Arthur D Little

What is Safety Culture and Case Study

Kuwait Safety Culture Conference

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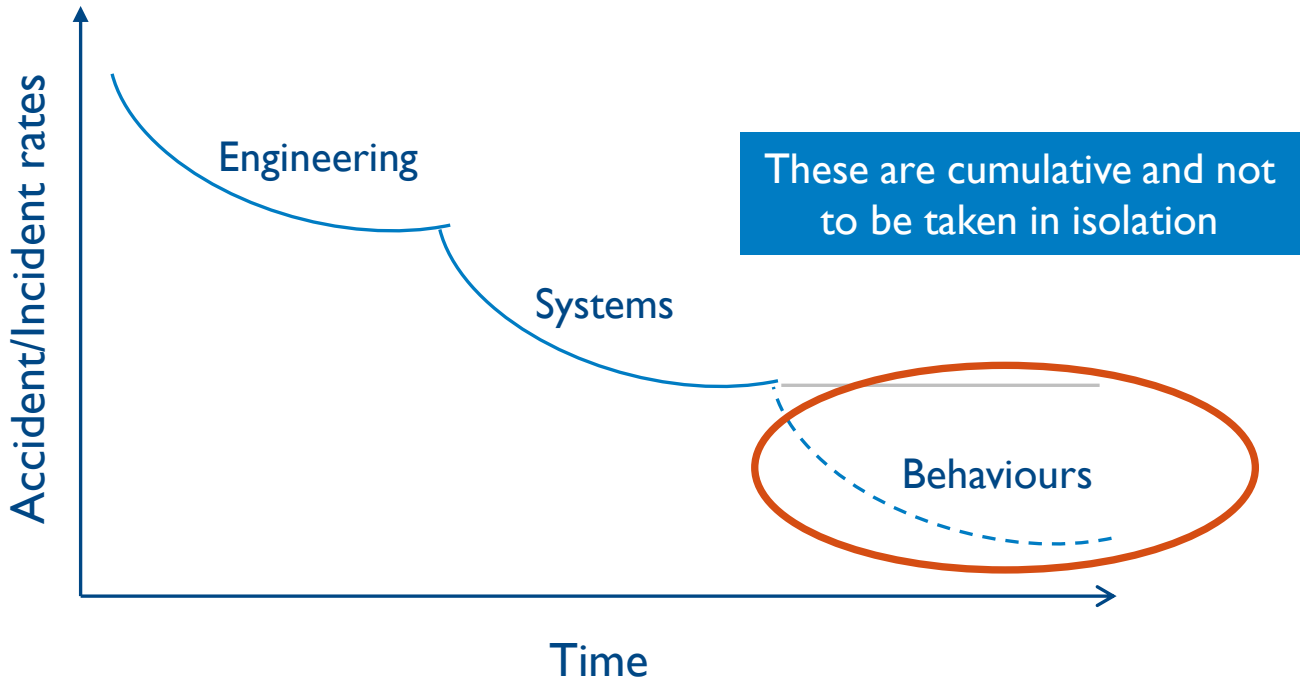
سباشيال spatial

Presentation by Stephen Watson

Who is Stephen Watson and why does he work in the safety culture field?

Petrochemical Industries Company

We have made progress by focussing on engineering out risks, then adding safety management systems – tackling behaviour is the next frontier



Weaknesses in 'safety culture' have long been recognised as a key cause of major catastrophes

Herald of Free Enterprise

"All concerned in the management from the members of the Board of Directors down to the junior superintendents were guilty of fault in that all must be regarded as sharing the responsibility for the failure of management. From the top to the bottom the body corporate was infected with the disease of sloppiness"

Weaknesses in 'safety culture' have long been recognised as a key cause of major catastrophes

Safety culture errors

Clapham Junction

"But it was not merely the errors and omissions of those who were engaged in the work on the day in question which caused the accident. The errors go much wider and higher in the organisation than merely to remain at the hands of those who were working that day."

– Ref: Hidden Report on Clapham Junction Accident 1989

Piper Alpha

"It is essential to create a corporate culture in which safety is understood to be and accepted as the number one priority."

– Lord Cullen - Piper Alpha Disaster

Nimrod XV230

"Business became the prevailing culture rather than safety"
"Organisational causes played a major part in the loss of XV230."

– Charles Haddon-Cave QC – The Nimrod Review

BP Texas city refineries

"BP has not adequately established process safety as a core value"
"The combination of cost-cutting, production pressures, and failure to invest caused a progressive deterioration of safety at the refinery."

– Ref: The report of the BP U.S. refineries independent safety review panel

Safety culture can be influenced by rules and procedures, but these are not aspects of the safety culture itself

Safety culture is a complex combination of values and attitudes that can be influenced by the rules and procedures present in an organisation

"A poor safety culture will encourage an atmosphere of non-compliance to safe operating practices"

James Reason

Effects of a good or poor safety culture on different aspects of business

Good safety culture

- Company image/Reputation
  Customers, shareholders, regulators and general public more likely to feel that the company is well-managed and valuable
- Performance
  Increased productivity due to fewer stoppages
  Increase in the safety performance (less accidents, incidents)
- Employee morale
  Staff feel proud to be part of a team together with management
- Work environment
  Enhancement of communications and trust
- Employee loyalty
  Greater motivation and engagement

Poor safety culture

- Company image/Reputation
  Loss of confidence by customers, shareholders, regulators and general public
- Performance
  Lost production due to incidents and accidents
  Decrease in the safety performance
- Employee morale
  Staff have no pride in their company – "us against them"
- Work environment
  Decline of communications and trust
- Employee loyalty
  Loss of motivation and engagement

"Organisations with a positive safety culture are characterised by communications founded on mutual trust, by shared perceptions of the importance of safety and by confidence in the efficacy of preventive measures"

UK Safety Regulator (1993)

What is safety culture?

A more structured definition of safety culture is:

"The safety culture of an organisation is the product of the individual and group **values, attitudes, perceptions, competencies** and **patterns of behaviour** that determine the commitment to, and the style and proficiency of, an organisation's health and safety management"

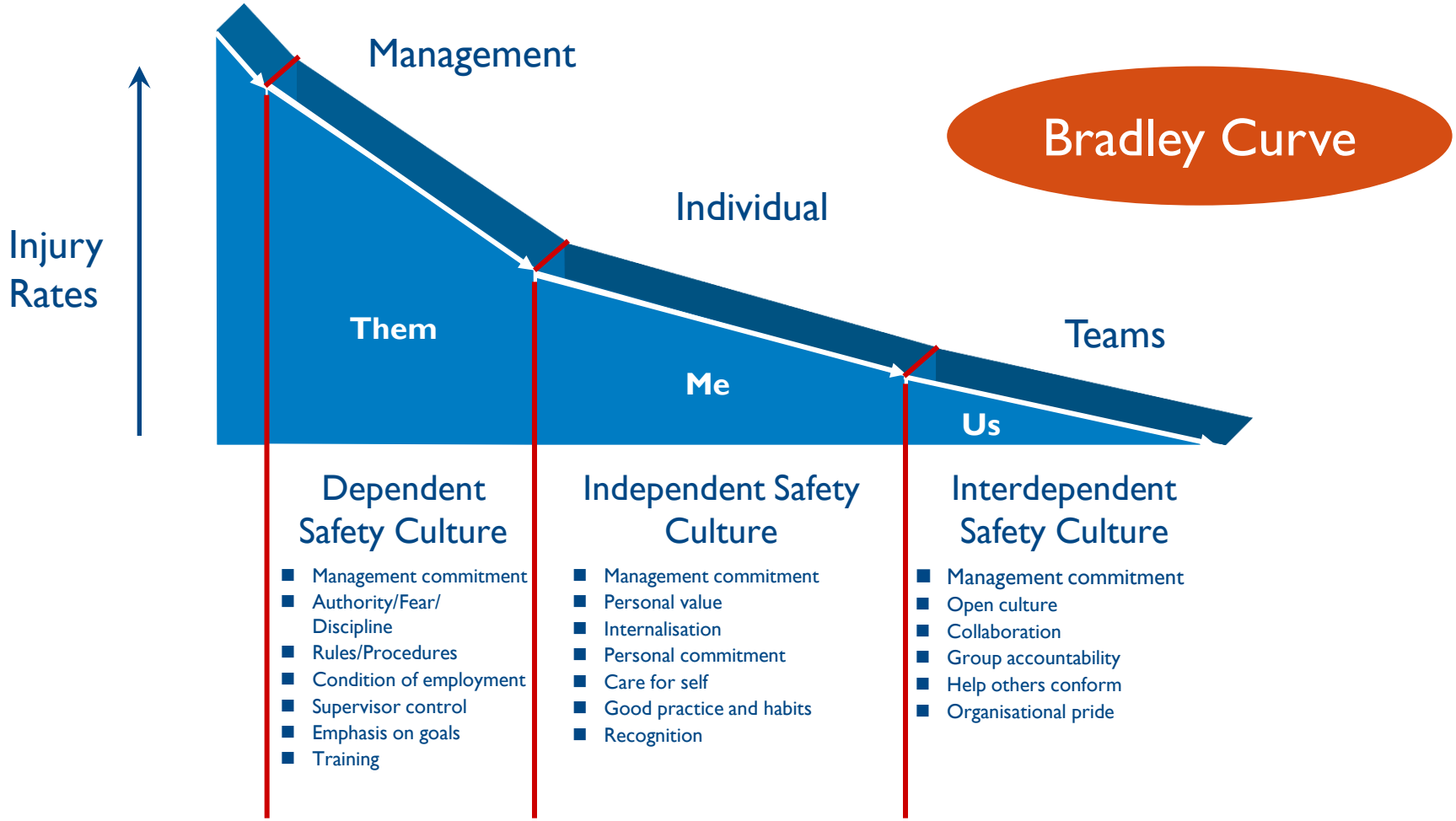
Managing safety culture requires an understanding of how values, attitudes, perceptions and competencies drive patterns of behaviour

What do we mean by "Values, Attitudes and Perceptions"?

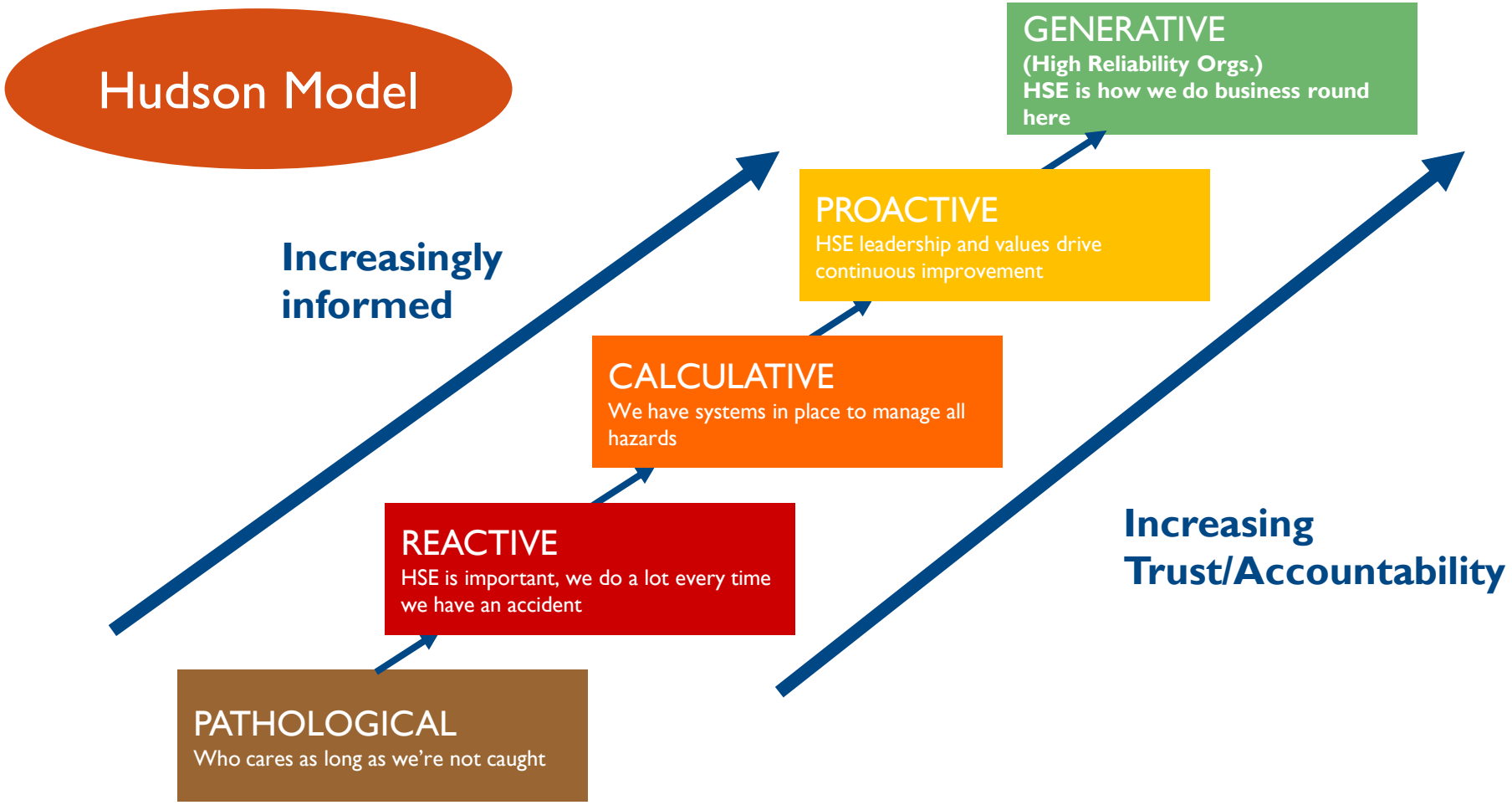
"The safety culture of an organisation is the product of the individual and group **values, attitudes, perceptions**, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation's safety management"

	Values	Attitudes	Perceptions
Meaning	Parts of belief systems acknowledged as being important	Positions adopted in relation to events or activities	People's interpretation of reality
Examples	■ Integrity ■ Professionalism ■ No-blame	■ Pride in work ■ Carelessness in work ■ Readiness to bend the rules	■ "Management are only interested in profits" ■ "We have an excellent safety management system"

Many organisations are trying to move their safety culture from 'dependent' to 'independent' and then onto 'interdependent'



The evolutionary (Hudson) model introduces a set of five development stages in the safety culture of an organisation



The Hudson model defines characteristics for each level

Pathological

Caring more about not being caught

- The Safety Management System is only implemented to answer regulatory requirements
- Blame culture is predominant
- Poor reporting of incidents, no lessons learnt from incidents and near-misses
- Nobody is informed, no feedback

Reactive

Fire-fighter attitude

- "Accident-driven". Actions are taken only after incidents and to prevent previous incidents
- Foundations of HSE processes (collection of statistics)
- Blame culture
- Accidents are reported and analysed to determine their causes (Root causes)

Calculative

Blindly following the processes

- HSE processes are in place
- Safety leadership taught
- Health policies starting
- Details focused/playing with numbers

The evolutionary model of safety culture from Prof. Patrick Hudson - characteristics

Proactive

Working on the problem we find

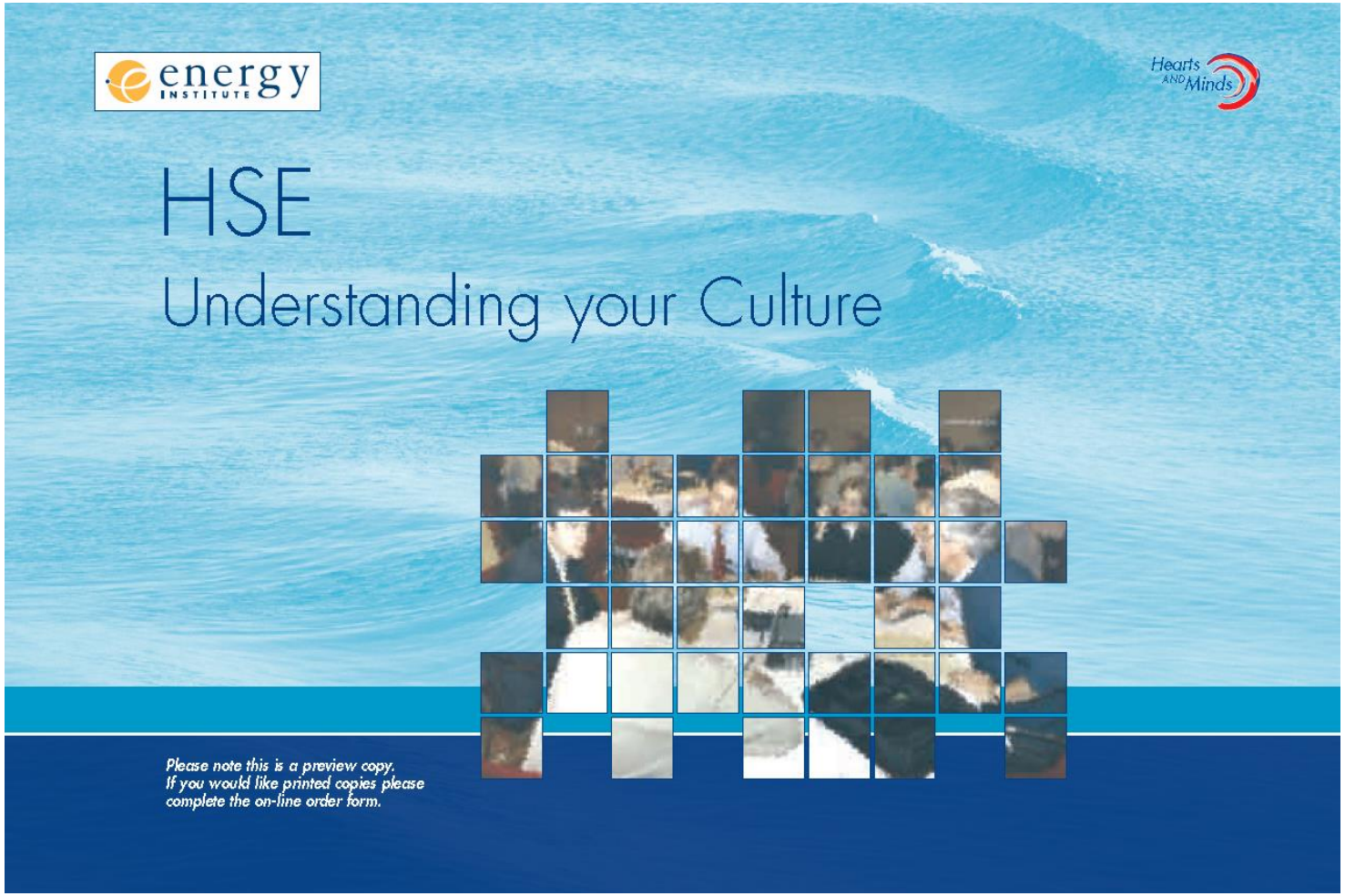
- HSE processes are well established, understood and used
- Just culture is established
- Continuous improvement begins
- Safety indicators and metrics in place

Generative

Safe behaviour is fully integrated into everything the organisation does

- Set standard to exceed
- Use honesty to improve
- Commitment to continuous improvement to zero incidents
- Mindful of what could go wrong

This tool from the Energy Institute is easy to use and effective in helping to understand your current positon on the Hudson model



The tools gives examples of how the culture feels personally for Management (see below) and Supervisors

PATHOLOGICAL	REACTIVE	CALCULATIVE	PROACTIVE	GENERATIVE
I accept that injuries are unavoidable in this kind of work	I have to take safety seriously as my bonus is partly tied to the accident rate	I say I take HSE seriously as I know this is expected of me	I find HSE interesting and feel competent to manage it	I am always on the lookout for new ways to manage HSE
I believe I have done my job when I have told everyone to work safely	I visit work sites when they are having serious problems	*I like to have accident investigations closed out*	*I try to have the best HSE performance among my peers*	*I will not allow business decisions to be taken without considering HSE*
I walk on when I see something dangerous as that's the supervisor's job	*I believe HSE is best managed by HSE specialists*	I avoid selecting contractors with a bad HSE record, if possible	I follow up action items personally after incidents and hazard reports	I trust my supervisors and workforce to tell me if there are problems
When we have an accident I find out who is to blame and get rid of them	I send warning letters when people are found behaving carelessly	*I think all accidents could be prevented if people only do what they are told*	*I agree that management bears responsibility for system failings that cause incidents*	*I create the conditions for my staff to solve the problems they encounter*
I think that meeting the legal requirements is good enough	*I feel comfortable if we have bought a reliable safety program*	I believe pre-qualification ensures that all our contractors are safe enough	I look for other ways than incidents to measure success of our HSE activities	I am aware that not every solution will work first time and seek to learn why

Practical characteristics are mapped in the brochure "Understanding your Culture"

"If you are convinced that your organisation has a good safety culture, you are almost certainly mistaken… a safety culture is something that is striven for but rarely attained"

James Reason

James Reason identified five key elements of Safety Culture – this is different to the Bradley Curve and Hudson models

Safety culture	
Flexible culture	A culture that can adapt to changing circumstances and demands while maintaining its focus on safety
Reporting culture	An organisational climate in which people are prepared to report any incidents or near-misses
Informed culture	An organisation in which people understand the hazards they are facing and are alert to the existence of potential breach and/or a bypass of the protections
Learning culture	Ability of an organisation to learn and implement changes from prior mistakes
Just culture	An atmosphere of trust in which people are encouraged, and even rewarded, for providing any safety-related information

Flexible culture – a culture that can adapt to changing circumstances and demands whilst maintaining its focus on safety

Flexible culture

Adaptive organisation driven by core principles

Determining factors of a positive flexible culture:

- Decision-making processes vary depending on the urgency of the decision and the expertise of the people involved
- Adaptation to changing demands and developments
- Opportunity for employees to question procedures and behaviours
  - Unsafe behaviours or practices can be stopped before there is an incident

Reporting culture – an organisational climate in which people are prepared to report any incidents or near-misses

Reporting culture

Encouraging employees to report any hazards or safety concerns contributes to establishing and maintaining a safe environment

Determining factors for a positive reporting culture:

- Ease of reporting
  - If reporting is a long and difficult process, would you do it?
- Analysis, actions and feedback
  - If there is no analysis of the incident you have reported, and no feedback is given, would you report an event again?
- Confidentiality or anonymity
  - Some incidents should be reported confidentially or anonymously
- Trust
  - An environment of trust is essential to help improve the proportion of incidents that get reported

Informed culture – an organisational where people understand the hazards and are aware of potential breaches or bypass of the protections

Informed culture

An organisation in which people, at all levels, do not forget to be afraid

Determining factors for a positive informed culture:

- Understanding of hazards and risks
  - Clear view of what the hazards and risks are within the organisation
  - Provision of necessary knowledge, skills and job experience to work safely
  - Continuous updating of knowledge and acquisition of new skills
- Encouragement to identify the threats to safety
  - Identifying all the threats within an organisation to increase the safety
- Strong reporting culture
  - Bottom to top communication

Learning culture – the ability of an organisation to learn and implement changes from prior mistakes

Learning culture

An organisation that is able to change or adapt after highlighting new safety concerns through assessments, incidents reported and/or accidents

Determining factors for a positive learning culture:

- Periodic review of the organisation
  - The analysis of risk assessments, incidents and the review of performance indicators help the organisation to draw conclusion and take the necessary measures to improve the working environment
- Training and updating of best practices
  - Refreshing and updating employees' knowledge with new practices

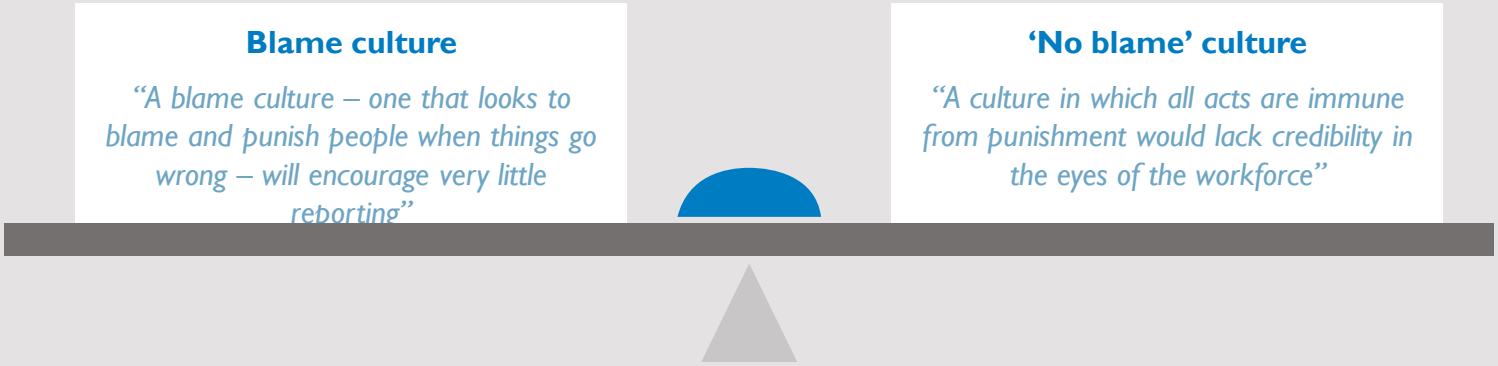
Just culture – an atmosphere of trust in which people are encouraged, and even rewarded, for providing any safety-related information

Just culture

Attitude of an organisation towards blame and punishment

Determining factors of a just culture:

- Blame when necessary
  - If blame is the routine answer, reporting will not be forthcoming. Blame should be considered in case of recklessness
- Definition of acceptable and unacceptable behaviours
- Definition of responsibilities and accountabilities
- Trusting environment



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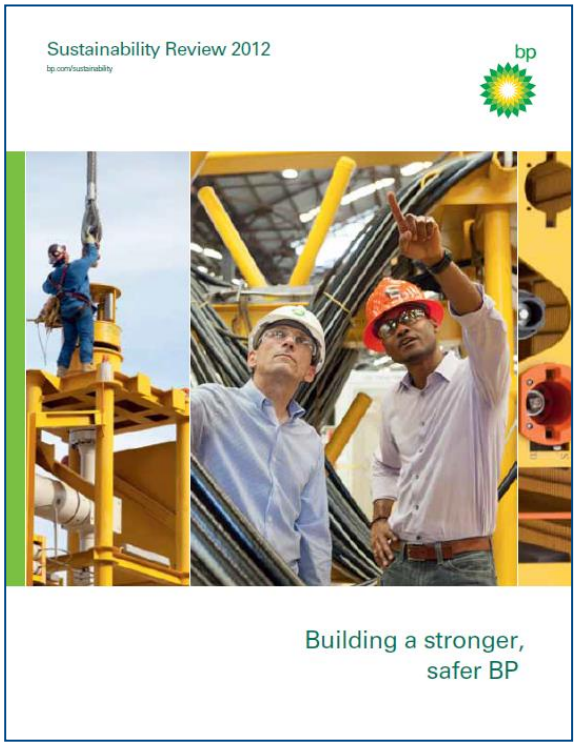
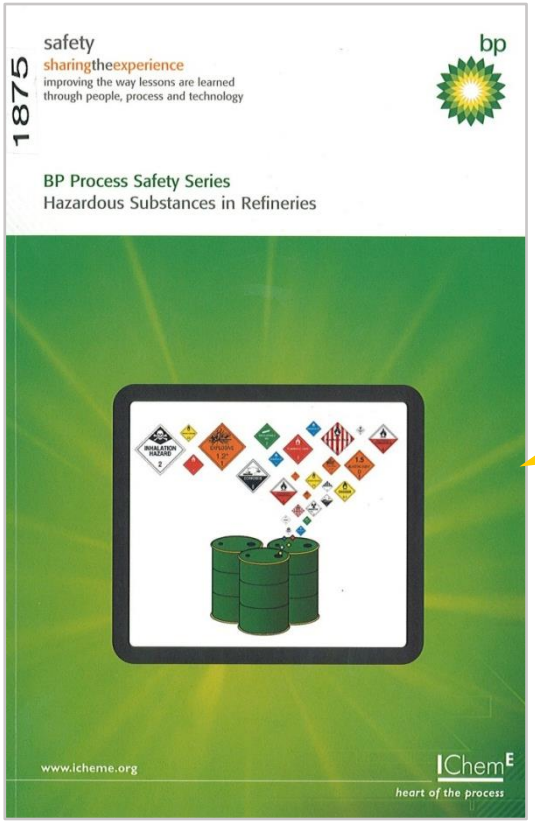
Case Study

BP is one of the world's largest energy companies with diverse interests and a number of globally recognised brands

- In 2012 it had sales of US$376 billion and a daily throughput of 2.4 million barrels oil from 16 refineries
- It is active in retail in over 80 countries with interests in oil, natural gas, wind, solar and biofuels markets, as well as having diversified into convenience stores and coffee shops, and it directly employs 80,300 people
- It includes the brands BP, Castrol, Arco, Aral, am/pm and Wild Bean Café and has been involved in numerous mergers and acquisitions including Veba Oil, TNK-BP and Vastar
- Its primary listing is on the London stock exchange, it is a constituent of the FTSE 100 index, and has a secondary listing on the New York stock exchange
- **Do you know why its Sustainability Review 2012 was sub-titled "Building a stronger, safer BP"?**



BP has promoted itself as a leader in safety for a number of years



One example was the publication with the Institution of Chemical Engineers (global engineering institution for chemical engineers) of the "BP safety series"

'Hazardous substances in refineries' was published in 2005, the same year as the Texas City refinery accident

safety
sharingtheexperience
improving the way lessons are learned
through people, process and technology

In 25 years BP has in fact experienced several major safety related disasters

These have caused significant harm to people and the environment, as well as damaging BP's reputation

March 1987
Grangemouth hydrocracker explosion

December 1998
Merge with Amoco, acquiring Texas City refinery

March 2005
Texas City refinery disaster

April 2010
Deepwater Horizon (Macondo) fatal explosion and oil spill

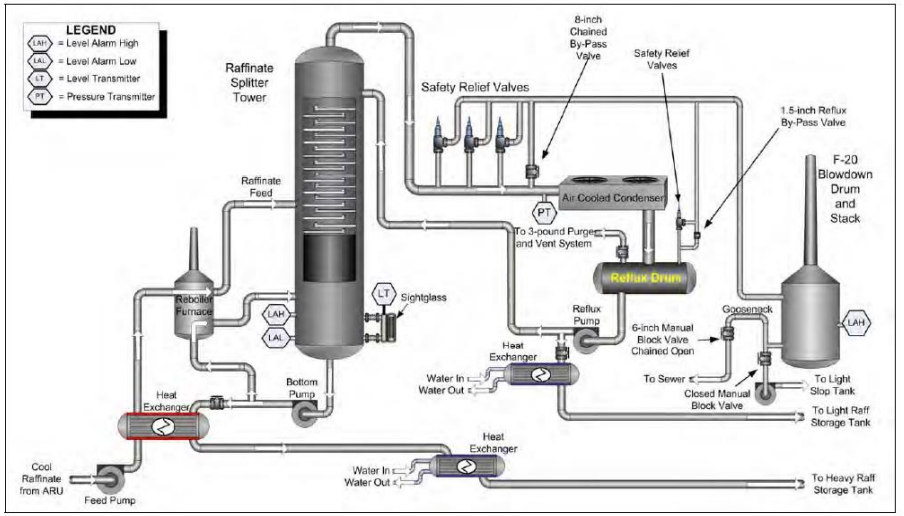
The Texas City accident was one of the most serious US workplace disasters and led to a review of BP's corporate safety culture

- BP had 5 refineries in the USA – Texas City was acquired as part of the merger with Amoco
- BP's refinery at Texas City was the company's largest and most complex refinery, and is the 3rd largest refinery in the United States
- A catastrophic process accident occurred on March 23 2005 – an explosion and fire originating at one of the blow-down stacks
- 15 fatalities and 170-180 injured

A consulting firm examining the refinery prior to the accident wrote in their final report "We have never seen a site where the notion 'I could die today' was so real"

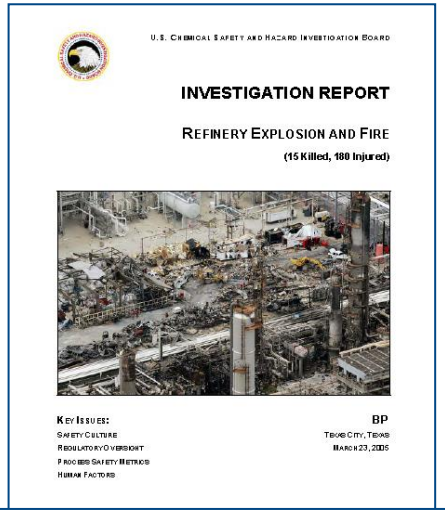
The accident was caused by overfilling a tower with flammable liquid which was discharged to the atmosphere rather than the flare system

- On the morning of March 23, 2005, the raffinate splitter tower in the refinery's ISOM unit was restarted after maintenance
- Flammable liquid hydrocarbon were pumped into the tower for over three hours without any liquid being removed - contrary to start-up procedure instructions
- Critical alarms and control instrumentation provided false indications that failed to alert the operators of the high level in the tower
- The 52m tower was overfilled into the blow-down drum. There was a geyser-like release out the 34 m tall stack. This blow-down system was an antiquated and unsafe design, originally installed in the 1950s, and never connected to the flare
- The released liquid evaporated and formed a flammable vapour cloud, most likely ignited by a diesel engine pickup truck running nearby



Much of what we know comes investigations carried out by the Chemical Safety Board and the Independent Safety Review Panel (Baker Report)

Texas City 2005


U.S. Chemical Safety and Hazard Investigation Board

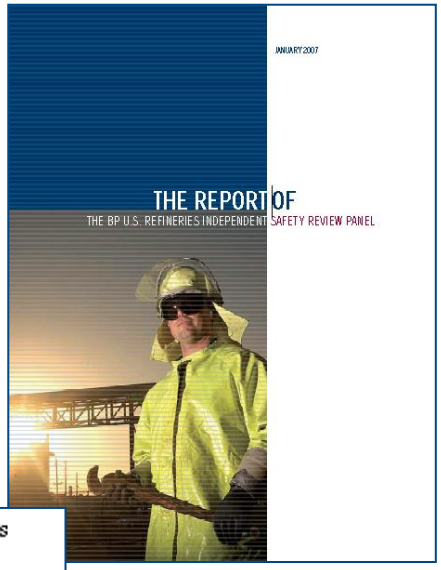
INVESTIGATION REPORT

REFINERY EXPLOSION AND FIRE

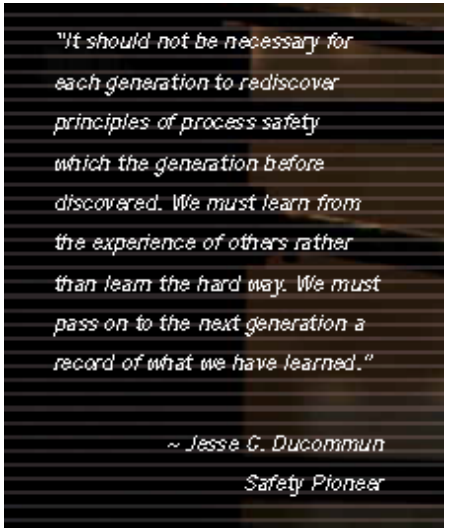
(15 Killed, 180 Injured)

Key Issues:
Safety Culture
Regulatory Oversight
Process Safety Metrics
Human Factors

BP
Texas City, Texas
March 23, 2005



1. Cost-cutting, failure to invest and production pressures from BP Group executive managers impaired process safety performance at Texas City.
2. The BP Board of Directors did not provide effective oversight of BP's safety culture and major accident prevention programs. The Board did not have a member responsible for assessing and verifying the performance of BP's major accident hazard prevention programs.



The BP Texas City investigation report identified five underlying causes of the Texas City refinery explosion

- Erosion of trust, motivation, and purpose in the working environment
- Management did not set up or failed to enforce process safety, operations performance and systematic risk reduction measures
- Organisational changes led to lack of accountability and poor communication within management hierarchy
- Poor hazard awareness and understanding of process safety on the site
- Poor performance management and little vertical communication meant that warnings were not given early enough

The Baker report blamed BP's 'short-term focus, and its decentralized management system and entrepreneurial culture'

BP operated on a highly decentralized management system and the leadership did not emphasize safety as one of its core values

- BP's decentralized system undermined process safety
  - A major audit by a high-powered BP team external to Texas City that concluded that process safety measures were inadequate failed to have significant impact
  - Major hazard accidents are rare and therefore difficult to manage on a local rather than global scale
  - Standards were determined centrally but responsibility for maintaining them was decentralized
- **Leaders were unwilling to listen to bad news from the bottom of the organisation and bonus schemes were heavily weighted towards financial rather than safety performance**
- **No culture of learning from near misses and embedding these lessons into operations**
- BP failed to establish process safety as a core value in its 5 US refineries – no culture of learning from near misses and embedding these lessons into operations
- Process safety was systematically de-emphasised in BP's budgeting priorities
  - London head office refused to take responsibility for the consequences of cost cutting
  - **Bonus schemes were heavily weighted towards financial rather than safety performance**

BP enforced financial requirements but did not utilise such force to implement safety and management initiatives

- The US refineries were viewed as independent business entities rather than being incorporated into the BP culture
- Texas City was viewed as a 'freestanding commercial organisation' judged primarily on Return On Investment
- Financial initiatives could be enforced but safety protocols were not
  - When a site manager argued against the 25% fixed cost cut it was reduced to 16% but then imposed
  - Fixed cost cuts 1998-2000 led to a deterioration in safety standards at the refinery and process safety was systematically de-emphasised in BP's budgeting priorities
- BP failed to enforce the requirement that business unit leaders stayed for a minimum of five years
  - 8 managers at Texas City in 5 years led to short term decision making

The national US regulatory authority, OSHA, had little power to enforce its regulations or act as a deterrent

- The federal Occupational Safety and Health Administration (OSHA) showed little interest in the Texas City refinery before the disaster
  - Only one of the planned inspections in the 13 years prior to the disaster was actually carried out
  - It lacked the resources to enforce its regulations
- The OSHA fines were unlikely to be a deterrent to BP as they were small compared to its profits and the actual damage
  - The initial fine in 2005 settlement was US$21 million compared to US$19 billion profit

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