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ENGINEERED

PERFORMANCE

WORLDWIDE

TUBULAR HANDLING RECENT FINDINGS

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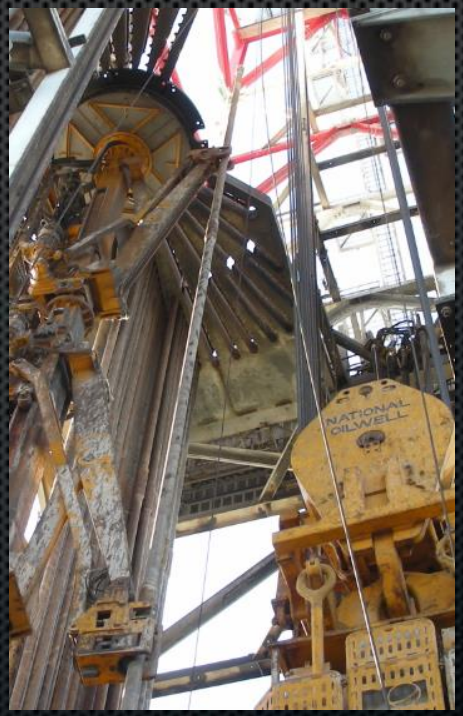
PRESENTED BY:
Stewart Gillies

TUBULAR HANDLING

Aberdeen Drilling Consultants presented the methodology for Tubular Handling Assessments at the DROPS forum last year

The purpose of this presentation is to discuss recent findings Tubular Handling Assessments



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TUBULAR HANDLING Content

- Recap Tubular Handling Methodology
- Provide Examples of Findings
- Questions

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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

Team

ADC use a Multi disciplined team comprising:

HSE

- Health and Safety Specialist

Technical

- Control System Specialist
- Mechanical Specialist (on less technically advanced rigs)

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TUBULAR HANDLING

Scenarios

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

Typical Tubular Handling Scenarios include:

- Supply boat to Pipe deck transfer
- Pipedeck to Drill Floor transfer
- Standbuilding/ Stand breakdown
- BHA Construction
- RIH /POOH
- And the return processes

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

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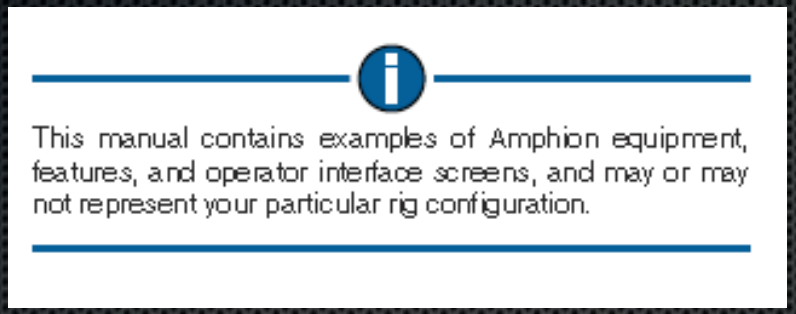
TUBULAR HANDLING FINDINGS

Documentation review



- Substandard documentation providing insufficient information. Particularly, regarding control system software and interlocks.
- Generic Documentation by OEM, not covering the specifics of the equipment as fitted to the rig.
- Poor Document Control Onboard – out of date documentation.

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TUBULAR HANDLING FINDINGS

Documentation review

- Over complex management systems.
  - Operators had multiple work instructions.
  - Conflicting information between shifts.
- Use of outdated procedures.
  - Procedures do not match equipment.
  - Cut and paste from previous rigs
- Impractical checklists and procedures.
  - Anti Collision system checklist was to be completed on a daily basis but no tests could be carried out due to drilling operations.

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TUBULAR HANDLING FINDINGS

EXAMPLE FINDINGS

- OEM Bulletins not embodied.
- Incomplete training and inadequate records.
- Faulty equipment not being repaired promptly resulting in work arounds.
- System Overrides required to be activated during routine operation.

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TUBULAR HANDLING FINDINGS

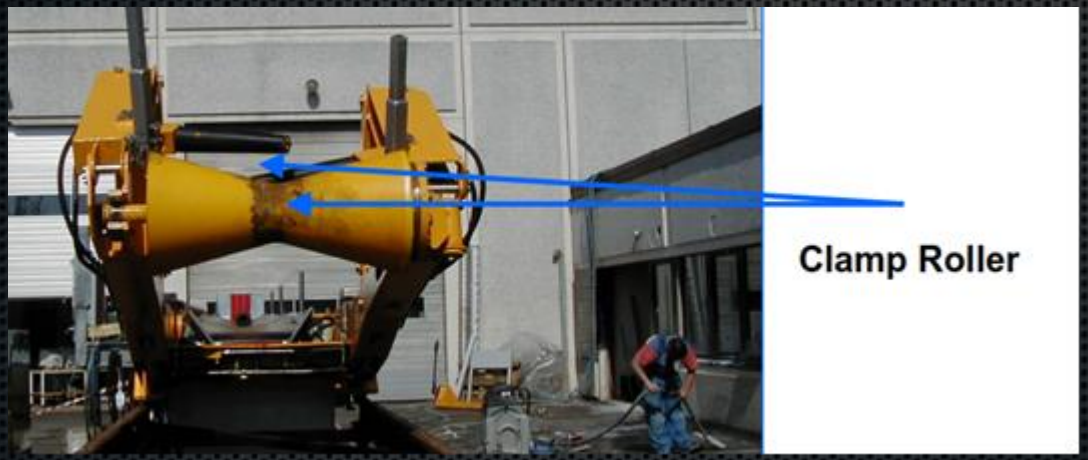
Equipment Visual Inspection

As Fitted on Rig
Clamp missing

Equipment

Missing parts

Pipe securing clamp fitted as designed.



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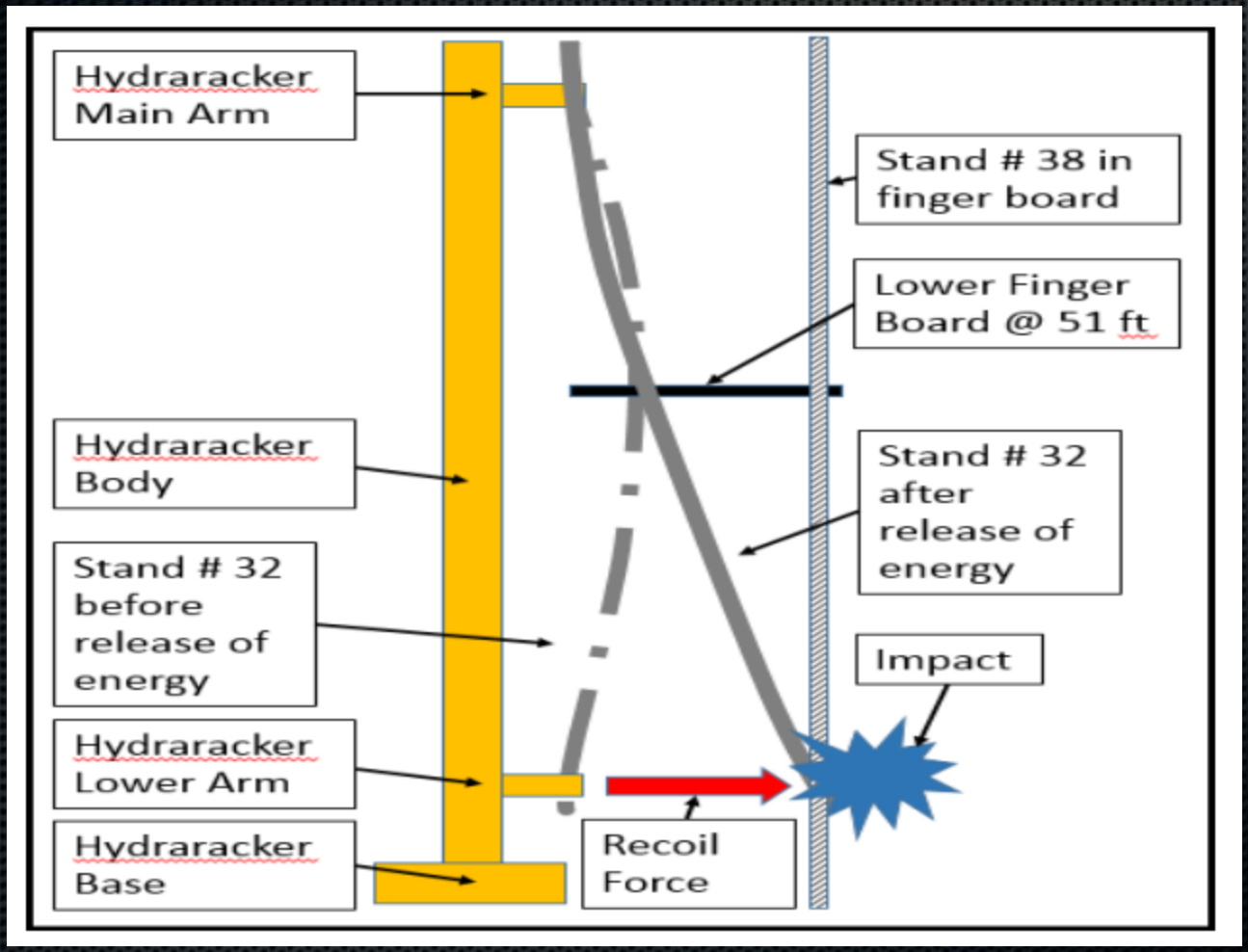
TUBULAR HANDLING FINDINGS

IADC Alert 15-10 Fatality on Drill Floor



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TUBULAR HANDLING FINDINGS

Each finger has mechanical locking latches which are:

- Closed by springs
- Opened by Pneumatic Pressure.

Pneumatic piping /hoses are connected from the Valve Cabinet to each pneumatic latch cylinder.

Safety Features

The latches are all of failsafe design. If air pressure is lost, each latch will lock down with the mechanical return spring.

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TUBULAR HANDLING FINDINGS

Control System

During operation, the operator selects which row to use. The locking latches then open to grant the stand access into the slot.

The Fingerboard is controlled by a Valve Cabinet mounted in the Derrick close to the Fingerboard. The Valve Cabinet contains solenoid valves connected to a Remote IO unit.

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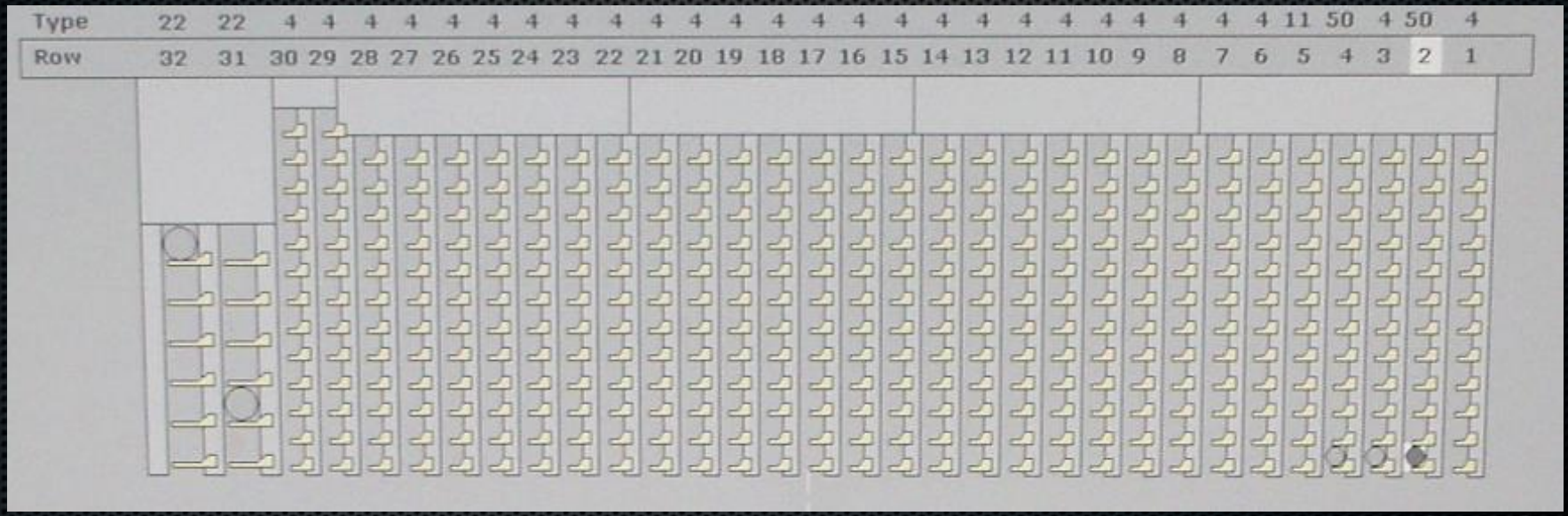
TUBULAR HANDLING FINDINGS

Control System

These I/O s provide feedback information to the driller that the solenoid is activated and on the drillers screen the finger appears as open. However, this does not mean that the finger is actually open.



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TUBULAR HANDLING FINDINGS

Visual Back Up

Most rigs use a system of visual back up or CCTV system.

Finding

From the roughneck position outside of the Red zone, it was not possible to see the position of the fingers on areas of the fingerboards. More than one occasion.

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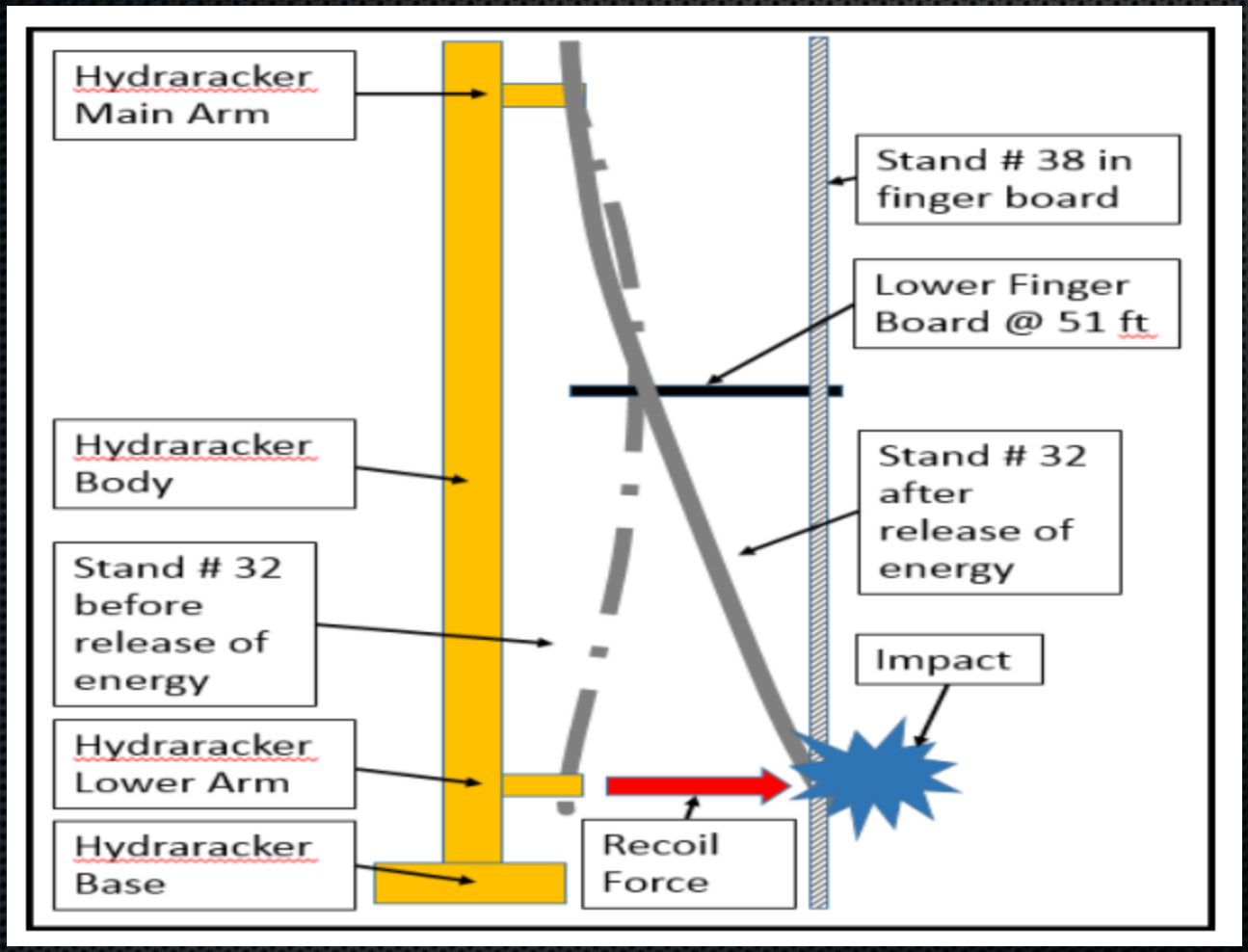
TUBULAR HANDLING FINDINGS

IADC Alert 15-10 Fatality on Drill Floor – repeat possibility remains



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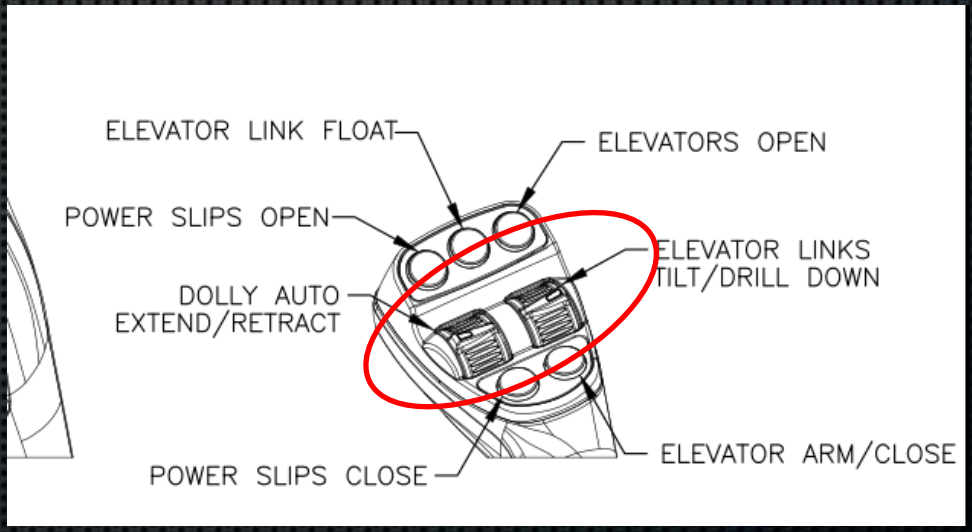
Finding

The Drillers chair Dolly Retract (Left switch) and Elevator links tilt (Right switch) were virtually identical tactile buttons placed next to each other on the right joystick.

It was considered to be very easy to inadvertently press the left switch whilst intending to press the right. Regardless of whether the Dolly was selected in Auto or Manual Mode, the Stick top switch was always active.



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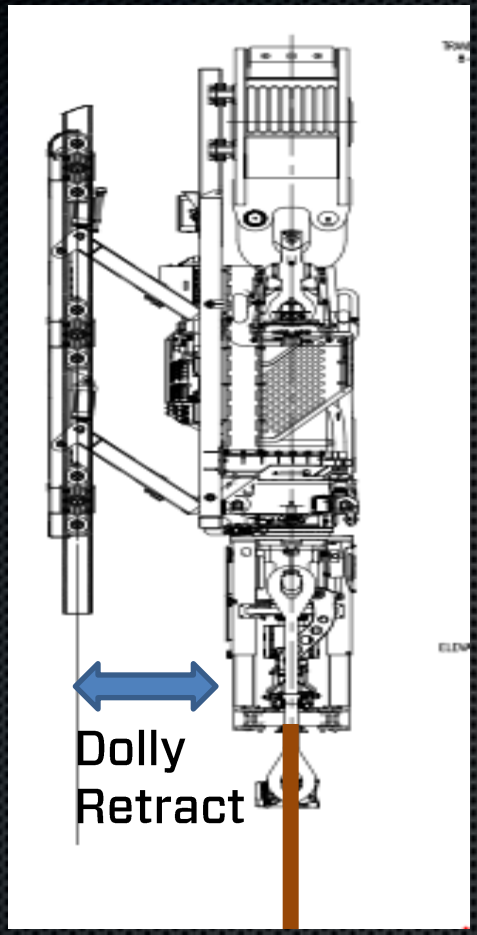
TUBULAR HANDLING FINDINGS



Drill pipe

- In Auto mode the Dolly fully retracted upon activation of the switch.
- In Manual Mode the Dolly retracted only as long as the button was activated.

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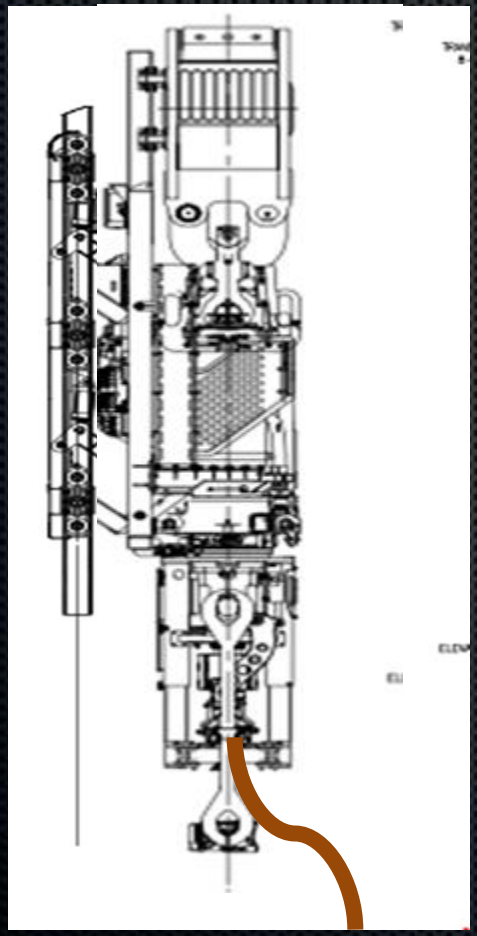
TUBULAR HANDLING FINDINGS



Drill pipe

Potential Consequences

- Inadvertent dolly retraction could result in a bent drill pipe, damage to the rotary table and damage to the top drive.

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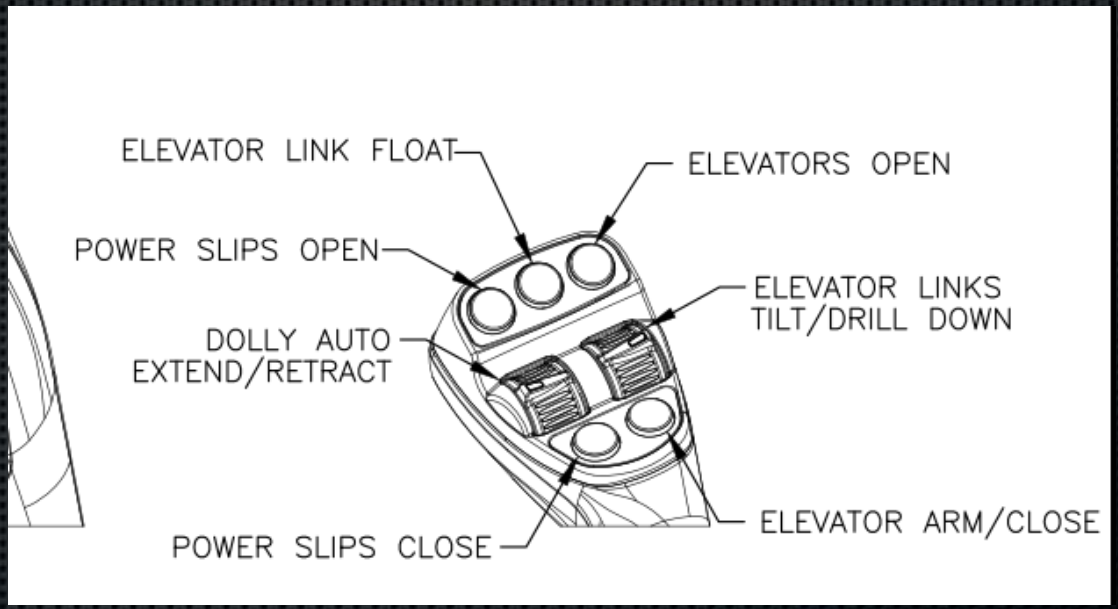
TUBULAR HANDLING FINDINGS

Lesson Identified

Contrary to OEM documentation, ADC suggested that the dolly should only be operated in manual mode. Thus, if the button was inadvertently activated, the operator would be more likely to identify the movement and cease the operation before the dolly had moved any significant distance.



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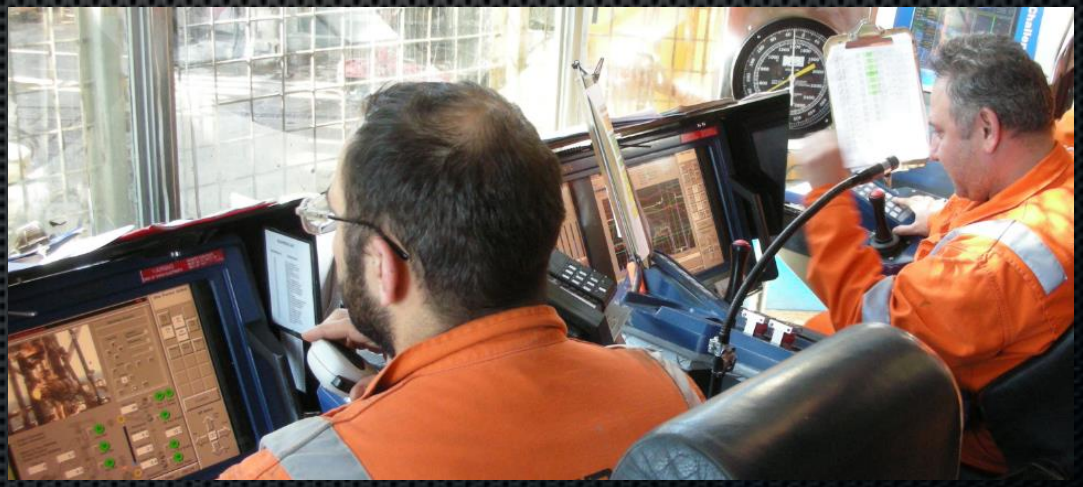
Assessment of Crew Competence

- In the rig competence system , there was no reference to zone management or anti-collision systems (beyond the Crown-O-Matic or other modern equipment such as Cyberbase chairs.
- Individuals had recently been assigned to the Rig Type from a lower Specification rig series and were deemed competent despite not having met the requirements stated within the CAP relevant to an employee moving asset type.



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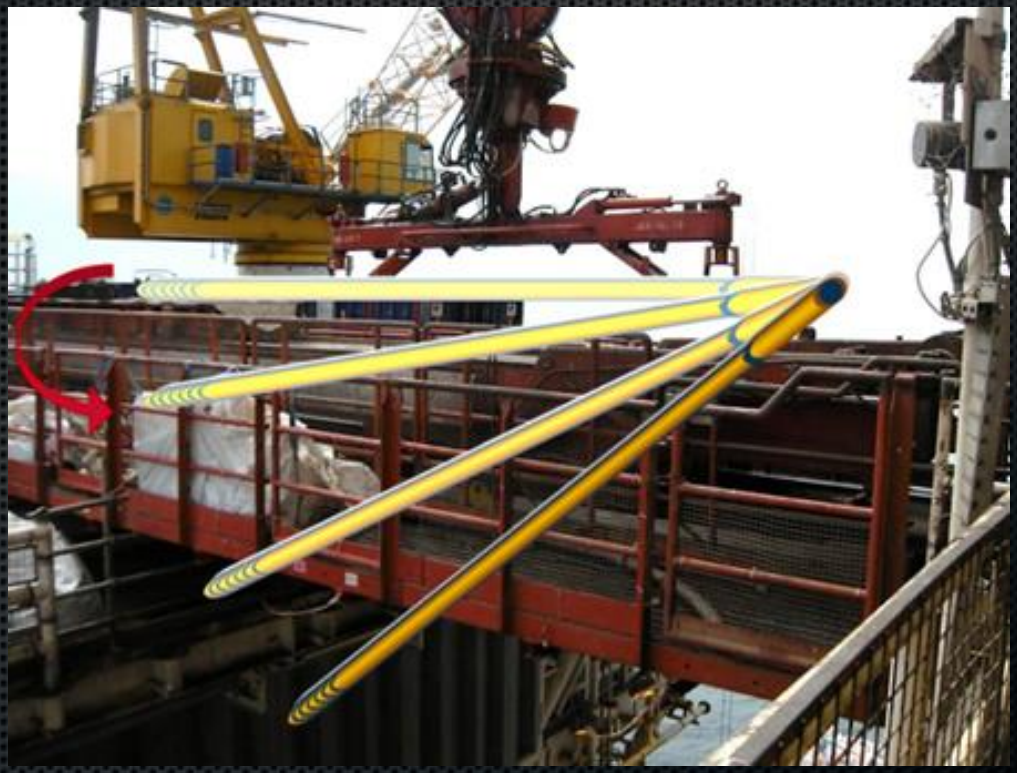
TUBULAR HANDLING FINDINGS

EXAMPLE FINDINGS

OEM Bulletins not embodied:

Pipe Deck Pipe Handler



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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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Another finding with this yoke was incorrect setting of the mechanical stop. This can cause the pipe support to be too far away for the size or number of tubulars being lifted and result in them being unsupported.

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QUESTIONS

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