

## SSM Focus - Mr. Arnold de Groot, State Supervision of Mines

**In your experience how does the cost of a safety failure typically compare with cost of avoidance** 2 votes

I will just repeat the famous quote 'If you think safety is expensive, try an incident!'. But a good preparation prior to start work will save costs and improve safety. A just enough culture will in the end be expensive by incidents and rework.

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## Safe Crane Operations in a Risk Based Environment - Mr. Chin Tze-Hur/Mr. Geir Jacobsen, ExxonMobil

**Where have the 2nd mechanical brakes been placed in the winch system? How independent are those two brakes from each other?** 4 votes

The 2nd mechanical (multidisc) is attached as a slave brake, bolted on the winch frame, and has a pinion on the brake shaft that runs on the winch drum tooth wheel. Both mechanical brakes are operated on the same hydraulic circuit. The brake line is arranged for individual stall test of each brake. They are not tested together to ensure that each individual brake is able to function independently.

**Following the winch failure did you look for other potential single point failures on other parts of your cranes?** 4 votes

The winch risk assessment focused on current winch solutions, mitigations, potential upgrades as well as understanding current and future risk. For other potential single point failures on other parts of the cranes, they were addressed separately via specific crane equipment and maintenance strategy.

**What are the ExxonMobil standards for man riding cranes?** 2 votes

Outside of the EU environment, API 2C gives guidance on requirements on cranes designed for personnel lift which is being employed by ExxonMobil. The winch (hoist) and the crane must be documented/certified with personnel lift limitations e.g. in the cranes load chart.

## Lifting equipment inspection data – possibilities and benefits - Mr. Kenneth Bjørseth, Axess

**Is the usage (operating hours, cycles) also stored in the database? This allows the determination of component failure rate** 2 votes

We do have access to this information, but it is not part of the database at his stage. It would be beneficial feature to have in the system and this will be considered in next revision of the software tool.

**Do you give feedback from your inspection data to the equipment suppliers?** 2 votes

Feedback on general basis is normally not given to the equipment suppliers. But this is something we will consider for future reports. Suppliers are however often included in discussions of remarks on a case by case basis.

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## Walk-to-work – safe and reliable offshore gangways - Mr. Per Arild Åland/Mr. Florian Teica, DNV GL

Personnel logistic offshore is a rapidly developing market segment that offers flexible, cost efficient and safe solutions for wind turbine maintenance, oil & gas offshore installation, offshore fish farms, etc. To learn more about DNVGL's cross-industry contribution ranging from suppliers, vessel owners and operators, do not hesitate to contact Mr. Per Arild Åland, Business Development Manager – Offshore Class at DNVGL.(per.arild.aland@dnvgl.com)

**How many gangways are already certified by DNVGL?** 3 votes

At the moment (beginning of May 2017) DNVGL has certified more than 20 offshore gangway units according to DNVGL-ST-0358, Certification of offshore gangways for personnel transfer.

**Do you think service vessels with gangways will replace helicopters for crewchange in european waters?** 3 votes

This development is hard to predict exactly. Having said that, we see that offshore wind farms moving further offshore into rougher waters. At the same time a new generation unmanned installations are introduced on the Norwegian Continental Shelf. Simplified concepts have been introduced where helicopter logistics are replaced by personnel transportation by ship. These conditions call for alternative marine transport solutions such as W2W.

**Does the W2W classification process also cover the verification of workability in terms of**

### **seastate?** 2 votes

Current scheme of certification/classification takes the sea state limitations given by gangway manufacturer as an input value, (presumption). The dynamics caused by the given sea state are taken into considerations as the gangway's structure and systems are verified. "Fit-for-purpose" related aspects such as the combined capability of vessel and gangway system is not verified, but the intention of the future "W2W-ready" notation is to verify and document operational limitations mainly based on L2 station keeping capability and vessel motion analysis.

### **Are interactions between a compensated Gangway and DP System considered in the Standard?** 2 votes

Requirements to motion compensation of gangway and dynamic positioning capabilities of vessel are addressed in separate standards. In case interaction between these two systems is relevant; the combined performance of the two will be considered according to function spec.

### **Have you developed competency and assessment standards for gang way operators or do you consider existing crane operator standards sufficient? Similarly for maintenance personnel?** 2 votes

DNVGL do not certify personnel and operators. However, we have a commonly used scheme to certify training – and simulator centers. The span of operations together with the wide variety of machines put to use limits the ability to settle common competence requirements to this kind of specialized equipment. Trade organizations such as IMCA, operators and makers have traditionally contributed here.

### **Is Dp 1 good enough for walk to work** 1 votes

In some less demanding waters DPS(1) is considered to be sufficient as a minimum requirement. (In practice most relevant vessels subject for the "Walk2work" notation have DP-capabilities equivalent to DPS(2) or better.) If the operator has special

requirements to DP, this is easily detected in the vessels string of notations at short listing.

**What is the reason the JIP is dominated by Oil & Gas parties while a lot of the current users are in the offshore wind sector?** 1 votes

We are actually working to get offshore wind operators on-board as well. Oil & Gas segment were addressed specially on this occasion since we on Norwegian sector are working to settle guidelines that will help users develop assurance cases for evacuation strategy and maritime-logistics solutions for NUIs (Normally Unmanned Installations) where SOVs and W2W-solutions are essential.

**how long time do you typical use for a certification process on a compensated gangway**

1 votes

Time from complete technical documentation is issued to DNVGL to product certificate is issued will normally be in the range of 3-4 weeks provided no delays due to non-conformities identified during design verification, building survey and testing.

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## Increasing vessel efficiency during decommissioning phase - Ms. Sandra Antonovic, Reflex Marine Ltd

Thank you for your interest! If you have any further questions please contact us directly at [info@reflexmarine.com](mailto:info@reflexmarine.com) or visit our website which has lots of useful information on it: [www.reflexmarine.com](http://www.reflexmarine.com)

**To use a frog you need an experienced crane driver, but how can you get experience when the frog is used as a backup?** 3 votes

Crane drivers should be fully trained before attempting to transfer crews. Only man-riding certified cranes can be used to perform crew transfers by crane. Reflex Marine can advise you on how to obtain training for your crane operator and certification for the crane used. Even if the FROG is only used as a backup, it should still be used as part of a schedule of drills and dry runs to ensure that everybody on the installation/vessel knows how to use the FROG. Using the FROG during drills and dry runs will enable the crane operator to gain some limited experience. A crane operator could also develop his experience through crane simulator training where personnel transfer can be carried out in a virtual environment. With every FROG Reflex Marine will also supply you with a User Manual which would include information on the procedures and the operating envelope for conducting safe crew transfers. The crane operator must always follow these guidelines.

**How do you define max allowed sea state? By Hs only as you said, or by also including the wave period (Tz)?** 2 votes

With every unit, Reflex Marine will supply you with a User Manual which defines

the safe operating envelope for the crew transfer. We only define limits for the significant wave height and the wind speed. However, it is up to the operator to consider all of the additional environmental factors that may affect the crane transfer. Factors such as wave period should be considered, however it should be noted that different conditions will have different effects on different types of equipment. We always advise that crane operators attempt a trial lift before commencing operations, as this can help to evaluate the conditions. To ensure the operation can be carried out safely, a risk assessment should be conducted beforehand. In exceptional circumstances (such as the influence of the Atlantic swell in the East coast Canada), Reflex Marine can work with you to help you assess the particular safe limits for your operations.

**What information does the HAWK system give that isn't also available from the motion reference unit on board?** 1 votes

The HAWK system uses an MRU as a hardware base, however with additional software analysis and wireless link it provides the crane operator and vessel master with real-time information in a simple traffic light display showing which deck areas (or quadrants) are safe to proceed with loading and transfer. The functionality of the HAWK system can be extended to include information received from a camera placed upon the vessel and or crane in the form of a live video feed. The camera on the vessel gives the point of view as seen from the vessel's bridge across the deck. The camera upon the crane gives a bird's eye view from the crane's boom tip. Both these feeds aid the crane operator in the safe timing of both lift and landing of cargo and personnel. Furthermore, HAWK can automatically email snapshot images, every 6 to 10 seconds, from the deck camera to update teams working onshore for the purpose of effective back load planning, improving operational logistics and as a means of providing accountability between on and offshore teams.

**How much of the total decommissioning project cost can be influenced by the Frog?**

1 votes

Every project is different so without further details it's not possible to give a specific

value as to cost savings incurred by the use of Reflex Marine's carriers for crew transfers. However, in most circumstances, using a FROG allows for a higher operating envelope when it comes to crew transfers. Reflex Marine's support, Inspection and Maintenance services can ensure uninterrupted availability of your transfer fleet. Together this means less downtime and extended weather window for your operations. The deck motion monitor HAWK, which can be used in conjunction with the FROG, could increase the operating window of all your crane transfer operations (crew, cargo or other) which would give your project further cost-savings.

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## Innovative and cost efficient Active Heave Compensation – the SAL APHC - Mr. Tilo Klappenbach, SAL Heavylift

**What modifications were required to the crane to implement the AHC part?** 2 votes

On the presented 1000t crane the auxiliary hoist needs to be converted. This can, depending on the required capacity and velocity, be achieved in two ways. The easy way would be implementation of the AHC control system and maintain the hardware as it is. If the required velocity can not be achieved with the existing hardware the pump, gear box and winch need to be upgraded. The load capacity of the auxiliary hoists will mostly be sufficient, which avoids structural changes on load path (along the sheaves).

**Will the vector between the auxiliary hoist and main hoist cause horizontal swinging?**

1 votes

In the presented example with the 260t hammer we see a lateral load of 1.2t. The tugger winches, which are anyway in place during offshore operations, provide horizontal control and avoid pendulum motions of the payload. The lateral load is not expected to have a governing influence on the tugger winch requirements. It is also possible to avoid lateral loads by symmetric rigging design. As we never encountered problems with the small lateral force we didn't detail that until now.

**How long time do the PID controller need to load its filters, before the AHC can operate**

1 votes

The control system will be a classical AHC controller with some additional input parameters and will same requirements. The OrcaFlex integrated PID was only used as a simplified simulation setup.

## ”SeaState5 Grasshopper T - New system for handling XL monopiles” - Mr. Willem Zwetsloot, SeaState5

**Can the Grasshopper also put the pile hammer on top of the pile? Is it high enough?**

4 votes

Yes, this is possible by placing the hammer on deck and skidding it underneath the Grasshopper. An additional sling would be used to lift the hammer.

**Why does this reduce the vessel size, as the monopile size and weight won't change?**

3 votes

It does not per se reduce the vessel size, but may be used on vessels without a crane with sufficient lifting capacity. The amount of monopiles is limited by allowable payload or deck size.

**How do you regard the own weight improvement? An 1300t SWL crane is already available at an own weight of 650t!**

2 votes

For a full weight assessment we must evaluate added steel for deck reinforcements, crane support and often also jack-up legs strengthening. This is in general lower for a Grasshopper-T compared to regular cranes.

**Is an additional crane required for driving the monopile (e.g by Hammer) into ground or is there a driving solution working with the grasshopper?**

2 votes

This is not required, as the grasshopper can lift the hammer. But if the vessel has a crane (for the hammer and not the MP) this may also be used

**Can the grasshopper be used from a floating vessel incorporating a pile gripper?** 1 votes

Yes this is possible but requires further developments, using the system in combination with a suitable gripper would be necessary. (like a motion compensated gripper)

**What about deck loads/structural foundation especially underneath the grasshopper?**

1 votes

existing deck structure with small modifications may be used in many cases we have currently evaluated. But this is also ship dependent.

**what is the difference to Allseas jacket lift system?** 1 votes

We have developed this system specifically for XL monopiles, and to be used on jack-up vessels. This results in a solution with a specific geometry, weight and functionality up to roughly 2000t max lifting capacity, the mentioned jacket lift system has a much higher load specification and is not made for jack-up vessels. Grasshopper-T (in it's current shape) is not able to lift these type of jackets.

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## Status NOROK R-002 and R-003 - Mr. Stein Ove Dyngeland, Statoil

**Why did the board reject R-003 rev3?** 3 votes

Due to the believe that it will increase the cost.

**when will the revised r003 be issued?** 2 votes

Hopefully during autumn 2017

**Why do you have technical requirements (grade 8 for SWL above 2 tonns) in an operational standard?** 2 votes

Requirements for grade 8 is to prevent the users offshore to have available shackles of grade 6, that may be replaced in a grade 8 lifting set for containers.

**Which types of companies will be involved in the JIP33 work (operators, manufacturers)?** 1 votes

In the first phase, only operators. In the hearing period - Manufacturers, EPC contractors, Regulators, Crane operating contractors and EoC's,

**Does R002 have requirements on hook safety latch design?** 1 votes

For offshore cranes G.11.11 has requirements for latches

**Which conditions constitutes a critical lift?** 1 votes

New definition: Critical lifting operations: Lifting operations that can cause major consequences for failure, eg. Lifting over pressure set hydrocarbon system, lifting over critical equipment, lifting outside the acceptance zone of the load-restriction map, passenger transport where there are no other approval schemes, tandem lifts where the load's weight exceeds the maximum lifting capacity of one of the lifting devices

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## **Liebherr, Industry 4.0 = Service 4.0? - Mr. Martin Mathis, Liebherr**

**What is so special to the 3000t crane you just sold?** 1 votes

It will feature some innovations about which we will be able to provide Information at a later stage. If you need more detailed Information on Liebherr heavy lift cranes, please contact me.

**Does Liebherr have acces to all the data by LiDAT at all its customers? How is the ownership of the data being arranged? In the end company-confidential information may be revealed.** 1 votes

Only if a Lidat System is installed and connected. There will be a contractual agreement between Liebherr and the customer in regards to usage of the data. No Information other than crane sytem data is used and it is not shared with other parties.

**Is Lidat installed in each Liebherr crane or is this an extra feature on request?** 1 votes

Yes, it is possible for cranes with a "Master 4 " control unit. Please contact me or the next Service Station for further Information on this.

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## “Development and implementation of crane limitation charts on offshore installation” - Mr. Kato Øvestad

**If the cylinder would hit deck in another Angle I suppose the result would be different**

1 votes

It is correct that a small inclination of the falling pipe would result in a more localized force transfer and higher local stresses. Depending on the size of the angle this could also probably result in a lower allowable drop height.

**Have you done much analysis of actual dropped loads onto/through actual decks to compare results with the theory?**

1 votes

Ref. /1/ presents equations for estimating the plugging capacity of a plated structure subjected to a dropped drill collar. The equations are based on basic principles of mechanics and test observations from several tests in scale 1/4. Maximum drop heights for several combinations of drill collar mass and end radius, plate thickness and size have been calculated based on these equations. When the various combinations were investigated through dynamic FEM analyses using Ansys Explicit, good agreement were found for the key parameters calculated from these equations (maximum displacement, critical shear stress etc.). Another aspect is that based on the results from these FEM analyses, other criteria (e.g. a strain parameter) can be selected and used in similar problems (see explanation of methodology in ref. /2/). For the larger objects (container, thruster motor etc.) no tests have been performed. /1/ Veritas Offshore Technology and Services A/S, “Design guidance for offshore steel structures exposed to accidental loads”, Veritec report no. 88-3172

dated 15.08.88. /2/ DNV GL, DNVGL-RP-C208 “Determination of structural capacity by non-linear finite element analysis methods”, September 2016.

**The analysis assumes plastic failure. Shouldn't risks of brittle fracture (e.g. in the vicinity of welds) also be considered?** 1 votes

Design standards specify the material grade, Charpy V-notch test temperature and corresponding minimum energy absorption, maximum allowable plate thickness etc. based on the minimum service temperature a structural component will experience during its lifetime. Together with fabrication and welding based on approved welding procedure specifications (WPS), the risk of brittle fracture is sought to be minimized. Even with all these efforts it is correct that there still can be areas with brittle material/welds in a steel structure. If however the structure is properly designed and fabricated, these areas should be small and have limited spread. Since our analyses are dealing with the accidental limit state (ALS) and the look for a representative overall capacity, we have not included brittle fracture as a failure criterion. One can however argue that this is to idealized.

**Did you verify the analyzis by dropping the thruster motor from 30 m?** 1 votes

The 30 m drop test is only done as test of the analysis model. The results to not comply wiht the allowable strain limits as specified in design codes.

**Did you analyse the impact of a pipe under a small inclination? I would expect higher stresses due to smaller contact area.** 1 votes

It is correct that a small inclination of the falling pipe would result in a more localized force transfer and higher local stresses. Depending on the size of the angle this could also probably result in a lower allowable drop height.

## Reduce number of manual tasks on DSA drill-floor through use of robotic technology - Mr. Jimmy Bostrøm, Chief Operating Officer, Robotic Drilling System

**Why is it so important to you to be fully electric?** 1 votes

To ensure a precise control of the robotics only electric motors can be used. It also has great benefits compared to old technology such as hydraulics with respect to energy consumption, condition based maintenance and noise

**From which location is the robot commanded?** 1 votes

Drillers cabin

**Is the Robot certified for operation on a permanent production and drilling platform? I.e according to Machinery directive?** 1 votes

Yes

**Is the robot certified for operation at a production and drilling platform. I.e declaration of Conformity and Norsok certificate?** 1 votes

Yes