



The contribution of competency to securing health and safety in the petrochemical industry

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Competence & safety

- The contribution of human factors to accidents at work.
- Identifying, assessing and reducing to risk of human errors.
- Systematic training models and management of competence.
- Securing competence in health and safety professionals.



Human Error

- Rasmussens Model
 - Skills based
 - Rules based
 - Knowledge based



Types of Error

- Skills based
 - Slips
 - Lapses
- Rule based
 - Mistakes
 - Misperceptions
- Knowledge based
 - Mistakes



Minimising error

- Job Factors
- Organisational Factors
- Individual Factors



Job factors

- Analysis of tasks and appraisal of likely errors.
- Work planning
- Ergonomics
 - layout of control panels,
 - displays of process information,
 - control devices,
 - balance between automatic and human contribution to safety actions
- Design of procedures
- Environmental factors, lighting, noise, etc.



Organisational Factors

- Scheduling of work patterns to control fatigue and stress.
- Clear safe systems of work and barriers to their abuse
- Learning from previous incidents
- Two-way communications
- Clear processes for co-ordination and defining responsibilities



Individual factors

- Skill and competence levels defined
- Policies to detect and deal with drug or alcohol use impairing performance
- Processes for support in the event of medical problems



Competence

- Prevents knowledge based error
- Repertoire of rule based behaviours



Accident at Esso Plant, Longford, Victoria, Australia,

- Operators did not understand dangers of cold metal embrittlement
- Carried out incorrect sequence of actions.
- Organisational failures
 - Previous incidents not investigated
 - resident engineers removed
 - no one to refer to for an expert opinion
 - Assessment could be passed without understanding significance of answers



COMAH Requirements

- Human reliability
- Structured identification
 - Safety-critical tasks,
 - Procedures and responsibilities in the measures for prevention, control and mitigation
- Establish and assure competence



Competence

“Health and safety competence is the combination of knowledge, skills and experience that ensures roles are fulfilled and tasks completed with due regard to the hazards involved and the risk control measures necessary.”



Securing competence

- Vocational training
- Examined qualifications
- In-company training



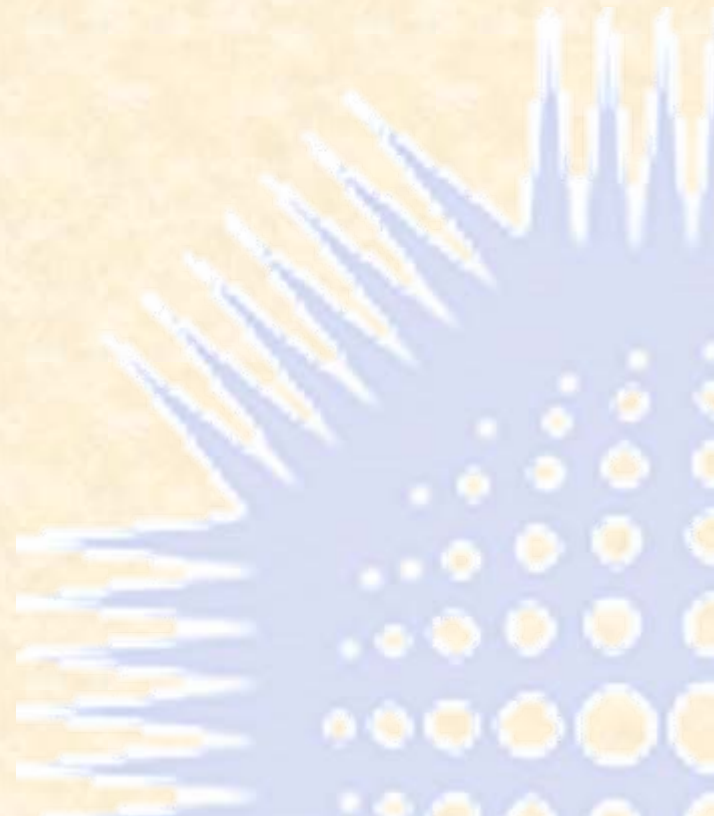
Vocational training

- UK System
 - Sector skills council
 - National occupational standards
 - National Vocational Qualifications
 - Assessing competent performance



Examined qualifications

- Systematic testing of knowledge underpinning competent performance

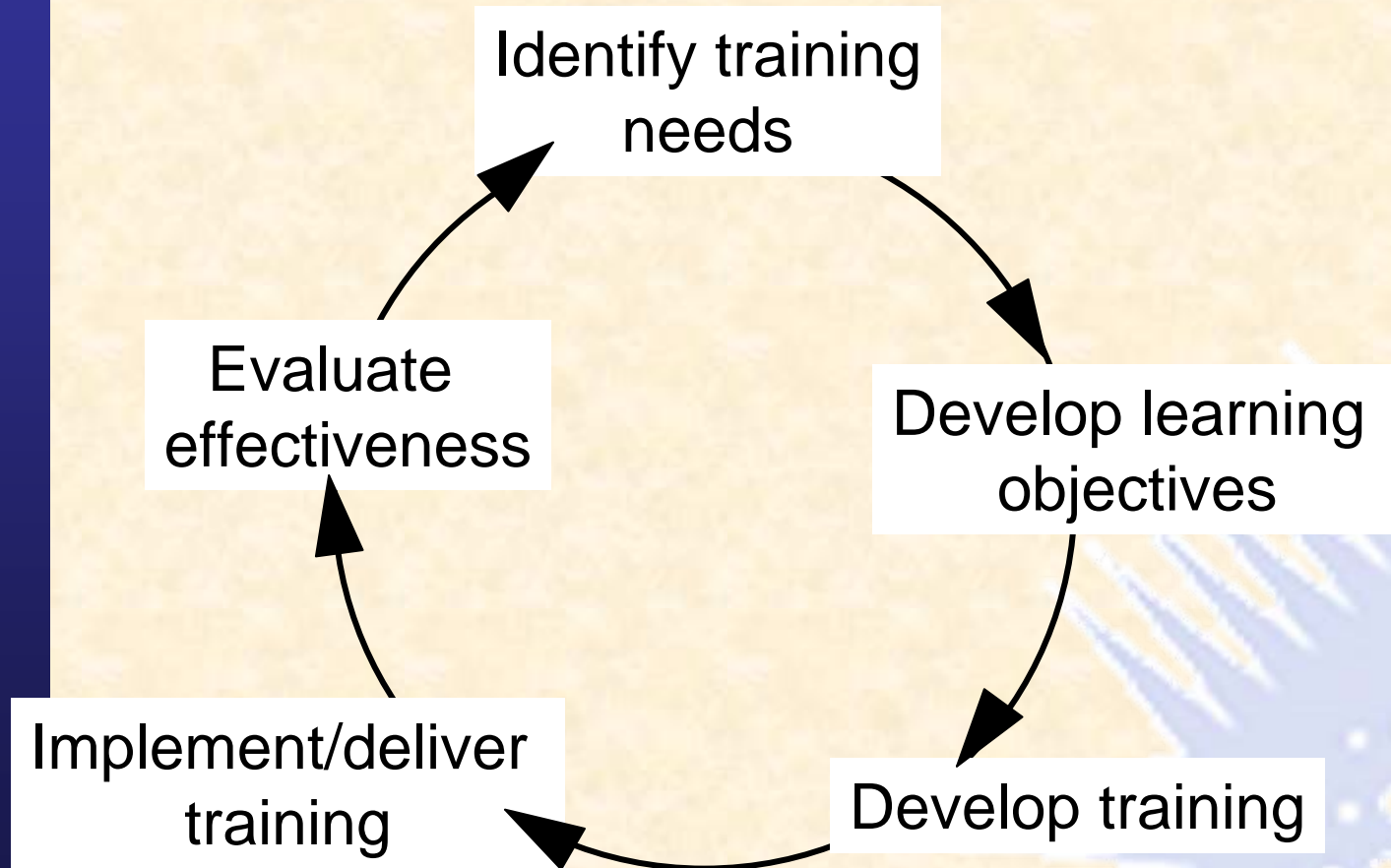




In-company training

- Systematic training model

Systematic training model





Planning

- What do people need to be trained on?
- Training Needs Analysis
- What
 - Knowledge
 - Skills
 - Attitudesdo they need to do the job?



Defining Objectives

- At the end of the training he will be able to.....
 - Demonstrate
 - Explain
 - Identify
 - Select.....
- Under these conditions...
- To this standard of successful performance.



Developing training

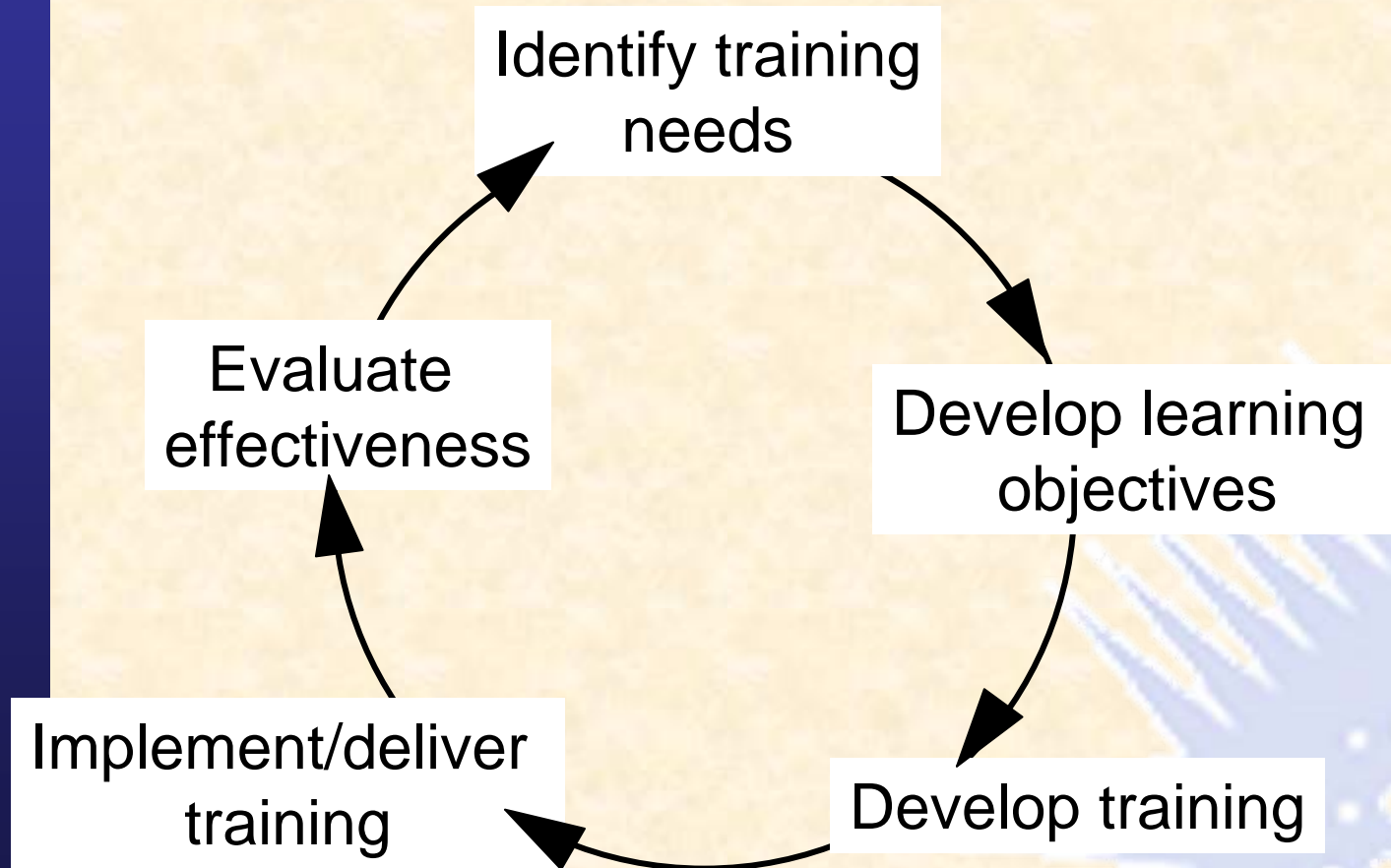
- To meet objectives
- Consider
 - Learning methods
 - Style and standard of presentation
 - Supporting materials
 - Method of evaluation



Learners Remember

- 10% of what they Read
- 20% of what they Hear
- 30% of what they See
- 50% of what they See and Hear
- 70% of what they Say
- 80% of what they Say and Do

Systematic training model





Summary

- Competence is key in ensuring safety of high hazard plant
- Training & experience do not guarantee competence
- Consider
 - Systematic training needs analysis
 - Underpinning knowledge
 - Performance based assessment



Thank you

