



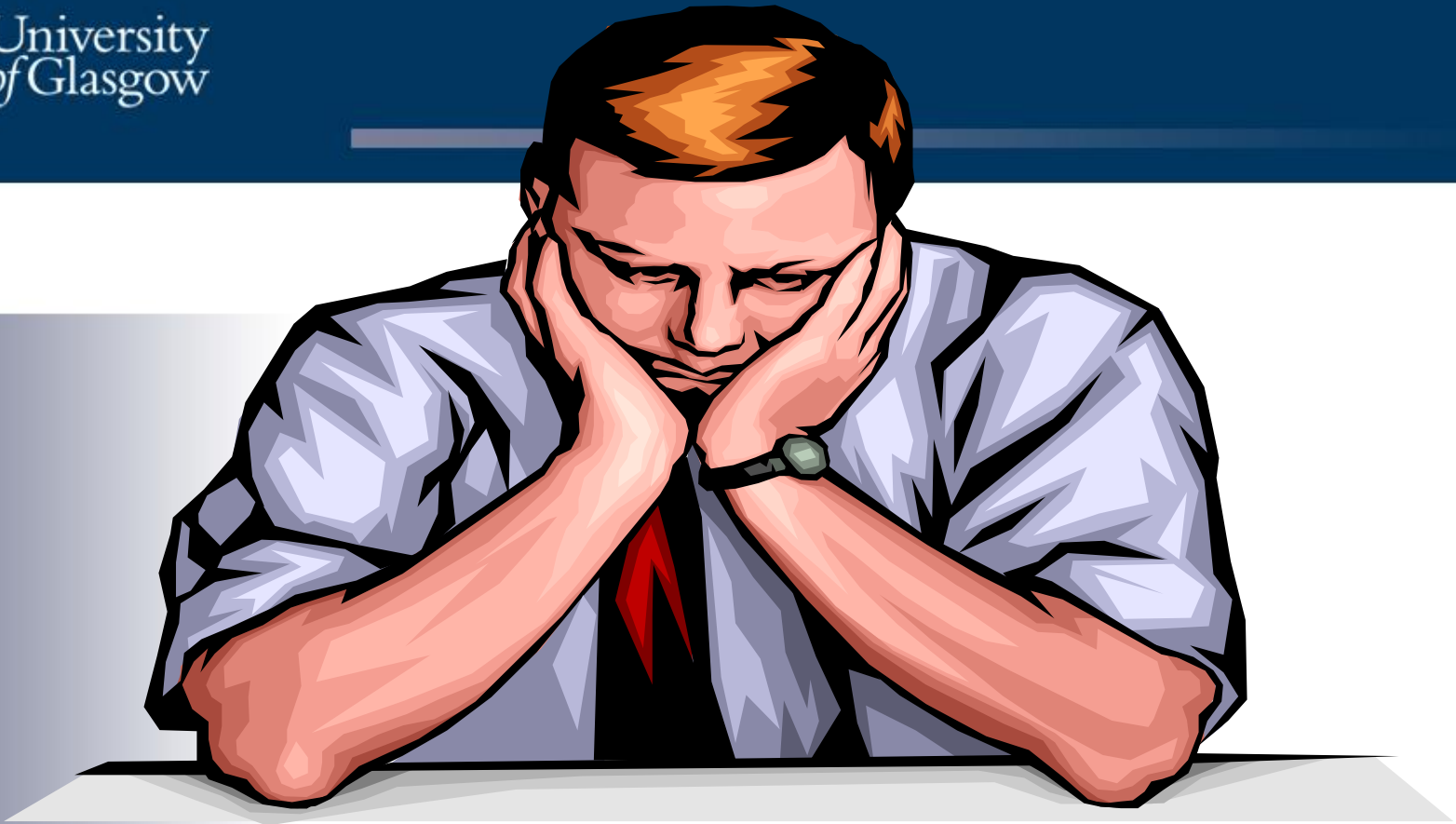
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Economic Recession and the Crisis in Safety Regulation

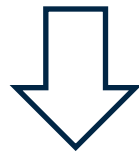
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Economic Recession



Increasing Accidents



Regulatory Cuts

- 3 flawed forms of safety governance:
 - *Market forces*: 3rd party effects;
 - *Tort and insurance*: inefficient and retrospective;
 - *State regulation*: risk based, can be bureaucratic.
- 2007 recession cut regulatory budgets 30%+
- Can we assess any impact on safety?
 - Fewer inspections and enforcement actions?
 - Less competent/motivated regulators?
 - Fall in accidents less than fall in economic activity.

- People do not demand unsafe products?
- Some politicians still seem to believe this...

Look, I'm not blaming you,
I am just suing you...

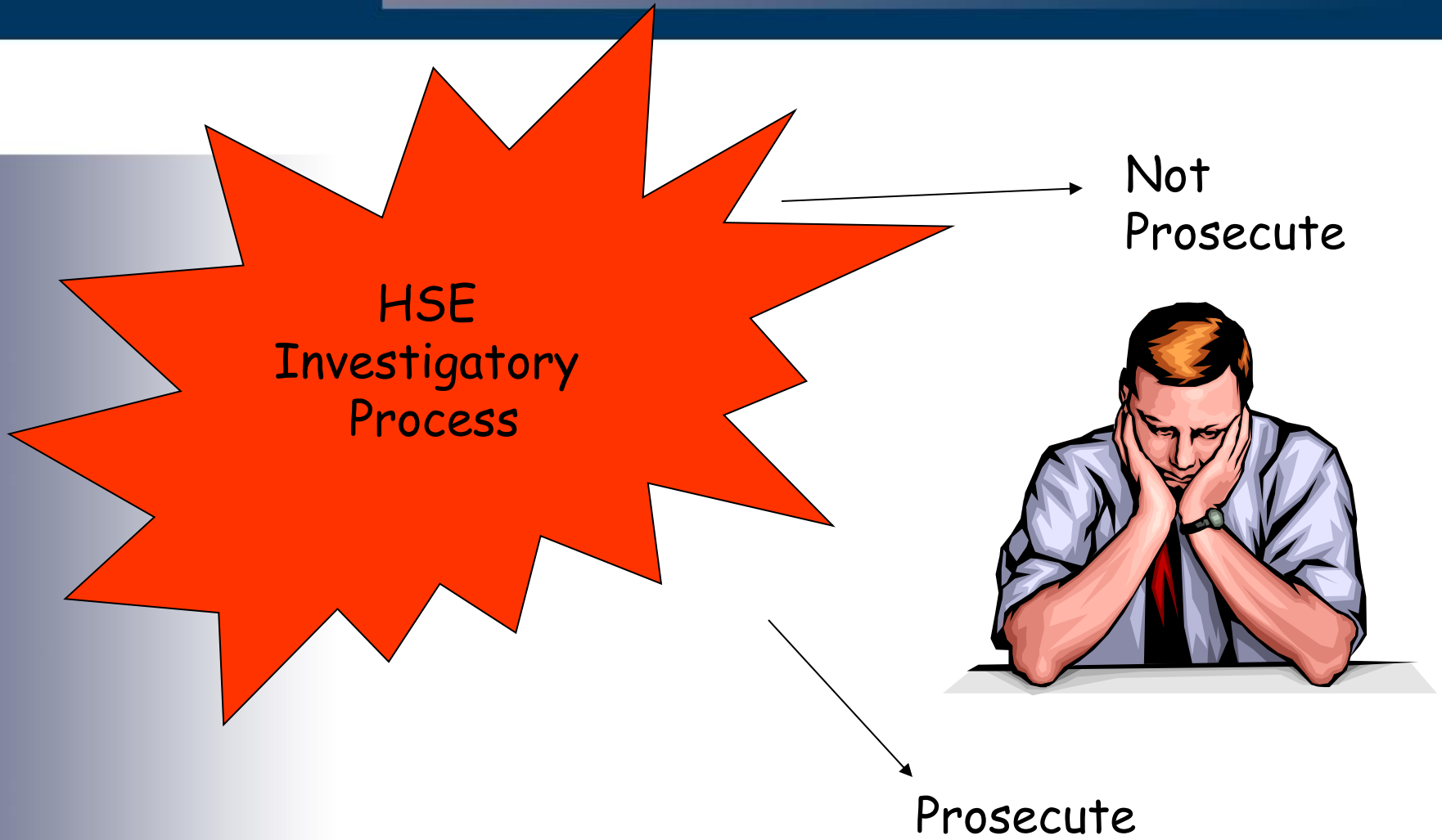
- 1999, Los Angeles County jury.
 - \$4.8 billion in punitive damages against GM;
 - 6 victims in car rear-ended by drunk driver;
 - Car catches fire, later reduced to \$1.2 billion.
- Third parties use tort for compensation:
 - Costs so high, companies improve safety?
- Individuals cannot assume they will win;
 - So they also take steps to improve safety.

Safety Governance 3: Different forms of Regulation



HSE
Investigatory
Process

What Do Regulators Do?



Safety Footwear Standards Explained EN345 / EN ISO 20345:2007

What you wear on your feet really matters. Getting the right footwear will make life safer and easier. Employers are legally responsible for providing the correct footwear. Protect now.

The safety footwear standard is referred as EN345, EN ISO 20345:2004, and EN ISO 20345:2007. All footwear designed before 2004 and still manufactured up to today carries EN ISO 20345:2004. EN ISO 20345:2007 is the latest standard for footwear designed or retested after 2007.

The EN ISO 20345:2007 standard sets out minimum requirements that safety footwear must be successfully tested against.

The standard specifies *all* safety footwear must have toe protection. In addition to different protective features footwear represented by a combination of letters.

All Safety Footwear in this standard is at least SB which means it has toe protection against a 200 Joule impact

Rating	Features	Key	Description
SB			
SB-P	P	A	Antistatic footwear
S1	A + FO + E	E	Energy absorption of heel region
S1-P	A + FO + E + P	FO	Resistance to fuel oil of outsole
S2	A + FO + E + WRU	P	Penetration resistance
S3	A + FO + E + WRU + P	WR	Water resistant
S4	A + FO + E + Waterproof	WRU	Water resistant upper
S5	A + FO + E + P + Waterproof		

Toe protection (SB)

Your toes are a very vulnerable part of your body, especially in a work place. Toe protection must withstand a 200 joule impact. Joule is the unit of energy and this standard is purposefully specific. Something heavy falling from a low height could have a lot less energy than something lighter from a much higher height. As well as impacts the toe area must withstand a resting mass of well over 1000kg.

Most people have heard of steel toe cap boots but the protection doesn't have to be steel. In fact there are advantages to alternatives. Non-metallic protection can be equally as strong but lighter.

Antistatic protection (A)

Clothing, seating materials, and climate factors can cause a build up a static charge of electricity in the body. Some materials in footwear can over insulate the body causing the charge to be held. When you then touch something the charge can rush from your body quickly causing a spark and a small uncomfortable shock. Antistatic footwear will significantly reduce this effect but does *not* offer full protection for exposure to electronics and explosives work. You will need Electro-Static Protection (ESD) for this.

Midsole penetration protection (P) - SB-P, S1-P, S3, S5

Sharp objects where we walk and stand are significant risk not only in the workplace but also outdoors and at home. Midsole protection will guard against nails and other objects. To meet this standard the footwear must be able to resist a penetration force of 1100N. Midsole protection is provided in one of three methods: a stainless steel insert in the sole, aluminium insert in the sole, or by Kevlar insole. The Aluminium and Kevlar solutions are the most flexible and lightest and cover the greatest area of the foot. Kevlar insoles also offer much higher thermal insulation.

Energy Absorption (E)

Energy Absorption in the heel region

Water Resistant Upper (WRU)

Water resistant upper, not used on all rubber or polymeric footwear.

Heat Resistant (HRO)

Heat resistant Outsole: To resist 300°C for 60 seconds

IEC 61508 Lifecycle phase	Detailed taxonomy	IEC 61508 ref
Concept	1. Hazard identification	7.2,7.3,7.4
Overall Scope	2. Consequence and likelihood estimation	
Hazard & Risk Assessment		
Overall Safety Requirements	1. specification	7.2 (2)
Allocation	2. selection of equipment	7.4.2.2 (2)
Planning of I & C, V, and O&M	3. design and development	7.4 (2)
Realization	4. installation design	7.4.4/5 (2)
Installation and commissioning	5. maintenance facilities	7.4.4.3(2),
Validation	6. operations facilities	7.4.5.2/3 (2)
Installation and commissioning	1. installation	7.5 (2), 7.13.2.1/2,
Validation	2. commissioning	7.13.2.3/4
Operation and maintenance	1. function testing	7.7.2.1/2/3 (2)
Operation and maintenance	2. discrepancies analysis	7.7.2.5 (2)
Operation and maintenance	3. validation techniques	7.7.2.7 (2)
Operation and maintenance	1. maintenance procedures not applied	7.7.2.1
Operation and maintenance	2. maintenance procedures need improvement	7.6.2.2.1/2/3 (2)
Operation and maintenance	3. operation procedures not applied	7.6.2.1
Operation and maintenance	4. operations procedures need improvement	7.6.2.2
Operation and maintenance	5. permit/hand over procedures	7.6.2.1
Operation and maintenance	6. test interval not sufficient	7.6.2.1
Operation and maintenance	7. maintenance procedures not impact assessed	7.6.2.4 (2)
Operation and maintenance	8. operation procedures not assessed	7.6.2.4 (2)
Operation and maintenance	9. LTA procedures to monitor system performance	7.6.2.1 (2)
Operation and maintenance	10. LTA procedures applied to initiate modification in the event of systematic failures or vendor notification of faults	7.8.2.2 (2), 7.16.2.2
Operation and maintenance	11. tools incorrectly selected or not applied correctly	7.6.2.1 (2)
Modification	1. impact analysis incorrect	7.8.2.1 (2)
Modification	2. LTA manufacturers information	7.8.2.2 (2)
Modification	3. full lifecycle not implemented	7.8.2.3 (2)
Modification	4. LTA verification and validation	7.8.2.4 (2)
IEC 61508 common requirements		
Competency	1. LTA operations competency	6.2.1 h
Competency	2. LTA maintenance competency	6.2.1 h
Competency	3. LTA modification competency	6.2.1 h
Lifecycle	1. LTA definition of operations accountabilities	7.1.4
Lifecycle	2. LTA definition of maintenance accountabilities	7.1.4
Lifecycle	3. LTA definition of modification accountabilities	7.1.4
Verification	1. LTA verification of operations	7.18.2, 7.9 (2)
Verification	2. LTA verification of maintenance	7.18.2, 7.9 (2)
Verification	3. LTA verification of modification	7.18.2, 7.9 (2)
Safety management	1. LTA safety culture	6.2.1
Safety management	2. LTA safety audits	6.2.1
Safety management	3. LTA management of suppliers	6.2.5
Documentation	1. documentation unclear or ambiguous	5.2.6
Documentation	2. documentation incomplete	5.2.3
Documentation	3. documentation not up to date	5.2.11
Functional safety assessment	1. LTA O & M assessment	8.2
Functional safety assessment	2. modification assessment LTA	8.2
Functional safety assessment	3. assessment incomplete	8.2.3
Functional safety assessment	4. insufficient skills or independence in assessment team	8.2.11/12/13/14

Key: LTA is Less Than Adequate, IEC 61508 references are to Part 1 except as indicated by parentheses e.g. (2)

- Sub-prime mortgages on bank balance sheets;
 - Government recapitalisation of banking sectors.
- The negative multiplier (1);
 - Government reduce deficit, demand falls;
 - Demand falls so companies sell less;
 - Less sales so government starved of taxes...
- The negative multiplier (2):
 - Economic uncertainty=more risk, banks reduce credit;
 - Less credit so private enterprise cannot invest;
 - Less investment reduces demand, more uncertainty.

Recessions Improve Safety?

- Companies fewer resources for safety;
 - Hard to show impact of safety spending...
- 2009 HSE survey of 200 employers:
 - 26% to cut health & safety budget in recession;
 - Under-reporting is a serious concern...
 - 59% “proactive health and safety enhances profit”;
 - In 2007, this figure was 72%.

14 August 2012 Last updated at 14:42



Fire service cover lacking in East Sussex towns: FBU

Towns and villages in East Sussex are being left without local fire cover while cuts are being planned, according to the Fire Brigades Union (FBU).

The union has criticised East Sussex Fire and Rescue Service (ESFRS), claiming that appliances have not been available for emergencies due to staff shortages.

They claim that further cuts will make the situation worse.

ESFRS said response times would not be affected by a reduction in funding.

The service will see a reduction in central government funding of £1.9m by 2016/17.

In a statement, the FBU said: "It seems apparent to the FBU that ESFRS senior managers, and indeed the fire authority of East Sussex, are comfortable with the situation, whereby whole villages and towns have no fire cover supplied by their local fire station and firefighters.

'Deaths risen'

"They are relying on neighbouring stations and firefighters who would have long travel times and distances to attend any emergency.

"Over the last year deaths due to fire have significantly risen within East Sussex and any further cuts, in the opinion of the FBU, will lead to further

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Luke Jenkins death partly due to 'low staffing' levels

A boy who went into hospital for heart surgery suffered cardiac arrest and died partly due to staff shortages, a report has said.

Luke Jenkins, seven, of Cardiff, was expected to make a recovery after surgery at Bristol Children's Hospital.

A report said he was moved from intensive care 24 hours after the operation because of "increasing demand" on beds in the department.

Later, ward staff did not "fully consider" why bleeding had increased.

The report, put together by an investigative team at University Hospitals Bristol NHS Foundation Trust, said "the workload and patient dependency is recognised as being significant" in Luke's death.

When he collapsed on his ward, junior staff did not know where a vital piece of resuscitation equipment was kept.

The report added the lack of knowledge had "caused a delay" but it was "minor and would not have affected the outcome".



Luke was born with a congenital heart defect and was in hospital for surgery

"Inadequacy of resources, both money and staff complement, and the difficulties in maintaining a sustainable cadre of suitably competent staff are the principal threats to safety in the defence nuclear programme in the medium term"

(UK MoD Head of Nuclear Safety, 2012)

- 2010-2012:
 - UK construction industry contracted by 5%;
 - Number of public houses built fell by 18%;
 - Public non-housing construction fell by 21%.
- No significant rise in fatal injuries:
 - UK 2006 (191), 2009 (104), 2011 (120).
- Might expect greater fall, so:
 - Accidents independent of economy/risk exposure?
 - Need more detailed statistical analysis?

- Chair of UK Health and Safety Executive

“The HSE has of course had to take its share of savings...

The headline figures are that HSE is required to make a minimum of 35% savings.

But let's put that into context. Savings of 35% are the norm across Department of Work and Pensions.

So we are not being treated more harshly than anyone else”



- 2011-12, UK government borrowing
 - Fell by £10 billion; stringent cuts in spending.
- Lord Young Common Sense, Common Safety
 - tort reform and reshaping UK regulation;
 - “*compensation culture* driven by litigation ... beset health and safety today”.
 - Risk based regulation exempt ‘low hazard businesses’.

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Health and safety inspections cut in regulation curb



Health and safety inspections will still apply to areas deemed to be of high risk, such as construction sites

Plans to exempt thousands of businesses from health and safety inspections have been announced by ministers.

Under new rules to be introduced in April 2013, checks will no longer be routinely carried out on premises considered to be low risk, like shops.

Ministers say the checks can place an unnecessary burden on some businesses, but some trade unions say it risks the safety of employees and customers.

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- Fall in HSE prosecutions
 - resulting in at least one conviction;
 - 517 (2006-7) to 484 (2010-11).
- HSE argued this is improved safety.
- But many other hypotheses:
 - Fewer successful prosecutions;
 - Less people for prosecution;
 - Side effect of fall in economic activity?

Not Just the UK and Europe

- 2007-8 Canadian government
 - Alter of free-market and regulatory safety;
 - Reduce Federal food safety inspectors
 - companies how to meet hygiene standards.
 - 22 people died in listeriosis outbreak, Ontario.
- Recession triggers new review:
 - government ask \$56 million of savings;
 - From Canadian Food Inspection Agency;
 - 100 posts into question over the next 3 years.
- Iterative process in safety regulation...?

- Symptoms of the crisis:
 - Cynicism, illness, lack of training;
 - poor pay, career development and staff retention;
 - Junior and elderly staff left in key positions.
- Multi-modal regulators out of their depth;
 - “can you explain caching please?” ...
- Lack of leadership across European safety:
 - New tools: how do we use risk to target resources?
 - New threats: cyber-security and safety;
 - New systems: Global Navigation Satellite Systems..

So What Do We Do?

- Financial constraints remain, so we need to:
 - carefully monitor mishap rate and risk exposure;
 - Consistent approach (enforcement vs education?).
- Some agencies are great but we need:
 - Competent, well motivated safety regulators.
- Need to:
 - Recruit regulators for the next decade not the last;
 - Software engineers, human factors, management;
 - Need new approach to regulation in recession.

Summary: Crisis in Safety Regulation



- 3 flawed forms of safety governance:
 - *Market forces*: 3rd party effects;
 - *Tort and insurance*: inefficient and retrospective;
 - *State regulation*: risk based but bureaucratic.
- 2006 recession cut regulatory budgets, 30%+
- Impact on safety?
 - Fewer inspections and enforcement actions;
 - Less competent/motivated regulators;
 - Fall in accidents less than fall in economic activity.

Any Questions?

Paper on: <http://www.dcs.gla.ac.uk/~johnson>