firm to handle the arbitration matters in London. Thus, the British law firm will also need to become familiar with the case, and some further documents will need to be translated from their original language into English; this will take up another 2 or 3 months. This series of activities necessarily increases the costs and extends the preparation period.

It is important to let all stakeholders be aware that arbitration is not only the work of lawyers and their internal legal departments. All stakeholders involved in the shipbuilder's organization need to be trained to know the principles and advantages of arbitration, as this is relevant to their

interests and responsibilities; this applies especially to the top management, who need to be educated. One senior internal legal counsel stated in interview:

The arbitration organization needs to do something to ensure that the decision-makers trust arbitration as a good way to solve disputes, and the project team members need to have the foresight to collect and store relevant documentation, records, and other evidence covering the whole period of the execution of the project.

If any international arbitration is required or has happened involving a shipyard, the shipyard's decision-maker would know how to face arbitration with confidence and would not just readily concede to avoid arbitration even if the shipyard had a very good chance at the very beginning of the dispute of winning.

6.3 Tailor-made contract terms and conditions for offshore project are essential

Special tailor-made contract terms are a good means of avoiding some potential disputes, and even arbitration. The shipyard needs to impose some terms and conditions concerning the mechanisms required for opposing the owner if he raises his criteria for approval and seeks the pretext to terminate the contract in order to escape its terms whilst it is in effect.

It is stipulated in some shipbuilding contracts that delivery delay by vendors of critical equipment should be considered as Force Majeure. One commercial director recounted a good case that he had recently had during the contract negotiation for an offshore newbuilding project, where his firm undertook risk identification from a commercial point of view. To avoid or minimise the potential risk of the owner being unable to take delivery, they designed and drafted special terms and conditions that stipulated that the client would not exercise any termination or cancellation rights under the offshore newbuilding contract before the client had secured a real charter from a recognised end user. This clause made a significance contribution to the occurrence of otherwise unexpected disputes that arose during the execution period of the contract. These unexpected disputes arose from one shareholder entering into rivalry with another over control of the client company. As the 2 shareholders had equal shares, each representing 50 % of the total shares, each had appointed his own project manager to supervise the construction work in the shipyard. The shipyard faced working for quite a long period with 2 project teams. The shipyard eventually suspended the offshore newbuilding contract, as the specially designed terms under the contract protected the shipyard from any potential claim from a client.

6.4 Lack of records, documentation, and collected evidence

Another important point is that, during the full period of the shipbuilding project, documentation and evidence should be collected, properly organised, and saved by the project team's members; there should be a procedure for calling attention to specific time limits, especially to the deadline stipulated in the shipbuilding contract, since having such a procedure is particularly important. In the case of Wuhan Ocean Economic & Technical Cooperation Co Ltd & Ors v Schiffahrts-Gesellschaft "Hansa Murcia" MBH & Co, arbitration could have been avoided if the guaranteed refund had been made rather sooner. The evidence was that the shipyard could have done it at a much earlier stage. The brief of this case is as follows:

Case: Wuhan Ocean Economic & Technical Cooperation Co Ltd & Ors v Schiffahrts-Gesellschaft "Hansa Murcia" MBH & Co KG (2012) EWHC 3104 (Comm) (06th November 2012).

On 28th June 2010, prior to the expiry date of the Refund Guarantee as 30th June 2010, the Buyers, in a letter from their solicitors to the Sellers, sent a termination notice by hand and by fax to inform that the shipyard was in repudiatory breach of the Shipbuilding Contract due to failing to obtain the extension of the Refund Guarantee and evinced an intention of not so doing. The Buyers claimed that they accepted the shipyard's repudiatory breach to terminate the Contract and notify the shipyard the Buyer's final and irrevocable cancellation of the Shipbuilding Contract. On the following day, 29th June 2010, the Buyers served a Notice of Demand for Arbitration, thereby

commencing such arbitration. On the same day, the Refund Guarantee was extended by the Bank. Finally, this arbitration decision got permission to appeal, and the final court order was issued almost 2 years and a half later (Wuhan, 2012).

The case of Zhoushan Jinhaiwan Shipyard Co Ltd v Golden Exquisite Inc also shows that systematic risk management is crucially important for a shipyard, and that such a system needs to cover all aspects, or one small mistake will result in irretrievable consequences. The outcome of this case was that the shipyard's claim was not supported by the arbitrators or by the judge in the appeal court. As the judge noted, suppose the yard was correct, but it did not notify the buyer in time of the latter's default' the yard's case cannot be supported even if its claim that the buyer was in default is true. The brief of this case is as follows:

Case: Zhoushan Jinhaiwan Shipyard Co Ltd v Golden Exquisite Inc (2014) EWHC 4050 (Comm) (05th December 2014).

The delivery of the vessel under the shipbuilding contract was delayed beyond the delivery date as defined in the shipbuilding contract; the buyer gave notice of cancellation of the contract on a date which was more than 270 days after the delivery date. After notice of cancellation had been given, the Yard made a claim and alleged that breaches of contract by the Buyer had resulted in delays in the construction of the vessel totalling, variously, not less than 90 days or 100 days, depending on the case. However, before such notice of cancellation was given, the Yard had not given notice to the Buyer of any delay which the Yard claimed had been caused by a breach of contract by the Buyer (or any other cause for which the Yard was not responsible) (Zhoushan, 2014).

6.5 The model and 'map' for customer credit checks needs to be enhanced and a dispute mediation mechanism needs to be in place

The offshore shipyards' customer credit rating model needs to be further developed and improved. A properly developed credit rating model should be able to weigh up salient quantitative and qualitative grading parameters in order to assess the totality of the customer's financial health and their franchise and market reputation, then to determine the probability of the customer defaulting on payment. Such kinds of tools need to have the flexibility to include some expert opinion. They also need to incorporate a ratings outlook. A 'map' based on a customers' credit ratings (showing respective customers' credit ratings and exposures) should be maintained in order to track proactively changes in customers' ratings, with an additional focus given to contract termination and any failure to take delivery after technical acceptance. A transparent framework needs to be implemented to regularly monitor customer payment delays and note corresponding remedial measures. For example, customers could be grouped according to different 'watch' categories: Insolvency; Legal Action Accounts; Deferment (due to deferral of payment terms or on project delivery date); and Delinquency. The shipyard needs to develop relevant measures and to take appropriate actions as required (SEMBCORP, 2016).

It is suggested that the UK arbitration organizations should consider establishing offices or sub-branches in Asia, where most shipyards are located. Secondly, combined with the establishment of a local office, it should discuss whether it could establish a more efficient mediation procedure to solve small disputes, such as disagreements between shipyards and owners of OVORs about acceptance criteria. The arbitration organization could select a few experts from among the arbitrators in order to establish a committee to mediate in such kinds of small dispute by a method other than arbitration; this may help the shipyard to fight against the owners' wrongful increase in the approval standards during the execution of the contract.

7. Conclusions

Owners are suffering from the downturn in the shipping and offshore industry, and the oil majors and offshore contractors are also facing an oil price that is uniquely low. All these factors, merged together, are leading to difficulties for shipyards to deliver vessels or rigs that they have built according to purpose-designed specifications agreed with owners; most of these vessels or rigs are one-off builds. In the current market situation, owners are unable to take delivery of vessels or rigs. In such cases, numerous shipyards need to institute or answer arbitration to settle their disputes with rig owners. Judging from available public information, most of the shipyards have lost in such arbitrations, and one of the consequences of this is that the they have to pay back to the owner all the instalments paid in advance, plus the interest; another one is that the owner may claim for the loss he suffered due to such termination or cancellation. Steps need to be taken to improve this relationship.

Firstly, shipyards need to establish a risk management system. A risk evaluation and management framework/system for shipyards needs to be established to cover the whole process of project risk management; this should combine risk management theory, best practice, relevant legal knowledge, and industry engineering technology. Shipyards' risk evaluation and management framework/system also needs to be designed after having absorbed the lessons learned from disputes or arbitrations in offshore cases. Such a kind of risk management system will help shipyards to minimise, or transfer, some of the potential critical risk at the very beginning of a shipbuilding contract. It was shown in this research that such a kind of risk management system could help shipyards to face potential arbitration with the prospect of a positive outcome, and even welcome asserting their rights by means of arbitration. The more important lesson that the shipyards need to draw is that their strategic risk tolerance should be defined; this will give a guide at the very beginning of offshore projects as to what kind of risks are permissible and what kinds of measures should be planned for and implemented in order to maintain these risks at an acceptable level throughout the entire phase of an offshore newbuilding project. The reason for doing so is that a shipyard needs ever more new orders to maintain its operation, and knowledge of strategic risk tolerance will help its commercial staff to know what kinds of new offshore orders should be sought.

Secondly, shipyards need to be positive in facing potential international arbitration to solve possible disputes, which are invariably going to occur. It is also suggested that shipyards should study how to avoid such kinds of disputes by summarizing lessons to be learned from previous and current disputes in cases involving shipbuilding and offshore newbuilding. The arbitration organizations are encouraged to market themselves to their relevant organizations and stakeholders, make their procedures more convenient, establish offices in Asia, which is close to most shipyards nowadays, and recruit more talented local UK arbitration professionals. It is suggested that arbitration organizations might investigate whether to donate some funds for the training of more local professionals, which are normally based close to shipyards.

The findings and discussions from this research contribute not only to the shipyards, but also are useful to the related stakeholders of shipyards, such as industry government regulators, legal entities, law firms, scholar experts, and so on. The research will also contribute to improving maritime arbitration in the UK, as well as the London arbitration regulations, procedures, and practices.

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