Teaching Practical Human Factors principles to non-specialists: What works and what doesn't

Dr David Embrey
Human Reliability Associates

human reliability

Overview

- What do we do?
- Who do we train?
- What are our training objectives?
- Structure and content of courses
- What has worked?
- To what extent can this experience be applied to the healthcare sector?

human reliability

What do we do: Healthcare

- Cultural aspects and evaluation of incident reporting systems (QIS Scotland)
- Evaluation of clinical interventions & Quality systems
- Clinical governance
- Aggregate root cause analysis
- Evaluation of maternity services organisational culture
- Mismatching errors: *Right Patient Right Care* (NPSA 2004)

human
reliability

Training activities

- Training courses provided in most safety critical industries over the past 25 years
- Courses give in in EU, Japan, Brazil, Venezuela, USA, Korea
- In-company, open courses, MSc module on Sheffield University Process Safety and Loss Prevention course (Process engineers)
- 1-4 day courses
  - Human factors in risk assessment
  - Incident investigation
  - Procedures development
  - Human error prevention

human
reliability

What are our training objectives?

- Provide an appreciation of the nature of human factors and its relevance to the participants' interests (normally safety related)
- Assist them in meeting the needs of safety regulators (Health & Safety Executive)
- Provide an overview of basic theory regarding human error & available tools and techniques
- Provide practical experience of using the techniques in a workshop context
- Persuade participants that risks cannot be managed without systematic evaluation of human factors

human reliability

Structure and content: Day 1: Introduction, theory and tools

- Introduction to human factors
- Core topics (HSE HSG 48)
  - e.g. procedures, training, communications
- Human error (Slips, mistakes, violations)
- Systems induced error versus individual causes
- Proactive error reduction tools

human reliability

Structure and content: Day 2- Incident investigation & causal analysis

- STEP technique (accident sequence analysis)-workshop
- Video-Kegworth incident
- Causal trees-workshop based on Kegworth
- Systemic causes of incidents
- Causal context analysis-workshop based on chemical plant incident

human
reliability

Structure and content: Day 3: Task based risk analysis

- Consensus based approach to risk management (CARMAN)-
  - Workforce participation
  - Codification of undocumented domain knowledge
- Task Error Analysis Method (TEAM)
  - Analogous to engineering risk assessment methods
  - Human reliability analysis & engineering risk analysis
  - Running case study (gas alarm in offshore production platform)

human
reliability

Barriers-1

- Participants may believe that engineering solutions to risk management are preferable
- Engineers distrust 'soft' disciplines such as psychology
- Belief that human error cannot be addressed systematically

human
reliability

Barriers-2

- Belief that human error is inevitable- 'original sin' doctrine
- Individual view: all human error can be prevented by sufficient application and self discipline
- Unaware of the system induced error perspective
- Unrealistic view of feasibility of exact numerical approaches in complex sociotechnical environments

human
reliability

Enablers

- Regulatory requirements for human factors analyses- COMAH Safety cases
- Extensive HF guidance notes published on the HSE website
- Major accidents, e.g. Texas City
  – Traditional behavioural safety approaches inadequate
  – Requirement for proactive approach to human error emphasised
- Influential authors , e.g. James Reason have popularised the systems approach to human error management

human reliability

What works

- Recognise the culture of the participants
  – Minimise theory
  – Provide a wide range of techniques
  – Provide as much hands on experience as possible (workshops in small groups)
- Make connections
  – Choose relevant examples/case studies to illustrate central importance of HF
  – Link tools and techniques with those from primary discipline of participants

human reliability

What works

- Establish credibility
  – Have plenty of stories/anecdotes from one's own experience (credibility)
  – Focus on well recognised problem areas, e.g. Why don't people follow procedures?

- Use a range of media
  –Videos
  –Integrate into workshops

human
reliability

What works

- Use active learning
  –Provide hands on experience (workshops in small groups)
  –Make sure that workshop difficulty level is set correctly
  –Supervise workshop groups carefully- ensure that no one is isolated or made to feel stupid
  –Provide full model answers

human
reliability

What works

- Emphasise continuity and relationships between tools / techniques
  - Develop a running example for use in workshops
  - Show how various techniques combine as part of a total analysis

human
reliability

How do we know that it works?

- Very strong positive feedback from participants
- Approach has become de facto standard to satisfy regulatory requirements (COMAH Safety cases for the HSE)

human
reliability

Translating these insights into the patient safety domain

- How do the barriers to human factors in healthcare differ from those in other industries?
  - Differing needs of groups such as nurses and clinicians?
  - Openness to insights from non-clinical settings/industries- NIH?
  - Emphasis on clinical trial 'evidence based' paradigm may undervalue pragmatic approaches

human reliability

Translating these insights into the patient safety domain

- Are the training strategies that have proved successful in an engineering context transferrable to healthcare?

- Are there effective regulatory pressures to drive penetration of human factors training into the healthcare sector?

- What is the healthcare equivalent of a Safety Case?

human reliability