

Preventing Dropped Objects – Introduction of the KCAD Maintenance to Operations Handover Certificate

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5th December 2019

KCA Deutag is a leading international drilling and engineering company working onshore and offshore with a focus on safety, quality and operational performance

www.kcadeutag.com



KCAD DEUTAG

Operating safely, succeeding globally.

Why create another form?

A few years ago in a galaxy far away:

A KCA Deutag Operated Rig had a Near Miss - HIPO Dropped Object

Brief summary of Incident:

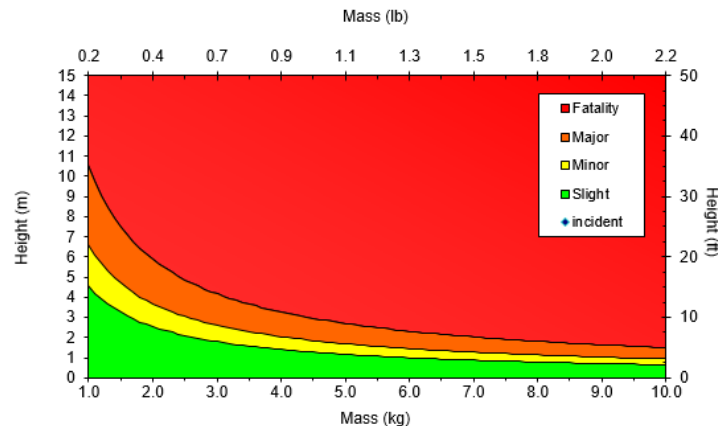
A piece of cable tray parted and fell from the Bridge Racking Crane (BRC) Drag Chain to the Rig Floor below.

Weight of parted cable tray = 1.1kg

Height = 27 metres



Outcome Calculator	
Height	27 m
Mass	1.1 kg
Outcome	Fatality



Why a HIPO Dropped Object

The piece of cable tray & positions of crew members



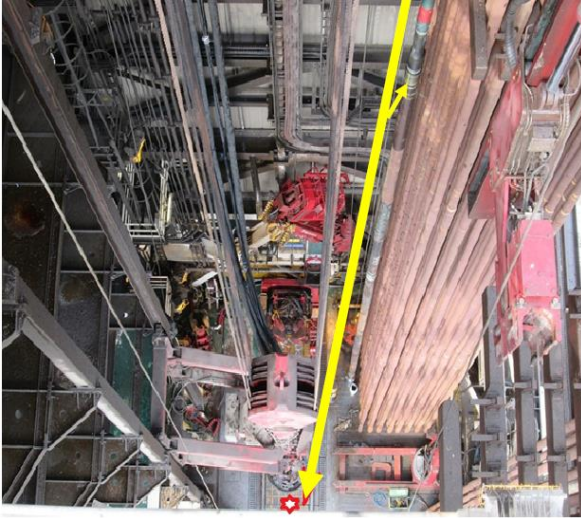
The dropped piece of cable tray weighting approximately 1.1 kg.



This photograph shows the position of personnel on the drill floor at the time of the incident, highlighting the dropped object potential.

Why a HIPO Dropped Object

The DO pathway and the damage to the cable tray



View from derrick giving approximate path cable tray fell to the rig floor.



The damaged East West cable tray above the Drag Chain.

Why a HIPO Dropped Object

The routing of the camera cable



The routing of this rig's camera cable is on the outside of the hydraulic swivel head.



A N other Rig - Camera cable is routed through the centre of the hydraulic swivel head (correct method).

Why a HIPO Dropped Object

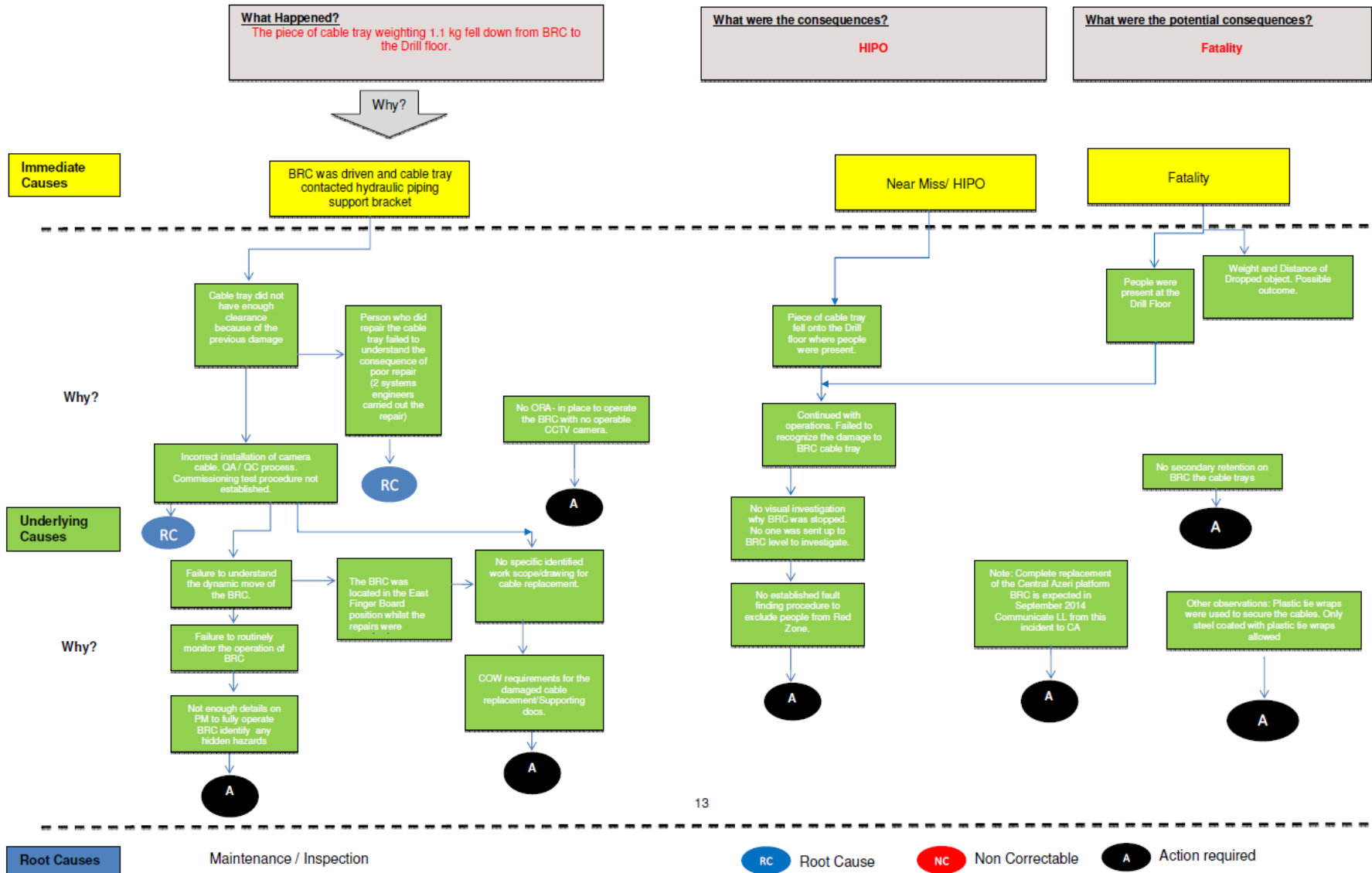
Section of Incident Time Line

Date	March
	BRC camera not working fault in cable
Date	21 st June
	New cable had been received and the BRC camera cable replaced using similar routing as previously installed
Date	27 th June
	Tested BRC camera as BRC was moved in and out of the East fingerboard. Test not carried out on the West fingerboard due to limited access
Date	1 st July
	Signed of camera Guidance on Certification (GOS)
Date	2 nd July
	During the normal operation of the BRC, it was noted that the BRC graphic in Drill view was in the incorrect position and that the camera had also stopped working. A visual inspection of the BRC revealed that the camera cable had parted and 2 x faulty encoder connections were found at the junction box. Re-terminated encoder cables, tested ok. Camera cable isolated and the deformed end of cable tray was straightened.
	Investigation took place, but could not identify the reason why the cable had parted.
Date	3 rd July 2014
	Pictures sent from another Rigs BRC showed a different routing of the camera cable - not around the outside as fitted on the DO Rig but routed down the center of the swivel.
Date	21 st July
	Investigation ongoing -- suspected that the cable installed was short for the application required.
Date	27 th July n- day of Dropped Object
	BRC was driven to West fingerboard to rack back landing stand. BRC was returning to the center position between East and West fingerboards, it was identified the BRC was showing the incorrect position in Drill view. Shortly afterwards a piece of cable tray dropped down to the rig floor.
Date	28 th July
	Incident investigation team sent out to the Rig to gather information.
Date	4 th August
	Incident team meeting at KCAD office. Root Cause Flowchart

If we had fully investigated the reason why the cable tray had been deformed at this point the HIPO Dropped object would not have occurred.

Why – Root Cause Analysis

Kelvin TOP SET RCA



Why – Causes

Immediate & Underlying

Immediate cause:

- Parting of the camera cable pulled the cable tray down, leaving insufficient clearance in between the cable tray and the hydraulic pipe work on West side of the Bridge Racking Crane (BRC) travel path resulting in the BRC cable tray making contact with the hydraulic piping support bracket causing damage to cable tray

Underlying causes:

Tools / Equipment not adequately maintained.

- Cable tray was not repaired correctly after the camera cable was damaged on the 2nd July
- The camera cable which was installed previously was too short. No camera cable installation work scope assessment was carried out. The position of the BRC at the time of installing the camera cable was facing east requiring the cable to turn/travel 180 degrees when going west.

Why – Causes

Underlying continued

Task/Activity hazards not recognised:

- Commissioning test procedure not established resulting in BRC being returned to service with incorrectly routed cable
- Schematics/drawings for the required work scope to replace the camera cable were not available.
- Operations were continued after failing to recognise on 2nd July the significance of the damage (which was straightened at the time) to BRC cable tray.
- KCAD failed to risk assess the full extent and consequences of the damage to the BRC cable tray
- No thorough investigation as to why the BRC “stopped” prior to the incident on the 27th July
- No one was sent up to the BRC level to investigate possible damage to the BRC & instead personnel were allowed on drill floor before fault finding the issues with the BRC were completed.

Why – Causes

Root causes

Maintenance / Inspection:

When the camera cable parted on 2nd July and attempts to repair the cable tray were made there was a failure to:

1. Understand the consequence of the poor repair 2nd July. Equipment put back in service with no clearance of the cable tray and hydraulic pipe clamps on West side of the BRC travel path
2. Commissioning back to service procedure not established resulting in BRC returned to operation with incorrectly routed cable.

Corrective Actions

Recommendations/Actions

1. Obtain fabrication drawings from OEM for installation of cable tray and supports and forward the drawings to all Maintenance Supervisors within KCAD
2. Review all OEM BRC cable tray installation and supports against as built drawings. The cable tray is required to have a minimum of 2 supports with one being at the end of the cable tray run.
3. Cable trays which do not meet the minimum standards in Action item No.2 are to be reported to OEM as a non-conformance.
4. Review PM and include detailed dynamic checks of BRC following regular monthly maintenance (moving equipment).
5. As per the initial alert KCAD Alert rev1, item 7 - During any fault finding or investigation of overhead equipment operation, clear all personnel away from potential drops zone and barrier off the area. This statement shall be captured in all Work Guideline "Control & Prevention phrases" section.
6. **Develop and implement a procedure for the handover of any equipment after any intrusive maintenance work has been completed or repaired to deem such equipment fit for purpose.**
7. Develop and implement a procedure for bringing back into service equipment that has been idle for seven days or more including a fully dynamic test prior to use.
8. Audit OEM Management of Change procedure for maintenance and upgrades.
9. **OEM to review and report the requirements for secondary retention on all possible dropped objects on OEM supplied equipment used at height.**
10. CATS action (GEN category) to be raised instructing all maintenance personnel on the requirement to record all damaged or defective equipment in the daily maintenance report and an Operational Risk Assessments (ORA) must be in place before any equipment is used when not 100% operational/functional.
11. Complete review of BRC drop object protection.
12. Contact SKN and establish procedure and policy on the use of steel cable ties
13. Obtain wiring diagrams if available for the cable routing of the BRC camera cable
14. Produce a LL report and distribute to all KCAD operated platforms, client and KCAD corporate office.

Corrective Actions


Item 6

Develop and implement a procedure for the handover of any equipment after any intrusive maintenance work has been completed or repaired to deem such equipment fit for purpose.

As the HSSE Manager for the KCA Deutag Offshore Business Unit I decided to ensure that the Maintenance to Operations Equipment Handover Certificate was implemented World Wide within the Offshore BU.

“A learning organisation acts”

Questions?

		Maintenance to Operations Equipment Handover Certificate																																																	
Installation:																																																			
Permit No:		Equipment / Service / Circuits :																																																	
Work Carried Out:																																																			
<table border="1"> <thead> <tr> <th colspan="4">HANDOVER CHECKLIST</th> </tr> <tr> <th>Activity (KCAD Maintenance Department)</th> <th>Name</th> <th>Signed</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td>1. Confirm all work has been completed.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2. Confirm all tools and equipment have been removed from worksite.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3. Confirm all permits and isolations have been signed off.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4. Confirm a full functional and operational check has been carried out.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>5. Carry out Dynamic Drops inspection and check for potential dropped objects. (Refer to DROPS inspection picture book)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>6. Confirm handover to KCAD Operations.</td> <td></td> <td></td> <td></td> </tr> <tr> <th>Activity (KCAD Operations)</th> <th>Name</th> <th>Signed</th> <th>Date</th> </tr> <tr> <td>1. Confirm all work has been completed.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2. Confirm a full functional and operational check has been carried out.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3. Confirm acceptance from Maintenance Department that the equipment is ready for use.</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				HANDOVER CHECKLIST				Activity (KCAD Maintenance Department)	Name	Signed	Date	1. Confirm all work has been completed.				2. Confirm all tools and equipment have been removed from worksite.				3. Confirm all permits and isolations have been signed off.				4. Confirm a full functional and operational check has been carried out.				5. Carry out Dynamic Drops inspection and check for potential dropped objects. (Refer to DROPS inspection picture book)				6. Confirm handover to KCAD Operations.				Activity (KCAD Operations)	Name	Signed	Date	1. Confirm all work has been completed.				2. Confirm a full functional and operational check has been carried out.				3. Confirm acceptance from Maintenance Department that the equipment is ready for use.			
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As from _____ hours on _____ the above noted plant / service / circuits may be charged and operated by Drilling staff.																																																			
Maintenance Supervisor (or Senior On Shift Person On Nights):	On Shift Senior KCAD Drilling Representative:	Client Representative (if applicable):																																																	
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