Analysis and prevention of accidents at work

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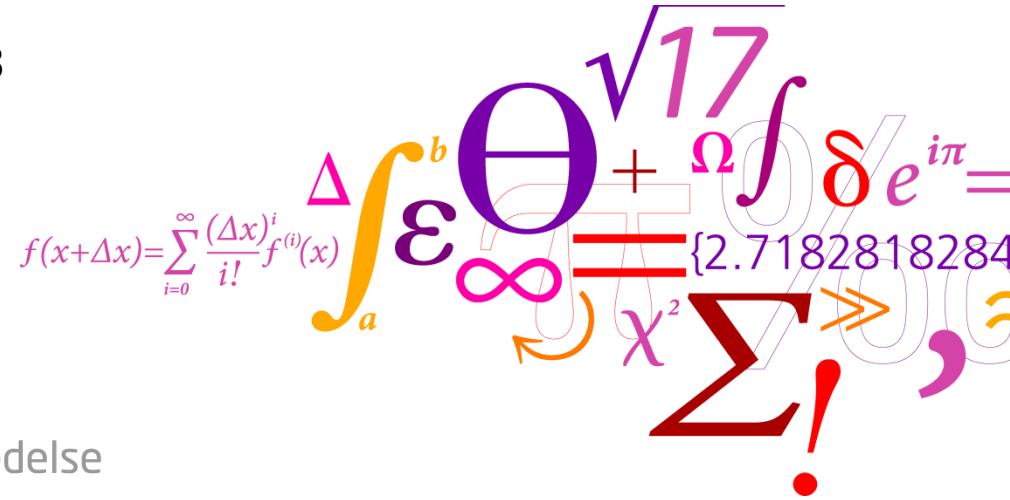


DTU Management
Institut for Planlægning, Innovation og Ledelse

Indhold

- Accident as a phenomenon and the hierarchy of causes
- The Accident analyses
- The risk analyses, risk identification and failure
- Safety barrier and INFO carts
- Prevention and safety management

The Accident phenomenon

- Consequences
- Events
- Immidiate causes
- Root causes

The Accident phenomenon

The risks can be very hard to observe

The risks you can see is manageable

The risks you can´t see or are conscious about is the one that most often results in accidents

It is most often a combination of conditions and situations that create the unexpected risks and events

This combinations is very difficult to foreseen the consequences of

The Accident phenomenon

It is normal to focus on the so-called high risk like fire, explosion etc.

While the simple risks has very little focus or awareness

98% of all accidents is ”simple” both when looking at the event as the injuring agent

Most accidents is caused by risks we do not take serious or are special aware of and because of that we do nothing about it.

Accident causes

1. Especially dangerous risks (deviation due to electrical problems, explosion, fire, deviation by overflow, overturn, leak, flow, etc.	**11,3 %**
2. Risks connected with use of technical equipment (loss of control)	**21,5 %**
3. Risks connected with falls (slipping, stumbling and falling, fall of persons),.	**23,3 %**
4. Risks connected with body movement and violence, where people's behaviour plays a large role and the risks are difficult to anticipate.	**41,8 %**

The Passiv safety and the Activ safety

The safety integrated in the technology and the workplace comdition

The safety that demands an active behaviour towards safety of the employee and the employer

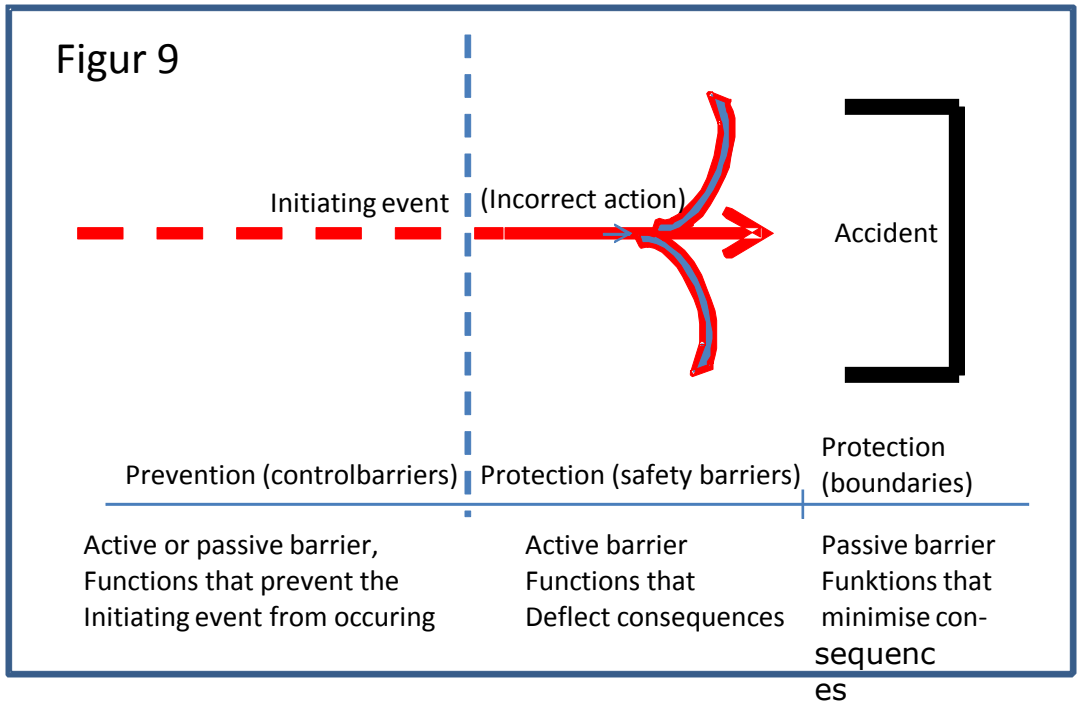
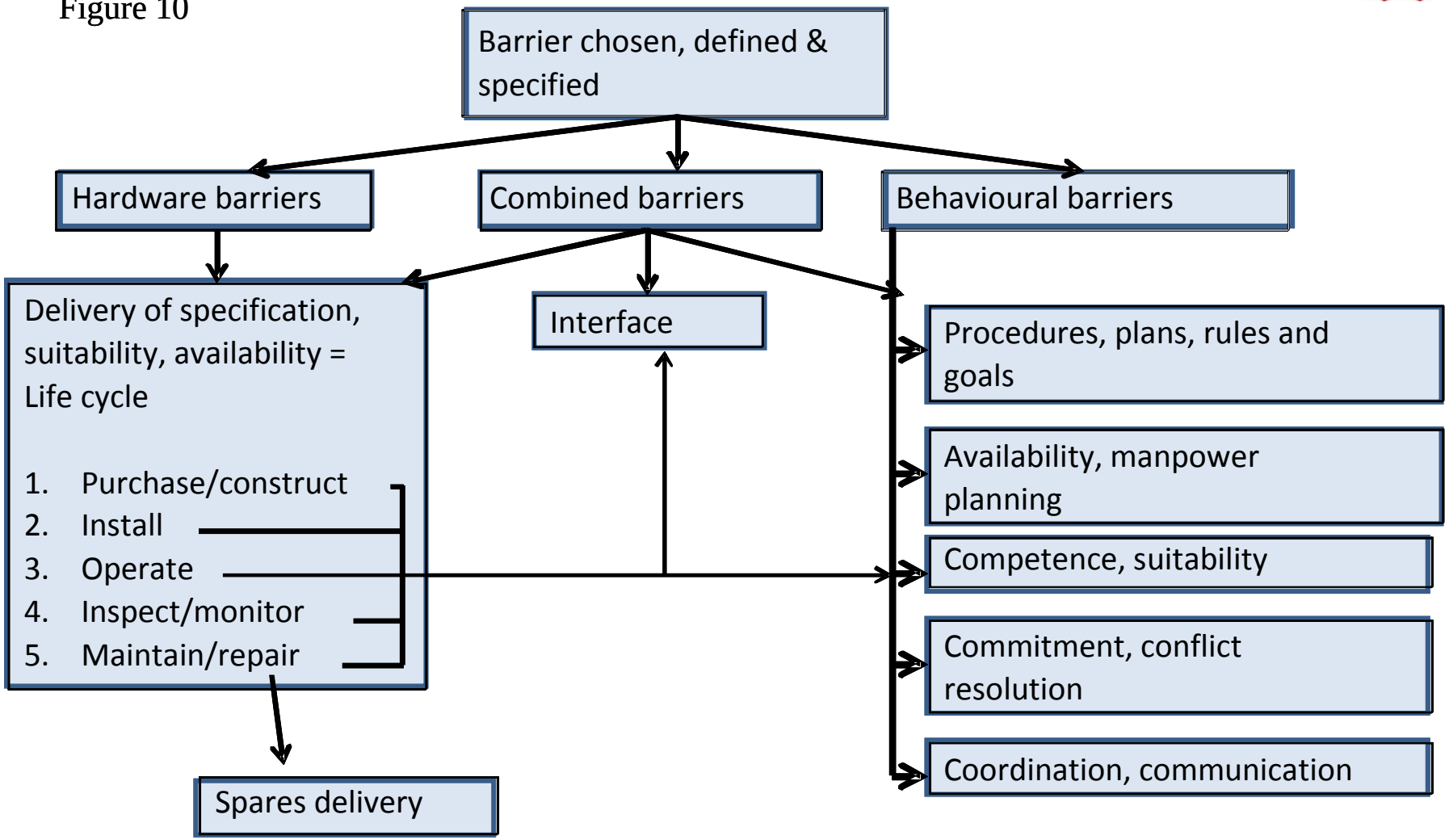
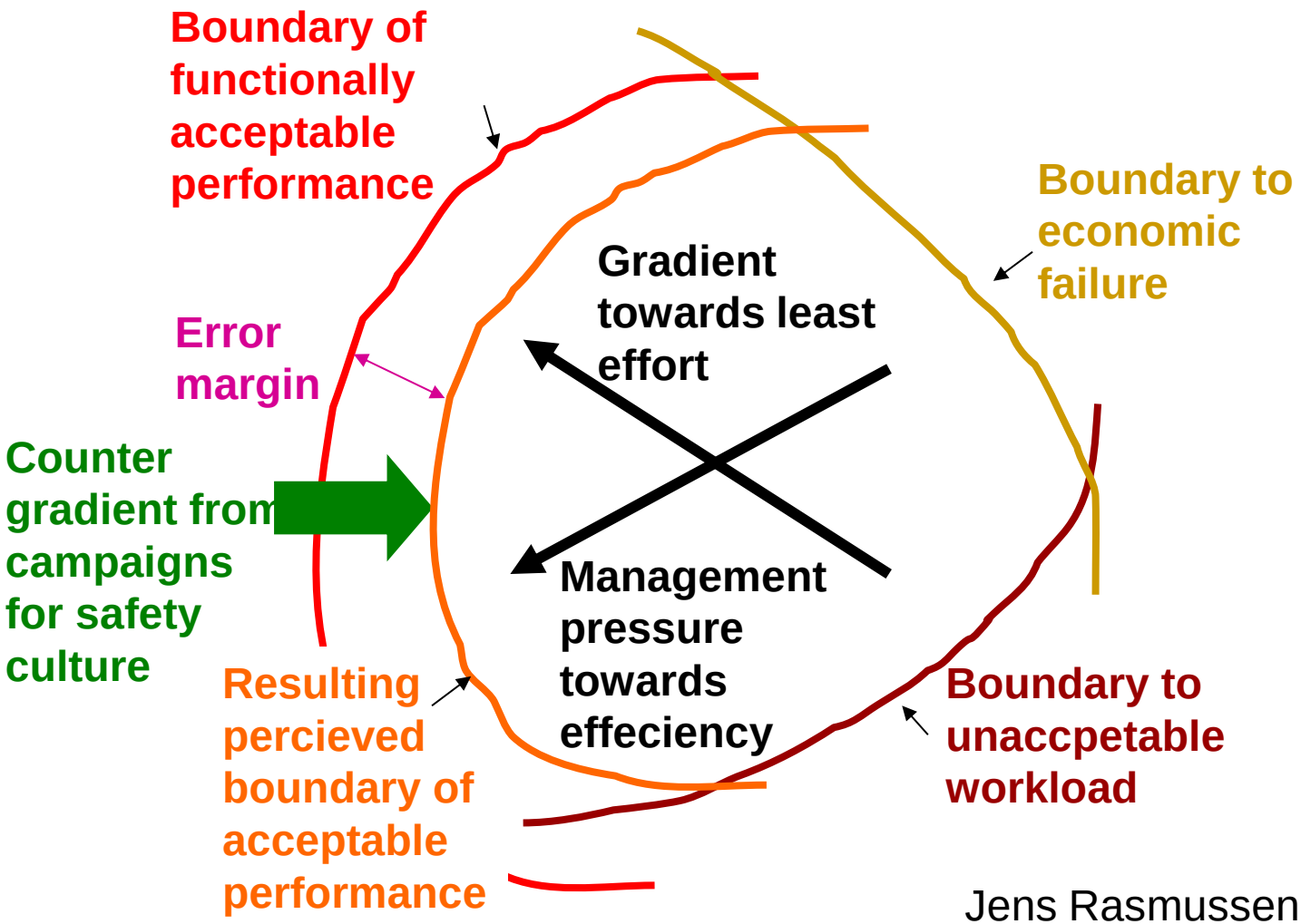

Figur 9
Initiating event
(Incorrect action)
Accident
Prevention (controlbarriers)
Protection (safety barriers)
Protection (boundaries)
Active or passive barrier,
Functions that prevent the
Initiating event from occuring
Active barrier
Functions that
Deflect consequences
Passive barrier
Funktions that
minimise con-
sequenc
es

Figure 10


Barrier chosen, defined & specified
Hardware barriers
Combined barriers
Behavioural barriers
Delivery of specification, suitability, availability = Life cycle
1. Purchase/construct
2. Install
3. Operate
4. Inspect/monitor
5. Maintain/repair
Interface
Procedures, plans, rules and goals
Availability, manpower planning
Competence, suitability
Commitment, conflict resolution
Coordination, communication
Spares delivery

The dynamic and dilemma of safety



Jens Rasmussen 1997

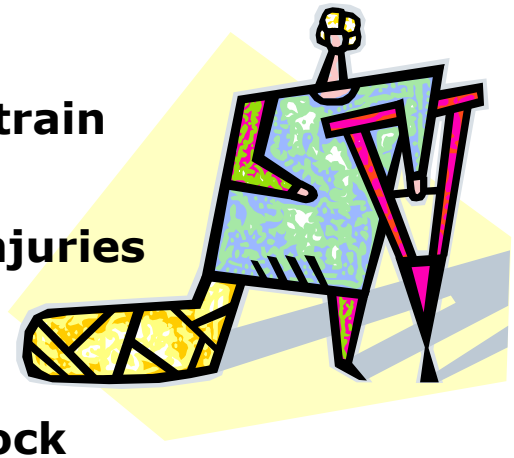
The consequences of accidents

The Injuries

- Fatalities
- Amputation
- Fracture
- Back pain
- Sprain and strain
- Wounds
- Superficial injuries
- Poisoning
- Infections
- Electrical chock
- Burns and scalds
- Shocks

Injuries and losses

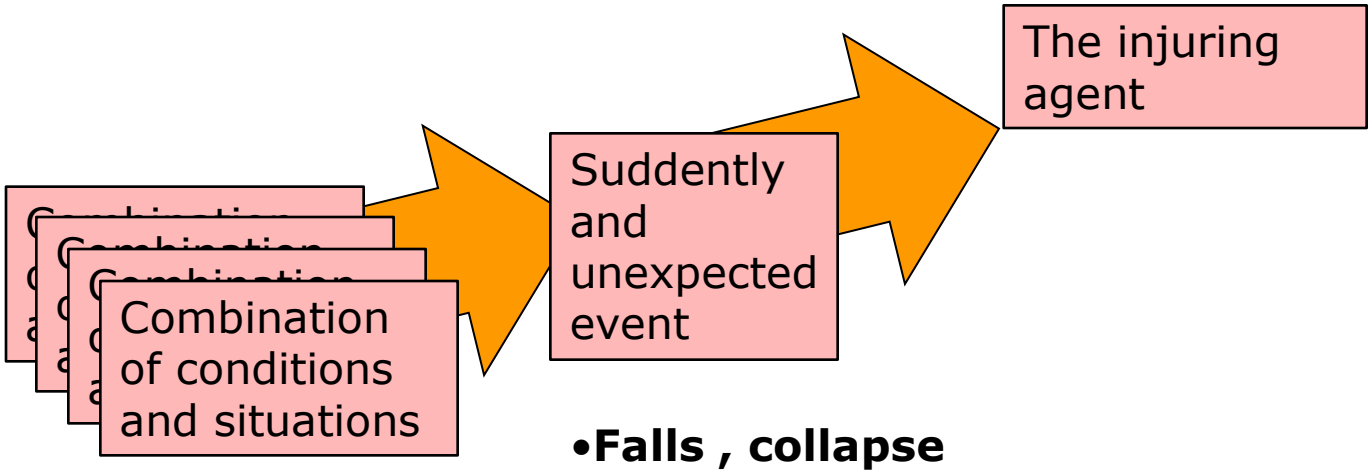
Treatment and rehabilitation



Losses

- Employee
- Constructions
- Technical equipment
- Production
- Qualitet
- Custumer
- Economy

The accident event

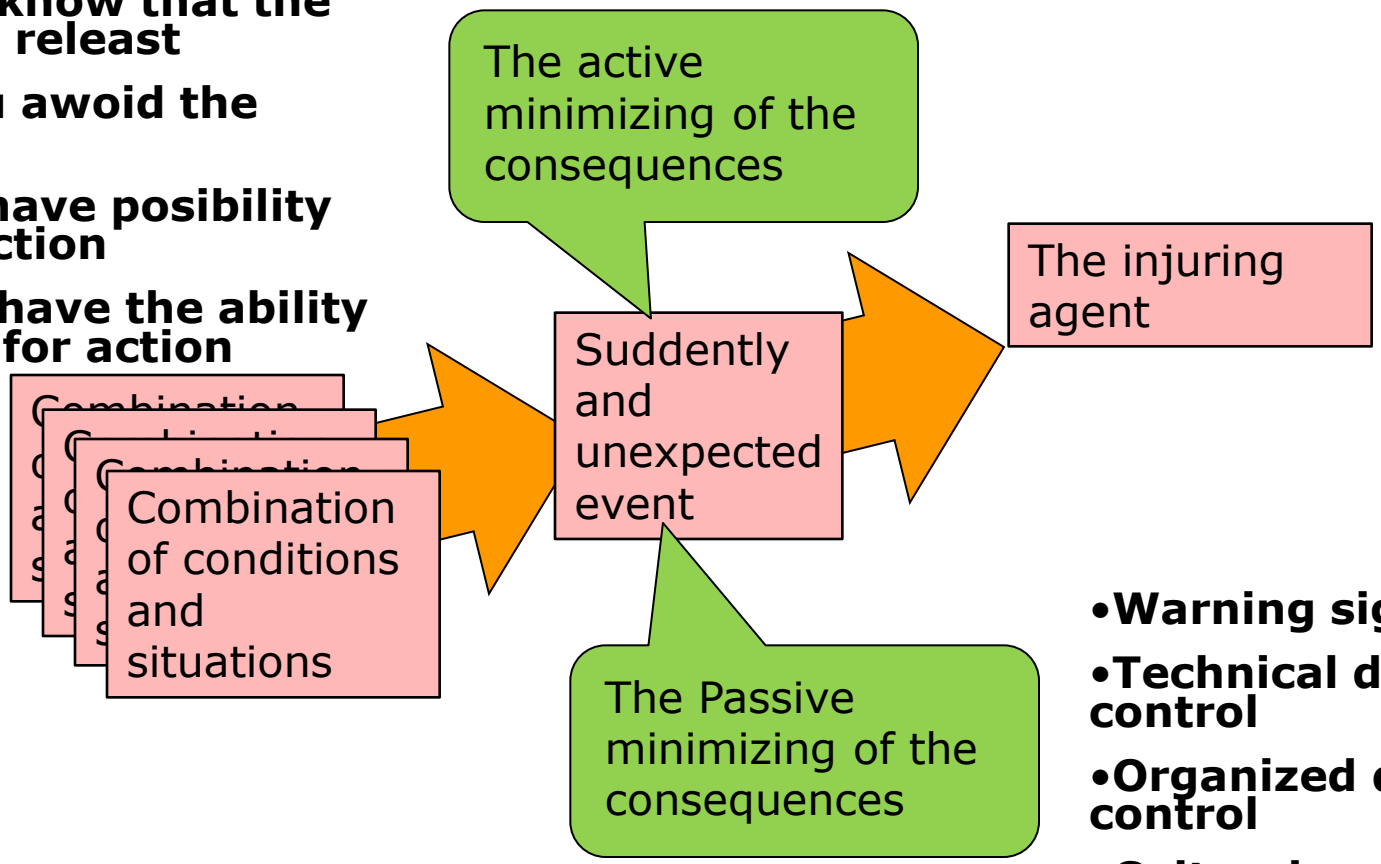


- **Falls , collapse**
- **Falling agents**
- **Collisions, flying objects**
- **Fire explosions**
- **Inappropriate movements**
- **Breakage, bursting**
- **Vaporization, overflowing, leaking**
- **Aggression**

- **Sharp edges**
- **Moving parts**
- **High pressure**
- **Kinetic energy**
- **Potential energy**
- **Heath, frost**
- **Electricity**
- **Chemicals**
- **Lights**
- **Sounds, Noise**
- **Heavy lifting**
- **Radiations**
- **Violence**
- **Lack of oxygen**

The accident event

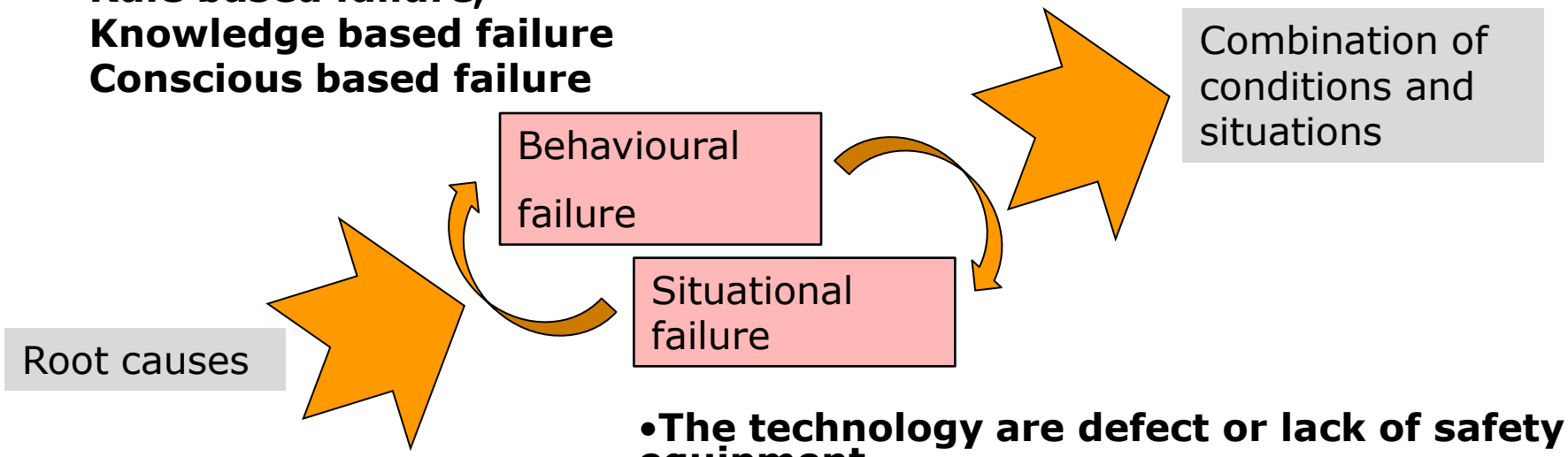
- **Can the danger be recoqnized**
- **Do you know that the danger is releast**
- **Can you awoid the danger**
- **Do you have posibility to take action**
- **Do you have the ability and time for action**



- **Warning signals**
- **Technical damage control**
- **Organized damage control**
- **Culturel and informal limitations**

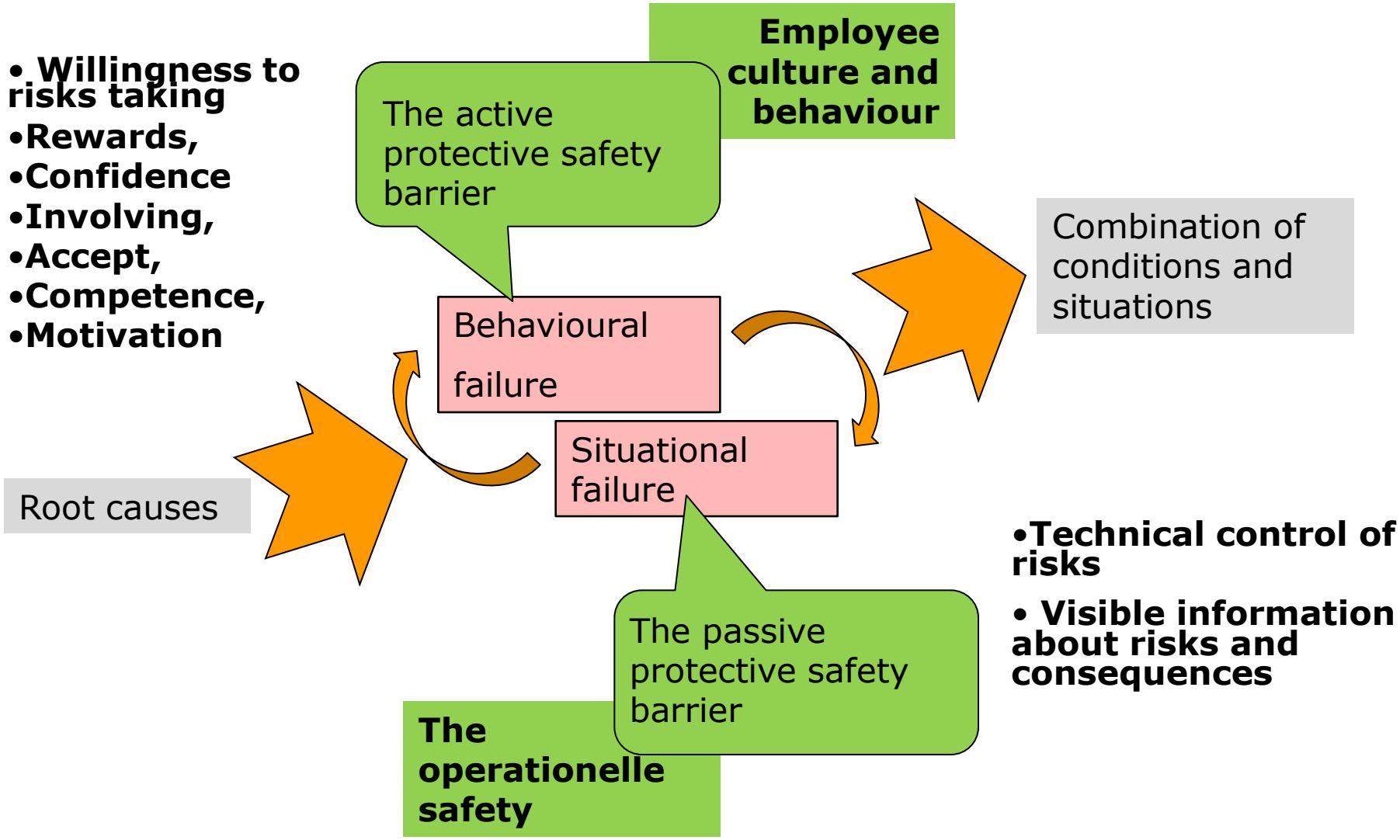
Immidiate causes

Experience based failure
Rule based failure,
Knowledge based failure
Conscious based failure



- **The technology are defect or lack of safety equipment**
- **The product are defect, do not function, or are wrong for the use**
- **The task has failure in instruction, collapse with other tasks, has lack of information**
- **The surroundings changes, change in weather, changes in light, sounds, interruptions**

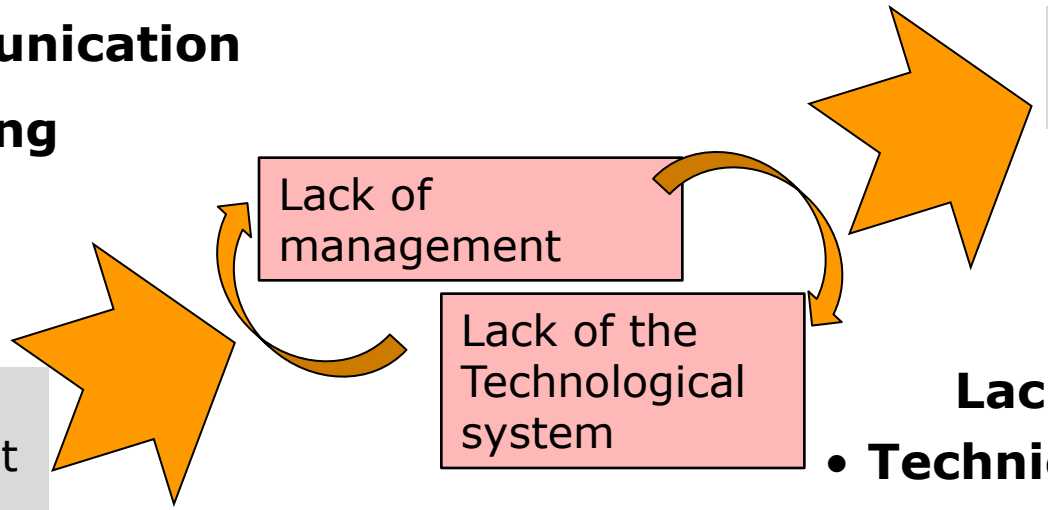
Immidiate causes



The root causes

Lack of

- **Instruction and training**
- **Procedures, standards**
- **Communication**
- **Planning**



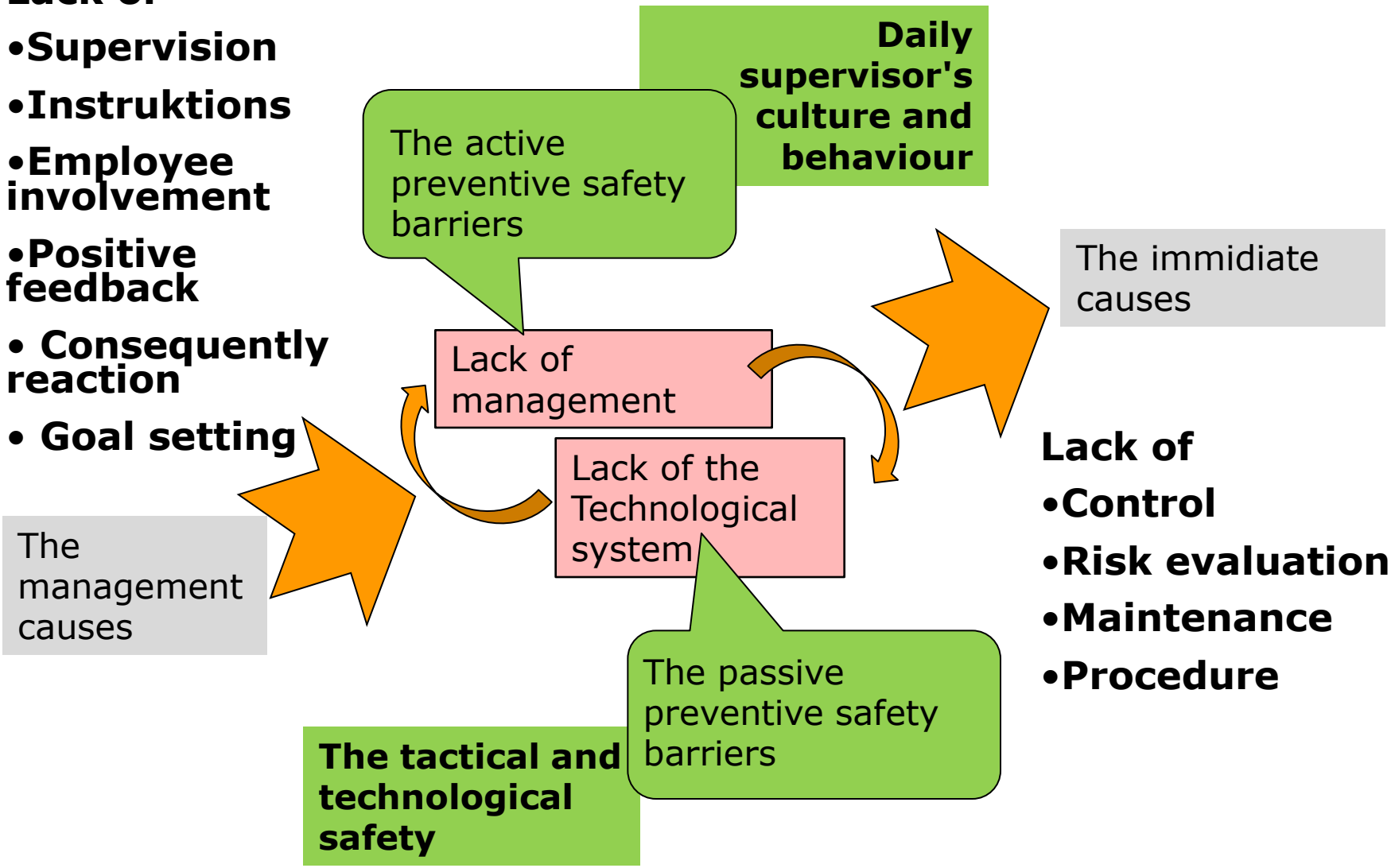
Lack of

- **Technical safety**
- **Maintenance**
- **Cleaning**
- **Constructional condition**
- **Environmental conditions**
- **Road safety**
- **Workplace conditions**

The root causes

Lack of

- **Supervision**
- **Instruktions**
- **Employee involvement**
- **Positive feedback**
- **Consequently reaction**
- **Goal setting**



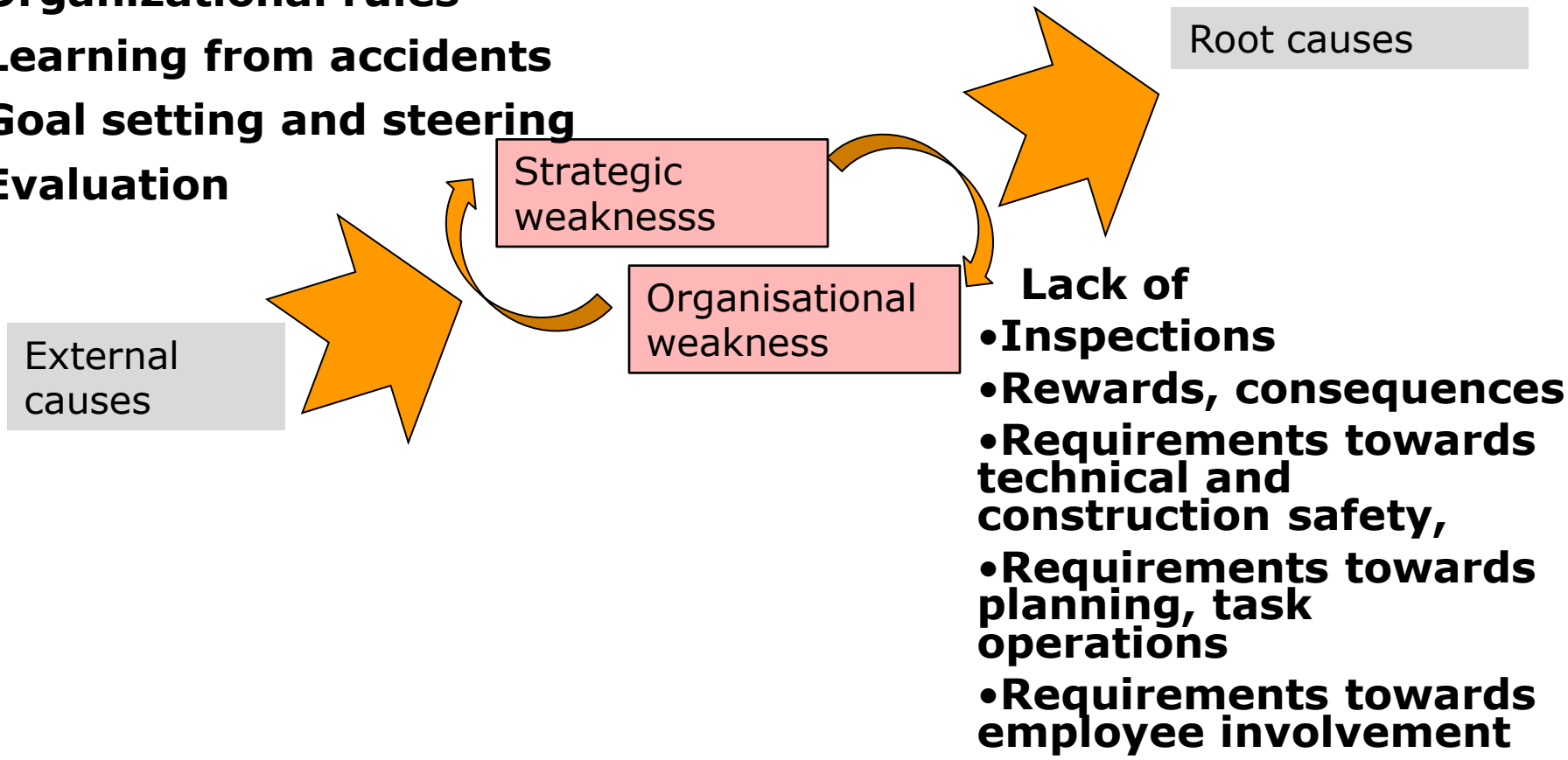
Lack of

- **Control**
- **Risk evaluation**
- **Maintenance**
- **Procedure**

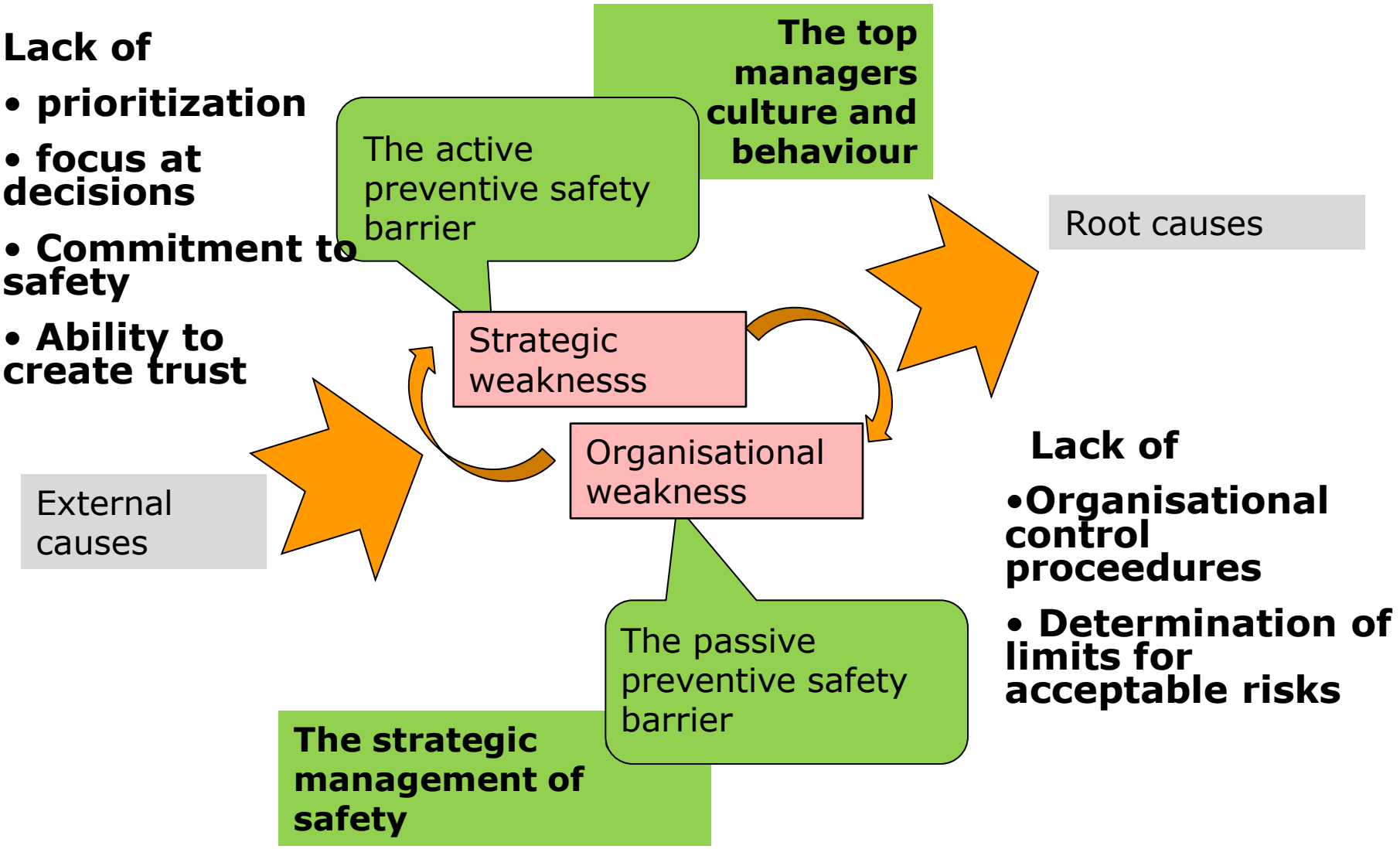
Management causes

Lack of

- **Prioritization of safety**
- **Safety management**
- **Management training**
- **Organizational rules**
- **Learning from accidents**
- **Goal setting and steering**
- **Evaluation**

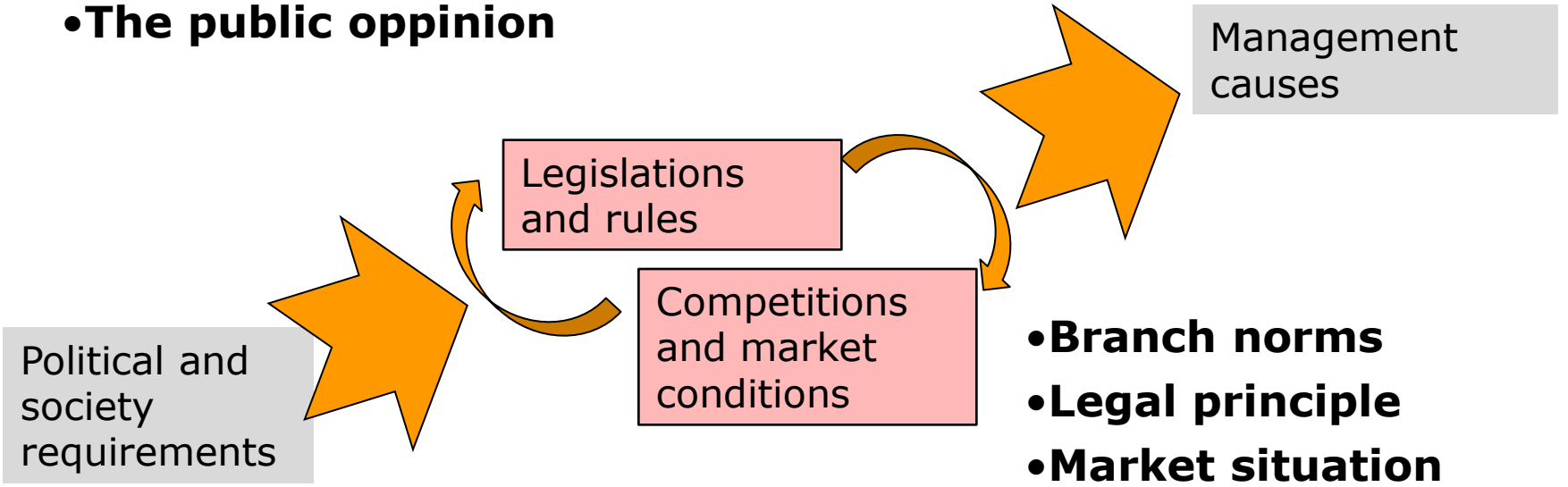


Management causes



Eksternal causes

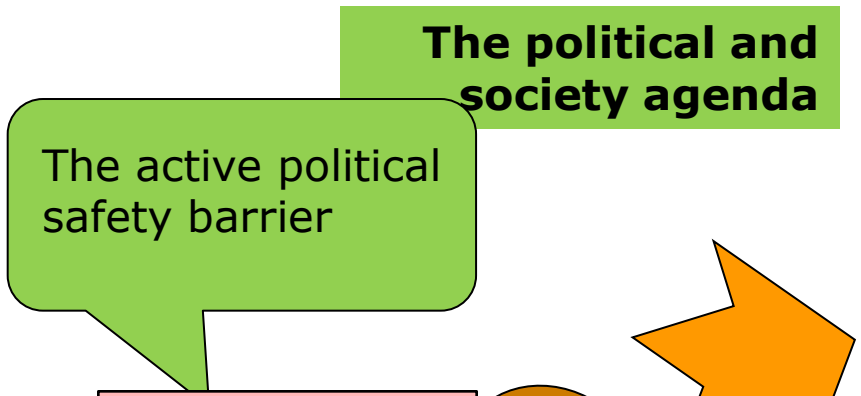
- **Nationale rules**
- **Internationale rules**
- **Informal rules**
- **The public oppinion**



- **Branch norms**
- **Legal principle**
- **Market situation**
- **Salary conditions**
- **Recruiting conditions**
- **Customer requriements**

Eksternal causes

- **Den politiske vilje**
- **Beslutnings-muligheder**
- **Den offentlige bevidsthed og accept**



- **The authority control**
- **Certification**
- **Auditing**
- **Insurance**
- **Organizational agreements**
- **Research**

Eksternal requirements, economical pressure,

The goal for the analysis of an accident

- To prevent the same thing happen again
- To find risks and causes of more general sort

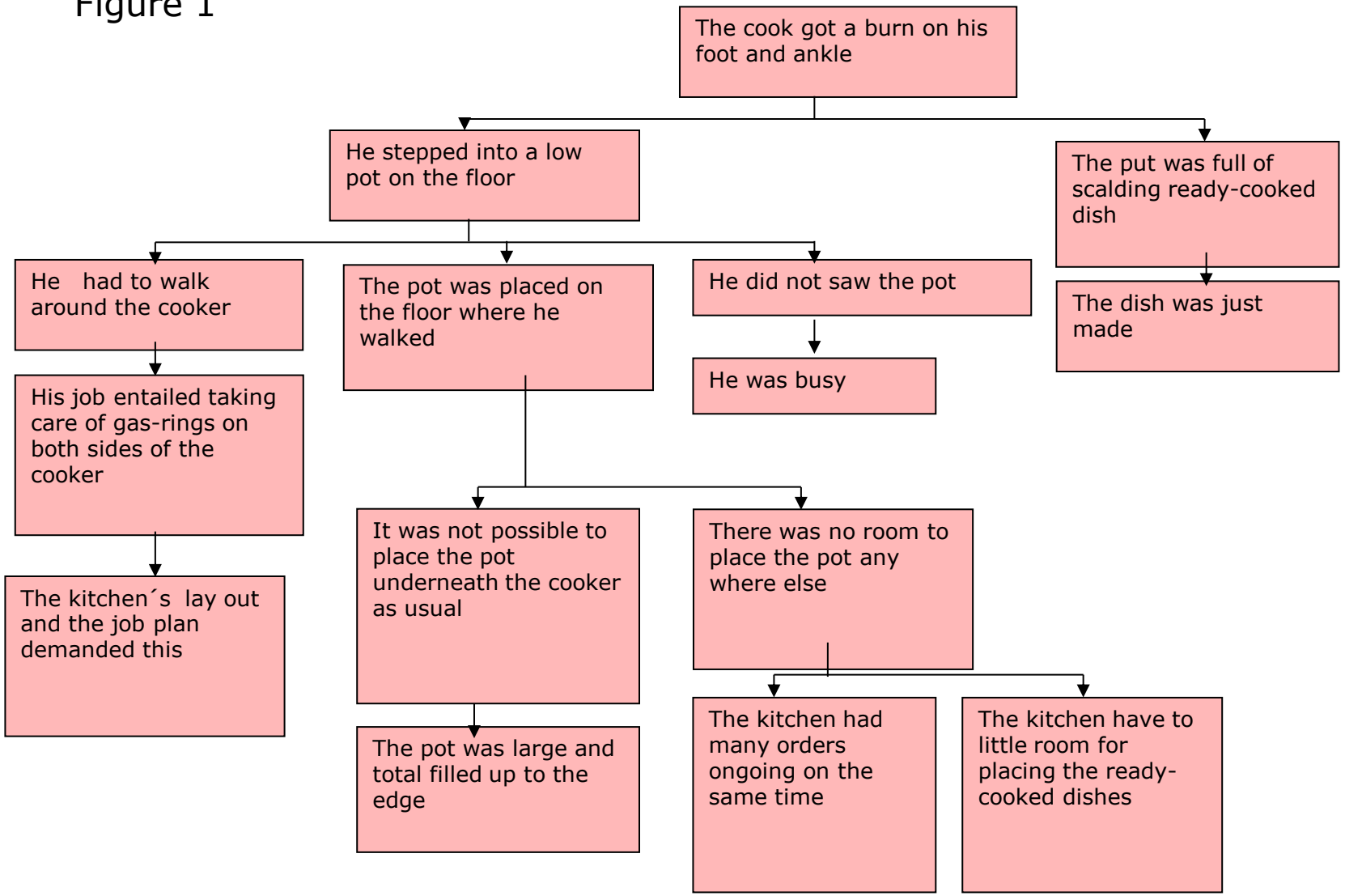
An accident desciption

A cook burn his angel and foot, when he stepped up in a pot with very hot just finished food.

The pot was placed on the floor beside the cooker. The cook has to work on both sides of the cooker, he had several task going on, so he had to pass the place where the pot was standing.

They were very busy in the kitchen. It was normal to place pots with finished food on the floor, but normal under the cooker and not beside.

Figure 1


The cook got a burn on his foot and ankle
He stepped into a low pot on the floor
The put was full of scalding ready-cooked dish
He had to walk around the cooker
The pot was placed on the floor where he walked
He did not saw the pot
The dish was just made
His job entailed taking care of gas-rings on both sides of the cooker
He was busy
The kitchen´s lay out and the job plan demanded this
It was not possible to place the pot underneath the cooker as usual
There was no room to place the pot any where else
The pot was large and total filled up to the edge
The kitchen had many orders ongoing on the same time
The kitchen have to little room for placing the ready-cooked dishes

An accident analysis is made on the wisdom of hindsigts

Analysis of accidents are always based on knowledge about what did happen. At that moment it is easy to see what should have been done differently.

But before the accident it can be very difficult to foresee what can happen.

A risk situation is very difficult to understand and realize

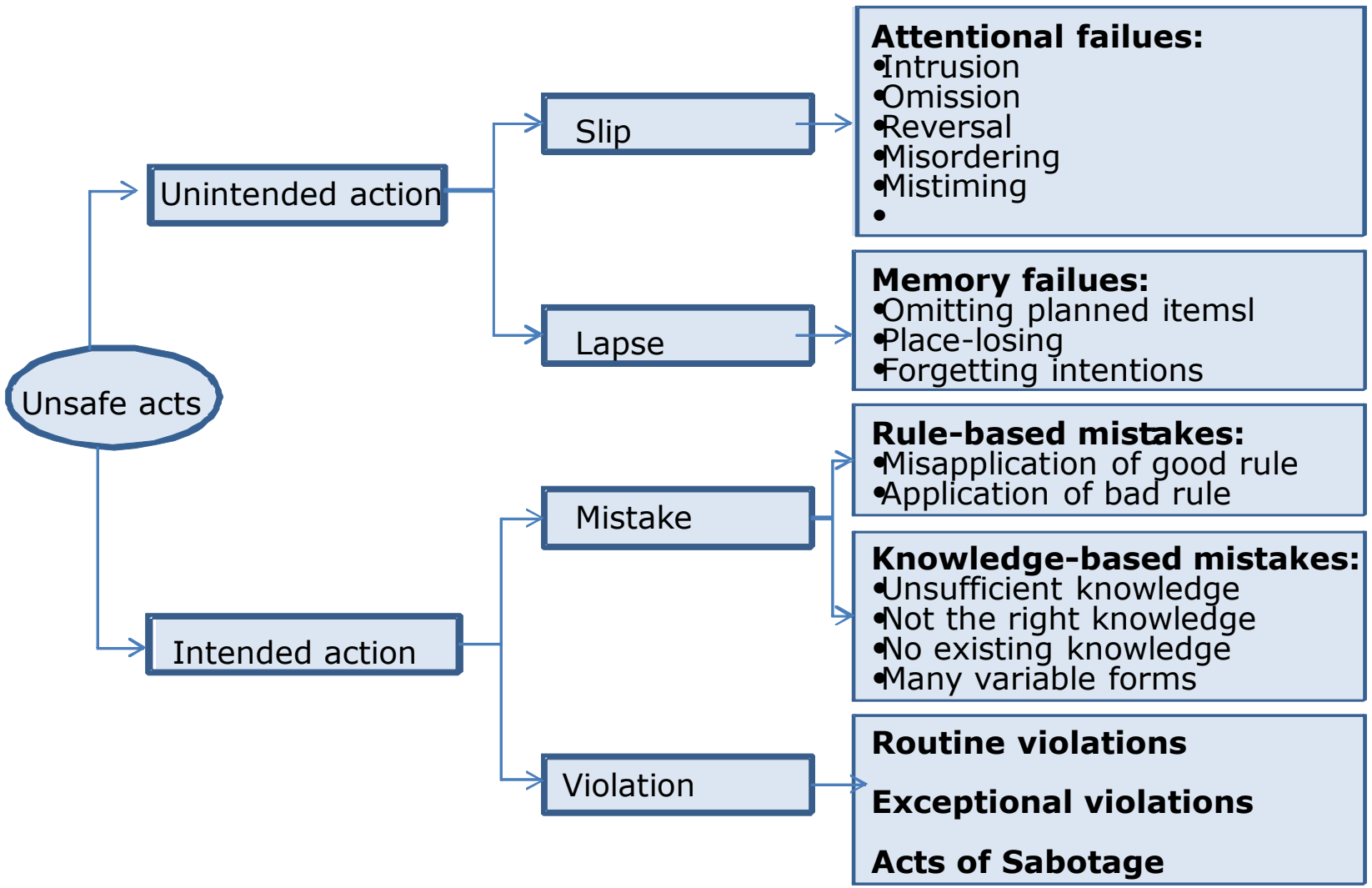
A certain situation can seems to be normal without special risks, but because of a new invisible combination of conditions can create the difference between good and bad.

There are many risks in our normal day life and we are used to cope most of these risks.

That can make us unaware and blind towards risks that can be dangerous in specific situations.

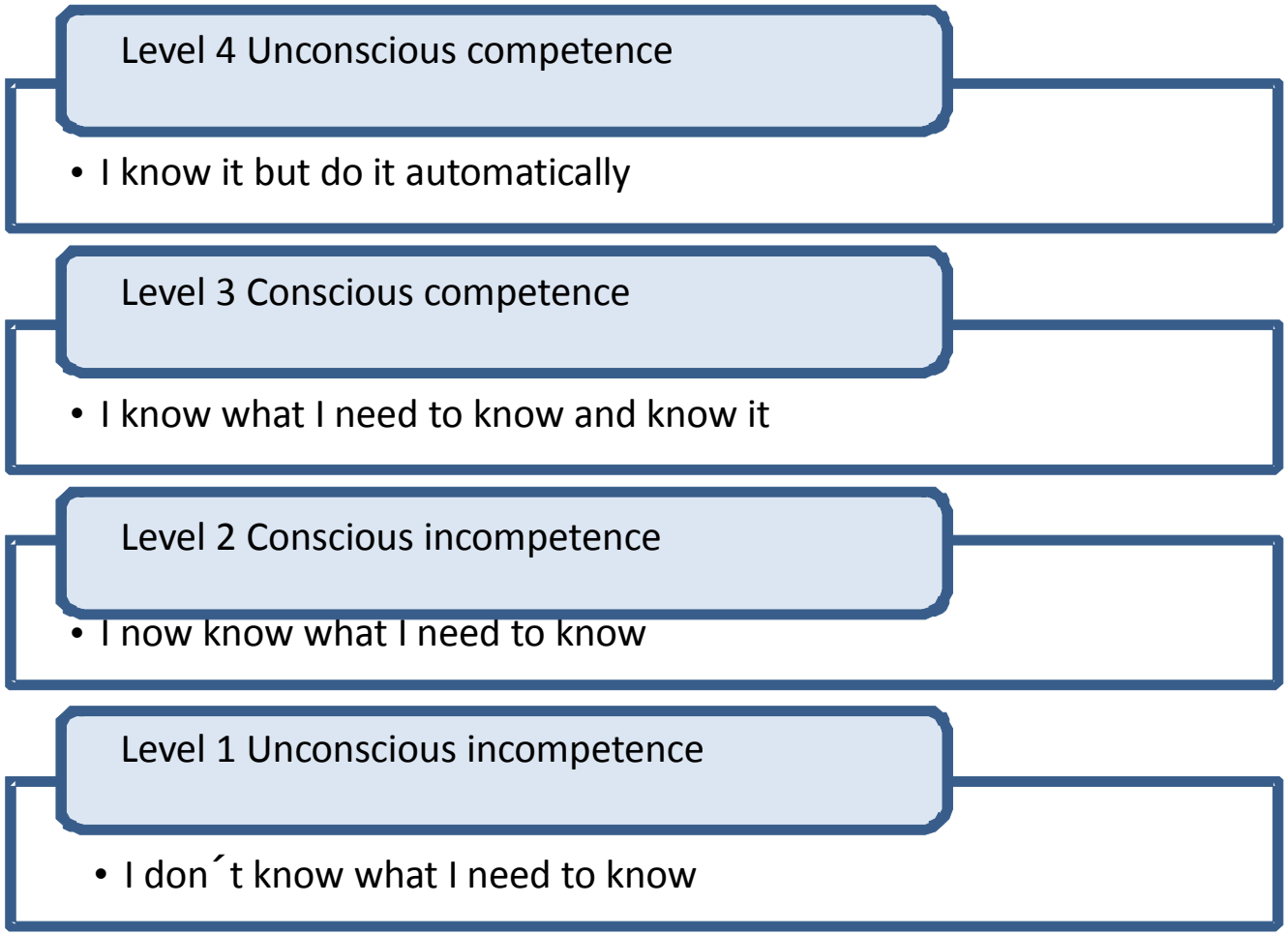
The Human failure

- When people Personen omit to do the task as prescribed
- When people do the task as prescribed but do it wrong
- When people do things that is not prescibed or asked for

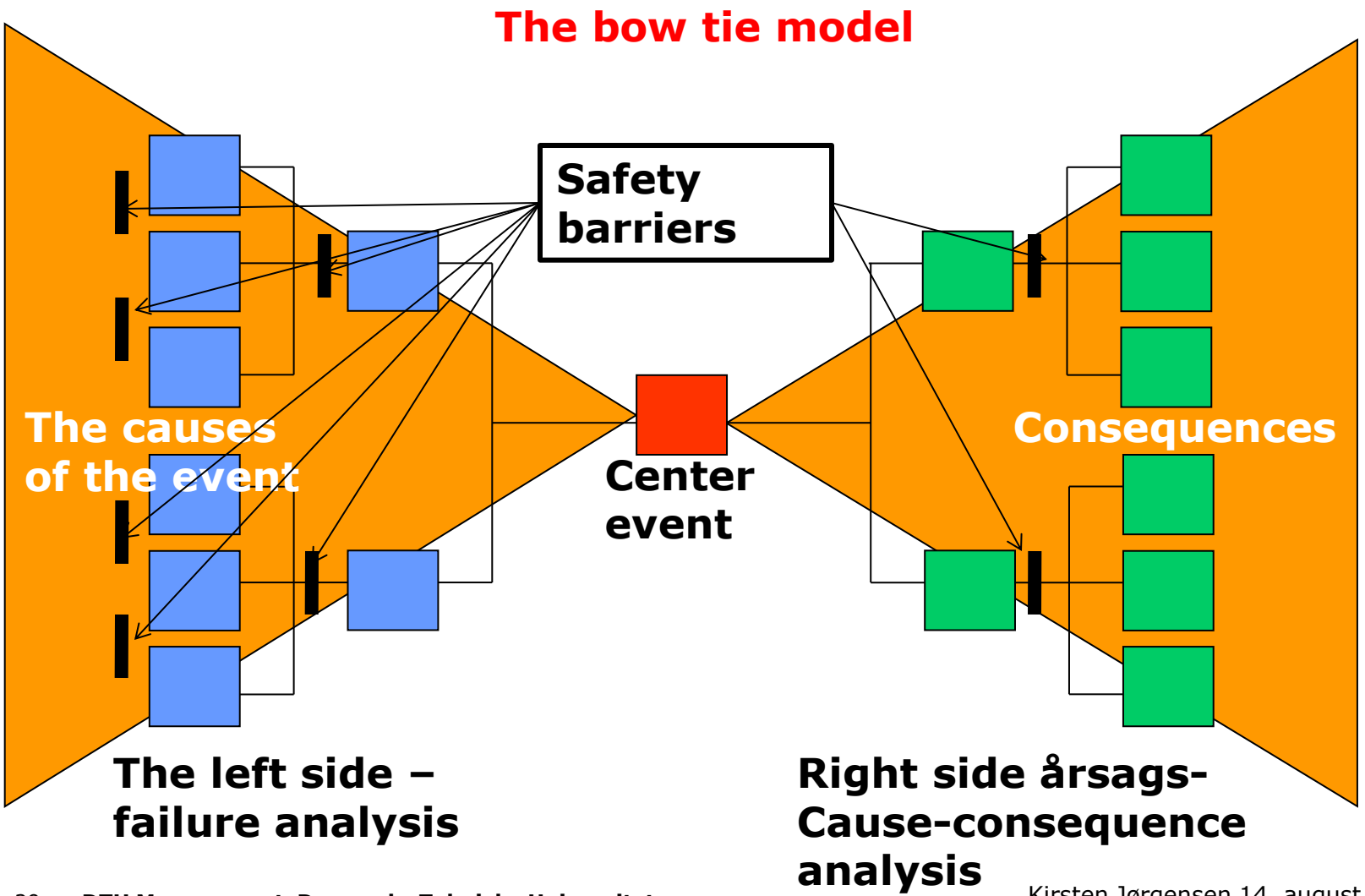


Reason J. 1990, Human Error

Level og competences



Focus on safety barrier and risks



Safety barriers can be observed

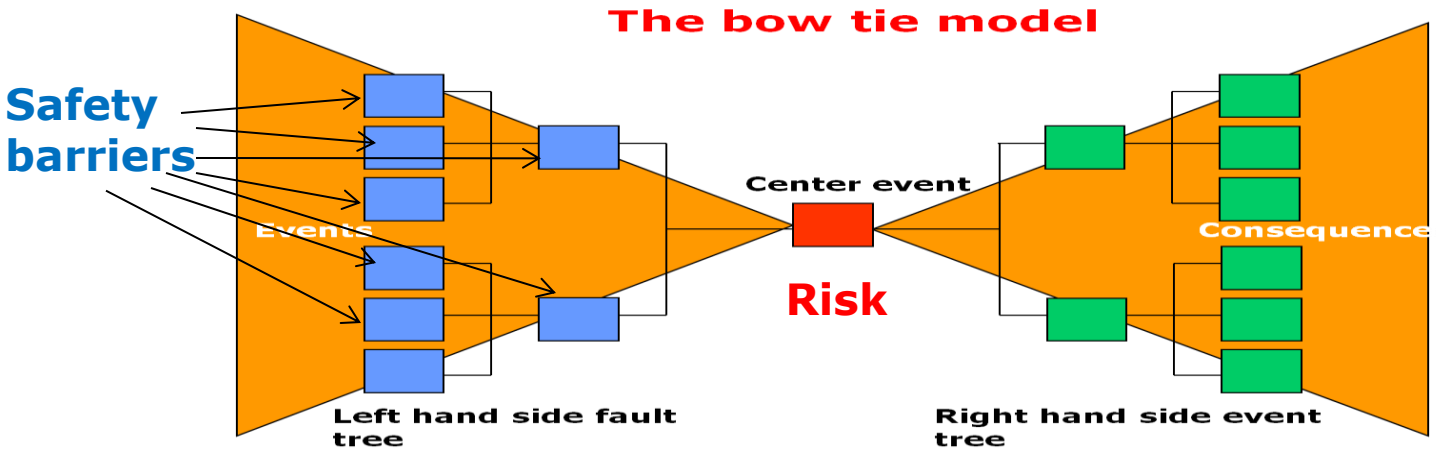
Risks are not there all the time

Risks vary from time to time

Risks can arise momentarily or be hidden all the time

Safety barriers must be in place in a good manner all the time

Safety barriers observable and possible to evaluate



Accident risks

4-17-64

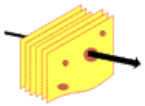
1. The surface on which you move/work - concerns the risk of falling
2. Conditions at the work place - concerns your surroundings where there is a risk of being hit or hitting something, being hit by collapsing or falling objects, flying objects or similar
3. What you are working with – concerns the risk of being cut (sharp edges), jammed, crushed, injured by moving tools or chemicals etc.
4. Special dangers - concerns very specific and infrequent high risks like fire, explosion, drowning, poisoning etc.

Characteristics	*Activity*	*Risk*	*Hazards*
A. The surface that is being travelled on or worked on;	1. Work at heights	Falls from heights	1. Falls from heights - movable ladders
			2 Falls from heights – fixed ladders
			3 Falls from height – stepladders
			4 Falls from heights – rope ladders
			5. Falls from heights – mobile scaffolding
			6. Falls from heights – fixed scaffolding
			7. Falls from heights – erection/dismantling of scaffolding
			8. Falls from heights - roofs
			9. Falls from heights – areas, floors with large differences in level
			10. Falls from heights – fixed platforms
			11. Falls into deep holes (e.g. in the earth, floors)
			12 Falls from heights – mobile platforms
			13. Falls from heights – stationary vehicles
			14. Falls from heights – other work at height without protection
	2. Work at the same level	Falls from the same level	15. Risk of stumbling or skidding on the same level
			16.3 Falls from steps or inclined surfaces

Characteristics	*Activity*	*Risk*	*Hazards*
B. The surroundings that are being travelled on or worked on;	3. Falling objects	Being struck by falling objects	17 Being struck by falling objects – cranes or hoists
			18. Being struck by falling objects - mechanical lifting (e.g. cranes)
			19. Being struck by falling objects – from conveyances or conveyor belts
			20. Being struck by falling objects – from manually lifting
			21. Being struck by falling objects – other objects at height
	4.Fragments	Being struck by fragments	22. Being struck by fragments – from machinery or hand tools
			23. Being struck by fragments – from objects under pressure/stress
			24. Being struck by fragments – that are blown by the wind
	5. Colliding against, between, being struck by	Being struck by moving objects, becoming caught up/jammed, crushed.	25. Collision with vehicle
			26. Being struck by rolling/sliding objects
			27. Being struck by hand tools held by another person
			28. Being struck by objects held by another person
			29. Being struck by swinging objects
			30. Becoming caught/jammed between objects
			31. Colliding against/with objects
	6. Sliding of materials	Becoming buried	32. Buried under loose material
	7. Aggression	Violence	33. Exposure to aggressive people (violence)
			34. Exposure to the behaviour of animals (falls, bites, stings, kicks)

Characteristics	*Activity*	*Risk*	*Hazards*
C. What is being worked on or with;	8. Technical aids	Being struck by moving objects, becoming caught up/jammed, cutting	35. Being struck by own hand tools
			36. Being struck by moving parts of machinery - operating
			37. Being struck by moving parts of machinery - maintenance
			38. Being struck by moving parts of machinery - preparing
			39. Being struck by moving parts of machinery - cleaning
	9. Vehicles	Collisions	40. Loss of control over vehicle
	10. Electricity	Electric shock	41. Contact with electricity – electrical equipment
			42. Contact with electricity – when installing/repairing
	11. Heat or cold	Burns	43 Burns - frostbite/burns from cold/hot surfaces or naked flames
			44 Fires – combustion from "hot" work
	12. Chemical	Poisoning, etching	45. Discharge of hazardous chemicals from open containers
			46. Contact with uncovered hazardous chemicals (without discharge)
			47 Release of chemical risk from closed containers - work/filling/draining
			48 Release of chemical risk from closed containers - without transportation
			49. Release of chemical risk from closed containers – when closing containers
			50. Release of chemical risk from closed containers – work in the proximity of a discharge
	13. Lifting, heavy loads	Strain injuries	51. Extreme exertions – heavy lifting
			52. Extreme exertions – inappropriate movements

Characteristics	*Activity*	*Risk*	*Hazards*
D Surroundings of a particularly dangerous nature.	14. High voltage	Electric shock	53. Contact with electricity – high voltage cables
	15. Fire	Fire	54 Fire – flammable and easily combustible substances
			55. Fire – fire extinguishing
	16. Lack of oxygen and water	Suffocation, poisoning or drowning	56. Suffocation/poisoning – work in confined spaces
			57. Suffocation/poisoning – work with respirators
			58. Drowning – work in/under the water or liquids
			59. Drowning – work above/in the proximity of water
	17. Explosion	Explosion	60. Physical explosion
			61. Chemical explosion – vapour or gas
			62. Chemical explosion - dust
			63. Chemical explosion - explosives
			64. Chemical explosion – exothermic reaction



HUMAN SYSTEM

TECHNICAL SYSTEM

Management Delivery Systems → **Safety Barrier Tasks** → **Safety Barriers** Prevent **Loss of Control Events** → ACCIDENTAL RELEASE OF THE HAZARD AGENT

FAILURE TO DELIVER :

- Procedures
- Equipment
- Ergonomics
- Availability
- Competence
- Communication
- Motivation
- Conflict resolution

FAILURE TO:

- Provide barrier
- Use barrier
- Maintain barrier
- Monitor/ supervise barrier

BARRIER FAILURE MODE:

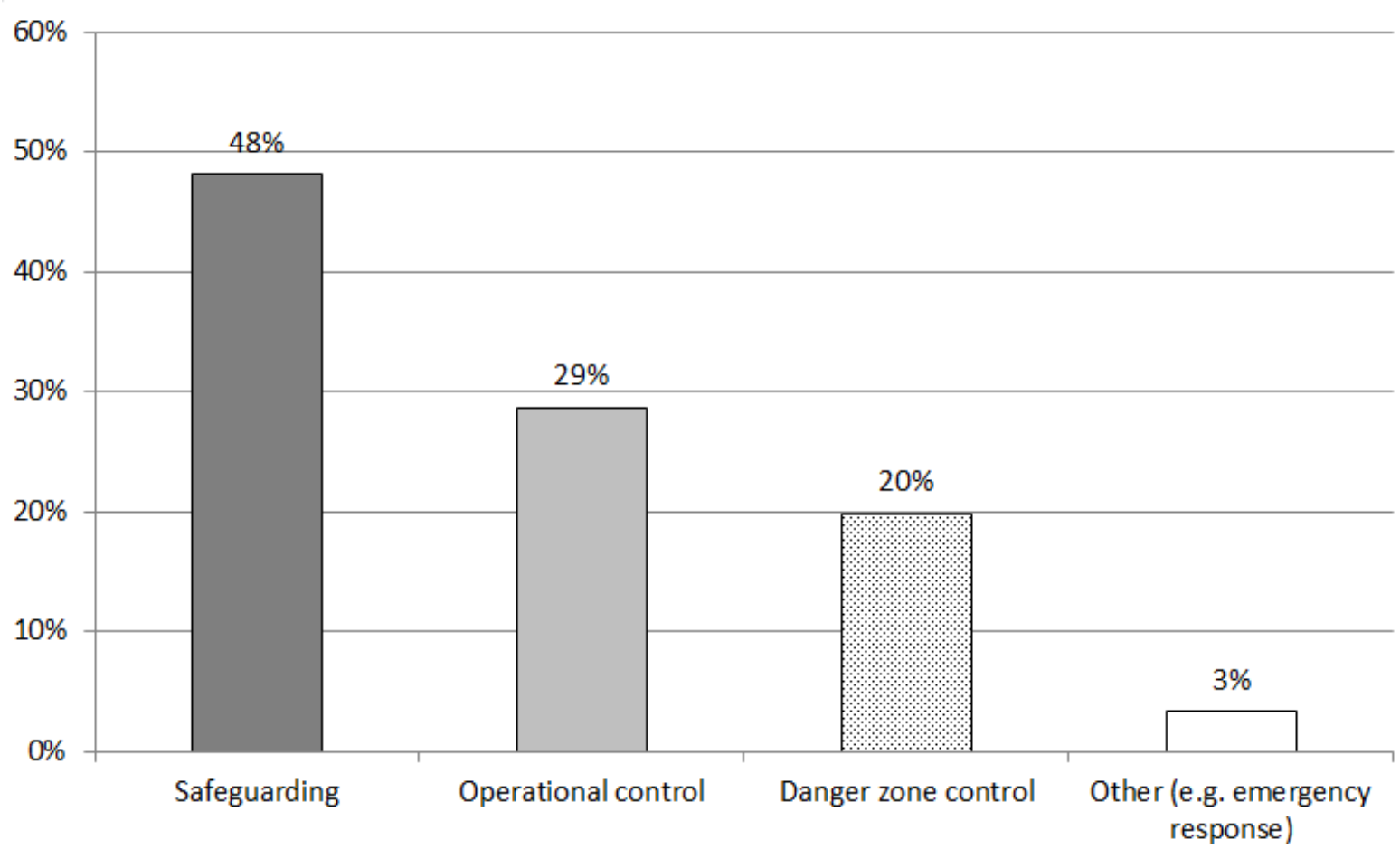
- Undesirable transmission of energy/ hazardous agents/ deviant conditions (e.g. vibration, temperature)
- Failed physical conditions (e.g. structural integrity, strength)
- Hazardous agent/ energy not separated from vulnerable target (e.g. distance of people from hazard)

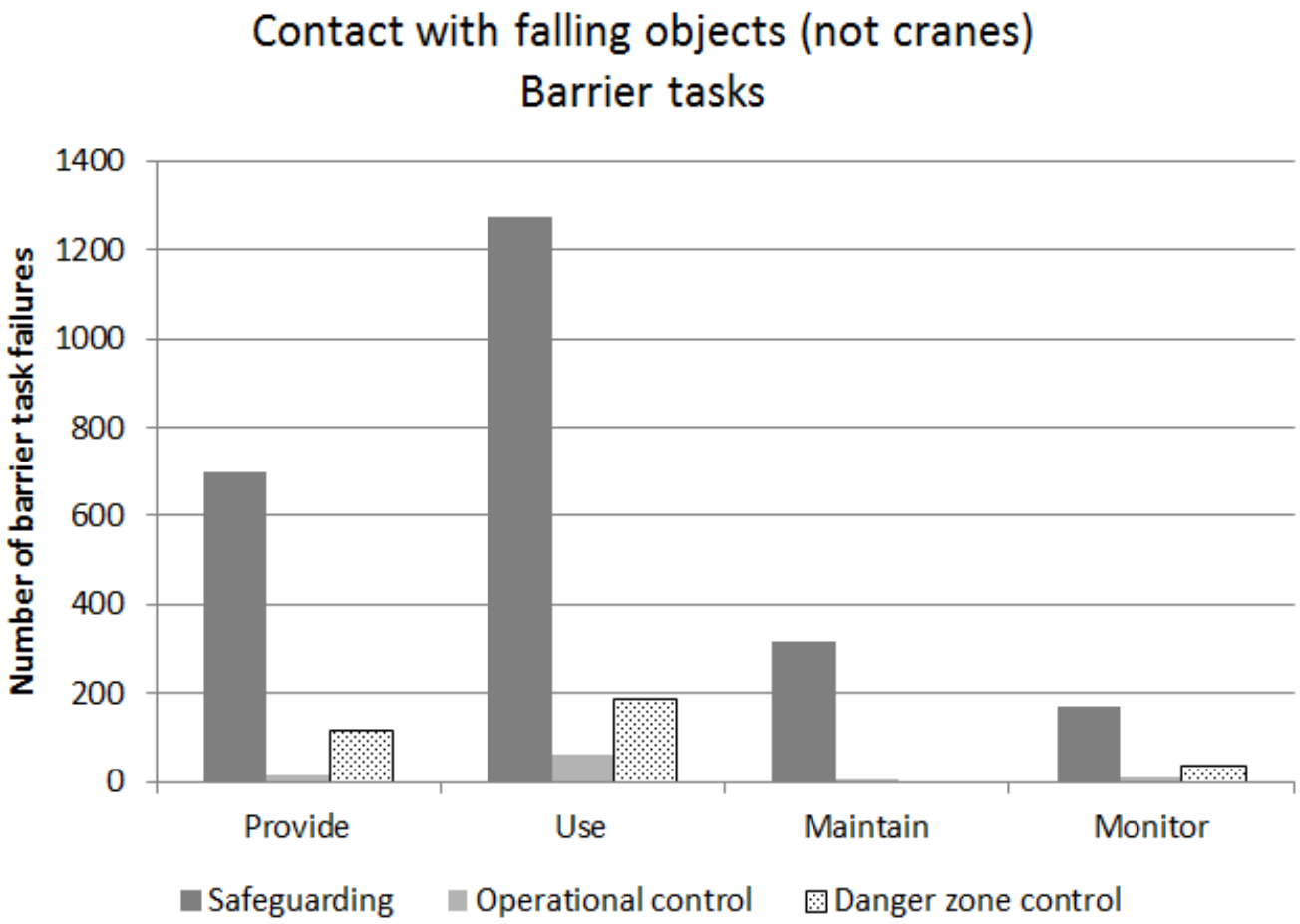
LOSS OF CONTROL:

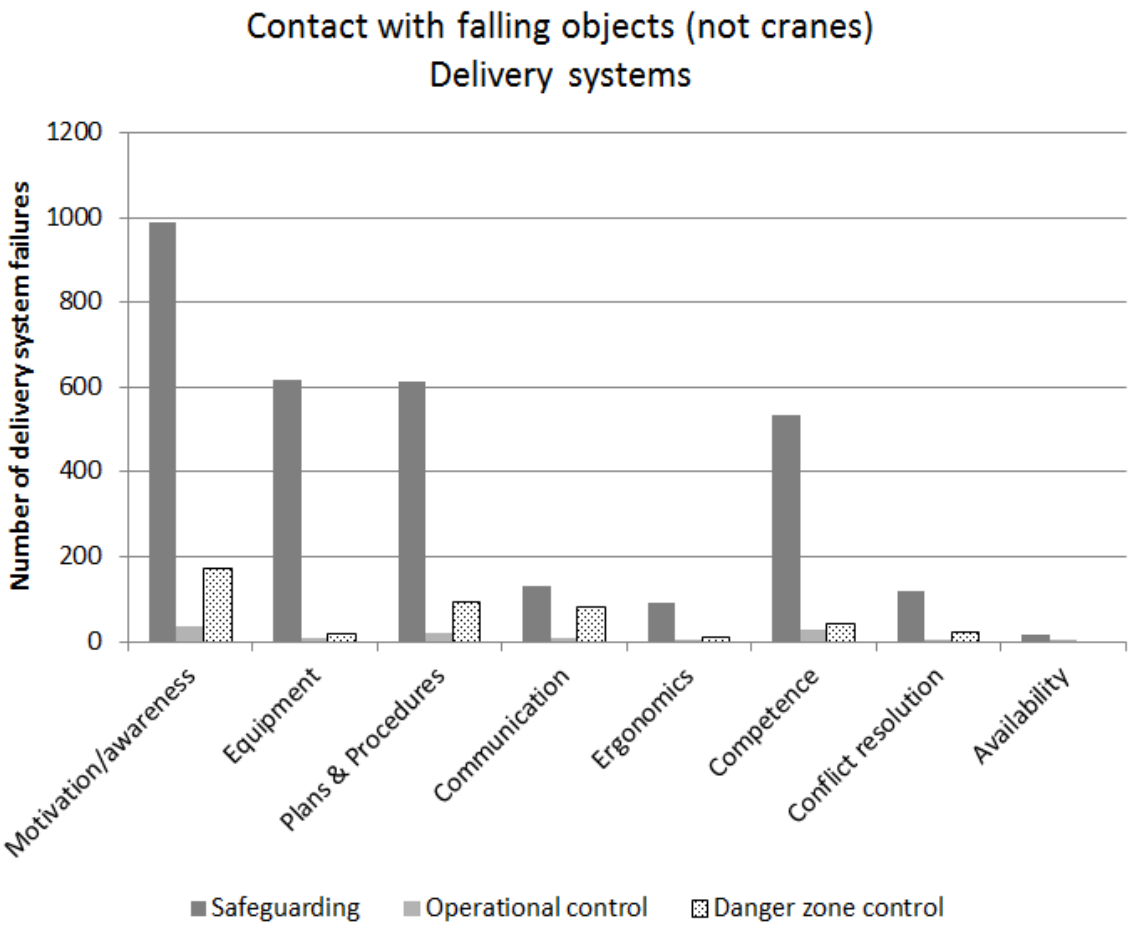
- Presence, build-up, or release of the hazardous agent/ energy.

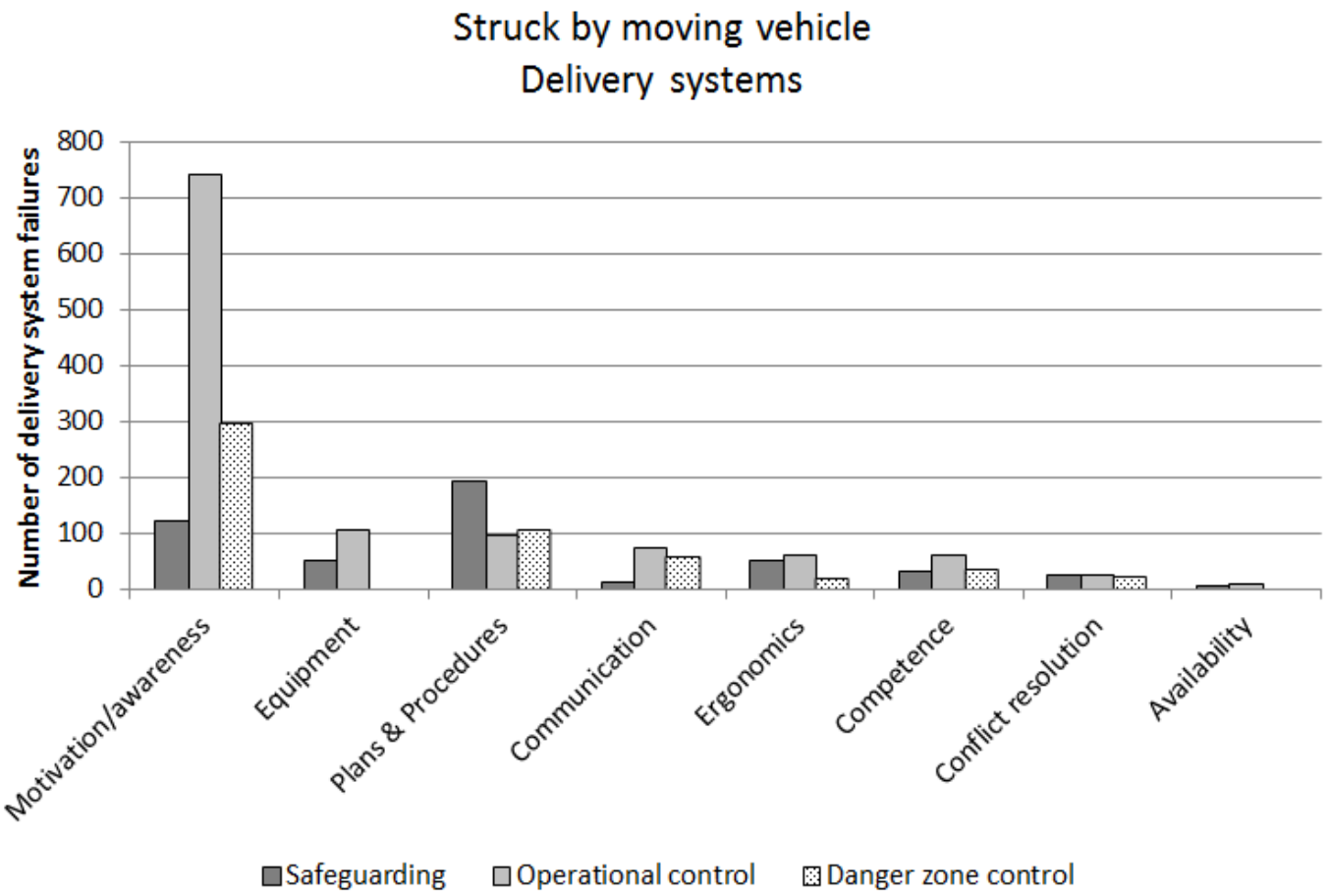
Risks – barriers and PIE´s an examble

Activity hazardous	*Primary safety barriers*	*Support safety barriers*	*Evaluation criteria – PIEs*
Work at placement ladders/ Risk of falling	1 Ladder strength	1. Type of ladder and its strength	Conditions of ladder steps
			Inspection of ladder capacity and length
			Maintenance and storage
			Cleaning
	2. Ladder stability	2. Placement and protection of the ladder	Placement on the ground
			Placement at the top, angle
			Protection against traffic
	3. User stability	3. Ability of the user to stay on the ladder	Position on the ladder
			Personal condition
			Use of both hands to hold onto the ladder
			External forces influence
			Appropriate movements

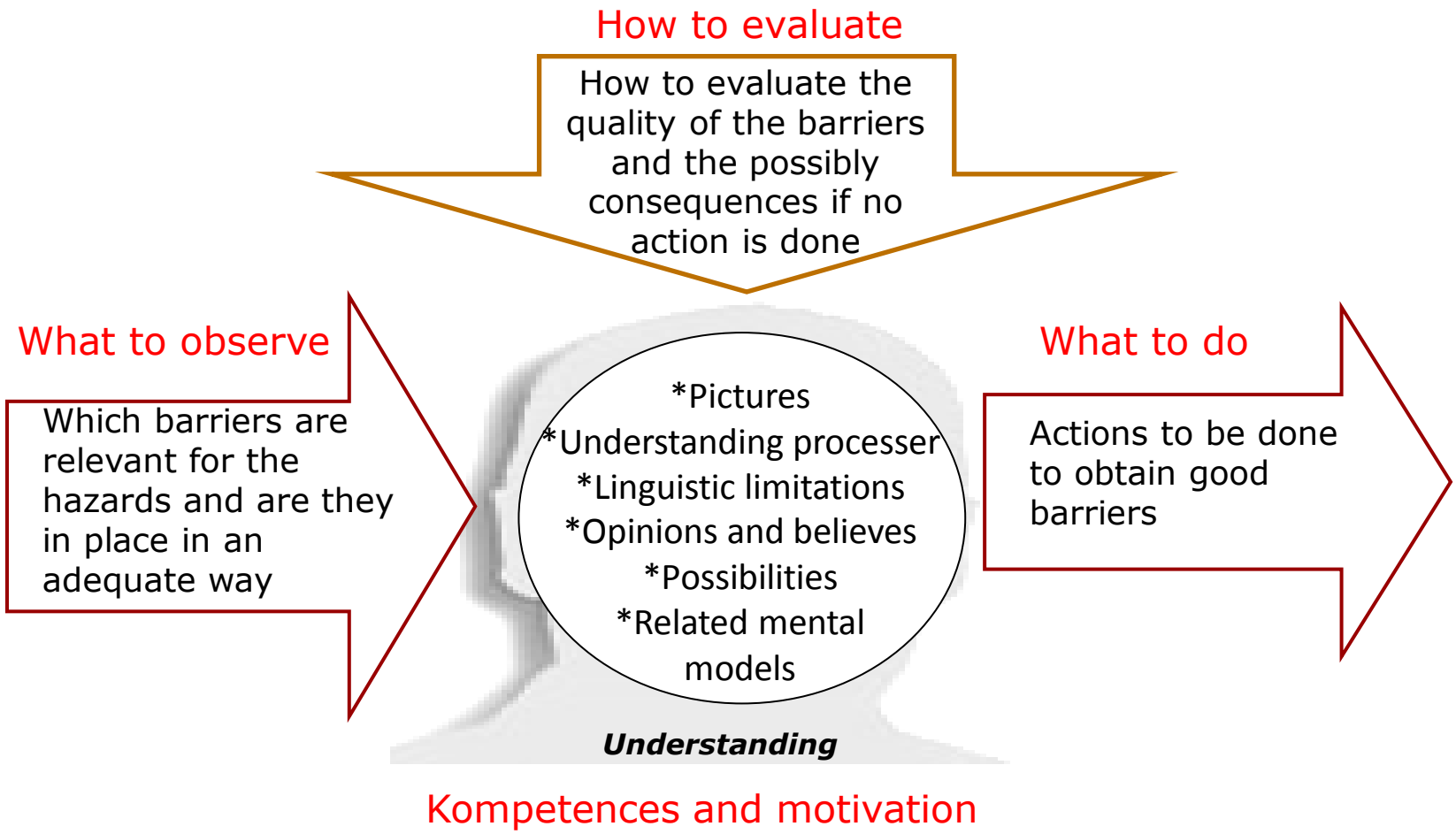

60%
50%
40%
30%
20%
10%
0%
48%
29%
20%
3%
Safeguarding
Operational control
Danger zone control
Other (e.g. emergency response)


Contact with falling objects (not cranes)
Barrier tasks
Number of barrier task failures
1400
1200
1000
800
600
400
200
0
Provide
Use
Maintain
Monitor
Safeguarding
Operational control
Danger zone control


Contact with falling objects (not cranes)
Delivery systems
Number of delivery system failures
1200
1000
800
600
400
200
0
Motivation/awareness
Equipment
Plans & Procedures
Communication
Ergonomics
Competence
Conflict resolution
Availability
Safeguarding
Operational control
Danger zone control


Struck by moving vehicle
Delivery systems
Number of delivery system failures
800
700
600
500
400
300
200
100
0
Motivation/awareness
Equipment
Plans & Procedures
Communication
Ergonomics
Competence
Conflict resolution
Availability
Safeguarding
Operational control
Danger zone control

Situational awareness



INFO Cards

For the employer

LEDELSE

Fare: Arbejde i højde med risiko for fald til lavere niveau
Omfatter ophold og arbejde på alle former for stiger, stilladser, platforme, niveauforskelle, tage mv.

Barrieretyper	Observer/undersøg	Forstå/tolk og vurder	Handle/udfør
Udstyrets styrke	Observer om udstyret er i orden, rengjort og vedligeholdt. Undersøg hvilket udstyr der er behov for til opgaverne og dets bæreevne. Undersøg om der er behov for andet udstyr til opgaverne. Observer om medarbejderne tilbage-melder når udstyret ikke er i orden. Observer medarbejdernes adfærd og anvendelse af udstyret.	Vurder om konstruktionen er hensigtsmæssig til opgave. Vurder bæreevnen i forhold til opgaven. Vurder vedligeholdelses-tilstanden. Vurder behov for afhjælpende foranstaltninger. Vurder behovet for information til medarbejdere og eventuelt. procedurer for arbejdet Vurder behovet for særlig instruktion. Vurder behovet for motiverende initiativer overfor medarbejderne.	Sørg for mangler udbedres Sørg for det rigtige udstyr kommer i anvendelse Fjern defekt udstyr Informer medarbejderne om hvilket udstyr de skal anvende Informer medarbejderne om hvilket udstyr der er defekt eller er under udbedring Sørg for procedurer for renholdelse og vedligeholdelse Motiver og instruer medarbejderne om hvordan du ønsker de skal forholde sig når de arbejder i højde og hvilke tilbagemeldinger de skal give, når de finder at tingene ikke er i orden
Behov for rækværk	Observer behovet for rækværk Observer nødvendigt rækværks kvalitet Observer om rækværk er monteret korrekt og i god vedligeholdt tilstand	Vurder tilgængelighed, vedligeholdelse, styrke, opsætning af rækværker. Vurder motivation til at sikre vedligeholdelse af rækværkernes kvalitet. Vurder behovet for særlig instruktion. Vurder behovet for motiverende initiativer overfor medarbejderne.	Sørg for at mangler udbedres Informer medarbejderne om hvordan de skal forholde sig Motiver og instruer medarbejderne om hvordan du ønsker de skal forholde sig når rækværker mangler eller ikke er i orden.
Udstyrets placering og fundering	Observer udstyrets placering of fundering Observer muligheden for ydre omstændigheder kan påvirke udstyret Observer behov for særlige foranstaltninger til sikring Observer medarbejdernes evne til at sikre udstyret Tjek godkendelse af udstyret	Vurder mulighed for udskridning, væltning Vurder mulighed for at nogen kan støde ind I eller påvirke udstyrets balance Vurder medarbejdernes evne og motivation til at opsætte og anvende udstyret korrekt	Sørg for at mangler udbedres Informer medarbejderne om hvad rigtig metode er og sørg for det sker Instruer om opstilling, fastgørelse, fundering, placering mv Motiver medarbejderne til at overholde procedurer
Bruger-stabilitet	Observer medarbejdernes helbredstilstand før de sendes I højden Observer vejrliget før opgaven starter op Observer medarbejdernes adfærd hen under fodtøj, frie hænder	Vurder om medarbejderne er OK Vurder om medarbejderne kan klare opgaven Vurder om medarbejderne ved hvordan adfærden bør være ved arbejde i højde Vurder medarbejdernes motivation til at udvise sikker adfærd	Sørg for klare instruktioner/aftaler Sørg for god fordeling af ansvar og opgaver Skab positiv motivation til sikker adfærd Sørg for en konsekvent holdning overfor misligholdelse

For The employee

Medarbejder

Fare: Arbejde i højde
Omfatter ophold og arbejde på alle former for stiger, stilladser, platforme, niveauforskelle, tage mv.

Barrieretyper	Observer/ undersøg	Forstå/tolke vurder	Handle/udfør
Udstyrets styrke	Observer om udstyret er i orden, rengjort og vedligeholdt. Undersøg hvilket udstyr der er behov for til opgaverne og dets bæreevne. Undersøg om der er behov for andet udstyr til opgaverne.	Vurder om konstruktionen er hensigtsmæssig til opgave. Vurder bæreevnen i forhold til opgaven. Vurder vedligeholdelses-tilstanden. Vurder behov for afhjælpende foranstaltninger.	Sørg for mangler udbedres Sørg for det rigtige udstyr kommer i anvendelse Fjern defekt udstyr Meddel arbejdsgiver og eventuelle kollegaer hvis forholdene ikke er i orden Følg de givne instruktioner og procedurer
Behov for rækværk	Observer behovet for rækværk Observer nødvendigt rækværks kvalitet og styrke Observer om rækværk er monteret korrekt og i god vedligeholdt tilstand	Vurder tilgængelighed, vedligeholdelse, styrke, opsætning af rækværker.	Sørg for at mangler udbedres Meddel arbejdsgiver og eventuelle kollegaer hvis der er mangler og hvilke forholdsregler der er nødvendige Følg de givne instruktioner og procedurer
Udstyrets placering og fundering	Observer udstyrets placering of fundering Observer muligheden for ydre omstændigheder kan påvirke udstyret Observer behov for særlige foranstaltninger til sikring Tjek godkendelse af udstyret	Vurder mulighed for udskridning, væltning Vurder mulighed for at nogen kan støde ind I eller påvirke udstyrets balance	Sørg for at mangler udbedres Meddel arbejdsgiver og eventuelle kollegaer hvis der er mangler og hvilke forholdsregler der er nødvendige Følg de givne instruktioner og procedurer
Bruger-stabilitet	Observer din helbredstilstand før du går i højden Observer vejrliget før opgaven starter op Observer behov for særlig adfærd herunder fodtøj, frie hænder til at holde fast	Vurder din egen evne til at arbejde i højden Vurder om du kan klare opgaven Vurder hvilken adfærd der er behov for i arbejdsopgaven for din og dine kollegaers sikkerhed Vurder metode til transport af materialer og værktøj, som skal anvendes til arbejdet i højden.	Kend til de nødvendige instruktioner/aftaler Kend til hvem der har ansvar og opgaver Sørg for hjælpemidler til at få hejst materialer og udstyr op, så du har en hånd fri til at kunne holde fast Udfør opgaven med en sikker og professionel adfærd

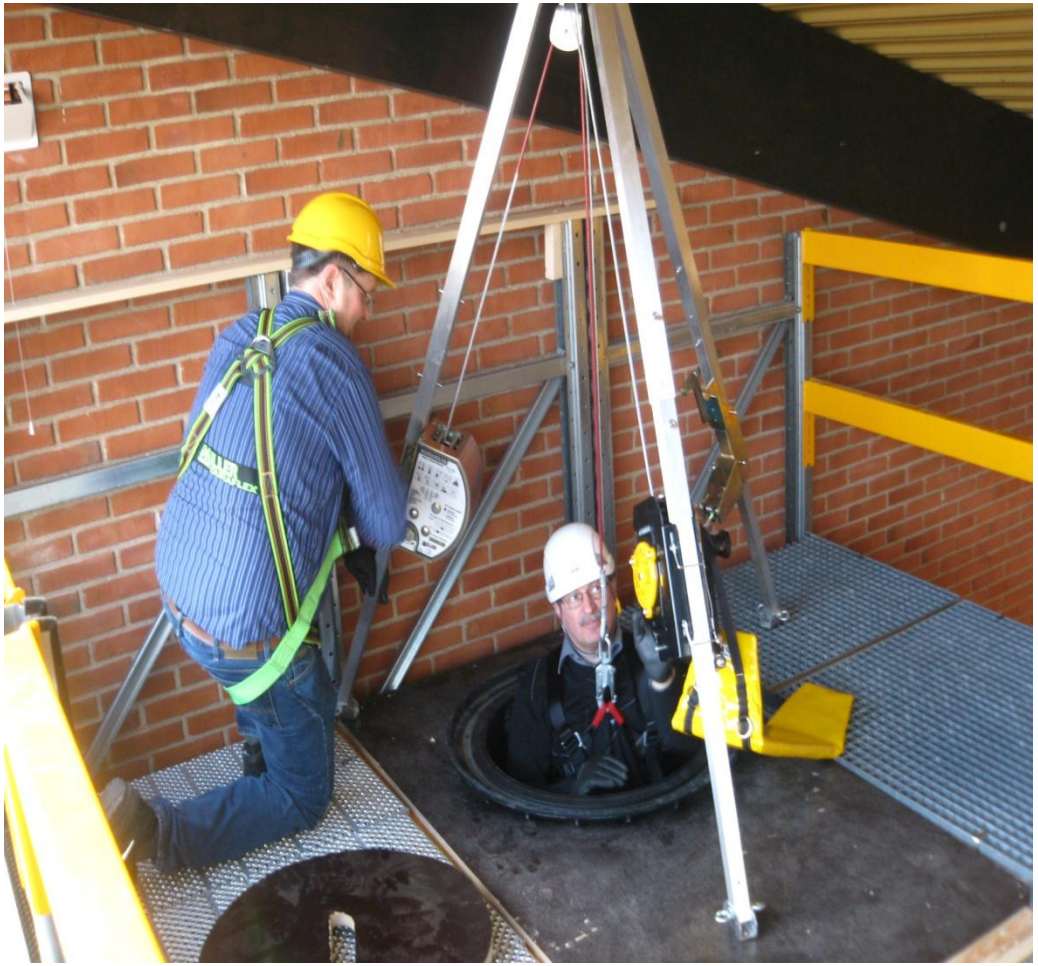
MANAGEMENT			
Hazard: Fall from heights Includes staying and working on all forms of ladders, scaffolding, platforms, differences in level, roofs etc.			
Barrier types	**Observe/investigate**	**Understand/interpret and evaluate**	**Act/perform**
The equipment's strength			
Railings			
The equipment's placement and basis			
User stability			

The problem of the risk awareness

- People are exposed to the simple risks in everyday life, but they seldom experience accidents.
- Therefore, people often believe that these accidents will never happen, and they do not see the risks.

The alternative is to control the safety barriers

- To be aware of safety barriers
- To discover and manage the needs for safety barriers
- To keep the safety barriers intact
- To replace safety barriers with others if needed
- To monitor and maintain the quality of safety barriers



Everybody has a responsibility

- Both employers and employees need to possess safety barrier awareness
- The employer have the responsibility in beforehand
- The employee have the responsibility in the situation where they very often are on their own

The managers responsibility

The employer shall ensure that the correct equipment is in place and in order, that employees know how to use it and are motivated to use it correctly, and that each employee knows what to do and when, if the equipment fails or does not suit the task.

The managers responsibility

- The employer shall organize the work so that there is clarity about the behaviour expected from the employee, and the employer shall ensure that the employee knows what is expected and is motivated to fulfil these expectations.

The managers responsibility

- The employer shall be aware of the competencies the employees need to have when organizing the work, and shall take part in improving these competencies with regard to the job's performance when necessary.

The employee shall ensure

:

- That he knows which safety barriers shall be in order before he starts working.

The employee shall ensure

- That he has the correct equipment, knows how to use it, and is also motivated to use it.

The employee shall ensure

- That he knows the procedures, management's expectations for carrying out the work, and finally, that he has acquired the necessary competencies.

The employee shall ensure

- That he takes part in communicating with the employer, when equipment, procedures, working conditions fail or are not in order, so that a solution can be found that adheres to safety requirements

Managing the Unexpected, Karl Weick

- Good management of the unexpected involves midfullness
- That means you are able to read even weak signals and give strong responses to these signals
- You must be able to notice the unexpected on an ealy stage and halt its developement or
- You must make the system resilient so it can cope with unexpected event

Requirements

- Expectations matter when it comes to safety
- To expect something is to be mentally ready for it.
- Expectations drive out attention to certain features of events
- People with most expertise must have high influence and authority

Mindfulness

- Means the combination of ongoing scrutiny of existing expectations
- Continuous refinement and differentiation of expectations based on new experiences
- Willingness and capability to invent new expectations that make sense of unexpected events
- A nuanced appreciation of context and ways to deal with it
- Identification of new dimensions of context that improve foresight and current functioning

Resilience

- To use information about errors already occurred and to correct them before they worsen
- To make knowledge about the system transparent and widely known
- To appreciate weakness and manage them better
- To share expertise and novel solutions across unit boundaries and in continual investments in improving technical systems, procedures, report processes and employee attentiveness'

Mindlessness

- Conventional plans and standard procedures can promote mindlessness
- Restricted attention to what we expect, preclude improvisation
- Routines uncomfortable cannot handle novel events
- Mindlessness occure when people are distracted, hurried or overloaded.
- Or when people cannot do anything about what they see

An informed culture

- Culture shapes expectations
- Agreement about appropriate attitudes and behaviour
- Core value makes decision making more efficient
- The managers have current knowledge about the human, technical, organizational and environmental factors that determine safety
- Bonuses, raises, promotions and approval flow must move towards those who act mindfully away from those who do not

The reporting culture

- When all kind of errors are reported
- When people are protected when reporting
- When people trust the system managing the reports
- When the report is used for a visible and useful goal

The just culture

- How people apportion blame when something goes wrong
- Clear distinction between acceptable and unacceptable behaviour
- Demands an atmosphere of trust
- Encourage to provide safety related information

The flexible culture

- How rapidly people can adopt to sudden and radical increments in pressure, pacing and intensity
- Facilitates quick adaption to changing demands
- People assume that the system is endangered until proofing it is not
- When evidenced safety, people dig for new information

The learning culture

- How adequately people draw the lessons learnt
- When information generate by knowledge people is available and disseminated
- People embrance best practice
- Debates that promote learning and help identify new sources of changes and how to cope

The key words in prevention

1. **The managers commitments to safety**
2. **The managers credibility**
3. **The employees involvment and awareness**
4. **The supervisors responsibility and awareness**
5. **The visibility of safety in all activities**

Thank you for lissening