

Management elements for the prevention of dropped objects

SfS Recommendation 024E/2018 – Part 2



SfS
Samarbeid for Sikkerhet

Prepared by the Working Together for Safety Working Group October 2018	Version history: Version 1	Working Together for Safety Project Manager: <hr/> Hugo Halvorsen
Applies from: January 2019	Next revision: 2023	Approved by the Working Together for Safety Board, Chairman: <hr/> Dag Yngve Johnsen

Table of contents

- 1. Introduction 2**
- 2. Design 2**
- 3. Production 3**
- 6. Transport 4**
- 7. Installation/completion 4**
- 8. Operations 4**
 - 8.1 Training 4
 - 8.2 Cleanliness and tidiness 5
 - 8.3 Inspections and ‘hazard hunts’ 5
- 9. Maintenance/repairs/modifications 6**
- 10. Decommissioning/disassembly 7**
- 12. References and links: 7**

1. Introduction

Through an established management system within the individual company, all industry participants (operators, drilling entrepreneurs, shipowners, service companies, manufacturers, suppliers, goods carriers and base operators) shall implement measures that ensure a reduction in the number of dropped objects (DO) and prevent future incidents.

The management system shall cover adherence to the company's procedures, routines for the follow-up of dropped objects and the measurement of results. The system shall be included in the company's inspection plan. The management system shall be part of the company's governing documents for preventive HSE work, and reflect the industry participant's overall objectives with regard to injuries and accidents.

In order to prevent DO, management elements must be in place throughout the entire value chain. This part of the Working Together for Safety Recommendation 024E/2018 describes the entire value chain and the elements that must be included to prevent DO.

'Recommendation 024E/2018: Prevention of dropped objects' consists of four parts:

Part 1: Handbook focused on operative personnel

Part 2: Management elements for the prevention of dropped objects

Part 3: Functional requirements for the establishment of visualised inspection systems

Part 4: Posters – Securing objects correctly

Two crucial aspects of all HSE work are an understanding of risk and barrier mindset. Risk comprises probability and consequences, in addition to uncertainty relating to these. The probability and consequences of DO can be substantially reduced through good planning and the establishment of barriers throughout the entire value chain, from design to operations and maintenance.

2. Design

Good design lays the foundation for a safe and DO-free workplace. Risk assessments and analyses focusing on dropped objects shall be carried out for the design of all equipment that is planned to be used at height. Wherever possible, any relevant findings from the analysis shall result in a re-design prior to starting production of the equipment. All decisions/choices made during the design phase must be able to be traced back to a risk assessment.

The weaknesses of the equipment that cannot be prevented through the design (re-design) shall be made known to the customer/user, so that compensatory measures can be assessed and implemented. Equipment that still poses a risk of DO shall preferably be secured using secondary barriers (ref. Part 1: Handbook, Chapters 4 and 7–10). If this is not possible, a securing device shall be added by the supplier. For new installations, or when

installing securing devices on existing equipment, an up-to-date user manual and maintenance instructions shall be made available.

All equipment shall also be designed so that inspection and maintenance can be easily carried out without a risk of DO. The system used to secure the equipment must tolerate the maximum load to which the equipment may be subjected.

Suppliers of complex equipment (cranes, top drives, pipe handling equipment, etc.) shall be able to supply image-based inspection and maintenance manuals that identify possible DO (ref. Part 1: Handbook, Chapter 3.3.2, and Part 3: Functional requirements), and include a description of how barriers shall be inspected and maintained.

All tools must also be designed so that they can be properly secured. Securing devices must be dimensioned in accordance with the maximum fall energy for the equipment.

3. Production

Production shall be carried out in accordance with recognised standards and specifications. A risk assessment focusing on DO shall be performed for any changes made to the design during the production phase. All decisions/choices made regarding solutions must be able to be traced back to such a risk assessment. The performed risk analyses shall be documented, and made available upon request.

The finished product shall be inspected for potential DO before it leaves the manufacturing site. The inspection shall be documented (ref. Part 1: Handbook, Chapter 3.3).

4. Purchasing

When purchasing equipment, it must be ensured that the equipment has been designed and manufactured in accordance with this Recommendation in order to prevent DO. Buyers should consult individuals within the operating environment and others with similar experience in order to ensure that all purchases facilitate a safe working environment.

5. Packing and securing of loads

The supplier/sender shall package and prepare the equipment for transport, and use the correct load containers for the equipment in question. Load containers shall be approved in accordance with the Norwegian Oil and Gas Association's Guidelines 116. The sender shall also ensure that involved personnel have sufficient competence in how equipment should be packed.

The shipment shall be checked for loose objects prior to transportation, and the inspection shall be documented.

6. Transport

This includes transport to the quay/base, reloading at the base, sea transport, the lifting of the load for installation, internal transport onboard and return loads to base/land.

The base/facility shall check the load containers for loose objects on the vessel before the load is taken on board. This includes checking all types of pipes and risers for loose objects within the pipes themselves, as well as for any loose thread protectors and caps.

The captain/driver shall notify the installation/base if the load has been exposed to abnormal stresses or possibly been damaged during transport.

The load containers shall also be checked at the installation prior to internal transport or return.

7. Installation/completion

Securing devices in addition to the usual attachment methods shall be installed for equipment that constitutes a risk of DO. This secondary retention shall be accommodated during the design phase. The secondary retention shall tolerate the maximum load to which the equipment may be subjected if the usual attachment method fails. The maximum load must be able to be documented. All equipment shall be secured in relation to movement, vibration, load during use, temperature, corrosion, and wind and weather conditions (*e.g. securing equipment at sea*). Securing devices shall be included in the inspection and maintenance programme. In the event of the installation or attachment of new securing devices to existing equipment, a user manual / maintenance instructions from the supplier shall be made available or be created/updated.

Securing equipment shall be subject to regular maintenance and inspections to ensure that it functions as intended. Involved staff shall carry out a DO risk assessment and implement the necessary measures during both planning and the entire work process.

8. Operations

The Handbook, Part 1 of Recommendation 024 (Chapters 4 and 7–10), contains many tips and suggestions regarding checks that apply to work at height. The Handbook also contains information about understanding risk, barriers and reporting, which are all important elements in daily operations.

8.1 Training

It is recommended that training in inspection/observation techniques focusing on potential DO be included as a part of the training programme for all relevant personnel. In addition,

personnel who work at height should receive training in the correct use of securing devices and the use of fall arrest equipment.

Working Together for Safety has created a film which provides good tips on securing equipment to prevent DO:

<http://www.samarbeidforsikkerhet.no/modules/m02/article.aspx?CatId=139&ArtId=193>

See also the Norwegian Oil and Gas Association's website, 'Dropped Objects', where you can find both suggested measures <https://www.norog.no/en/operations/dropped-objects/action-on-dropped-objects/> and a training pack

<https://www.norog.no/en/operations/dropped-objects/dropped-objects/>

8.2 Cleanliness and tidiness

A high level of tidiness and cleanliness shall be maintained at all times.

The responsible company shall set a standard which constitutes an acceptable level of tidiness and cleanliness. The standard of tidiness and cleanliness within the various areas shall be visualised. Guidelines shall be developed for where all equipment shall be placed.

8.3 Inspections and 'hazard hunts'

The frequency of inspections of areas and equipment, both with and without the use of rope access, shall be based on a risk assessment. The starting point for this shall be an annual review of the entire facility. The frequency of inspections for certain parts of the facility/installation shall be increased or reduced in accordance with a documented risk assessment and subsequent conclusion and recommendation regarding the frequency of inspections.

Risk assessments should be based on:

- Inspections after the equipment has been exposed to significant stresses (adverse weather, jarring, collision, changed operations, new equipment, new loads, etc.).
- Inspections prior to upcoming significant known stresses (autumn storms, longer transportation routes, etc.).
- Environmental stresses to which the equipment is exposed during normal operation.

Time shall be allocated for the inspection of equipment that is in continual use or which is difficult to access due to its operation or location.

Nonconformities/findings should be documented using photos and text, and suggestions for corrective actions should be included.

8.3.1 Inspection programme

Equipment stored either permanently or temporarily at height and which involves a potential risk of DO shall be identified and visualised. Inspections shall be included, registered and followed up in the maintenance programme.

The inspection shall cover equipment that is installed at height but which is not in use. Whether such equipment should be removed shall be assessed.

Regular inspections focusing on DO shall be carried out in accordance with the visualised inspection systems.

Securing equipment shall be subject to regular maintenance in order to ensure that it functions as intended. Involved staff shall carry out a DO risk assessment and implement the necessary measures during both planning and the entire work process.

8.3.2 Hazard hunts

Regular 'hazard hunts' focused on identifying potential DO should be carried out in all zones/areas.

Hazard hunts may be based on specific topics or areas, and should be performed a minimum of once per week. Hazard hunts can be used to identify and minimise potential DO, as well as to help improve tidiness and cleanliness at the workplace. The Handbook should be part of the materials used in connection with hazard hunts.

8.3.3 Execution

It is recommended that personnel from other departments participate in such inspection and hazard hunt teams. It is particularly important that new/inexperienced members of staff participate in order to learn good observation techniques.

The use of a dedicated checklist / inspection guide is recommended for each area. These should be updated as and when new equipment is installed (preferably with pictorial descriptions).

9. Maintenance/repairs/modifications

For repairs, modifications and maintenance of a more extensive scope it may be necessary to introduce additional routines to prevent DO. This might include checklists for equipment that shall be used at height, and additional risk assessments due to a greater number of simultaneous operations.

In connection with modifications, it is important to ensure that user guides for new equipment are made available and reflected in the maintenance and inspection programmes.

Remember that maintenance/repairs have a relatively higher accident frequency than normal operations!

10. Decommissioning/disassembly

There is significant potential for DO during the decommissioning and disassembly of equipment. Good planning is therefore important – particularly in relation to the securing of heavy equipment that shall be removed from greater heights. All lifting equipment and lifting/rigging competence must be checked well before the work commences.

Factors that should be considered might include: In what order shall fixtures and securing devices be dismantled? How shall the weight of the equipment to be removed be verified? How shall the equipment be secured during interruptions/breaks in the work? What procedures apply in the event of stoppages due to e.g. adverse weather conditions / strong winds?

11. Transfer of experience, learning and continual improvement

It is important to learn from incidents involving DO, and to implement measures to prevent similar incidents from happening in the future. The lessons learned should be shared with relevant industry participants such as suppliers, the authorities, partners and other operators. It is also important to keep up-to-date regarding the development of new and improved (safer) products and to seek to ensure continual improvement.

The management system and procedures, etc., must also be regularly revised to ensure that they are up-to-date and reflect the current reality/technology.

12. References and links:

[Training pack for the prevention of dropped objects](#), Norwegian Oil and Gas Association

[Action plan to fight dropped objects](#), Norwegian Oil and Gas Association

[Summary of lessons learned](#), Norwegian Oil and Gas Association

NORSOK R-003 and R-005