

Human Factors in accident investigation

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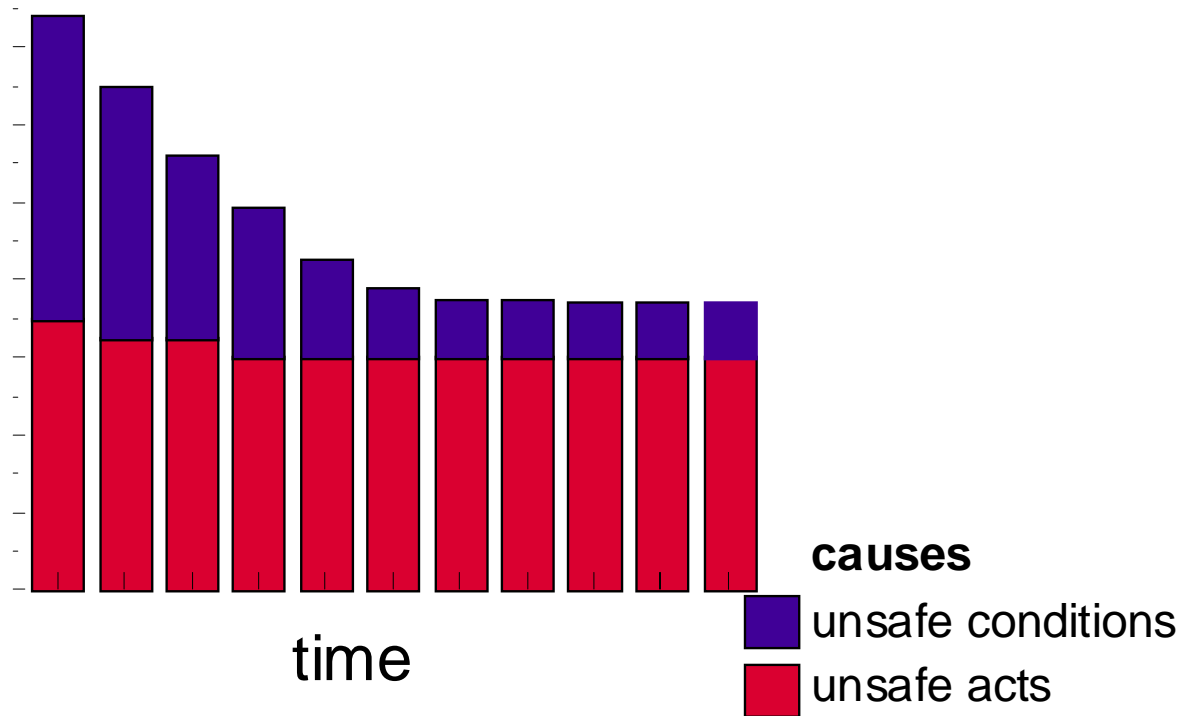
HID Onshore Human &
Organisational Factors Group

What we expect from investigations

- Methodical process for gathering information, analysing what went wrong (and right), and learning lessons in order to:
 - Manage risk
 - Prevent reoccurrence
- Retrospective tool, but can be powerful in promoting change

The Accident Plateau

Frequency

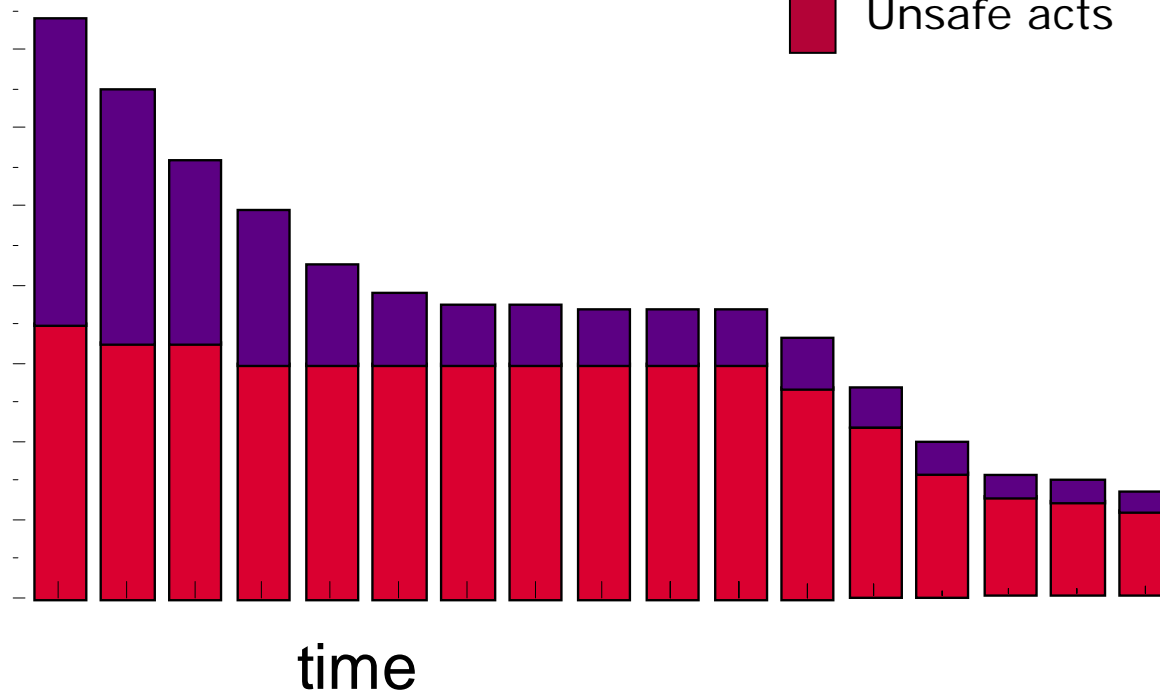


The Accident Plateau

Causes

Frequency

- Unsafe conditions
- Unsafe acts



Significance of Human Factors

- Up to 90% of accidents attributable to some degree to human failures.
- ...Texas City...Buncefield... ...Texaco
Milford Haven ... Southall & Ladbroke
Grove crashes ...Zeebrugge...
- Proportion and significance increasing as technical safety measures improve.

Human Factors in Accident Investigations

- “This accident was the result of human error”
- “.....pilot error”

Error or rule-breaking put down to

- “Lack of competence”
- “Poor supervision”
- “Not paying attention”

It's not usually as simple as that!

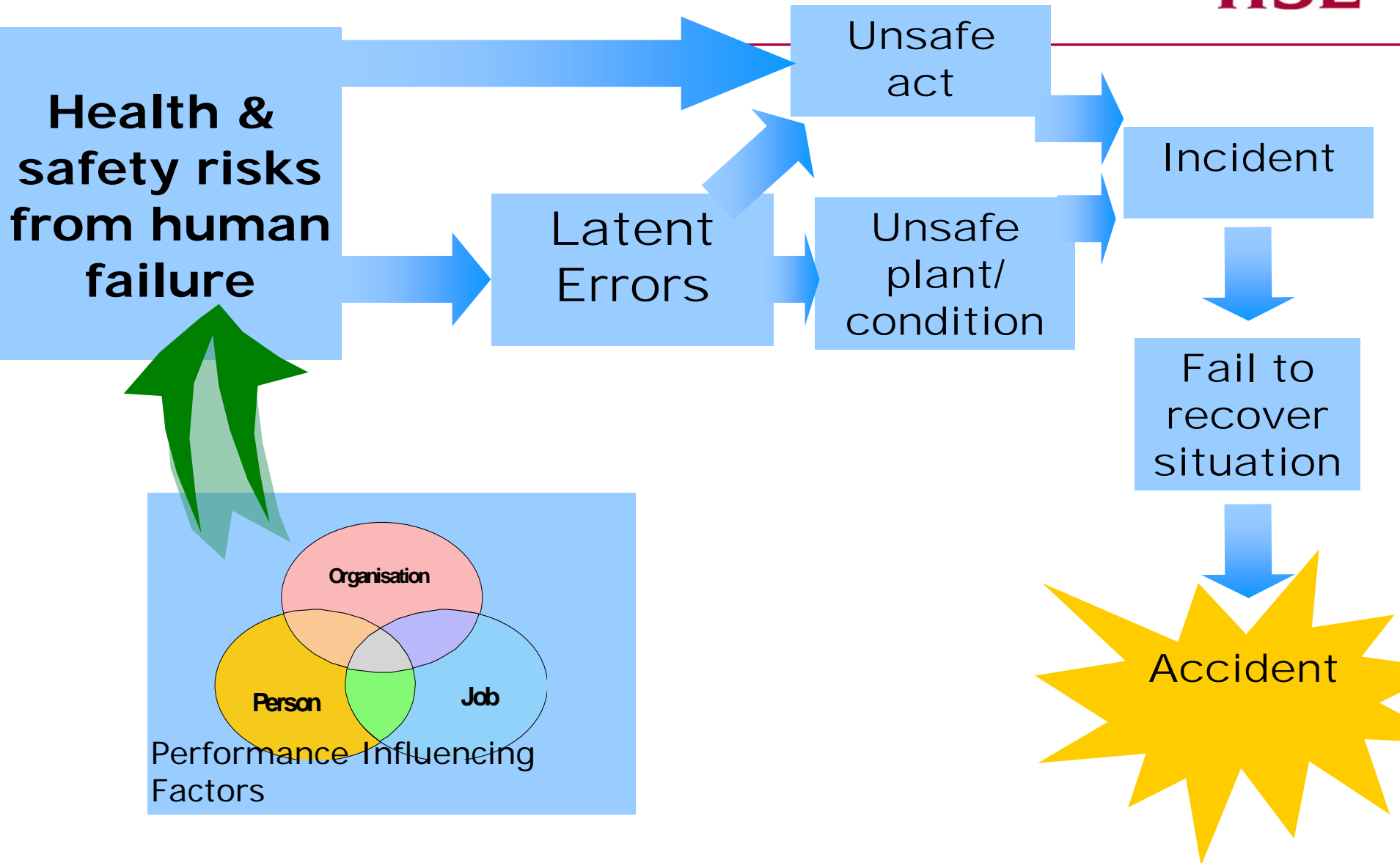
Accident reports

- What happened
- Who to
- When
- How it happened
- **But not why**

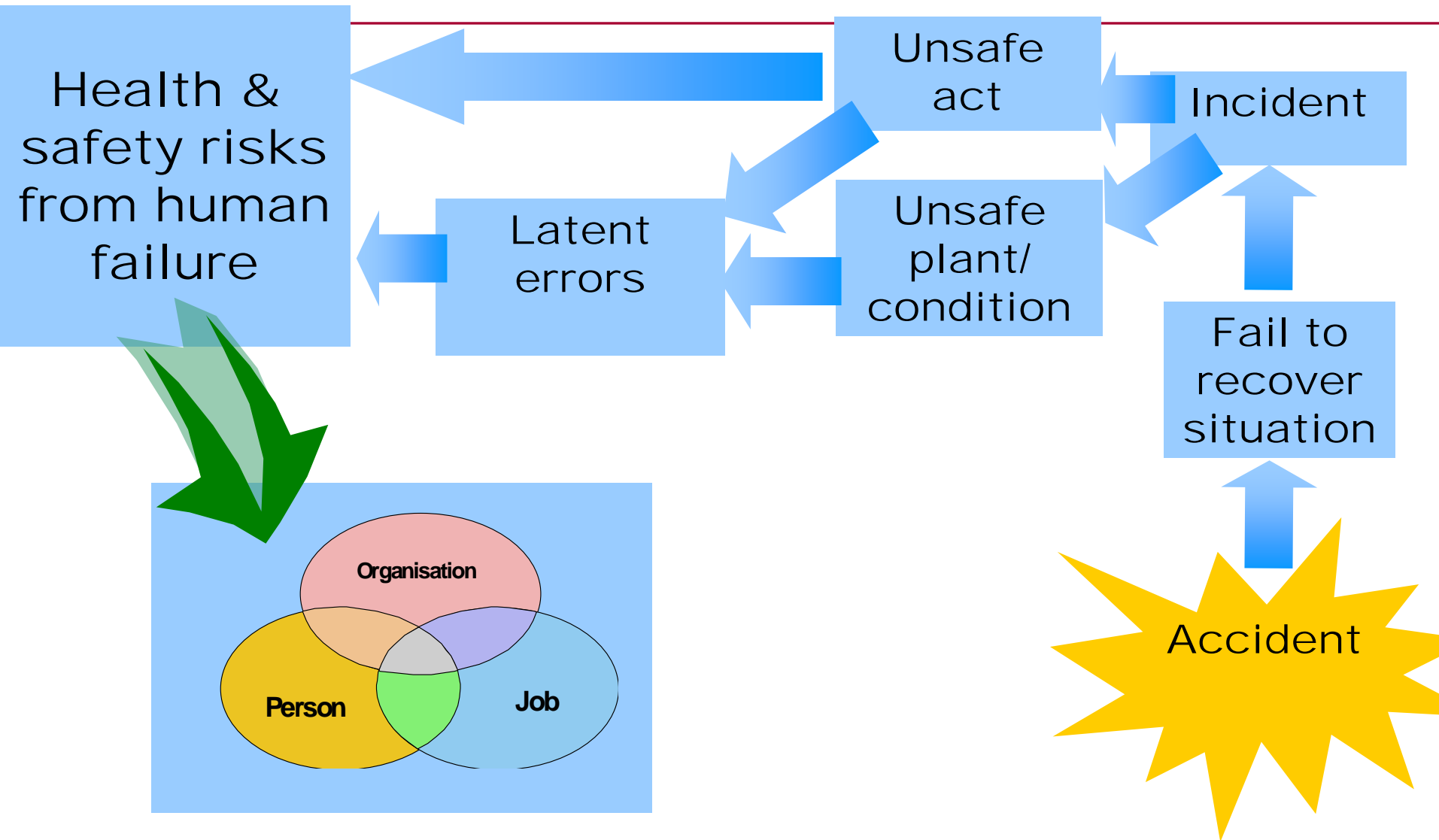
Technical myopia

Failure to consider human factors

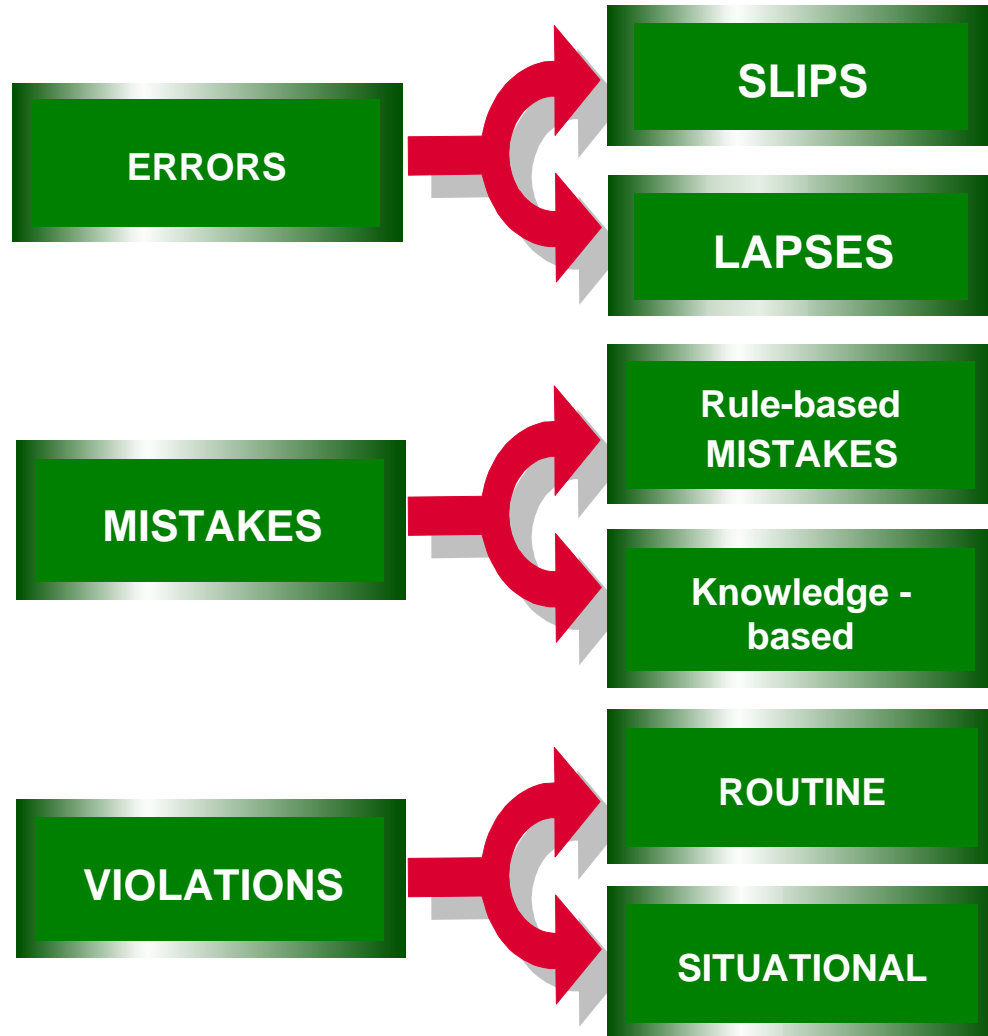
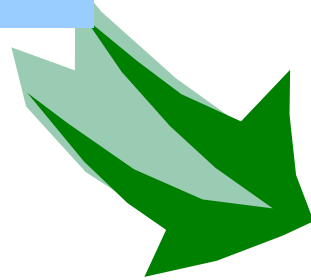
Accident Model



Accident Investigation Model



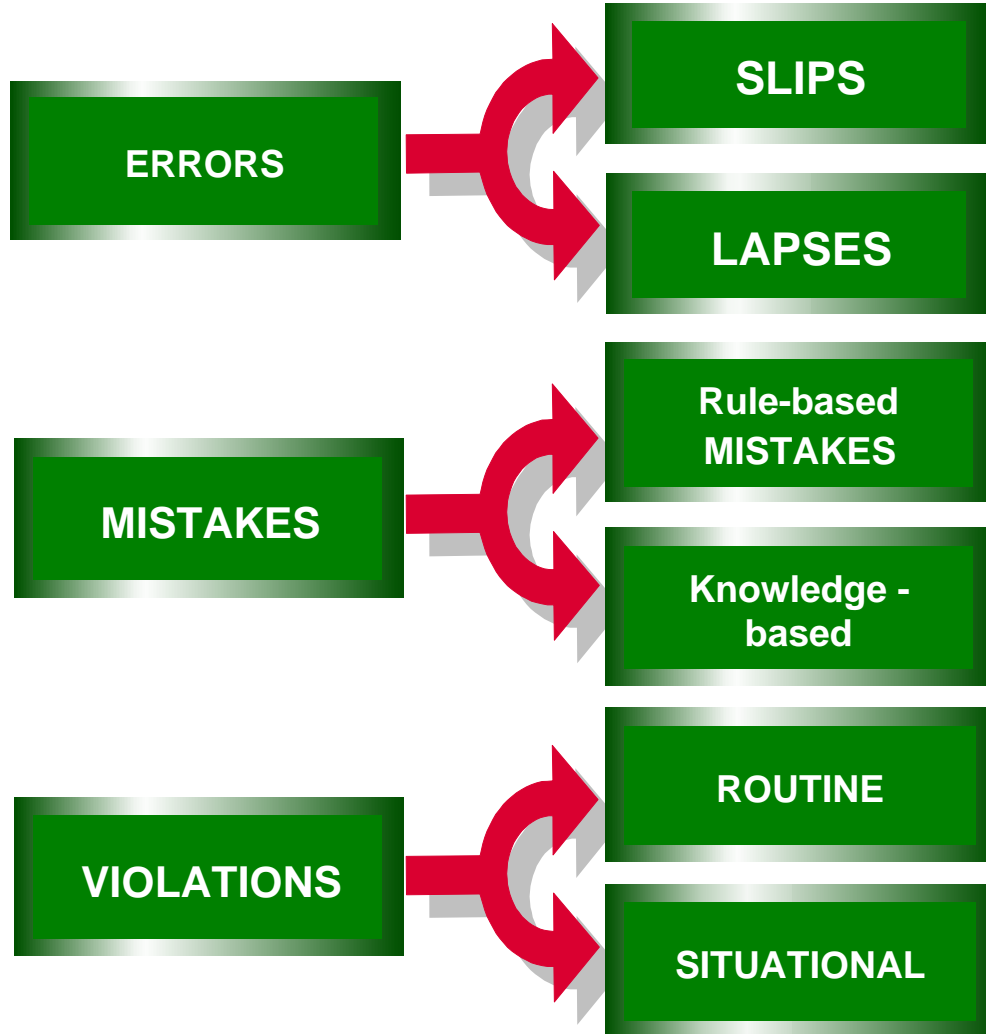
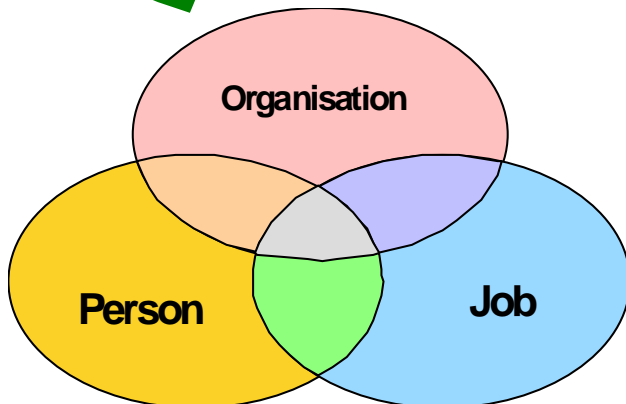
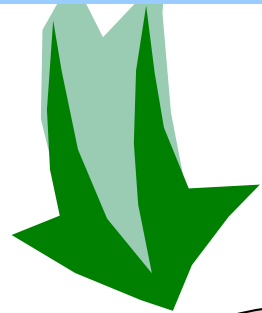
Health & safety risks from human failure



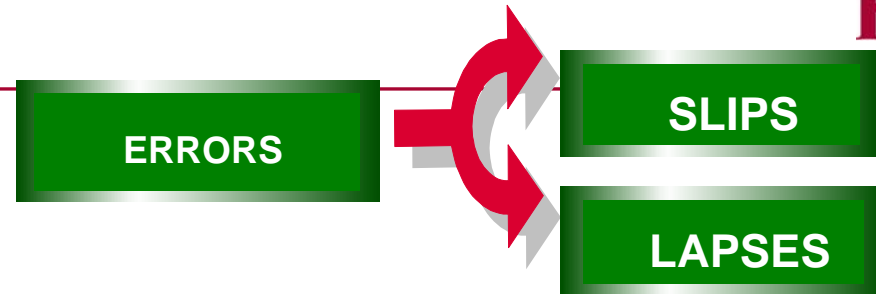
Categories of Human Failure

Root Causes

Health & safety risks from human failure



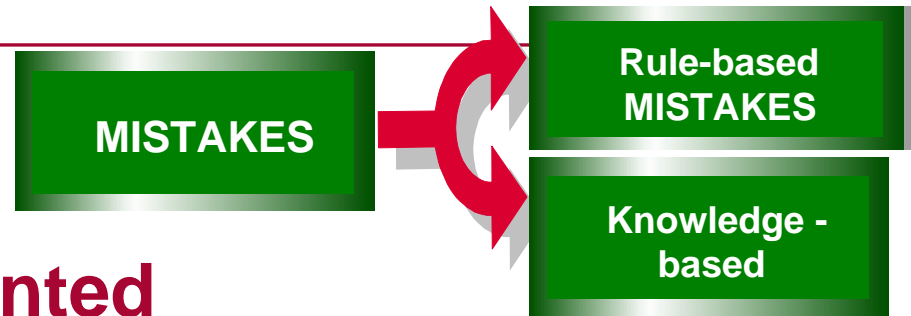
Error



Action not as planned when working on a task at which skilled ('autopilot')

- Miss a step – omission of component on reassembly after maintenance
- Transpose – wiper instead of indicator
- Habit intrusion – driving to work instead of where intended

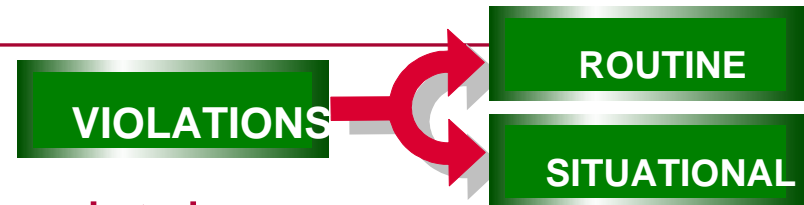
Mistakes



Wrong plan implemented

- **Rule-based** – if the situation is X then the cause must be Y, and the right cause of action Z – “Its just another false alarm”
- **Knowledge based** – working from first principles – Heathrow tunnel collapse

Violations



- Probably more important than mistakes or errors, *IS NORMAL BEHAVIOUR*
- **Routine** – everybody else ignores the rule
 - ppe, driving at 30mph, closing bow-doors
- **Situational** – perceived benefits of ignoring outweigh perceived penalties
 - Discomfort/inconvenience
 - Time/deadline pressure
 - Financial cost
 - e.g. forging documents, skimping permit procedure

Investigation process

- **Gather evidence**
 - Establish timeline /event sequence
 - Competence
 - Bias
- **Analysis**
 - Immediate & underlying causes
 - Checklists*
 - Failed controls (revisit RA)
 - Bias
- **Recommendations**
 - Implementation
 - Communication

* Caution

What to Remember

What to Remember

- Preventable accidents involve human failures...
 - Individual, serial or collective
 - immediate or latent

...amongst the root causes

- Human failures are not random...
 - there are *patterns*
 - there are underlying job, personal and organisational *performance influencing factors*

...that need to be understood, investigated & managed

Sources of Guidance

- Reducing Error & Influencing Behaviour
HSG 48
- Investigating Incidents & Accidents HSG
245
- Successful Health & Safety management
HSG 65
- Human Factors Website pages

<http://www.hse.gov.uk/humanfactors/majorhazard/index.htm>

- Energy Institute guidance

<http://www.energyinst.org.uk/index.cfm?PageID=1268>