

# Dynamic Dropped Objects

and Offshore Helicopter Operations

# Dynamic Dropped Objects

## Dynamic Dropped Object <sup>1</sup>

*Any object that falls from its previous position due to applied force. For example impacts involving travelling equipment or loads, snagging on machinery or stacked items, motion, **helicopter downdraft** or **severe weather**.*

### ENVIRONMENTAL FACTORS:



Gravity is an inherent hazard in every workplace. When combined with constant exposure, sea motion and severe weather conditions, the risk of dropped objects increases significantly. During all tasks, particularly transport, lifting and working at height, take special care to identify and mitigate dropped object incidents that can be caused by environmental factors.

- Temperature (cold hands, sweaty hands, materials perishing)
- **Winds and Helicopter Downdrafts** (box lids, doors, signage, meteorological equipment, stacked items)
- Sea Motion (stacked items, shelving, loose items, suspended items)

- Load Movement (forces exerted on loads during transportation and lifting, eg. road conditions, turning, braking etc)
- Ice and Snow (icicles, ice build-up, hard packed snow – can also obscure loose items)
- Rain (accumulations in buckets and vessels can add significant weight)
- Mud and Sand (can add weight but also obscures loose items, particularly on cargo units)

Fog, poor light, sun light, darkness can also become contributing factors when vision is critical to safe operations.

<sup>1</sup> Source: Dropped Objects Awareness and Prevention, Reliable Securing Rev 4    *Best Practice Recommendations for the securing of equipment and tools at the worksite*

# The scenario

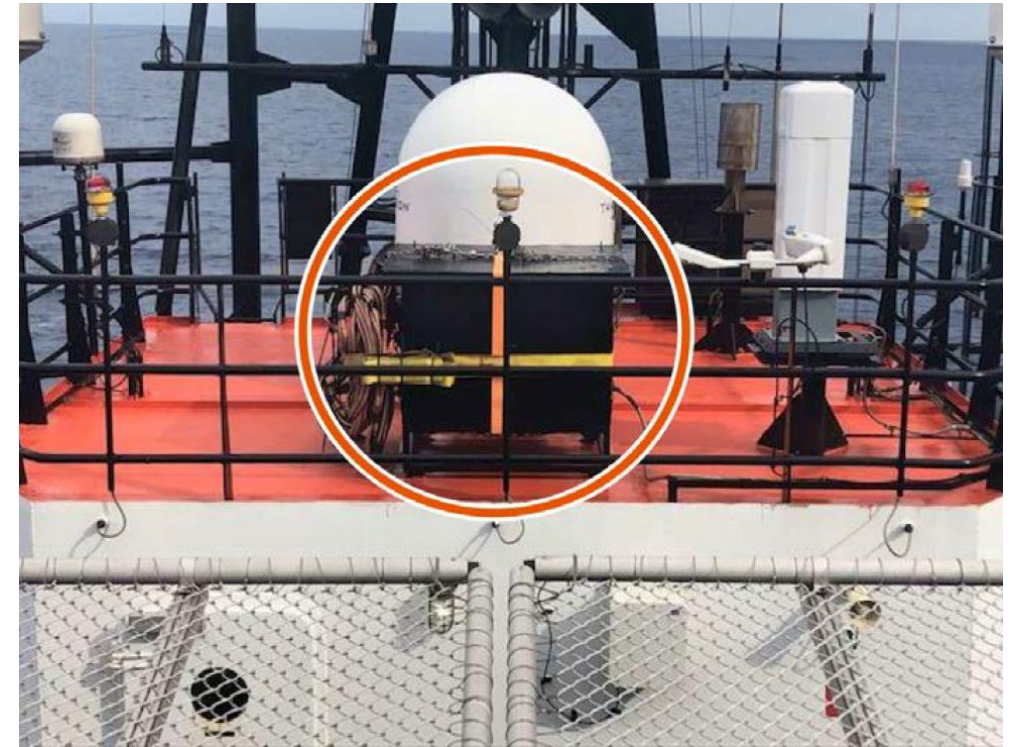
## Helicopter approach to support vessel helideck

Sikorsky S92 helicopter approaching a vessel helideck for routine landing.

Helicopter restarter kit located in a box positioned on the monkey island, located aft of the helideck and not part of the helideck structure.

Lid of the restarter kit normally secured by a ratchet strap and four bolts. The strap had not been re-attached after routine maintenance conducted. Furthermore one of the four bolts sheared as a result of galvanic corrosion.

The downdraft of the arriving S92 dislodged the 10kg lid which was blown overboard and 75 feet below into the water.



*Figure 1: Circle indicates lid on restarter kit*



A crew change chopper landed and the windsock located to the STBD side of the helideck became dislodged from its mounting ring and was sucked into the main rotor blades of the helicopter. The pilot shut the helicopter down and inspected the blades and found one blade had suffered damages.

### INITIAL FINDINGS

- The windsock was attached to the windsock pole by small black zip-ties (quantity unknown)
- The proximity of the windsock and pole may be within the Limited Obstruction Sector and not in compliance with CAP437 (requires further investigation with RM-22).
- A 'D' shaped hole was found on one of the main rotor blades. A new blade was shipped from Tanajib to the Drilling Rig by boat.
- Maintenance removed the damaged blade and installed the new blade overnight. A ground balance test was completed and found within specification.
- Aircraft flown back to Tanajib last night and arrived at 00:25am.
- Maintenance performed a track and balance on the aircraft. The aircraft was returned to service at 9:48am on November 24<sup>th</sup>.

### INITIAL RECOMMENDATIONS:

- Send request to Drilling, Marine, and Offshore Producing Department:
  - Inspection of all windsock poles and windsocks for condition and security.
  - Replace all windsock showing any sign of wear around the attachment points.
  - Replace all windsock fasteners and all ensure that all attachment points are being utilized.



**Facts:** A Billy Pugh personnel transfer basket and fibre glass box were blown from the emergency generator roof to the main deck below. The incident occurred when a crew-change helicopter was landing on the helideck. The box and the Billy Pugh, of an estimated combined weight of 200kg fell a distance of 10.6m, with a potential of 20797 joules. The box struck the corner of a container before reaching the deck. The corner of the box was damaged, but the Billy Pugh was not. No injuries were sustained. The area on the main deck that the box landed on was not a designated walkway and the area was clear for helo ops.

### Causes:

The box containing the Billy Pugh had been deliberately located in position (for approx 5 months) to limit boom movement & for ease of access for previous operations prior to the rigs arrival in Australia. The box was positioned on 2" dunnage (which provided an air gap). The lid had been secured to the box, however the box was not secured to the deck. The design of the box (i.e. large surface area) contributed to it being lifted by rotor wash from the (EC225 aircraft). Significant critique had been placed on helicopter operations, in the lead-up to the first aircraft arrival. Planned inspections had been conducted by competent personnel, where the box had not been identified as a hazard.

### Actions/learnings:

even heavy objects (more than 200 kg), or objects seemingly unlikely to be moved by helicopter downwash should be assessed as potential hazards. Re-inspect helidecks with this scope.



Outline of where box was situated & final position where it came to rest



# The issue (from an aviation perspective)

## Helideck Inspections

Helideck inspections are conducted typically on an annual frequency in the oil & gas environment.

Inspection includes helideck operations encompassing Helideck Landing Officer (HLO) duties and responsibilities.

Inspection **includes** Foreign Object Debris (FOD) management of the immediate helideck environment. Loose items, rubbish, flakes of paint, positioning and management of bags, carriage of loose papers etc.

Inspection **does not** interrogate how facility/ vessel manage their **dynamic dropped objects** which is the discipline that will capture **management of loose objects** from helicopter downdraft (or severe weather events) over the whole facility.



### IOGP Helideck/helipad review checklist

IOGP Report 322

Published June 2019

Supporting IGO Report 590 - *Aircraft Management Guidelines, Version 2*

Refer to Sections B - Emergency Response, C - Personnel Competence, D - Aircraft Operations, F - Helideck Facilities, S3 - Cold Weather Operations, S4 - Night Operations

#### Introduction

This helideck inspection checklist provides inspection personnel with basic criteria to follow to establish if operational helidecks are conformant with industry requirements for safe operations. The checklist is not intended to override any specific regulation required by the country of operation and should be adapted to reflect regional requirements.

Originally published in 2011, this tool has been updated to reflect the most recent industry guidance, in particular that of ICAO and the most recent version of IOGP Report 590 - *Aviation Management Guidelines*.

This spreadsheet is locked for editing. You can only enter comments in the white boxes or tick-boxes. Existing text (in grey) in the white boxes provides clarifying guidance.

Users of this tool are encouraged to provide feedback on content, layout, and functionality. Please email: [publications@iogp.org](mailto:publications@iogp.org)

General information	
Name of facility, installation or vessel	
Owner/operator	
Type (Refer to ICAO Heliport Manual Chapter 1.1 & 1.2)	if other, please describe
Country of operation	
Regulatory authority	
Approval certificate	
Limitations (Helicopter Landing Limitations Plate)	
Periodic review category or interval	other, please state periodicity
Reviewer/inspector	
Review date	
Previous review date	
Signature	

# What good looks like

## Conduct of a Dropped Object Survey

- Dropped Object Inspection picture book
- Dropped Object Survey Report
- Failed items list

### Annex H Permanent and Temporary Equipment At Height

Figure H. 1 – Inspection Quick Reference Guide

Stab-Rite Securing Systems - Quick Reference				
Item	Description	Securing and Retention Method	Dwg.	Photo
1	Derrick Adapter Connector (Saddle) - Right	2 Pins each c/w Lynch Pin Retainers / Each Pin c/w Lanyard	1	1
	Derrick Adapter Connector (Saddle) - Left	2 Pins each c/w Lynch Pin Retainers / Each Pin c/w Lanyard		2
	Derrick Adapter Connector (Saddle) - Bottom	1 Bolt / Nut c/w Cotter Pin	1	3
2	Bed Plate	2 Pins each c/w 4 Bolts (Lock Washers)		4 & 5






Photo 1	Derrick Adapter Connector (Saddle) – Left Side	Photo 2	Derrick Adapter Connector (Saddle) – Right Side
			
Photo 3	Derrick Adapter Connector (Saddle) – Bottom	Photo 4	Bed Plate – Left Side
			

Figure H. 2 – Example DROPS Inspection Picture Book

Dropped Objects Survey Report - Crown and Water table - Area 1					
Photo	Ref	Description / Location	Fastening Method	Condition	Control
	CWN010	Crown block sheaves and pins, central crown	Primary Securing : Bolted with lock nuts Secondary Retention: Lock wire	Condition : ( X ) Pass ( ) Fail Comments : Satisfactory	Monthly
	CWN012	Dead line deflector sheave, Aft Crown	Primary Securing : Bolted with lock nuts Secondary Retention: Lock wire	Condition : ( X ) Pass ( ) Fail Comments : Satisfactory	Monthly
	CWN014	Fast line sheaves, fwd Crown	Primary Securing : Bolted with lock nuts Secondary Retention: Lock wire and safety chain	Condition : ( X ) Pass ( ) Fail Comments : Satisfactory	Monthly
	WTT006	Timber block crown saver, underside of crown	Primary Securing : Bolted with lock nuts Secondary Retention: Lock wire, safety chain and 4 part shackle	Condition : ( X ) Pass ( ) Fail Comments : Satisfactory	Monthly



# How the helideck inspection can assist

**Amend the IOGP Helideck review checklist by adding 4 areas:**

Dynamic Dropped Objects - Impact of Helicopter Downwash		
62	Helideck crew pre-inspection of the helideck environment (helideck, all access points and fireguard stations) for Foreign Object Debris (FOD) and dynamic dropped object potential	<i>Confirm Helideck Team procedures require pre-arrival loose object and FOD check for the helideck environment. This should include lightweight items and fixtures that may require securing in place to avoid being lifted or moved and then becoming a dynamic dropped object. New items introduced to the helideck environment should be risk assessed for dynamic dropped object potential.</i>
63	Offshore installation/facility/vessel management of dynamic dropped objects that extend well beyond the immediate helideck environment	<i>Review the process the offshore installation or vessel has to manage minimisation of dynamic dropped object events. Review Dropped Survey Assessment, local risk assessment, Dropped Object Inspection Book and detailed visual infographic showing specific items and proper methods of retention. Sample conduct of periodic inspections, means of securing and accuracy of photographic documentation.</i>
64	Access to industry safety shares and DROPS safety alerts	<i>Review the safety awareness material used by the facility/vessel in providing awareness of dynamic dropped objects and helicopter downwash.</i>
65	Assessment of the offshore facility/installation/vessel in management of dynamic dropped objects that extends well beyond the immediate helideck environment	<i>From a helicopter operations aspect, rate the offshore installation or vessel as 'High awareness' of dynamic dropped objects' (all 3 dynamic dropped object questions listed above are satisfactorily addressed). 'Medium awareness' of dynamic dropped objects' (2 of the 3 questions satisfactorily addressed) 'Low awareness' of dynamic dropped objects' (1 or 0 of the 3 questions satisfactorily addressed)</i>



# Industry collaboration

## **Possible further interaction between DROPS and IOGP Aviation Sub Committee (ASC)**

1. Develop a shared understanding of dynamic DROPS awareness based on helideck inspection feedback.

Action: Ongoing. DROPS community to provide feedback on suggested DRAFT helideck inspection inclusions

2. IOGP ASC to provide reports of helicopter related dynamic dropped load events.

Action: ASC Working Group (WG) to raise at January IOGP ASC to present suggested ongoing activity

3. Development of safety promotional information – posters/videos.

Action: ASC WG to raise at January IOGP ASC to present suggested ongoing activity.



**MAERSK VENTURER**

All personnel should report to radio room for safety induction.

Days without Lost Time Accident

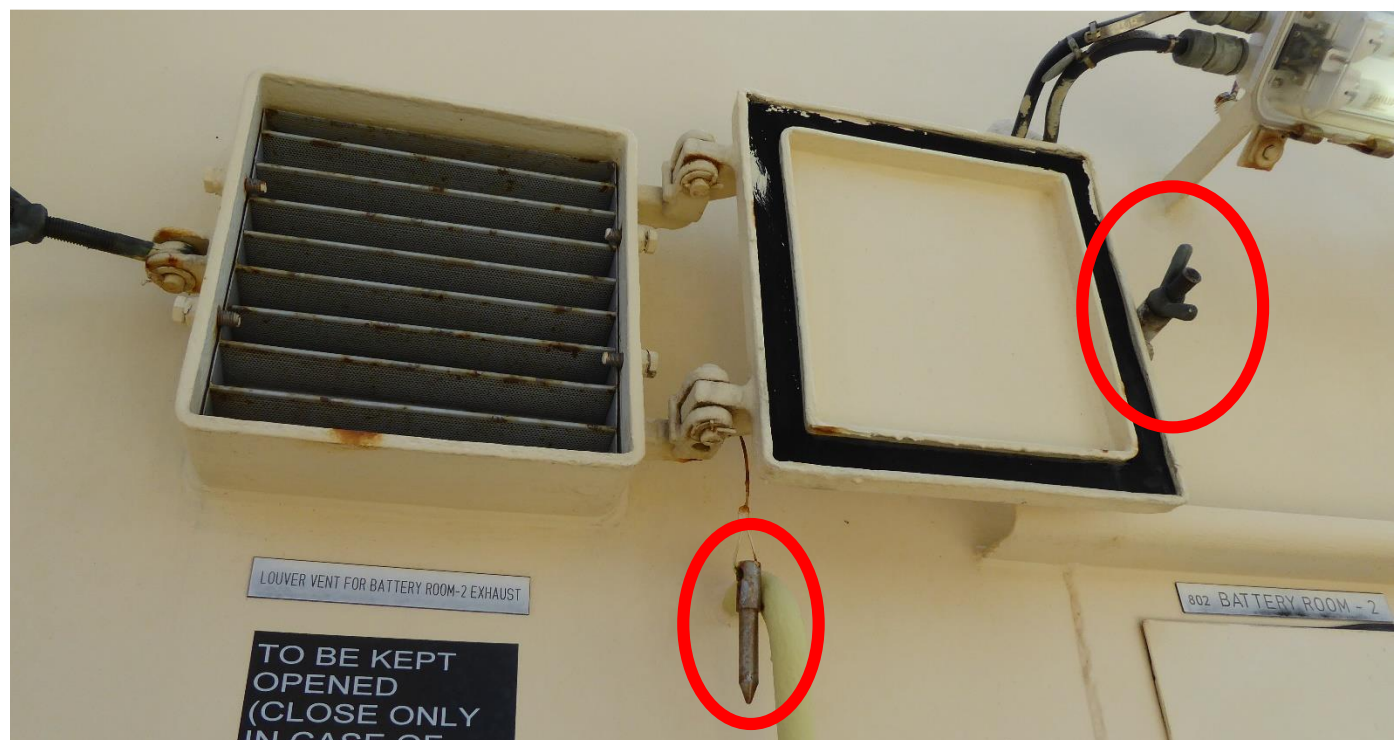
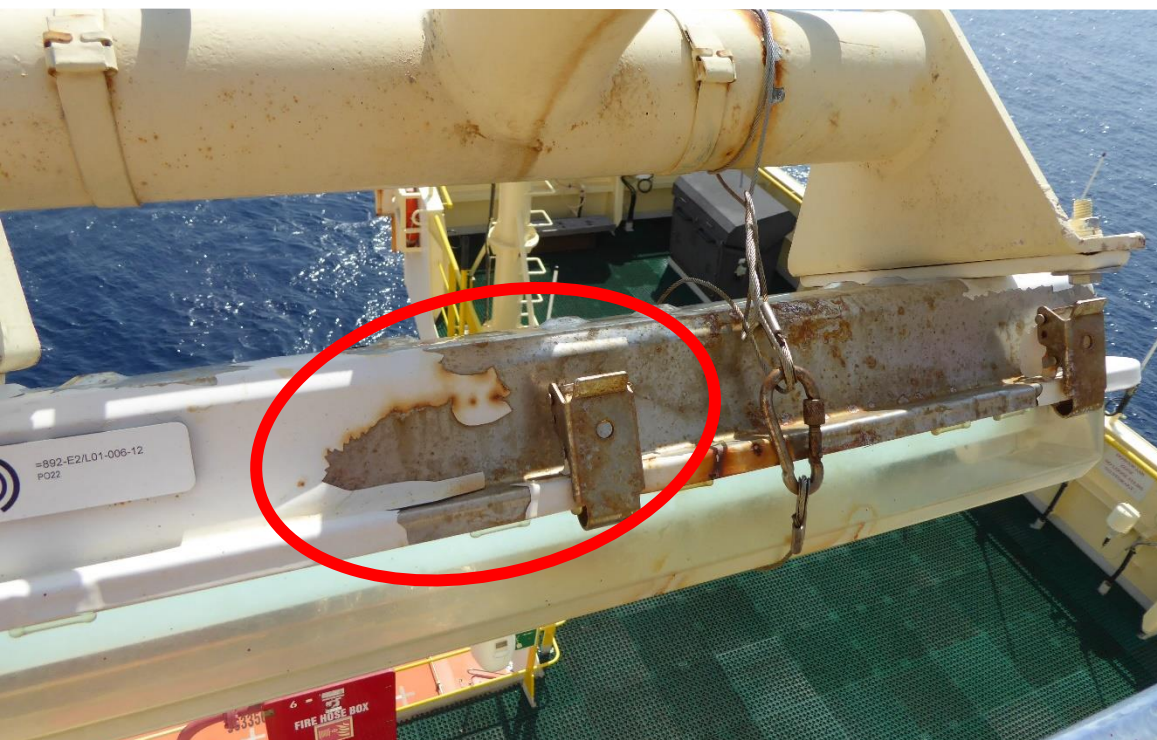
6	5	7
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Days without Major Events

0	4	5
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# Conclusion

**Sticky notes for your ideas**

**Feedback will be consolidated and sent to IOGP Aviation Helideck workgroup**

**DROPS to develop an awareness pack**

**Seeking feedback on suggested 'draft' helideck inspection inclusions no later than Friday 15<sup>th</sup> December 2019.**



**Ideas???**