

# Barrier management in operations

## Operational implementation

### Organisational anchoring

Glenn Gormsen  
Offshore Installation Manager  
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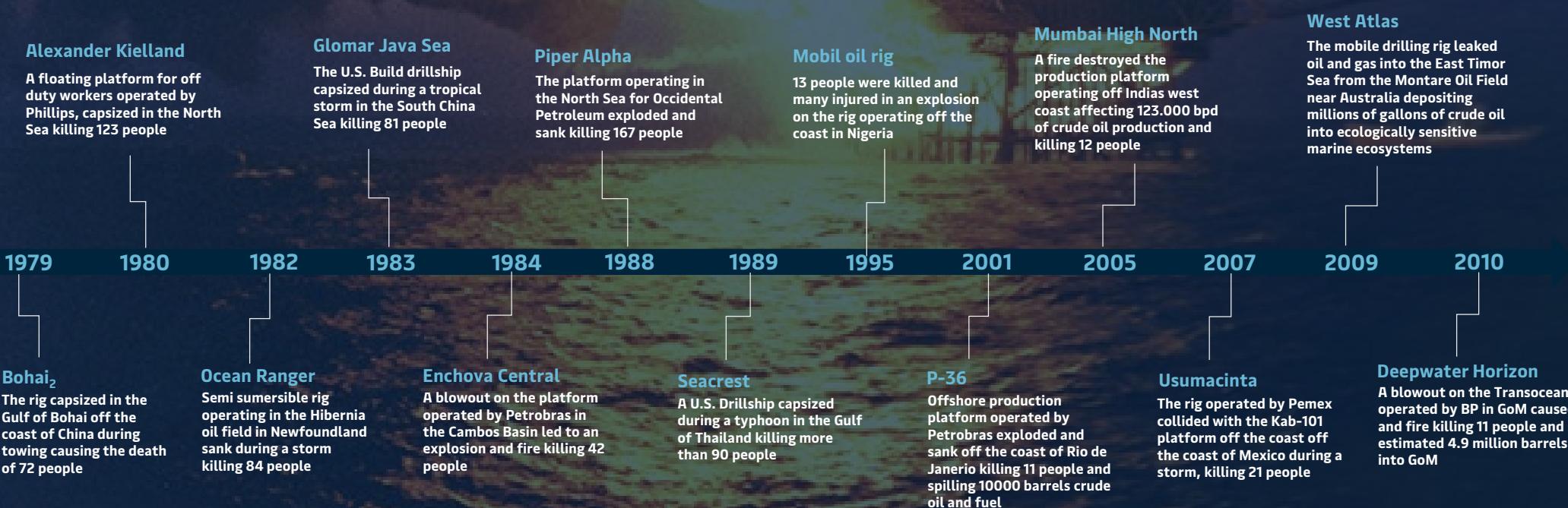
# Agenda

- 1 Introduction – Barrier management background
- 2 Main Maersk Drilling drivers
- 3 BM strategy + Our commitment
- 4 Organisational anchoring of barrier management  
(competencies and responsibilities)
- 5 Barrier management framework
- 6 Development of performance standards
- 7 Non-technical assurance activities
- 8 Communication and barrier status
- 9 Barrier management in daily operations
- 10 Q&A



# Background

History shows that offshore drilling activities entail the hazard of major accidents with potentially severe consequences to the life and health of workers and pollution of the environment



# Main drivers towards barrier management in Maersk Drilling

CHAPTER II  
RISK MANAGEMENT

Section 4  
Risk reduction

In reducing risk as mentioned in [Section 11 of the Framework Regulations](#), the responsible party shall select technical, operational and organisational solutions that reduce the likelihood that harm, errors and hazard and accident situations occur.

Furthermore, barriers as mentioned in [Section 5](#) shall be established.

The solutions and barriers that have the greatest risk-reducing effect shall be chosen based on an individual as well as an overall evaluation. Collective protective measures shall be preferred over protective measures aimed at individuals.

[Guidelines](#) [Interpretations](#)

Section 5  
Barriers

Barriers shall be established that at all times can

- a) identify conditions that can lead to failures, hazard and accident situations,
- b) reduce the possibility of failures, hazard and accident situations occurring and developing,
- c) limit possible harm and inconveniences.

Where more than one barrier is necessary, there shall be sufficient independence between barriers.

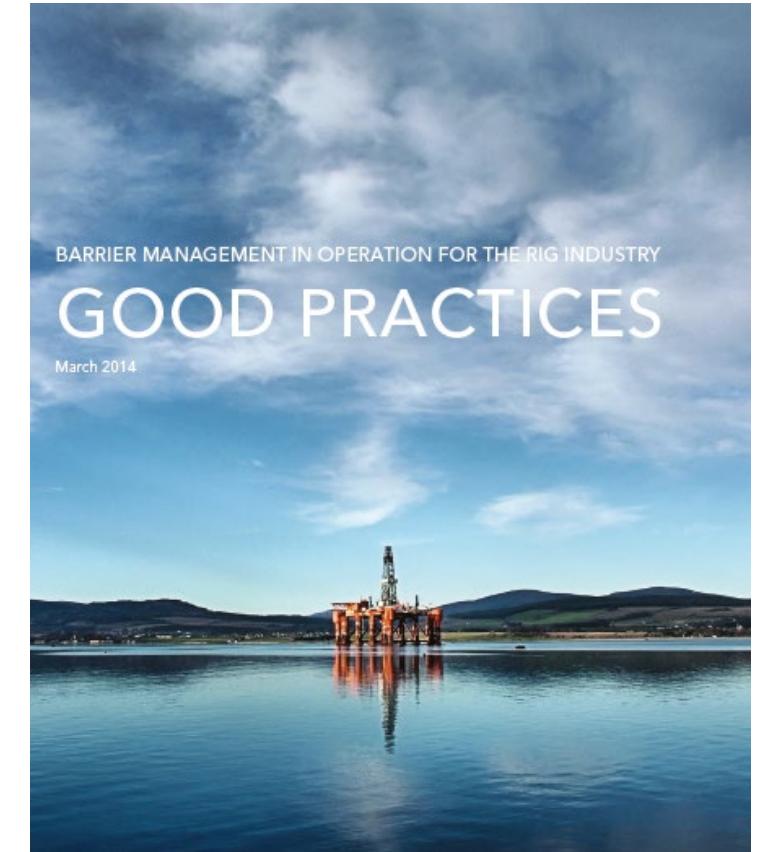
The operator or the party responsible for operation of an offshore or onshore facility, shall stipulate the strategies and principles that form the basis for design, use and maintenance of barriers, so that the barriers' function is safeguarded throughout the offshore or onshore facility's life.

Personnel shall be aware of what barriers have been established and which function they are intended to fulfil, as well as what performance requirements have been defined in respect of the concrete technical, operational or organisational barrier elements necessary for the individual barrier to be effective.

Personnel shall be aware of which barriers and barrier elements are not functioning or have been impaired.

Necessary measures shall be implemented to remedy or compensate for missing or impaired barriers.

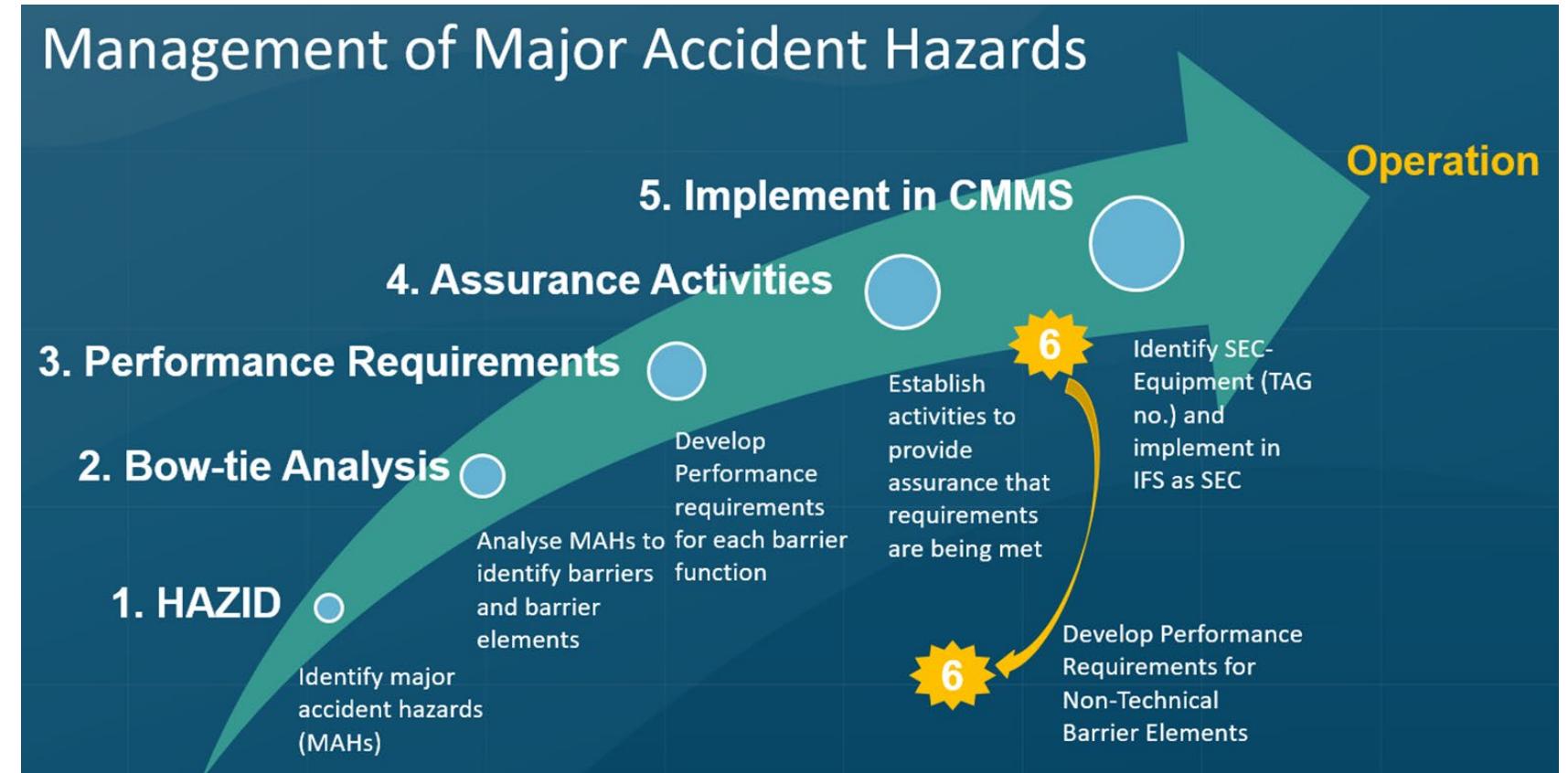
[Guidelines](#) [Interpretations](#)



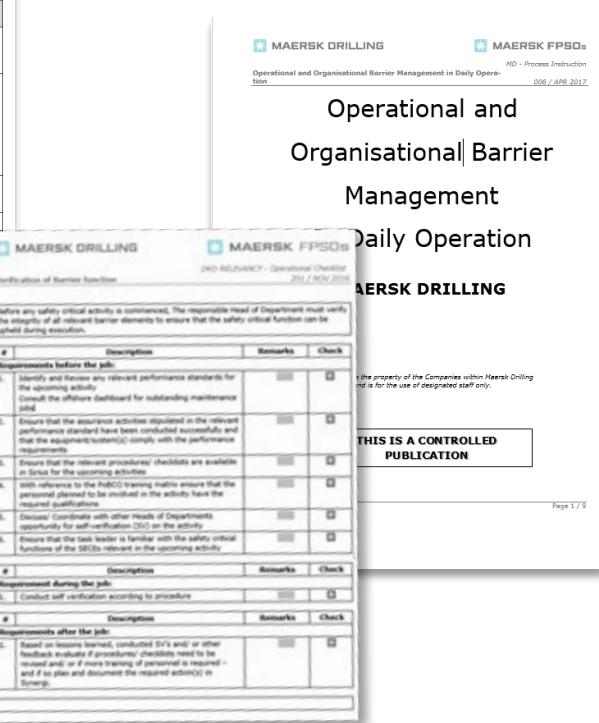
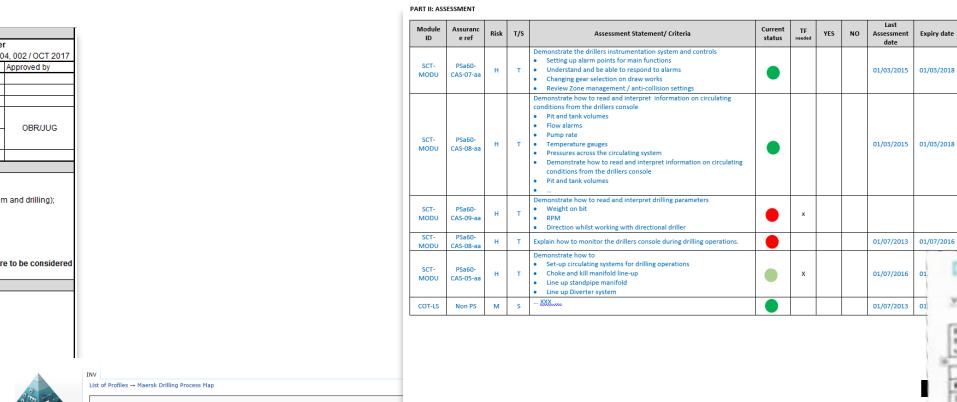
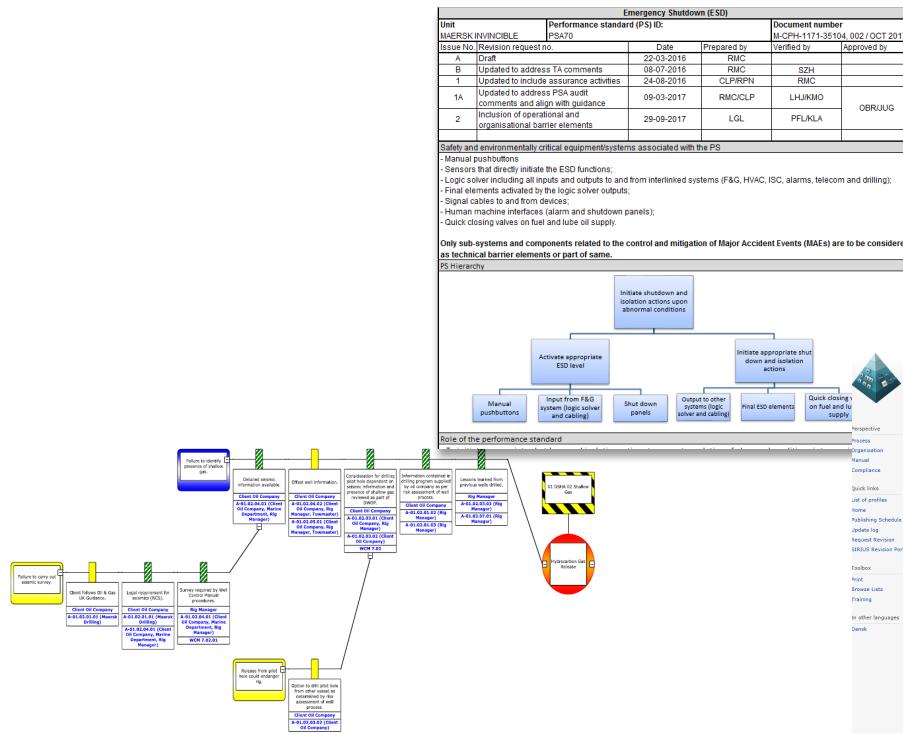
# Implement non-technical barrier elements

The development of barrier management in Maersk Drilling was also driven by the new-building project of the XLEs in period 2013/2017.

During the course of 2017, all performance standards were developed to also include non-technical barrier elements.



The barrier management strategy outlines how barrier elements are identified and maintained



## Identify

## Evaluate and Maintain

# The promise: A commitment to minimising the risk of major accidents

## Corporate Major Accident Prevention Policy (CMAPP)

Identification of all relevant Major Accident Hazards (MAH) in our operating environment

Use of proven analytical hazard management methodologies to reduce risk associated with MAH to ALARP

Minimisation of hazardous releases to the environment

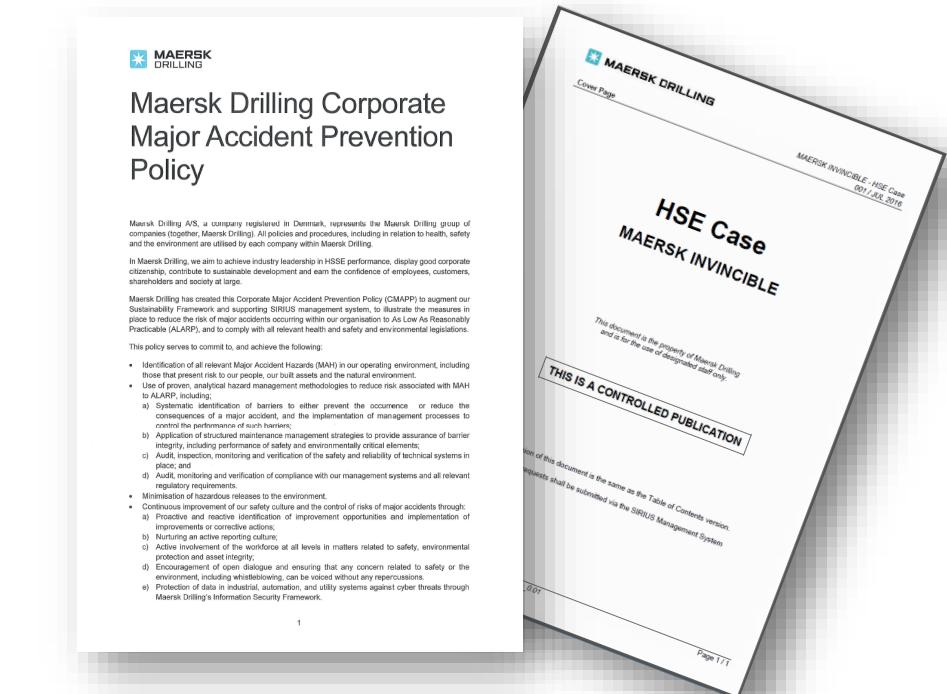
Continuous improvement of our safety culture and control of risks of major accidents

## Excerpts from the CMAPP

### COMMITMENT FROM OUR LEADERS

From our CEO down to rig crew level, all levels of leadership within Maersk Drilling are committed to work actively to reduce the potential for major accidents to ALARP.

“ Maersk Drilling is committed to ensure that personnel at all levels in the organisation are skilled, knowledgeable and competent in their position.



# Organisational anchoring

In Maersk Drilling, we believe that the first step in sustainable implementation of a successful and well-functioning operational barrier management framework, is thorough organisational anchoring and establishment of purpose and need.

We have, through a very methodical and structured learning process, ensured that competencies have been imbedded in the organisation on different learning levels.



# Responsibility governed by a RACI

**Offshore management** is responsible for barriers being in place, Safety Critical Activities understood and upheld, maintaining barriers, and verifying barrier integrity

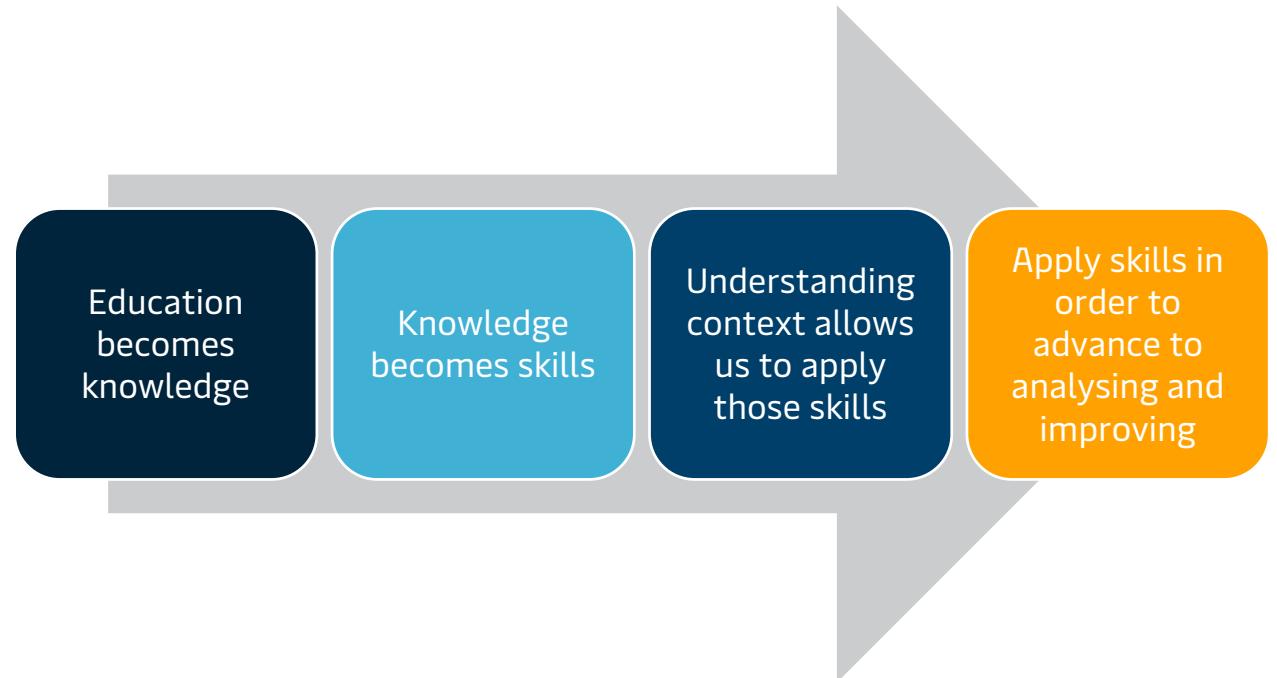
**Crew members** are responsible for assessing equipment, procedures and competences for the planning of specific jobs

Role	Offshore operations					Onshore operations					HSSE		Technical Organisation						
	OIM	Head of Departments	Safety Officer	Task Leader	Middle Managers	Rest of personnel	COO	Asset teams	Rig Manager	Assistant Rig Manager	Technical Superintendent	HSE Coordinator / Advisor	HR Coordinator	Training Coordinator	Head of HSSE	BPE for BM	HSE Support	Head of E&I and Technical Safety	Head of Maintenance and Materials
Offshore Management								A	R										
Ensuring the Operations integrity and barrier protection its assets of																			
Ensuring barrier integrity and for creating	A	R	R	R	R	I			R	I		C	I	C					
Ensuring barrier integrity and for creating							A	R	R		R			R	C	R	R		C
Document Control																			
Document Strategy	I						A	I		I		C	C		R			C	
Organisational Barrier	R						C	I		I		A	R		C			C	
Daily Operation							I				R		A		C	I			
Performance standards upon	I																		

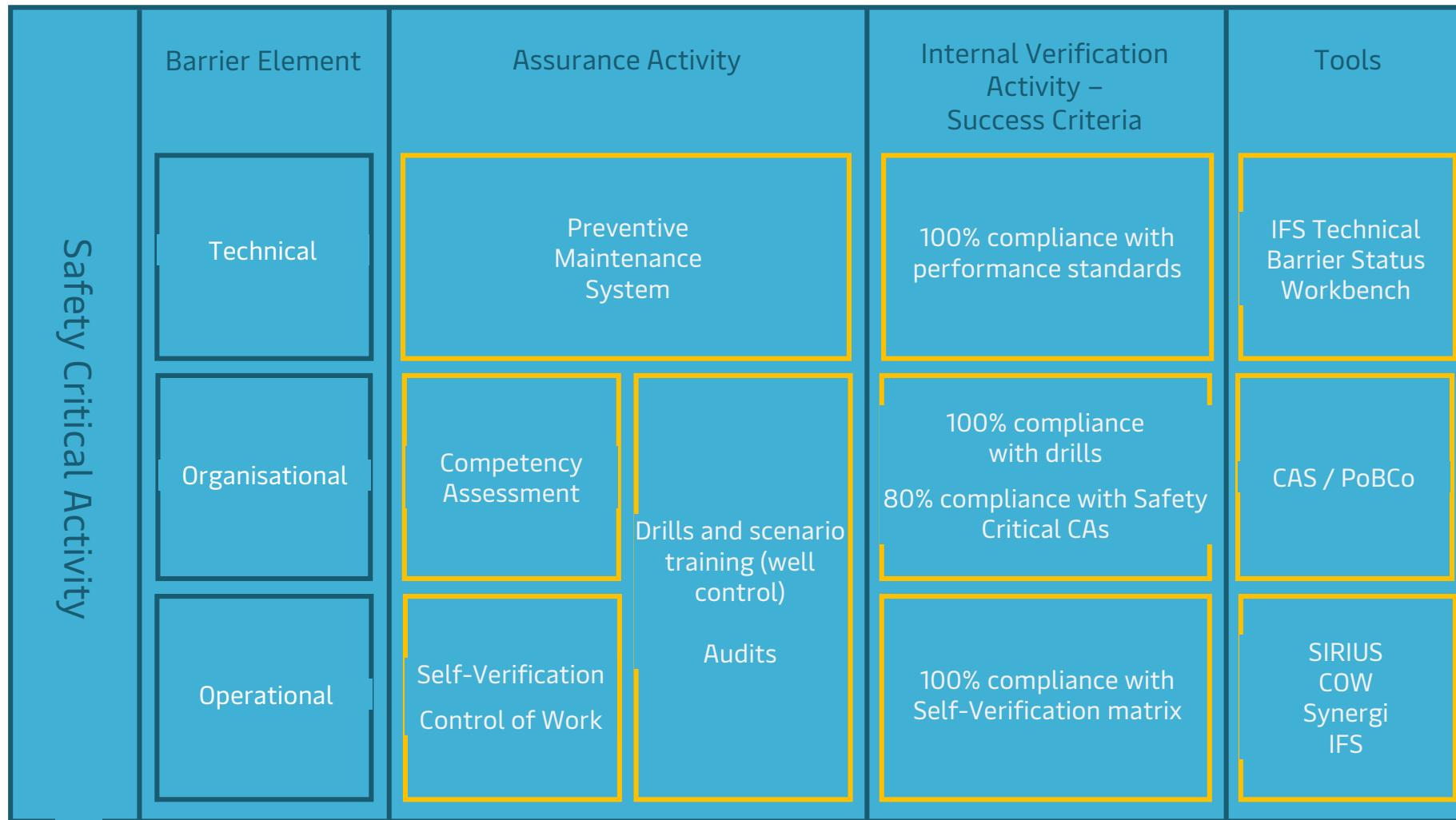
**Onshore Management** is responsible for committing the operation to the Barrier Management Strategy and creating awareness

**Onshore HSE** is responsible for initiating reviews of the Performance Standards, including performance requirements and assurance activities

# Organisational anchoring



# Barrier Management framework



# The Barrier Management framework is based on tools we already use

## Technical Barrier Elements

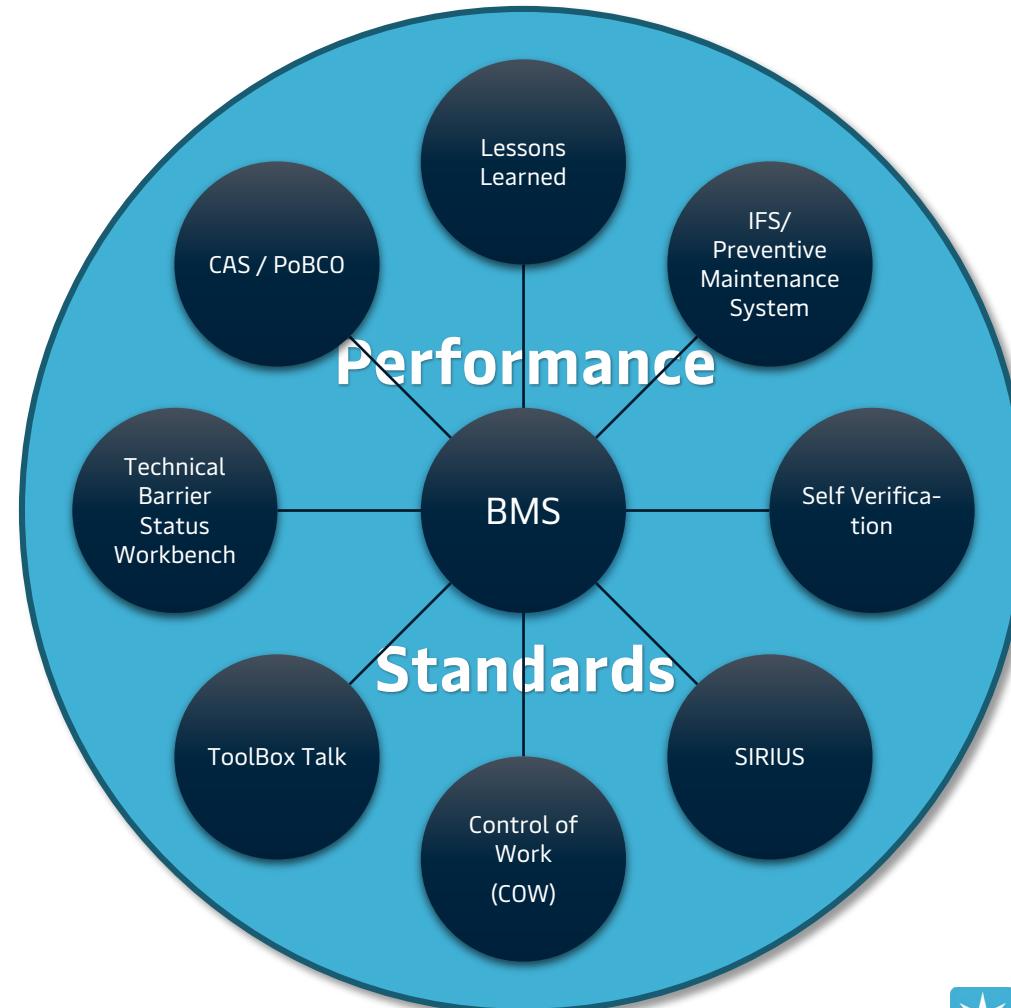
- IFS/Technical Barrier Status Workbench

## Organisational Barrier Elements

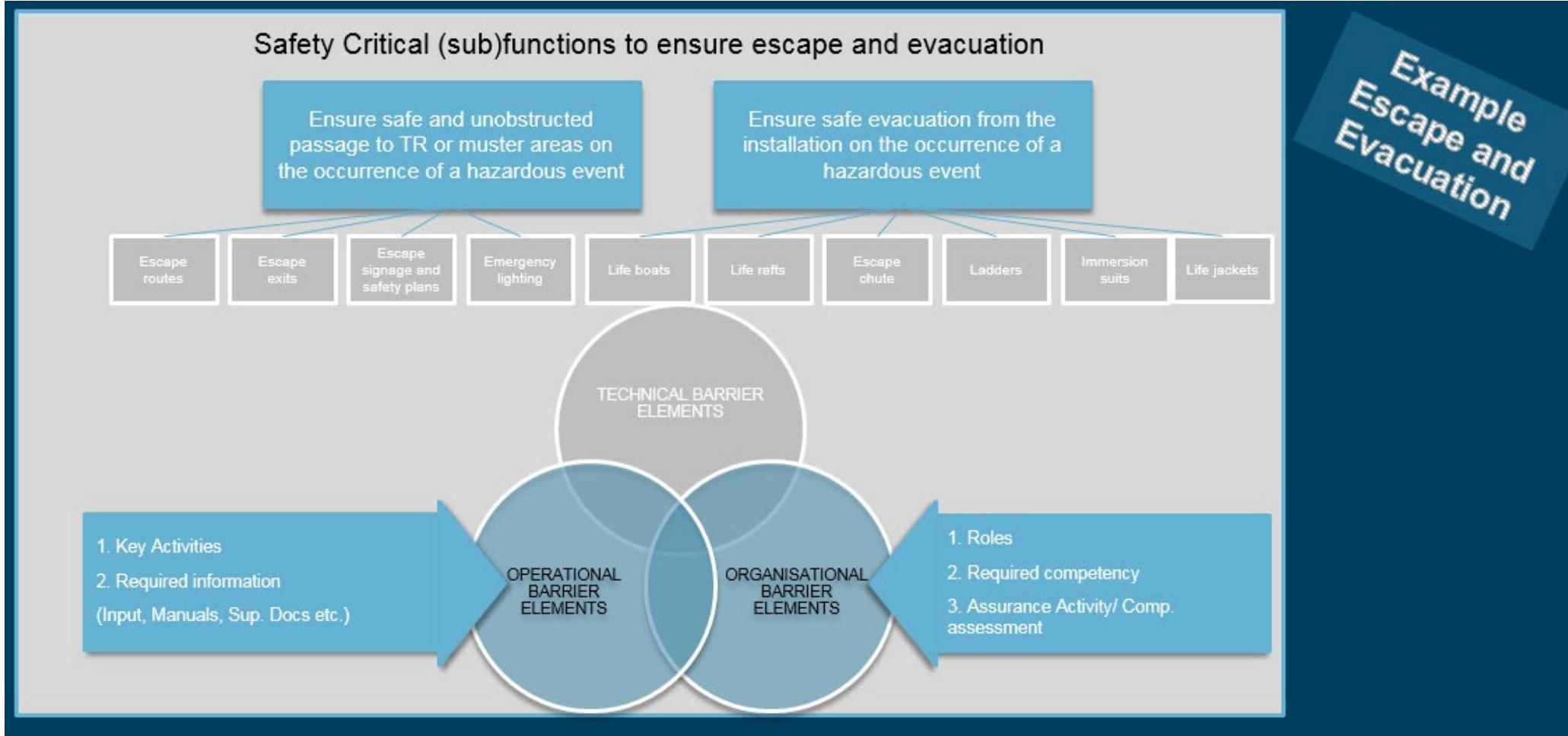
- CAS / PoBCO
- Self-Verifications
- Toolbox Talk

## Operational Barrier Elements

- Procedures / Checklists in Sirius
- Self verifications
- Permit to Work Evaluation
- Toolbox Talk



# Our performance standards



## Performance standards – example: PSa110 Process Safety

Process Safety			Front Sheet		
MÆRSK INSPIRER	Performance standard (PS) ID: PSa110				
Issue No.	Revision	Date	LHJ	RMC	BPH/ITP
1	Original	01-02-2013			
2	Updated to address SME comments and revised assurance activities	24-09-2014			
3	Separate HSE Case and Performance Standards	24-10-2014	NHO		
4	Addition of new reporting requirements	04-02-2016	LHJ		
5	Updated for Yme development	24-07-2019	RMC	TIA, SKJ, IHO, ATA, AMC, SPP	Technical Authorities
<b>Safety and Environmentally Critical Equipment / Systems Associated with the PS</b>					
The equipment associated with this performance standard comprises:					
<ul style="list-style-type: none"> <li>- PSD instrumentation (including car sealed/locked open valves, heat tracing where required)</li> <li>- PSD control system (SAS)</li> <li>- PSD actuated valves</li> <li>- PSVs (including key interlock system and locked open valves, heat tracing where required)</li> <li>- Bursting discs</li> <li>- VISOP (instruments, control logic and valves).</li> </ul>					
Only sub-systems and components related to the control and mitigation of Major Accident Events (MAE) are to be considered as technical barrier elements or part of same.					
<b>PS Hierarchy</b>					
<pre> graph TD     A[Detect process upsets and prevent process upsets from escalating into a major accident] --&gt; B[Isolation of process]     A --&gt; C[Pressure relief]     A --&gt; D[Protect overpressure of downstream process system from Beta during start-up]     B --&gt; E[PSD instruments]     B --&gt; F[PSD Control System (SAS)]     B --&gt; G[PSD valves]     C --&gt; H[PSV]     C --&gt; I[Bursting discs]     D --&gt; J[VISOP instruments]     D --&gt; K[VISOP Control Logic]     D --&gt; L[VISOP valves]   </pre>					
<b>Performance Objectives</b>					
The role of the Process Shutdown system is to prevent the process plant from operating outside of its safe working envelope and to provide pressure relief if process shutdown fails					
<b>Relevant Top Events from Bow-Tie</b>		<b>PS Functions to Prevent &amp; Mitigate Top Events</b>			<b>Bow-tie number (Refer to HSE Case, Section 11)</b>
Process hydrocarbons / Loss of Containment		Prevent escalation of process upset by process isolation and pressure relief.			6

Mærsk Inspirer - Performance Standard PSa110 for Process Safety - Technical Barrier Elements						
Performance Requirement				Assurance Activity		
Functionality						
Role/Function	Requirement Reference No.	Sub-Element	Performance Requirement	Regulation Codes, Standards and Internal Requirements	Assurance Activity ID	Assurance Activity
Isolation of process	F5	PSD instrumentation and control system	Process instrumentation shall detect process upset at levels defined by alarm and trip schedule and initiate appropriate process shutdown actions in accordance with system control diagrams	NORSOK S-001, Section 10.5.1 Alarm and trip schedule System Control Diagrams	AAF 1.1	Check functionality of input/o process transmitters of the PSD system.  PASS: PSD transmitters are functional and initiate appropriate process shutdown actions in accordance with system control diagrams as defined by alarm and trip schedule.
					AAF 1.2	Check that all block valves installed upstream of process instrumentation are in "Open" position with a car seal (CSO).  PASS: All block valves installed upstream of process instrumentation found in "Open" position with a car seal (CSO).
					AAF 1.3	Check that heat tracing on pressure instrumentation, where installed, is operational.  PASS: Heat tracing is functional and in good condition.
	F2	PSD Valves	PSD valve closing times shall be sufficiently fast to ensure that the primary level of protection has fulfilled its task without activation of the secondary level of protection (PSD/bursting discs)	NORSOK S-001, Section 10.4.5 CRITICAL PROCESS VALVES	AAF 2.1	Carry out stroke test of process shutdown valves and measure travel time via the event log. Visual verification of smooth operation.  PASS: PSD valve travel time meets criteria given in VOP-P-08-B-PP-2007-001 for critical valves or is less than 2 sec/in for all other valves, with smooth operation.
					AAF 3.1	Check certification tag is sealed, readable and less than two years old.

110 for Process Safety - Operational and Organisational Barrier Elements						
Safety critical activity		Input	Operational Barrier Element	Organisational Barrier Element		
Identify cause for unsuccessful PSD	Dynamic information	Static information				
	Output from ABB HMI screens Feedback from Process Operator Feedback from Instrument Technician Operational status	ABB System manuals System control diagrams (SCDs) Technical System manuals Operating procedures P&IDs ABB Alarm philosophy	Senior Process Technician (SPT) Senior Process Technical Lead (SPTL) Production Section Leader (PSL) Instrument Technician (IT)			
Initiate manual blow down of relevant segment	Output from ABB HMI screens Feedback from Process Operator Operational status	ABB System manuals System control diagrams (SCDs) Technical System manuals Operating procedures P&IDs ABB Alarm philosophy	Senior Process Technician (SPT) Senior Process Technical Lead (SPTL) Production Section Leader (PSL)		1) Able to identify consequences of blow down. 2) Explain consequences of blow down, including effect on helicopter operations.	
Verify pressure stabilisation	Pressure reading from ABB HMI screens Pressure readings from local gauges	ABB System manuals	Senior Process Technician (SPT) Senior Process Technician Lead (SPTL) Production Section Leader (PSL)		1) Able to identify pressure stabilization through output from ABB HMI screens and/or local gauges.	1) Explain how to identify pressure stabilization.
streaming start-up	Line up topside for Beta flow, including equalisation	Status on valves from ABB HMI screens Output from ABB HMI screens Feedback from Process Operator Operational status	Visop manual P&IDs Methanol manual System control manuals Technical system manuals Operation manuals	Senior Process Technician (SPT) Senior Process Technician Lead (SPTL) Process Operator (PO) Production Section Leader (PSL)	1) Able to prepare topside for Beta start-up, including VISOP system. 2) Explain correct sequence of VISOP and of potential consequences of incorrect start-up. 3) Able to line up and operate methanol injection system during Beta start-up.	1) Explain Beta start-up, including VISOP system. 2) Explain correct sequence of VISOP and account for potential consequences of incorrect start-up. 3) Demonstrate line up and operation of methanol injection system during Beta start-up.
	Open riser ESD valve and normalize	Status on valves from ABB HMI	Vison manual	Senior Process Technician (SPT)	1) Knowledge of potential risks. 2) Explain potential risks.	1) Explain potential risks. 2) Explain potential risks.

## Technical Barrier Elements

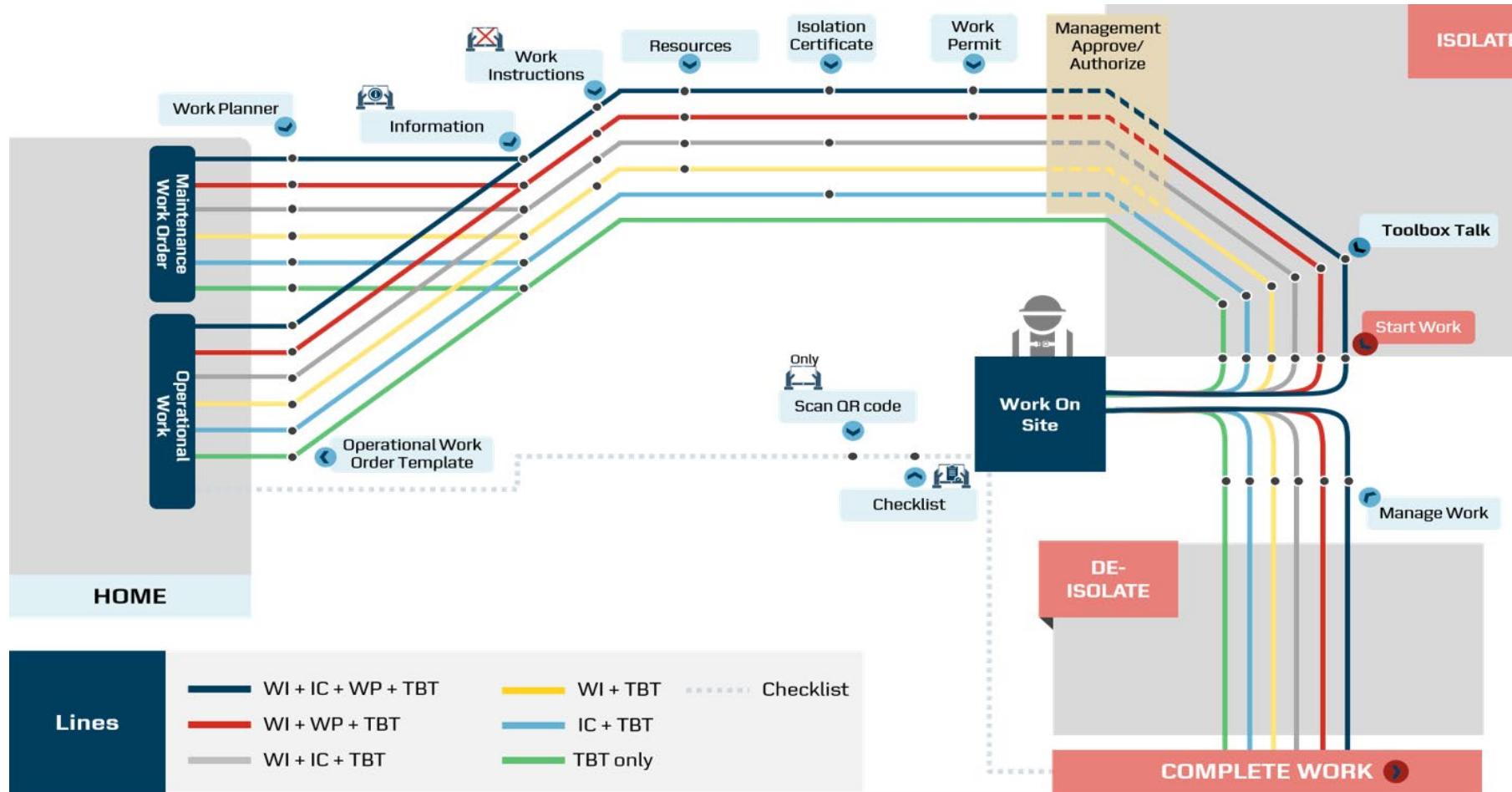
## Operational & Organisational Barrier Elements



**MAERSK  
DRILLING**

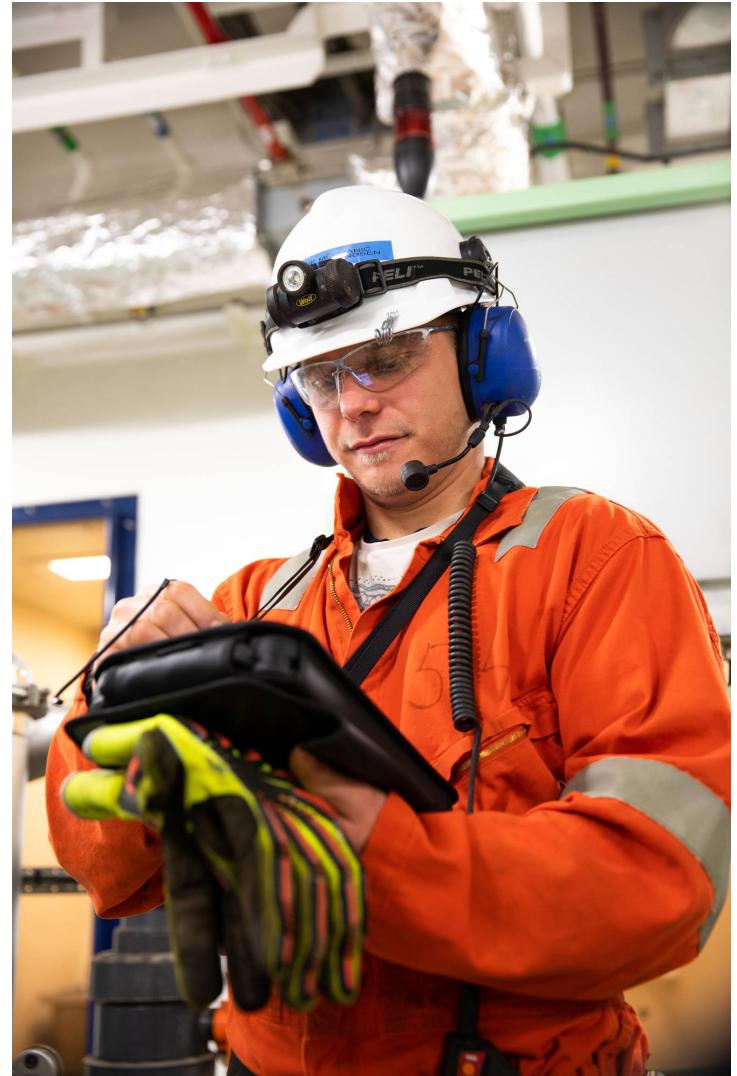
# Controlling the Operational Barriers:

## Control of Work



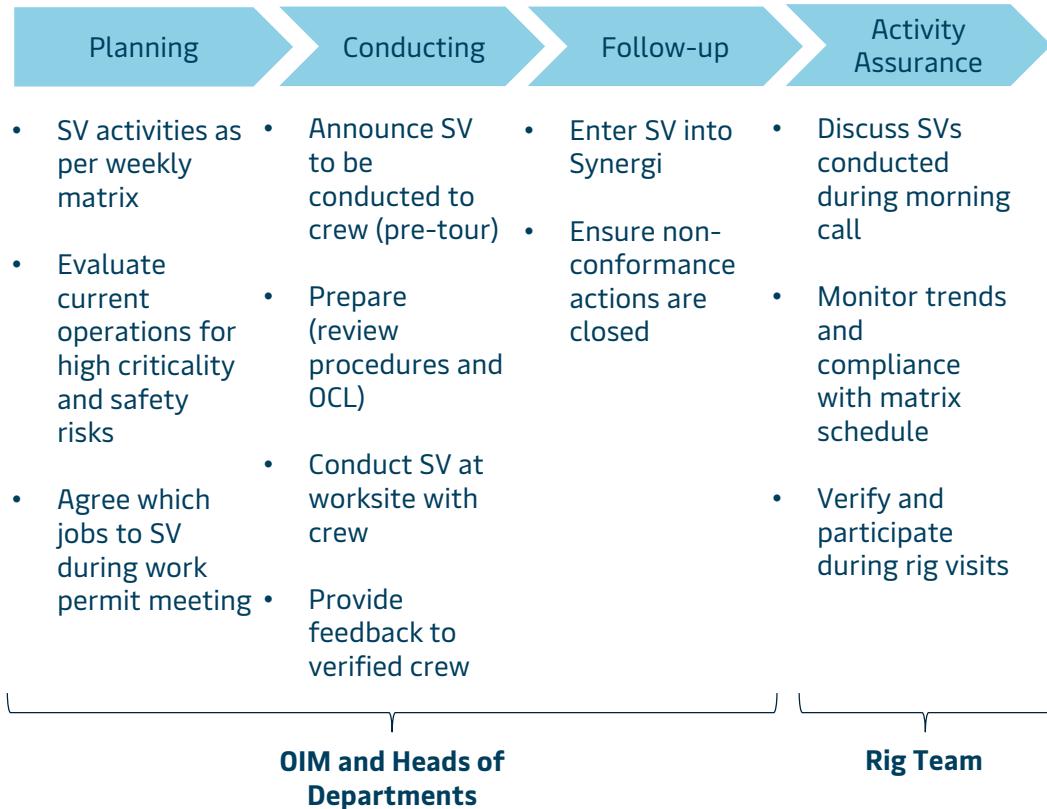
# Controlling the Operational Barriers: Self-Verification

- Self-verification is a well-proven way of testing and ensuring the right barriers and the integrity of the barriers are in place while performing safety critical tasks.
- In addition to this the self-verification provides assurance of the integrity of operational barrier elements to uphold our barrier elements against major accident events.
- Self-verification is a key element in ensuring that Maersk Drilling's Management System is understood and followed and that gaps in our procedures are identified and rectified.
- Self-verification engages front line leaders in verifying compliance, testing understanding of our management system, coaching the gaps, and in recognising and reinforcing the right behaviours.



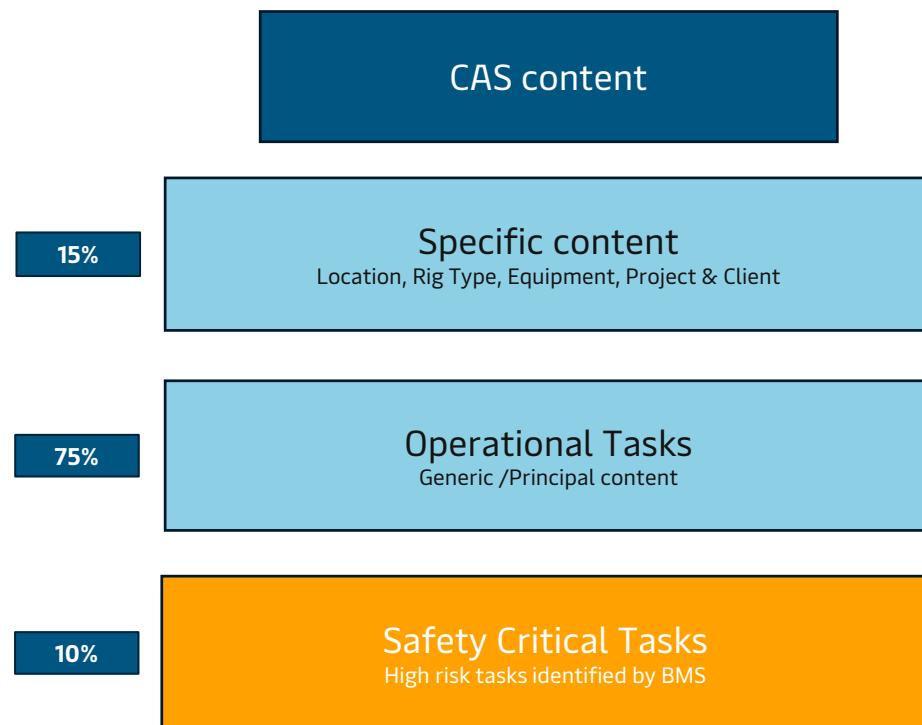
# Controlling the Operational Barriers: Self-Verification

- Practical and easy to embed in daily operations
- Follows our PDSA approach and philosophy

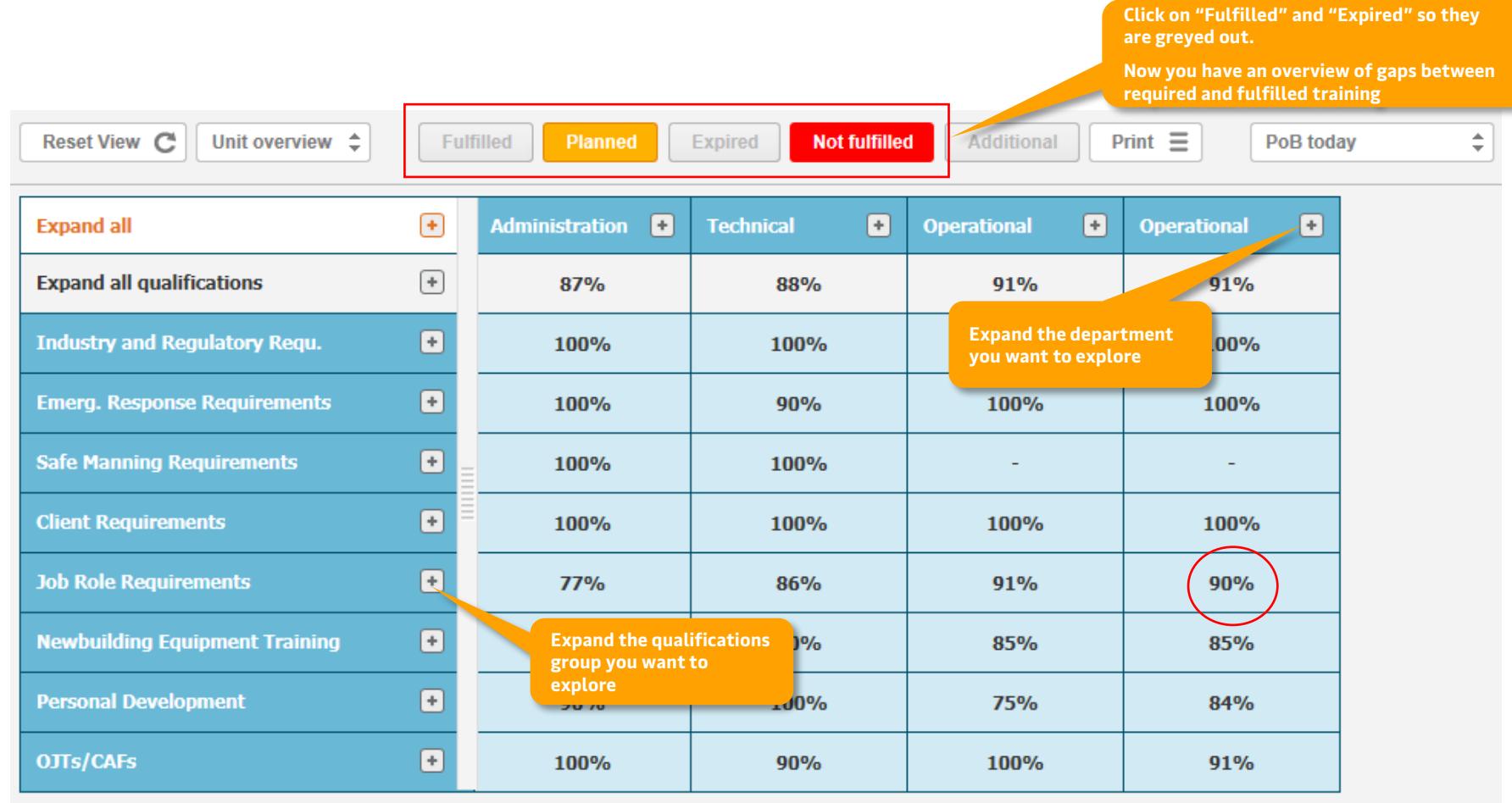


Verification		
1.	Were relevant positions familiar with the content of the well control bridging document? Comments: _____	C    NR    N
2.	Were there any deviations in place relating to equipment, policies or procedures? If so, was risk assessed individually and cumulatively and were all relevant personnel made aware of the deviations in place? Comments: _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.	Was the well shut-in first response procedures posted and were next steps recorded and documented? Comments: _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4.	Was it clear to all who had the authority to close in the well? Comments: _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5.	Was the required space out for shut in on an annular and ram understood? Comments: _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6.	Was the basis and authority for deciding when to flow checks clearly understood? Comments: _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
7.	Was it clear what alarm levels the gain/loss and return flow sensors are set to? Comments: _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
8.	Were kick sheets and kick tolerance calculations available and updated at appropriate intervals? Comments: _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
9.	Were regular well control drills conducted according to an agreed matrix and against a success criterion? Comments: _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
10.	Were well control drills recorded with gaps identified, rectified and documented? Comments: _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

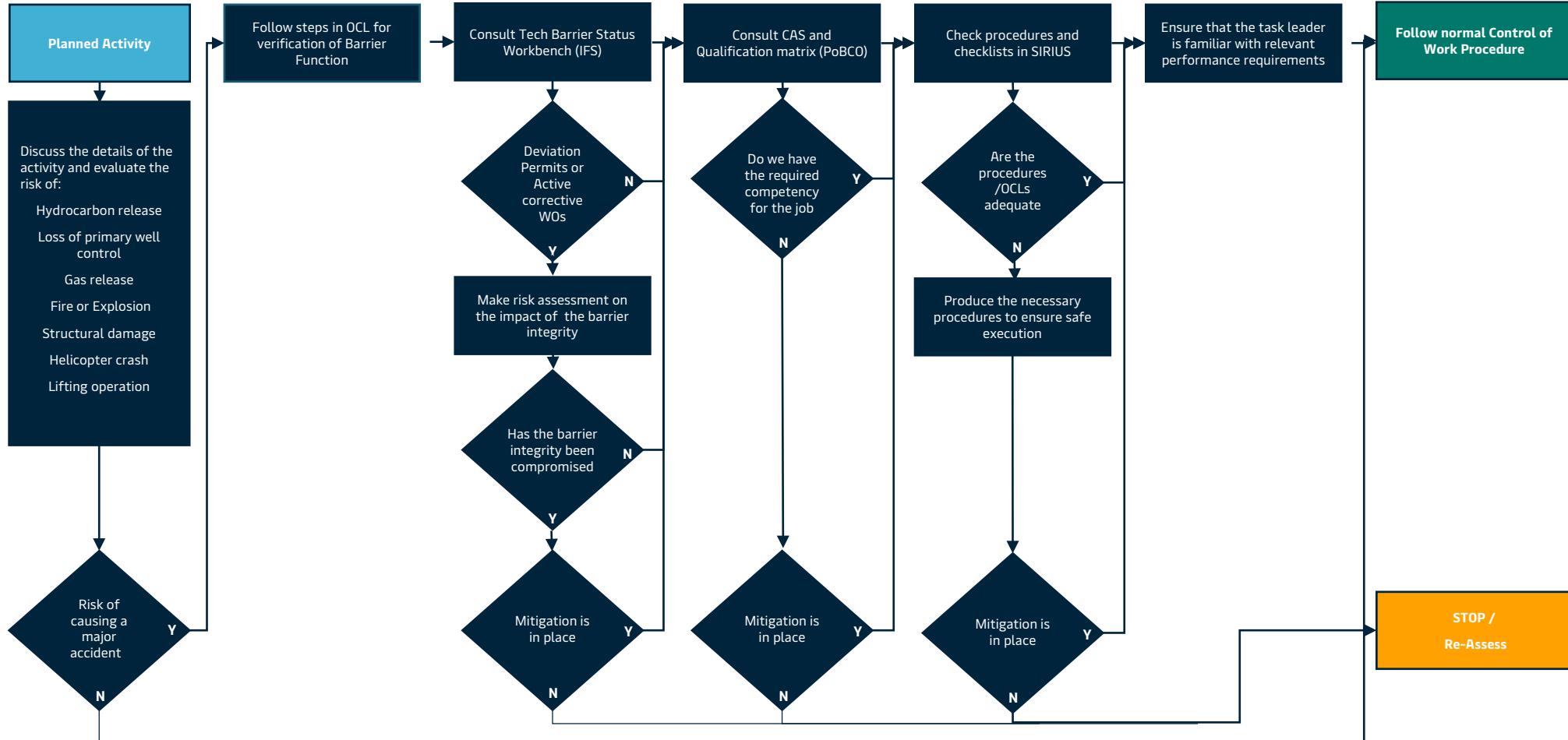
# Controlling the Organisational Barriers: CAS content and flow



# Controlling the Organisational Barriers: Personnel on Board Competency overview (PoBCo)



# Barrier Management decision flowchart – BM day-to-day



# Verifying barrier integrity during daily Ops meeting

1. OCL is delegated in turns to meeting participants
2. The Delegate ensures that topics in OCL are covered during the meeting
3. After the safety discussion the Delegate sums up on issues from discussion which are relevant in relation to pt.1
4. During the meeting when upcoming activities are discussed the Delegate asks questions to ensure all barrier elements are discussed
5. At the end of the meeting, there must be a sum up on overall barrier integrity using the Barrier Strength Indicator (BSI)
6. Agreed SV's and other instructions to task leaders are communicated via the permit.
7. It has been assured that the overall barrier integrity has not been compromised by any of the planned activities for the next 24 hours (both activities covered by a PTW and activities outside PTW)

This checklist shall be used as part of the daily work planning (permit) meeting. The list does not define the agenda of the meeting but ensures that the barrier management thought process has been covered. It will guide you through the process of evaluating the integrity of the barriers on the unit in relation to upcoming Safety Critical Activities (SCA). An SCA is one which involves a risk of releasing any of the Major Accident Hazards. Examples of such activities are drilling operations, helicopter operations or repair/function test of Safety and Environmentally Critical Equipment (SECE). The evaluation of the overall integrity of the unit shall be done by the Offshore Installation Manager (OIM) and the Heads of Department. The OIM shall have the final responsibility of verifying the overall integrity of the unit. The task of filling out the checklist can be delegated to any participant in the meeting.

#	Description	Remarks	Check
1.	<p>It has been evaluated, based on the <b>daily input</b> from after action review (AAR) active cards and findings from <b>self-verification</b>, whether there is an identification of weakened barrier functions</p>		<input type="checkbox"/>
2.	<p><b>Technical:</b> A brief summary of the status on SECE has been given to indicate the following:</p> <ul style="list-style-type: none"><li>• Whether all assurance activities have been undertaken according to required frequency</li><li>• Whether there are corrective work orders or any raised deviation permits</li><li>• If there is any need for additional mitigation.</li></ul> <p>Consult: IFS Operations line characteristic PSX and Technical Barrier Status workbench</p>		<input type="checkbox"/>
3.	<p><b>Organisational:</b> It has been assured that the personnel planned to be involved in the activities have the required qualifications/competency.</p> <p>Consult: Qualification matrix for information if needed</p>		<input type="checkbox"/>
4.	<p><b>Operational:</b> It has been assured that the relevant procedures/checklists are referenced in the permit. It has been assured that procedures/checklists are available for SCAs without permit.</p> <p>Consult: SIRIUS for information if needed</p>		<input type="checkbox"/>
5.	<p>Discuss/coordinate opportunities for <b>self-verification</b> on the planned SCAs with other Heads of Department</p>		<input type="checkbox"/>
6.	<p>It has been assured that the <b>overall barrier integrity</b> will not be compromised by any of the planned activities for the next 24 hours. This applies to activities covered by a Work Permit (WP) and activities outside a WP</p>		<input type="checkbox"/>

# Evaluate and communicate barrier status - Barrier Strength Indicator (BSI)

## Purpose

- Summary of identified **weakened barrier elements** and their **mitigations**, including **risk assessments**
- To support offshore management in forming a **mutual overview** of barrier integrity on board
- Support overall Barrier Management discussions during daily planning meeting
- Help assess which activities onboard affect barrier functions
- Help offshore management communicate barrier status

Barrier Elements Assessment
Assessment after Mitigation

Daily Barrier Strength Indicator :		Unit Name		19-Aug-19
Barrier	Barrier Elements affected	Barrier Elements Assessment (1-5)	Key Mitigating Measures Barrier Elements	Assessment after mitigation (1-5)
Technical	1. FRC remote 2. ACS Hydra Tong 3. SY test on fire loop 11 4. Crane boom wires overdue 5. FW pump on VFN u/s	3	1. Centralized launching possible, remote taken out of use 2. Update SIA to capture learnings (AAR) 3. Mitigated through PTW 4. Evaluate use of cranes, perform visual inspection, PM, prepare deviation 5. Share risk assessments, minimize exposure time (push for delivery)	4
Operational	1. POB control VFN/INV 2. Ambiguous helicopter procedures 3. Challenging volume control (ultra light mud)	3	1. T-card system in place and working 2. Full procedural compliance, helideck crew training 3. Ensure supply of fresh mud available	5
Organisational	1. Crew change in operations department - for many this is the first time drilling with Maersk	3	1. After action review process, handover procedures, familiarization on VFN, OJT	5

## Assessment scale guide:

Score 1:	Score 2:	Score 3:	Score 4:	Score 5:
At least one barrier affected with no feasible mitigation available	Several barriers affected needing extensive mitigations, or barrier redundancy compromised	At least one barrier affected requiring deviation or other workaround	No barriers significantly affected	Full barrier integrity



# Barrier management in daily operation

## Summary of the meeting based on agenda and OCL for barrier function Integrity

Maersk Invincible Crew Reports 26.08.2018 TRC days: 499 Active Cards: 79										
Weekly Safety Focus: Multiple activities / Operation dynamics /Managing service personnel										
Daily Safety Focus: Well Control / Crew change										
Barrier Integrity:										
Technical: Baker gas trap, Life boat release indicators, FRC remote control - OK										
Operational: Calibration of gas trap, Well control - To be monitored										
Organisational: Crew change / New Personnel (OJT training) + serv pers. declaration - OK										
Case type / Self-Activity	Date	Case no.	Title/Brief Description/Observation	Case taken / Immediate action taken / Risk Severity	Reported by Company	Action proposal	Action Status	Action Responsible	Action impl.	
SE incident - Unsafe off-condition	2018 08 26	1951449	PT3 system not fit for combined mode	During PT3 system not fit for combined mode to obtain full/Accurate POB by using the automated PTS system.	Permittee Performing SV no.	Have operators to make report of the observations during today's drill and convey in OIM handover and to SISD	In process	CEO - Asset Manager, Harsh Oil & Marine, Invincible - Maersk Invincible, OIM		
The system is apparently working as intended as per the latest upgrade (Seismic) main drill on the unit and is fully capable when a full POB is obtained within internal boundaries (Only counting)										
Verification of Barrier Function Integrity 002 / MAR 2018										
This checklist shall be used as part of the daily work planning (permit) meeting. The list does not define the agenda of the meeting, but ensures that the barrier management thought process has been covered. It will guide you through the process of evaluating the integrity of the barriers on the unit in relation to upcoming Safety Critical Activities (SCA).										
An SCA is one which involves a risk of releasing any of the Major Accident Hazards. Examples of such activities are drilling operations, helicopter operations or repair/function test of Safety and Environmentally Critical Equipment (SECE).										
The evaluation of the overall integrity of the unit shall be done by the Offshore Installation Manager (OIM) and the Heads of Department. The OIM shall have the final responsibility of verifying the overall integrity of the unit.										
The task of filling out the checklist can be delegated to any participant in the meeting.										
#	Description	Remarks								
1.	It has been evaluated, based on the <b>daily input</b> from after action review (AAR) active cards and findings from <b>self-verification</b> , whether there is an identification of weakened barrier functions	<input type="checkbox"/> Check various incidents vs basic leadership								
2.	<b>Technical:</b> A full summary of the status on SECE has been given to indicate the following:- <ul style="list-style-type: none"><li>Whether all assurance activities have been undertaken according to required frequency</li><li>Whether there are corrective work orders or any raised deviation permits</li><li>Whether there is any need for additional mitigation. Consult: operations line characteristic PSX and Technical Barrier Status workbench</li></ul>	<input type="checkbox"/> Check gas blanking PT3 home Value Schalters isolating on basic PM Gas detectors								
3.	<b>Organisational:</b> It has been assured that the personnel planned to be involved in the activities have the required qualifications/competency. Consult: Qualification matrix for information if needed	<input type="checkbox"/> Check crew change w/o. service personnel								
4.	<b>Operational:</b> It has been assured that the relevant procedures/checklists are referenced in the permit. It has been assured that procedures/checklists are available for SCAs and personnel. Consult: SIRIUS for information if needed	<input type="checkbox"/> Check								
5.	Discuss/coordinate opportunities for <b>self-verification</b> on the planned SCAs with other Heads of Department	<input type="checkbox"/> Check								

## Daily meeting agenda (follows the OCL Verification of Barrier Function Integrity)

- Review/discuss daily safety reports
- Discuss next 24 hours operation and work tasks incl. related risks and identified weakened barrier elements
- Review of work permits
- Update daily safety focus based on risk picture seen
- Agree on barrier function status as well as weakened elements and which mitigations to have in place

Meeting Agenda			
TOPIC	KEY POINTS	DISCUSSION LEADER	TIME REQUIRED
Operations the last 24 hours	<ul style="list-style-type: none"> <li>For safety, drilling operations, maintenance and marine:</li> <li>What has taken place (bigger subjects)?</li> <li>Performance highs/ lows and root causes</li> <li>Preventive actions identified based on lessons learned</li> <li>Go through top 3 safety cards and top 3 AAR cards/reviews.</li> </ul>	OIM (HOD round table)	00H15
Operations the next 24-48 hours	<ul style="list-style-type: none"> <li>Upcoming operations - refer to weekly plan and pre-phase meetings</li> <li>Ensure that risks have been managed: <ul style="list-style-type: none"> <li>Safety risks</li> <li>Equipment risks</li> <li>Identified preventive actions.</li> </ul> </li> <li>Decide on actions to ensure good operational performance</li> <li>Identify coordination needs between departments</li> <li>Decide on next pre-phase meeting.</li> </ul>	OIM (HOD round table)	00H20
Actions	<ul style="list-style-type: none"> <li>Status on previous actions</li> <li>Summarise what actions are agreed on</li> <li>Check that a responsible is assigned to all actions</li> <li>Update action log and distribute to participants.</li> </ul>	RM	00H05
Closing comments		RM	-----



# Thank you!



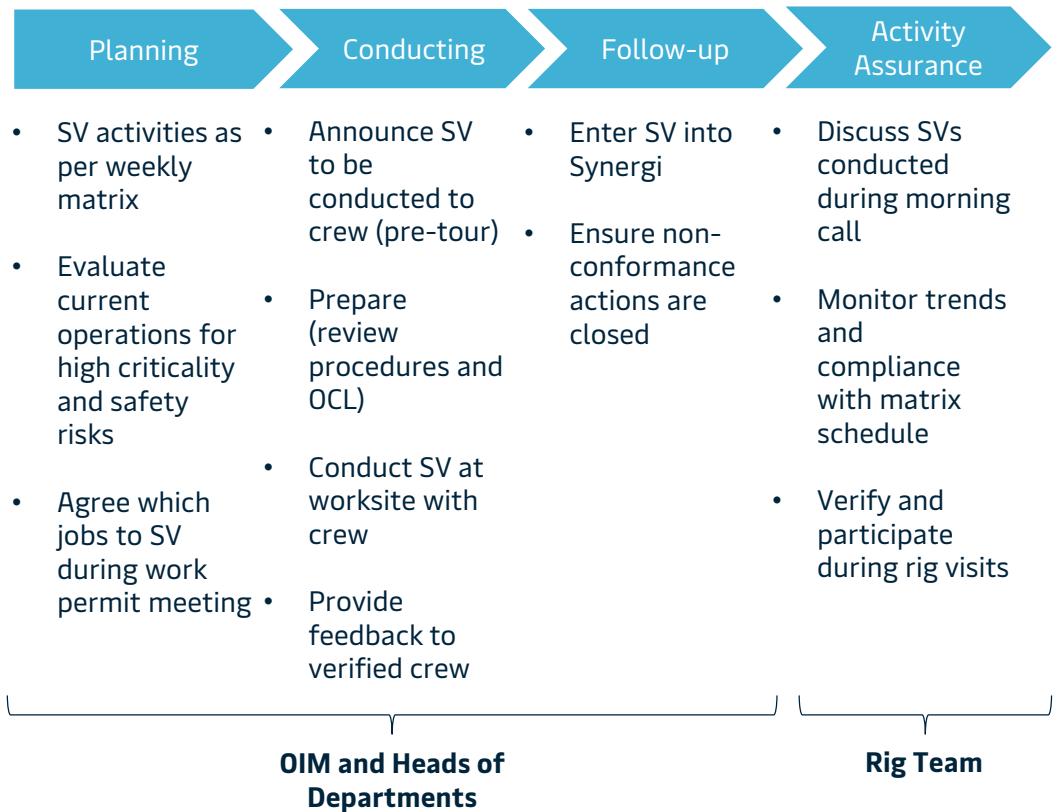
# Back up slides

# Bringing Barrier Management into the Toolbox Talk



# Self-verification follows a simple flow

- Practical and easy to embed in daily operations
- Follows our PDSA approach and philosophy



# Safety as Capacity = BM + human factors

Safety is not the absence of events – it is the presence of capacity.  
Capacity is our ability to manage the unexpected without consequence.



Capacity = safeguards + Performance shaping factor → fail safely

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- ✓ Safeguards that flex, bend and recover to failures or abnormal conditions:
  - Technical barriers
  - Operational barriers
  - Organisational barriers

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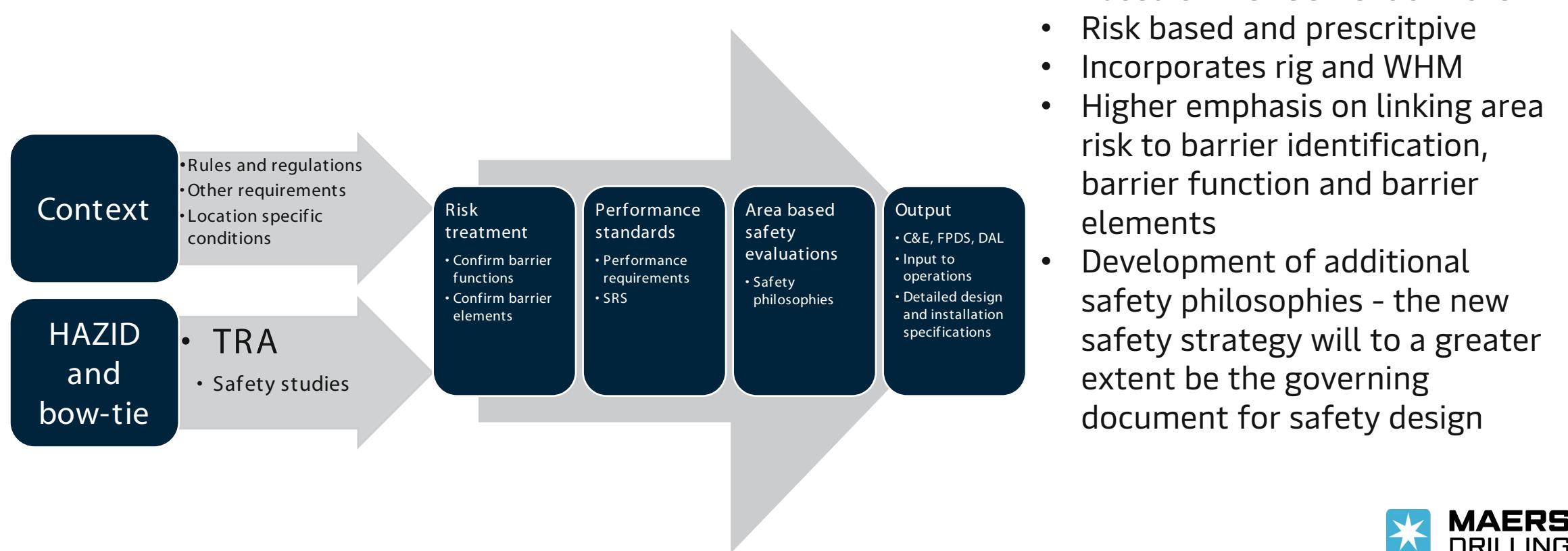
- ✓ Our ability to identify and know how to react when things change and recover when we fail:
  - Maintain overview of conditions and systems
  - Knowledge and experience
  - Learning to improve
  - Stop the job authority
  - Human factors

=

- ✓ Achieve the best result without anybody getting hurt

# Status on Barrier Management System for Mærsk Inspirer at Yme

## Development of new Yme safety strategy and philosophies



# Governance - How do we meet our commitment?

- Barrier Management **governing documents**:
  - Barrier Management strategy
  - Operational and Organisational Barrier Management in daily operation
- Technical, Operational and Organisational barrier elements identified and defined in **performance standards**
- Barrier Management **Operational Checklist** for work planning meeting
- **Training and coaching**



*Sustaining barrier management as a factor in work culture in Maersk Drilling - a shared language*