Health and Safety
Executive

Overview

John Wilkinson

Outline

- What's the worst that could happen?
- What are 'human factors'?
- Today's event

What’s the worst that could happen?

Major accidents: The wider picture

- Most accidents & incidents involve human failures as a significant cause
  - E.g. Texaco, BP Texas, Esso Longford, BP Grangemouth, Conoco, Mexico City, Piper Alpha, Flixborough, Columbia/Challenger, Three Mile Island, Bhopal, Chernobyl, Kegworth, Herald of Free Enterprise, Southall, Ladbroke Grove, Clapham…
- We also see this in our inspections

Buncefield December 2005

And over the pond……

Grangemouth Incidents
May – June 2000

- http://www.hse.gov.uk/comah/bpgrange/contents.htm
- In particular, see “Wider Messages for Industry”

BP Grangemouth

"The underlying causes were **organisational**, local and corporate."
Alistair McNab, HID investigating PI

"The key findings of the Human Factors team explained why, notwithstanding the high standards set by BP, those standards were not always implemented and met consistently over each part of the Complex."
From the public report via hse.gov.uk\comah\bpgrange\index.htm)

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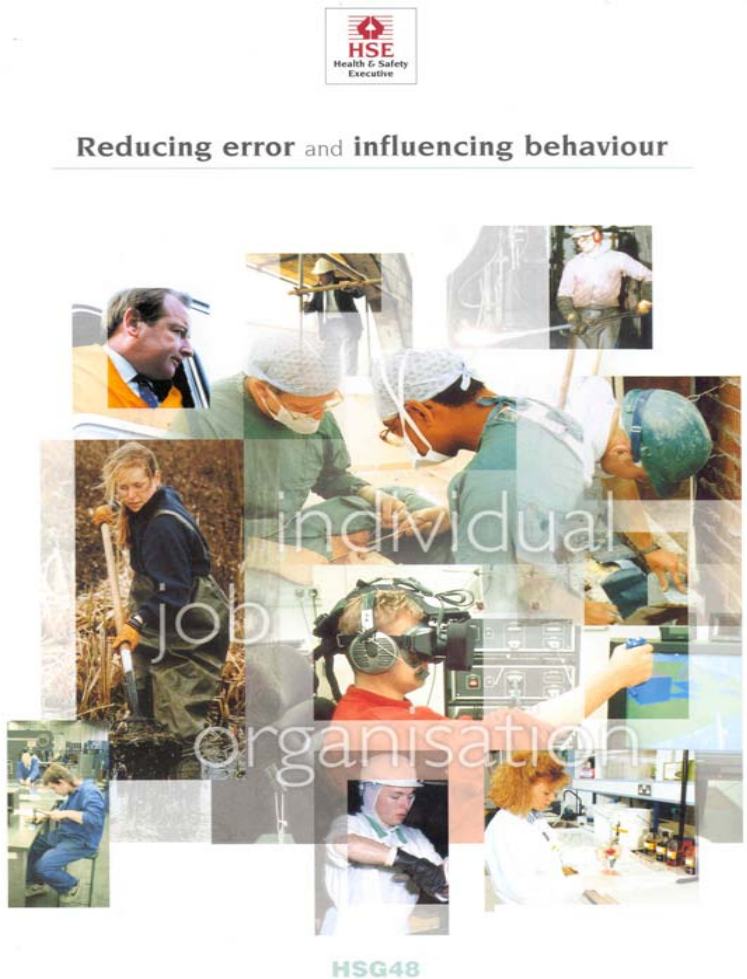
What are Human Factors?

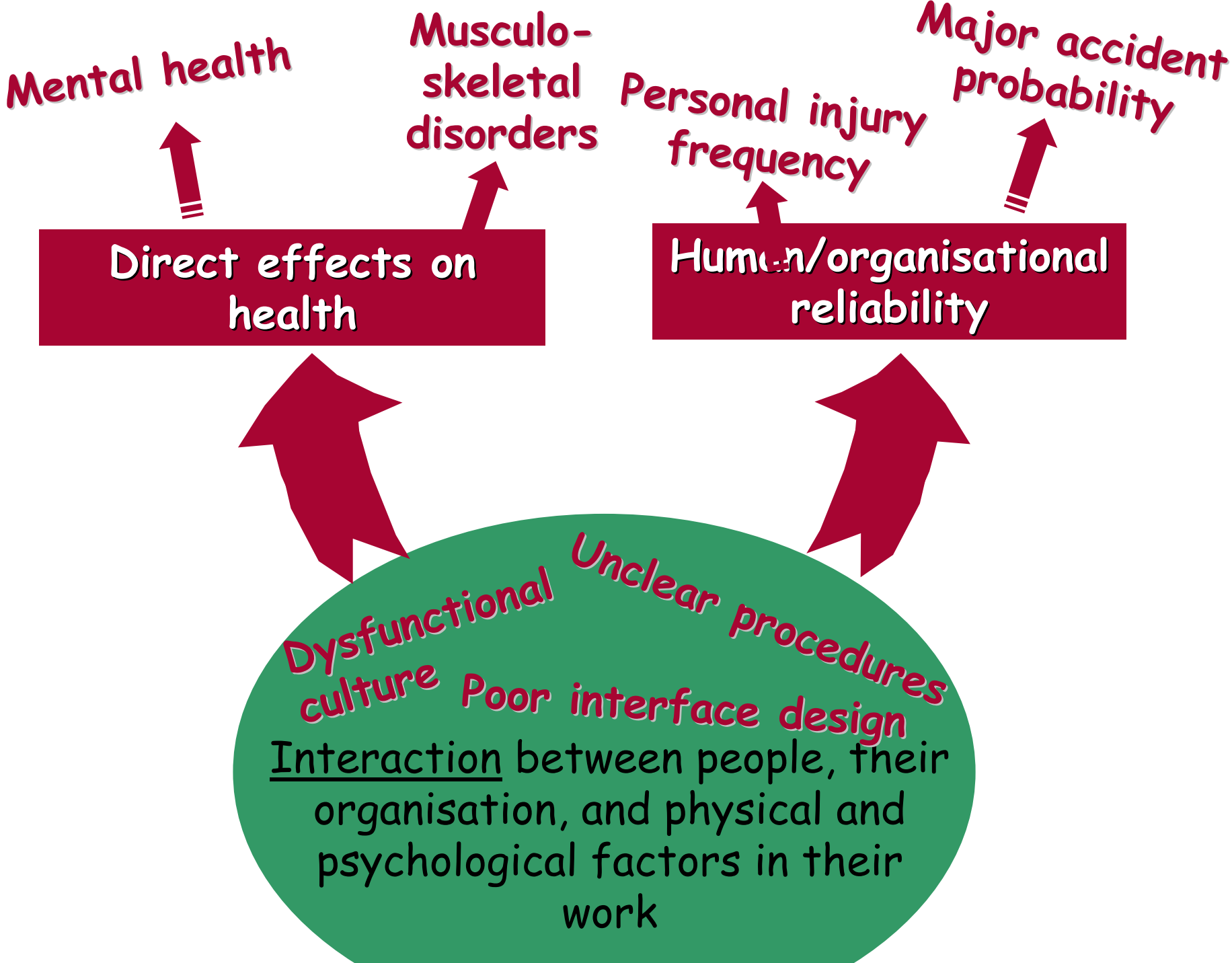
HS(G)48 – Reducing Error & Influencing Behaviour



Proper consideration of human factors is a key ingredient of effective H&S management

What is ‘Human Factors’?

- Job
  - –Time, procedures, tools, environment, system interface, complexity, frequency…
- Individual
  - –Fatigue, stress, competence, motivation, risk perception, physical attributes…
- Organisation
  - –Work pressures, communication, manning levels, safety culture, roles/responsibilities, peer pressure…


Mental health
Musculo-skeletal disorders
Personal injury frequency
Major accident probability
Direct effects on health
Human/organisational reliability
Dysfunctional culture
Unclear procedures
Poor interface design
Interaction between people, their organisation, and physical and psychological factors in their work

Human performance

When we (HID) address human factors we're aiming to **optimise human performance** and **reduce human failures** in Major Accident Hazard prevention and control

What do we mean by ‘human factors?’

Key human factors issues for COMAH sites

- Organisational change
- Staffing levels/workload
- Training & competence
- Procedures
- Fatigue & shiftwork
- Managing human failure

- Organisational culture
- Human factors in design*
- Safety critical communications & Interfaces
- Integration of HF into risk assessment & investigations

**Includes Alarm Management*

- Human factors home

Human performance

- Alarm handling
- Interfaces
- Safety critical communications
- Supervision
- Behavioural safety
- Procedures
- Training and competence
- Organisational change
- Workload
- Managing human failures
- Fatigue
- Organisational culture
- Integration
- Design

- Briefing notes
- Human factors toolkit
- Further guidance

Managing human performance

Human factors are environmental, organisational and job factors as well as human and individual characteristics which influence behaviour at work and can affect health and safety.

- **Detailed introduction to human factors [PDF 300KB]**

Human factors has been "operationalised" as a list of key topics. Each of the topics below link to a topic-specific page where you can download briefing sheets, extracts from an inspectors toolkit and other useful resources.

- **Alarm handling**
- **Interfaces**
- **Safety critical communications**
- **Supervision**
- **Behavioural safety**
- **Procedures**
- **Training and competence**
- **Organisational change**
- **Staffing levels and workload**
- **Managing human failures**
- **Fatigue from shiftwork and overtime**
- **Organisational culture**
- **Integration of human factors into risk assessment and investigations**
- **Human factors in design**

These are not in priority order but they do reflect key topics for industry currently. The topics have proven to be the key issues based on research, consultation with industry and intermediaries, and inspection experience. These topics will be highly relevant for "major hazard industries", such as chemical processing, refineries, offshore, nuclear and rail. Many of these topics and the guidance provided will also be relevant to non-major hazard industries, such as manufacturing and healthcare.

What we've learnt so far

HID industries:

- Need to focus on human factors issues for the prevention of major accidents as well as on the prevention of occupational injuries and health; and
- Are generally less aware of human factor issues than nuclear, defence, and rail sectors

From site inspection: three concerns

- Sites often still focus on:
  1. Hardware/engineering issues
     - at the expense of human factors
  2. Personal safety
     - at the expense of COMAH
  3. The front line
     - at the expense of management & organisational factors

- **The key issue for HID is:**
  How does the site prevent major accidents and do they manage the role that people play in these systems?

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Today’s event

Selected topics

- Human failure…
- …and links to procedures & competency
- Texas City
- An external view
- Accident investigation
- Putting it all together…

So we aren't trying to cover all the key topics today but to get you started.

- Human factors home

Human performance

- Alarm handling
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