ABERDEEN DRILLING CONSULTANTS

ENGINEERED

PERFORMANCE

WORLDWIDE

TUBULAR HANDLING

ABERDEEN DRILLING CONSULTANTS

PRESENTED BY:
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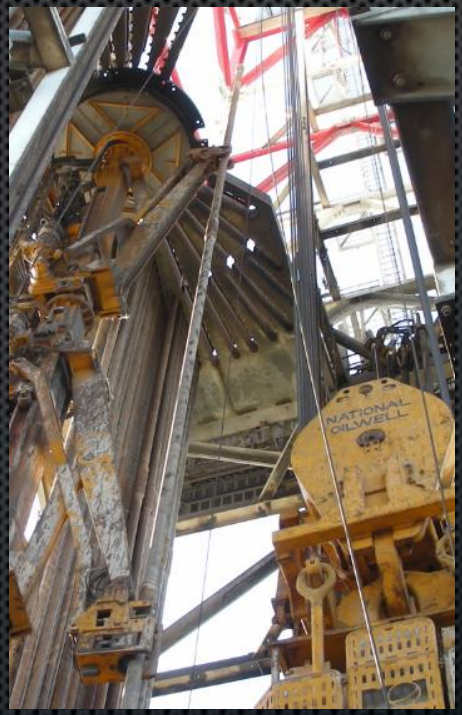
Team Lead
Integrated Control Systems

TUBULAR HANDLING

The purpose of this presentation is to outline Aberdeen Drilling Consultants' Approach to addressing points raised within

UK HSE Offshore Information Sheet No 2/2013



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TUBULAR HANDLING

"Automation of drill-floor machinery and tubular-handling equipment has many advantages but it can introduce new hazards. Malfunctions of such machinery and equipment have a high potential for serious injury or fatality."

Offshore Information Sheet No 2/2013

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TUBULAR HANDLING

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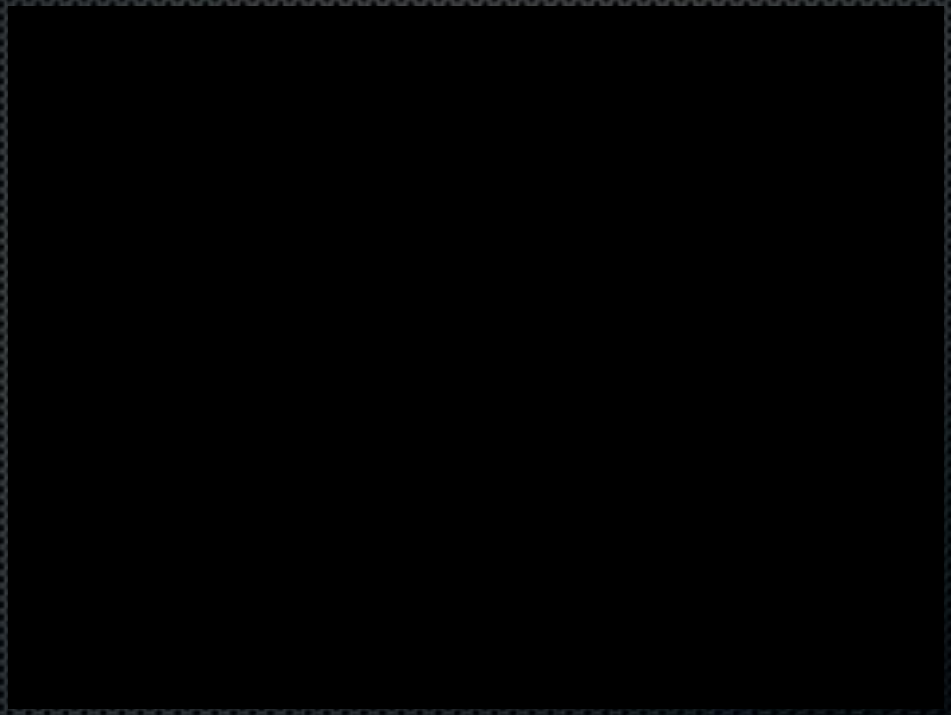

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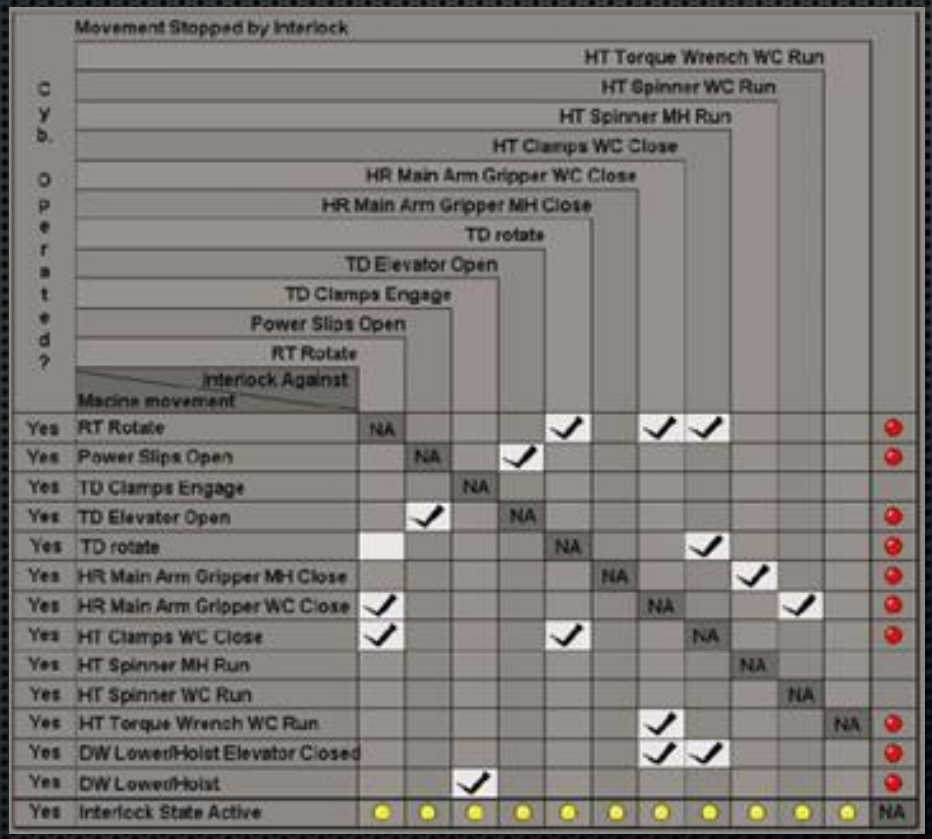

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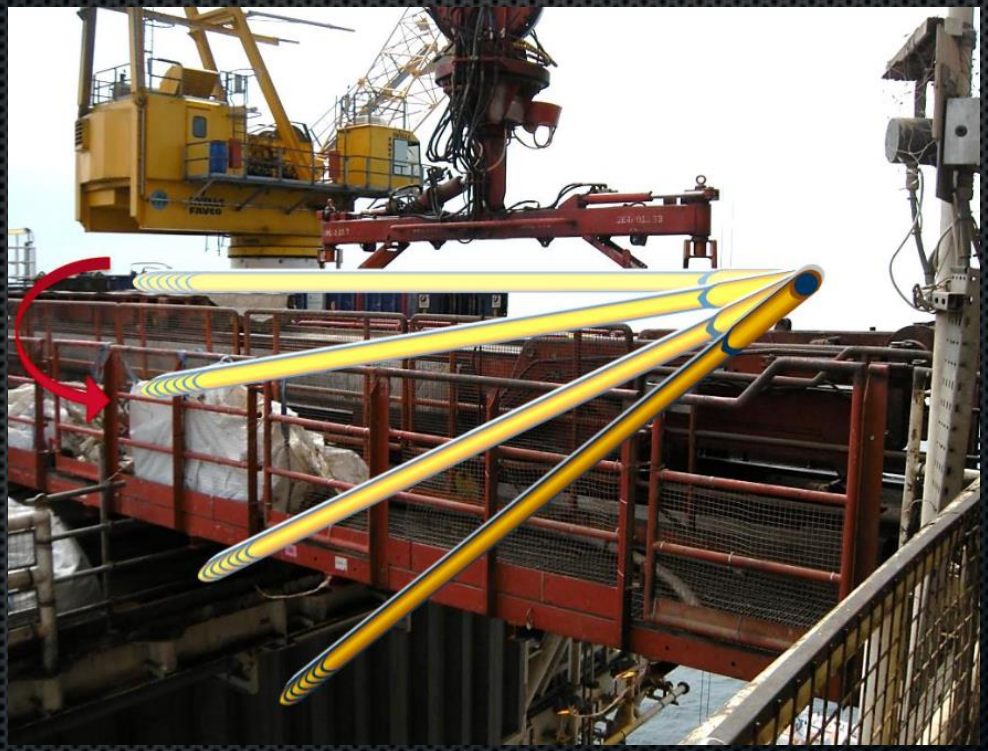
TUBULAR HANDLING

Due to a company having suffered a dropped tubular incident and had 2 further High potential of dropped tubular incidents, ADC was approached to conduct their first Tubular Handling Audit in 2014.



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This proved so successful that a further 5 surveys were procured for 2015

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TUBULAR HANDLING

Offshore Information Sheet No 2/2013

Provides guidance on managing risks in relation to drill-floor machinery and tubular-handling equipment, both existing and new.

It applies both onshore in Great Britain and offshore on the United Kingdom's Continental Shelf, wherever drilling or well work-over is undertaken.

The guidelines within this document were used as the framework for ADC's methodology

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TUBULAR HANDLING

Team

ADC use a Multi disciplined team comprising:

HSE

Technical

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TUBULAR HANDLING

ADC Control Systems Specialists

ADC are well placed to conduct tubular handling and drill floor machinery handling surveys by utilising fully trained and experienced Control System Specialists

ADC INSPECTORS DURING TRAINING

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TUBULAR HANDLING

ADC HSE Specialists

ADC HSE specialists are hand picked for their industry related expertise and knowledge. Particularly with regard to competence assessment and load handling safety best practice.

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TUBULAR HANDLING

Methodology,

A similar methodology is used for each individual rig:

- Construction of unique Tubular Handling Assessment Matrix
- Physical Inspection of Equipment
- Observation Practical Tubular Handling Operations
- Production of Report and Observation List

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TUBULAR HANDLING

Matrix

For each Rig a unique Tubular Handling Assessment Matrix is produced in conjunction with the rig operator.

The Matrix provides structure to:

- The various Tubular Handling Operations under review

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TUBULAR HANDLING

Typical Matrix

Processes, Procedures

Operations →

Equipment →

Rig Name: East Azeri Platform
Type of Rig: Drilling and Production Platform
Owner: BP
Drilling Contractor: KCA Deutag
Inspection conducted by: 1) Cameron Laing and 2) Steven Harris
Position: 1) Senior Project Engineer and 2) Safety and Environmental Senior Specialist
Completed between the dates of the 6th September 2014 and 12th September 2014.

	Process inclusion within procedure?	Equipment inclusion within procedure	Is equipment included within ACS	Visual condition of Equipment (Proximities etc.)	Equipment included within PMS?	Equipment operated as per work instruction	Equipment in Manual/ Automatic/ Maintenance Mode	Equipment not Blind/Undeliverable within control system	No alarms present on Equipment	Confirmation of Status of Internal Interlocks	Confirmation of interlocks between each piece of Equipment	Communications Status present with PLC?	Confirmation the LIR status is same as Driller's Saucer Equipment	IDC capability	Remote Diagnosis history of equipment?	Confirmation of communication/ sight of operator and equipment	Access restrictions to IDC / Cranes etc.	Utilisation of tools for job / is correct tool available and being used	GAP analysis between Procedure and Industry document	GAP analysis between Training and Competency and stated requirements
A. Boat to Pipe deck		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		n/a
North Deck Crane	n/a							n/a			n/a	n/a	n/a		n/a	n/a			n/a	
South Deck Crane	n/a							n/a			n/a	n/a	n/a		n/a	n/a			n/a	
B. Pipedeck to Tubular Feeding Machine		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		n/a
Palfinger Knuckleboom Crane (occasionally referred to as Pipedeck Pipe Handler or PDPH)	n/a																		n/a	
Tubular Feeding Machine (occasionally referenced as 'TFM' or 'Conveyor System')	n/a																		n/a	
C. Tubular Feeding Machine to Drill floor (Fingerboard)		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		n/a
Tubular Feeding Machine (occasionally referenced as 'TFM' or 'Conveyor System')	n/a																		n/a	
Eagle Light (occasionally referenced as 'ELT')	n/a				n/a	n/a	n/a		n/a	n/a			n/a						n/a	
Hydraulic Roughneck (occasionally referenced as 'Iron Roughneck' or Hydraulic Iron Roughneck' or HRN' or 'make up')	n/a				n/a	n/a	n/a		n/a	n/a			n/a						n/a	
Weatherford Overdrive	n/a			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			n/a		n/a	
Vertical Pipehandling Equipment (occasionally referred to as VPH or Bridge Crane or BRC)	n/a				n/a	n/a	n/a		n/a	n/a			n/a						n/a	
Fingerboard (occasionally referenced as 'Monkeyboard')	n/a				n/a	n/a	n/a		n/a	n/a			n/a						n/a	
D. Pipedeck to Well Centre		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		n/a
Palfinger Knuckleboom Crane (occasionally referred to as Pipedeck Pipe Handler or PDPH)	n/a																		n/a	
Tubular Feeding Machine (occasionally referenced as 'TFM' or 'Conveyor System')	n/a																		n/a	
Eagle Light (occasionally referenced as 'ELT')	n/a				n/a	n/a	n/a		n/a	n/a			n/a	n/a					n/a	
Drawworks	n/a																		n/a	
DDM (occasionally referenced as 'Elevators' or 'DDM Pipe Handling Equipment')	n/a			n/a															n/a	
Hydraulic Roughneck (occasionally referenced as 'Iron Roughneck' or Hydraulic Iron Roughneck' or HRN' or 'make up')	n/a				n/a	n/a	n/a		n/a	n/a			n/a						n/a	
D. Drill floor (Fingerboard) to Well centre		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		n/a
Fingerboard	n/a				n/a	n/a	n/a		n/a	n/a			n/a						n/a	
Rotary Table (occasionally referenced as 'RT')	n/a				n/a	n/a	n/a		n/a	n/a			n/a						n/a	
Vertical Pipehandling Equipment (occasionally referred to as 'VPH' or 'Bridge Crane' or 'BRC')	n/a				n/a	n/a	n/a		n/a	n/a			n/a						n/a	
Lower Guide Arm (occasionally referenced as 'LGA')	n/a				n/a	n/a	n/a		n/a	n/a			n/a						n/a	
Drawworks	n/a																		n/a	
DDM (occasionally referenced as 'Elevators' or 'DDM Pipe Handling Equipment')	n/a			n/a															n/a	
Power Tong	n/a				n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			n/a		n/a	
Manual Slips	n/a				n/a	n/a	n/a	n/a	n/a	n/a			n/a	n/a	n/a		n/a		n/a	
Hydraulic Roughneck (occasionally referenced as 'Iron Roughneck' or Hydraulic Iron Roughneck' or HRN' or 'make up')	n/a				n/a	n/a	n/a		n/a	n/a			n/a						n/a	
E. Well centre to Downhole		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		n/a

CRITICAL	Essential equipment, processes, or systems that were used inappropriately, exceed operational limits, were out of service or obsolete to a point that may lead to loss of life, a serious injury or environmental damage.
MAJOR	Essential equipment, processes, and systems that were being ineffectively used, approaching operational limits or experiences some downtime to a point that may lead to damage to essential equipment or have a detrimental effect on the drilling operation.
MINOR	Equipment processes & systems that may have minor deficiencies observed that may lead to a situation that contributes to an incident or circumstance in which the required standard of operation was not met.
OK	Equipment processes & systems were observed to be operated within their operational limits or to which the required standard for operation was met.

Observation Categories

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Documentation review

Typically:

Equipment
- Equipment List

Management System
- Detailed instructions for Tubular Handling

Details of DROPs or Tubular Handling Incidents.

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TUBULAR HANDLING

Scenarios

The various process involved in moving tubulars from supply vessel to well centre and return is evaluated.

However, other tubular handling scenarios can be defined and audited. e.g. Casing and liners.

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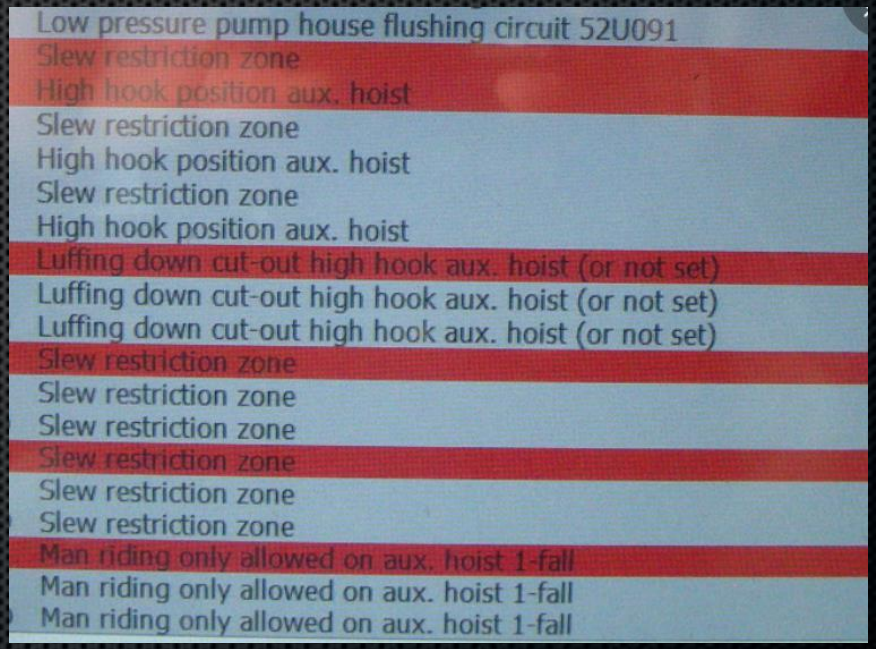
TUBULAR HANDLING

Visual Inspection of Equipment

- Mechanical inspection of equipment



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TUBULAR HANDLING

Assessment of Crew Competence

Crew List Qualification Matrix
Training Matrix
Crew Interview

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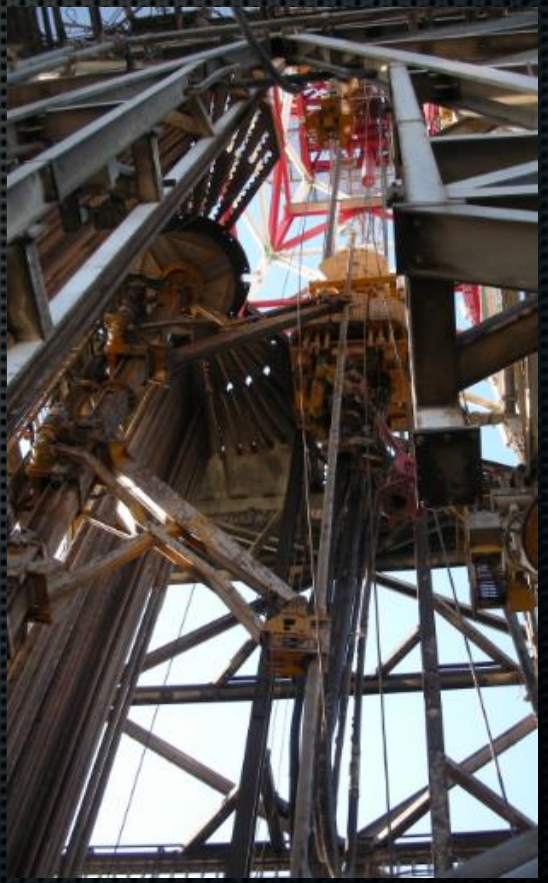
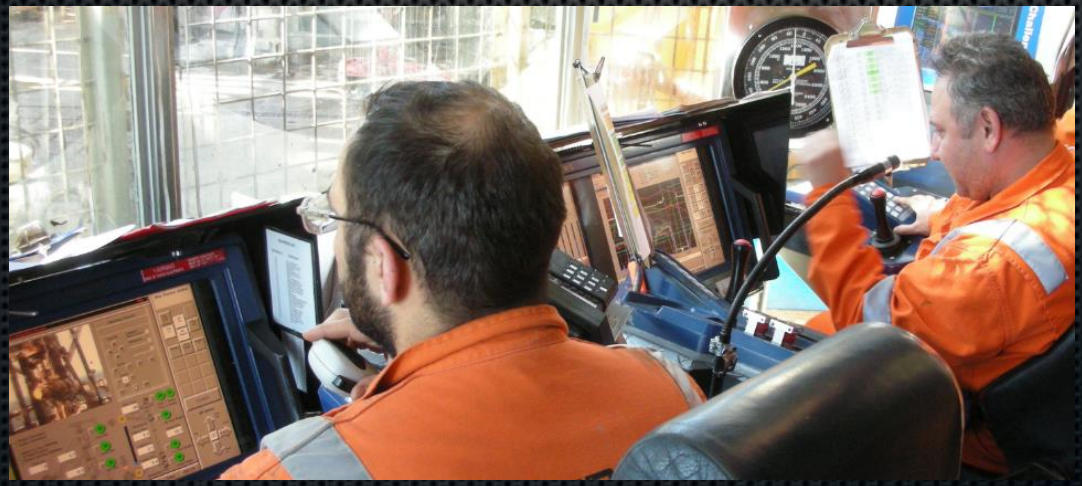
TUBULAR HANDLING

Observe Operations

Review Job Pack

Witness operations





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TUBULAR HANDLING

Crew Interview

Discuss processes and procedures for

- Normal Operations
- Non standard modes of operation

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EXAMPLE FINDINGS

Procedures

- Over Complex Management system.
- Duplicated work orders and checklists.

Result

- Use of incorrect procedures. Normal lift procedures when blind lift is being carried out.

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Typical Findings

Boat to Pipe Deck Lift Plan

The lift plan used was classified as a routine lift, further inspection (Observation from the Crane) highlighted that all lifts to the pipe deck from a vessel by the port crane would actually be a blind lift. Another lift plan (blind lift) was found in the system. The inspector witnessed both lift plans being used during the inspection.

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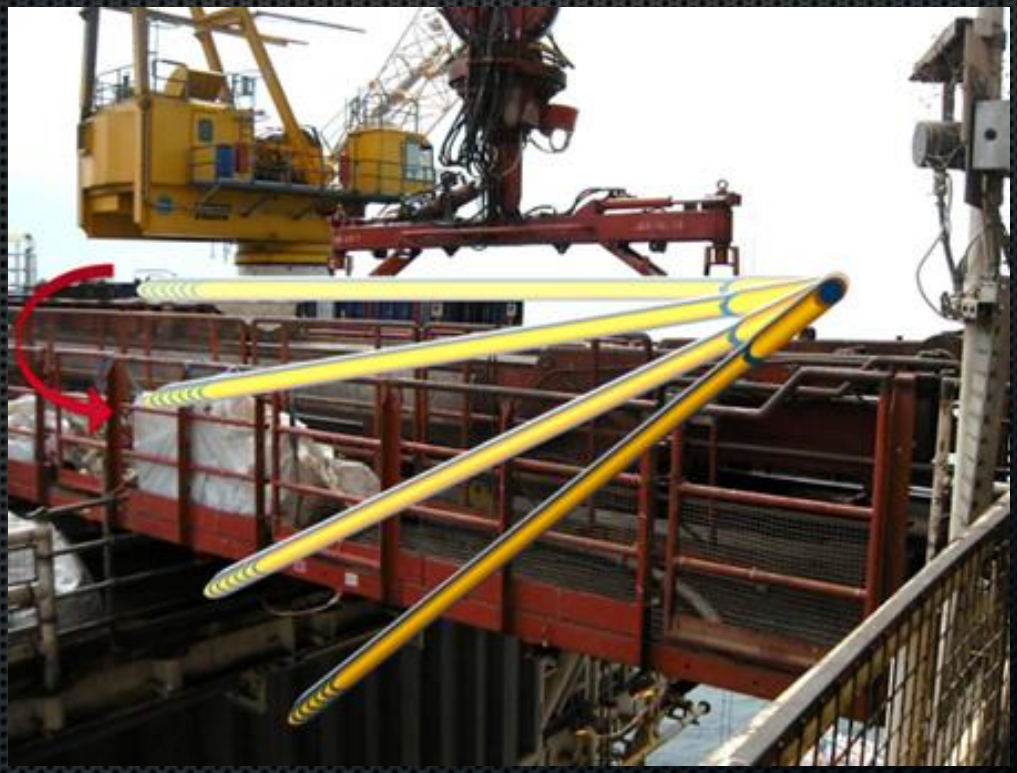
EXAMPLE FINDINGS

OEM Bulletins not embodied:

Pipe Deck Pipe Handler



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A product bulletin identifying the potential for a dropped object incident on the Pipe Deck Pipe Handler (PDPH) had been issued by AKER in 2012.

Change was not implemented until a after a further dropped object incident involving the PDPH had occurred in 2014.

This called into question the processes and procedures for handling Product and Safety Update bulletins..

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A request for Details of OEM Bulletins resulted in the discovery of NOV Gripper Yoke Software Change - Product Information Bulletin

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Previous incident - 5” drill pipe (HWDP) slid out of a NOV standard 20“ gripper yoke.

The crane operator was using the gripper yoke with the pipe support de-activated.

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NOV recommended a small change in the software program for the pipe support function on the gripper yoke.

This software change would automatically activate the pipe support when the gripper claw is closed.

Software Update was not embodied

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Other findings - Confusing Indications

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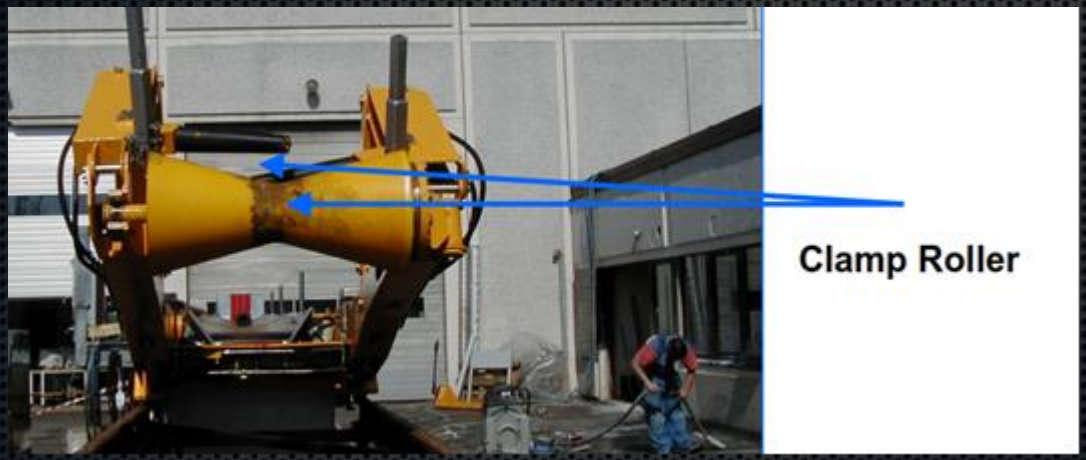
TUBULAR HANDLING

As Fitted on Rig
Clamp missing

Equipment

Missing parts

Pipe securing clamp fitted as designed.



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TUBULAR HANDLING

QUESTIONS

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