



16 Life Saving Rules

2017





We continue to face significant challenges in the area of Health and Safety. In 2016, there were **5** on site and **3** third party fatal accidents across the CRH Group. In addition there were a number of serious accidents in the precast and paving side of our business. This situation is clearly **unacceptable** and we must re-focus our efforts, at all levels, to eliminate potential injury to those working for or exposed to our business activities .

No fatalities are acceptable and our aim is to achieve zero fatalities.

The **2017 version of the 16 Life Saving Rules (16 LSR)** incorporates some new requirements and represents our ongoing effort to improve risk control measures and raise our safety standards. These Rules are **mandatory** and must be implemented in full.

When we look at the fatal and serious accidents in 2016, the same risk areas as previous years appear again – **Transport Safety, Energy Isolation and Work at Height**. We all have a personal and professional responsibility to understand the risks in our business and to manage those risks to eliminate any form of injury or harm.

We also face an ongoing significant challenge across our 1,300 locations to ensure that **contractors**, who represent a significant proportion of the workforce on our sites, are properly qualified and have clear expectations on how they behave whilst working for CRH.

We must continue to maintain a daily diligence on the management of safety and ensure that we are **relentless** in our implementation of the **16 LSR** and ensure that we direct our attention to those areas with the greatest potential for serious injury.

I repeat my closing message from the 2016 16 LSR – “ *Our management of safety is a direct reflection of our overall management of our company. I expect **you** to provide the leadership and visible commitment to the various elements of our safety program.*”

I look forward to working **together** with you to achieve zero fatalities and serious accidents in 2017.

A handwritten signature in black ink, appearing to read 'Ken McKnight', written in a cursive style.

Ken McKnight,
President, CRH Europe Heavyside,
January 2017



The **16 Life Saving Rules (LSR)**, are designed to give clear, specific requirements which will ensure consistency across our operations. The 16 Life Saving Rules are not intended as an outline of a safety management system, the 16 Rules represent a set of minimum mandatory requirements that allow to focus our efforts on the areas where we know the serious accidents occur.

The 16 LSR are supported by example based guidance documentation (see pages 4 to 8 of this document) and have been developed following wide ranging consultation at all levels within the division.

The 2017 version includes some additional requirements (see summary table at the bottom of this page).

The implementation of the 16 Life Saving Rules is supported by the following:

- A program of independent 16 Life Saving Rule audits, which are carried out with minimum notice throughout the year and across all companies.
- Management training programs designed around the overall safety strategy and the 16 LSR are run on an on-going basis across the division.
- Each of the monthly Safety Alerts and each monthly "Best Practice Example" document relate to one area of the 16 LSR as a means of ensuring regular reinforcement of these rules.
- A dedicated safety campaign is run each year, led by the Country/Platform Managers which will focus on a key element within the 16 LSR.

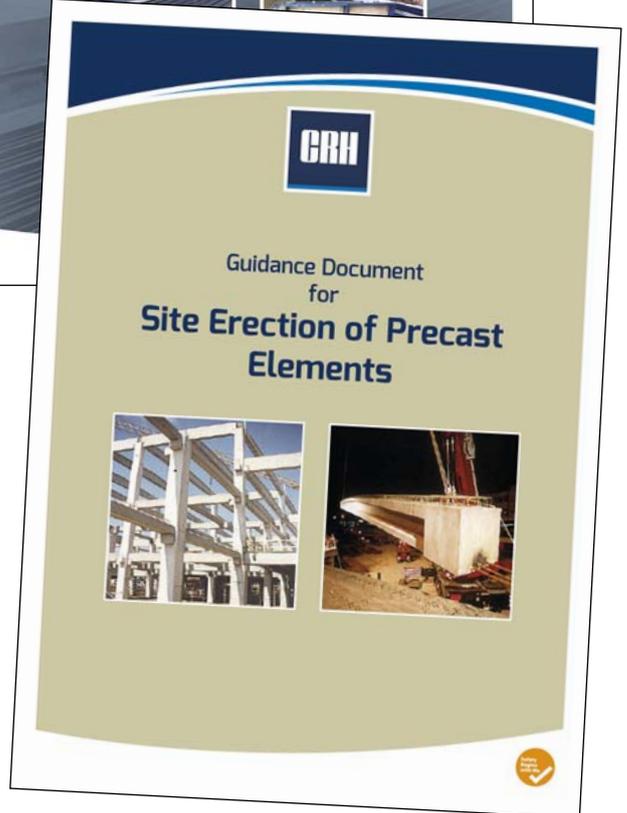
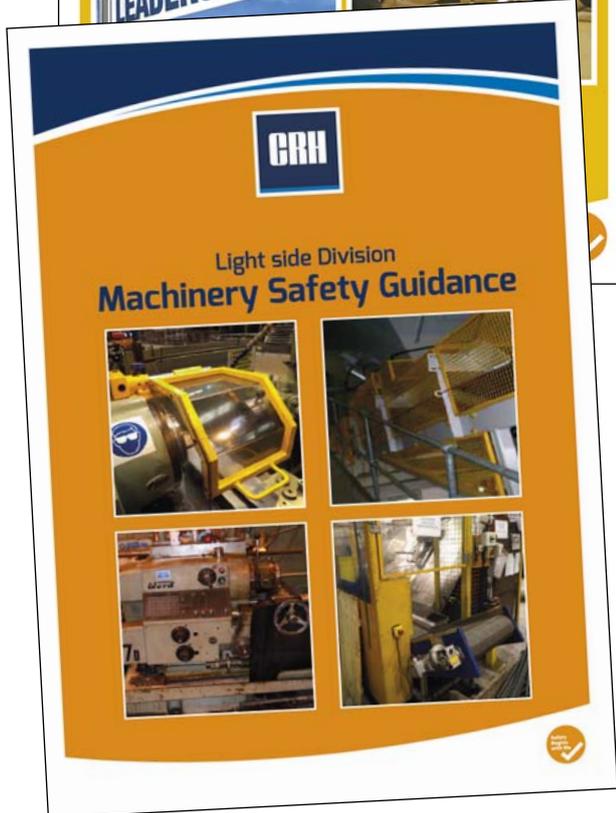
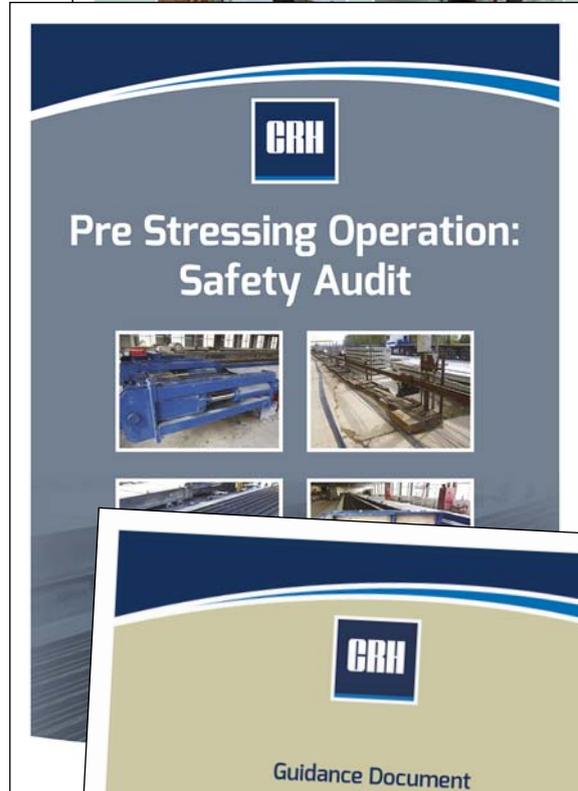
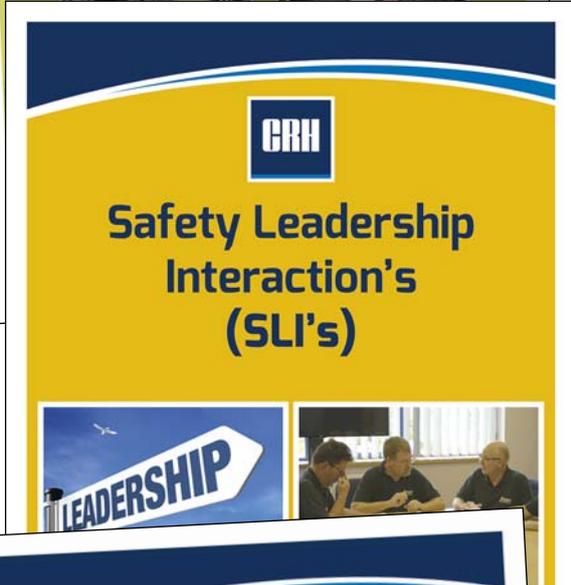
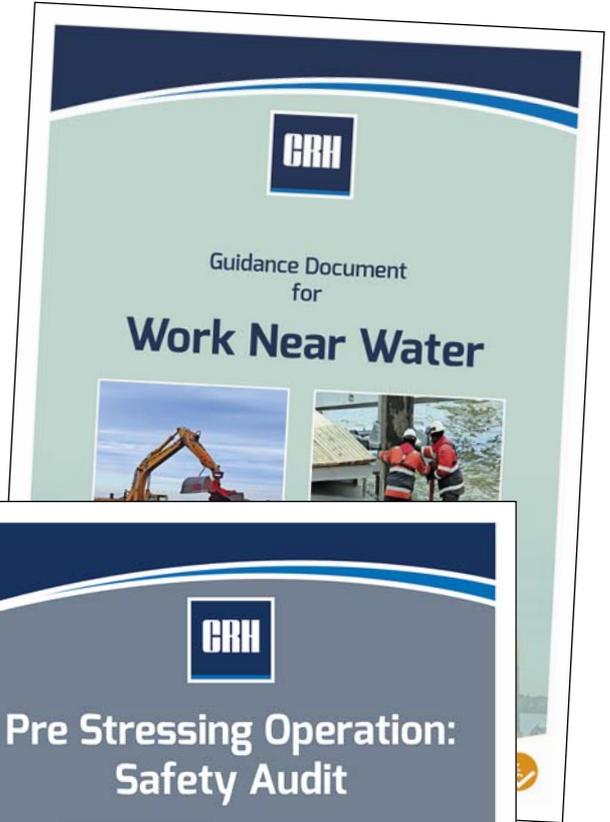
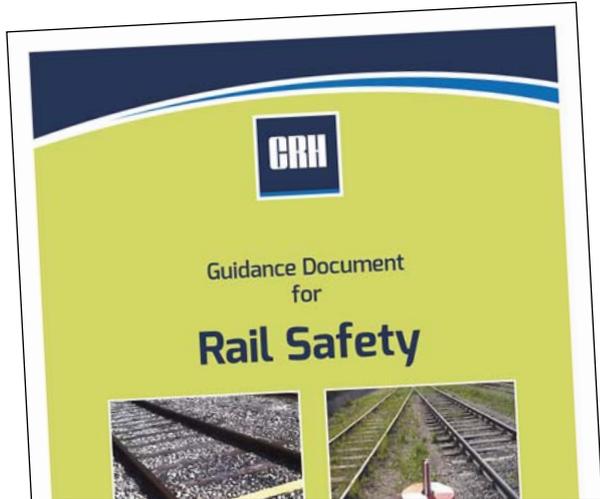
The CRH minimum mandatory framework for Health & Safety Management is also contained in this document (see pages 66 and 67) and covers the minimum requirements for a safety management system.

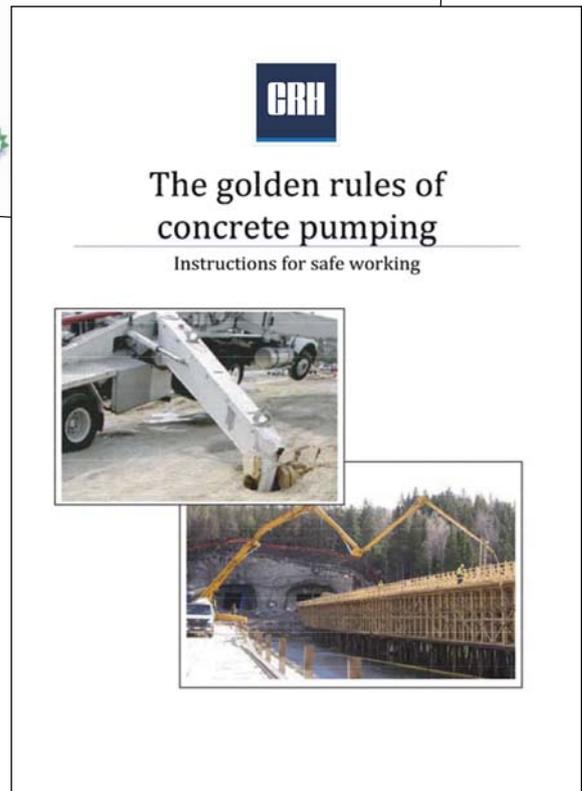
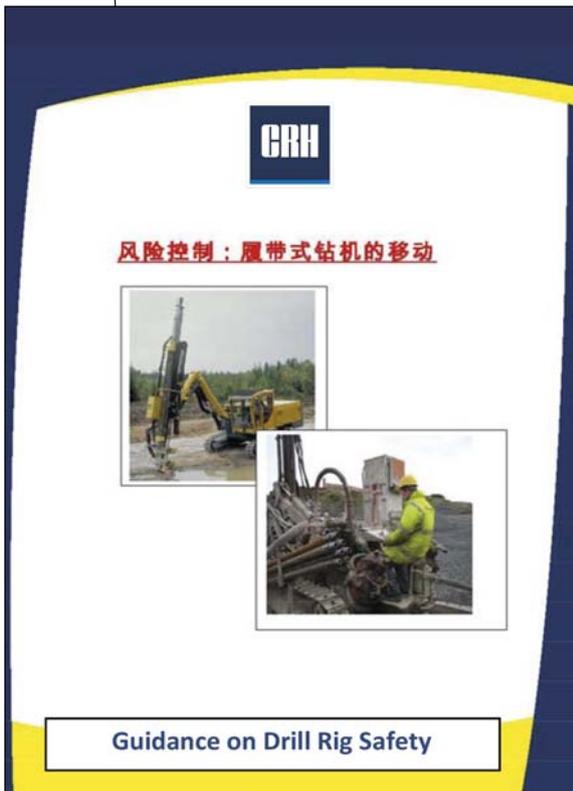
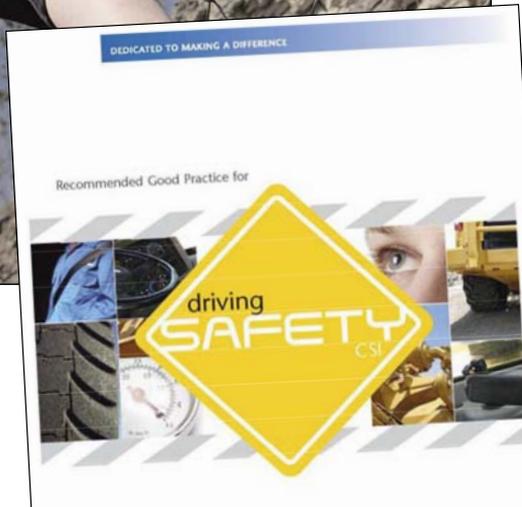
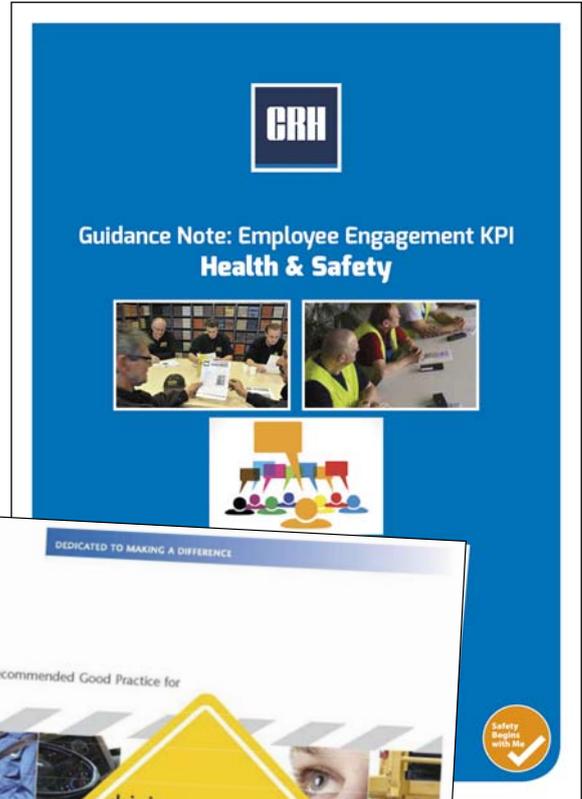
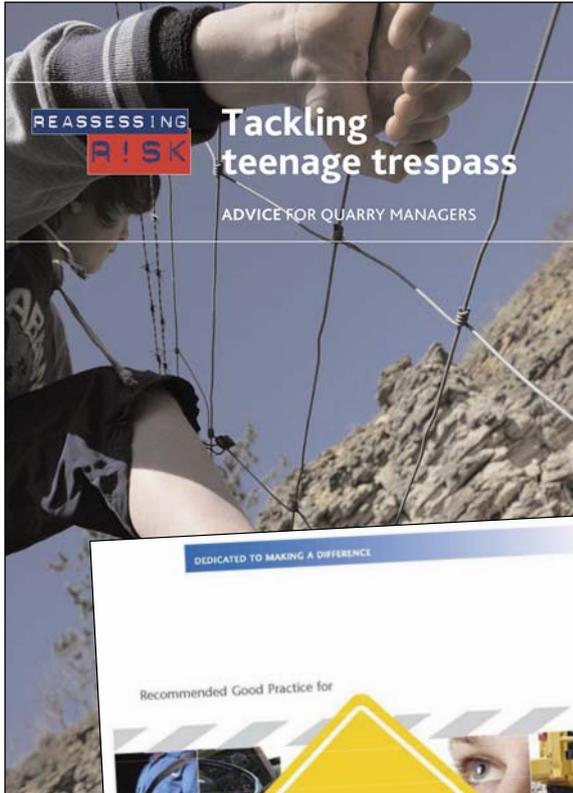
The HSE team look forward to working with you all to ensure the on-going development and implementation of the **16 Life Saving Rules**.

Michael Keating
HSE Director
CRH Europe
January 2017

Key Changes in the 2017 16 LSR		
Page	Addition/Change	Comment
4	New Guidance Notes	SLI & Pre Stressing Safety Audit
7	New Guidance Notes	Occupational Health & Pre-stressing Guidance
17	Requirement 3	Annual training for those involved in LOTO/LTT
18	Requirement 9	Mould Box Changing
24	Requirement 4	High Visibility Clothing – consistency
35	Requirements 5 & 6	Heavy Goods Vehicles
37	New guidance	Safety element of contract with Transport companies
44	Requirement 11	Load security
48	Requirements 14 & 15	Flooring safety / safety footwear
55	Requirement 3	Assessment of communication system
63	Requirements 7 & 8	Various
64	Requirements 8, 9 & 10	Various
66/67	Review all sections	

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CRH

16 Life Saving Rules
Work in Confined Space





CRH

Guidance on Safety Specifications for the purchase of Plant and Machinery



CRH

16 Life Saving Rules Audit Format



Guidelines for Auditors

Company: _____
 Location: _____
 Date: _____
 Auditor: _____

CRH

Construction Project Safety Manual



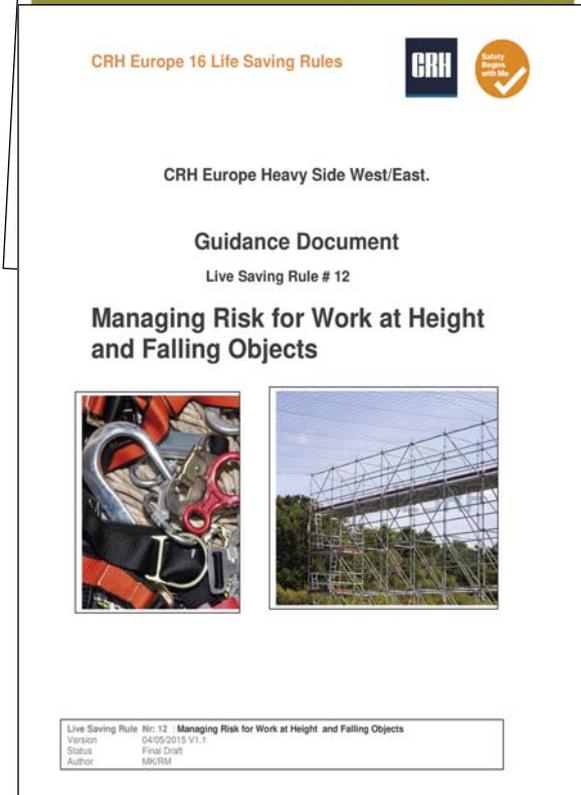
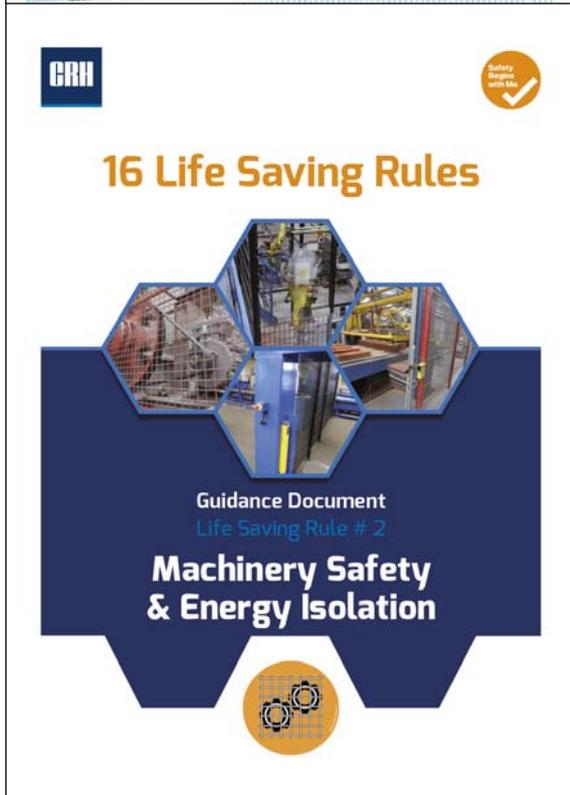
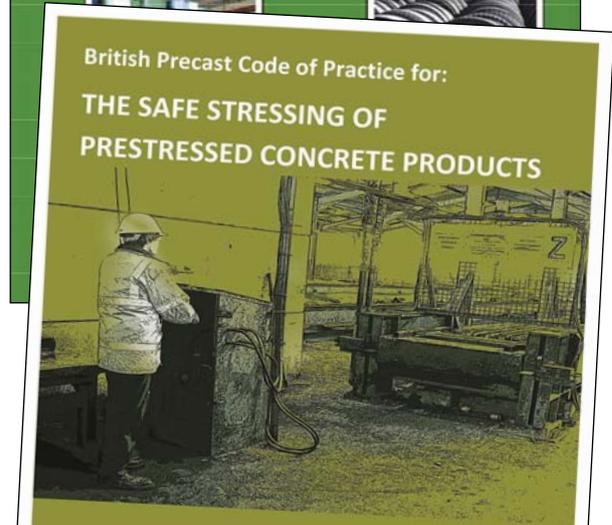
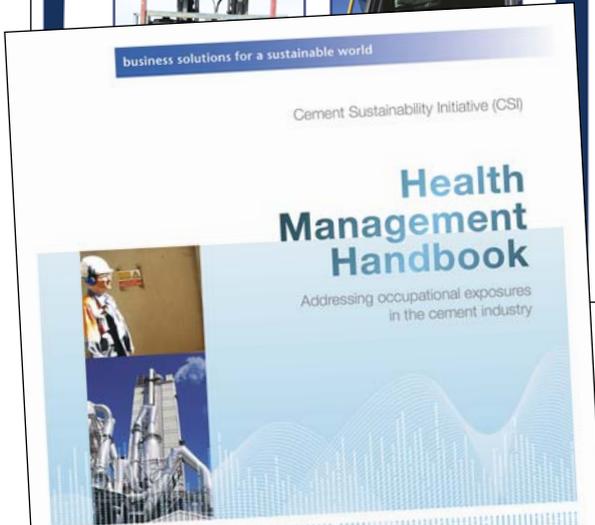
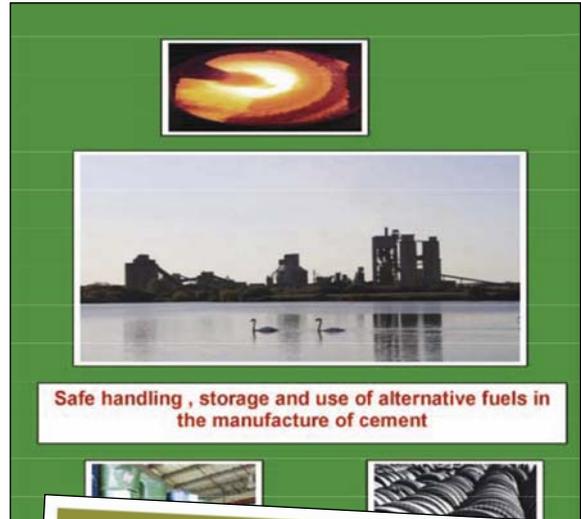
CRH

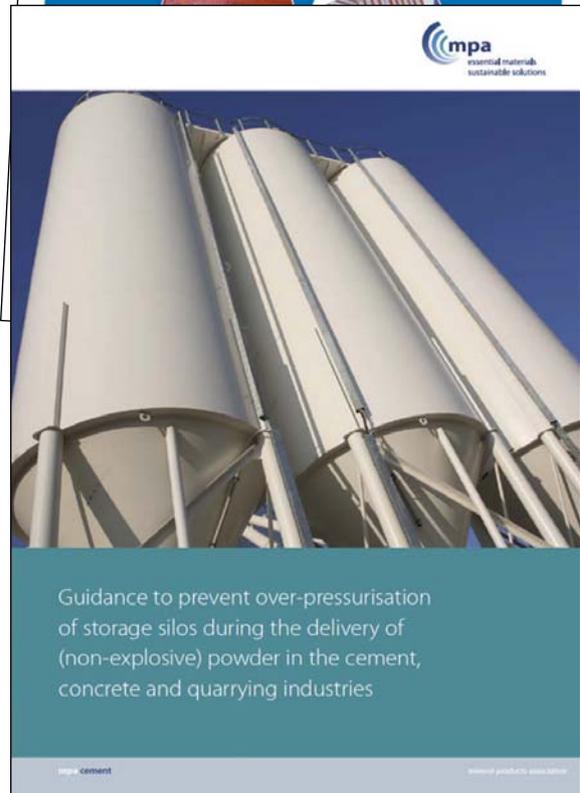
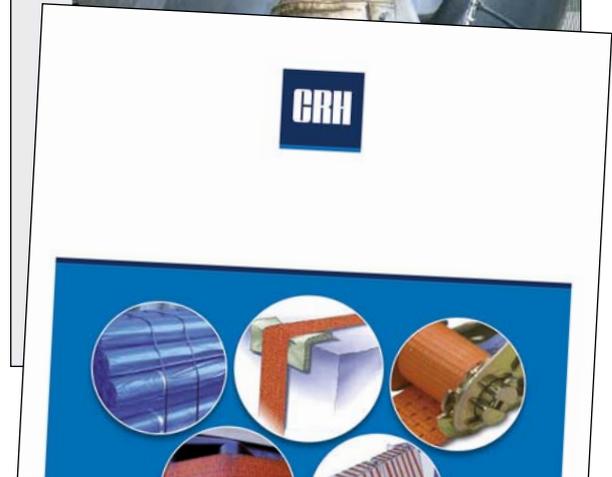
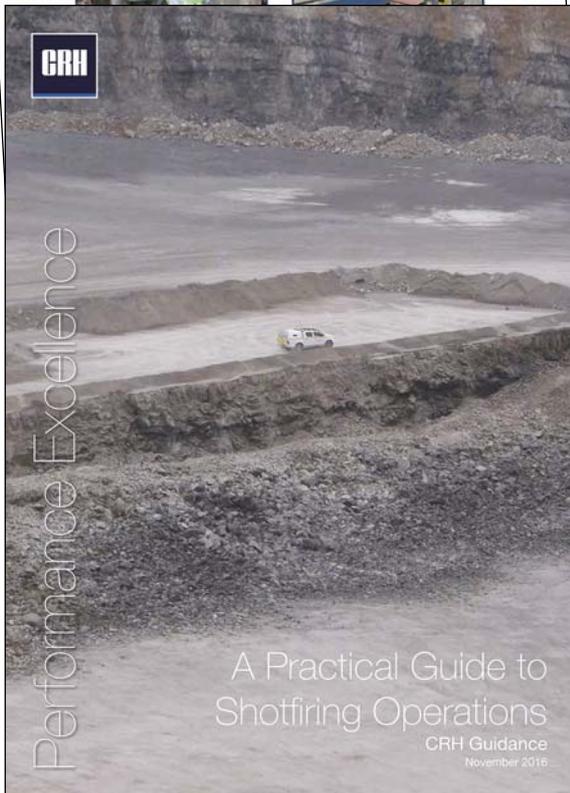
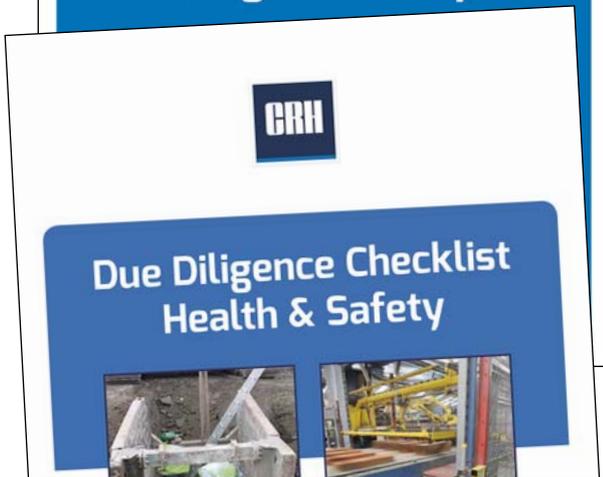
Materials

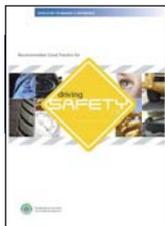
Electrical Safety
Guidance Note

- ◆ This guidance note is intended to act as a template for each country / company to draw up their own internal guidance in consultation with their in house or external electrical specialist . This will allow country specific issues such as national legislation and national supply voltages (which differ across the division) to be assimilated into specific company guidance .
- ◆ A suggested checklist is included at the back of this guidance . These may be of use for each company when drawing up their own checklist as a means of formal follow up to the 2 recent fatal accidents involving electricity
- ◆ This guidance relates to portable and transportable electrical equipment . This covers equipment that is not part of a fixed installation but is intended to be connected to a fixed installation by means of a flexible cable and either a plug and socket or a spur box or similar means . This guidance also applies to equipment likely to be moved when connected to a supply . Fixed plant should have permanent and efficient earthing in accordance with national legislation .









Contractor Safety Management

Please note: Contract Haulier / Transport contractor issues are covered in LSR No.8

Introduction

Contractors and their employees continue to represent a significant proportion of the serious accidents within the Group. Based on this level of risk, it is policy that a robust pre qualification system is in place in each company for the use of contractors.

To ensure that the contractor prequalification system is consistent across the divisions and fulfils a minimum standard, a contractor prequalification system based on the requirements of a prequalification template the CRH Heavy/Light side **“Contractor Safety Checklist “ or agreed equivalent.**

The sample **“Contractor Safety Checklist” (or agreed equivalent)** must fulfil the objective of ensuring that, prior to any contractor commencing work at a CRH location, that the operation is aware of the following:

- The details of the people the contractor will be using.
- Information about the previous safety performance of the contractor company.
- Confirmation that the contractor company have systems for ensuring that their plant and equipment is safe.
- Confirmation that the contractor is aware of the safety requirements of CRH.
- The level of supervision in place.

Please note the following key points in relation to the contractor prequalification system:

- The **“Contractor Safety Checklist ” (or agreed equivalent)** is completed by the contractor.
- The operational manager who engages the contractor is responsible for ensuring that the prequalification process with the contractor is completed prior to the contractor commencing work at the location.
- Where contractors are used throughout the year for one operation, the form can be completed once per year.

Example:

where a contract company carry out maintenance throughout the year at different times, that contractor company can complete one Contractor Safety Checklist in January of each year. They are required to list all the procedures and personnel that they will use throughout the year. If the personnel used by the contractor company are different to the personnel listed in the January Contractor Safety Checklist, then the CRH company / location would have to be informed of the change. The same applies where the contractor company carries out a different job or different work than that listed in the January Contractor Safety Checklist, then the CRH company / location would have to be informed of the change. (can be updated if personnel details change).

- Where contractors sub-contract an element of this work, the sub-contractors involved must also complete the relevant prequalification questionnaire.
- The contractor prequalification system detailed above is not required for low risk contractors such as
 - Security Contractors
 - Office Cleaners
 - Inspection Bodies
 - Personnel repairing office equipment only

One pre-qualification approach will ensure a system which is:

- Consistent
- Auditable

The contractor prequalification system is intended as a formal system of ensuring that contractors:

- Provide safe systems of work and risk assessment information relating to the work that they are going to carry out.
- That they are issued with the relevant CRH safety requirements and expectations.
- That the past safety performance of the contractor in terms of previous fatalities and serious accidents is identified.
- That the machinery and equipment to be used by the contractor companies is identified and where appropriate certification is made available.
- That the contractor and his personnel are suitably qualified and experienced to carry out the required work. This also covers the need that the contractor and those working on his behalf are medically fit to carry out the required work.
- That adequate insurance arrangements are in place.
- That the CRH requirements relating to Personal Protective Equipment are outlined.
- That the contractor is mandated to notify CRH of any changing work procedures, changing personnel or equipment.

National legislative requirements can be added by each company as appropriate.



Employment of Contractors

Requirements for Rule No.1

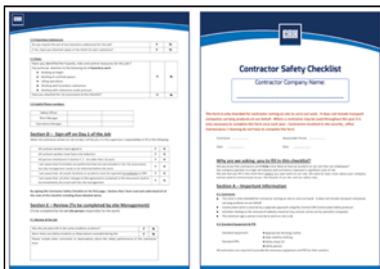
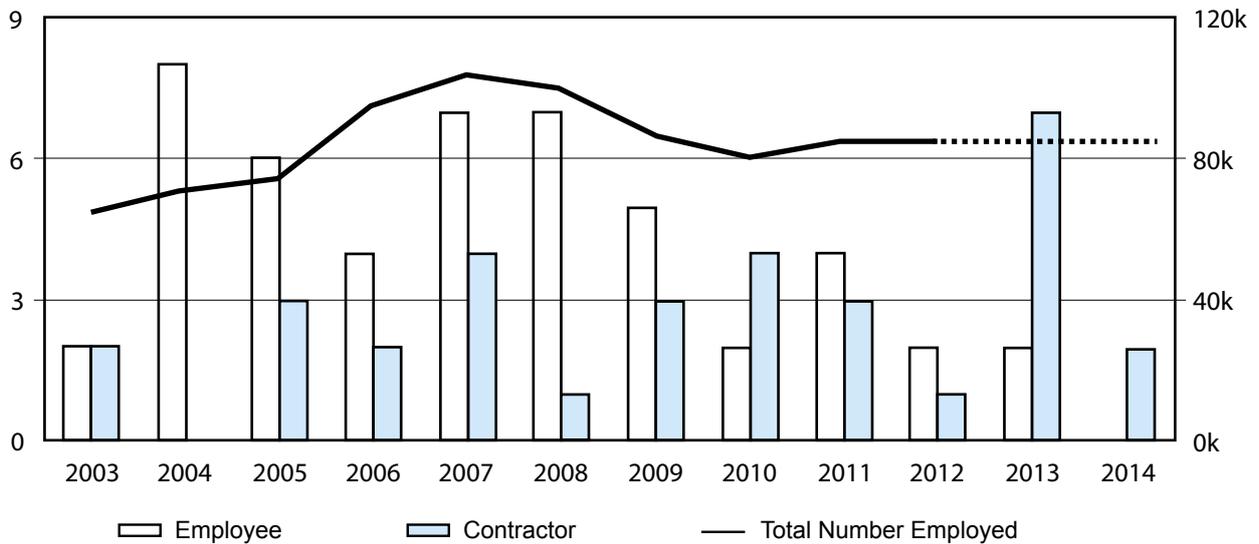
1. All companies must have in place a contractor prequalification system based on “The Contractor Safety Checklist” or similar prequalification questionnaire. Where contractors sub-contract an element of this work, the sub-contractors involved must also complete the relevant prequalification questionnaire. The contractor must provide safe systems of work and risk assessment information relating to the work that they are going to carry out.
2. The issuing of the “Contractor Safety Checklist” to the contractor firm is the responsibility of the manager or supervisor who engaged the contractor firm in the first instance.

The purpose is to ensure that the “Contractor Safety Checklist” is completed well in advance of commencing work on site . This is to allow a comprehensive prequalification assessment.

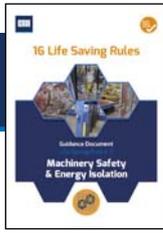
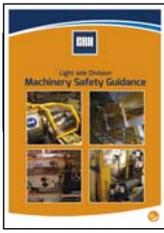
Each operation will be required to demonstrate that such a system is in place.

Rule No.1 Contractor Safety Management

Group Fatality Data: 2003 - 2014



Serious Accident 2014
 Accident involving major contractor firm:
 lifting gear failure during a lifting operation.
 Lifting gear certification out of date, task safe system of work incorrect.



Machinery Safety

Introduction

There have been a very significant number of fatal and serious accidents involving persons

- becoming trapped in machinery due to inadequate guarding
- becoming trapped in machinery having accessed protected areas
- becoming trapped in machinery and emergency stop cords failed to operate

Fatalities involving machine interlocks integrity are outlined on the following page. Fatalities within the group relating to inadequate guarding can be summarised as follows.

Year	Fatality Details
1999	Contractor trapped in unguarded return roller
2001	Contractor trapped in conveyor roller
2005	Contractor trapped in conveyor belt
2007	Contractor trapped in conveyor tail drum

This Life Saving Rule focusing on the following aspects

- Machinery Guarding standards.
- Where interlocks are in place, to ensure the integrity of such systems.
- Technical requirements for emergency stop buttons and trip cords.
- The need to review the need for start-up warning alarms as a last line of defence.

The 9 specific requirements for Life Saving Rule No.2 are outlined on pages 12 & 13.

Machinery Guarding Standards

The following technical guidance documentation has been prepared to assist operations in complying with the requirements on machinery guarding . This guidance can used when carrying out machinery safety inspections , risk assessments and when formulating safety training courses

- **16 Life Saving Rules guidance document on Machinery Safety** which incorporates the U.K Quarry Products Association “Code of Practice for the Safeguarding of machinery used in the aggregates industry”- this guidance contains pictorial guidance on guarding and isolation requirements.
- **Machinery Safety in Lightside activities:** this is an internal guidance document which contains pictorial guidance on guarding and isolation requirements.

The integrity of interlock systems

There have been a number of serious accidents within the group, where interlocks have been bypassed by maintenance staff.

Year	Fatality Details
2000	Maintenance person crushed by pallet clamp during maintenance
2001	Contractor crushed during commissioning of machinery
2001	Employee crushed by brick setting machinery
2004	Employee struck by automated machinery while carrying out maintenance
2005	Employee trapped inside cuber machine
2005	Employee trapped in polystyrene block feeder
2007	Employee accessed an EPS cutting line to clear a blockage, was trapped and killed
2009	Employee entered an interlocked area and was trapped and killed between a slider and column
2011	Employee accessed a brick gripper area and was trapped and killed

Each company must introduce a system of formal checks on all interlocks to ensure integrity i.e that they have not been bypassed. Interlock systems should be connected to a failsafe circuit.

Machinery Safety

Experience indicates that attempts to bypass interlocks are indicative of a production or maintenance issue that can be easily addressed placing the guard close to the machine to allow easier visual inspection and installing features such as remote greasing points.

Where inspections reveal that machine interlocks were being by passed, a management assessment must be carried out to identify the cause(s) leading to such a by-pass (the bypassing of an interlock is a serious breach of safety procedures and will result in significant disciplinary action).

Emergency Stop Systems

A Conveyor trip switch, when activated, should open a pair of contacts that are electrically connected to a failsafe circuit. This electrical failsafe circuit has to be risk assessed and engineered, so that the necessary measures are taken to ensure the reliability of this failsafe circuit. At the same time the trip switch has to operate a latching mechanism which keeps the contacts open. The setup should be such that having reset the emergency stop button or trip wire the machine does not restart.

For all Conveyor Trip wires, the following applies:

1. Technical Specification

- a) Either a switch is provided at each end OR
- b) A single switch is used at one end and a tension spring anchors the other end so that a pull on the wire in any direction will stop the conveyor.

2. Testing (conveyor trip wires and emergency stop buttons)

It is important that all trip wires are tested regularly i.e physically checked to ensure latching performance, and also to ensure that the switches have not seized up – the following are the requirements

- Trip cords and emergency stop buttons must be tested at least once per year.

Requirements for Rule No. 2

1. All machinery must be guarded in accordance with the CRH guidance which applies to your operation, namely:
 - The 16 Life Saving Rules guidance document on Machinery Safety (incorporating the QPA Technical Guidance Document).
 - The Lightside Machinery Safety Document.
2. From the requirements / guidance mentioned above in 1), attention is drawn in particular to the following requirements:
 - All machinery guards must be fixed. This means that an engineering tool is required to open the guard.
3. All interlock systems must be tested and inspected monthly by a competent person. The Site Manager is responsible for ensuring such a system is in place.

Where interlock systems have been found to be bypassed, the reasons for such modification should be investigated and identified.

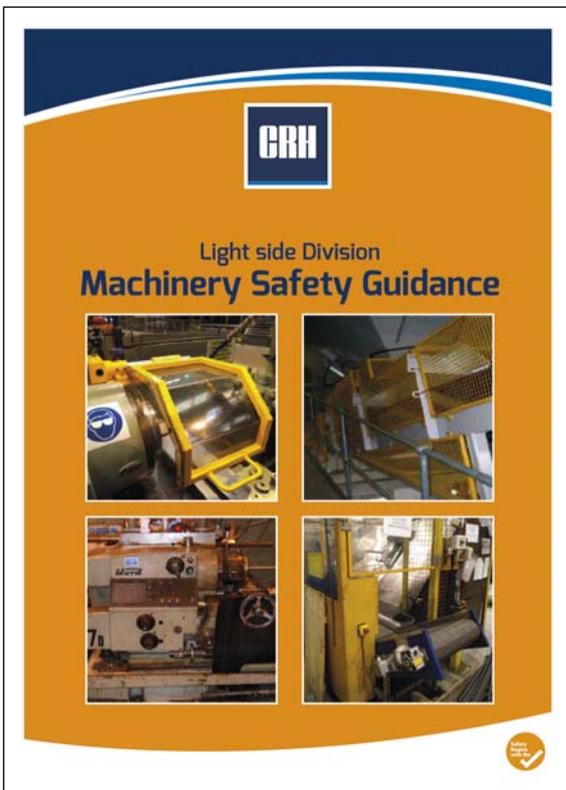
4. Each machine which relies on interlocked gates or interlocked guards must:
 - Have a specific risk assessment, which clearly identifies
 - Which circuits and relays are deployed when an interlocked gate or guard is opened/removed. This is to clearly identify what is controlled (and not controlled) by interlocks
 - Pneumatic / Hydraulic power sources.
 - Pneumatic / Hydraulic isolation sources.

Technical requirements around interlocks are included in the CRH guidance note on Machinery Safety / Energy Isolation.

Machinery Safety

Requirements for Rule No. 2 (cont.)

5. All emergency trip cords and buttons must be in compliance with the technical requirements outlined above.
6. As a minimum, all emergency trip cords and emergency stop buttons must be tested at least once per year. Each operation will be required to have evidence of such inspections and testing.
7. The use of start up warning alarms must be considered as part of the risk assessment process relating to individual machines. Operations will be required to have evidence that this issue has been considered in the relevant risk assessment for each machine.
8. Machinery Safety: Safety Rules to live by (see below) must be integrated into machinery safety training programs.
9. Emergency stop buttons fitted to electrically driven and mechanically driven machines such as motors, presses and rollers have to be clearly marked – see examples on page 14.



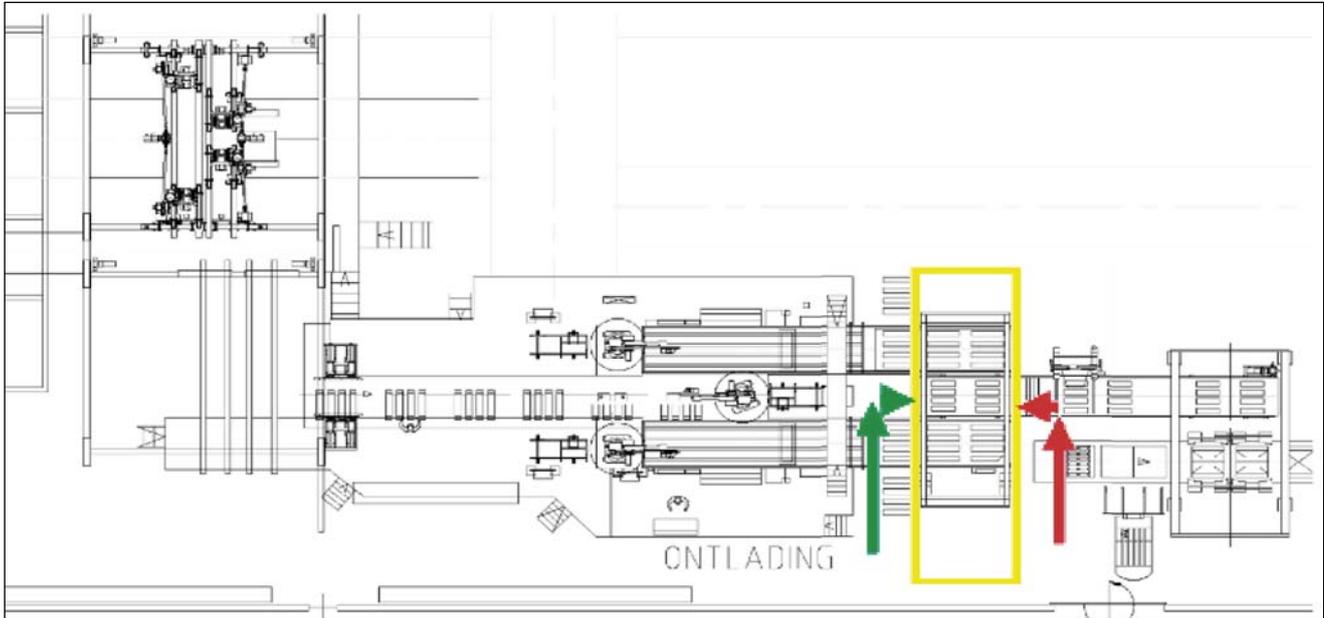
MACHINERY SAFETY: SAFETY RULES TO LIVE BY

- 
Conveyors SHALL
 only be operated with approved guarding in place
- 
Workers SHALL
 LOTO/LTT all energy sources before doing maintenance
- 
Workers SHALL
 LOTO/LTT all energy sources before cleaning & clearing jams
- 
Workers SHALL NOT
 modify, misuse or remove controls, interlocks or warning devices
- 
Workers SHALL
 keep clothing, tools, body parts and loose hair away from conveyors
- 
Workers SHALL NOT
 climb, sit, ride, stand, touch, or walk on or walk under exposed conveyors
- 
Workers SHALL
 be trained and competent to operate & maintain conveyors
- 
Workers SHALL
 know the location and function of all stop & start controls
- 
Workers SHALL
 ensure everyone is away from conveyors before starting
- 
Workers SHALL
 report all unsafe conditions and behaviours

Machinery Safety

Rule No. 2 Machinery Guarding

Group Fatal Accident – Case Study



Fatal Accident April 2011
 CRH Brick Factory
 A gripper (outlined in yellow) was protected on one side by an interlocked system. The assumption had been that staff would access the gripper using the route outlined by green arrows and would activate the interlock system. However a short cut through the route highlighted by the red arrows had developed, this access point was not protected.



Serious Accident 2005
 Operator sustained serious injuries when he became trapped in tail drum.



Emergency Stop

Machinery Safety



Serious Accident – Case Study 2013
Employee lost both hands after they became trapped in a machine producing plastic dimpled sheets.

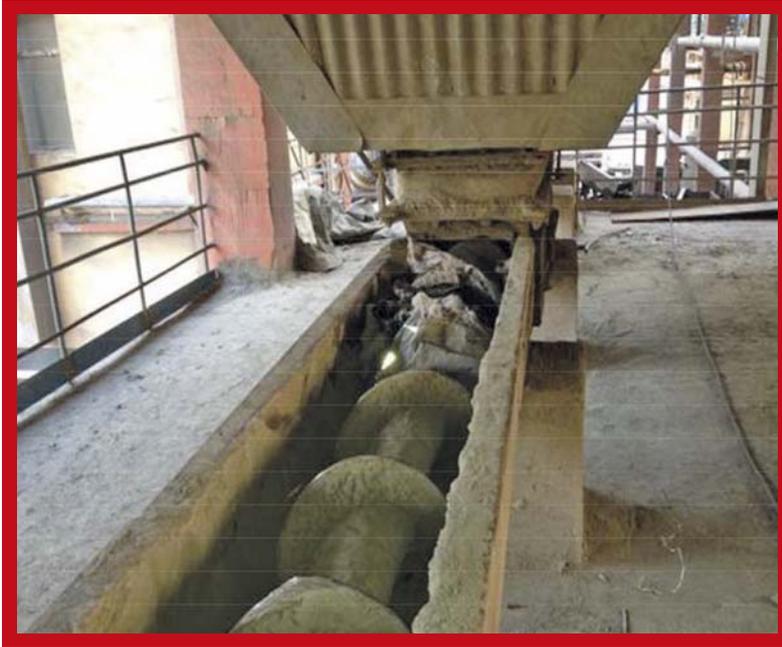


Serious Accident – Case Study 2014
Employee sustained serious hand and arm injuries when he was trapped between the discharge doors of a bucket and the bucket frame.

Remote greasing to prevent the need to remove the machine guard.



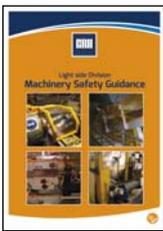
Machinery Safety



Serious Accident
 Case Study 2014
 Employee removed cement screw
 cover and became trapped in the
 screw which was still running and had
 not been isolated.



Dedicated inspection point with protective grid



Energy Isolation

Introduction

There have been a very significant number of fatal and serious accidents involving persons becoming trapped in machinery due a failure to follow the correct isolation procedure, a number of these accidents have been outlined on the following pages.

The concepts Lock Out Tag Out Confirm (LOTOC) or Lock Out Tag Out Try (LTT) are both used and are based on the same principle. It is important that there is a consistency in the understanding of the term “Energy Isolation”.

“Energy Isolation“ relates to the following sources of energy:

- Electrical
- Pneumatic
- Hydraulic
- Mechanical/Gravitational
- Thermal
- Residual energy in machine component parts
- Material flow

Year	Fatality Details
2000	Maintenance person crushed by pallet clamp during maintenance
2001	Contractor crushed during commissioning of machinery
2001	Employee crushed by brick setting machinery
2004	Employee struck by automated machinery while carrying out maintenance
2005	Employee trapped inside cuber machine
2005	Employee trapped in polystyrene block feeder
2007	Employee accessed and EPS cutting line to clear a blockage , was trapped and killed
2008	2 contractors fatally injured when a mill was restarted while still working within it
2009	Employee entered and interlocked area and was trapped and killed between a slider and column
2011	Employee accessed a brick gripper area and was trapped and killed

Requirements of Rule No.3

1. Each location must have a documented LOTO/LTT policy incorporating machine specific LOTO/LTT rules.
2. That policy must cover the 7 energy sources outlined above. Operations will be required to have evidence that the various energy sources have been considered in machinery risk assessments.
3. Employees, who are involved in any element of LOTO/LTT procedures, must be trained in the policy and associated procedures. Such training must be carried out on an ongoing basis and the interval of such training should not be less than one year.
4. All Isolators must be clearly labelled to identify the item of equipment that they isolate.
5. In addition to padlocks, hasp locks (see photograph on page 19) must also be in place as part of all Isolation safe systems of work.
6. All employees and contractors involved in LOTO/LTT must be issued with their own personal padlock and identification system to be attached to the isolator as part of the LOTO/LTT procedure. When multiple persons are involved in a LOTO/LTT procedure , a multi hasp or lock out box must be used.
7. LOTO/LTT procedures and site specific information relating to LOTO/LTT must be included in the site safety inductions (for employees and contractors).
8. Each item of equipment which relies on interlocked gates or interlocked guards must:
 - Have a specific risk assessment, which clearly identifies
 - Which circuits and relays are deployed when an interlocked gate or guard is opened/removed. This is to clearly identify what is controlled (and not controlled) by interlocks.
 - Pneumatic / Hydraulic power sources.
 - Pneumatic / Hydraulic isolation sources.

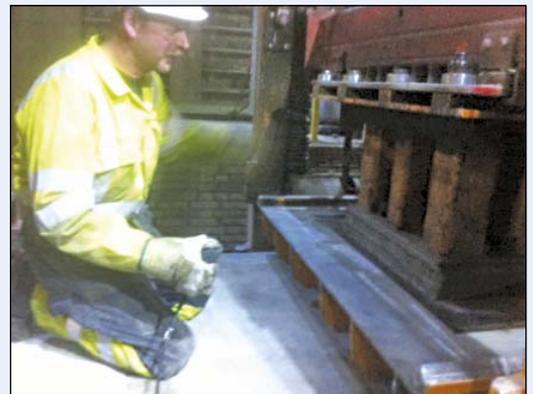
Energy Isolation

Requirements of Rule No.3 (cont.)

9. Standards for Mould change on machines with face feeder sections:

- Mould changing must be carried out according to site level risk assessment and safe operating procedures including machine specific LTT/LOTOC.
- This procedure must include photographs of the various steps to be taken in the mould changing process.
- This procedure must be a 2 man operation unless there is an automatic mould loading feature.
 - Drive back face feeder section to the isolation position and remove the mould from machine following the documented procedure.
 - After cleaning place the new mould in the machine as per the procedure.
- Where the power system of driving the face feeder section into position is a hydraulic system, there is an additional risk in the lack of a slow speed mode, so the following procedures must apply.
 1. All adjustments to the back feeder section and the mould positioning must be completed.
 2. All operators involved in the mould change must have vacated the machine area.
 3. The moving of the face feeder section to its operation position must be performed from the main operating panel.
 4. If local conditions only allow for the moving of the face feeder section from a local panel, then the panel must be located at safe distance (+ 2.0 meters) from the locking position.
 5. When the face feeder is in the locking position, isolation (LTT/LOTOC) must be in place where manual bolting of the face feeder section to the main frame is required.
 6. Only after the locking and ensuring that all sections are connected and may the operator removed LTT/LOTOC.
 7. At this stage the machine is ready to be put into operation mode.
- In addition to the procedures where the power system of driving the face feeder section is electrical there must be a slow mode and an enabling button/dead man switch (**wired to a safety-controller/relay**) in use for moving the unit.
- For machines that require any movements to be controlled inside the enclosure best practice would be to use an enabling/dead man switch for all such movements. See the picture.

Use of an audible alarm or bell that goes off prior to any movement would also alert other operators in the vicinity of the work zone.

**2016 Fatal Accident: Lime Works**

2 employees were replacing rubber skirting around a discharge point. The belt had been shut down for maintenance (by another team of maintenance personnel) with full isolation (LTT/LOTOC). The isolation was removed at the far end of the line to run a belt for a few moments (to clear material from a build-up at another discharge point) – the team that had restarted the belt believed the other team had completed their work. Neither of the two employees had applied their personal locks. One of the employees was killed when the belt restarted.

Energy Isolation



LOTOC/LTT training



LTT or LOTO



Pneumatic Isolation



Clearly identified pneumatic isolation point



Mechanical Isolation: protecting a sliding door (Mechanical + Padlock)



Mechanical Isolation: protecting a sliding door (Mechanical + Padlock)



2015 Accident:
 An employee placed this bar through a conveyor guard to remove a material build up. The bar was trapped in the moving nip point resulting in the bar and the worker's hand being pulled inwards. The worker lost the top section of his middle finger on his right hand and sustained soft tissue damage to the thumb of his left hand.



Electrical Safety

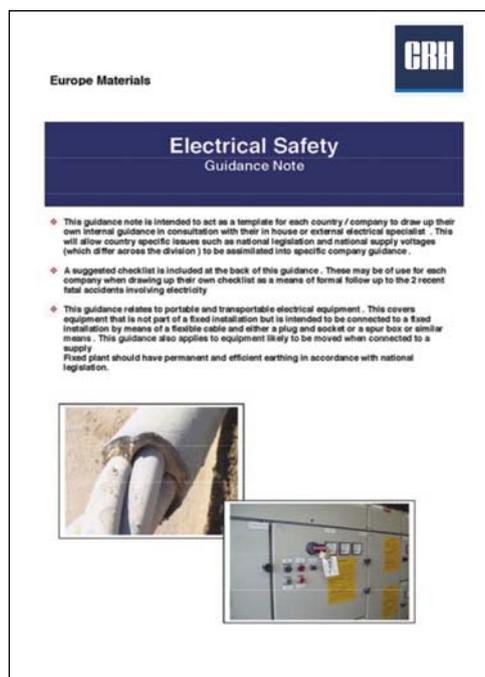
Introduction

There have been a very significant number of fatal and serious accidents involving persons being electrocuted or burned (a number of this accidents are summarised on page 21).

A guidance document: **CRH Heavy/Light side Electrical Safety Guidance** has been developed to assist operations to comply with this rule.

Requirements of Rule No.4

1. Each operational site must have a list of electrical equipment or an electrical survey completed. As a minimum this information must cover the following:
 - A list of all electrical installations at the site.
 - Confirmation that the electrical line/circuit drawings are up to date.
 - A summary of maintenance requirements for the electrical equipment.
 - Emergency shut off devices are in place at each installation.
 - LOTO/LTT facilities are in place .
 - There is a scheme in place to restrict access to electrical panels and enclosures, transformers and substations.
 - All installations have the correct IP rating for the location and activity.
 - Confirmation that the electrical distribution systems likely to be affected by lightning are fitted with over voltage protection.
2. The CRH Europe (HS/LS) electrical guidance includes a checklist which must be completed at each operation once per year (or shorter intervals if required by local/national legislation) by a competent qualified electrician (internal or external) and this checklist must be available for inspection. The completion of this checklist for each operation each year is a mandatory requirement.
3. Each operational site will be required to show evidence that electrical supply cables subject to physical damage have been identified and replaced by reinforced / strengthened cables.
4. Each operational site must comply with the requirements from the CRH Electrical Safety Guidance document .
5. All electrical contractors must be externally accredited (accreditation to be defined at country level) and all internal electrical people formally authorised by plant management.



Electrical Safety



Fatal Accident 2011
Employee picked up cable which was damaged –he received a fatal electric shock.



Fatal Accident 2012
Electrician was changing light bulbs when he suffered an electric shock- the electrical isolation of the circuit had not been confirmed.

2015 Accident
A contract electrician received superficial burns to both his hands whilst removing a fuse compartment in the control room sub station at Croxden Quarry. The incident was the result of an electrical arc in the panel.



Electrical Safety

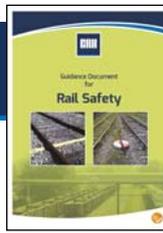
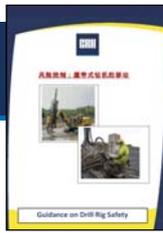
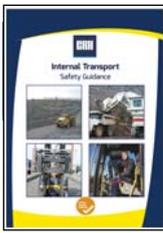


A Digital Multi-Meter



Insulated Tools





Site Transport (Including Rail Operations)

Introduction

Accidents involving mobile plant account for over 60% of fatal accidents within the aggregates industry. This rule is designed to focus on the key accident causes within this sector.

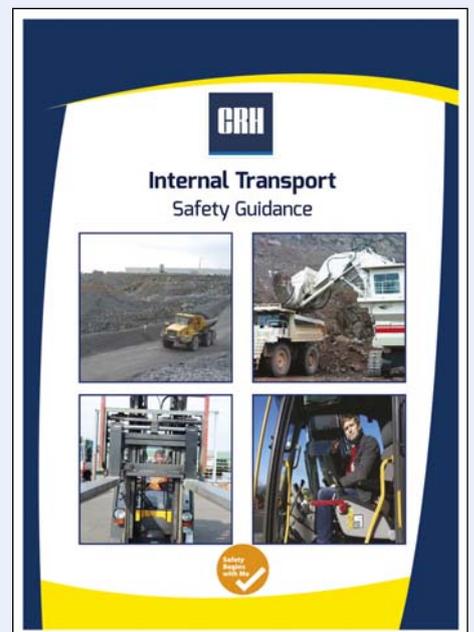
Year	Fatality Details
1997	Contractor struck by a reversing RMC truck on site
2001	Dump truck driver killed when vehicle overturned
2004	Contractor struck by reversing excavator
2004	Employee struck by reversing truck on site
2006	Truck struck an overhead power line on a road surfacing project – driver was killed when he touched the truck
2007	Contract HGV driver killed when truck went off a public road
2007	Contract HGV driver crushed between his vehicle and gate after he left the truck and did not engage the handbrake
2013	Excavator struck a control cabin where a workers was situated, the building collapsed killing the worker.
2014	A truck driver stopped on a public road to check the security of a load of pipes he was transporting when the load fell onto him
2014	Contractor struck and killed by rail wagon during repair

Note: Issues relating to Forklift Safety are specifically referred to in Life Saving Rule No. 6

Requirements for Rule 5

1. Each location must have documented site transport rules in place, based on a site transport assessment which, at a minimum, address:
 - a) Vehicle / Pedestrian separation: This must include a site transport risk assessment. In effect this is an overview of truck , car, site mobile plant and people flow/movement. See a worked example in the CRH Guidance note “ Internal Transport: Safety Guidance” (pictured below).
 - b) Edge protection for slopes/benches.
 - c) Mobile plant driver competency and training requirements.
 - d) Vehicle rules –
 - a. Speed limits / restrictions.
 - b. Use of mobile phones.
 - c. Mandatory wearing of seat belts by all drivers for all vehicles.
 - d. Carrying of passengers in vehicles. Passengers must only be carried in vehicles where there is a separate seat.
 - e. **Vehicle towing:** Prior to towing, it is necessary to ensure that:
 - A risk assessment must be completed, which consider aspects such as suitability of towing vehicle, competence of personnel, proximity of vehicles, slope & gradient, attachment points, exclusion zone etc.
 - Only certified towing ropes or slings(non steel) or fixed draw-bars may be used for towing. They should be regularly examined.
 - Chains/Slings used for towing must never be used for lifting and should be clearly labelled “ Towing Only”.

A guidance document outlining specific guidance and a significant number of examples is available to assist in full implementation of this rule.



Site Transport (Including Rail Operations)

Requirements for Rule 5 (cont.)

- All loading shovels, dozers and dump trucks must be fitted with CCTV systems and external flashing beacons. The need for CCTV's on excavators should be based on a site risk assessment.

All site vehicles/mobile plant must be fitted with reverse warning alarms and concave and convex mirrors.

- A system must be in place to ensure that a documented pre start check is carried out on each work vehicle at the start of the working shift.
- Each site must have a policy which requires all employee, contractors and visitors to wear high visibility clothing where appropriate. High Visibility bibs/vests must not be used by production/maintenance staff as they may become open/loose and present a hazard. In such cases, high visibility overalls or polo shirts should be used. High Visibility clothing must be of yellow or orange colour with reflective banding (such high visibility clothing should comply with EN471).
- A system must be in place to ensure that the brake systems on dump trucks and loading shovels are tested at least twice per year.
- All employees operating site vehicles (this does not include company cars for use on public roads) must be trained, and must carry out documented daily pre-use company vehicle inspections for both on-site and off-site use. Employees operating site mobile plant must receive regular refresher training. This refresher training for employees must be carried out at a minimum of **every 3 years** and must include an assessment by a competent instructor of the plant operator actually operating the item of mobile plant. This requirement does not apply to construction projects where contract mobile plant operators hold evidence of competence from accredited external bodies.

The 3 year interval for employees is to recognise the high level of risk involved with site vehicles. The refresher training does not need to be a time consuming process, it can simply involve a competent instructor observing a driver operating the vehicle for 45/60 minutes to ensure that no bad habits or poor practices have evolved since the driver's initial training.

- Edge protection must be in place on haul and access roads within the operation to prevent a vehicle going over an unprotected edge. The height of this edge protection must be equal a minimum of 1.5 metres or half of the diameter of the wheel of the largest site vehicle using that road. Haul road widths and gradients must comply with the diagram outlined on page 28, unless a risk assessment of existing conditions has been completed and it is deemed not necessary.
- All employees who drive on a public road on company business should be assessed as to a need to have refresher training. Each company can define the criteria for the selection of personnel for such training, but is it is envisaged that personnel driving in excess of 16,000 km (10,000 miles) per annum on company business should have a form of refresher training (to be defined at country level) at least every 3 years.



2016 Fatal Accident: RMC Plant

A worker was using a water hose to clean a yard . At the same time a RMC mixer was being cleaned out (engine running). Following the cleaning operation, the RMC mixer started to move forward. The driver was looking to his left, where his view was blocked by another RMC truck (see photo).

While moving forward the driver did not see the worker (cleaning the yard) and he ran over him.

Site Transport (Including Rail Operations)

Requirements for Rule 5 (cont.)

9. Railway Safety

- All personnel with responsibilities relating to any aspect of planning , operation or maintenance around railway operations must hold evidence of competence in their area of responsibility from an accredited external body or from an accredited internal training program.
- An overall risk assessment for railway activity must be completed covering, as a minimum, the following:
 - Contacts between trains, head to head and head to tail.
 - Contacts between trains and other things (e.g. vehicles, workgroups, plant, machinery and equipment, people and animals).
 - De-railing and re-railing.
 - Decoupling during the journey or shunting.
 - Shunting.
 - Yard shunting (other than by locomotives) .
 - Locomotive/load characteristics.
 - Unexpected operator/s incapacity and impairment of operators (including traffic controllers).
 - Procedures and rules around chocking.
- The indicator which denotes the safe parking point must be clearly visible – see examples on page 26.

10. The CRH guidance note “ Work near water” must be used when devising risk assessment for work or vehicle movement close to water – see LSR No. 12, requirement 13.



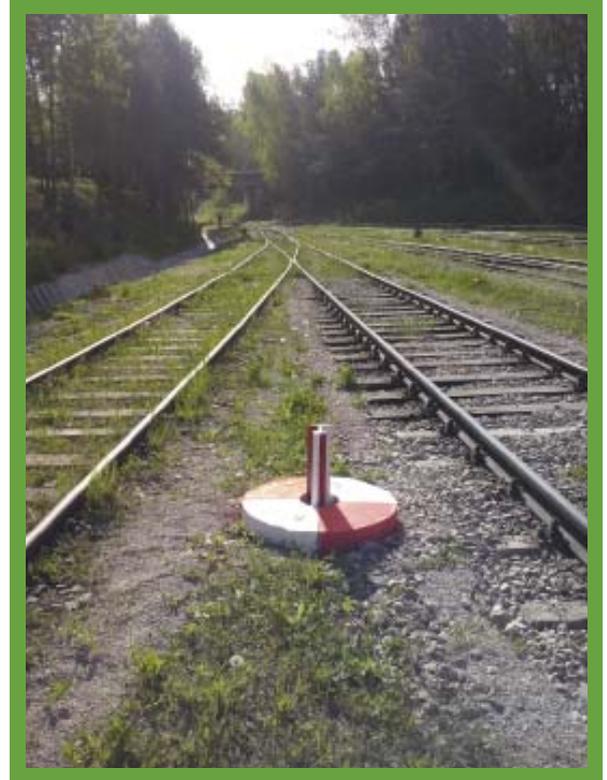
Personal Protective Equipment: see point 3 of the Minimum Mandatory Framework on Page 65



Site Transport (Including Rail Operations)



Markers to clearly identify the required holding position for parked wagons



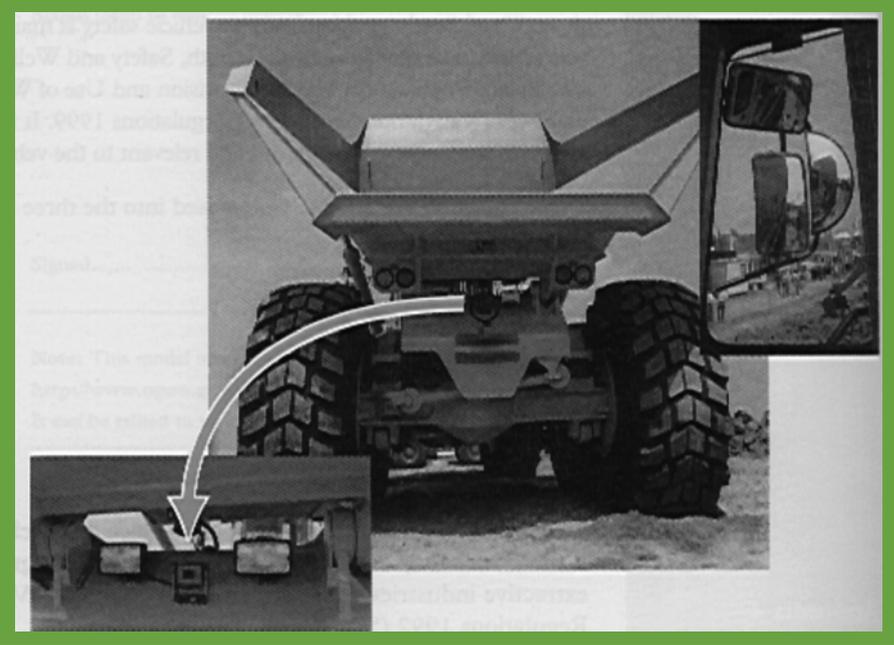
2014 Accident

An employee was standing on the access steps of the locomotive (using a remote control) . The locomotive struck a wagon was had rolled onto the main track from a siding. The wagon brake was not engaged and the wagon was not chocked.

Site Transport (Including Rail Operations)

Group Fatal Accident:
Case Study 2004
Foreman fatally injured when he was run over by a vehicle reversing off the weighbridge.

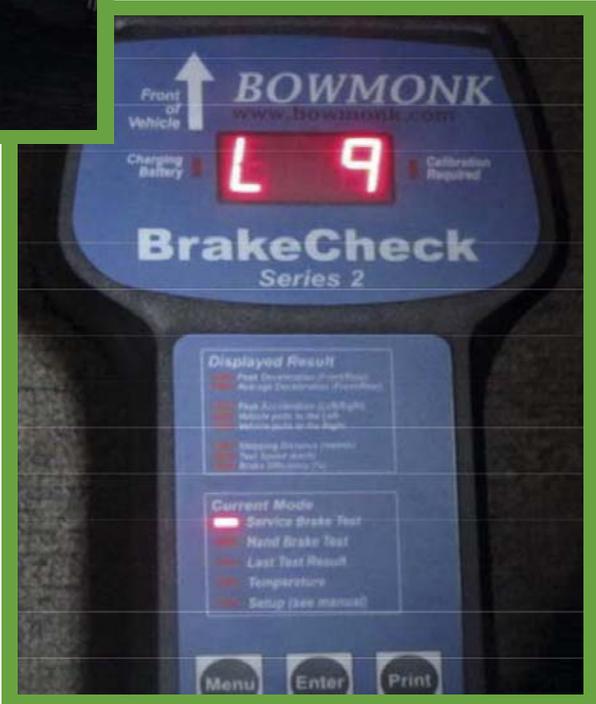
Group Fatal Accident:
Case Study 1998
Foreman run over by a reversing dump truck.



There are 3 persons in this photo – can you spot all 3?

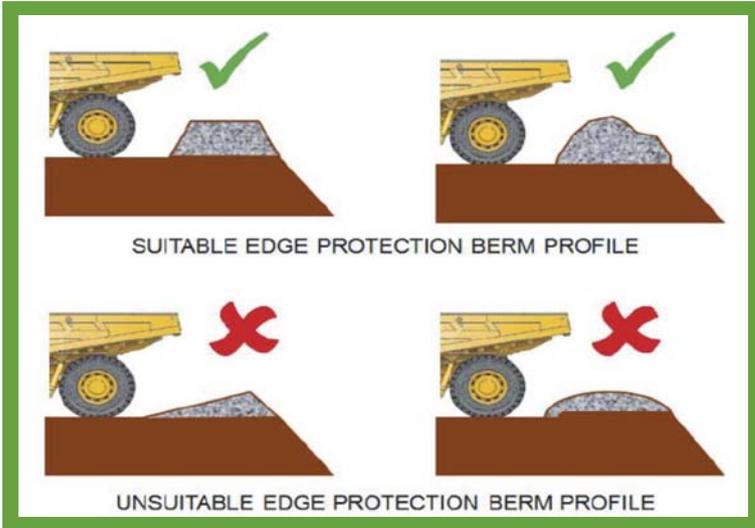


PPE requirements specified at site entrance



Brake tester for large site vehicles

Site Transport (Including Rail Operations)

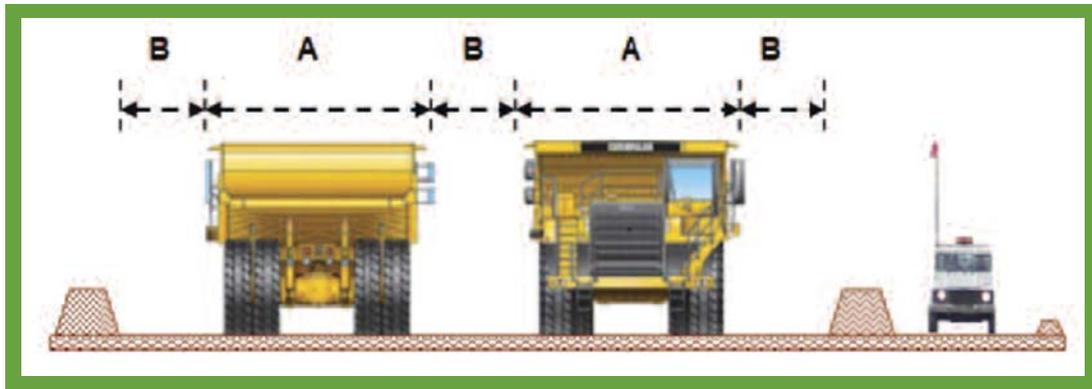


Edge protection using precast structures



Safety Banks in practice

<p>10% < slope < 15% Put in place the following sign "Dangerous Descent"</p>	<p>15% < slope < 20% Modify the ground to bring the slope to 15% - if this is not possible put a sign in place stating " Dangerous Descent " and also limit access to the road to authorised vehicles only.</p>	<p>Slope > 20%</p> <p>Not allowed for use</p>
<p>USE 3RD GEAR AND USE THE RETARDER NO ACCESS FOR HEAVY GOODS VEHICLES</p>		



A = Width of widest truck using road
B = Half width of widest truck
eg. For two lane traffic - road width should be three and a half times widest truck width.

Forklift Safety

Introduction

There have been a number of fatal and serious accidents involving forklift trucks within the group in recent years.

Year	Fatality Details
2007	Employee struck by a reversing forklift truck
2009	Employee struck by a reversing forklift truck
2009	Employee struck by a forward moving forklift truck carrying a load
2013	Employee struck by a forward moving forklift truck

Requirements for Rule No.6

- The operational speed of the forklift must be restricted through the vehicle management system (where available) to
 - Forward speed : 16km/h
 - Reverse speed: 5 km/h

For forward and reverse movement a warning light system such as the Blue light system shown below must be considered as a possible control measure while risk assessing forklift activity within each operation (evidence of such an assessment will be required).

- A risk assessment must be carried out for each forklift to ensure that the visibility of the driver is not restricted when carrying typical/standard loads as part of the normal working shift.
- As a minimum, all forklifts must be fitted with:
 - A seat belt
 - A cabtop flashing beacon
 - A reverse warning alarm
 - A convex mirror
- All forklift drivers must carry out a documented pre start check before the commencement of their shift.
- All persons operating forklifts (including maintenance personnel who may only operate the units periodically) must receive formal training.
- Employees operating forklift trucks must receive regular refresher training. This refresher training for employees must be carried out at a minimum of **every 3 years** and must include an assessment by a competent instructor of the plant operator actually operating the item of mobile plant.

The 3 year interval for employees is to recognise the high level of risk involved with site vehicles. The refresher training does not need to be a time consuming process, it can simply involve a competent instructor observing a driver operating the vehicle for 45/60 minutes to ensure that no bad habits or poor practice have evolved since the driver's initial training.



Blue Spot System in operation

Forklift Safety



Group Fatal Accident:
Case Study
Contract fitter struck and killed by a Forklift unit.



Group Fatal Accident:
Case Study 2009
Employee struck and killed by a reversing forklift truck.



Group Fatal Accident:
Case Study 2006
Employee fatally injured when he became pinned between forks and stack of wallboard.

Mobile Phones

This rule sets out the minimum requirements relating to the use of mobile phones in companies. Some companies have introduced additional measures in relation to mobile phone use.

Introduction

Accidents involving mobile plant account for a significant section of serious accidents in our Industry. An issue that has arisen over recent years has been the use of mobile phones by both mobile plant operators and pedestrian / workers walking in areas of traffic movement. Page 32 covers two such accidents in recent years.

Year	Fatality Details
2004	Employee on a mobile phone was struck by a reversing truck
2012	Employee on a mobile phone struck by a truck moving forward

To deal with this risk, each company must implement a policy in relation to mobile phones (a sample to assist in this process is shown on page 33)

As a minimum, each company's mobile phone policy must include:

- A requirement that the use of mobile phones in the workplace must be restricted to a minimum.
- A commitment that all company public road vehicles must be fitted with a hands free system.
- A commitment that all phone calls using the handsfree will be kept to a minimum and that the company vehicle driver will immediately inform the caller than he/she is driving.
- A clear requirement not to use mobile phones near moving machinery or near to areas where moving mobile plant is operating.
- The policy must also cover the use of a mobile phone for texting and the accessing of information through a mobile phone.

Requirements for Rule No.7

1. A Mobile Phone policy to be formulated and implemented, and as a minimum, refer to the issues highlighted in the sample policy produced (see page 33).
2. This policy must to be circulated to all employees and contractors. The policy must be incorporated into the safety induction process for employees and contractors (including all contract transport operators).
3. Site rules on the use of mobile phones must be specified in the site transport rules as required under Life Saving rule No.5.



Mobile Phones

*This rule sets out the minimum requirements relating to the use of mobile phones in companies.
Some companies have introduced additional measures in relation to mobile phone use.*

Group Fatal Accident: Case Study 2012

A Foreman was run over by a concrete truck which was moving forward. He became distracted after taking a mobile phone call

Group Fatal Accident: Case Study 2004

Foreman run over by a vehicle reversing off the weighbridge.



Mobile Phones

This rule sets out the minimum requirements relating to the use of mobile phones in companies. Some companies have introduced additional measures in relation to mobile phone use.

SAFE USE OF MOBILE PHONES – SAMPLE POLICY

In most countries , it is an offence to use a Handheld phone while driving . Accordingly while driving a CRH Vehicle (HGV, Car, Van etc) on a Public Road , you must be in possession of a hands free apparatus i.e. a Bluetooth handsfree or similar device.

WORKSITES**TO SITE MANAGERS / SUPERVISORS / ALL STAFF SUBCONTRACTORS:**

The Use of Personal Phones for personal calls or personal messages should be restricted to break times. Any employee who needs to make/receive an urgent personal telephone call will be accommodated – please ask your Supervisor.

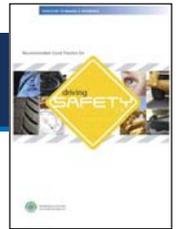
Where Possible , machine operators and those working near fixed plant/machinery should avoid the use of mobile phones.

DO NOT

- **DO NOT** Answer a call when operating Plant and/or Machinery.
- **DO NOT** Answer a call if communicating with others on site radios. e.g. slinger/banksman / crane drivers.
- **DO NOT** Use or operate a phone when climbing a ladder or other similar structures.
- **DO NOT** Operate mobile phones or other electrical equipment near petrol containers or other flammable substances.
- **DO NOT** Permit the use of mobile phones when excavating near gas pipelines.
- **DO NOT** Use mobile phones in areas where the site rules strictly forbid them.
- **DO NOT** Operate mobile phones when crossing traffic routes.
- **DO NOT** Operate mobile phones near any shot-firing operations.

DO

- Carry a mobile phone if working alone in a remote area e.g. driller.
- Carry a mobile phone if you are concerned about your safety going to or from work.
- Ensure you have quick and effective communications available for emergency situations.
- Ensure you are standing in a safe area before answering a call.



The Management of Contract Transport (Heavy Goods Vehicles on the Public Road)

Introduction

A significant section of the working population within our operations are employee and contract drivers of public road HGV's (Heavy Goods Vehicles) transporting material on our behalf. While we cannot monitor and check every aspect of contract haulier safety and behaviour, we must have in place a system that ensures that each contractor transport company is aware of our safety requirements and that we have a system that monitors the implementation of these requirements by the transport contractor.

Drivers who are involved in the delivery and erection of precast elements are also covered by Life Saving Rule No.11.

The key elements of any such system relating to the management of contract public road transport contractors must cover the following:

- Screening drivers – in practice undertaking background screening checks on drivers to verify their driving records.
- Driver training programs.
- Monitoring driver fitness for work.
- Vehicle standards.
- Providing facilities to enable drivers to comply with company rules – rest areas etc .
- Journey management planning (in certain countries).

It is important to note that these requirements do not apply to:

- Vehicles coming on site to collect on behalf of a customer.
- Vehicles delivering goods or products from an outside source e.g fly-ash, welding equipment etc.
- Courier companies.

It is essential that:

- a) A formal system is in place to ensure that all such contract drivers have received formal induction safety training for the type of work they will be conducting. This training should include a detailed section on the hazards of:
 - Overhead electrical power lines.
 - The precautions required while tipping a load. This particular aspect of contract transport activity represents a significant number of high potential learning events in 2015.
 - Requirement for Personal Protective Equipment (PPE).
 - Site safety requirements relating to the CRH site that they are collecting material from.
 - The issues to be covered in a vehicle pre start check (prestart checks must be documented).
 - Where partial or mixed loads are a feature of the work carried out for CRH, the contract transport company must have training programs that cover details considerations for securing / strapping loads.
 - The CRH policy on mobile phone use and the requirement for a hands free system only.

The key requirement here is that contract transport companies working on our behalf must maintain records confirming that their drivers have received this training. From time to time the CRH company must carry out random checks on the **implementation of the CRH safety requirements** within that company.

In summary we are requiring contract transport companies working on our behalf to train their drivers on the issues highlighted above. In many cases the CRH company may assist the contract transport company in this process by providing training material such as DVD's etc . In some cases , where regular contract transport companies are used on a long term basis the CRH company may decide to carry out some of the training requirements

- b) Each transport company working on our behalf has a system in place to ensure all of their drivers have a valid driving licence to drive/operate the particular class of vehicle. The CRH company must have a system to periodically **check the implementation of** such a system among it's contract transport companies.

The requirements of a) and b) above need to be included as part of a prequalification process.

The Management of Contract Transport (Heavy Goods Vehicles on the Public Road)

Requirements for Rule No.8

1. All transport companies (operating public road vehicles) operating on behalf of a CRH company must have a formal safety awareness training program which as a minimum covers the issues in a) above. Each CRH company must have a system to periodically check the **implementation** of such a program among their contract transport companies.
2. Each transport company operating on our behalf must have an internal database (a basic record system will suffice for smaller contractors) which records the licence details for each of their drivers and the insurance details for each of their vehicles (which could operate on behalf of CRH).

Each CRH company must have a system to periodically check the **implementation** of such a database among their contract transport companies and

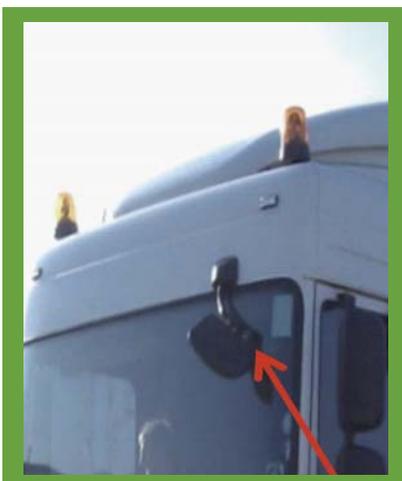
3. All drivers operating for a contract transport company must carry out **documented** daily pre-use vehicle check.

As a minimum this prestart check must include:

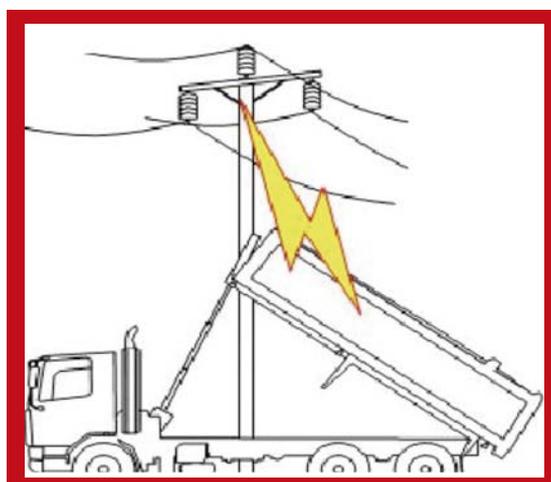
- A visual inspection of each vehicle tyre.
- The condition and position of vehicle mirrors (including the pedestrian safety mirror).
- That all vehicle lights are operational.
- That the reversing warning system is operational.

The requirement is for the CRH company to check that a documented prestart check has been carried out, the CRH company does not have to carry out that check.

4. Where partial or mixed loads are a feature of the work carried out for CRH, the contract transport company must have training programs that cover details considerations for securing / strapping loads.
5. From March 1st 2018, all Heavy Goods Vehicles working for CRH will be required to have the following safety devices fitted:
 - An audible alarm which warns the driver that the handbrake is not applied when the cab door is opened.
 - To have side under run protection guards with combined pedestrian/cyclist warning sign (see photo on Page 36).
 - All rigid heavy goods vehicles (aggregate tipper trucks and RMC mixers), either contract or owned must be fitted with a CCTV or radar system to assist with reversing.
 - All owned articulated vehicles must be fitted with a CCTV or radar system to assist with reversing.
6. From June 1st 2017, all new contracts signed with Contract Transport Companies must include a safety section as outlined on page 37.



Pedestrian Safety Mirror
a CRH requirement

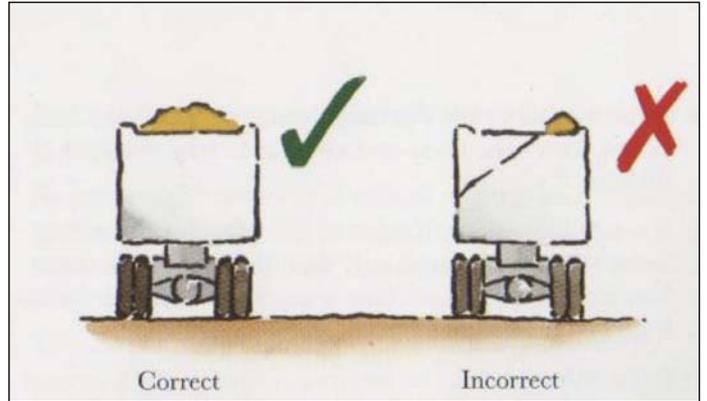
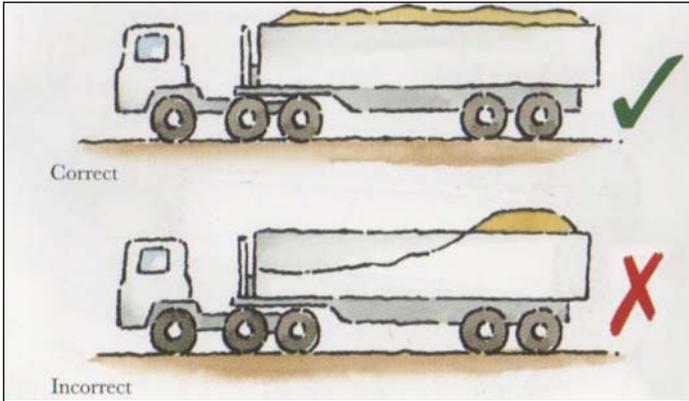


Danger from overhead power lines
must be covered in the Haulier Induction

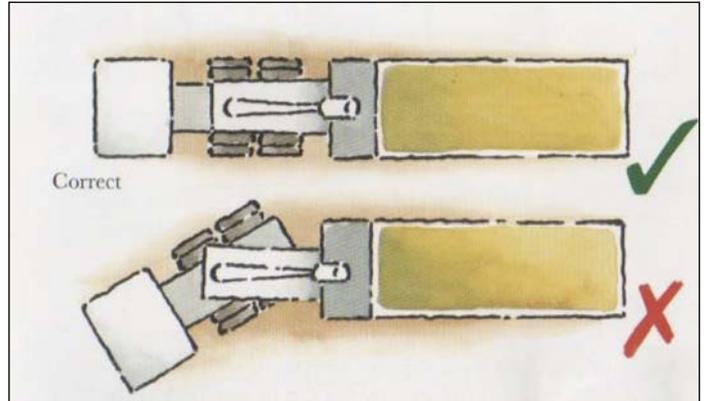


Pre start check book for truck
operator

The Management of Contract Transport
(Heavy Goods Vehicles on the Public Road)



Safe loading and unloading rules must be covered in the Haulier Induction



Side protection warnings



The Management of Contract Transport (Heavy Goods Vehicles on the Public Road)

Safety Element/Addition to Contracts

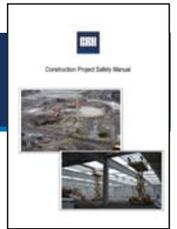
A transport contractor for CRH shall on signing the contract agree to the following requirements:

- 1.1.1. Must pass an initial safety prequalification process in accordance with the relevant operating company procedures.
- 1.1.2. Must comply with CRH driver and vehicle safety requirements and the key aspects covered in the “ CRH Transport Safety Checks “ which cover verification of the following:
 1. That the driver of the contract vehicle has conducted a daily prestart check of the vehicle before the commencement of his shift.
 2. That the driver has the required personal protective equipment in the vehicle.
 3. That the reverse warning system (a reverse alarm and a CCTV * (or similar detection system)) is in working order.
 4. That a pedestrian mirror is fitted to the front windscreen of the vehicle.
 5. That a handbrake warning alarm is in place where if the driver door is opened an alarm will sound if the handbrake is not engaged.*
 6. To have side under run protection guards with combined pedestrian/cyclist warning signs.*
 7. Load security (where applicable).

* required by March 2018
- 1.1.3. All vehicles purchased by the Transport Contractor after the date of this contract are expected to comply with the safety specifications outlined in relevant heavy goods vehicle section the CRH Red Book (guidance on procurement).
- 1.1.4. If the Transport contractor fails to pass any element of the CRH Transport Safety Check – they shall be liable to a sanction . The system of sanction will be decided by the opco.

Example

 - Failure of a CRH Transport Safety Check: €100 (and dismissal from site if non-compliance is deemed by local management to be serious).
- 1.1.5. Additional sanctions, as defined by the opco may also be put in place.
- 1.1.6. The Transport Contractor will be required to be attend and participate in ongoing Driver health initiatives.



Construction Project Safety

There are a wide range of project activities across the CRH group which come under the category of construction project. Such projects can range from the large undertakings such as the construction of cement plants (which can cost in the region of €250m), lime works, captive power plants and waste heat recovery plants to the installation/dismantling of a concrete plant.

Due to the scale of the activity on a construction project including the quantity and diverse nature of contractors/contractor work present, such projects carry a very significant risk of serious injury.

Such projects require considerable levels of planning and risk management in addition to significant levels of co-ordination of both processes and contractors.

To counter this risk, all construction projects within this division must comply with:

1. The CRH Construction Project Protocol

This document covers the key aspects of:

- Project Management structures: Safety.
- Project Planning: Design (Safety).
- Contractor Management.
- Project safety plan development and implementation.

2. The CRH Construction Project Safety Manual

- This document covers the technical safety requirements that all designers and construction contractors must comply with:

Construction Project Definition

Projects for the purposes of this protocol are defined as:

- A greenfield development of a:
 - Greenfield development of an aggregate location
 - Cement manufacturing process
 - Cement grinding process
 - Installation/ preassembly of a Concrete Plant
 - Addition/extension to a concrete products facility
 - Concrete Products plant e.g precast plant
 - Lime
 - A lightside fabrication/assembly facility
 - Asphalt plant
 - Any other development deemed by the management team as a significant project
- Brownfield (refurbishment) development (or dismantling) of:
 - New cement manufacturing line
 - Captive Power Plant
 - Waste heat recovery plant

As with previous projects, CRH personnel can be integrated into the project management structure as deemed appropriate by CRH.

It is the responsibility of the manager responsible for the project to ensure that the protocol and safety manual requirements are assessed at the project planning stage.

Requirements for Rule No.9

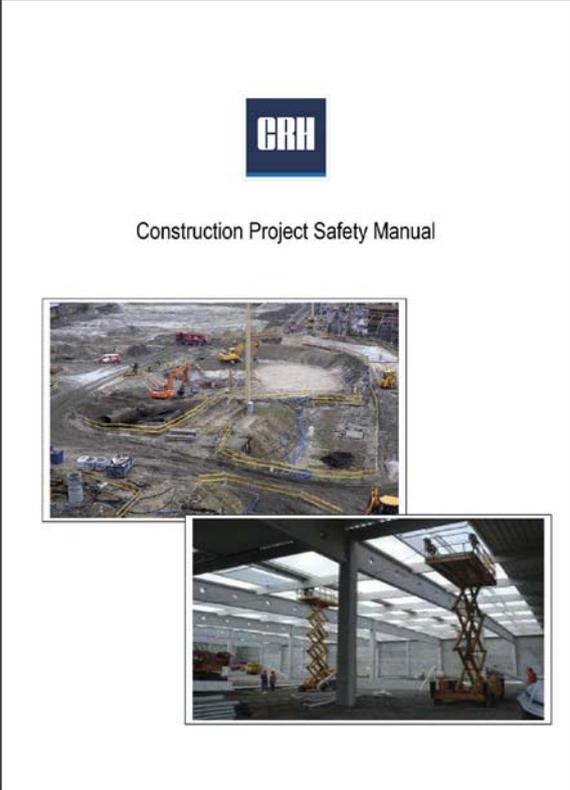
All construction projects (major and non major) within this division must comply with:

- The CRH Construction Project Protocol.
- The CRH Construction Project Safety Manual.

Construction Project Safety



Fatal Accident 2011
Contractor fell while crossing a wall during the construction of an extension



Raw Meal Silo Project

Construction Project Safety



Safety Netting in place



Transport systems at a construction site



Trench Boxes in use

Road Surfacing / Repair Operations

Introduction

Road surfacing / maintenance / repair is a significant activity within a number of our businesses. In addition to the hazards within the work site of moving vehicles, machinery and the handling of hot material, the additional very significant hazard of working close to live/moving public road traffic requires specific risk control measures.

Requirements for Rule No.10

Each work project/job must have a specific risk assessment, which as a minimum must cover the following:

1. Control Reversing Vehicles

- HGV delivery or collection vehicles must be instructed not to reverse unless they are under the direct control of a banksman/approved traffic controller.
- The banksman/approved traffic controller must be identified by wearing the designated orange jacket or vest with the word 'Banksman/Approved Traffic Controller' on the back.
- All vehicles delivering aggregates, asphalt or concrete must be fitted with:
 - i. A working CCTV rear view camera
 - ii. Audible reverse warning alarm
 - iii. White reversing lights
 - iv. Amber rotating beacon(s)

2. Mobile Plant Safety Zones

- All mobile plant/vehicle drivers must maintain a safety zone (in the path of travel) between the item of mobile plant/vehicle that they are driving and any pedestrian.
- The safety zones are:
 - 5 metres in the direct line of travel of any vehicle or item of plant.
 - 20 metres for mechanical road sweepers in the direct line of travel. You are allowed access to the paver augers only for the purpose of hand shovelling, testing or back casting of material.

3. Overhead Services

- Work adjacent to overhead service must only be carried out following the completion of a specific risk assessment and the development of a job specific safe system of work.

4. Buried Services (Underground Cables)

- Excavation work must only be carried out following the completion of a survey for buried services and the development of a job specific safe system of work.
- Procedures must be in place to ensure protection of workers against the risk of engulfment while working in the excavation and the risk of falling while working around the excavation.

5. Traffic Management

- Each project/job must have a specifically designed traffic management system based on a risk assessment. In addition to the issues around live traffic control, each traffic management system must include pedestrian management controls.

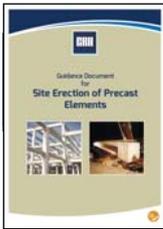
Road Surfacing / Repair Operations



Road-surfacing at night close to live traffic



Checking for the presence of underground services prior to the erection of fencing.



Lifting Operations

Introduction

There have been a number of serious accidents within the division which have occurred during lifting operations. Such operations have often involved the use of mobile cranes and the use of gantry cranes within operations.

A summary of these accidents is as follows:

Year	Fatality Details
1997	Contractor crushed when load fell from crane
1997	Contractor struck when a frame being lifted fell on him
2005	Contractor fell from a walkway while supervising a lifting operation being carried out by a crane when the walkway he was standing was undermined and collapsed
2008	Employee, a crane operator was killed when a precast wall panel she was moving fell and she was crushed
2009	Contractor struck by a glass element which was being lifted when the special vacuum lifting system malfunctioned
2009	Contractor struck by a beam which had fallen after being struck accidentally being a crane
2010	Employee lifting a concrete panel from a mould onto a transport car using a bridge crane when the lifting attachment on the mould failed and fell

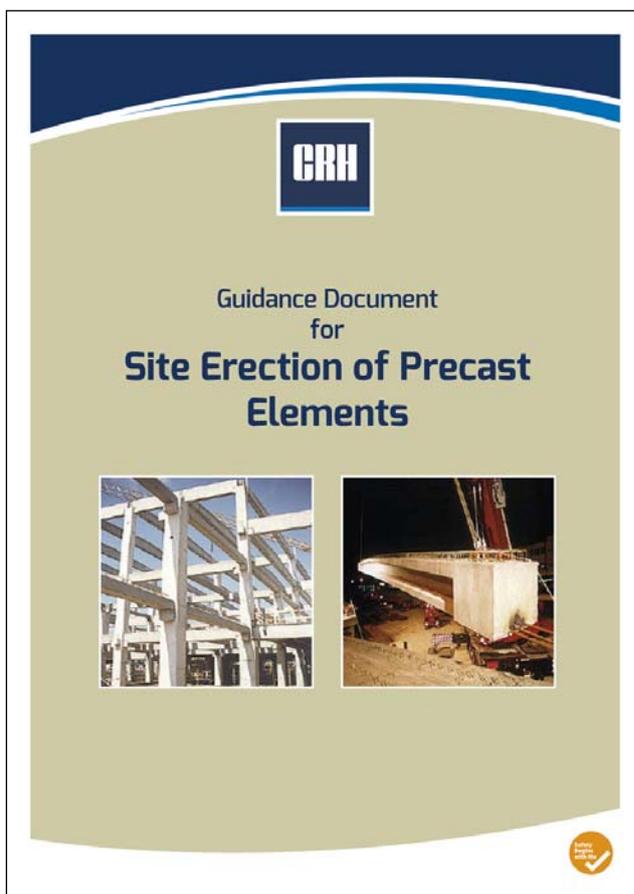
Requirements for Rule 11

1. Each company must have a system in place to ensure that in the prequalification of contractors who will be involved in lifting operations includes the verification of lifting equipment certification (See also LSR No.1).
2. Each company must have a system in place to ensure all operators of lifting equipment – static or mobile – must be trained in the operation of the equipment. A training program must also be in place for those responsible for securing loads for lifting.
3. Each company must have a system in place to ensure that the risk assessment for lifting operations covers checks on personnel competency, equipment certification and loading rates in accordance with a defined location specific policy.
4. All slings and chains in use must have a rated capacity tag and evidence of last inspection on the sling or chain.
5. All gantry crane controls must be labelled.
6. All gantry crane controls must be risk assessed for the possibility of inadvertent contact by the operator with the controls. As a minimum this will involve a barrier around the control to prevent inadvertent contact with the crane joystick – see photograph on page 45.
7. All lifting hooks must be fitted with safety latches.
8. Each company must have a system in place to ensure the regular inspection of:
 - Hoisting ropes
 - Load hooks
 - Limit switches
 - Brakes
 - Hoisting
 - Bridge
 - Trolley
 - Straps
 - Chains
 - Lifting Accessories
 - Alarms
 - All other safety features

Lifting Operations

Requirements for Rule 11 (cont.)

9. In operations where cranes are operating, exclusion zones (for personnel not involved in lifting operations) must be clearly identified and established.
10. Inserts embedded in the concrete product shall be designed for an ultimate load that is 4 times the working load (Factor Safety of 4) or as per national standards/requirements.
11. Material being moved into storage should be stored in a securing mechanism similar to photograph at the bottom of this page.
12. Site Erection:
 - Every company involved in site erection activities must have a construction site guidance manual, covering erection issues. A sample is provided.
 - Every construction site must have a specific plan for curing/stiffening during construction time, including clear rules for curing times and the withdrawal of structural supports.
 - There must be a start-up meeting with all involved staff, to ensure correct handling, stiffening, dismantling, use of fall protection, use of scaffolds, PPE safe areas for crane use, site transport roads and other relevant items.
 - There must be clear guidelines for any adjustments to the proposed construction methods or processes.



Lifting Operations



Group Fatal Accident: Case Study 2005
Contractor fell from walkway as it was being lifted.

Group Fatal Accident: Case Study 2006
During a lifting operation, a supervisor was trapped between the load being lifted and a steel beam.



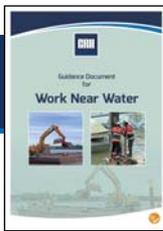
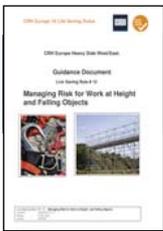
Dead Mans Joystick
You must push down to activate the joystick.

Lifting Operations



Typical lifting scenarios





Work at Height / Work near Water / Falling Objects

Introduction

Falls from height and falling objects have accounted for a number of fatal accidents across the group in recent years.

Fatalities within the group relating to work at height and falling objects can be summarised as follows:

Year	Fatality Details
1997	Employee crushed when load fell from crane
2000	Contractor fell through opening in roof
2000	Contractor fell from quarry face
2002	Contractor fell through opening in roof
2002	Employee fell through chute opening
2002	Contractor fell through roof sheeting while repairing smoke vents
2003	Contractor fell from silo while painting it
2004	Employee fell from first floor in storage area
2005	Contractor fell 10 metres while involved dismantling a walkway
2006	Employee fell 5 metres through an unprotected opening in the floor
2007	Manager fell through a steel section of walkway which gave way when he stood on it
2008	Employee fell from a walkway while trying to re-align a conveyor belt
2008	Contractor was descending from a work platform when he unclipped his safety harness, he fell while descending an access ladder
2009	Contractor entered a restricted area and fell through a section of walkway flooring which had been removed
2013	Contractor fell from height during mill repair
2014	Employee drowned while he fell from boat during maintenance work

This rule focuses on five risk control strategies for this particular hazard:

- The full time presence of a leased/hired/purchased MEWP (Mobile elevating work platform) or “Cherry Picker“ on site, where the scale of operation warrants the presence of such a vehicle (Company Safety personnel can determine the need based on a risk assessment).
- The installation of man grids on all hopper/bin openings, where there is a risk that a person may fall into that structure.
- As a last line of defence , safety nets should be used during the construction/demolition / modification of plant or buildings (in addition to having a MEWP available).The installation of the nets should only be carried out by a competent contractor.
- The risk to those working on the quarry top (Drilling and Blasting operations) from falling over the edge is eliminated through the use of a barrier system or bund (see photo on page 49). It is important that a safety harness / lanyard is also provided to deal with a situation where a person may have to go in front of the barrier.
- The use of ladders at any operations:
 - Should be kept to a minimum.
 - Should be restricted i.e not accessible. This will involve controlling access to ladders.
 - Their use should be subject to a visual inspection before use.

Risk assessments relating to work at height must now address the 5 key risk control measures outlined above.

Work at Height / Work near Water / Falling Objects

Requirements for Rule No.12

1. The risk assessments for each location within each company should include an assessment for the presence on a full time basis of a MEWP (purchased or leased).
2. An inspection system for all safety harnesses and associated accessories must be in place at each operation. Where a person working at height needs to move such that he needs to attach and re-attach from an anchor point, then a double leg lanyard shall be used – see photographs on page 50.
3. Man grids should be fitted to all hopper and bin openings where there is a risk of a person falling into such an opening. Maintaining “ full bins “ is not adequate.
4. A policy relating to the use of ladders should be in place covering the issues outlined on the previous page.
5. Where deemed appropriate, safety nets should be used as a means of reducing the risk of injuries involving falls from height during construction /modification/maintenance work.
6. Systems for work on the quarry top , such as barrier systems or bunds (see photographs on next page), must operate to a site specific safe system of work. A safe system of work for the installation / removal of any barrier / protective system.
7. All locations must carry out a Risk Assessment related to working at heights and document location-specific risks and control measures. This risk assessment must cover the issue of emergencies and the need to rescue a person working at height, e.g a person who has fallen while attached to a lanyard or who has fallen into a safety net. (Please note in many cases, the use of the local emergency services, once assessed as being likely to react in a timely fashion, will be a sufficient control).
8. Where material is being lifted overhead or where machinery is moving overhead and/or where there is a risk of:
 - Material falling downwards from a manufacturing process onto an area where people may be present.
 - Storage material falling sideways onto a person’s head.
 - Products being loaded falling from the loading vehicle such as a forklift.Then the use of safety helmets must be a requirement at that operation.
9. Specific training must be given to all relevant employees relating to working at heights.
10. In some of our operations where the risk of a fall from height may be high, one possible element of the risk control strategy is the use of straps on helmets (see photograph on next page). In situations where a person falls a short distance backwards or forwards, the level of injury from striking against a structure may be reduced if the helmet stays in position on the person. The need for straps to be used with helmets, for work at height or while working in certain areas, should be assessed on a company basis in 2016.
11. Storage and Racks:
 - Racks must be installed and maintained according to ISO 15635. When racks are adjusted or modifications are made, there must be a new inspection by a competent person.
 - Procedures for securing and preventing storage material from falling must be in place at each location.
 - A system must be in place to ensure all damage must be reported immediately to the location manager / nominated person.
 - All racks must be annually inspected by a competent person.
12. From 2017, a barrier system, in the adjustable form (see photograph at the bottom of page 51) must be in place to protect persons having to access the top of cement tanker vehicles for loading purposes.
13. Working near water.

Work near water is defined as work where pedestrians may have to work within 2 metres of water or vehicles may have to work within 4 metres of water where the water depth is in excess of 1 metre.

In the case of work near water – each operation where this may apply must have system to cover risk assessment, work practices, PPE and training. A guidance document on work near water is available to offer specific guidance on each of these key points.
14. Grids and flooring on walkways must be fixed by clamps and inspected at least annually by a competent internal person.
15. As a non primary control measure to prevent foot injury from falling objects, locations must introduce a type of safety boot which provides metatarsal protection. This is a form of safety shoe which provides full protection to the front of the foot, not just the area of the foot covered by the traditional toe cap protection safety shoe. This type of safety footwear should be introduced by January 1st 2018. An exception to this rule only applies where a risk assessment prepared by an internal safety professional allows the non use of this type of safety shoe.

Work at Height / Work near Water / Falling Objects



Group Fatal Accident: Case Study 2008
Contractor fell from upper level while descending. Risk assessment identified the need for a MEWP (Mobile Elevating Work Platform), but none was used.



Group Fatal Accident: Case Study 2006
Employee fell from a platform during the erection of an RMC Plant.



Barrier system at quarry face.



Fatal Accident 2011
Construction Project: contractor fell while crossing a wall during the construction of an extension.



Use of material bunds at the quarry face.

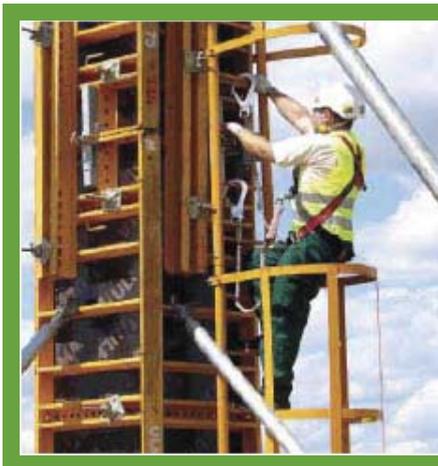
Work at Height / Work near Water / Falling Objects



Safe access system for securing and detaching lifting slings



Additional securing hooks for harness use – installed where required



Harness Lanyard

Work at Height / Work near Water / Falling Objects



Safe access for attaching lifting hooks



MEWP's in operation in brick manufacturing and cement production



System at Finnsementti to protect the tanker driver during loading. This system has been adjusted in terms of length and height to cover all vehicle sizes



Work at Height / Work near Water / Falling Objects



Man grids in place



Safety Nets in use



Work in Confined Space

Introduction

In terms of the risk management of work in confined spaces, it was agreed that 2 key risk management approaches would be taken:

1. The definition of confined space, will be taken in the context of elimination of hazards, that is:
 - Hazard of engulfment – work in silos, work in excavations.
 - Hazard of fire/explosion – contact with underground services or overhead power lines.
 - Hazard of oxygen depletion.
 - Hazard of exposure to toxic gases.
 - Hazards of falling objects.

2. All risk assessments must be reviewed to ensure the following issues have been included:
 - The need to eliminate work in confined spaces, through design and procedure.
 - Risk assessment and safe systems of work for such tasks to cover:
 - Risk of engulfment.
 - Risk of fire / explosion.
 - Risk of oxygen depletion.
 - Risk of exposure to toxic gases.
 - Risk of falling objects.
 - Formal planning and resourcing of such work.
 - **NO** lone working.

Requirements for Rule No.13

1. All locations must have a documented confined space entry policy and supporting rules for each confined space identified on site. All confined space entry points shall be identified and properly labelled as such.
2. Employees must seek prior authorisation to enter a confined space and documented authorisation procedures must form part of each location's confined space entry policy.
3. All confined space permits/authorisations must include a rescue plan (see incident on page 54). The rescue procedure outlined should be tested with emergency drills at least twice per year.
4. Shoring or appropriately designed sloping must be provided for all excavations over 1.5m (5 feet) in depth (where national legislation requires shoring at depths less than 1.5 metres, then that national requirement must be met).
5. All employees, who may be involved in confined space work, must be trained in the confined space entry rules including rescue / emergency procedures. Annual emergency drills should be carried out where specified in the site risk assessment.

Work in Confined Space

**Fatal Accident 2007**

The deceased was attempting to clear a raw meal silo blockage, by using a makeshift "bridge" to enter the silo. While working from the bridge, material from overhead came loose, struck the bridge causing the victim to fall. He suffocated within the material.

**Fatal Accident 2009**

Trench (2.1m) collapsed no shoring/support

**Incident 2011**

A specialist contractor was engaged to carry out a general inspection of a rail wagon used for storing waste solvent. During this process the worker showed signs of being overcome by fumes – the person observing the work from outside entered the tank to assist and also experienced difficulties – a second observer activated the rescue plan and both men were safely removed and treated.

Lone / Remote Working

Introduction

Notes:

- Lone working refers to a situation where a person is the only person on site at an operation i.e there is no one else on site.
- Remote working relates to a situation where a person is not the only person on site but he is working remote from others e.g drilling personnel.

Lone working is not permitted at company operational sites unless a risk assessment has been carried out by the company safety personnel or other qualified person.

A risk assessment must be carried out for all those working remotely and that risk assessment must assess:

1. The health of the person involved - has the person any medical condition which warrants additional monitoring measures when they are working remotely.
2. Communication – that this person has a means of communication e.g a mobile phone available to him so he can contact other persons on site.
3. Has the person working alone or remotely received detailed work instructions which tell him/her what they can and cannot do.

Example: A worker is required to open an operational site at 6 am and to start certain machinery. A procedure must be put in place to make sure that points 1 to 3 above are covered and in this case the worker must be issued with and trained on a procedure which clearly states what he can and cannot do. For example in this case, the procedure could state that if a fault develops in the machinery (which he has started) then he cannot attempt to rectify that fault unless there is a second person in attendance.

Requirements for Rule 14

1. All lone and remote working must be identified and a formal risk assessment completed for such work.
2. The need for additional training for those working in lone or remote work must be considered in the risk assessment for that work.
3. All 2 way analogue radios should be considered for replacement with digital radio systems (with integrated man-down features). There will be an information campaign around this issue in H1 2017 and the assessment should be conducted out at each site by October 1st 2017.

Lone / Remote Working



Man down Unit



On site Receptor (top box)

Explosive Safety

Introduction

There have been a number of flyrock incidents in group companies, any of which could have resulted in fatal injuries to employees, contractors and indeed members of the public.

In order to eliminate such dangerous occurrences, the following systems are required for each drilling and blasting operation.

Drilling

- Each driller must have completed a training course, which focuses on basic shotfiring procedures i.e burden and spacing considerations, causes of flyrock, dangers of clay in quarry faces, dangers of falling from the face, dangers from angled holes.
- Each drill rig and associated compressor must undergo a full detailed inspection at least once per year.
- Each compressor system must be fitted with a device to restrain the compressed air line in the event of it coming loose from the compressor.

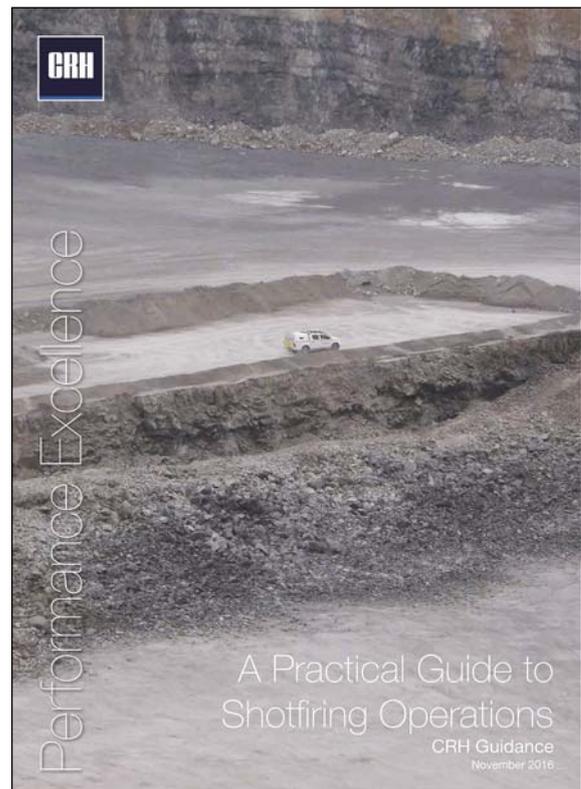
Blasting

- All those involved in blasting operations must receive specialised training in the use of explosives.
- Key parameters such as burden, spacing, amount of explosive, hole depth and angle must be recorded for each blast.
- A risk assessment must be completed for each blast and a “ Danger Zone “ must be determined and recorded in writing for each blast.

A guidance document entitled “ A practical guide to shotfiring operations” has been designed to assist operations in implementing these requirements.

Requirements for Rule No.15

1. Companies should now arrange to have in place system for the formal training of all those involved in drilling and blasting. Systems to record key data for both drilling and blasting should now be introduced.
2. Each operation, where blasting takes place, must have a documented site specific “safe blast policy” and implementing rules.
3. Operating records of all blasts must be maintained.



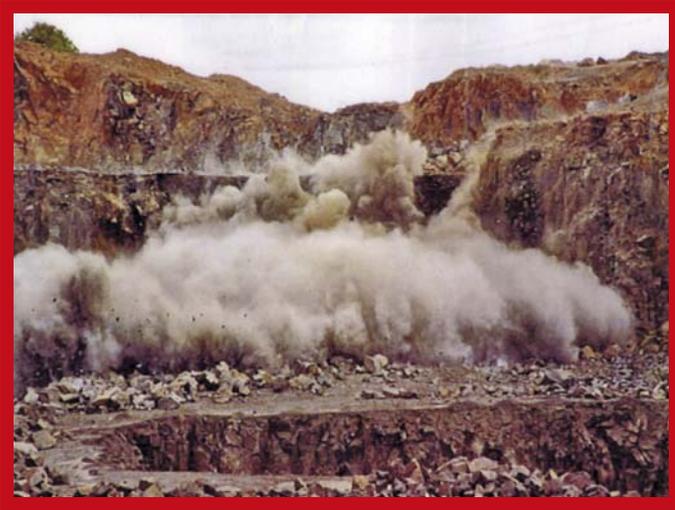
Explosive Safety

Incident: Case Study 2007

Fly-rock from the blast travelled some 100 metres onto a nearby public road and struck a school bus and another vehicle injuring 4 people (3 of whom were schoolchildren).

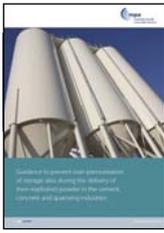
Group Incident: Case Study 2001

Fly-rock from the blast travelled some 300 metres causing extensive damage to quarry equipment and a nearby factory (fortunately no injuries).



See also Rule No.12





Process Safety / Occupational Health / Housekeeping

Introduction

This is a broad based rule covering the required safety management principles around process safety. Rule 16 deals with the following:

1. Prevention of contact with hot material, gases and surfaces.
2. Prevention of Fire & Explosions.
 - a. Including the prevention of overpressurisation in vessels.
3. Process: Change management.
4. Storage, handling and process use of hazardous substances.

1. Prevention of contact with hot material

A risk assessment of the overall process must identify and record each potential discharge point and the define the

- Operational controls
- Fail safes
- Work practices

to be applied to prevent discharges and protect personnel from exposure to hot material, gases and surfaces.

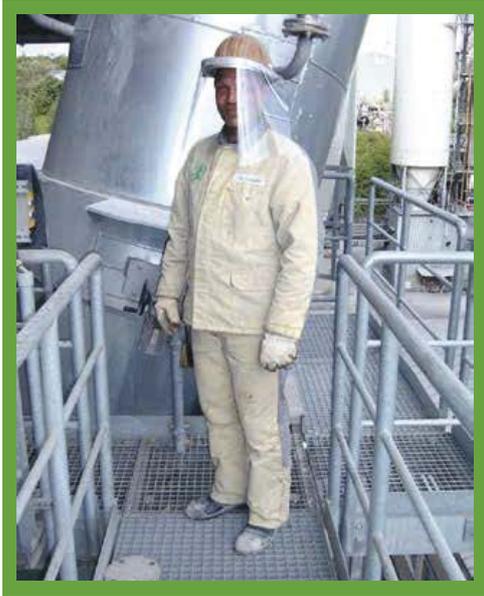
As a minimum the risk assessment must consider, where relevant, the following facilities and processes including all subcomponents within that process:

Cement Manufacturing:

- Raw mill systems
- Pre-heaters and pre-calciners
- AFR feeding systems (kiln feeding)
- Rotary kiln – kiln lines
- Clinker cooler and clinker handling systems
- Cement mills.
- All activities involving the removal of:
 - cyclone blockages
 - coatings
 - dust settlings
 - cooler blockages
- Removal and handling of samples of hot meal and bypass dust
- Planned kiln start up and shut down
- Any maintenance or inspection activity which involves removing equipment that may expose people to hot material or gases, such as kiln inlet probes, cooler cameras, air blasters etc.



Process Safety / Occupational Health / Housekeeping



Heat Resistant Suits



Process Safety / Occupational Health / Housekeeping

The **VDZ guidance document** (see page 62) must be used as a reference document when conducting and reviewing risk assessments relating to work in preheater towers and other areas where contact with hot material or dust is a risk. This guidance document covers the issue:

- Blockage detection / clearing blockages.
- PPE selection.
- Emergency procedures / design of escape routes etc.
- Sampling.

Ancillary Services:

- Gas bypass and dust handling systems.
- Hot gas generating, extraction and exhaust systems.
- Boiler and/or heat exchangers of heat recovery systems.
- Coal mills and other fuel preparations systems.

Bitumen: Handling & Use

- Transfer pipes and valves.
- Discharge pipes and valves.

Lime Manufacture:

- Heating
- Cooling
- Hydration

2. Prevention of Fires & Explosions

- Each operation will be required to develop a dedicated risk assessment which identifies potential areas of fire and explosive risk within their operations.
- The risk assessment will have to cover:
 - Identification of situations where the development of an explosive atmosphere is possible and the risk control measures required.
 - Control measures in place to prevent fire arising out of maintenance activities:
 - Oxy-Fuel and Electric arc welding.
 - An assessment of current fire detection and fire suppression systems.
 - An assessment of current extraction and ventilation system to prevent the build-up of an explosive atmosphere.
 - Assessment of current measures in terms of fighting a fire including personal protective clothing and equipment.

Silo pressurisation: There have been a number of incidents where overpressurisation in silos has resulted in parts such as filters been blown some distance from the plant. Blocked filters and damaged or under-rated relief valves have been some of the causes of such accidents. The MPA (Mineral Producers Association) guidance note in relation to the prevention of over-pressurisation. **“Guidance to prevent overpressurisation of storage silos during the delivery of (non explosive) powder in the cement, concrete and quarrying industries”** provides specific information to assist in the development of these risk assessments. As a minimum each silo, which is capable of being pressurised, must be fitted with:

- High Level Alarm.
- Pressure Relief Valve.
- A means to ensure the level of available capacity within the silo can be determined.
- Pinch valve on filling pipe to prevent back flow of material.
- The use of chains to secure the filter (as a final backup in the event of failure of primary measures) should also be considered.

3. Process: Change Management

A system must be in place at each operation to ensure that changes or modifications to the manufacturing process and ancillary services which contain, process or transfer materials at high temperature must be subjected to a risk assessment and risk controls defined and communicated prior to the change or modification being performed.

Process Safety / Occupational Health / Housekeeping



Silo Filter

Pressure Relief Valve



Tanker making delivery

Incident:
Near Miss – 2012
Filter blown onto nearby area



Last line of defence:
Filter chained to silo structure



Whipcheck Safety Cable

Process Safety / Occupational Health / Housekeeping

4. Storage, handling and process use of hazardous substances

The requirements here focus on hazardous substances in use at our operations, ranging from various types of alternative fuels, some admixtures, bitumen and process gases.

For each type of hazardous material, a dedicated risk assessment must be developed covering the following:

- Storage safety requirements:
 - Location.
 - Storage area infrastructure/design.
 - Condition of tanks, drums etc / Required inspection regimes.
 - Stock control.
 - Site security.
 - Ventilation and extraction requirements.
 - Earthing.
- Handling
 - Material handling requirements.
 - Occupational Health risks.
 - PPE requirements.
 - Training and competency.
- Use
 - Risk of Fire:
 - Risk of incorrect fire fighting medium being used.
 - Risk of explosion.
 - Required process parameters and risk when those parameters change.

A CRH safety guidance note relating to the safe handling, storage and use of alternative fuels is available.

Requirements for Rule No.16

1. A risk assessment of the overall process must identify and record each potential discharge point and define the
 - Operational controls
 - Fail safe mechanisms
 - Work practices
 to be applied to prevent discharges and protect personnel from exposure to hot material, gases and surfaces.
2. The VDZ guidance document (see page 62) must be used as a reference document when conducting and reviewing risk assessments relating to work in preheater towers and other areas where contact with hot material or dust is a risk. This guidance document covers the issue.
3. Each operation will be required to develop a dedicated risk assessment which identifies potential areas of fire and explosive risk within their operations.
4. A system must be in place at each operation to ensure that changes or modifications to the manufacturing process and ancillary services which contain, process or transfer materials at high temperature must be subjected to a risk assessment and risk controls defined and communicated prior to the change or modification being performed.
5. For each type of hazardous material, a dedicated risk assessment must be developed covering the issues of storage, handling and use.
6. The MPA (Mineral Producers Association) guidance note in relation to the prevention of over-pressurisation. ***“Guidance to prevent over-pressurisation of storage silos during the delivery of powder in the Cement, Concrete and Quarrying Industries”*** must be used in the development of relevant risk assessments.
7. All operations where prestressing of cables is an element of manufacture must:
 - Fulfil the requirements of the MPA (UK Minerals Producers Association) guidance note “The safe stressing of prestressed concrete products”.
 - Complete on an annual basis, the BPA (British Precast Association) “Audit checklist for pre stressing operations”.
8. Cement tanker discharge pipes have the potential to disconnect from the plant if the retaining clasp fails. With no secondary catchment device to hold the pipe, it can whip due to the pressure in the pipe, with the potential to cause serious injury to anyone in the vicinity. To protect against this risk, a whipcheck safety cable (see photo on page 62) must be in place at the discharge point(s).

Process Safety / Occupational Health / Housekeeping

Requirements for Rule No.16 (cont.)

9. Occupational Health:

- From January 2018, all operations must report on the following 2 Occupational Health KPI'S:
 - Occupational illness frequency rate.
 - % of employees working on sites where the recommendations from the CSI Health Management Handbook, relating to Noise and Dust, have been implemented.
- Where dust masks are issued to personnel, as a control measure to reduce exposure to dust, then each such employee should have an individual face fitting for that dust mask, to ensure a correctly fitting and suitable dust mask is made available.

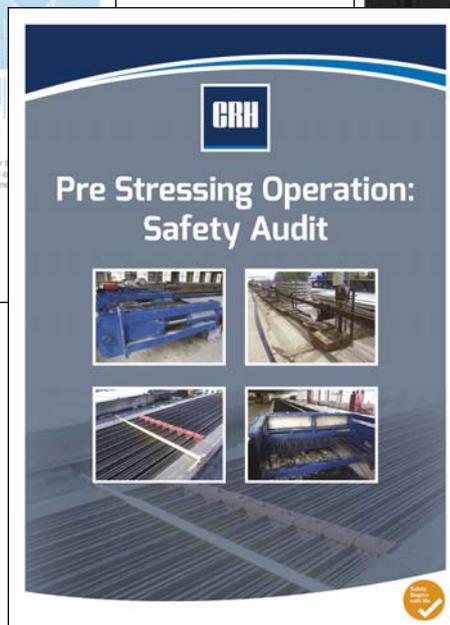
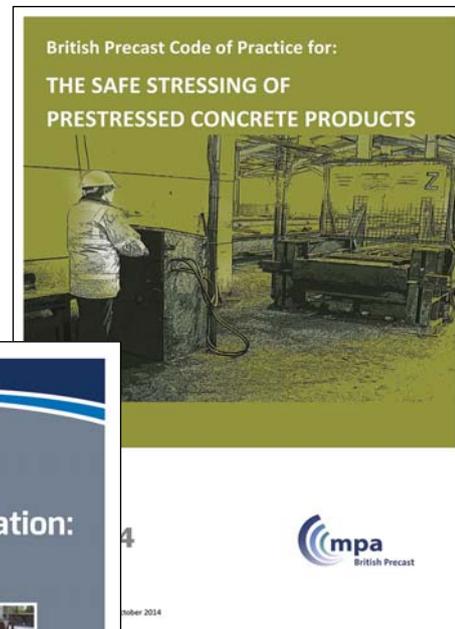
10. Structural Safety: Each operating company must have in place an overall risk assessment which covers the issue of structural safety at it's operations. This opco level risk assessment should cover:

- Reference to (and the presence of) an internal database which includes all structural safety issues raised previously from internal inspections and external inspections e.g insurance company surveys.
 - This internal database must detail remedial measures in place for each structural safety issue raised.
- An overall approach to an ongoing program and schedule of inspections of structures within the opco.

11. Housekeeping: all sites must have procedures in place to demonstrate a systematic approach to housekeeping.

This overall program should cover:

- Standard required/expected in terms of housekeeping at the site.
- A fugitive dust control assessment and corrective action program.
- Clear area (of the operation) line management responsibility for housekeeping.



The Cement Sustainability Initiative (CSI) is a global effort by 18 leading cement producers, with operations in more than 100 countries. All CSI members have integrated sustainable development into their business strategies and operations, as they seek strong financial performance with an equally strong commitment to social and environmental responsibility.

Over its 10-year history, the CSI has focused understanding, managing and minimizing the impacts of cement production and use by addressing a range of issues, including: climate change, fuel use, employee safety, airborne emissions, concrete recycling and quarry management.

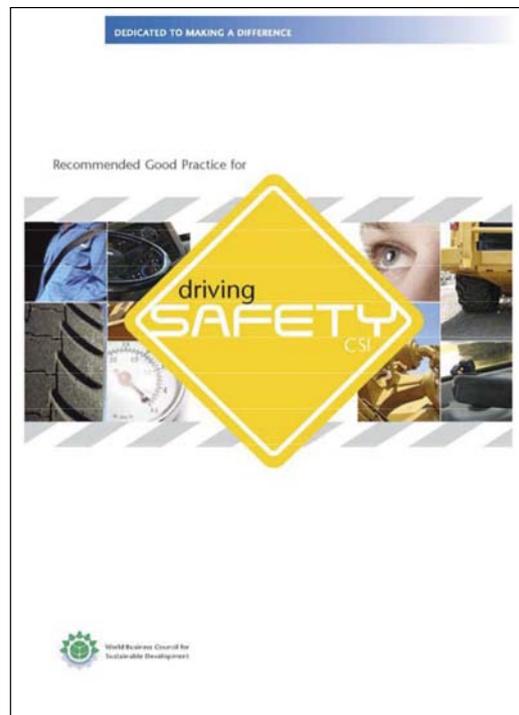
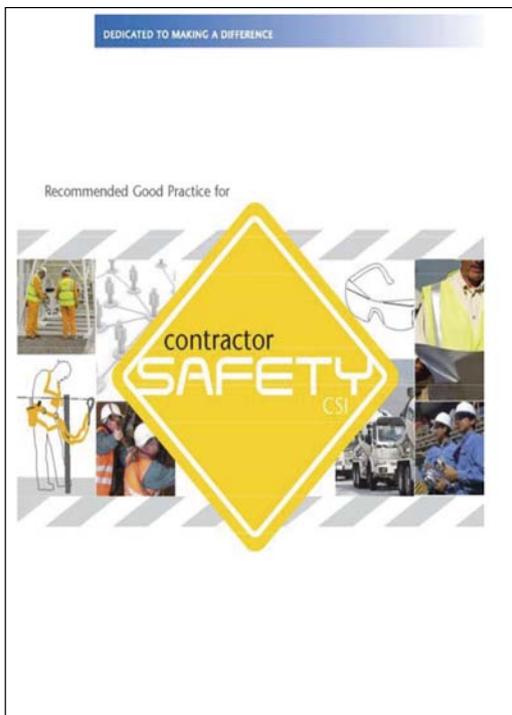
Industry statistics from the CSI confirm that transport related fatalities and contractor fatalities represent the majority of fatal accidents within the construction materials industry.

Considering this background, the CSI Safety Task Force has developed Recommended Good Practice documents on Driving Safety and Contractor Management. These documents have been distributed through the divisional safety best practice groups.

CSI members have agreed to implement the key elements of these good practice documents by 2014.

Mission for Contractor Safety

CSI member companies are committed to giving contractor safety equal priority as employee safety. While our contractors are always responsible for their own safety, we now commit to setting an example for their safety management through our own activities and contract management. We believe that this can be achieved by implementing this Good Practice, which has proven effective in reducing contractor incidents within our and other industries. In turn we require our contractors to achieve good safety performance in carrying out their contracts.



Mission for Driving Safety

CSI member companies are committed to eliminating driving-related injuries and fatalities. We believe that this can be achieved by implementing the Good Practice outlined in this document, which has proven effective in reducing road incidents within and outside our industry.

1. POLICY STATEMENT

A Health and Safety policy statement based on the CRH model should be signed by the Company Managing Director and displayed at every location.

2. H+S OFFICER

Every company shall appoint a Health & Safety Officer (full or part-time) who shall provide advice and assistance on development and implementation of safety policy. For the health and safety function, competencies must include technical expertise, managerial and leadership skills and change management abilities (coaching, communication skills etc.)

3. PERSONAL PROTECTIVE EQUIPMENT: MINIMUM REQUIREMENTS

- Each operation must have a clearly defined policy for the PPE requirements for the site.
- While each site can define PPE requirements, the following are considered minimum requirements (unless their non-use is permitted through a site specific risk assessment).
 - **Safety Helmet** (not a bump cap).
 - **High Visibility Clothing** (see requirement 4 of LSR No. 5 on page 24).
 - **Safety Glasses** (the use of goggles or other tight fitting safety eyewear may need to be mandated for specific activities e.g maintenance/cleaning work – this should be addressed and identified as part of the site risk assessment process).
 - **Safety Footwear** (As a non primary control measure to prevent foot injury from falling objects, locations must introduce a type of safety boot which provides metatarsal protection. This is a form of safety shoe which provides full protection to the front of the foot, not just the area of the foot covered by the traditional toe cap protection safety shoe. This type of safety footwear should be introduced by September 1st 2017. An exception to this rule only applies where a risk assessment prepared by an internal safety professional allows the non use of this type of safety shoe).

4. SAFE SYSTEMS OF WORK / RISK ASSESSMENT

- Standard Operating Procedures (SOP's) must be developed, implemented and maintained for repetitive tasks. Tasks without SOP's shall have a task risk assessment conducted prior to the work starting.
- An appropriate system of risk assessment should be employed, which must cover changes in work procedures.
- Construction / Project work such as installation or removal of plant should be accompanied by a detailed Project Risk Assessment.

5. TRAINING

- Each company should have an annual employee training program with special emphasis on risk avoidance. Such training must be assessed and recorded. The training scheme must involve 12 hours annual Health & Safety training for each operational employee.
- All Managers and Supervisors must receive dedicated training relevant to their positions. Management and supervisor training must include the leadership aspects of health and safety.
- Contractors must receive all appropriate training (see also point 11).
- A specific safety induction process must be in place for all new employees and contractors. This induction process must include an assessment to ensure the key points of the induction are understood.
- The recruitment of new employees or promotion of employees and the engagement of contractors must include a documented assessment of the health and safety competencies needed to fulfil the role for which they are being selected for.

6. MEETINGS WITH EMPLOYEES

Regular safety meetings (formal and informal) should be held with employees on relevant safety topics and where possible should include contractors.

7. SAFETY COMMITTEE

Each location should have a committee of employees from across the location who will review Health & Safety on a regular basis (formal minutes shall be produced from such meetings).

8. TRADE UNIONS

Subject to local custom and law safety discussions should be held with Trade Unions (if present at a location).

9. ACCIDENT / INCIDENT INVESTIGATION

- A system must be in place to ensure that incidents can be reported and reviewed at each site.
- All lost time accidents must be notified to the relevant Senior Vice President or Platform MD within 48 hours of the LTI occurring. The notification should include a brief summary of the accident details.
- Accidents and HPLE's must be investigated to determine immediate and root causes – records of such investigations must be maintained. Training in the Apollo Root Cause Analysis methodology will be provided to safety professionals involved in such investigation.
- All serious accidents must be reported by the opco to the country/platform MD and notified to the Central Safety team in Amsterdam as soon as possible after the accident.

Fatal accidents must be reported immediately by the relevant Country Manager

10. MONTHLY SAFETY ALERTS / BEST PRACTICE CASE STUDIES / ANNUAL SAFETY CAMPAIGNS

- 3 safety alerts are issued each month in 15 languages. This should be used as a basis for safety discussion on an ongoing basis at all operations. The CRH Annual safety campaign runs from November to February. The campaign is a key element of our annual safety strategy and must be implemented in full. Contractors must be fully incorporated into all campaign related activities.

11. CONTRACTOR SAFETY CERTIFICATION

- Only contractors who have successfully completed a prequalification process should be engaged. Contractors must be included in all safety awareness and safety training programs where possible.
- Transport related contractors must be subject to random safety checks (known as Transport Checks) – the number of checks and the number of non-compliances must be recorded and reported to CRH quarterly.

12. DISCIPLINARY MEASURES / CONSEQUENCE MANAGEMENT

- Each company must have in place a disciplinary procedure related to safety. All aspects of the procedure must be clearly communicated to all employees and contractors and enforced by Managers in conformity to local law and Trade Union agreements.

13. EMPLOYEE INCENTIVES

- Whilst this is not a mandatory requirement, safety incentives schemes (e.g. most improved location etc) are strongly recommended to give an ongoing focus to safety in the workplace.

14. REVIEW / AUDITING

Each operating company must conduct a 16 LSR self assessment each year at each of their sites using the CRH 16 LSR Audit Guidelines.

15. ACQUISITIONS (Purchasing of new companies)

- A Health, Safety and Environmental review should be part of the due diligence process and should be noted in the Board proposal. A safety due diligence checklist has been developed to assist in this process. The integration plan should set out a programme and timetable to ensure conformity to CRH policy as soon as practical.

16. CAPITAL EXPENDITURE

All capex proposals shall have a Health & Safety assessment completed. Preparation of purchasing specifications should include a reference to the guidance document on safety specification for new plant and equipment (The Red Book: The CRH guidance document on safety aspects to the procurement of plant and machinery).

17. PERFORMANCE REVIEW

Health & Safety Management Reviews must be conducted at least on an annual basis at a country / platform level. Reviews must follow a formal documented process and must be led by a senior leadership team member at country level. The purpose of these reviews is to:

- Review health and safety performance
- Determine the continued suitability, adequacy and effectiveness of health and safety policy
- Evaluate any need for change and establish actions to improve the system

18. IMPLEMENTATION OF BEST PRACTICE

All Companies shall ensure that a representative attends the National and European Safety Best Practice Groups.

19. EMPLOYEE OCCUPATIONAL HEALTH CHECKS / WORKPLACE HEALTH MONITORING

- These should be carried out where applicable for job function, and include pre employment and exit medicals where required under company policy. The 2016 CSI (Cement Sustainability Initiative) document “Health Management Handbook” forms our minimum mandatory requirement in this regard.
- Management systems around the areas of “Fitness for work” or “Return to work following injury” must be established, including rehabilitation for injured employees and where appropriate contractors.
- All operating companies must have a risk based annual industrial occupational hygiene plan which must cover high risk materials and focus on personal monitoring.

20. KEY TASKS

Every company shall have annual set Health & Safety Targets & Objectives, which are approved and signed by the operating company Managing Director.

