Improve approaches to train SHE principles, strategies and rules

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Purpose and agenda of intro & workshop

• Intro: causes of the problem that SHE knowledge, although being intensively trained is not correctly applied in problem situations and how to improve your training approach?
• Workshop part 1: collect cases of non-recognition and analyse causes
• Workshop part 2: collect examples of experts’ approaches for proper risk diagnosis, risk imagination, risk alertness and risk recognition
• Discuss the findings
Intro: the problem and its causes

- Hazards, once recognized or diagnosed, are dealt with correctly, the way they have been trained
- The problem is that hazards are not recognized or diagnosed properly
Examples comparable to hazard recognition

- Air traffic controller
- Train driver
- Cook in a restaurant kitchen
- Car driver
Intro: the problem and its causes

Reasons for this problem from an instructional design perspective (Merrill, Sweller, van Merriënboer):

- Hazard recognition is not trained in an meaningful **authentic context** (workplace)
- The trainees have not exercised the full **variety** of contexts in which hazards will occur
- Hazard recognition might suppose **too complex** reasoning, not having practiced safely
- **Transfer** of training not occurs
- There is no or too **little feedback** on proper recognition principles
Improve training designs: routines and non-routines

- **Routines:** rule based behavior
  IF-THEN patterns: train trainee that, IF event X occurs, he THEN takes the procedures card Y to see which rules he has to follow or that he in case of Z just follows the rules specified for Z

- **Non-routines:** reasoning based behavior
  - characteristics of imagination and recognition of risk
  - **approaches** of risk-analysis and diagnosis
  - complexity of risk patterns
  Demonstrate appliance of risk observation methods
  - analyze causes of non recognition, give rules of thumb

In the workshop we will work out some examples of non-routines: analysis of typical ‘forgotten’ risky situations
Improve training designs: learning task construction

- Learning tasks:
  - Construct enough of different **cases** to let the trainee experience what to do in realistic conditions and to form proper ‘cognitive schemata’
  - First learning task is always a demonstration of approach (e.g. risk assessment)
  - Following tasks are strongly supported (e.g. partially solved hazard diagnosis)
  - Last tasks to exercise are to be done independently
  - Give enough feedback on use of proper mental schemata
Design of learning tasks for a training

Promoting schema formation by
Providing support

Given situation (problem)
Goal
Solution with explanation of the approach
Demonstration of the problem solving approach

Given situation
Partial solution

Given situation
Goal situation
Design of learning tasks for a training

Promoting schema formation by
Providing support

Given situation (problem)
Goal
Solution with explanation of the approach
Demonstration of the problem solving approach

Given situation
Partial solution

Test task
Performance measures
Training effectiveness

Given situation
Goal situation
To summarize

Improper schema construction presumable cause training problem
To improve training design:
• Promote schema construction: by practicing to apply methods for hazard recognition and hazard alertness
• Analyze complexity of hazard diagnosis tasks in workplace
• Promote transfer of training by variation in tasks
• Use authentic problem cases in a supported environment
• Give always feedback on task performance (coaching)
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Workshop part 1

• Please divide into small groups of mixed origin about 10 persons
• Assign per group a chair and a secretary
• 45 minutes to assignment
• Secretary reports in plenary session

• Assignment: place yourself in the working situation. In a role as an operator, manager, plant manager. Collect situations where risks were not recognized properly. Try to analyse why this occurred. Prioritize non-routine recognition/diagnosis of hazard
• Select after discussion 1 or 2 situations to report
• Report shortly, written on the report format
Discussion causes

• Report of cases
• Discussion of causes:
  - never experienced risk in working situation
  - not prepared properly for the unexpected
  - not the attitude of the train driver: he is hit as first! Danger seems not present, cannot be observed without measuring methods
  - only know risk analysis never did a systematic risk assignment in practice
  - scope of all potential risks is to big
  - topic is too complex
  - ..............................................................

• Conclusions
• Are these causes to be taken away by improved training design?
Workshop part 2

• Same group constellation. But now 25 minutes
• Assignment: place yourself in the working situation. In a role as an operator, manager, plant manager, this time as a SHE expert. Try to solve the problem cases from workshop part 1 as an expert. Analyse Non-routines: reasoning based behavior
  - characteristics of imagination and recognition of risk
  - approaches of risk-analysis and diagnosis
  - complexity of risk patterns
Can you demonstrate as an expert the appliance of risk observation methods? Do you have rules of thumb?
• Use the report format to report your group’s solution
• Deliver both of the report to Huang Ling, conference block manager.
• The outcome will be sent to all of you and will form a first series of learning tasks, for everybody’s use.

First series of Learning tasks for SHE training
Thank you for co-operating!
Have a nice conference.

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