

Lessons Learned? from Disasters

National Emergency Management Summit.

Date 31st March 2011

Sean Coleman

sean@colemanrisk.ie

A photograph of a blue bus on a wet street, pulled by a brown ox. A person is visible in the open front of the bus. The scene is set in a rural or semi-rural area with trees and utility poles in the background. A yellow callout box points to the bus, and another yellow callout box points to the ox. A red banner is at the bottom of the image.

Aspirations

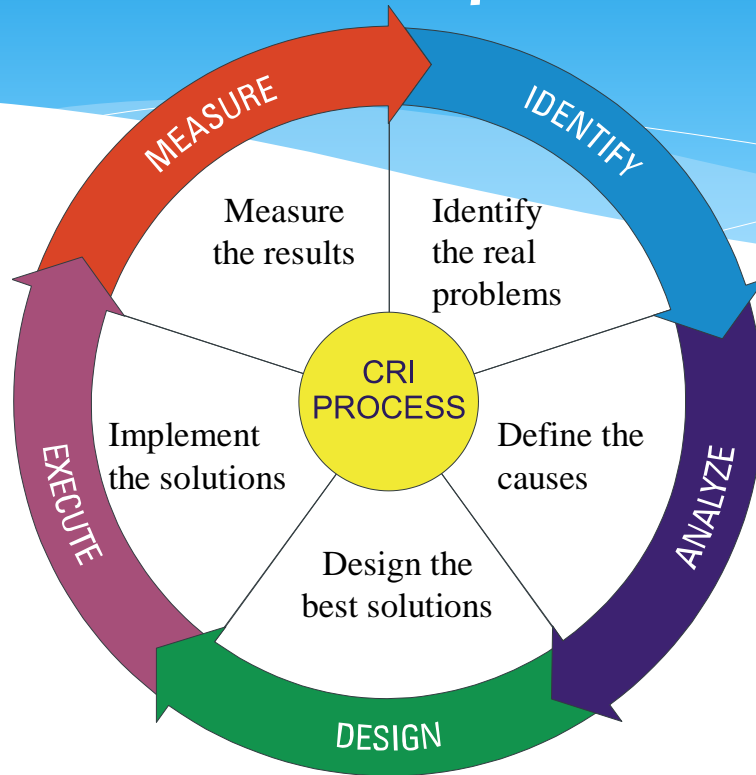
More Resources

Risk Management: a constant battle between aspirations and resources

What is risk management?

- Management of uncertainty
(The effect of uncertainty on objectives)
- Learning from our mistakes and better still the mistakes of others
- Balanced decision making based on **sound** evidence
- Ideally a structured system see ISO 31000
- How crisis management fits into RM?

Continuous Risk Improvement Process



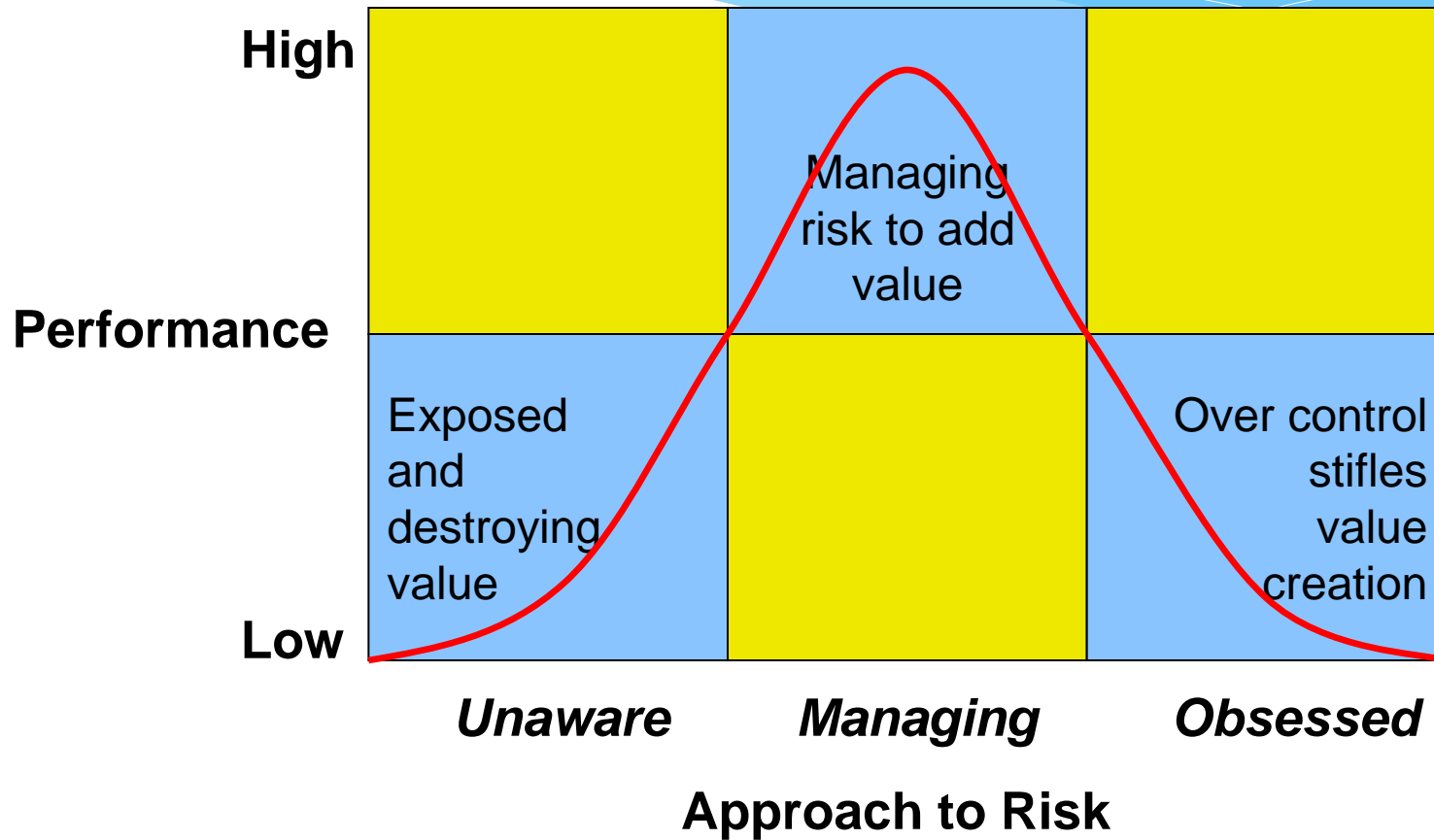
Learning from Mistakes

“Nobody wants failures. But you also don’t want to let a good crisis go to waste.”



Remember Bantry bay?

Approach to Risk



Issues with Monitoring

KPIs HSE

- * **Grangemouth BP 13th March 1987**
- * Critical Systems deteriorate over time without causing any impact until they fail catastrophically.
- * Audits tend to be too infrequent to detect problems in time – can focus on compliance.
- * Workplace inspections not always focused on critical controls.
- * Directors, CEOs and senior managers had no means to assess adequacy of process safety risk – reliance on Lost Time Incidence Rates.
- * Performance assessed based on failure data – not positive assurance that systems operating as intended.

Legislation v reality

- * Low risk v high risk (perception?)
 - * FM fire test in office waste basket fire
7 mins to flashover and ceiling temp of 800° C
- * Glasgow plastics factory LPG explosion 9 killed 2004
- * Lakanal House 2009 6 fatalities -more innovative ways of ensuring tenants are aware of the fire precautions in social housing', including the importance of fire-resisting doors, self-closing devices, escape routes and keeping common areas clear.-
- * fire risk assessment review??

Legislation v reality

- * Boundary rules
- * Yard Storage
- * Compartmentation
 - store 14,000 sq M High bay
- * Building regulations ? Chemical plant
- * Is security addressed in building regulations? Arson 42%

Case Studies

On October 20, 1977, almost two-thirds of the Ford Parts Depot near Cologne, Germany, was destroyed by fire.⁷ Only 10 minutes after the fire started, power to the electric fire pump failed. The power wiring for this pump was run inside the building, across the ceiling directly over the area of fire origin. About 45 minutes after the electric fire pump lost power, it was discovered that the diesel fire pump was also not running. It was then successfully started manually. Ultimately, 74,000 m² (800,000 sq ft) of warehouse space was completely destroyed by this fire, resulting in a loss exceeding \$100 million.

Case Studies

BP Texas City refinery on 23 March 2005, which killed 15 people and injured many more.

- * BP supervisory personnel were aware of the equipment problems with the level transmitter before the 23 March start-up says the report, but still had signed off on equipment checks as if they had been done. The report notes that this reflects the prevalence of production pressures at the refinery
- * BP managers and executives attempted to make improvements from 2002 to 2005 but these efforts were largely focused on personal safety, such as slips, trips, falls, and vehicle accidents, rather than on improving process safety performance, which continued to deteriorate.

Longford vs. Texas City

- Longford Royal Commission Report 1998
 - “Those who were operating GP1 on 25 Sept 1998 did not have *knowledge* of the dangers associated with loss of lean oil flow and did not take steps necessary to avert those dangers. Nor did those charged with supervision of the operations have the necessary knowledge and the steps taken by them were inappropriate”.
- Texas City Report 2005
 - Raffinate Splitter Startup Procedures and Application of Skills and Knowledge:
 - “Failure to follow the startup procedure contributed to the loss of process control. Key individuals (management and operators) displayed lack of *applied skills and knowledge* and there was a lack of supervisory presence and oversight during this startup.”

Emergency Response to Incidents Buncefield

Fire Pre-Plans

- Response was generally uncoordinated
- Lack of understanding of the nature of the incident
- Firefighters 'did their own thing'
- Poor foam management such as incorrect proportioning, incompatible hardware, excessive/aggressive application



- Local fire brigade had no experience of foam systems and terminal facilities
- Did not use Buncefield's own foam stocks

Buncefield – the core message

“the overriding need to ensure the integrity of the primary means of containment; in other words, to make sure that liquid does not escape from the vessels in which it is normally meant to be confined.”

Case Studies

- * LPG Tank South east mid 90s
 - * BLEVE
 - * Cylinders next to tank
 - * Hydrant system incompatible
- * The Maroochy Shire sewage spill 2001 Australia
 - * 4.5 mill l of sewage via laptop
 - * Open end most vulnerable
- * Fire Doors/ Glazing
 - * No I.D.
 - * Exit v self closing

Case Studies

- * 11m wax storage
 - * 100mm fire main minimal pressure/flow
 - * No sprinklers no sectional valves
- * High rise
 - * Car park smoke vents o/s windows
 - * Kitchen ducting
 - * Polystyrene in void fire spread 2nd to 5th floor
- * Modular Buildings
 - * School prefabs & polystyrene

**On Thursday, April 11,
1996, a fire in an
occupied passenger
terminal at
the airport in
Düsseldorf, Germany,
killed 17 people
and injured 62.**

Case Studies

Kleen Energy, Middletown, Connecticut Feb 2010

- * Initial calculations by CSB investigators reveal that approximately 400,000 standard cubic feet of gas were released to the atmosphere near the building in the final ten minutes before the blast.

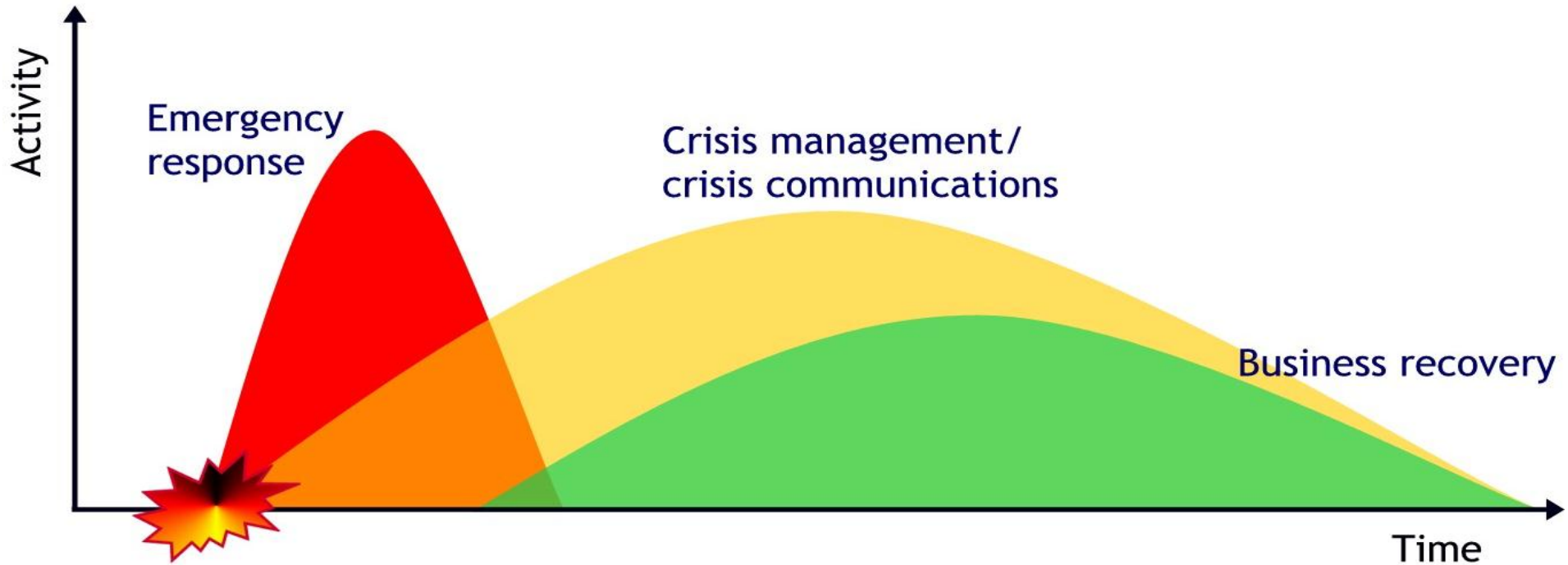


Risk Management 1900's

- * Whiskey Distillery
- * Several Detached buildings
- * Brick construction
- * Sprinklers

Prevention v Cure?

Business Continuity Management British Standard BS25999 ?



Business continuity— Managing disruption-related risk

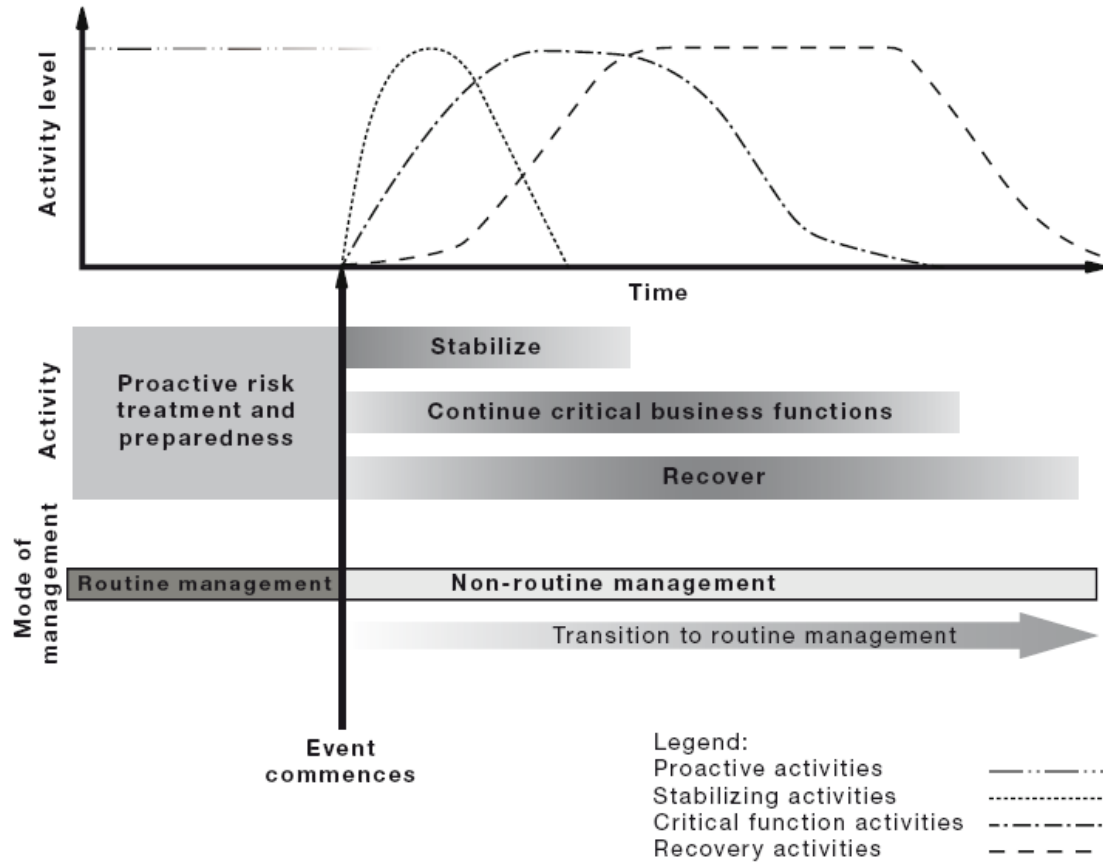


FIGURE 2 RELATIONSHIP OF TREATMENTS FOR DISRUPTION-RELATED RISK

Summary

- * Look beyond legislation
- * Plan *for and to avert* the crisis.
- * Learn from mistakes and especially those of others
- * Develop meaningful KPIs and consider big bang
- * Validate – Validate - Validate
- * Retain original designs and corporate memory
- * Fail to Plan = Plan to fail