Know where you are going Not where you have been

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Overview

- **Background**
- **Lessons from disasters**
  - **Why failures occur**
- **Importance of information**
- **Safety performance measures**
- **Improvement vs compliance audits**
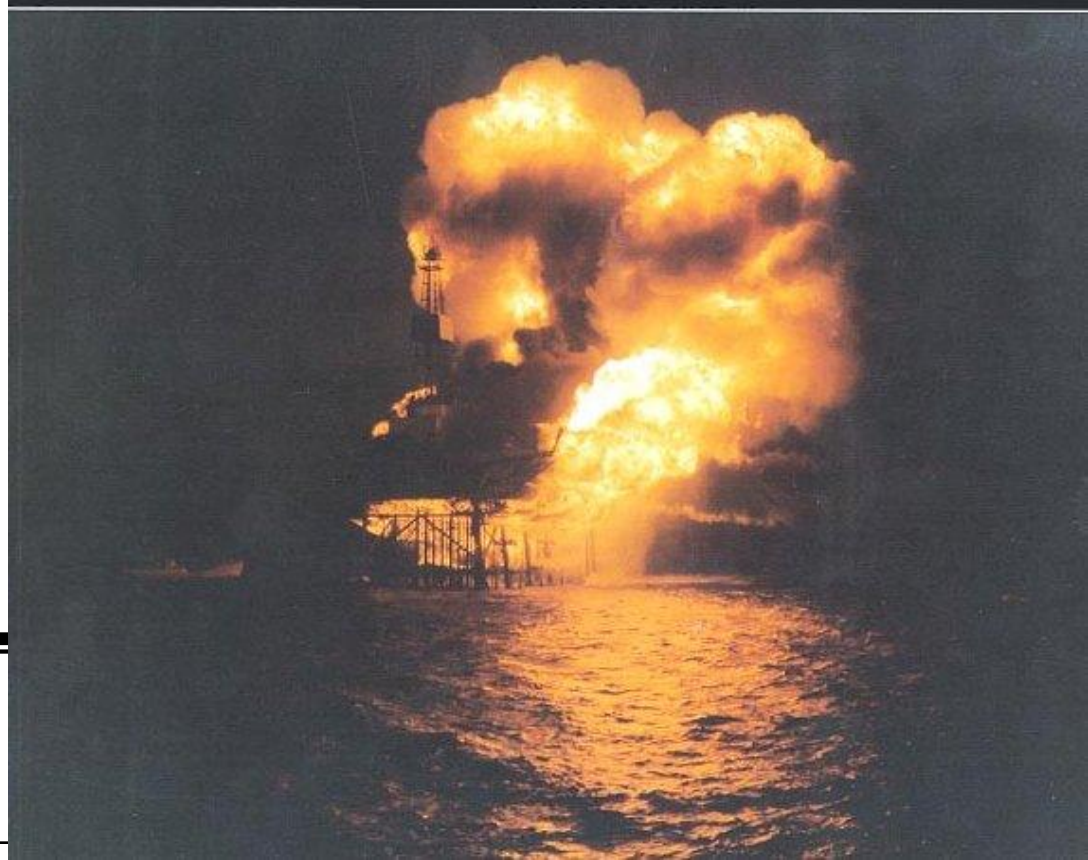 - **Cultural Indicators**

Piper Alpha

DEPARTMENT OF ENERGY

The Public Inquiry into the Piper Alpha Disaster

The Hon Lord Cullen

Organisational Failure

➢ **Failures occur, even though organisations have adopted of a full range of engineering and management systems,**

➢ **These complex systems break down because the people running them failed to do what they were supposed to**

➢ **They are not due to simple individual errors but malpractices that corrupt the social system that make the organisation function**

➢ **Blaming "human error" and hoping that a cure can be found for these random frailties is unlikely to work**

What leaders need to know

➤ **Information**

    – **Current state of safety**

    – **Future direction**

➤ **Information**

    – **Potential threats**

➤ **Information**

    – **What is being done to manage threats**

```
You've made a mistake
         │
         ▼
    Will it          Yes      Can you        Yes      Conceal it before
    show?      ─────────▶    hide it?   ─────────▶    anyone finds out
         │                       │
      No │                    No │
         ▼                       ▼
                          Can
      Bury it          you blame someone        Yes
                       else, or special    ─────────────┐
                       circumstances?                   │
                               │                         │
                            No │                         │
                               ▼                         ▼
                       Could an admission    No    Get in first with your
                       damage your career  ─────▶   version of events
                       prospects?
                               │
                          Yes  │
                               ▼
                       Sit tight and hope the
                       problem goes away
         │
         ▼
   Problem avoided ◀──────────────────────────────
```
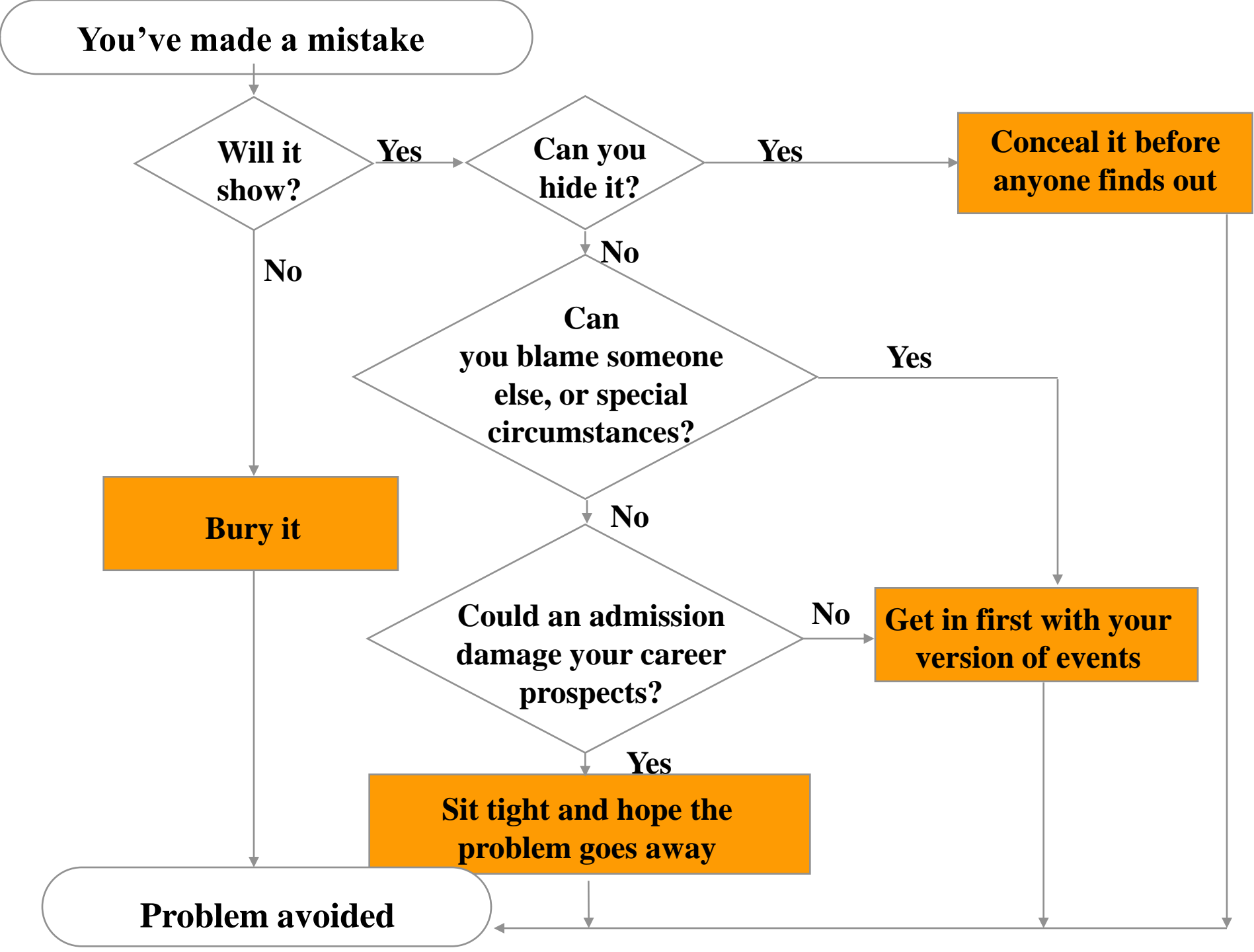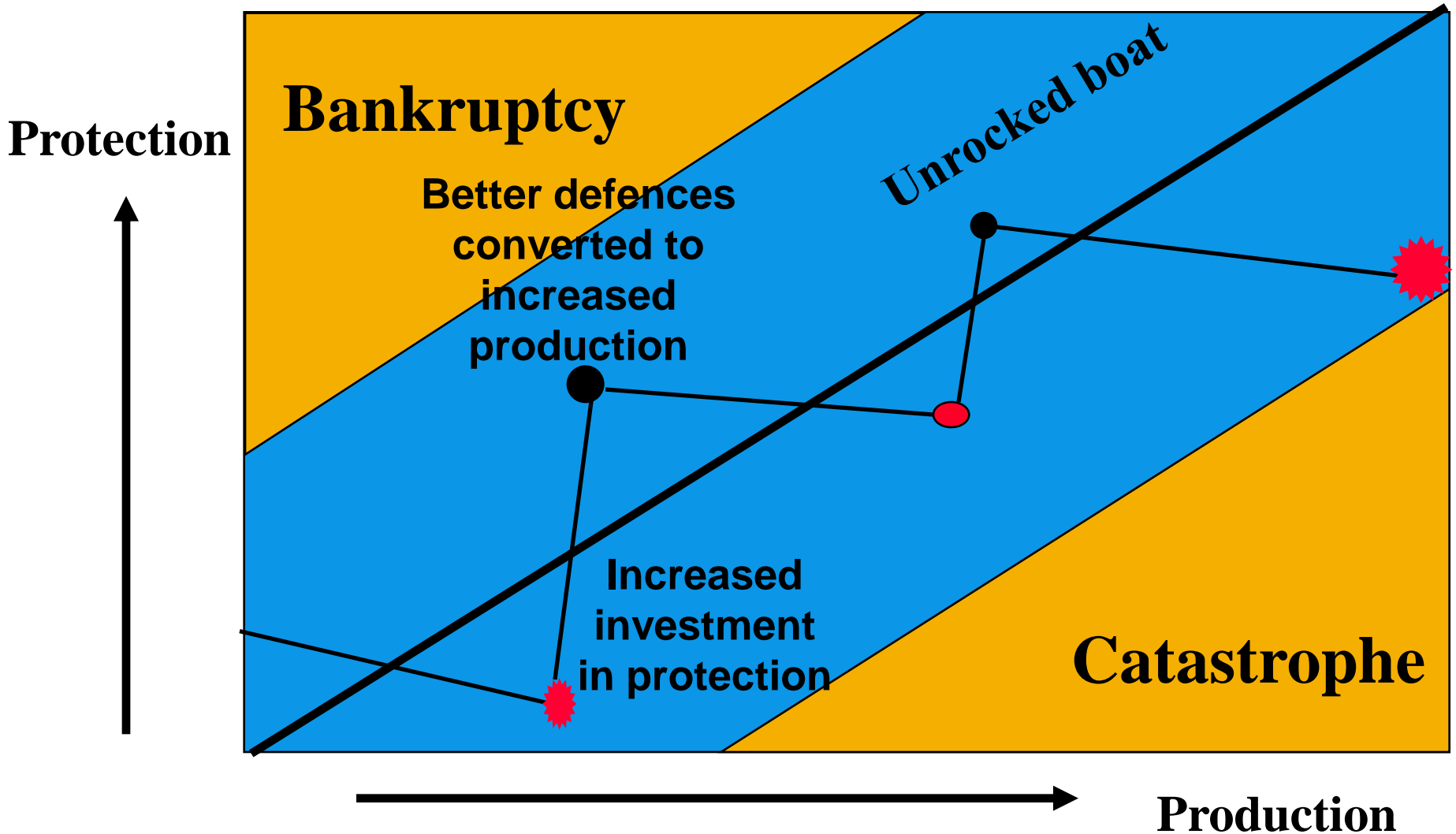
Over-reliance on LTI/ TRFR

Questionable assumptions

➢ **The causes of first aid injuries are the same as those of process events.**

 – Focus safety effort on investigating and preventing minor injuries

➢ **Absence of minor injuries equals safety**

 – Use individual injuries as primary/ sole safety performance measure

Forgetting to be afraid!

Protection

Bankruptcy

Better defences converted to increased production

Unrocked boat

Increased investment in protection

Catastrophe

Production

From Reason 1997

Steering a safe course

Navigation

➢ **Continuously updating current location**

➢ **Always know direction and speed**

➢ **Focus on anticipating future position and hazards**

➢ **Quick reaction times**

➢ **Accurate data**

Safety management

➢ **Intermittent information on safety performance**

➢ **Uncertain if moving in the right direction**

➢ **Majority of indicators are retrospective**

➢ **Slow response times**

➢ **Weak predictive validity of indicators**

Outcome vs indicator

Outcomes	Indicators

Outcomes
- ➢ **Retrospective**
- ➢ **Important performance measure**
- ➢ **Objective**
- ➢ **Examples**
  - – **LTI**
  - – **Leak rate**

Indicators
- ➢ **Predictive of future**
- ➢ **May only be of interest for prediction**
- ➢ **May be subjective**
- ➢ **Examples**
  - – **LTI**
  - – **Leak rate**
  - – **Worker perceptions**

Status and curative indicators

- **Status**
  - Continuous metric of AIM health
  - Predictive of AIM outcomes
  - Include in performance evaluation
- **Curative**
  - Drivers of performance
  - Periodic assessment
  - Identify how to improve

Process Safety Indicators

Curative

- **Leadership**
  - **Responsibility**
  - **Accountability**
- **Data management**
  - **Quality/ interpretation**
- **Organisational learning**
- **Communication**
  - **Employee involvement**

Status

- **Rate of maintenance problems**
- **Ratio of corrective to preventative maintenance to critical systems**
- **Rate of plant changes not incorporated into design documentation before next turnaround.**

Good indicators

➤ **Accurate**

– **Direct relationship with system status**

– **Difficult to manipulate**

➤ **Predictive**

– **Related to future system states and performance**

➤ **Current**

– **Real time information**

Future indicators

- **Worker reports**
  - Passive e.g. safety concern lines
  - Active e.g. Undercover agents
- **Perception surveys**
  - Worker assessment of system safety is relatively accurate
- **Improvement audits**
  - Assessment of sophistication of systems to improve culture

Improvement audits

➢ **Based on Safety Culture Maturity**

➢ **Simple performance indicator**

➢ **Allows comparison between organisations**

➢ **Developmental stages**
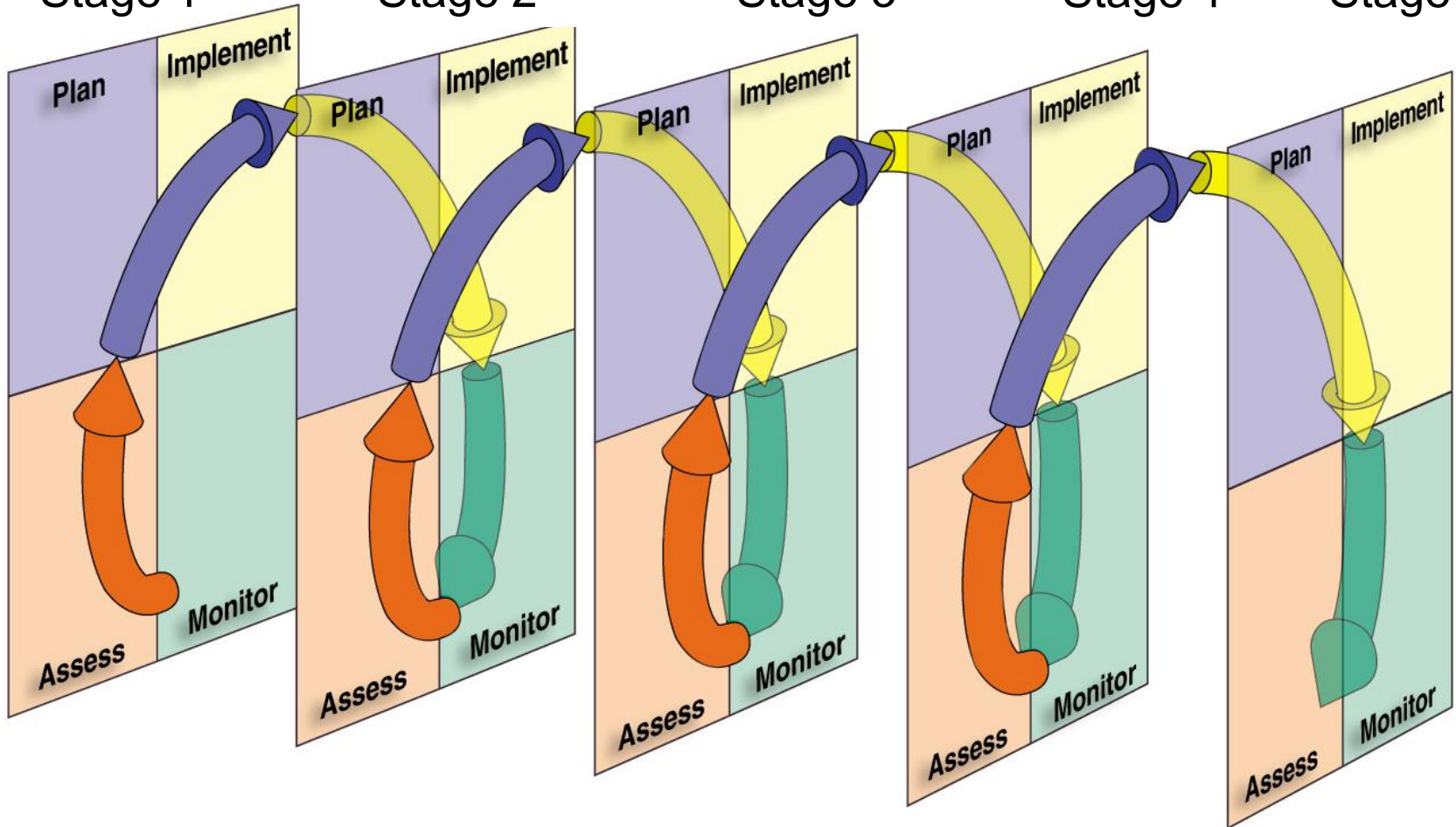
➢ **Includes leading indicators**

Uncertainty — Stage 1 · Awakening — Stage 2 · Enlightenment — Stage 3 · Wisdom — Stage 4 · Certainty — Stage 5

Improving Safety Management

Adapted from Crosby (1979)

STEP CHANGE IN SAFETY

Review systems that drive culture

- ➤ **SCM Improvement Process (SCMIP) is designed to develop improvement plan without the need to survey workers**
- ➤ **Rational for SCMIP**
  - **Employee perceptions are based in reality**
    - i.e. perceptions of management commitment reflect their interactions with managers
  - **Organisations with different cultures have different practices**
  - **Safety culture improvement involves system change**
    - e.g. perceptions of management commitment is improved through training and evaluating leadership practices

SCMIP elements

- **Organisational learning**
  - **Incident Investigation Team**
- **Workforce involvement**
  - **Workforce Involvement**
- **Training**
  - **Frontline Worker Safety Training**
  - **Supervisor Safety Training**
  - **Manager Safety Training**

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SCMIP elements

- **Safety performance evaluation**
  - Manager Safety Performance Evaluation
  - Supervisor Safety Performance Evaluation
- **Communication**
  - Safety Communication
- **Commitment to safety**
  - Planned Maintenance
  - Rules and Procedures
  - Managers Visiting the Worksite
  - Supervisors Visiting the Worksite

Sample: Commitment to safety

Managers Visiting the Worksite	Select level
Managers do not visit worksite to specifically discuss safety	0
Managers visit worksite regularly to discuss safety as specified by a formal policy/ program (e.g. STOP)	1
There is a formal manager worksite visit program that specifies the number of visits to be conducted by each manager and tracks completion.	2
There is a comprehensive program that specifies how to perform a worksite visit, trains managers how to conduct a visit, evaluates managers to ensure they are competent and tracks frequency of visits and close out of actions.	3
There is a comprehensive program described above plus the quality of the managers' visits is evaluated by workers and anonymous feedback is provided.	4

Utility and Validity

- ➤ **Audit can be used as a self assessment and improvement process**
- ➤ **Assess compatibility between contractor systems and operator systems**
- ➤ **Form part of regulator audits**
- ➤ **SCMIP interviews conducted with high and low injury rate contracting companies**
- ➤ **High injury rate companies had a statistically significant lower score**

Conclusions

➢ **Continuous safety performance measurement requires:**

- The development and adoption of new measures

- The use of different types of measures

- Input from multiple sources

- Quality control

Current process safety indicators

	Injuries	Micro releases	Audit
Accuracy	Poor	Medium	Medium
Predictive validity	Poor	Poor-Medium	Medium
Current	Poor	Poor-medium	Poor

Failure resistant organisation

- ➤ **Preoccupation with failure**
- ➤ **Employee report errors and problems**
- ➤ **Develop deep understanding of problems and issues**
- ➤ **Decentralised decision making**
- ➤ **Seek employee concerns**