



# **— Guidelines for investigation of logistics incidents and identifying root causes**

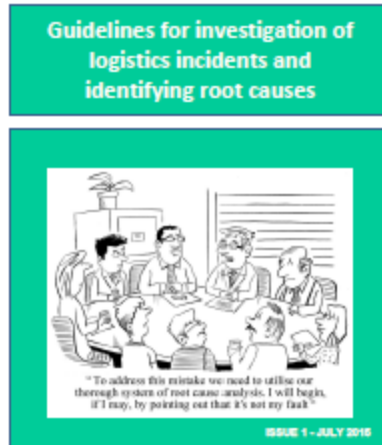
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# Guideline content

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  - 1. Incident investigation**
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# Scope & Objective of the guideline

- Learning from accidents is key to avoid same type of accidents occurring again.
- Good learning is only possible if the root causes have been identified!



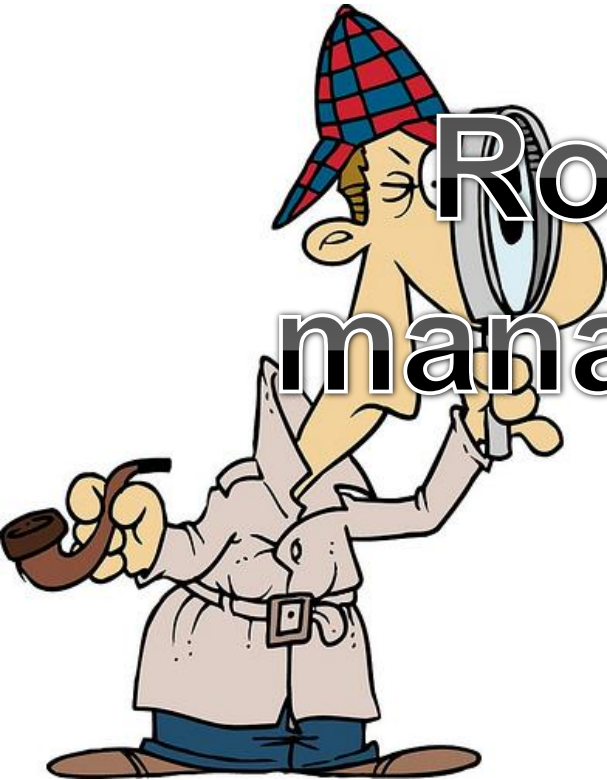
- Provide guidance on how to carry out an **off-site incident investigation**
- Identify the **root causes**
- Identify the **corrective actions** to prevent re-occurrence

# Incident investigation



An incident investigation is a process conducted for the purpose of **incident prevention** which includes the gathering and analysis of information, drawing of conclusions, including determination of causes and, when appropriate, making of safety recommendations.

## Root cause analysis (RCA)



**Root causes are**  
A **Root Cause Analysis (RCA)** is a method that allows **identification** of the **true causes** of incidents, with the aim of **preventing** **General Excuses** that are **repeated** over and over again  
**management system**  
**errors**

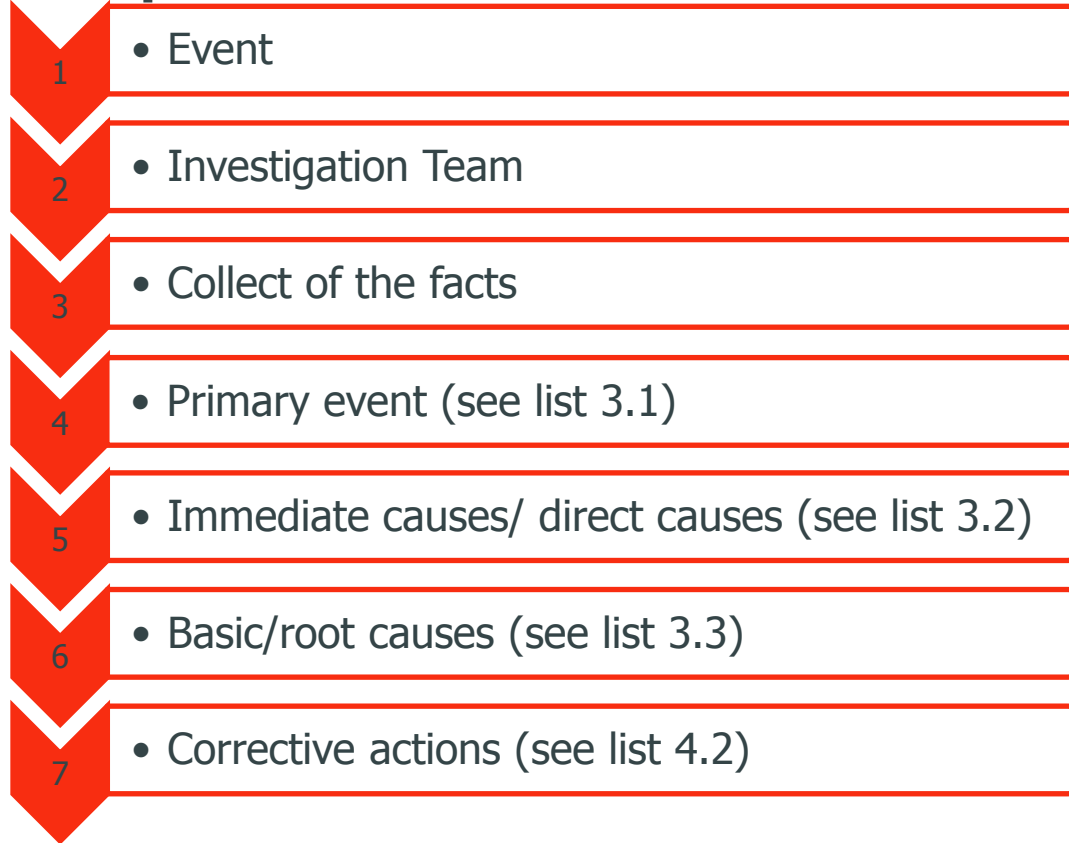


# The incident investigation process



“To address this mistake we need to utilise our thorough system of root cause analysis. I will begin, if I may, by pointing out that it’s not my fault”

# The different steps



# The incident investigation process

## 1. Setting up an effective **incident investigation team**

- Team leader should be close to but **not have any responsibility** for the incident
- Team members must be **aligned** to the business process
- The facilitator must be **trained** and **independent**
- Team members have to be sufficiently **trained** or **guided** through the process

## Conditions

- People involved in the incident should never be part of the team but should be **interviewed** as part of the investigation process
- Corrective actions should be **agreed upon** with the process owners



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25 February 2016





# The incident investigation process

## 2. Description of the incident

- When, where, what happened and who was involved
- Affected elements : products, material, type of failure, ...
- Consequences

## 3. Gathering evidence and facts

- Record only facts, not opinions
- Interview people involved in the incident
- Pictures , CCTV, on board camera recording
- **IMPORTANT** : do not allocate blame during the evidence gathering!

# The root cause analysis method for logistics operations

## 1<sup>st</sup> step: TYPE OF PRIMARY EVENT

Select the defect from the **primary event list** (see **list 3.1**) based on the evidence/facts gathered by asking the following questions:

- What was needed for that event to happen?
- Was it necessary?
- Was it sufficient ?

### Example

3.1.9 Leaving the road. *This is the main event to be investigated*

3.1.12 Roll-over. *This is the consequence of the vehicle leaving the road*

# The root cause analysis method for logistics operations

## 2<sup>nd</sup> step: IMMEDIATE/DIRECT CAUSES

Identification of the **immediate/direct cause(s)** of the primary event (see **list 3.2**) and investigation of each **immediate cause** based on the evidence/facts asking the following questions:

- What was needed for that direct cause to happen?
- Was it necessary?
- Was it sufficient ?

### Example

3.2.1 Non-standard operation: *the parking is normally not used for loaded vehicles*

3.2.16 No warning: *there is no sign or other warning that the exit should not be used to turn right*

3.2.22 Human failure: *the driver followed the example of drivers of empty trucks. The driver could have stopped to assess the sharp turn*

# The root cause analysis method for logistics operations

## 3<sup>rd</sup> step: BASIC/ROOT CAUSES

For each direct cause, dig deeper to find the **Basic/Root causes** (see **list 3.3- 3.3.1** for organisational causes – **list 3.3.2** for human causes) by asking the questions:

- What was needed for that basic cause to happen?
- Was it necessary?
- Was it sufficient ?

### Example

3.3.1.2 i) Incomplete risk analysis: *the transport company did not inspect the site for parking of loaded trucks. The cleaning station did not assess the exit of the parking area. Inadequate routing on the site*

3.3.1.7 i) Inadequate design: *the design of the exit was not adequate. There were no warning signs that vehicles should not turn right*

3.3.1.9 i) Work environment inadequate: *inadequate lighting of the parking exit*

# The root cause analysis method for logistics operations

## 4<sup>th</sup> step: CORRECTIVE ACTIONS

For each basic/root cause corrective actions must be implemented in order to **prevent re-occurrence** of the same kind of incident

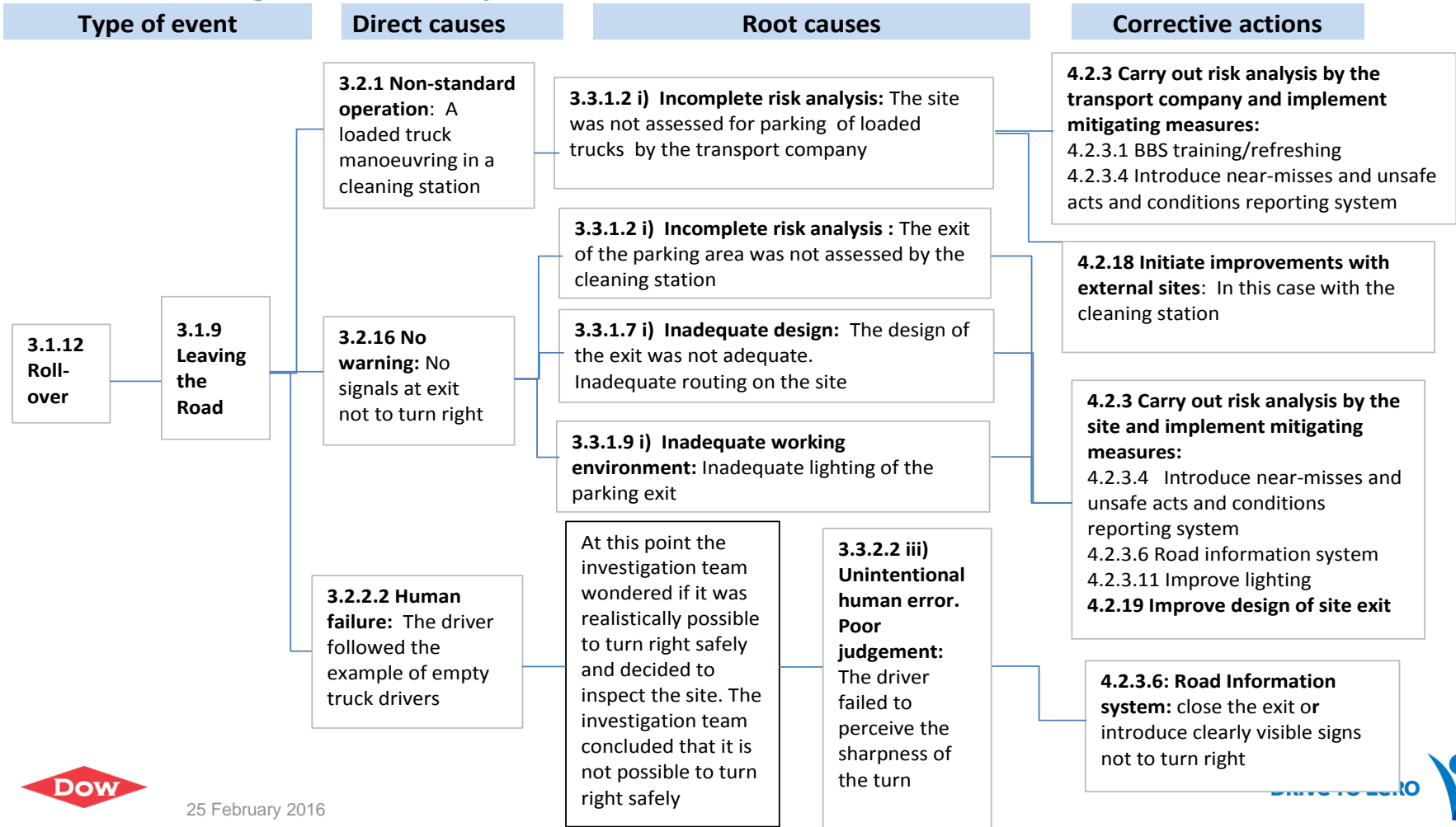
Two types of corrective actions

### 1. Organisational causes. See the [list 4.2](#)

- Select the type of cause and define an appropriate action to close the gap

### 2. Human causes

# Accident Investigation Tree example 1



# Reporting the incident

Following reports should be issued :

1. An **immediate incident notification** to the stakeholders (basic information by a quick call followed by the “first incident report” within 24 hours),
2. An **investigation report** (full description of the event, facts and evidence, root causes analysis & corrective actions) for sharing the findings with the stakeholders
3. A **report** for sharing the **learning** via **Cefic** (optional)

# Summary

- Focus on the processes in your **own control**
- Look for **management system errors** and not for personal error
- Make sure your **report is clear** also after one year
- Do not hesitate to ask for support in the process to third parties
- **AND FOR SURE DO NOT BLAME EMPLOYEES OR THIRD PARTIES**





# BACK UP SLIDES



25 February 2016



### 3.1 Type of events

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- 3.1.1 Person / object caught between/in/on
- 3.1.2 Collision of persons / equipment
- 3.1.3 Human exposure to (electricity, heat, cold, chemicals, etc.)
- 3.1.4 Container / tank implosion
- 3.1.5 Equipment failure
- 3.1.6 Explosion
- 3.1.7 Fall from height
- 3.1.8 Fire
- 3.1.9 Leaving the road / derailment
- 3.1.10 Loss of containment (leaks, spills, etc.)
- 3.1.11 Overfilling / overflowing of tanks
- 3.1.12 Overturning / Roll over / Tipping over
- 3.1.13 Slip and fall / trip over
- 3.1.14 Struck against / by / into
- 3.1.15 Unintended mixture (for example (un)loading in the wrong tank)
- 3.1.16 Chemical reaction
- 3.1.17 Object falling off
- 3.1.18 Unintended moving of cargo



**Whilst exiting a parking zone of a cleaning station, the driver had to turn right onto the road. The turn was taken too sharply and the rear wheels passed onto the grass verge. The wheels slid and drove down the banking, leading to the tip and roll-over of the vehicle.**

## 3.2 Immediate/direct causes (Partial view)

- 3.2.1 Non-standard operation
- 3.2.2 Weather conditions
- 3.2.3 Equipment / material failure
- 3.2.4 Instrument failure
- 3.2.5 Instrument non calibrated
- 3.2.6 Failing to use PPE properly
- 3.2.7 Too high speed
- 3.2.8 Inappropriate loading of truck (overweight /  
underweight/uneven load distribution)
- 3.2.9 Incorrect (un) loading
- 3.2.10 Incorrect lifting
- 3.2.11 Incorrect position for task
- 3.2.12 Incorrect cargo securing
- 3.2.13 Incorrect storage / placement
- 3.2.14 Lack of coordination between operator and driver
- 3.2.15 Lack of instrument
- 3.2.16 No warning

## Facts of Example

1. This was the first time the driver visited this cleaning station. The driver used a gate/road he/she was unfamiliar with
2. The incident happened during the dawn. The visibility was reduced
3. The turn was to the right and the driver sat on the left
4. The driver misjudged the road corner
5. The driver was not injured and there was no leakage
6. The driver had loaded at another site the evening before and stayed overnight on the parking of the cleaning facility
7. There were more drivers leaving through the same gate, but these vehicles were empty (cleaned)
8. There were tyre marks on the grass



## 3.3.1 Organisational causes (partial view)

### 3.3.1.1 Inadequate training / coaching programme

- i) Inadequate communication (omission / misunderstanding / wrong information)
- ii) Inadequate guidance / supervision / monitoring / coaching
- iii) Inadequate / lack of training (driver not familiar with load / route, inadequate skills, lack of knowledge, etc.)
- iv) No BBS programme (including defensive driving / roll-over prevention)

### 3.3.1.2 Inappropriate (use of) procedures/processes

- i) No/incomplete or incorrect risk analysis
- ii) No/inadequate procedure
- iii) Task design inadequate (competence requirements not well defined, responsibility not clear, repetitive tasks, excessive length of shift, etc.)
- iv) Corrective action not implemented
- v) Procurement process failure (inadequate specifications, inadequate receiving/inspection, inadequate contractor selection)
- vi) Quality assurance / quality control failure

### 3.3.1.3 Incorrect contractor management

- i) Inappropriate selection process
- ii) Inadequate definition or communication of requirement
- iii) Inadequate monitoring and reviewing of requirements

### 3.3.1.4 Inadequate fitness to work

- i) Inadequate physical / mental condition, sick, misuse of drugs, fatigue

### 3.3.1.5 Incompatible goals

- i) Task planning inadequate
- ii) Work pressure too high

## More facts from Example:

- the transport company did not inspect the site for parking of loaded trucks. The cleaning station did not assess the exit of the parking area. Inadequate routing on the site
- the design of the exit was not adequate. There were no warning signs that vehicles should not turn right
- inadequate lighting of the parking exit
- ...

## 4.2 Corrective actions on organizational causes:

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- 4.2.1 Implement HSE management systems
- 4.2.2 Improve visible and felt (senior) management commitment to HSE
- 4.2.3 Carry out risk analysis and implement mitigation measures accordingly.  
See examples below of mitigation measures:
  - 4.2.3.1 BBS training/refreshing training
  - 4.2.3.2 Fatigue risk management
  - 4.2.3.3 Installation of interlock systems to avoid human error
  - 4.2.3.4 Near-misses and unsafe acts and conditions reporting
  - 4.2.3.5 Preventive maintenance
  - 4.2.3.6 Road information systems
  - 4.2.3.7 Route familiarization training
  - 4.2.3.8 Subcontractors selection (for example through SQAS) and follow up of gaps and performance issues
  - 4.2.3.9 Task analysis
  - 4.2.3.10 Investigate if working at height can be avoided or provide fall protection
  - 4.2.3.11 Improve lighting
- 4.2.4 Clarify responsibilities
- 4.2.5 Define/implement/improve procedures
- 4.2.6 Implement Management of Change
- 4.2.7 Improved engineering
  
- 4.2.8 Follow up of corrective actions from previous incident