NATIONAL OILWELL VARCO

# DROPS-HSE Tracker Ticket flow and questionnaire

Flow describing the use of Tracker Tickets that are HSE (dropped object related) and questionnaire used for incident investigation.

| REFERENCE; | REFERENCE DESCRIPTION |
|---|---|
| Replacing 10848534-PRO “DROPS Root cause Analyses” and 10848541-PRO “DROPS Tracker Ticket flow | **DROPS-HSE Tracker Ticket Flow and Questionnaire** |



**National Oilwell Varco**

Nijverheidsweg 45

4879 AP

Etten-Leur

| DOCUMENT NUMBER | REV |
|---|---|
| **111944381** | **10** |

## Revision history (Rigdoc)

| | | | | | |
|---|---|---|---|---|---|
| 10 | 15/10/2024 | Editorial | Anton Krijnen | Lukasz Szadkowski | K. Kjellevand |
| 09 | 11/07/2024 | Corrected | Anton Krijnen | Lukasz Szadkowski | Bente Heimdal |
| 08 | 11/03/2024 | Editorial | Anton Krijnen | Lukasz Szadkowski | Bente Heimdal |
| 07 | 12/09/2023 | Editorial | Anton Krijnen | Lukasz Szadkowski | Andrew Scaife |
| 06 | 22/08/2023 | Editorial | Anton Krijnen | Lukasz Szadkowski | Andrew Scaife |
| 05 | 28/01/2021 | Editorial | Anton Krijnen | Lukasz Szadkowski | Andrew Scaife |
| 04 | 27/11/2020 | Editorial | Anton Krijnen | Lukasz Szadkowski | Anton Krijnen |
| 03 | 10/19/2020 | Editorial | Anton Krijnen | Lukasz Szadkowski | Anton Krijnen |
| 02 | 7/1/2020 | Editorial | Anton Krijnen | Lukasz Szadkowski | Billy Gill |
| 10 | 03/12/2020 | First Issue | Anton Krijnen | Chris Hardy | Billy Gill |
| **Rev** | **Date (dd.mm.yyyy)** | **Reason for issue** | **Prepared** | **Checked** | **Approved** |

## Change Description

| **Revision** | **Change Description** |
|---|---|
| 01 | New release replacing 1084834-PRO and 10848541-PRO |
| 02 | Editorial changes clarifying actual flow with contact functions only. Names are listed in separate doucument. Expanded questionnaire and reordered some sections. |
| 03 | Changed one sentence in questionnaire |
| 04 | Clarify the QAM to be assigned |
| 05 | Add guidelines when customer is not responding on correspondance and when recommendation is not or cannot be implemented. |
| 06 | Updated the tracker ticket flow to reflect the work around as captured in Rigdoc document 115898390. |
| 07 | Added incident summary, preliminary RCA and referenced essential incident information to be added in Tracker FSM field prior to opening QPR. This information shall be copied in the relevant QPR fields prior to handing over to the PRE.<br><br>Added specific questionnaire example for elevator appendix B |
| 08 | Added group manager when enetering QPR and send notification through mail when QPR is created |
| 09 | Changed reference from document 10850689 to document 16650841-PRO (Procedure for Failure Mode, Effects and Criticality (FMECA)). |
| 10 | In general flow is followed. In several cases however AM is not informed after closing QPR and Tracker FSM ticket remains open. Updated flowe accordingly. |

# 1 Purpose and Scope

## 1.1 Purpose

The DROPS Engineering team provides support to all NOV employees that are involved in the design and building of NOV land and offshore drilling and handling equipment, field support to Aftermarket and sales personnel, and assistance with any activities related to dropped object prevention. The objective of the DROPS Engineering team is to ensure NOV follows industry best practices for secondary retention and dropped object prevention.

The DROPS team is responsible for developing NOV DROPS standards, providing guidelines for secondary retention and dropped object prevention, training for NOV Rig Systems employees, as well as increasing DROPS awareness.

This specific document is part of the awareness change process and it supports the proper follow up on those Tracker Tickets that are HSE/ Dropped Object related.

## 1.2 Scope

Provide a uniform entry and follow up sequence for HSE (dropped objects) related Tracker Tickets which includes responsibilities, registration, RCA and processing to closure.
The main points of focus:

- Evaluate request with care.
- Respond/ Process in a timely manner.
- Handle request proactively.
- Respond with relevant and professional explanation.
- Transparency.

# 2 General

## 2.1 Documentation

Supporting documents are usually revision controlled by local entities. When using any supporting documents make sure you are using the latest revision.

## 2.2 Confidentiality

All correspondence documented in Tracker is considered proprietary and confidential information which is the property of National Oilwell Varco, its affiliates or subsidiaries (all collectively referred to hereafter as "NOV"). Any customer specific information is treated in the same manner and shall not be used or distributed in any way that can harm or expose any of the involved parties.

## 2.3 Hyperlinks to NOV internal documents

When describing responsibilities and roles, only titles and mentioned in document 111944381 DROPS-HSE Tracker ticket flow and for that reason it can be shared with external parties outside NOV.

To simplify finding the proper NOV resource for internal users one can access document Resource overview (http://rigdoc.nov.com/Get.aspx?docid=112151293&LastReleasedFiles=1). This link provides access to a file showing the titles with the resource assigned. The same applies for Modelmanager (http://modelmanager.nov.com/Model) listing product Hierarchy setup and access to the NOV DROPS site using link NOV DROPS Site (https://inside.nov.com/rigtech/AftrMktSvcs/Global/DROPS/Pages/DropsHome.aspx). All three mentioned links can only be opened by NOV personal and are not for external use.

## 2.4 Abbreviations

| | |
|---|---|
| COE | Center Of Excellence. |
| EM | Engineering Manager. |
| HSE | Health Safety and Environment. |
| IPB | Internal Product Bulletin (is distributed only internally to advise Manufacturing, Spares, and Aftermarket of retrofit or upgrade opportunities and logistical or other equipment information. These bulletins can be released in conjunction with a PIB or Safety Alert to inform NOV personnel of any information related to the equipment. This type of bulletin is not released to the customer (end user) and does not require approval from NOV Legal). |
| NCR | Non-Conformity Report (QPR, QIR, PIMS, etc.). |
| PE | Product Engineer and/or Product Champion can be consulted in the green and yellow boxes |
| PIB | Product information Bulletin (specifies information regarding proper operation, updated requirements, improved maintenance procedures, or retrofit kits. A PIB shall be used in place of a Product Improvement Notification when a retrofit is needed for the equipment to adhere to the original functional design specifications). |
| PIN | Product Improvement Notification (is issued to specify product improvements for a specific piece of equipment and shall be written to include the product upgrade information with a clear justification of why there is an associated cost. Upgrades will be at the customer's cost). |
| POB | Product Obsolescence Bulletin (is released to inform the customer when NOV or our suppliers will no longer supply a component, sub-component, or product. POBs shall provide an NOV solution to the obsolescence and provide customers with as much time as possible to implement the solution. If there is not a current solution a POB will be revised per the bulletin revision policy and distributed once a solution is known). |
| PTD | Product Technical Director |
| PTM | Product Technical Manager. Although this individual is not necessarily the person that must take ownership, he/she must follow up if the process stalls and take corrective action to those that should take ownership. |
| QAM | Quality Assurance Manager. |
| QPR | Quality Performance Report. QPR ensures that information on failures of NOV equipment is ultimately reported back to the manufacturing and engineering groups responsible for a given |

| | |
|---|---|
| | product. These failures are then analyzed, root causes are determined, and the knowledge thus gained is implemented to improve the product. |
| RCA | Root Cause Analyses, training available in Achieve. |
| RI | Risk index (Procedure for Failure Mode, Effects and Criticality Analysis (FMECA) document “16650841-PRO”). |
| SA | Safety Alert (is a bulletin that specifically identifies a potential safety issue with the operation of the equipment and corrective action, if known. The issuance of a safety alert is mandatory when a Tracker ticket is marked with "HSE" unless there is an existing bulletin on the subject or the SA has limited effectivity (i.e. isolated to a single customer and a limited number of rigs or pieces of equipment) where issuance of a SA to all customers could result in confusion). |
| Tracker | Within Tracker, "Tickets" are entered and assigned to NOV personnel to log and track customers’ requests for the following tasks:<br>Inspections, Upgrades, Repairs, Installation and Commissioning and other interactions between NOV and our customers. |

# 3 Data collection and resources

## 3.1 Responsibilities, actions and Questions to ask

Responsibility and actions:

- Whenever there is a dropped object or unintended release of energy, a Tracker ticket shall be opened and HSE box tagged generating a QPR.
- Tracker ticket and/or QPR shall be referred to in the “cc” of all following correspondence.
- The Tracker ticket **shall be assigned to a specific single person as early as possible in the process.** The field name to be used for assigning in Tracker ticket calls out for “Responsible”.

For linking correspondence to tracker tickets and QPR’s:
add RS-USA-RSISBusAppTrk@nov.com in the cc,
add “(NOVi-xxxxxxx)” and “(QPRi-xxxxx)” for internal correspondence,
Or “(NOV-xxxxxxx)” and “(QPR-xxxxx)” for external correspondence.

Depending on the situation as a minimum, equipment involved, serial number, Rig name and location, should be asked.

Appendix A, can be used as guidance for asking more detailed and specific questions. Completing the questionnaire and correspondence back and forth with customer shall be linked to and is part of the process for driving the QPR to completion and the Tracker ticket to closure.

The goal is to limit the days an HSE related ticket changes to closed status. The average target days open to closure is published in the Metrics on the NOV DROPS Site.

## 3.2 Resource-Subscribed

Sr. Vice President RS-Aftermarket
Vice President Service and Repair Americas
Director Service North and South America
Senior Manager Service
Manager of the equipment being worked on
Service Supervisor of the equipment being worked on
Mid-Continent Region office manager if in their area
Aftermarket Technical Leader
HSE Manager
DROPS Team

## 3.3 Resource-Assigned

The product Hierarchy is setup and managed through Modelmanager within NOV. When a product involved in the incident is selected it will automatically assign the Ticket/QPR to the responsible QA person who then can assign resources depending on the issue. The assignee shall take appropriate actions including communication to get the QPR to completion and ticket to closure.

Modelmanager is setup such that QA representative assigned has quality responsibilities related to the subject equipment. In most cases the QA representative is located where the subject equipment is manufactured and /or where receiving of purchased finished equipment from external parties takes place.

In case multiple machines are involved, Product Engineer assigned at that point shall drive the ticket to closure and not revert to other product owner as an excuse. When needed coordinate with other product owners or higher-level deliverable responsible person integrating product functionality (for example software and Multi Machine Control) to get ticket to closure.

One off the DROPS members will review the correct assignment of the tracker ticket with the ticket creator within a maximum period of two weeks after ticket creation. This review will minimize delays due to improper assignments and clarification in the beginning of the process.

## 3.4 Ticket follow up

Progress of tickets is monitored on a monthly bases using metrics showing:

- number of open tickets,
- average age of closed tickets,
- average age of open tickets.

There are two types of metrics:

- Covering all incidents regardless of equipment and customer that will not be distributed to customers, however can be shown during customer meetings in a less detailed format.
- Covering customer specific incidents split per rig and equipment. These metrics can be shared with that specific customer for further analyses and follow up.

NOV representative to contact one of the DROPS members in case of metrics requirements. Metrics update is also available and updated on NOV DROPS site.

Each month a list with aging tickets will be shared with the responsible area and/or product responsible managers. They can on their turn direct the applicable tickets to their reports to get the most efficient follow up within an acceptable time frame. The objective is to get the tickets closed within the yearly defined and agreed upon target.

## 3.5 Area and/or product responsible

### 3.5.1 Engineering responsible

Engineering is responsible for providing technical follow up and support driving the issue captured in the QPR to completion. Within Rig Systems there are four main engineering groups identified:

- PCG
- Marine and construction
- Engineering Eastern
- Engineering Western

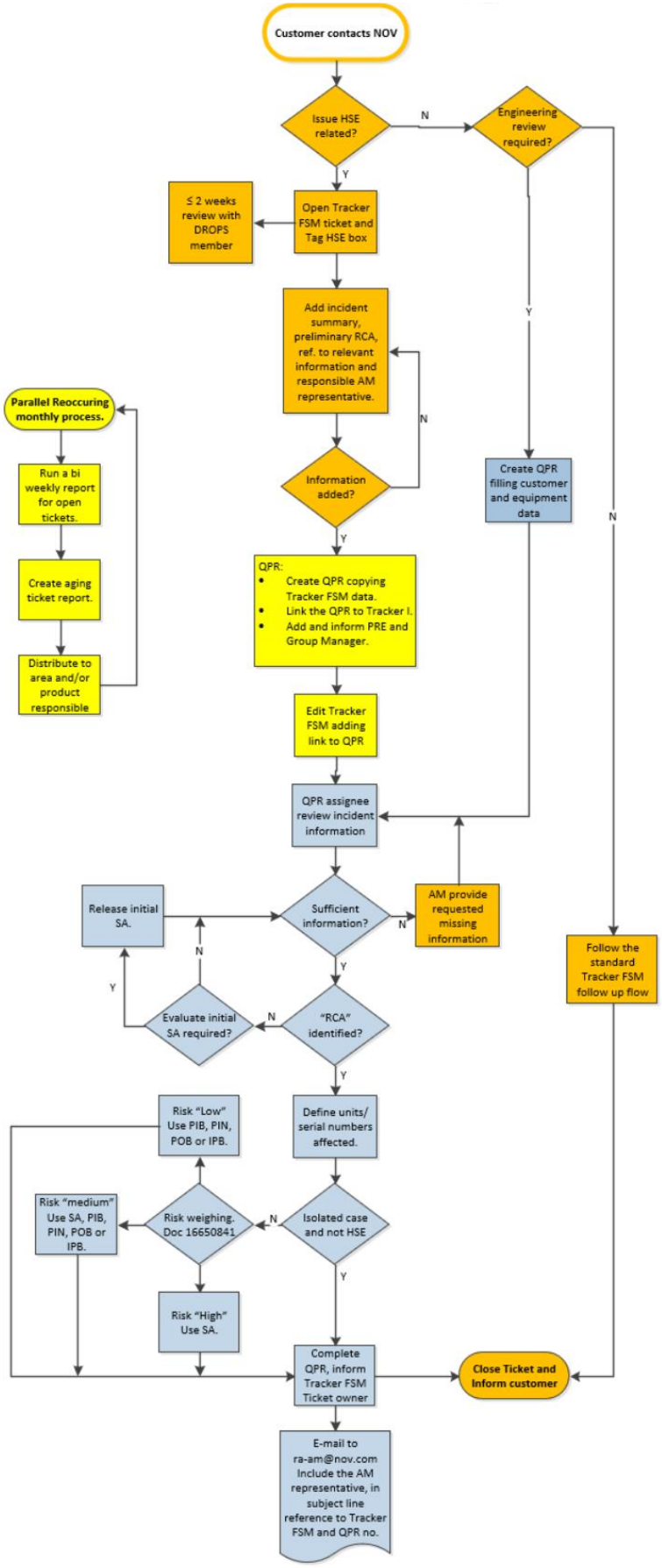
### 3.5.2 Center Of Excellence

Centre Of Excellence is an after-market group supporting customers having issues with equipment in any manner. In a dropped object scenario the Centre Of Excellence will have ownership of the case and coordinate between engineering and the customer during the RCA Within Rig Systems there are eight groups identified each assigned to a product group, system, area or a combination:

| Support group | Branch |
|---|---|
| COE 1 | Norwegian drilling equipment + Motion Compensation |
| COE 2 | Cyberbase & Fluide controls system |
| COE 3 | Marine & Construction |
| COE 4: | NOI & Varco legacy Drilling equipment |
| COE 5 | Pressure Control equipment |
| COE 6 & 7 | Amphion & Power System |
| COE 8 | NOVOS |

# 4 Tracker ticket process

## 4.1 Tracker ticket flow



## 4.2 Responsibilities

| | |
|---|---|
| Orange marked | Aftermarket |
| Yellow marked | DROPS member |
| Blue marked | Non-Conformity Report Responsible, he/she is in most cases QAM where the equipment originated from and is entitled to delegate tasks to PE, EM, PTM and PTD. |

## 4.3 Energy calculator

The Drops calculator is a general guideline that can be used to quantify the possible consequences of dropped object by plotting the mass of a dropped object against the distance it falls. The plot shows that even a small object like a nut or screw dropped from significant height can prove fatal.

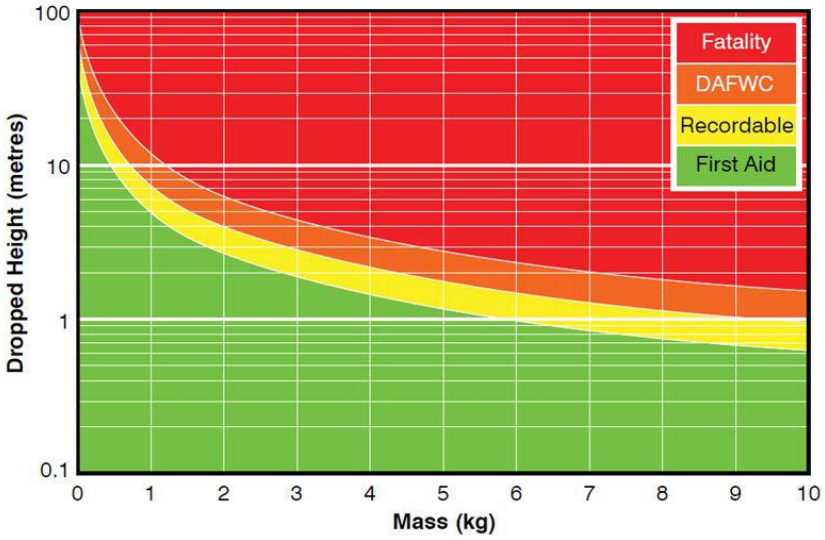
Factors (but not limited to):

- Ratio to height and mass of object
- Location against area where object may land (i.e. at manned areas OR at the seabed, damaging the X-mas tree OR falling into the well)
- Possibility and probability of dropped objects
- Danger of dropped objects
- Ejected / detached objects due to movements and stored energy

**[Reference to SfS–guide]:**
0-20 J may require for the need of first aid
20-40 J may result in need for medical treatment
>40 J may result in serious injury or death

The injury potential must be classified in accordance with these values and if necessary adjusted regarding the type of dropped object. Sharp objects with a low kinetic energy can have a higher injury potential then a blunt/soft object with a higher kinetic energy. For static dropped objects with starting velocity of 0 m/s.

**NOTE: The calculator shall not be used as the final decision tool; a case-to-case assessment shall be carried out for each potential dropped object.**




Note: DAFWC stands for Days Away From Work Case. This is quantified by the dropped object that can result in an injury where a person is unable to work for a day (shift) or more.

## 4.4 Taking away obstructions for closing.

### 4.4.1 No customer response

When Customer neglects to provide requested information and/or does not respond on NOV's correspondence:

- send 2 reminders as a minimum within a target period of two weeks after the first request/correspondence, Elevate within customer management system if appropriate.
- if again no response is received one week after sending the last reminder, complete the QPR. For completing the QPR, use root cause category "07: Other" and root cause code "701: unclassified".
- After QPR is completed close the Tracker ticket and inform customer issue is closed.

### 4.4.2 Recommendation is not implemented

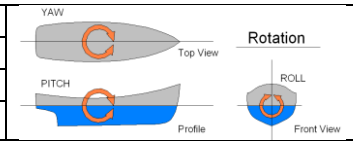
When customer is not able or willing to implement NOV's recommendation captured in completed QPR:

- assure to get a confirmation and log the confirmation customer is not able or willing to implement recommendations,
- when needed open a new non-HSE related ticket referring to the originating HSE ticket to allow tracking of implementation.
- Close the originating HSE ticket informing customer issue is closed. When closing refer in the originating HSE tagged ticket to the new non-HSE related tracker ticket(s).

**Note: Never use the "on hold" status for HSE related tickets!**

# 5 Appendix A Questionnaire

| Question | Answer | |
|---|---|---|
| | | |
| **Client and Rig information** | | |
| Caller name? | | |
| Caller contact number? | | |
| Caller mail address? | | |
| Current rig location? | | |
| Rig name (who owns the rig)? | | |
| Operator name (who the rig is working for)? | | |
| | | |
| **Medical consequences of people involved** | | |
| Are there any casualties reported? | | |
| If the answer is yes, how many? | | |
| Are there any injuries reported? | | |
| If so, how many? | | |
| What is the status and severity of the injuries? | | |
| | | |
| **Financial consequences** | | |
| Is there any material damage? | | |
| If so, please estimate the financial amount? | | |
| Is there rig down time reported? | | |
| If so, how long? | | |
| | | |
| **Equipment, time and conditions** | | |
| What equipment/ System does the incident concern? | | |
| Make? | | |
| Model? | | |
| Serial number? | | |
| Date of incident? | | Month/Day/Year |
| Time of incident? | | |
| Details of overall weather conditions? | | |
| Details of overall sea conditions? | | |
| Details of wind conditions? | | Meter/second |
| Details of Roll,? | | Degrees |
| Details of heave? | | Meters/second |
| Details of pitch? | | Degrees |
| | | |
| Incident description and operations | | |
| What is the description of the part that failed, when possible provide pictures and/or video footage? | | |
| Did any part(s) drop? | | |
| If so, what was the overall size (length x width x height)? | | Inch |
| If so, what was the weight? | | lbs |
| Description of event (operations) just before, during and after the incident including order of events? | | |
| Troubleshooting steps taken up to time of call? | | |
| Is there any provisional root cause identified at this time? | | |
| Description of current operations. | | |
| | | |
| Corrective actions that can be taken | | |
| Parts known to be needed (quantity and part number)? | | |
| Parts suspected to be needed (quantity and part number) | | |
| Does an NOV Technician need to be dispatched, if so, how soon? | | |



# 6 Appendix B Example of specific equipment questions

Example of referenced documents and questions to be asked specific for BX elevator:

**Referenced documents**
Bulletin BX-171-PIB; Bulletin describing typical damage in case load is applied on elevator with latch not fully closed. This can happen when latching mechanism is not properly adjusted, due to wear what should be detected prior and during the use of elevator or transferring string weight prior to elevator fully latched. Consequently, the latch lock function is disabled, and elevator can open under load especially when running square shoulder.

**Elevator**
- Serial number of the elevator:
- Part number of the elevator:
- Serial number of the bushings installed:
- Part number of the bushings installed:
- Confirmation the bushings all have the same part and serial number engraved:
- Any abnormalities like damage, excessive wear affecting from fit or function:
- Check and findings of the mechanical lock condition using bulletin BX-171-PIB-001 as attached:
- Pictures of the elevator taken from different angles in open and closed position allowing analyzes of the hardware.
- Picture of the elevator in closed condition with the right-hand door insert bushing being pushed down simulating string weight and activating the mechanical lock.

**Pipe**
- Pipe specification sheet:
- Actual nominal pipe diameter:
- Actual TJ diameter:
- Dimensions of the TJ chamfer on the OD:
- Dimension of the TJ radius where in transfers to the nominal pipe OD:
- Picture of the TJ with part of the nominal pipe OD showing condition: