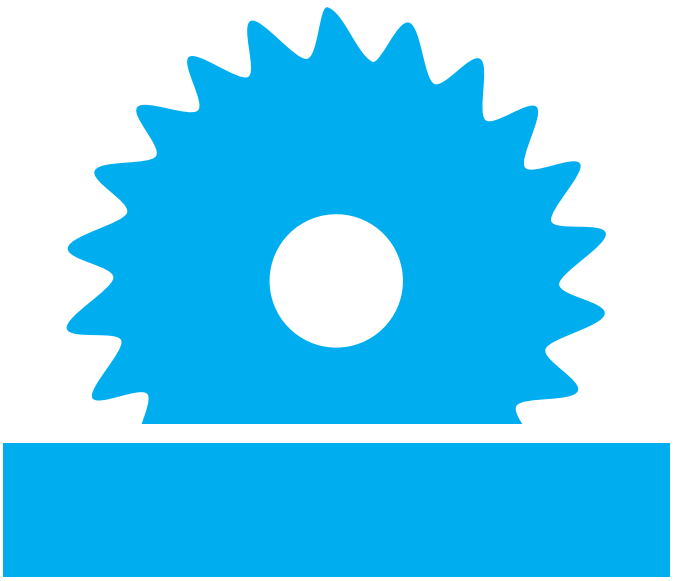
QBE European Operations

Guarding against machinery risks

Issues Forum



QBE

Issues Forum

Guarding against machinery risks

Contents

Workplace machinery is frequently involved in accidents resulting in minor, severe and even fatal injuries. In this latest Issues Forum, QBE reviews the current UK safety and employers liability claims history in relation to machinery incidents.

Introduction

Written in conjunction with industry specialists Procter Machine Guarding, we explore recognised best practice risk controls and assessment of workplace machinery, the business case for investment in safe machinery and a review of the associated regulatory framework and standards.

Machinery is of course diverse and found in a range of industrial, commercial, educational and other establishments, not just within manufacturing industries. While some premises contain a considerable number and often eclectic variety of machines, others have little more than a drill, a press and a set of hand tools. In all cases it is important to ensure adequate guarding and controls. It is estimated that half of machinery accidents arise during maintenance activities.

Machines with well designed guards deter users' attempts to bypass them, eliminating risk of injury and leading to greater operating efficiency for the business. Personal injury claims associated with work equipment often succeed; hence investing in proper guarding systems will potentially lead to an improved accident and claims record, notwithstanding the moral reasons to protect the workforce. The damages and legal costs from a civil liability claim or criminal prosecution can far exceed the cost of providing suitable machinery guarding.

Regulatory requirements

The employer's statutory duty to provide safe and suitable work equipment was previously governed by a variety of regulations made principally under the Factories Act 1961. The regulations dealt with specific risks arising from groups of machinery such as power presses, abrasive wheels and woodworking machines. Most of these regulations have been superseded by those of the more general nature in response to EU Health and Safety Directives.

Employers' have legal obligations under Provision and Use of Work Equipment Regulations (PUWER) 1998, the Health and Safety at Work etc. Act 1974, and The Management of Health and Safety at Work Regulations 1999. Other relevant legislation includes The Supply of Machinery (Safety) Regulations 2008 which apply to suppliers (not users) and The Enterprise and Regulatory Reform Act 2013.

Poor machine guarding is 'an accident waiting to happen'.

Unravelling the numbers

According to the HSE, across all industries in 2013/14, 13 of the 89 fatal injuries reported in the UK involved contact with moving machinery. This figure has increased since 2010/11 (8 of 122) despite a positive downward trend in total work related fatalities. Contact with machinery incidents have been static at around 4% of all major injuries since the 2009-10 period, with 784 reported in 2013/14. This figure is up from 760 in the 2012/13 period.

For the manufacturing sector alone the 2013/14 performance is a concern. Approximately 14% of reported major injuries and 11% of over-seven-day injuries involved contact with moving machinery. There were 1,148 over-seven day injuries to employees in the sector from contact with moving machinery type incidents during the period. This figure is slightly down from 1,158 for the 2012/13 period.

In QBE's experience, contact with machinery claims are often difficult to defend, leading to significant compensation awards. Over the past 5 years, QBE has seen just short of 2,500 personal injury claims from contact with machinery type incidents, at a total incurred cost of £48 million. Due to the onerous nature of the regulations and the common law the claims defensibility (claims closed with no damages paid) rate for such machinery claims that is lower than for other claim types, in the majority of cases insureds should expect to see damages payments where claims are made for such incidents.

The average cost of machinery employers liability claims in this period was £22,678, well above QBE's average accident damages payment, with claimant damages averaging at £15,495. The direct and indirect cost of accidents and claims are a costly alternative to appropriate guarding, supervision and training arrangements.

Whilst defendants and policyholders may take some comfort from the changes that section 69 of The Enterprise & Regulatory Reform Act (2013) affected around the concepts of strict liability and negligence (as explored in a previous Issues Forum), the reality is that with this legislation still in its infancy and with no landmark court of appeal cases to point toward, an absence of or inadequacy of guarding will likely find employers liable for accidents and injuries. Due to the risks associated with operating machinery, the courts place a higher duty of care on employers. If there is a risk of foreseeable injury, has the employer taken reasonable steps to minimise and/or reduce the risk of injury? Such reasonable steps are considered in the hierarchy of machinery guarding.

The hierarchy of machinery guarding

A machine, by definition, contains moving parts and it is these that usually present the hazards to be guarded. There are of course other hazards such as: hot surfaces; sharp blades or edges; emissions of noise, dust, fumes or radiation (e.g. weld flash); and ejected parts (e.g. swarf, or broken tools or work pieces). In order to decide on the most appropriate guarding for different parts of the machine, it is therefore essential to undertake and document a formal risk assessment to establish risk . A machinery risk assessment will typically involve identifying significant hazards and, for each one, evaluating the likelihood of occurrence, frequency of exposure, degree of possible harm and number of persons at risk. Having identified which risks need to be reduced, suitable safeguards can be considered. It is then essential that the risks are reviewed to establish whether controls have, indeed, sufficiently reduced the risks.

In most cases the appropriate risk reduction measures will require physical machine guarding. PUWER Regs, regulation 11 relates to protection against dangerous parts of machinery (i.e. the moving parts). Regulation 11(1) requires employers to take effective measures to prevent access to dangerous parts or stop their movement before any part of a person enters a danger zone. Note that Regulation 11(1) also applies to contact with a rotating stock-bar projecting beyond a lathe headstock.

Regulation 11(2) specifies the measures required to prevent access to the dangerous parts and achieve compliance with regulation 11(1).Your control strategy should follow the Hierarchy of Machinery Guarding as follows:

(a) Fixed enclosing guards;

(b) Other guards or protection devices such as interlocked guards and pressure-sensitive mats;

(c) Protection appliances such as jigs, holders and push-sticks; and

(d) The provision of information, instruction, training and supervision.

Fixed guards should remain in place at all times, except when they need to be removed by authorised and competent persons for the purpose of maintenance. Interlocked guards and devices such as pressure-sensitive mats and safety light curtains should be considered where fixed guards would not be practicable because they would hinder normal operation of the machine. Care should be taken in their specification, however, as pressure-sensitive mats will not protect against, for example, ejected parts or weld flash. Regulation 11(3) covers factors including the suitability of different guards and protection devices, materials of construction, and the need for safeguards to be positioned at a sufficient distance from the danger zone.

Modern machining centres are fully enclosed, with interlocked guards providing good access for loading and unloading work pieces.

The advantage with items (a) and (b) in the hierarchy of machine guarding (guarding and safety devices integrated within the machine) is that a significant effort is required on the part of operatives or maintenance personnel to bypass or overcome the safety measures – though if it is foreseen that this is likely to happen, then appropriate steps should be taken to prevent it. In contrast, the use of protection appliances such as jigs, holders and push-sticks depends largely on the operative. Similarly, the provision of information, instruction, training and supervision cannot guarantee that an operative will not act inappropriately. Following the principles of the hierarchy of control outlined by Regulation 11(2) provides an effective control strategy. Sadly, employers will often focus on short term and less effective lower order controls such as the provision of information, instruction, training and supervision.

While Regulation 11 relates to protection against dangerous (moving) parts of machinery, Regulation 12 relates to protection against specified hazards (e.g. ejection of parts, emissions of fumes and explosion due to pressure build-up) and Regulation 13 relates to high or very low temperatures.

In reality, a physical guard will often be designed to protect against a combination of hazards covered by Regulations 11, 12 and 13.

It's worth noting that just because machinery carries the CE mark, this is no indication that the machine is safe or compliant with UK regulations. Employers must carry out a thorough risk assessment. Where there are major faults, then you could take this up with the supplier; they are the ones who should supply equipment which is fit for purpose.

Effective health and safety is usually delivered by an integrated package of measures that take account of the hardware (guarding), the systems (for intervention, such as lock off and isolation) and the human factors (understanding what goes on and how to maximise compliance). These measures are interdependent and should be treated as such in the assessment and management of risk.

In their guidance note INDG291 (http://www.hse.gov.uk/pubns/indg291.pdf) the HSE outline some "do's and don'ts" of machinery safety.

Current standards and guidance

The Procter Guarding website lists the key British Standards relating to machinery guarding. However, there are numerous other bespoke standards relating to, for example, various types of safety devices and machinery (e.g. milling machines, packaging machines and food processing machines).

Note that compliance with standards and Approved Codes of Practice is not mandatory, but doing so is normally the simplest way of applying best practice and meeting legal obligations. In other words, compliance is strongly advised.

What is your strategy?

Organisations should adopt a best practice strategy to managing machinery risks, giving consideration to the following issues:

- That they have carried out a risk assessment and followed the hierarchy of controls for machine guarding under PUWER.
- PUWER Risk assessments evidence involvement of machine operatives in assessing the tasks and considering controls.
- A live risk assessment schedule and training matrix exists for all workplace machinery and those who use it.
- For energised machinery, two points of isolation are achieved e.g. a lock out-tag out system to supplement interlocking guards or emergency stop controls.
- The company policy outlines the site rules for the safe use of machinery, including management and employee responsibilities.
- Guarding surveys have been commissioned by competent third parties where experience is not available in-house.
- The operation, servicing and maintenance of machinery is considered in the risk assessment. When introducing controls, consequential risks such as maintenance, falls from height, noise, hazardous substances, ergonomics and manual handling should be considered.
- The health and safety management system will define work instructions on the safe use and maintenance of machinery. Training based upon these instructions will be provided, recorded and users' competence validated. Compliance is then monitored and audited.

In addition to the physical controls, the softer controls for machinery safety are of equal importance. For example:

- a formal machine risk assessment, which takes into account its intended use, should be completed before the machine is started up or integrated on to a production line. To avoid any production versus safety clashes, this risk assessment stage should be recorded from the outset in any project plan.
- Following the risk assessment, a safe operating procedure (SOP) and machine operator/user training lesson plan should be produced. Training should be validated by both peers, line managers and trainers on several occasions before the formal sign-off for individuals.
- The key risk controls and procedural steps should be enforced by site management and supervisors in a non-confrontational manner via site tours and behavioural safety observations. Any unsafe practice should be condemned and eradicated immediately so to ensure it does not become custom and practice or seen as the norm by employee peer groups.
- Employees, safety representatives and management should together complete regular reviews of a sample of completed permits-to-work (PTW) in site meetings.
- Any PTW process should be supplemented by a dynamic risk assessment process for ad-hoc and non-routine maintenance tasks for which a formal SOP does not exist.
- Employers should ensure that any safety alerts or lessons learnt from safety incidents with similar machinery (either internal or outside of the organisation) are dissected and communicated to employees in the spirit of continuous improvement.

Conclusion

Whilst employers may have civil claims and legal defence costs covered on their insurance policy, these are far outweighed by the uninsured costs that machinery incidents bring. These can include fines, remediation costs, adverse publicity & reputational damage, poor work force moral and productivity. Of course, a poor claims history associated with no plans or strategy to deal with machinery risks will also ultimately result in rising insurance premiums. Today, with the HSE operating a Fee for Intervention (FFI) cost recovery scheme, companies are being invoiced an average of approximately £500 for inspections, investigations and enforcement action. Such costs makes guarding look an attractive investment.

The appropriate guarding of dangerous machinery and moving parts is a vital element of any health and safety management system. Such equipment can be highly hazardous and when things go wrong during routine use, maintenance or operation, the consequences for both the employer and injured person(s) can be severe.

The hierarchy of machinery guarding rightly prioritises such demanding controls around guarding, recognising the significant factor that human error can play in machinery safety incidents.

Further information

www.hse.gov.uk/work-equipment-machinery/index.htm

www.hse.gov.uk/safemaintenance/index.htm

www.hse.gov.uk/statistics/industry/manufacturing/manufacturing.pdf

www.machinesafety.co.uk

www.tuv-sud.co.uk/uk-en/industry/industrial-machinery-safety

www.osha.europa.eu/en/press/photos/napo/multimedia-film-episodes-listing-view?filmid=napo-014-safe-maintenance

www.QBEeurope.com/documents/riskmanagement/standards/QBE-Casualty-Risk-Management-Standards-27-Machinery-Guarding.pdf

www.shponline.co.uk/interlocked-moveable-guards-common-failures

www.shponline.co.uk/beware-the-ce-mark-its-no-guarantee-of-safety

www.shponline.co.uk/machine-guarding-pros-cons-different-types

A formal risk assessment enables hazards to be identified so that, if necessary, risk reduction measures can be applied.

Risk Solutions

Recognising that machinery safety is an area which can generate significant losses and safety concerns for companies, QBE Risk Solutions has partnered with Procter Machine Guarding as a provider of best practice solutions.

Procter Machine Guarding will support QBE policyholders as follows:

- Advising on guarding requirements and assisting with the implementation of any necessary improvements.
- QBE policyholders can obtain free Machine Guarding Compliance Surveys. These involve a safety engineer from Procter Machine Guarding visiting the policyholder to assess machinery and current/required safeguards. A short written report is then prepared, identifying areas of non-compliance and actions that can be taken to reduce risk, improve safety and legal compliance with the. If requested, Procter Machine Guarding can carry out any remedial guarding work and/or put the policyholder in touch with other specialists. The emphasis is always on cost-effective guarding and, when appropriate, a safety engineer can help the QBE policyholder to prioritise actions and formulate a phased implementation plan.
- A machinery risk assessment calculator, including a video walkthrough guide.
- A live and interactive chat-line service available on the Procter web site.
- Providing access to the machinery safety guides and resources that Procter Machine Guarding has developed to support users and designers of machinery.
- Through access to Procter's website and email newsletter; these both carry up-to-date information about machinery safety standards and regulations, as well as articles covering topics such as the business case for machine guarding and the role machine guards play in safe maintenance practices.

To find out more about Procter Machine Guarding and the services available, in the first instance please contact your QBE Risk Manager or other QBE contact. You can also visit the QBE website: **www.QBEeurope.com/risk-solutions/casualty/procter.asp**

Author biographies

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Paul joined QBE in 2011 bringing over 10 years of management and health and safety experience at global organisations, predominantly in the Logistics and Manufacturing sectors. Working in QBE's Casualty Risk Solutions team, Paul specialises in claims defensibility and risk profiling. Paul holds an honours degree in Business Management and the Nebosh National Diploma in Occupational Health and Safety. He is a Graduate Member of IOSH and is currently reading for an MSc in Risk Management.

Steve Allen - National Sales Manager, Procter Machine Guarding

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Steve is a health & safety professional with 25 years experience of machinery safety. Passionate about safety and helping people who may have or use hazardous machinery, Steve prides himself on providing three key services to clients: expert advice when needed, delivering effective safety solutions and ensuring all legal requirements are met. Steve has an extensive working knowledge of various industry sectors including Automotive, Aerospace, Rail, Paper & Board, Steel manufacturing and Construction material manufacturers.

Disclaimer

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