

Safety guidelines for working around railcars in chemical sites



ISSUE 1 – MARCH 2017

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Disclaimer

This document is intended for information only and sets out safety guidelines for working around railcars in chemical sites. The information provided in these guidelines is provided in good faith and, while it is accurate as far as the authors are aware, no representations or warranties are made with regards to its completeness. It is not intended to be a comprehensive guide. Each company, based on their individual decision making process, may apply these guidelines, in full or partly or apply any other adapted measures.

No responsibility will be assumed by Cefic in relation to the information contained in these Guidelines.

1. Introduction

"A shunting operator was found dead trapped between the buffers of a stationary rail tank car and the shunting locomotive. He had been hit from behind by the locomotive, and his abdomen was compressed between the buffers. At that time the locomotive was operated by the operator using the remote control, and the operator was working alone."

Such an accident, resulting in a fatal injury while carrying out on-site rail activities, is rare in our industry, but still happens from time to time. For companies practicing Responsible Care, safety of operations comes first. In order to minimize the risks associated with on-site rail activities across the chemical industry and to share best practices, Cefic has elaborated this safety guideline.

2. Purpose and scope

Working on chemical sites is always bound to strict safety rules. Working with or nearby rail vehicles on chemical sites has specific risks that must be carefully and specifically addressed.

The purpose of this guideline is to provide insights to the reader about safe practices for protection of personnel from hazards that can arise when working on and /or around rail vehicles and tracks at chemical sites.

This document addresses the different aspects relating to the safety of on-site rail activities. It does not intent to substitute any company procedures or local, national or international regulations. When local, national or international regulations apply to an activity covered by this guideline, sites shall fully comply with the applicable regulations.

The guideline addresses safety in the following activities:

- Shunting
- Inspection, maintenance and repairs of rail vehicles and tracks
- Activities near rail infrastructure
- Traffic control
- Third party/subcontractors activities

The guideline does not address safety in the following activities:

- Loading/ unloading operations
- Risks related to the material transported
- Emergency response

3. Risk assessment

Companies should perform a risk assessment before starting on-site rail activities. Risk assessments should be renewed on a regular basis or after a change, and at least address the activities and risks mentioned in the following table. Nevertheless, this table should not be considered as an exhaustive list of all risks or activities in chemical sites.

Activity	Risk	Causes of the risk
Inspecting rail vehicles	Physical/fatal injury resulting from:	<ul style="list-style-type: none">➤ Uneven/slippery surfaces➤ Suitable platform /step /handrail not available on the rail vehicle
Repairing rail vehicles	<ul style="list-style-type: none">➤ Falling/stumbling➤ Entrapment (e.g. between rail vehicles or rail vehicles and buffer stop)➤ Hit by rail vehicle➤ Falling from a rail vehicle➤ Electrocution	<ul style="list-style-type: none">➤ (Un)intended movement of vehicles (e.g. slope, wind, bumping)➤ Rail vehicle movement at adjacent tracks➤ Track has not been closed from operational activity➤ Limited visibility (e.g. line of sight, fog, mist, darkness, inadequate lighting)➤ Not respecting rules/procedures (e.g. not using appropriate PPE)➤ Wrong position of shunting operator➤ Insufficient consideration of safety measures at working under overhead [wiring /wire – check word]
Crossing rail tracks		
Walking along tracks		
Inspecting rail infrastructure		
Repair/maintenance of rail infrastructure		
Shunting: coupling/uncoupling		
Shunting: standing on a rail tank car		

For mitigation measures see section 6.

4. General safety practices

The specific role and responsibilities for specific tasks can vary according to the site, the rail service suppliers, including independent third party contractors, and the people performing the work. Independent third party contractors should master the means, methods and details of the work performed as well as the safety processes and the equipment.

- 4.1 People working on rail sites or rail tracks should wear in addition to usual standard site Personal Protection Equipment (PPE) a highly visible jacket according to European norms (such as EN ISO 20471: 2013).
- 4.2 People should not walk on a rail track, unless necessary for the work to be carried out.
- 4.3 People should not cross a track through a switch.
- 4.4 People should not cross between stationary, coupled railcars without using the platforms and handholds designed for that purpose.
- 4.5 People should maintain “three-point contact” when crossing between stationary, coupled railcars via the platform.
- 4.6 People should never cross between moving railcars.
- 4.7 People should never stand on buffers and coupling, etc., and only use the platform and the steps leading to it.
- 4.8 People should not stand on moving equipment unless specific duties require them to do so and site procedures allow for it. While standing on a moving railcar, people should face the direction of movement and maintain three-point contact with the railcar. They should only stand on the platform or the step. Sites should have procedures in place that define the necessity, the safe practices, and the restrictions for standing on a railcar or railcar mover. Sites should have a documented risk assessment that defines locations on the site where standing on the step poses a safety risk.
 - 4.8.1 If the risk assessment documents zones where riding on the sill step is dangerous, that site may prohibit riding on the railcar or mandate riding on the end platform.
 - 4.8.2 There are only two acceptable positions for riding the leading edge of a moving railcar, subject to risk assessment and individual site procedures.
 - On the step, (stirrup) while remaining within the gauge of the rail car.
 - On the end platform, outside the rails.
- 4.9 Prior to climbing up or down, railcars should be at a complete stop.
- 4.10 People should maintain three-point contact while on a railcar, platform or step during climbing up or down.

People should always face the equipment when climbing up or down.
- 4.11 All pushing movements should be carried out with a person on or ahead of the leading car in the push (No blind push).
- 4.12 Pushing (“Kicking”) uncoupled railcars should not be practiced.

5. Safe practices for locomotives and other moving equipment

- 5.1 A procedure should be in place to securely prevent unwanted rail vehicle movements. Locomotives and railcars movers should have an adequate safeguarding system (e.g. dead man's button, men down system, speed limiters, etc.). The safeguarding system should be frequently tested according to legal and/or company requirements.
- 5.2 When available on the mover, rail vehicles should have the air braking system connected and fully charged before being moved.
- 5.3 Movers should be fitted with appropriate lighting and when a rotating beacon is present, it should be turned on when moving.
- 5.4 Local traffic regulations should be in place such as maximum speed, level crossing, etc..

6. Safety when walking/moving/working on and around rail tracks

6.1 Work Zone

Rail facilities on chemical sites must be safe areas at all time. Because different types of people may have to enter such areas from time to time for different purposes, specific rules have to be set up to ensure safe and secure activities. Such rules are set on the basis of appropriate and regularly updated risk assessments for the rail facility as a whole.

When carrying out on-site rail activities, which are by nature temporary operations and limited in space, a work zone has to be clearly defined and secured at its boundaries within the rail facilities. In practice, the work zone is a plot of land close to the rail track where the works will take place. Its boundaries have to be well delimited and visible from an adequate distance at all time during operations. The work zone must be large enough to allow safe operations, safe way in and out for personnel and /or equipment, mobile or not.

The goal of defining a work zone is to protect people working inside, allow for a safe outcome of their temporary operations, and warn people working outside. Rules have to be set in advance for protecting people from the unexpected intrusion of a danger within the work zone and for allowing people and /or equipment to safely get in and out and work within the work zone. Due to the temporary nature of on-site rail operations, such rules can only be set after having carried out beforehand dedicated risk assessments.

Risk assessments have to account for the specificities of the rail facilities where the work is going to take place, and to fully comply with the applicable regulations.

6.2 Protection methods

Depending on the outcomes of the risk assessment, different protection measures of the work zone can be implemented. They can be of (a) physical or (b) procedural nature, or a combination of both.

- (a) Physical protection is used to physically isolate the work zone. It protects people performing work in the work zone by preventing rolling equipment from entering the work zone and by securing railcars or railcar movers within the work zone (e.g. derailers, chocks, used in combination with flags, warning lights, warning signs or red cordons to prevent unintended stay in shunting areas, etc.).
- (b) Procedural protection is used to insure safe and secure operating conditions to people carrying out standard operations or not, on a routine basis at more or less longer intervals. For standard operations (e.g. shunting, pre-departure/arrival checks) procedures should be always in place. Non-standard activities (e.g. inspection, repairs) should be covered by work permits.

6.3 Physical Protection

6.3.1 Site with rail facilities could use Positive Protection Devices (PPD) in their site procedures. PPD are devices that contain and /or redirect vehicles in order to reduce the risk of vehicle intrusion into the work zone, and that meet adequate crashworthiness evaluation criteria (e.g. barriers with energy-absorbing attenuators, switch lock or trap point /derailing points, etc.).

6.3.1.1 Derailer: This is a stationary protection device intended to protect an area from unintentional rail vehicle movements (example: the yellow part fixed onto the rail shown on the picture).

A predefined clearance zone should be maintained on the correct side of the derailer. The derailer should be put in such a way that it provides sufficient physical distance from the work zone.



The location of the derailer should depend on local circumstances and the outcome of the risk assessment. When work is being performed inside derailers, a red flag or signal light should also be employed.

Derailers and visual signs, may only be removed after the work is completed by authorized personnel.

The above should be subject to a work permit system.

- 6.3.1.2 Switch lock: This is a device that protects a rail from unintentional rail vehicle movements towards this specific rail. Switch locks can be implemented at any switch. It mechanically blocks the switch to avoid it turning in the direction of the rail track that needs to be isolated, so no rail vehicles can go in that direction.
It is essential to check that the entire track to be isolated cannot be reached by any other switches in both directions. In that case, all other switches should be blocked with a switch lock as well.
- 6.3.1.3 Other means of positive protection such as wheel chock: this device can be used as secondary protection only for vehicles that are at a stand still, not for moving vehicles.

6.4 Procedural protection

- 6.4.1 People should never enter the work zone unless explicitly invited to do so by "authorized personnel".
- 6.4.2 Coupling or decoupling railcars or railcar movers does not constitute a work zone entry.
- 6.4.3 People working alone and operating rail car movers via remote control should confirm that a work zone protection is in place prior to entering the work zone.
- 6.4.4 People working as part of a switching crew who wish to enter a work zone temporarily for any reason should first contact the railcar mover operator and request work zone protection and then confirm that the protection is in place.
 - 6.4.4.1 The railcar mover operator should make the necessary work zone protection adjustments and then acknowledge to the person who requested entry into the work zone that work zone protection is in place.
 - 6.4.4.2 The railcar mover operator shall maintain this protection until the same person that requested work zone protection states that he is in the clear and no longer needs protection.
- 6.4.5 The independent brake of the railcar mover should be in the fully applied position.
- 6.4.6 The air brakes should be applied to any charged railcars.
- 6.4.7 For remote control, the railcar mover should be air-braked.
- 6.4.8 The generator field switch of a diesel/electric driven railcar mover should be in the off/open position if available.

7. Shunting/ manoeuvring / (un)coupling

The site should define:

- The responsibilities of the train driver/ shunting operator.
- The minimum number of people required for shunting operations.
- The shunting permit requirements.
- The position of the shunting operator (at the front or the back of the train).
- The requirements for stopping/braking/parking of rail cars.
- The handling of rail cars.
- The maximum speed.
- The rules for the use of non-standard equipment to move rail cars (i.e. forklifts, tractors).
- The communication procedures.

8. Communication

- 8.1 There should be a uniform terminology for rail communication at each site.
- 8.2 Site has to define the communication procedures to be used (signals, radio, etc.).
- 8.3 Radio commands issued during rail movement activity should be repeated by the operator of the railcar mover receiving the command to ensure clear communication. This is referred to as Echo Communication.
 - 8.3.1 The operator of the railcar mover should not move the train unless direct radio verification with all shunting crew members has been made. In case the radio communication or visual contact between the operator of the rail car mover and other shunting crew members is interrupted, all rail movements should be stopped immediately.
 - 8.3.2 All members of the shunting crew should be able to speak the national language or a language that is understood by all members of the crew.
 - 8.3.3 Only relevant communications during the shunting tasks should take place.
- 8.4 There should be clear instructions how communication in case of technical problems or incidents should be done and what actions need to be taken.

9. Training and job qualification

- 9.1 Each site should develop a rail specific training program for own personnel and contractors who work on or near the rail tracks. An overview of the risks accompanying work around tracks should be part of this training.
- 9.2 Refresher training should be provided on a regular basis and in any case after any significant changes (e.g. organization, equipment, procedures).
- 9.3 Depending on the type of function, training should include a written test to check comprehension of the procedures and a field test demonstrating a minimum skill level. Training and testing should be appropriately documented by both employer and employee.
- 9.4 Each site should verify that contractors involved in rail activities have a training program in place aligned with the job to be performed.

10. Monitoring/ audits

Procedures should be in place for:

- Carrying out audits.
- Carrying out regular observations, such as safety tours, spot checks, etc..

11. Other important aspects (not an exhaustive list)

- Maintenance and inspections of tracks and rail cars should be in accordance with legal requirements and good practice guidelines.
- Behavior Based Safety (BBS).
- Management Of Change (MOC).
- Medical and psychological evaluation.
- Near miss reporting and incident investigation: all incidents, unsafe conditions, and situations should be reported. Upon receipt of each report, an action should be taken to investigate, implement agreed corrective actions and give feed back to the person who reported the near miss. A system to encourage reporting should be in place.

One can also refer to other existing Cefic guidelines on these subjects.

12. Glossary of Terms

- Gauge: The gauge or “**loading gauge**” defines the maximum height and width for railway vehicles and their loads to ensure safe passage through bridges, tunnels and other structures. Classification systems vary between different countries and gauges may vary across a network, even if the [track gauge](#) remains constant.
- Near miss: An unplanned event that did not result in any way in illness or damage but could have resulted in or has the potential to do so.
- Rail vehicles: Either, a **Railcar**: a powered single unit or articulated passenger car, usually “railroad-derived” light DMU or EMU, with a driver's cab at one or both ends; or a **Rail tractor**: a small petrol (gas) or diesel shunting (switcher) locomotive; or a **railroad car**: any railroad vehicle other than a locomotive; or a **light engine**: a locomotive travelling on its own, or perhaps with just a caboose (brake van) attached; or a **locomotive**: a **locomotive** or **engine** is a rail transport vehicle that provides the motive power for a train. It is a shortened form of the term *locomotive engine*, first used in the early 19th century to distinguish between mobile and stationary steam engines. Traditionally, locomotives pulled trains from the front. However, push-pull operation has become common, where the train may have a locomotive (or locomotives) at the front, at the rear, or at each end.
- Responsible Care®: Responsible Care® is the global chemical industry voluntary initiative under which companies with operations along the chemical supply chain, through their national associations, work together to continuously improve their health, safety, security and environmental performance, and to communicate with stakeholders about their products and processes. Responsible Care® embraces the development and application of sustainable chemistry, helping the chemical industry contribute to sustainable development while meeting the world’s growing need for essential chemicals and the products those chemicals make possible.

- Shunting activities: In UK and Australian parlance, to make up and divide trains in sidings, to move trains to or from sidings, or to move trains between platforms in a station.
In US parlance, to electrically bond the rails or power feeds between sections on light-rail or trolley systems, so as to temporarily bridge past dead areas.
- Three points of contact rule: The three points of contact rule requires three points of contact to be maintained with the vehicle at all times - two hands and one foot, or both feet and one hand. This system allows for maximum stability and support, reducing the risk of slipping and falling.

Contact list



Bril Henk
SABIC Europe
T +31 464762698
M +31 6 22949999
henk.bril@sabic.com



Gervais Benoît
VFLI Sud-Est
T + 33 4788755
M + 33 6 15 73 22 40
Benoit.gervais@vfli.fr



Verhelst Bram
Shell Chemicals Europe B.V.
T +31 104415515
M +31 6 54 22 87 76
bram.verhelst@shell.com



Schelling Ron
LyondellBasell
T + 31 102755868
M +31 6 53624510
ron.schelling@lyondellbasell.com



Ilves Antti
Borealis Polymers OY
T +358 9 394 936
M +358 50 379 0284
Antti.ilves@borealisgroup.com



Klein Torsten
BASF SE
T +49 6216071972
M +49 173 3478932
Torsten.klein@basf.com



Van Driessche Astrid
Evonik Degussa Antwerp
T +32 3 560 35 59
M +32 475 854 647
Astrid.vandriessche@evonik.com



Van de Velde Luc
Ineos Europe AG
T +32 3 210 36
M +32 475 272331
Luc.vandevalde@ineos.com



Wachelder Roel
Deutschebahn
M +31 6 29598773
Roel.wachelder@deutschebahn.com



Lévéque Francis
T +32 2 676 73 78
M +32 496 278 543
fle@cefic.be