REDUCING OPERATIONAL RISK BY MANAGING HAZARDOUS MACHINE ENERGY

MICHAEL SHAW
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ARE WE DOING ENOUGH TO PREVENT PEOPLE BEING INJURED OR KILLED MAINTAINING MACHINERY?

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YOUR SPEAKER

Michael Shaw MSc CMIOSH MICE IEng IMaPS

Principal at Ramboll

UK&I Health & Safety Consultancy Leader

Engineering, health & safety risk management career

Much experience in the industrial and manufacturing sector

Successfully delivered broad strategic and operational H&S assignments across the UK, Europe, America, Canada, Australia, Saudi Arabia & Jordan

RAMBOLL IN BRIEF

- Independent sustainability, EHS, engineering, design and management consultancy
- Founded 1945 in Denmark
- 15,500 experts, in close to 300 offices across 35 countries
- Strong presence in the Nordics, UK, Europe, North America, Middle East and Asia Pacific
- Foundation owned – stability, re-investment, long-term perspective
- Key Markets: Environment & Health, Energy, Buildings, Transport

Ramboll supports manufacturing and industrial clients to manage a wide range of organisational health, safety & environmental risks

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HEALTH, SAFETY AND HAZARDOUS ENERGY SERVICES

Ramboll provide broad strategic H&S services to clients, and in relation to hazardous energy management include:

- Organisational evaluation
- Policy and procedures
- Implementation
- Training and coaching
- Behavioural change management
- Performance review
- Incident investigation

WEBINAR AIMS

01

Machine safety advancements

02

Legal framework

03

Accidents happen

04

Business considerations

05

Hazardous energy management roadmap

MACHINE SAFETY ADVANCEMENTS

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MACHINE SAFETY ADVANCEMENTS
A BRIEF HISTORY

- Dawn of the industrial revolution
- Concern relating to worker health and incidents impacting on productivity
- Industry learning/initiatives
- Legislation (early 1800s) introduced rules on age, working hours, sanitation, ventilation, machinery guarding, etc.
- Most industries captured by early 1900s
- Current EU Directives and country level Acts, Regulations and Guidance

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MACHINE SAFETY ADVANCEMENTS
THE MODERN WORKPLACE

- Improved work environments
- Safeguarding
- Automation
- Reliability
- Operator competence
- Risk assessment / safe systems of work
- Health & safety governance
- Legislation
- Hazardous energy management

MACHINERY SAFETY ADVANCEMENTS
HAZARDOUS ENERGY

Hazardous energies are encountered when maintaining machinery, following removal of other safeguards, and include:

- Electrical
- Chemical
- Mechanical
- Thermal
- Water/steam
- Hydraulic
- Radioactive
- Gravitational
- Pneumatic

Hazardous Energy Management

The Physical isolation of hazardous energies (lockout/tagout) to prevent unexpected start-up of machinery or release of stored energy that could otherwise cause injury

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LEGAL FRAMEWORK

LEGAL FRAMEWORK
NORTH AMERICA

- United States Occupational Safety & Health Administration (OSHA)
- OSHA 29 CFR 1910.147, Control of Hazardous Energy (Lock-Out/Tag-Out)
- In place almost 30 years
- Marked reduction in incident frequency
- Systemised/prescriptive approach

OSHA 29 CFR 1910.147 STANDARD

Comprehensive minimum requirements that apply to servicing and maintenance of all workplace machinery and equipment

Not risk based and applies to all businesses

Often applied across a US corporate's global business

Contains lots of good practices

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LEGAL FRAMEWORK
EUROPEAN UNION

- No EU equivalent to US LOTO standard
- Electrical LOTO isolation clearly defined
- Country legislation not wholly prescriptive:
  - Goal setting and self-regulation
  - Risk assessment/safe systems of work
  - Workforce engagement and training
  - Suitable tools and material
  - Adequate resources
  - Energy isolation inferred

EUROPEAN DESIGN CODES INCLUDE:

BS EN ISO 12100: Measures for isolation and energy dissipation

89/655/EEC: "every piece of equipment must be fitted with clearly visible devices with which it can be separated from every energy source".

EN 1037 'Safety of machinery – Prevention of unexpected start-up'
Defines design measures regarding the energy isolation of machinery and power dissipation to prevent equipment re-energising.

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LEGAL FRAMEWORK
UK & IRELAND

UK

HASAWA: Employers must ensure, SFARP, the HSW at work of employees, including to provide and maintain safe plant and equipment

MHSWR: Risk assess, introduce safe systems of work, coordinate activities, provide training

PUWER: Where appropriate, apply machinery isolation procedures and arrangements

Electricity at Work Regulations: Isolation of equipment before working on live circuits

IRELAND

SHWAWA: Every employer shall ensure, SFARP, the safety, health and welfare at work of his or her employees. Risk Assessment, safe systems of work, training etc.

Safety, Health and Welfare at Work Regulations 2007:

- All work equipment is fitted with clearly identifiable means to isolate it from all its energy sources, and
- The reconnecting of the work equipment to its energy sources poses no risk to the employees concerned

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ACCIDENTS HAPPEN

https://www.hse.gov.uk/statistics/fatals.htm

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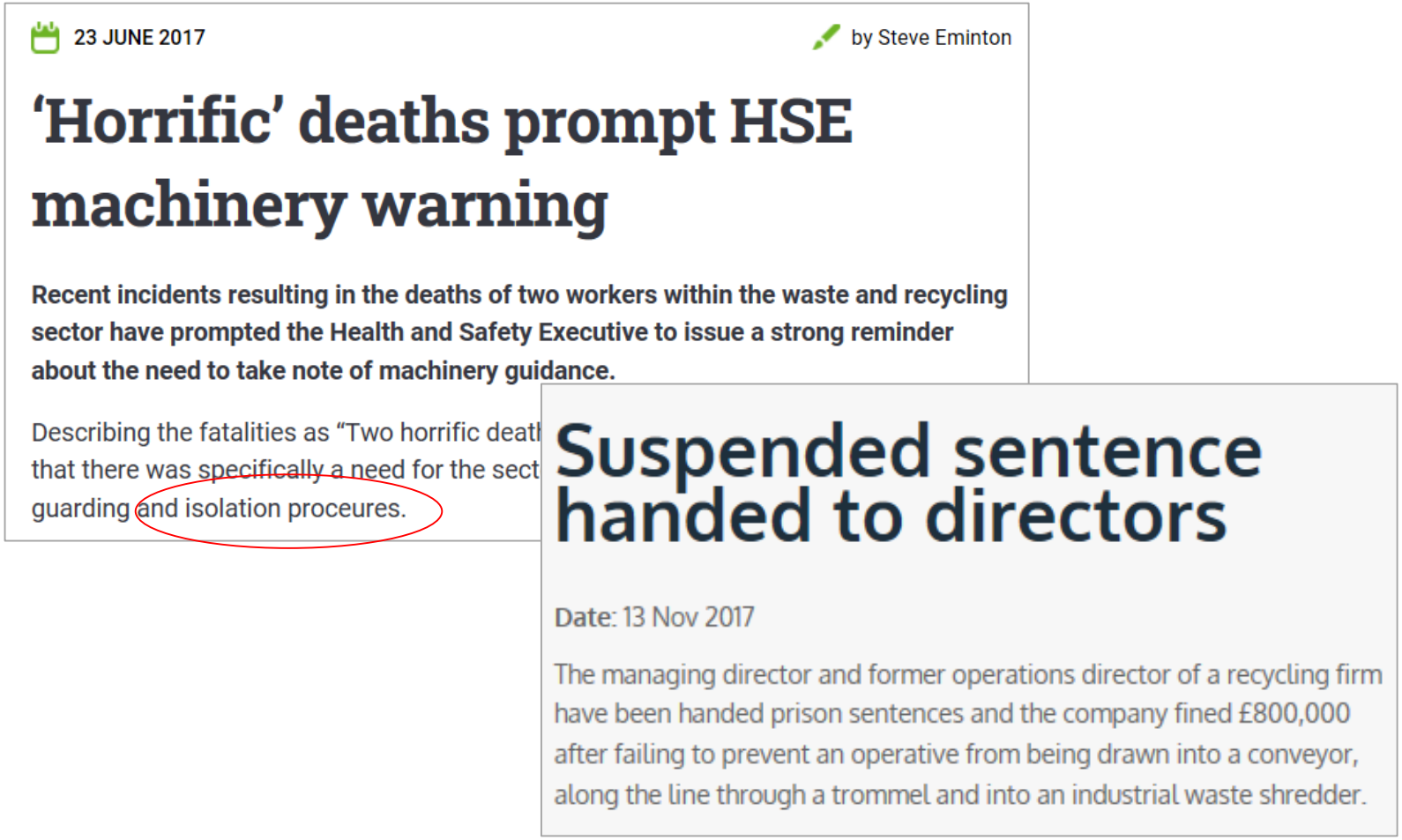
ACCIDENTS HAPPEN
UK HEADLINES



23 JUNE 2017 by Steve Eminton

‘Horrific’ deaths prompt HSE machinery warning

Recent incidents resulting in the deaths of two workers within the waste and recycling sector have prompted the Health and Safety Executive to issue a strong reminder about the need to take note of machinery guidance.

Describing the fatalities as “Two horrific deatl
that there was specifically a need for the sect
guarding and isolation proceures.

Suspended sentence handed to directors

Date: 13 Nov 2017

The managing director and former operations director of a recycling firm have been handed prison sentences and the company fined £800,000 after failing to prevent an operative from being drawn into a conveyor, along the line through a trommel and into an industrial waste shredder.

14

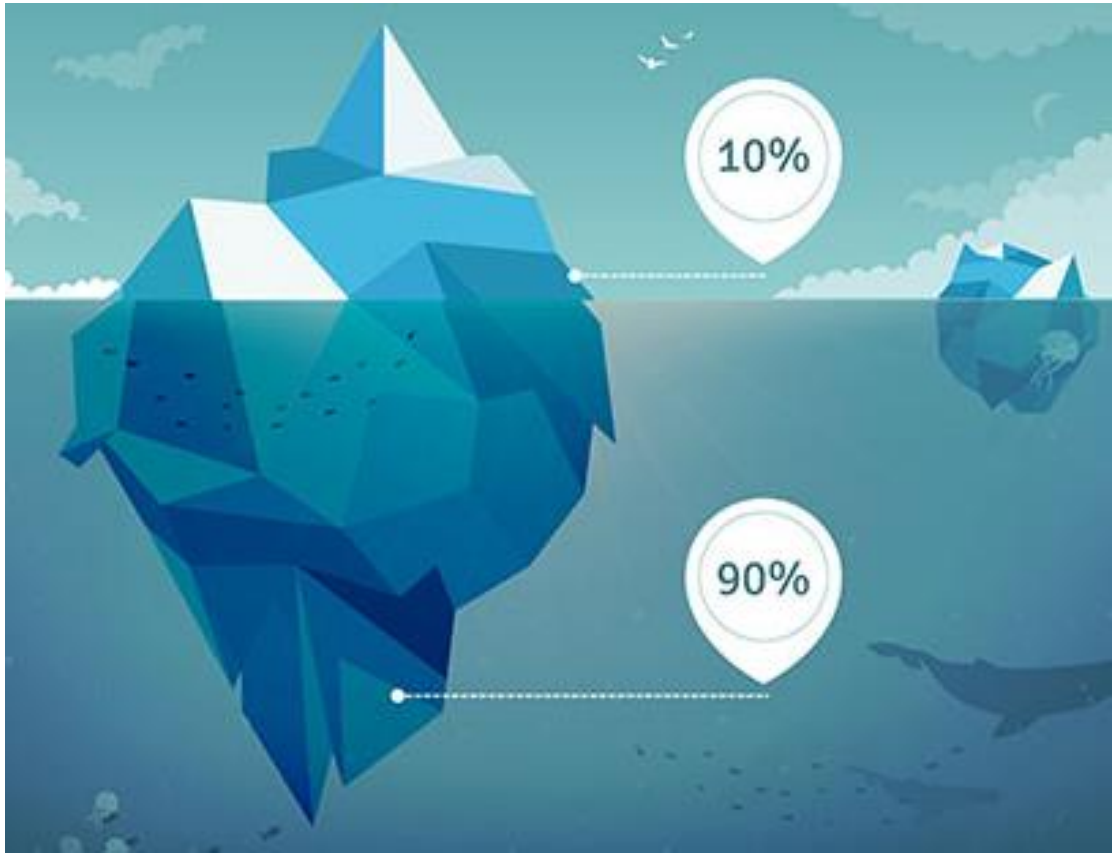
UK workers killed in 2018/19 from contact with moving machinery *1

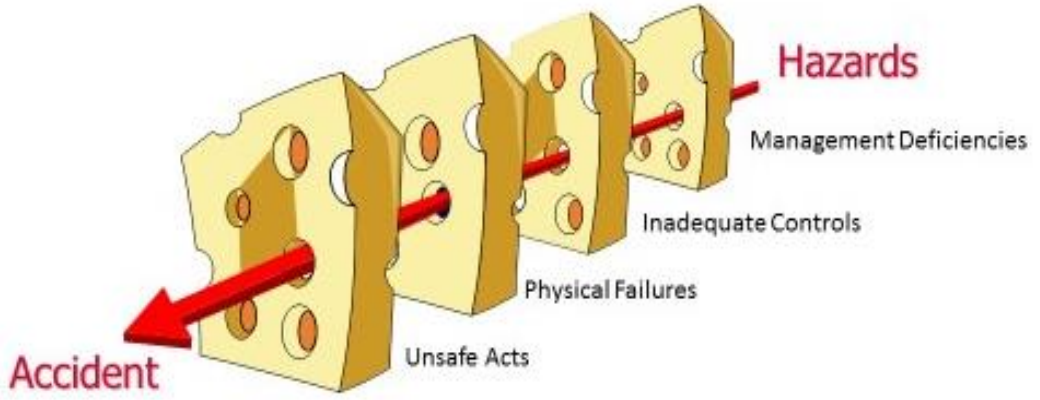
65

UK workers injured **EVERY DAY** in 2018/19 by moving machinery *1

https://www.letsrecycle.com/news/latest-news/horrific-deaths-hse-machinery-warning/
https://www.puwer.co.uk/suspended-sentence-handed-directors
https://www.hse.gov.uk/statistics/fatals.htm (*1 excludes vehicles)

ACCIDENTS HAPPEN
THE BIGGER PICTURE





For each RIDDOR reported accident, there will be numerous near misses, minor or unreported incidents

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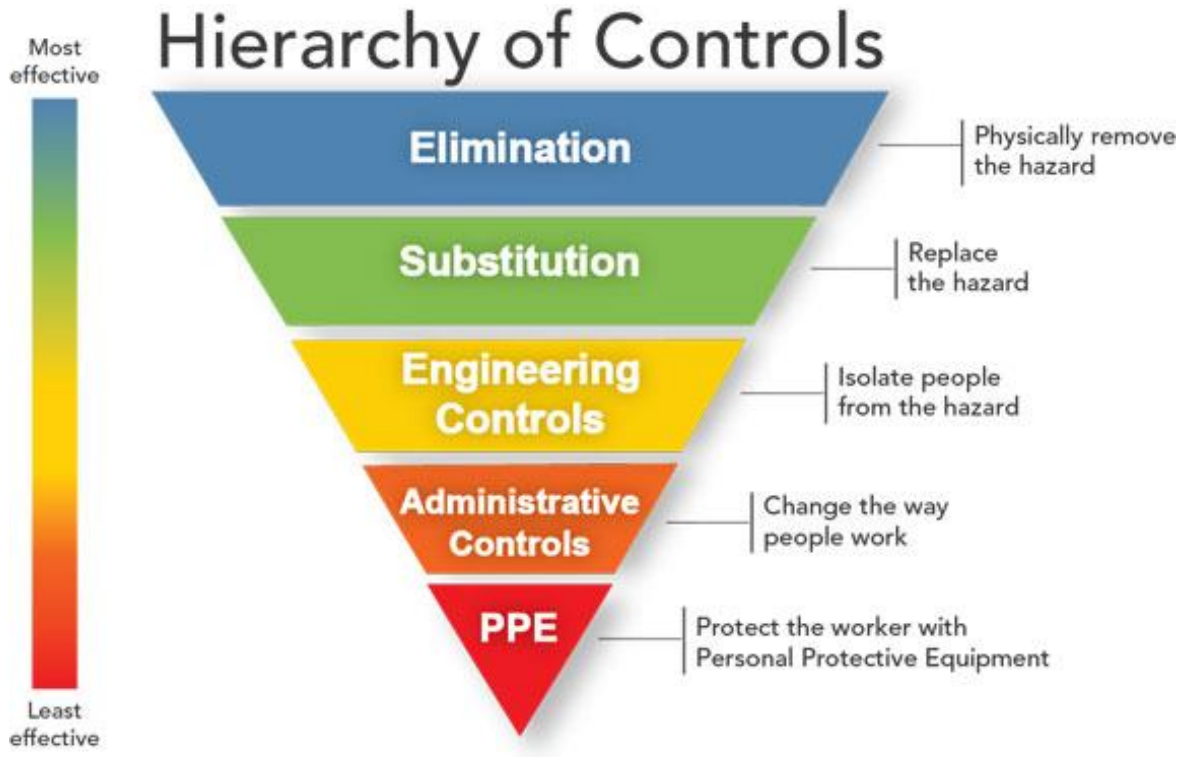
ACCIDENTS HAPPEN
PRIMARILY A RESULT OF HUMAN FACTORS

- Leadership and investment
- Machinery design
- Safeguarding
- RAMS
- Competence
- Behaviour
- Poor hazardous energy isolation



BUSINESS CONSIDERATIONS

BUSINESS CONSIDERATIONS
LEADERSHIP

Legal responsibilities for positions held

01

H&S must have at least equal governance to finance, quality, HR etc

02

Commit suitable dedicated time and resources

03

Take proactive measures to improve H&S policies and processes

04

Support those tasked with implementation

05

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BUSINESS CONSIDERATIONS
POLICIES AND PROCEDURES

- Unclear or poorly designed, and difficult to implement
- Limited arrangements for launching a LOTO programme
- Limited corporate/H&S support
- Scale of effort required to launch is often overwhelming
- Limited local investment in time and resource

BUSINESS CONSIDERATIONS
APPLICATION

- Missing PUWER risk assessments
- Machinery adaptations (age, position)
- LOTO often not aligned to other safe systems of work
- Complex upstream/downstream process
- Inadequate equipment specific procedures
- Insufficient LOTO devices/stations
- Reliance on interlocks and software – can be defeated
- Management of contractors

BUSINESS CONSIDERATIONS
COMPETENCE

- Limited subject specific skill, knowledge or experience
- Role often added to the ‘day job’
- Responsibilities not clearly defined at all levels in the business

BUSINESS CONSIDERATIONS
CULTURE AND BEHAVIOUR

- LOTO often thrust into a business
- Employee behaviour
- Workforce training
- Business messaging
- LOTO arrangements are often not monitored or reviewed
- Making a cultural shift

"Do not assume existing LOTO programmes are working and keeping employees safe"

HAZARDOUS ENERGY MANAGEMENT ROADMAP

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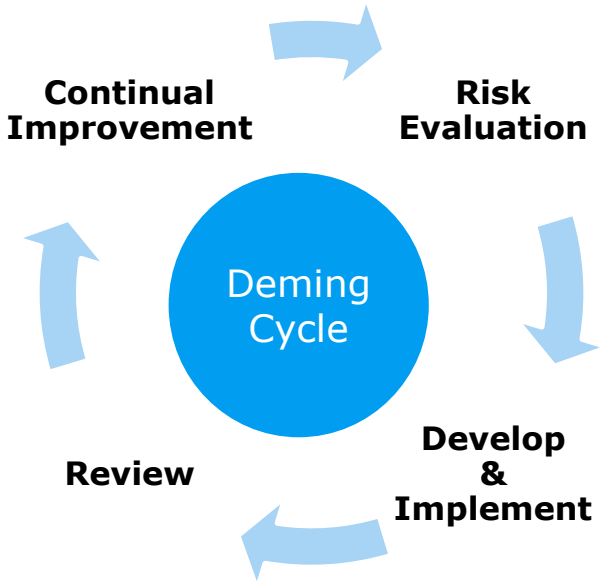
HAZARDOUS ENERGY MANAGEMENT ROADMAP
IMPLEMENTATION



1. Appraisal and scoping study
2. Establish policy and arrangements
3. Establish and educate LOTO implementation team
4. Equipment-specific LOTO procedures
5. Identify and source LOTO devices
6. General LOTO training to workforce
7. LOTO live start
8. Promote, support and monitor performance
9. Review and continual improvement

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HAZARDOUS ENERGY MANAGEMENT ROADMAP
WEBINAR TAKEAWAYS

- Define business expectations within clear machinery safety policies and arrangements
- Consider OSHA good practices and industry guidance
- Prioritise high-risk machinery maintenance activities
- Train and support those tasked with implementing LOTO
- Allow sufficient time and resources – a clear plan
- Promote LOTO through regular workforce engagement
- Don’t assume existing LOTO arrangements are fully understood or implemented; monitor and review regularly

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THANK YOU FOR LISTENING - QUESTIONS?

Michael Shaw MSc CMIOSH MICE IEng IMaPS
Principal - UK&I H&S Consultancy Leader
+44 7764 660 387
mshaw@ramboll.com

OUR GOAL

"To embed consistent environmental, health and safety industry good practices, with measurable improvements in client performance, productivity, quality, and profit, as a result"

"Our next FDF webinar will be on the Topic of Climate Resilience, follow Ramboll on LinkedIn for updates"

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