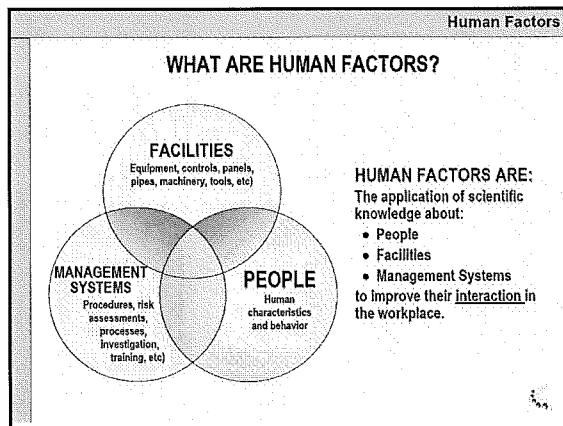
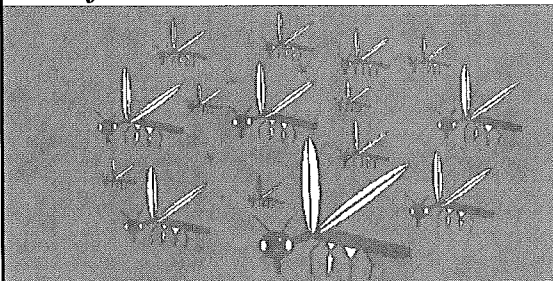


A Systems Approach to Effective Investigations

The Human Factors
Group



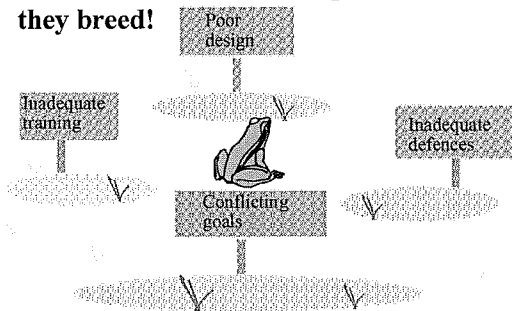
Unsafe Acts....



...Are Like Mosquitoes....

Compliments of James Reason

It's best to drain the swamps in which they breed!



Being 'careful' or 'mind on task' will not protect you from getting sick because of working in a bad working environment



Foto hentet fra boken "The quiet sickness. A photographic chronicle of hazardous work in America" Earl Dotter. 1998, ISBN 0-932627-85-4. AIHA

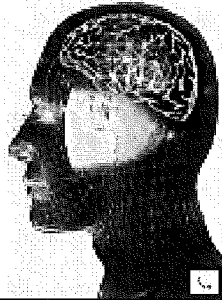
Local Rationality Principle



Workers do reasonable things - given their knowledge, objectives, point of view and resources.

What were they thinking???

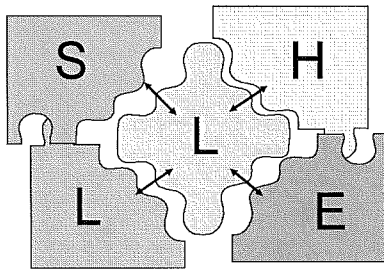
"The reconstruction of the mind set begins not with the mind. It begins with the circumstances in which the mind found itself"



Dekker (2002)

SHELL

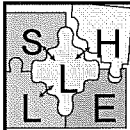
Data collection model



Your purpose is....

- To draw defensible conclusions with appropriate levels of certainty (evidence)
- To identify safety deficiencies
- To convince others of the need for action
- Follow the scientific approach
- Treat Human Factors as a science

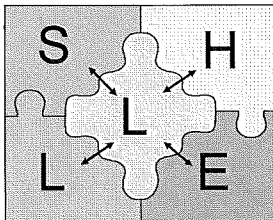




Case study

- Use the SHELL model to probe into system elements
- SHELL – look at the interaction between worker and other elements and query why was there a mismatch /an incompatibility between them

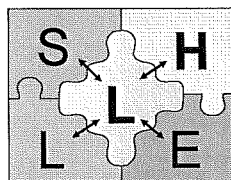
SHELL MODEL



S = Software Rules, regulations manuals, work instruction policy, procedures
H = Hardware Vehicles, tools, machinery, equipment, instruments, controls Example – testing equipment)
E = Environment Climate, vibration, visibility, noise Management environment, org. culture
L = Liveware (Human) Worker, attention, expectations, Workload, personal factors
L = Liveware Co-workers, supervisors, managers, public, owners, emergency crews (communication)

L = Liveware - Central

- The most flexible and valuable part of a system – the human element (placed at the center)
- Each brings their own limitations and capabilities:
 - Physical
 - Physiological
 - Psychological
 - Psychosocial



How many F's?

- FINISHED FILES ARE THE RESULT OF YEARS OF SCIENTIFIC STUDY COMBINED WITH THE EXPERIENCE OF YEARS...



■3?

- Wrong, there are 6.....
 - The brain can't process the word "of"..
 - Anyone who counts all 6 "F's" on the first go is a genius.
- Three is normal, four is quite rare.

The pweor of the hmuan mnid

Aoccdrnig to a rscheearch at Cmabrigde Uinervtisy, it deosn't mttair in what oredr the ltteers in a word are. The olny iprmoetnt tihng is that the frist and lsat ltteer be at the rghit pclae. The rset can be a total mses and you can still raed it wouthit porbelm. This is bcuseae the huamn mnid deos not raed ervey lteter by istlef, but the word as a wlohe.

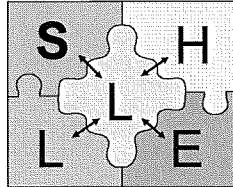
Amzanig huh?

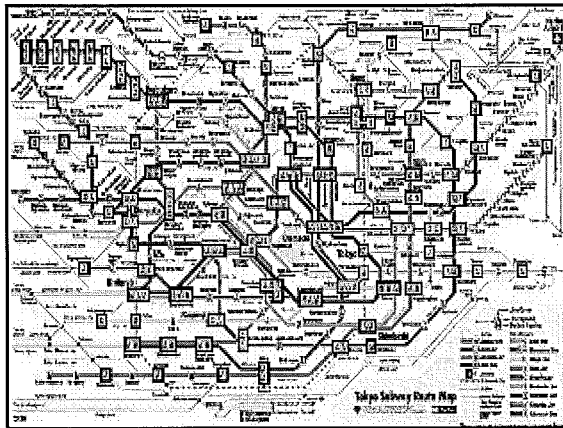


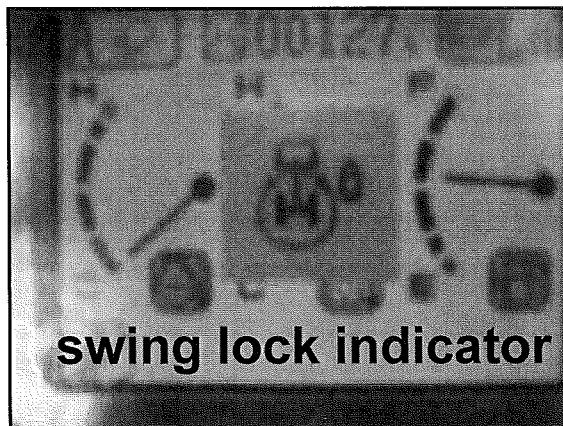
S = Software

■ Non physical part of a system:

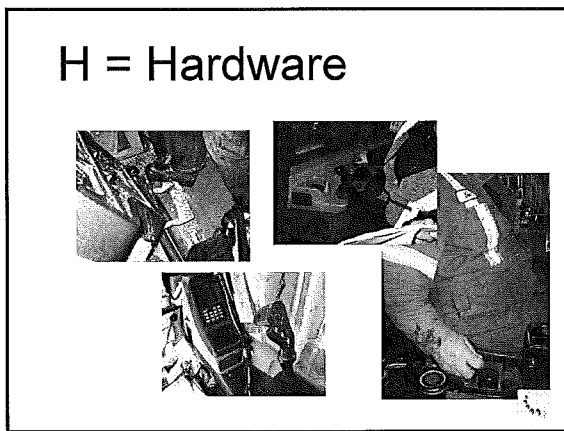
- Organizational policies
- Safety program
- Procedures/Instruction
- Checklist layouts
- Maps

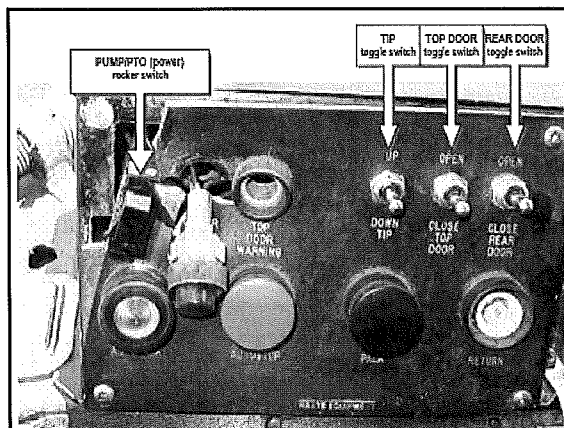


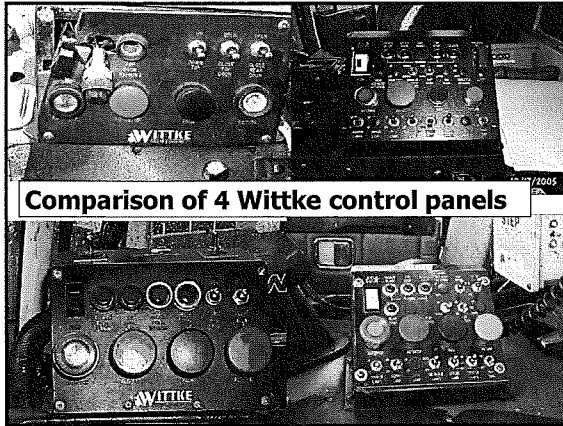












Comparison of 4 Wittke control panels

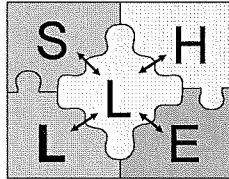
Environment

- Internal and external climate:
- Temperature, visibility,
- Vibration, noise and other conditions within which fallers are working
- Safety climate is also part of this entity – political, economic restraints
- Regulatory climate – affecting communication, decision making, control and coordination



L = Liveware - Peripheral

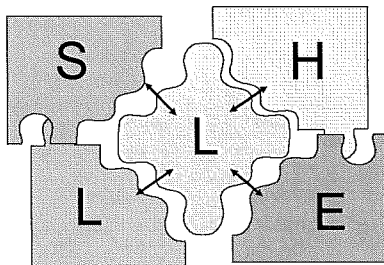
- Human to human interactions
- Management
- Supervision
- Worker interaction
- Communication

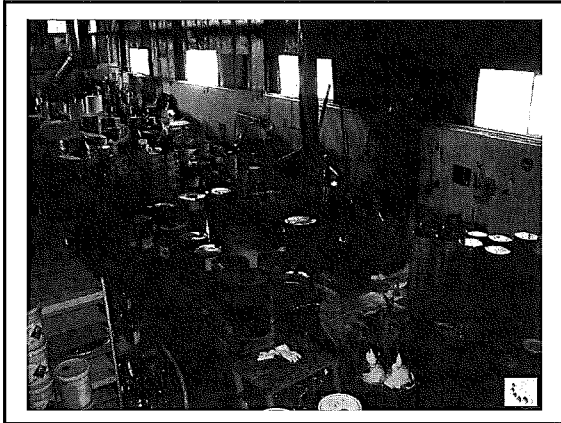


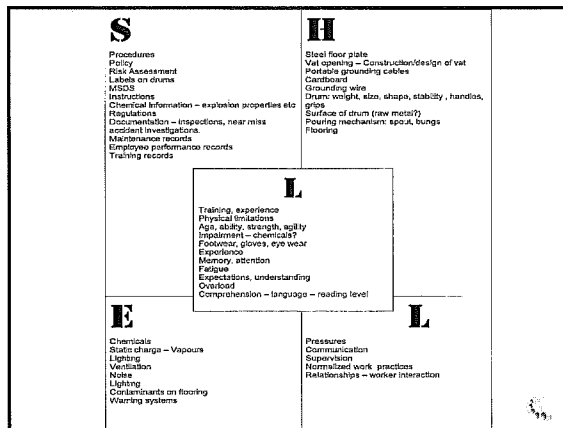


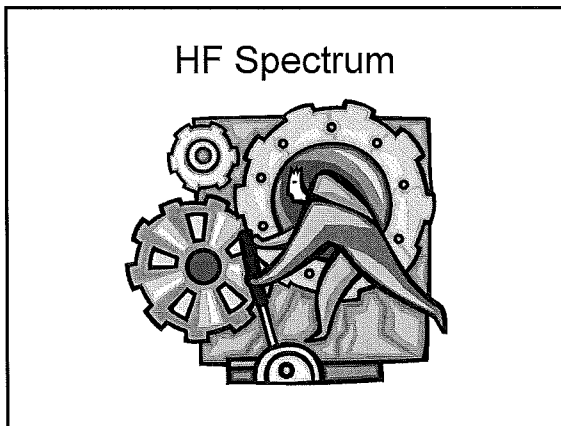
Case Studies

Data collection model









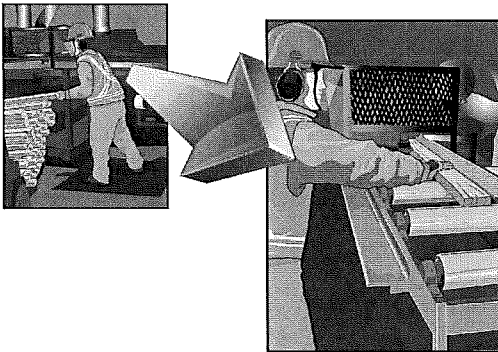
Group Work

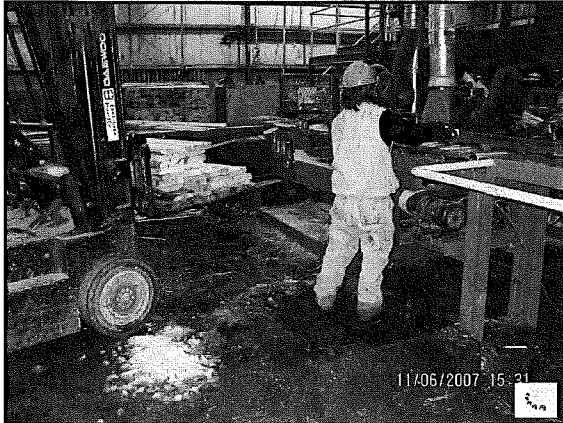
- Document SHELL and transfer onto flip charts
- Relay findings
- Discussion
- Distribute completed SHELL
- Highlight relationships/interaction
- Develop questions to probe into incident causation

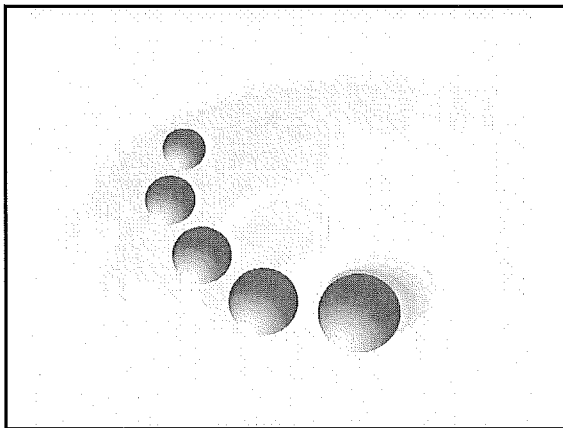


Case study

- Use the SHELL model to probe into system elements
- Why it makes sense to the worker - given their knowledge, resources, focus of attention, their goal and the larger goal of the organization
- SHELL – look at the interaction between worker and other elements and query why was there a mismatch /an incompatibility between them







Understanding HF

- Not following procedures at first is focal – complacency mentioned
- Examine procedures in context-told to "Follow procedures"
- What factors are driving the behaviour?
- Greater physical demands standing at the side compared to pushing wood in from behind in-feed table (postures, force, rep)

Understanding HF

- Machine – in-feed rollers adjusted 10 x's, steel – not original rubber
- Lumber – rough, wet, various thicknesses
- SOPs – trained, signed, mentored – didn't fully understand machine workings and thus limits ability to recognize severity of hazard (for others too)
- History of chunks ejected no "kickback"

Ways to check your conclusions

- Is your logic flawless; have you made assumptions?
 - E.g. It's grey, so it's an elephant
- Have you drawn from your own experience but not backed it up with human factors science?
- Can you produce useful recommendations?
- Have your review checked by peers - the reasonable person test

Why take the Time and Effort?

- Applying the appropriate focus
- Maximizing the potential for the compelling argument for change
- Avoiding the tautology:
 - Human factors issues are key to understanding, key to prevention
 - Recommendations for safety action that count



Effective recommendations...

Ideally:

"...your recommendations essentially propose to re-tool or re-shape parts of the operational or organizational environment in the hope of altering the behaviour that goes on within it."



Sidney Dekker, 2002

Effective recommendations...

Where do you aim?

Low-end recommendations


- dismiss, demote, retrain, tighten procedures
- concentrate on a few individuals or subsection of an organization
- satisfy those who want to "set an example"
- deal with symptoms, not with causes
- after implementation, system as a whole is not much wiser or better

Effective recommendations...

Where do you aim?

High-end recommendations

- mitigate/eliminate the risks of structural decisions regarding resources, technologies and pressures in workplace but:
- require a serious human factors investigation because
- the higher the aim, the more difficult it becomes to find acceptance



- Analysis of physical working environment
- Anthropometrics
- Force
- Safeguards or Feedback
- Attention

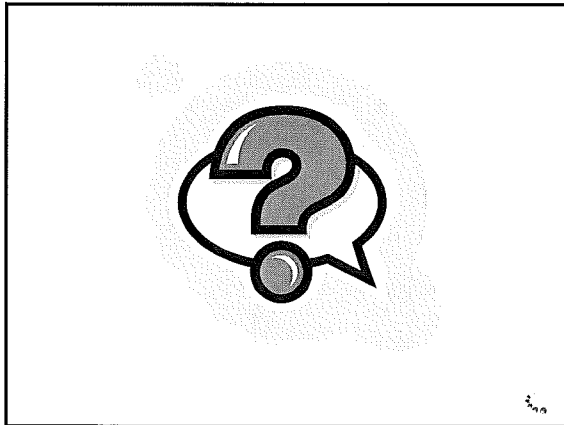
Although good work practices “may be making the most of the hand one is dealt, human factors has always been about providing that hand more and better opportunities to do the is right thing. Merely leaving the hand with what it is dealt and banking on personal motivation to do the rest takes us back to prehistoric times, when behaviorism reigned and human factors had yet to make it’s entry in system safety thinking”

Dekker (2005) p204

Moving Forward

~ Resources/Tools ~

- Human Factors Webpage
- Human Factor Bulletins
- Community of Practice ~ The goal is to create a forum for practitioners to collectively learn and to share their knowledge and experiences to enhance the application and success of human factors
- Availability of Human Factor Specialists at WorkSafeBC



Remembering the goal
~ Advancing Safety ~



WORKING TO MAKE A DIFFERENCE
worksafebc.com

Human Factors
