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RISK SESSION

Use of LFI - delivering incident free DP operation through life
cycle of vessel

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Abstract

DP industry is continuously evolving and has its own share of challenges and opportunities. There have been numerous DP incidents in the industry resulting in consequences to human, environment, asset and operational downtime.

There are industry platform available on incident reporting however unless the deliverables include “learnings from the incident (LFI)”, the incident reporting itself delivers limited value. The maritime industry requires enhanced awareness on reporting of LFI and the philosophy behind actively adopting a culture of sharing.

LFI reporting are kept anonymous and meant for greater benefit of the industry. It should not be seen as a platform for blame culture, negative way of performance assessment or perverse incentives but an opportunity to improve performance and ability to deliver incident free DP Operations predictably.

This paper emphasizes that incident reporting in itself is not the only solution. The culture of sharing, and learning coupled with the application of learnings through the life cycle of vessel will result in achieving the objective of delivering incident free operations.

It is therefore imperative that the philosophy behind Learnings from Incidents and the process of embedding this in the culture of an organization are applied in its entirety to achieve the desired objective - consistent and predictable delivery of incident free DP operations by application in design, operations, people and process.

A holistic approach is required by vessel owners, operators, managers and other interested parties on embedding of LFIs through the life cycle of vessel towards achieving ZERO HARM. This requires a shift in culture and a journey from being reactive towards being proactive and generative.

This paper emphasises three distinct aspects of LFIs;

1. Embedding the Philosophy into the culture of the Organization by embracing the principles of transparency, sharing, leaning from LFIs to transform an organization:
 - i. To a learning Organization
 - ii. From a culture of blind compliance to one of outcome/objective focus
 - iii. Deliver outstanding business performance consistently
2. Reporting of Incidents including sharing of LFIs
3. A case study of application of LFIs to demonstrate the shift to a generative culture

Abbreviation / Definition

ASOG	: Activity Specific Operating Guidelines
ASV	: Accommodation Support Vessel
DP	: Dynamic Positioning
DPC	: Dynamic Positioning Committee
DPO	: Dynamic Positioning Officer
FLNG	: Floating Liquefied Natural Gas
LFI	: Learnings from Incidents
M3	: M3 Marine Expertise Pte Ltd
MTS	: Marine Technology Society
NOPSEMA	: National Offshore Petroleum Safety and Environmental Authority (Australia)
POSH	: PACC Offshore Services Holdings Ltd
SIMOPS	: Simultaneous Operations
TECHOP	: MTS DPC Technical and Operational Guidance

Introduction

Philosophy

Delivering consistent and predictable incident free DP operations is integral to POSH delivering outstanding business performance. Reliance on a compliance based mind-set is not effective in delivering business objectives.

In order to achieve the desired business performance, the journey to move from a culture of blind compliance to an objective and outcome focused culture is essential. LFIs provide a pathway to embark and complete this journey.

LFIs have numerous associated advantages and provide for:

- ✓ Transparency
- ✓ Fosters no blame culture
- ✓ Transforms organisation to become a learning organisation
 - This in turn fosters a continuous improvement mindset
 - Enables personnel both onshore and offshore to continuously enhance skills and capabilities
- ✓ Fosters a Generative Safety Culture
 - A cultural change of sharing, mining and learning from LFI
 - A conscious mind set of embedding in work process and in all aspects of Design, Operations, People and Process

Philosophy in Action

A journey to change in mindset and culture takes time, every Journey starts with a small step. POSH was conducting incident reporting and investigations as per industry norms. Through industry engagements, POSH became aware of MTS DP Committee TECHOP on Incident investigation. The TECHOP outcome focus was on developing lessons learned and sharing it with the wider audience which will benefit the industry.

In 2016 post a DP incident, TECHOP was utilized for incident investigation and developing of LFI. Lessons learned were shared internally, further corporate decision and commitment was made to share LFI with MTS DP Committee. Though the response was reactive in nature, familiarisation with MTS DP Committee documents and processes enhanced awareness of benefits of an outcome focused approach.

Thereafter, the Journey towards culture change commenced and realising the potential and value of LFI, enhanced engagement with activities of the MTS DP Committee started. In 2016, POSH hosted a DP workshop at its office which was attended by over 30 participants from more than 15 different offshore companies. The objective was to bring majority of the owner, operator and managers on a common platform and work towards a common goal of incident free DP operations. During MTS DP Asia 2016 conference, a presentation on LFI was carried out by POSH to share the journey and spread awareness among delegates. This was followed by another 3 days ASOG Workshop held at POSH premises facilitated MTS DPC.

POSH has greatly benefited from these engagements and has spread the awareness to the industry in return. As the assets operated by POSH are diversified in nature and so are people operating them, idea of DP centre of expertise was coined and implemented. The internal DP committee consists of subject matter experts across the POSH Group who meets regularly to keep abreast of industry information, reviewing and implementing latest guidelines affecting the fleet vessels.

Incident Investigation and Developing of LFI

In 2016, a DP class 2 platform supply vessel suffered a drift off near a platform. The incident had no consequences for people, assets or the environment.

POSH utilised MTS DPC TECHOP (TECHOP_GEN_03 Conducting Effective and Comprehensive DP Incident Investigation) for internal investigation. The Fish Bone method was used for root cause analysis and proved to be of a great value. Elements of Design, Operation, People and Process were evaluated for causal and contributory factors.

Effective incident investigations rely on the ability to correlate often seemingly unconnected events. In process of the investigation by its internal team of subject experts, POSH realised that the organisation should not miss the forest for the trees. To avoid the pitfalls of confirmation bias, we reached out to its business partner M3 for expertise. They are an organisation with broader expertise on the subject matter and we leveraged on industry expertise and resources. POSH developed a culture of embedding deference to expertise to business partner.

The findings included power supply arrangements that did not follow the individual vessel's redundancy concept and cross connections that could defeat the overall redundancy concept, such as dual power supplies and automatic change-overs spanning redundant groups. With reference to the MTS 'Seven Pillars', Independence, segregation and autonomy of redundant DP groups was compromised by commonality in the provision of 220Vac and 24Vdc control power supplies for thrusters and propellers.

Undetected design flaws, hidden failures and acts of incorrect operation are often causal and contributory factors in DP incidents. The DP system FMEA should identify potential configuration errors and the effects of hidden failures such as flat batteries.

M3 subsequently produced a report which summarized the findings for each vessel in the fleet and included suggested modifications to remove the risks in their entirety. Implementation and validation of these modifications is an ongoing process across the fleet. In the interim period, the findings of the report were used to identify the necessary barriers for implementation during DP operations, which are managed through CAM and ASOG processes.

The lessons were shared with entire fleet for knowledge enhancement and transparency. Since there was substantial learning from the incident, POSH developed LFI based on TECHOP and shared with MTS DPC.

LFI reporting are kept anonymous and meant for greater benefit of the industry. It should not be seen as a platform for blame culture, negative way of performance assessment or perverse incentives but an opportunity to improve performance and ability to deliver incident free DP Operations predictably. Learning from LFIs, assists to consciously strive for anonymity and provide information with the intention of promulgating learnings across industry. Learning becomes a part of philosophy to drive.

During the DP Asia 2016 conference, values derived from reporting of LFIs were shared with delegates.

Journey to Generative Safety Culture

The journey progressed further, with the active participation with industry; POSH applied the learnings from incidents and learnings from experience into projects. POSH was awarded with ASV contract to support Prelude FLNG facility in Australia. It is a technically challenging project as Prelude FLNG facility is the largest offshore floating facility ever built. LFIs were mined for DP relative positioning challenges and own experience with operating the ASV on other weather vaning FPSO was factored in.

Concept:

Due to its sheer size, the motion of the FLNG in the weather vaning mode bring a new challenge for ASV while gangway connected in follow target mode. Studies were conducted to identify interfaces between ASV and FLNG which may affect station keeping:

- ✓ Evaluate ASV/Tug configuration for the heading control phase (Stern/Port Quarter)
- ✓ Confirm the ASV DP station keeping operating limits and gangway connectivity for heading control and free weather vaning phases
- ✓ Assess the impact of the Prelude FLNG thrusters and seawater discharge on station keeping capability

Design:

MARIN simulation was developed to test the ASV DP capability to hold position in the follow target mode and to establish operational parameters. Rate of turn limit was established at the two gangway landing platforms. Challenges on position keeping were overcome by adding functionality in DP control mode. As a result, quick response mode was added in Kongsberg Marine DP software.

Operations:

Results of Simulations and Field Management attributes were embedded in the ASOG. The boundary condition and operating condition for FLNG rate of turn was established in ASOG.

People:

A team of DP operators who will play an active role during the operation conducted the real time simulation. It was recognised through simulator that majority of DPOs would need to have their knowledge and skills supplemented. Industrial mission specific simulator was jointly developed by KM Maritime, POSH and Lease Operator. Further, 3 days of bespoke training was developed for the project to instil confidence in DPOs while at DP Desk which included:

- ✓ ASOG
- ✓ Follow Target Mode
- ✓ Quick Response (within follow target mode)
- ✓ Auto Position Fall Back Functionality (provided to gracefully exit ongoing operation)

This instils a culture of change and development of trust and transparency between the vessel's officers and management. Once the officers are confident to operate the equipment, the company in return is confident that project objectives will be achieved without harm.

Process:

Safety case was developed under NOPSEMA guidelines and loss of position was identified as a Major Accident Event. The learnings were embedded in the safety case and project specific procedures.

In execution and in Service near real time sharing of experiences in the field with all vessels is being carried out (approximately 16 vessels are engaged in SIMOPS).

A cultural change was observed, end user requirements were understood and embedded, a partnership mindset was developed to achieve predictable outcome.

Conclusion

Outcomes of the Journey

The philosophy behind Learnings from Incidents and the process of embedding this in the culture of an organization should be applied in its entirety to achieve the desired objective - consistent and predictable delivery of incident free DP operations by application in design, operations, people and process.

This will ensure delivery of design outcome and will help in flawless start up in the challenging circumstances and essentially achieve project objectives. There were significant learnings during the journey:

- ✓ Structured approach to investigation of incidents
- ✓ Benefits of transparency and sharing starkly visible
- ✓ Understood the importance of Deference to Expertise
 - Avoided the pitfalls of confirmation bias
 - Leveraged industry expertise and resources
- ✓ Active Mining of LFIs from Industry
 - Enhanced robustness of planning for execution of complex projects
 - Developing the basis of confidence for positive outcomes

A Cultural Change

It is a journey from culture of compliance to a culture of objective outcome focused approach with predictable achievement of goals.

- ✓ A shift from blind compliance to a more effective outcome/objective focus
- ✓ Transparency
- ✓ A no blame culture and a “not afraid to speak your mind culture”
- ✓ Generative Safety Culture
- ✓ A learning organization
- ✓ A continuous improvement mindset
- ✓ A strong sense of ownership
- ✓ A partnership mind set
- ✓ Outstanding Station keeping performance leading to desired business outcomes

**THE ENTIRE JOURNEY WAS TRIGGERED THROUGH A DELIBERATE APPROACH OF
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References

TECHOP_GEN_03 (Conducting Effective and Comprehensive DP Incident Investigation)

TECHOP_ODP_13_(D) (Control Power Supplies and Auto Changeovers)