

Major Incidents – what are the common threads?

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What does history tell us?

There are no new incidents just new people repeating the same mistakes.

Analysis of over the past history of major accidents has reached some clear conclusions.

Our insights into these then point to some clear observations on the underlying reasons and lead to potential actions.



Conclusions

The major accident you will have tomorrow is lurking in your organisation today. A seismic quake is always preceded by warning signs

It's the routine day to day tasks and activities that go wrong not the unusual / obscure



Conclusions

Not a shared sense of risk and what process safety management looks like in an individual organisation

No clear understanding by individuals (from Board to shop floor) of what they need to do to prevent major accidents



Conclusions

No clear sense of vulnerability. Belief in the infallibility of control systems

No 'off the shelf' or 'one size fits all' solution to managing major hazard risks

Regulatory Codes can at best only be a imperfect fit to risk management – not a guarantee of safety



Conclusions

Process Safety is compartmentalised and communication acts as a barrier to effective risk management

Many organisations suffer from severe learning deficiencies – they have to have their own major accident before they seem able to learn

Safety Culture is a fragile entity



Evidence

What goes wrong?

- HSL Research on c 1000 incidents from last 20 years
- Review of the big headline incidents



What goes wrong?

*“You are designing for people the way you would like them to be,
not for the way they really are.”*

Don Norman, *The Psychopathology of Everyday Things*

People do safety not systems or technology,
And, people undo safety just as effectively.

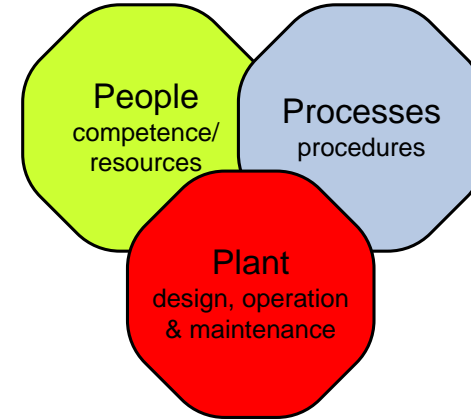
Incident Analysis

Activity:

- 640 incidents during **normal operations** (66%)
- Then:
 - Maintenance
 - Start up

Process:

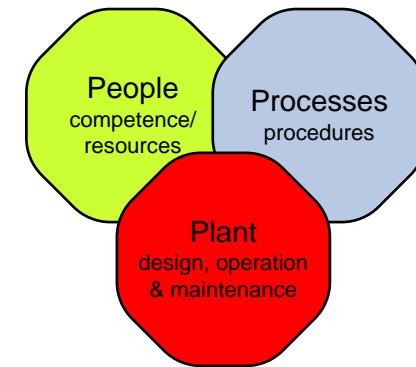
- Adding/filling
- Emptying/removing



Incident Analysis

Types of Plant:

- Highest number of failures with fixed systems rather than mobile
- Associated with supply and distribution equipment (pipes and associated equipment)
- Reactors for fixed systems
- Fixed storage next highest



Incident Analysis

Failure type

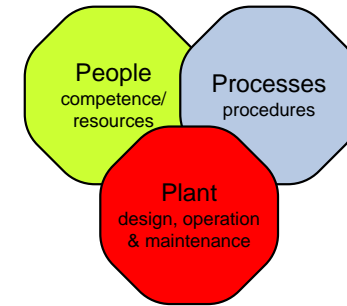
- Primary containment due to
 - Material failure
 - Structural failures

Mechanical damage

Corrosion/erosion

Failure in isolation

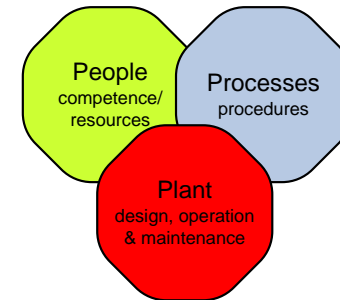
Connection failure



Incident Analysis

Operational Control Failures:

- Sub-standard containment indication. Failure to:
 - Detect
 - Diagnose
 - Respond



To an opening in primary containment

Incident Analysis

Operational Control Failures:

Failure to

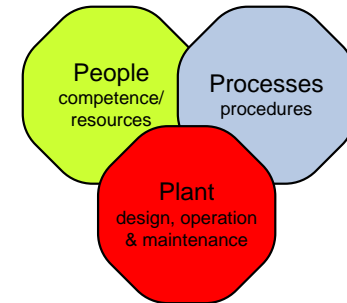
- indicate/detect deviations in process conditions temp/pressure/level

Failure in design

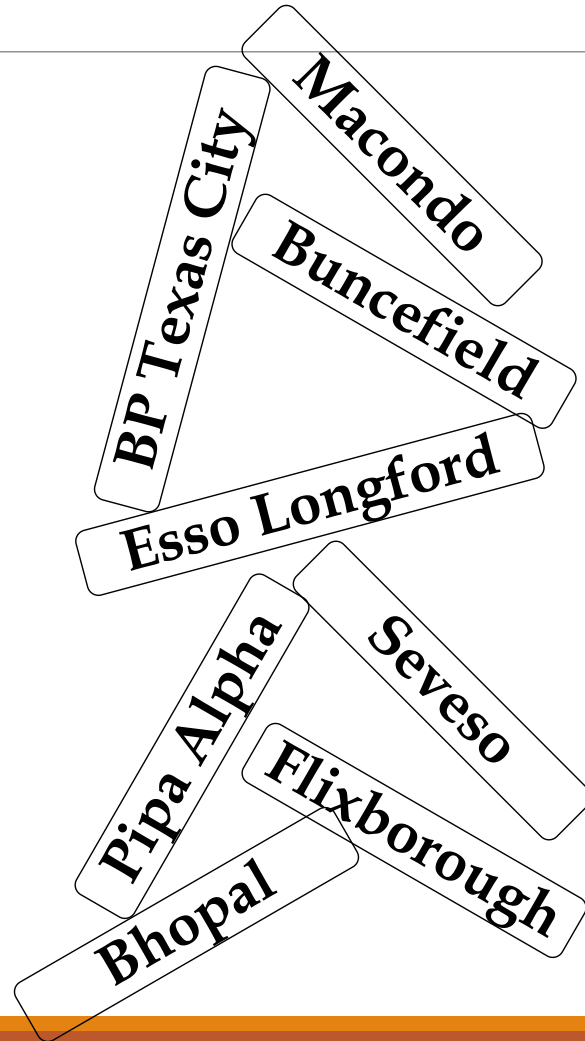
Absence of a control mechanism

Human error

- Not following procedures
- Wrongly opening valve
- Wrongly operating part of containment
- Sequence co-ordination failure



Lessons from Notorious Incidents



What are the general lessons?

Failure to appreciate hazard/risk by those directly involved in the activity

Familiarisation with activity – complacency

Deviation from the designed system/procedures

Tolerance of deviation by organisation:

- activity/ system design/competence

What are the general lessons?

Wilful or passive neglect of maintenance

Failure to detect and act on previous incidents

Lack of a shared and deep rooted understanding of process safety risks and the measures need to control those risks

What are the general lessons?

Inability to learn from incidents – internal or external

Poor or non-existent safety culture

Failures in Leadership and Corporate Governance

Belief in the infallibility of control systems

Conclusions

The major accident you will have tomorrow is lurking in your organisation today. A seismic quake is always preceded by warning signs

measure / monitor / act !

Conclusions

It's the routine day to day tasks and activities that go wrong not the unusual / obscure

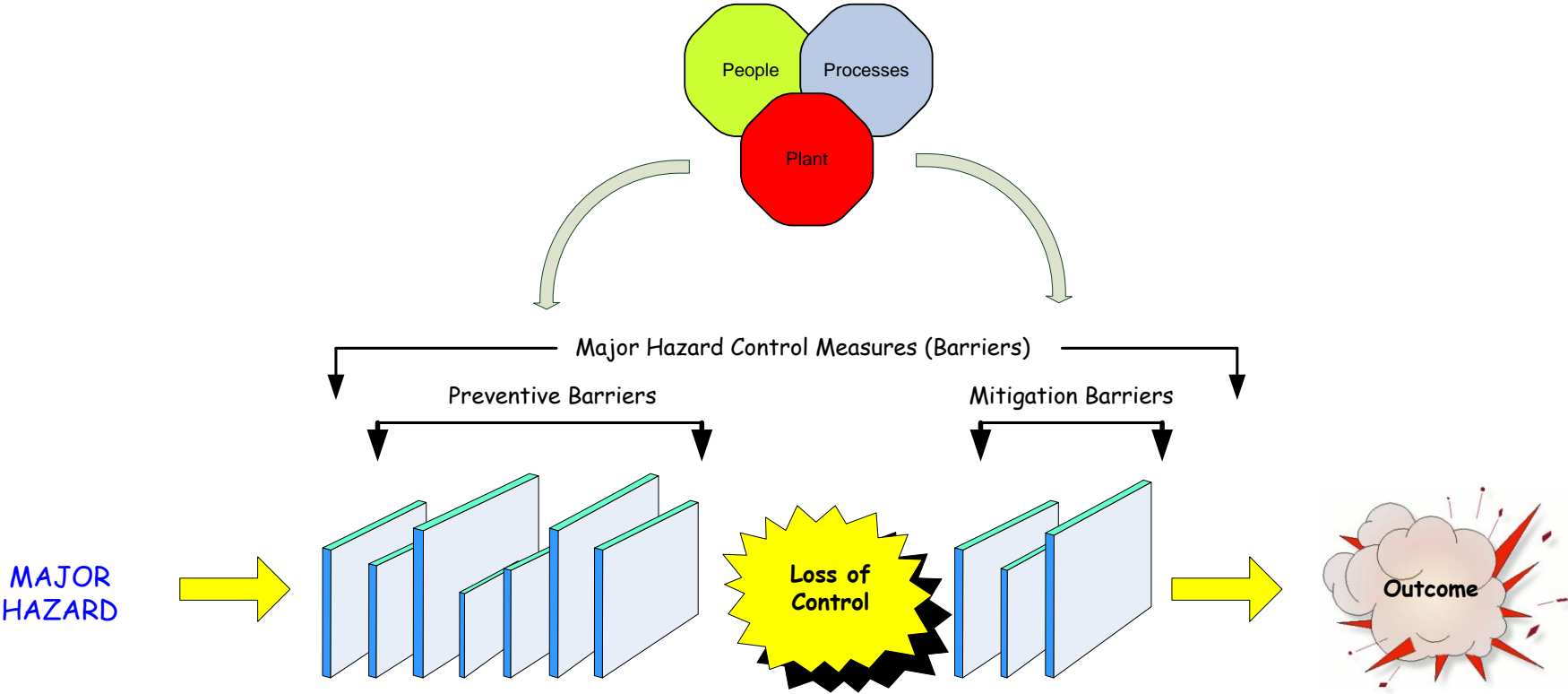
Get the basics continuously right !

Conclusions

Not a shared sense of risk and what process safety management looks like in an individual organisation

Be clear on the risk profile, what PSM looks like in an organisation – what's most important in controlling risk and how it goes wrong!

PSM Mental Model



Conclusions

No clear understanding by individuals (from Board to shop floor) of what they need to do to prevent major accidents

Firm and frank recognition of what 'you do' and 'how you' contribute to the control risk!

Conclusions

No 'off the shelf' or 'one size fits all' solution to managing major hazard risks.

Control measures need to be tailored to the specific activities undertaken – risk profile!



Conclusions

No clear sense of vulnerability

Know where you are weak and pay close attention to assurance that the weak points are being managed!

Conclusions

Process Safety is compartmentalised and communication acts as a barrier to effective risk management

Education and understanding of process safety at all levels

Use a common framework and use KPIs as the currency to talk about process safety

Conclusions

Most organisations suffer from severer learning deficiencies – they have to have their own major accident before they seem able to learn

Become a Learning Organisation

Find the relevant learning from every event/incident – capture, analyse and learn from adverse/unexpected outcomes

Conclusions

Safety Culture is a fragile entity

Formalise a Culture Approach and freely demonstrate its values

