European Aggregates Industry



Health & Safety Good Practice Case Studies



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Equipment case studies





Dr Rafael Fernández Aller

Chairman of the UEPG Health & Safety Committee

These Case Studies are drawn from a compilation of more than 200 examples of risk prevention in the European aggregates industry covering 14 European countries. The examples are not exhaustive and they seek only to contribute to ideas to improve risk-prevention in this sector.

The examples described by the companies were developed to resolve specific problems in one or more of their operations. Their possible

application to other companies in the sector will depend on the particular circumstances.

The term "good practice" implies compliance with the obligations in the legal provisions on the prevention of labour risks and moving forward in actions which make it possible to improve safety.

The examples contain inexpensive but nevertheless effective measures as well as others involving larger investment which may require a medium to long-term approach.

Most good practice in the prevention of labour risks as described in the Case Studies have made it possible to improve the production process from reductions in operational times to improved work efficiency. They have also increased employee commitment to a company, moving forward in environmental protection in certain cases, while also of course increasing employee safety as part of daily working life.

I hope this CD-ROM will make a positive contribution to preventing accidents and promoting good practice.

I would like in particular to thank César Luaces Frades for his excellent leadership in bringing together these Case Studies, Dirk Fincke for supporting him and Caterpillar with the European Minerals Foundation for sponsoring the CD-ROM.



Pedro Ortún Silván Director DG Enterprise & Industry European Commission



I welcome this voluntary initiative of UEPG, the European Aggregates Association to increase knowledge about risk and accident prevention.

This exchange of experience of good practice amongst UEPG's 28,000 sites, which provide jobs for a quarter of a million employees across the European Union, will be a valuable business contribution to promoting corporate social responsibility.

Initiatives like these can be a particularly valuable tool for small and medium sized companies which do not have the resources of larger companies but wish to develop health and safety strategies relevant and appropriate to their needs.

I wish UEPG all success in taking such practical steps to bring 200 Case Studies together for dissemination of good practice, of which a selection are contained in this CD-ROM.



Country:	Austria	
Company:	CEMEX Austria	
Site:	Hollitzer Quarry	
Place:	2405 Bad Deutsch Altent Am Pfaffenberg 1	ourg,
Field:	Prevention	

Working on dangerous machines

A Manual is used securing the maintenance while working on dangerous machines like crushers and conveyor belts. Double locking of the AC-energy switch is provided with lockers and name sheets, which can only be removed by a single person.

Advantages observed

Procedure improves security for the work on dangerous machines against unforeseeable switch-on of electricity.



Country:	Belgium
Company:	GRALEX
Site:	Several sites
Place:	Belgium
Field:	Prevention

Cartoon booklet

Main recommendations for safety are given by cartoons.

Advantages observed

The cartoons are drawing more attention and they are easier to read and to understand.



Country:	Czech Republic	
Company:	Tarmac CZ a.s.	
Site:	Hard stone quarry - Plaňany	/
Place:	Plaňany u Kolína	
Field:	Extraction site	

Steel barriers

Robust manufacturing of the steel structure is strong enough to provide support against a potential fall, but individual segments enable easy manipulation even by one worker.

Advantages observed

Robust barriers from steel structures, highlighted by color, are placed at the edges of the quarry face. These eliminate the danger of falling people in these workplaces – mainly during drilling and blasting operations. These barriers, which prevent the danger of falling, are installed at all sites of Tarmac in the Czech Republic, where it is necessary.



the sheeting of loads, so that there is no dust.

Advantages observed

Country:Czech RepublicCompany:Tarmac CZ a.s.Site:Hard stone quarry -
PlaňanyPlace:Plaňany u KolínaField:Auxiliary operations

Operation ramps

For increasing of safety of truck drivers, we have installed at Tarmac CZ, at all sites, manipulation ramps used for safety checks of loads, taking of aggregates samples from a loading space, operating



Country:	Czech Republic
Company:	Tarmac CZ a.s.
Site:	Hard stone quarry - Plaňany
Place:	Plaňany u Kolína
Field:	Working conditions

Automatic washing device

For increasing the cleanness of vehicles and for better communication at the site departure point, a new automatic washing device has been installed, which washes the chassis of vehicles by using pressurized

water. Water circulates through a bunker in a closed circle and so its consumption is not very high. Consolidated road links the washing device, so vehicles are at least as clean as they were on their arrival.

Advantages observed

Decrease of secondary dustiness not only at the site, but also in the neighboring villages.



Country:	Finland
Company:	SML Finland
Site:	all sites
Place:	all sites
Field:	Prevention



"Crusher Index" – Evaluation and development of safety at work

The safety level is measured with a short and simple manual containing specific objects to be measured visually, number of observations and the principles for their acceptance. Observations – "right" and "wrong" – are calculated together and

the percentage of the "right" ones gives the result – the Crusher Index. The development of the results can be followed by a feedback table located in the site office and in workers facilities. Because the points to be measured, the number of observations and the principles for their acceptance is defined in advance, it does not matter who makes the measurement. This ensures that the results are comparable.

Advantages observed

The method improves the safety level and decreases the costs resulting from accidents. The same kind of method has already been in use in the house building sector and in the civil engineering sector in Finland some years with good experience.



Country:	France	
Company:	CARRIERES DE CHAILLOUE -	
	Subsidiary of EUROVIA	
Site:	Carrières de Chailloué	
Place:	61500 - Chailloué	
Field:	Innovation	

Automation of the adjustment of crushers

In order to reduce the exposure of the operators to dust, we automated the adjustment of the crushers. The monitoring of the adjustment is carried out by analysis of images taken by a camera on the exit conveyor of the crusher.

Advantages observed

Suppression of the exposure of the operators to dust for the adjustments and control. Continuous follow-up of the adjustments with computerised treatment.



Country:	France
Company:	LEROUX PHILIPPE Subsidiary of EUROVIA
Site:	MONTEBOURG QUARRY
Place:	50310 MONTEBOURG
Field:	Innovation/Working conditions

Loading systems for trucks in silos

The loading of the trucks under silos generates substantial dust. The quarry conceived and implemented an

innovating loading unit assuring a relative sealing around the lorry platform and using the depression due to both the unloading of the hopper and aspiration and filtration systems.

Advantages observed

The exposure to the dust is extremely reduced in the vicinity of the loading. Moreover, a joystick allows the driver to control loading of the truck with closed windows and door.



(less than 25 right answers) the worker has to retake it.

Country:	France
Company:	EUROVIA - Subsidiary of VINCI
Site:	All quarries of the company
Place:	All quarries of the company
Field:	Prevention

First day test

In order to evaluate knowledge of the staff intervening on a site and especially at the end of the "first day" of training organised for every newcomer, each worker answers the 30 questions of the quarry safety test. The test is corrected. If its results are not sufficient

Advantages observed

Evaluation of the acquisition of the procedures and safety instructions as well as further training.



Country:	France		
Company:	CARRIERES DE CHAILLOUE - Subsidiary of EUROVIA		
Site:	Carrières de Chailloué		
Place:	61500 - Chailloué		
Field:	Prevention		

Dust exposure control sheet

The dust exposure of each worker is followed by recording the hours of exposure for each type of work (for wages) on a special sheet allowing at the end of

the period (generally a year) the calculation of the total dust exposure.

Advantages observed

This constitutes an additional method of individualized control.



Country:	Germany	
Company:	Rheinische Bau- stoffwerke GmbH	
Site:	all sites with dry extra	action
Place:	Auenheimer Straße, 50129 Bergheim	
Field:	Prevention	

Reducing depth of extraction face

The official safety rules in Germany require that the upper level of the upper edge of the extraction embankment/face must not exceed the maximum

dredging height of the extraction equipment plus 1 m. The Rheinische Baustoffwerke GmbH ensures the fulfilling of this requirement in pits with extraction above groundwater level even in cases of face heights up to 40m by pushing down the material along the extraction embankment/face using chain dozers to an appropriate level.

Advantages observed

Extraction on only one common level allows a simpler transport technique (smaller number of conveyer belts and connectors). The required gradient and shape of the embankment can be achieved without additional procedure steps.



Country:	Germany	
Company:	Rheinische Bau- stoffwerke GmbH	
Site:	all sites with dry extra	action
Place:	Auenheimer Straße, 50129 Bergheim	
Field:	Prevention	

Safe maintenance and repair works

Maintenance and repair works on extraction machines, engines and conveying equipment are allowed only after the total disconnection from current/power supply. The employees responsible for

these works have to ensure, that there is no possibility of "reconnection by accident", using an appropriate lock. The Rheinische Baustoffwerke GmbH has solved this problem by introducing "the personal/individual lock fixed on the working clothes". This enables every worker involved to start the security measures at any work place directly.

Advantages observed

Reduction of superfluous waiting time. Problems can be solved immediately and inspection of measure follows directly. Employees' awareness of safety rules and behavior is increased. They use security installations by routine.



Country:	Germany
Association:	MIRO
Site:	several sites
Place:	several sites
Field:	Prevention



Work Safety Campaigns to Help Prevent Accidents

To provide local assistance to companies in safetytechnical matters, the MIRO Health & Safety Committee has revised and further developed existing safety regulations. The safety regulations are grouped

into 29 main topics and provide concise information on safe work practices that have been derived from legal regulations, rules from the Union StGB, operating manuals, operating directives and analysed accident reports. The safety regulations have a card-like format so that employee can carry them in their pockets.

Furthermore, guidelines were developed for safety instructions, and aids were created for fulfilling the obligations of the Work Safety Law. To raise the awareness of company employees to safety-related issues, MIRO has announced a work safety contest.

Advantages observed

The amount of accidents of MIRO's member companies is lower than the average amount of accidents of all companies in this sector.



Country:	Italy			
Company:	Holcim Italia			
Site:	Est cave – Treviglio			
Place:	Via Bergamo 125, 240 (Bergamo)	47 1	revi	glio
Field:	Auxiliary operations			

Hand railed weighing platform

The weighing platform has been equipped with handrailed walkways to facilitate the entrance and the getting out from the lorry's cab. The platform is also protected by guard rails to permit safe weighing

operations.

Advantages observed

It has avoided the risk of an accident getting out from the cab on to the weighing platform (especially the risk for the driver to slide down directly to the ground). It has also eliminated the risk of a wrong positioning of the lorry wheels on the platform.



Country:	Italy		
Company:	Vezzola Spa		
Site:	Cava e Impianto di asfalto Lonato (Brescia)		
Place:	Lonato (BRESCIA)		
Field:	Auxiliary operations		

Secured quarry area

The plant area is completely cut off from the loading and circulation area by secure fencing (from 2 up to 3.5 meters). Only authorised people

may have access to the plant area for maintenance duties. The access is only possible via gates, guarded by a television camera, and opened only to authorised people.

Advantages observed

The risks linked to the plant activity and the maintenance are greatly reduced via the prohibition of the access of incompetent (i.e. visitors) and unauthorized people.



Country:	Italy	
Company:	Holcim Est cave srl	
Site:	Cava della Vailata	
Place:	Via Bergamo 125, 24047 Treviglio (Bergamo)	
Field:	Working conditions	

Safe Walkway

A new walkway, equipped with a handrail, has been added to connect directly the dredging operations control cabin and the tread way in front of the vibrating screen.

Advantages observed

The new course of the walkways facilitate ordinary maintenance duties for the workers in more safe conditions, avoiding unnecessary movement up and down the stairs.



Netherlands
NIBA Beheer B.V
several sites
several sites
Prevention



Vacuum cleaner to reduce dust exposure

Dust vacuum cleaning with sieve-analyses of quartz-dust is used to avoid high dust concentrations in laboratories and offices. With the greater attention to "respirable" silica dust companies take steps to reduce dust in indoor-air. Working in barges: at least 24 hours ventilation is provided before work starts.

Advantages observed

In these barges there is always polluted or bad air quality. With ventilation, the air quality will become suitable for people to work in the area.

Country:	Norway
Company:	Kolo Veidekke a.s
Site:	all plants (25) in the Kolo Veidekke a.s in Norway
Place:	Main office: Postbox 508 Skøyen, 0214 Oslo
Field:	Prevention

Health & Safety meetings with employees

Monthly workers' involvement meetings with an agenda are arranged at each plant (25 plants in Kolo Veidekke producing some 6 mill tonnes). In addition to general improvements, economy and forthcoming deliveries, Health & Safety are the main issues. Concerning Health & Safety, the main task for the meetings is to evaluate and classify all H&S deviation reports prepared by the plant since last meeting. Corrective actions in addition to the immediate actions taken, when the deviation was discovered are proposed in the meeting. In addition deviation reports from other plants of importance are discussed.



Country:PolandCompany:Lafarge KruszywaSite:MOWAP Sp. z o. o.Place:Wapienno, 88 – 190 BarcinField:Working conditions

Filler loading station

The steel pipe (yellow on the picture) with moving rings (red on the picture) is mounted on the existing construction of the cement truck loading station. Operator equipped with the safety harness snaps the end of the life

line by the shackle (catch) to the moving ring. Then the operator is able to walk on a truck catwalk and to load safely the truck using a slope chute.

Advantages observed

The risk of an operator falling down to the ground is avoided.



Country:	Portugal
Company:	Agrepor Agregados Extracção de Inertes, S.A.
Site:	Alenquer
Place:	Vale Grande, 2 – Serra de Ota Apartado 137, 2580-909 Alenquer
Field:	Processing plant

Control room for loading trucks

The control room with a central command has been established for loading trucks for dispatch and to put in

different storage places according the different limestone aggregates particle size. The implementation of this practice improved productivity because one can load simultaneously six trucks with different aggregates.

Advantages observed

Loading many trucks and loader's operations in same place, one minimizes the risk of accidents because the employees are not exposed:

- to accidents by being run over;
- to the noise, dust and projection of small limestone particles

The work atmosphere in the control room is protected and controlled as regards temperature, noise and dust concentrations.



Country:	Spain
Company:	Compañía General de Canteras, S.A.
Site:	all sites
Place:	all sites
Field:	General Aspects of Risk-Prevention

Photography as a tool for improvement

When a supervisor observes an action which is wellimplemented in preventive terms, or a breach of safety regulations, this is notified so that the incident can be photographed. A brief monthly information note is published on various actions observed, along with photographs, and an explanation of why that action is correct or incorrect and, in the latter case, with a detailed description for its correct implementation.

Advantages observed

Personnel operating correctly are compensated with this modest public acknowledgement. An employee acting incorrectly will be given an explanation of the error made. All understand that the company is reviewing their work performance, applying preventive measures, and they make greater efforts to operate according to safety criteria.



Country:	Spain
Company:	Lafarge, Áridos y Hormigones
Site:	all sites
Place:	all sites
Field:	General Aspects of Risk-Prevention

A children's art competition on safety

The company has offered art prizes to the children and grandchildren of its employees and collaborators, dealing with safety at work, and the prevention of risks in the workplace. The competition is run for two categories by age, and the prizes are a fully-paid trip for four to any theme park in Spain, along with cash for additional expenses. All competitors receive a gift from the company.

Advantages observed

This initiative results parents and children thinking about various aspects of safety in the operations.



Country:SpainCompany:Tarmac Iberia, S.A.U.Site:all sites (Quarries)Place:all sitesField:Extraction sites



Anti-fall protection at the face

The company has introduced a protection system to avoid falls from various levels at the face during bore drilling and the loading

of explosives. Use of this system, designed in the United Kingdom, is mandatory in all the company quarries. This is a mobile system comprising two posts inserted into the ground at a safe distance from the face and to which the lifelines are secured which the employees wear on their anti-fall belts. This protection is installed before the work begins on drilling the bores, and is withdrawn before blasting.

Advantages observed

This prevents risk of falls from the face during bore drilling and loading operations.



Country:	Spain
Company:	Grupo Cetya, S.A.
Site:	all sites
Place:	all sites
Field:	Processing Plant



Key grouping

Keys are grouped on a closed ring to prevent possible risk situations involving both the mobile machinery and in the treatment plant.

Advantages observed

Vehicle refueling: the key for access to the diesel pump is through the start key for each unit of mobile machinery so that refueling is impossible with the vehicles running.

The press filter is in the middle of a platform along with the control panel. To avoid access to the panels while the filter is loading or unloading (with the resulting risk of being trapped), two doors have been fitted, each with their locks, separating the filter from the control panel.

The keys for access to the press filter are kept with the manual or automatic startup key for this machine. When access is required to the filter for maintenance or repair work, it is necessary to open one of the doors, the key of which is kept with the command key. When the command key is removed, the installation shuts down. A door must be properly shut to remove its key. At the same time, there is an emergency shutdown button alongside the command.

If a manual adjustment is required, rather than closing and opening doors, another set of keys has to be requested from the supervisor running the operations at the control panel.



Country:	Switzerland
Federation:	FSKB
Site:	all sites
Place:	all sites
Field:	Prevention



Risk Analysis – branch solution

The Federation is responsible for a so called "branch solution" for the aggregate and ready-mixed concrete industry. As such those done a risk analysis and defined the measurements against situations which are not accordance with Swiss legislation.

Each year FSKB works on a specific topic in order to reduce the risks in the production sites of its members. In a yearly inspection it checks if the member have carried out the necessary measurements.

Advantages observed

FSKB has the possibilities to indicate the importance of good H&S practice because each accident costs a lot of money. We observed a general reduction of the total number of accidents in the sector.



Country:	United Kingdom	
Company:	Lafarge Aggregates	
Site:	Johnson's Wharf	
Place:	Crossways Boulevard, Greenhithe, Kent DA9 9AD	
Field:	Working Conditions	

Travelling platform

During a ship to shore conveyor reconstruction at this wharf, staff identified issues governing the lack of access to both the conveyor rollers and the motor for the Gravity Take-up Unit (GTU), which resulted in difficulties carrying out standard maintenance. Lafarge, in conjunction with its conveyor construction company, decided to lower the GTU to floor level for ease of maintenance, and to construct a travelling platform at the top of the conveyor structure so that all the conveyor rollers could be accessed for cleaning and maintenance.

Advantages observed

Increased confidence of all staff to access areas for maintenance and inspections.



Country:	United Kingdom		
Company:	Hanson Aggregates		
Site:	Chipping Sodbury Quarry		
Place:	Wickwar Road, Chipping Sodbu Bristol BS37 6AY	ıry,	
Field:	Working Conditions		

Transporter for for heavy gas bottles

The fitting department at Chipping Sodbury Quarry has designed and fabricated a transporter that makes handling heavy gas bottles a far safer process. A trailer with a winch at the rear lifts the bottles from ground level on a base plate that can be fixed in position. The design incorporates a holster to prevent the gas nozzles being damaged during transit, a bracket to store a fire extinguisher and protruding brackets to keep the hoses neatly stored.

Advantages observed

A specially designed transporter reduces the manual handling of gas bottles and thus the risk of injury.



Country:	United Kingdom		
Company:	Hanson Aggregates		
Site:	Hanson		
Place:	Hanson Aggregate South East region	S,	
Field:	Prevention		

Body props in case of hydraulic failure

Hanson Aggregates identified a trend in the company's South East region of tipper vehicle drivers inspecting or maintaining their trucks with the

body raised, but without employing sufficient safeguards against a hydraulic failure. This was discussed at the area safety representatives' meeting and a suggestion was put forward to provide purpose-built body props at all sites. The props are lightweight and easy to handle to both encourage their use and allow them to be placed in position without undue effort. They are also universal and will fit all body types. Prior to their issue, the driver is talked through the safe working practice and issued with a set of instructions. Now all quarries and asphalt plants in the region have two body props, held in the weighbridge, for use by delivery drivers as and when required.

Advantages observed

Lightweight props allow safer inspection and maintenance of tipper vehicles. In addition, the props are easy to handle, universal and fit all body types.



Country:	United Kingdom			
Company:	CEMEX UK Materials			
Site:	Pendean Quarry			
Place:	Off Oaklands Lane, Pendean, Midhurst, West Sussex, GU29 0ER			
Field:	Working Condition	ns		

Self-cleaning hopper grid

Following a risk assessment of gaining access to the hopper grid to remove clay and deleterious material, a self-cleaning hopper grid has been designed and

manufactured by the workforce, which avoids manual handling and can be adaptable to any type of hopper. The loading shovel approaches the hopper and puts the bucket blade under the lifting bar. The operator then flicks the bar with the bucket blade causing the grid to pass the point of balance, which causes the finger bars to move forwards, removing clay and deleterious material before the spring mounted stops cause the grid to return to its seating.

Advantages observed

Manual handling is avoided and the design can be adapted to any hopper.

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Equipment case studies

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