

Prevention of “simple accidents” with major consequences

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The program

1. Some figures
2. The question: are all accidents of the same kind?
3. The cause-consequence process
4. What we know and what we don't know?
5. Safety barriers
6. INFO cards
7. How to create safety?

Eurostat data notified accidents x 1000 for 27 EU countries (Unknown not showed)

Severity:	Fatal	Perm. Invalidity	1-6 months absent	4-30 days absent	Total
Year 2009	4	99	541	1511	2,440
Year 2010	5	83	452	1251	2,059
Total for 2 years	9	182	994	2762	4,499

Accident causes

	% of all Notified accidents	% of all fatal accidents
Electrical probl., explosion, fire, etc.	11 %	23%
Technical equipment	22 %	38%
Falls	23 %	19%
Body movement and violence	42 %	13%
Other deviation not listed above	2 %	6%

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" looking at the deviation and 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.

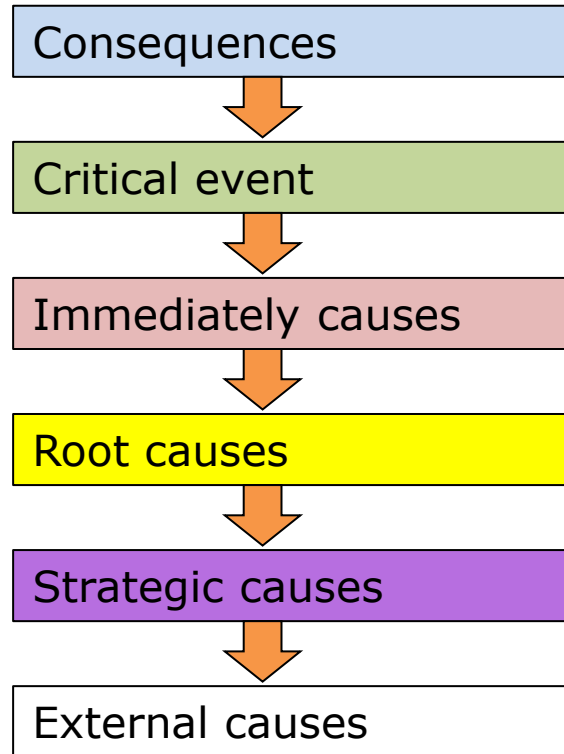


Is accident one of a kind

- Definition
- Frequency and seriousness
- Hazard information
- Accident investigation
- Blame and guilt
- Risk awareness and risk aversion

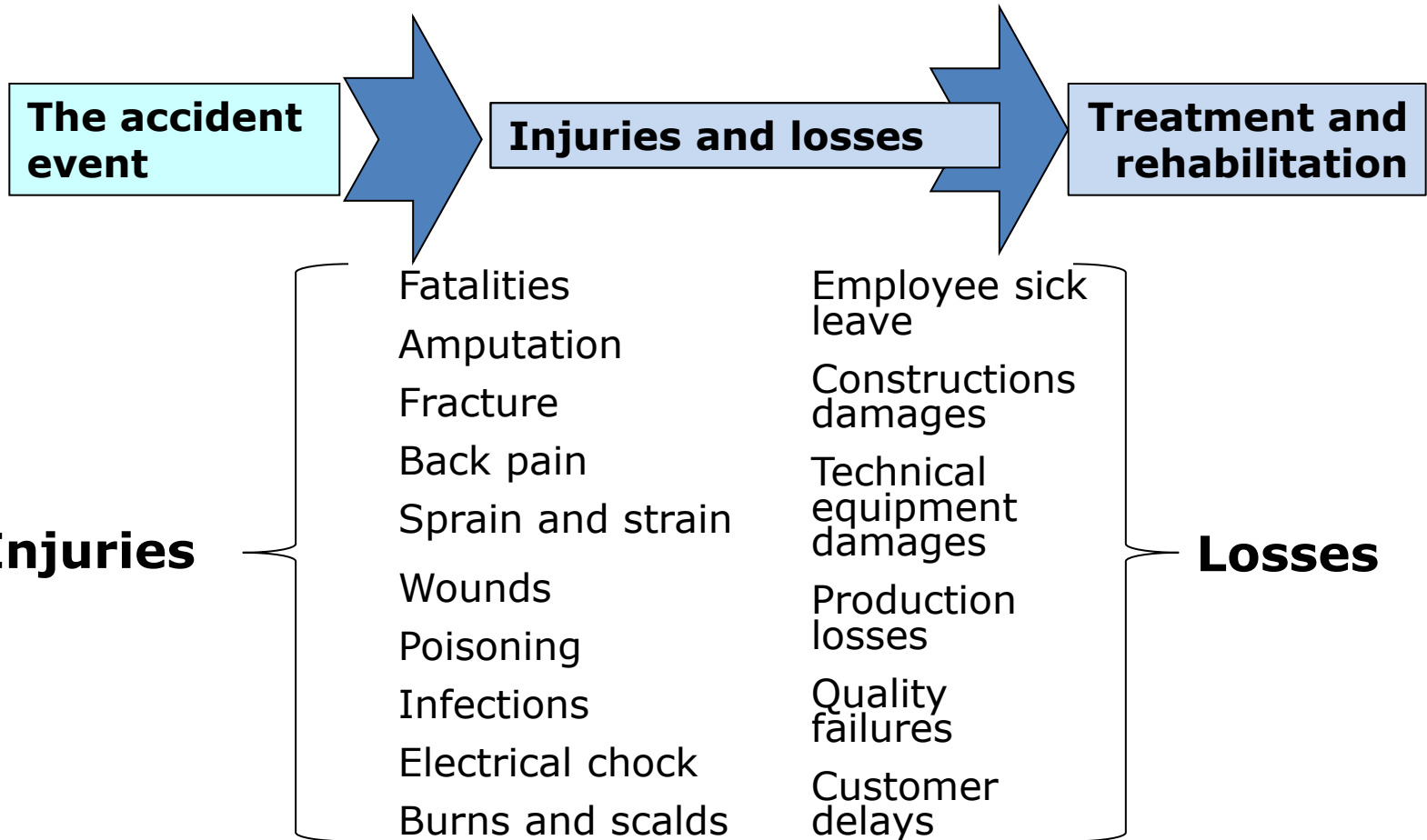
The definition can be used for all kind of accidents, but the condition for prevention for different type of accidents have major differences

The accident causation process



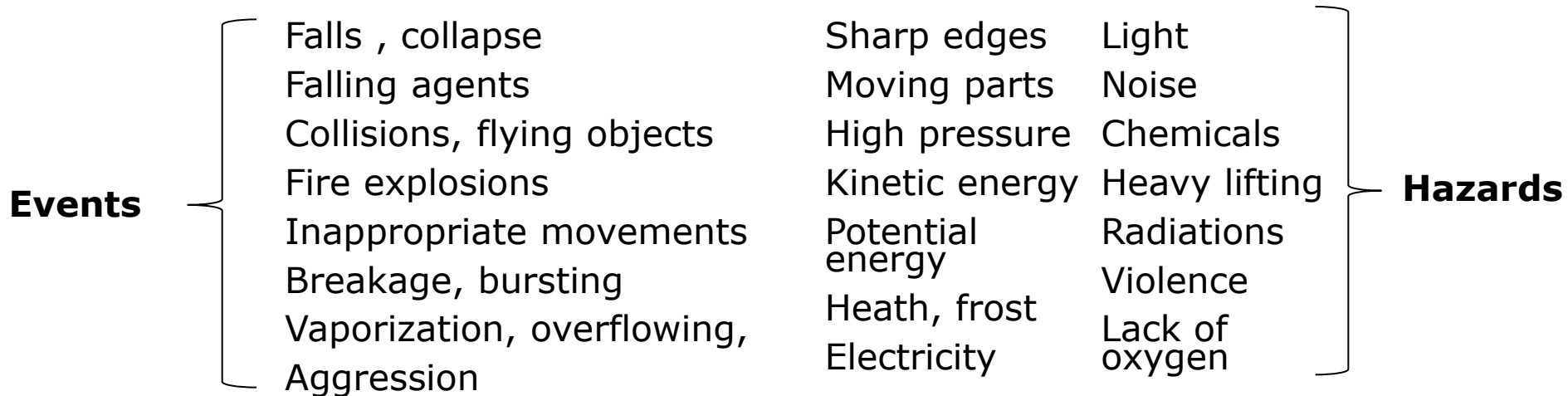
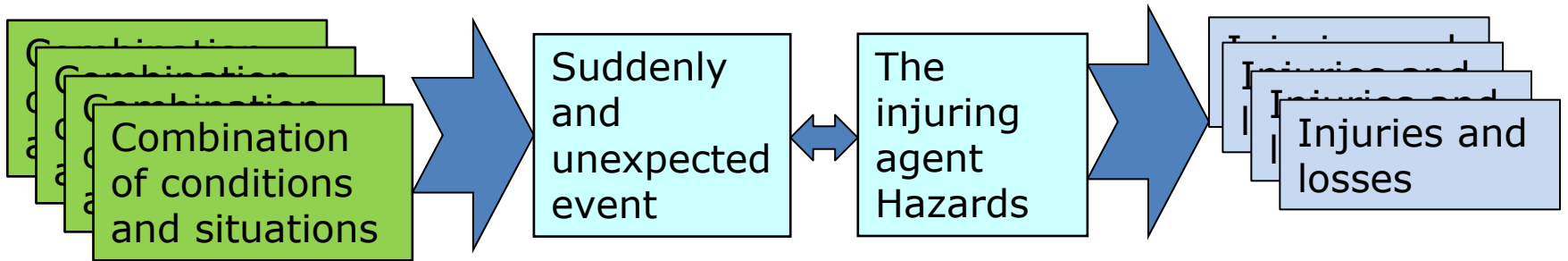
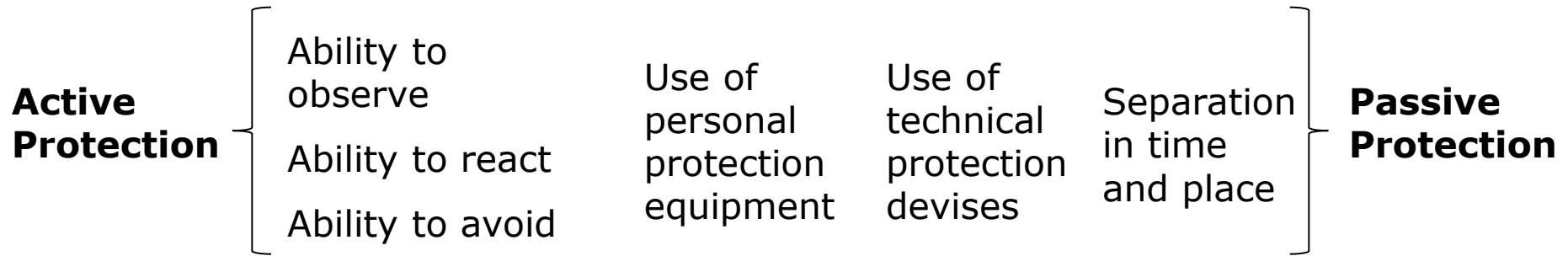
1. The injury and the victim,
2. Deviation and harmful agent
3. The work situation and the victims' behavior.
4. Management conditions and processes delivering controls.
5. Management's strategic prioritization and commitment.
6. Legislation, competition, market relations, stakeholder requirements etc.

The consequences

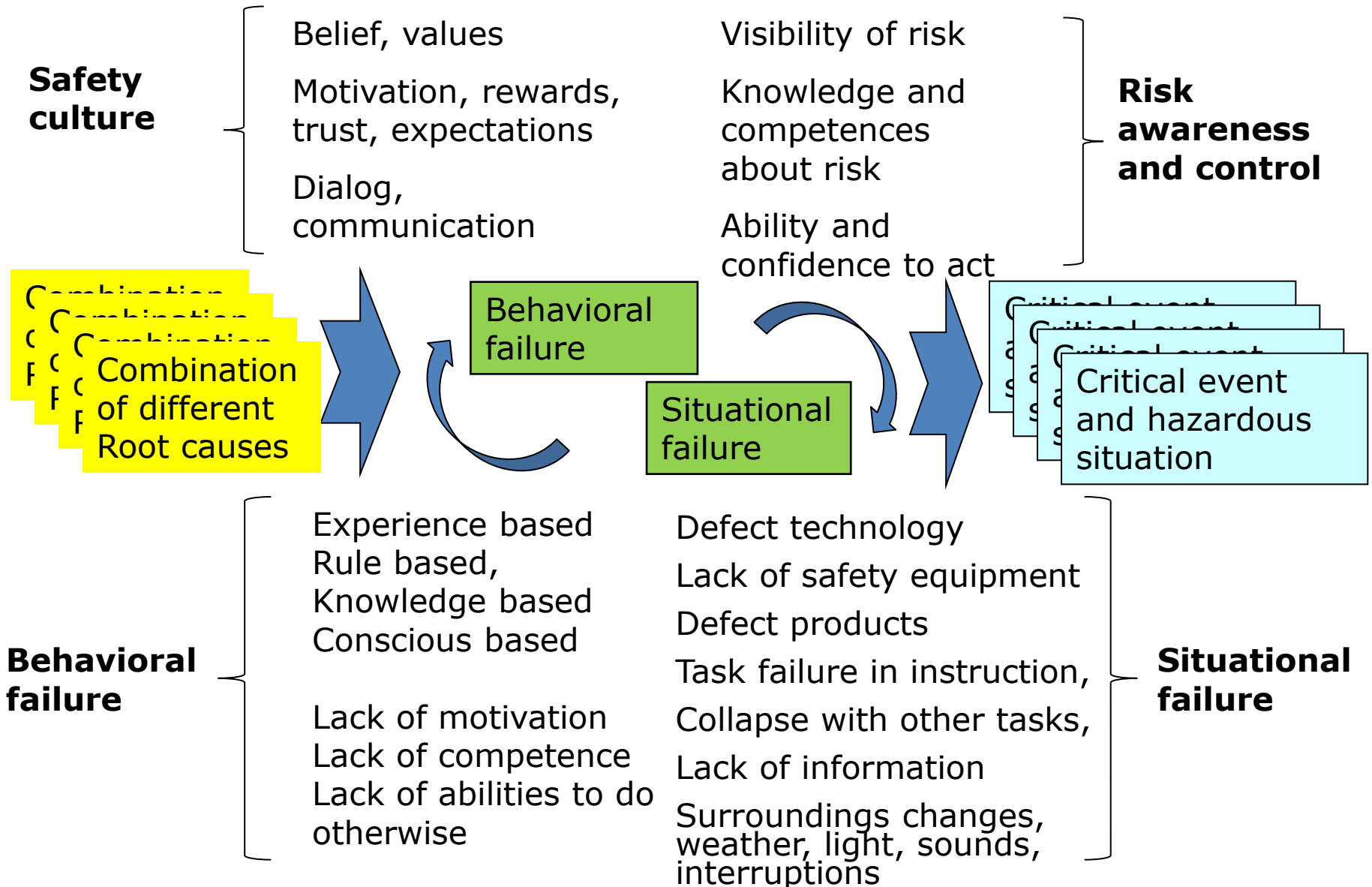


Costs = average 5.000 Euro pr. accident

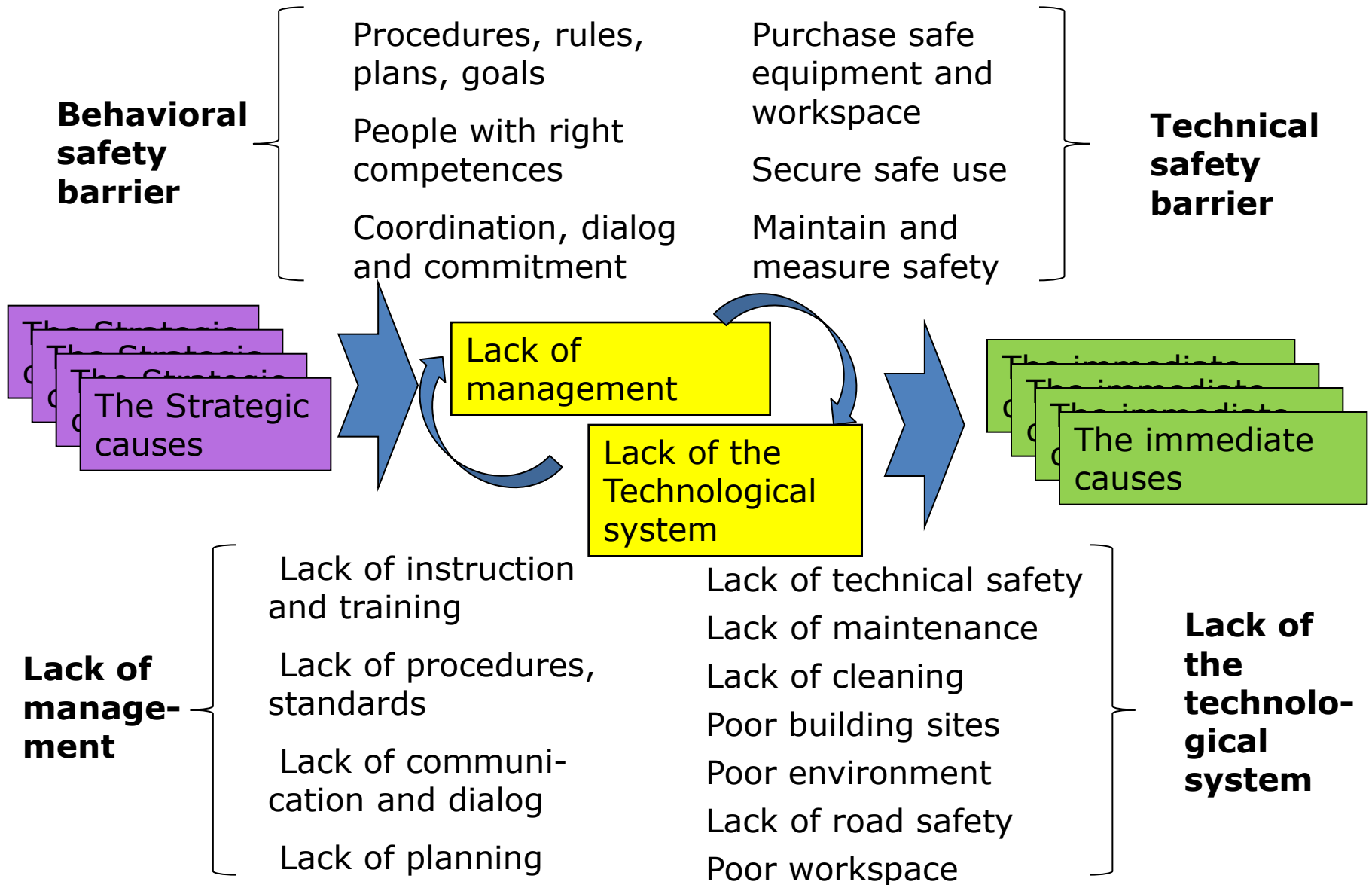
The critical event



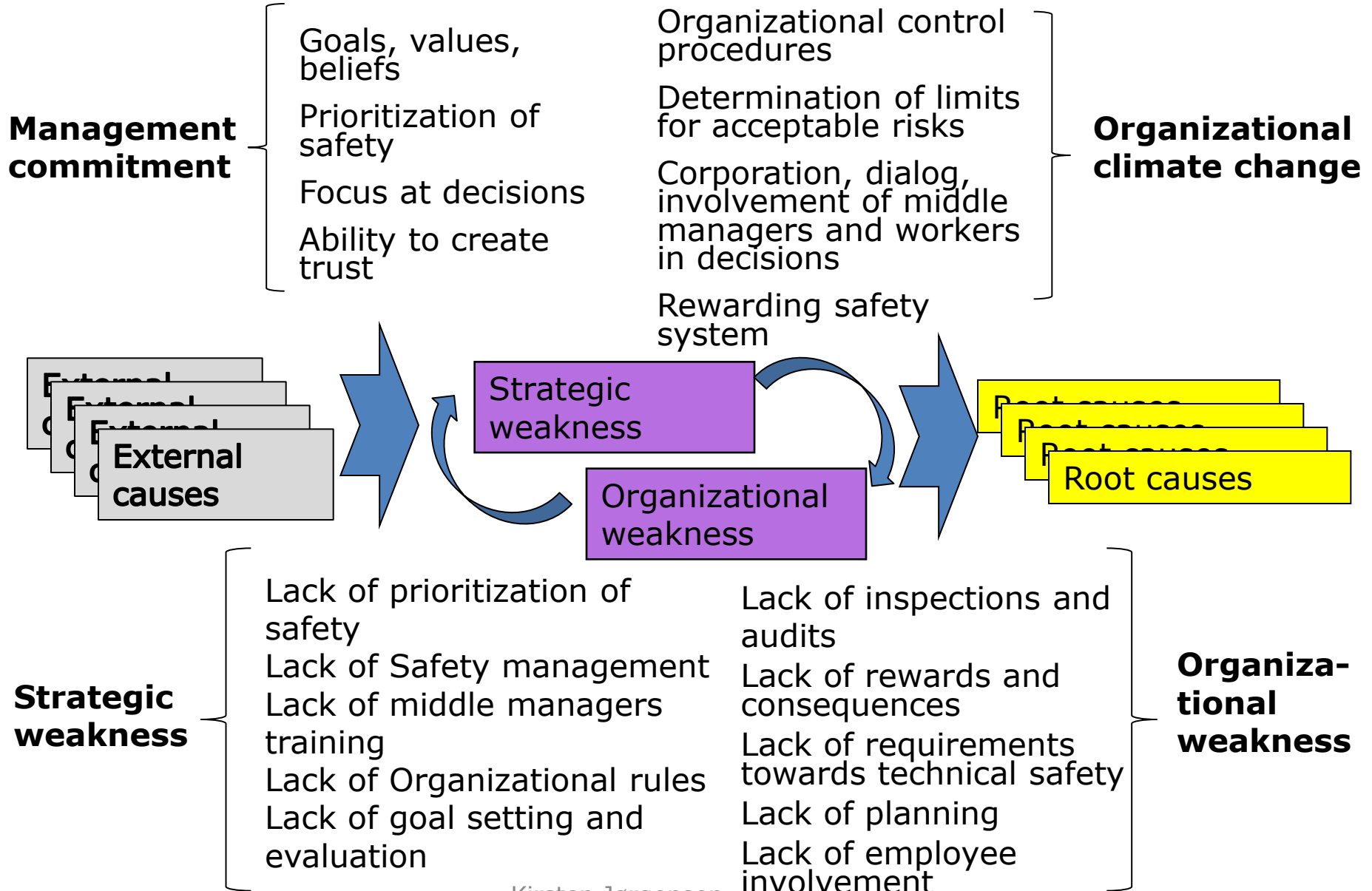
Immediate causes



The root causes



Strategic causes



External causes

The political and society agenda

The political willingness
Possibilities for decisions
The public awareness and acceptance

The authority control
Certification
Auditing
Insurance
Organizational agreements
Research

External requirements, economical pressure,

Political and society requirements

Legislations and rules

Competitions and market conditions

Management causes

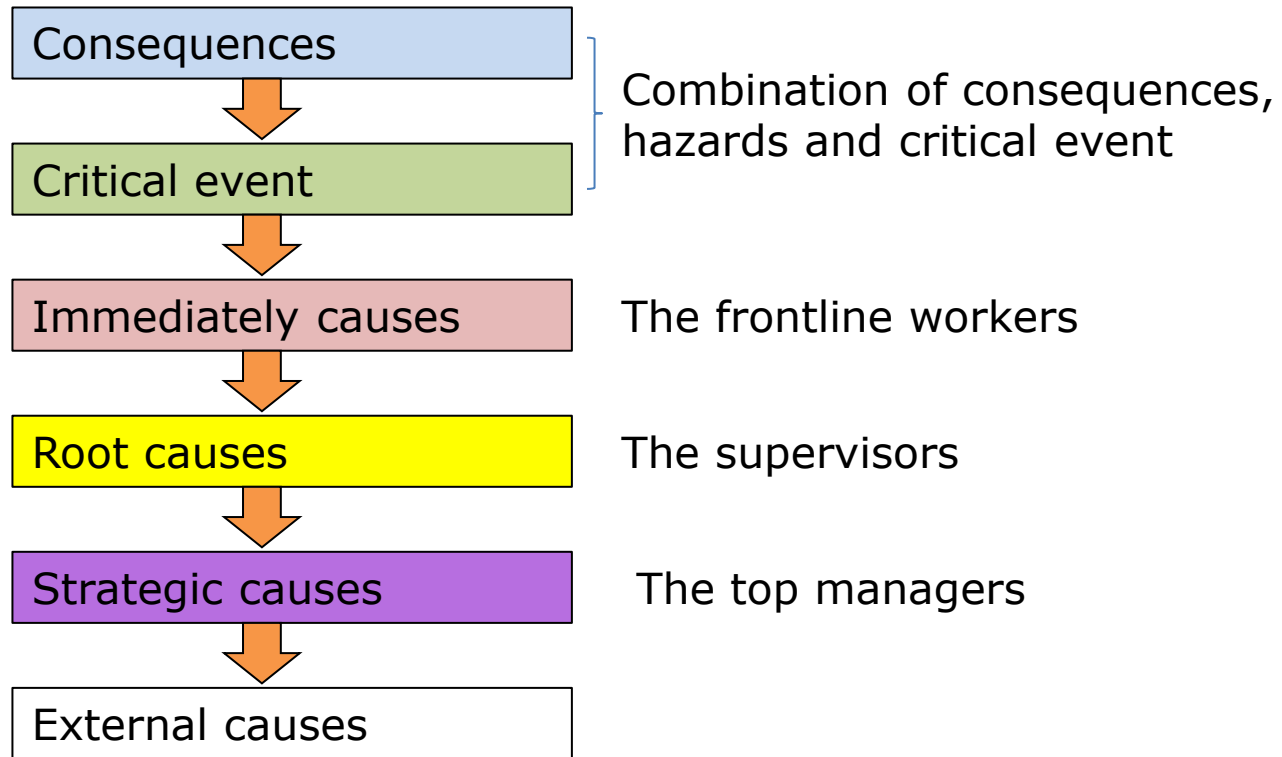
Weak legislation and rules

National rules
International rules
Informal rules
The public opinion

Branch norms
Legal principle
Market situation
Salary conditions
Recruiting conditions
Customer requirements

Weak competitions and market conditions

What is known from research



What can be questioned

- Do the top manager know what risks problems the workers are facing doing their tasks?
- Do the middle managers and daily supervisors know how to identify risks and do they know how to manage those risks?
- Do the workers know how to identify his own risk situation and do he know how he can manage those risks?

Because hazards are not there always,

Risk occur in situations where combinations of causes are interacting,

It can be too late to act in the dangerous situation

The alternative 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

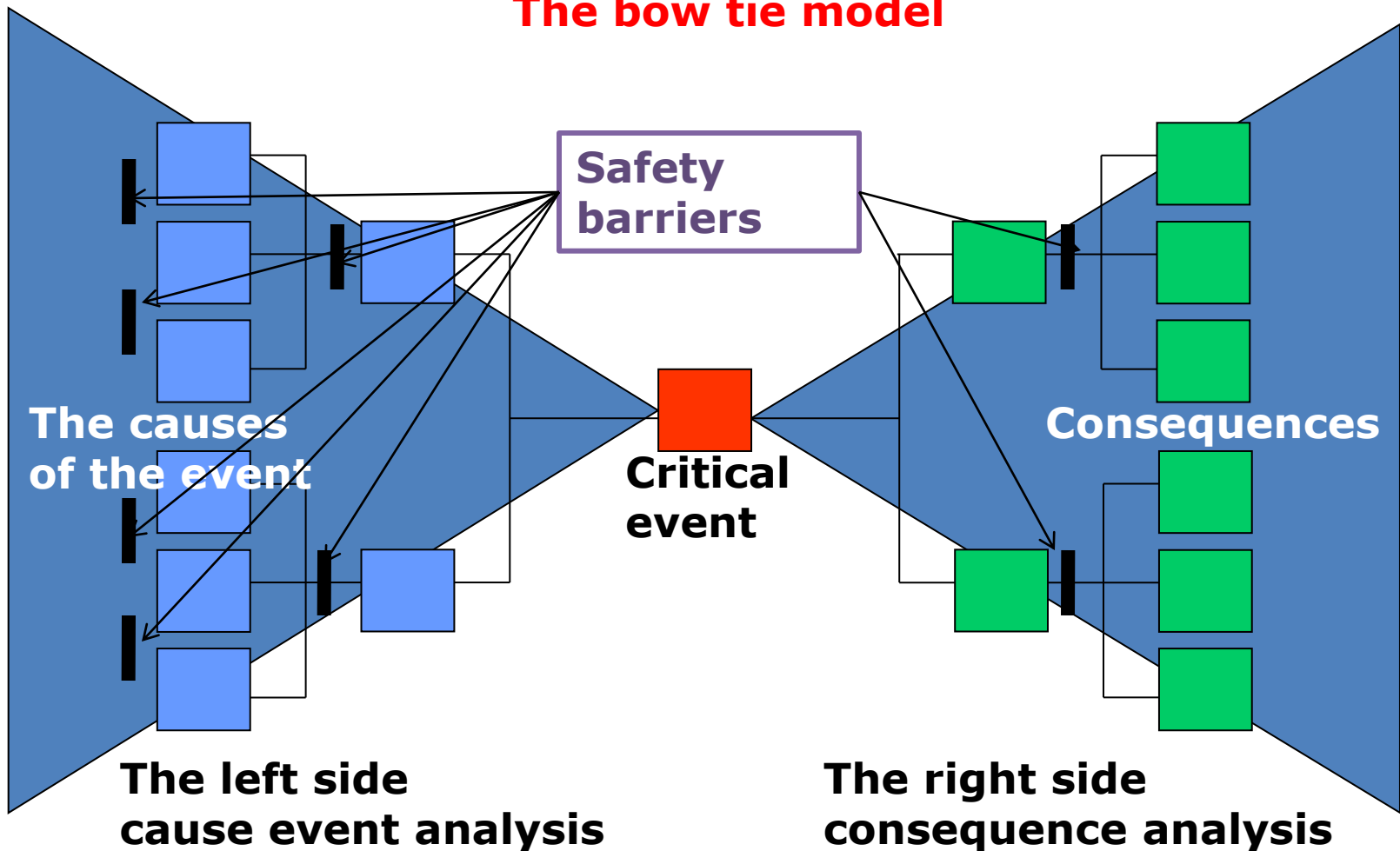
To replace safety barriers with others if needed

To monitor and maintain the quality of safety barriers

Physical and behavioral safety barriers

The Dutch project

The bow tie model



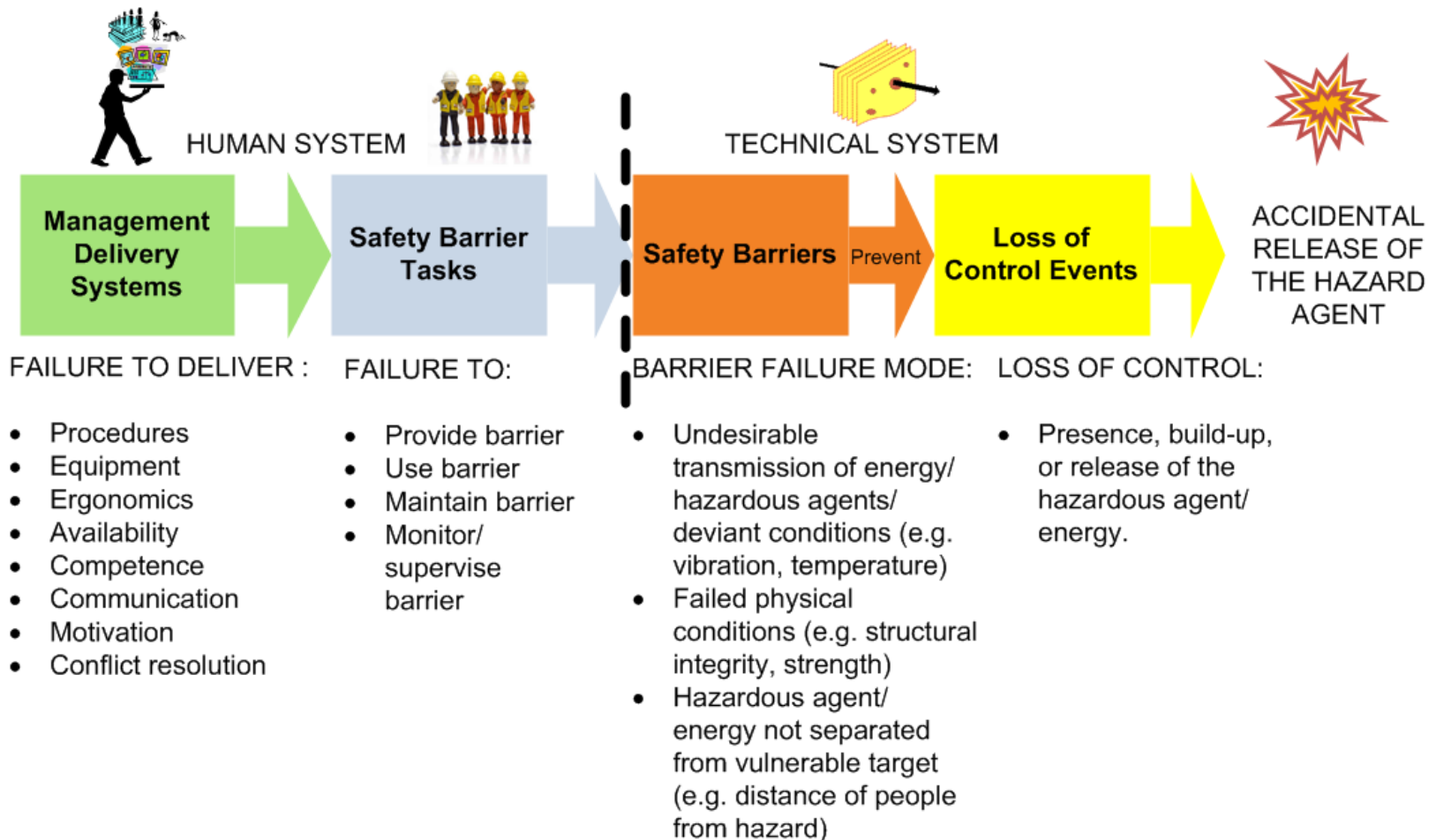
Hazard sources

Safety barriers and PIE's

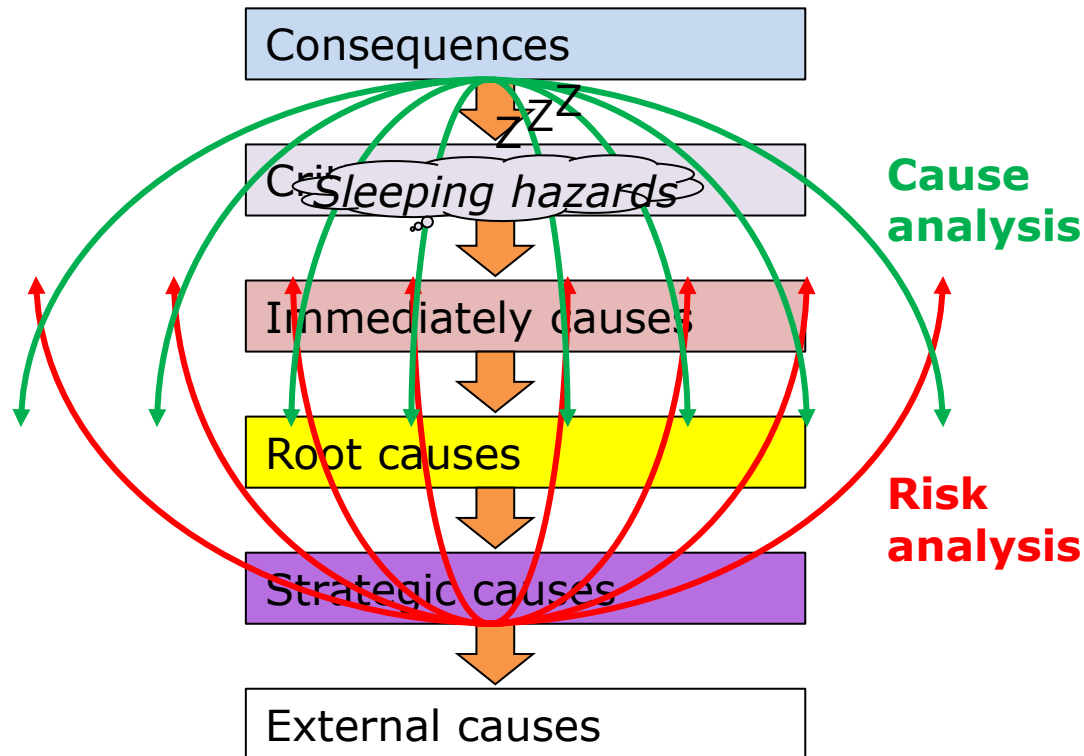
<i>Activity hazardous</i>	<i>Primary safety barriers</i>	<i>Support safety barriers</i>	<i>Evaluation criteria – PIEs</i>
Work at placement ladders/ Risk of falling	1 Ladder strength	1. Type of ladder and its strength	Conditions of ladder steps
			Inspection of ladder capacity and length
			Maintenance 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			



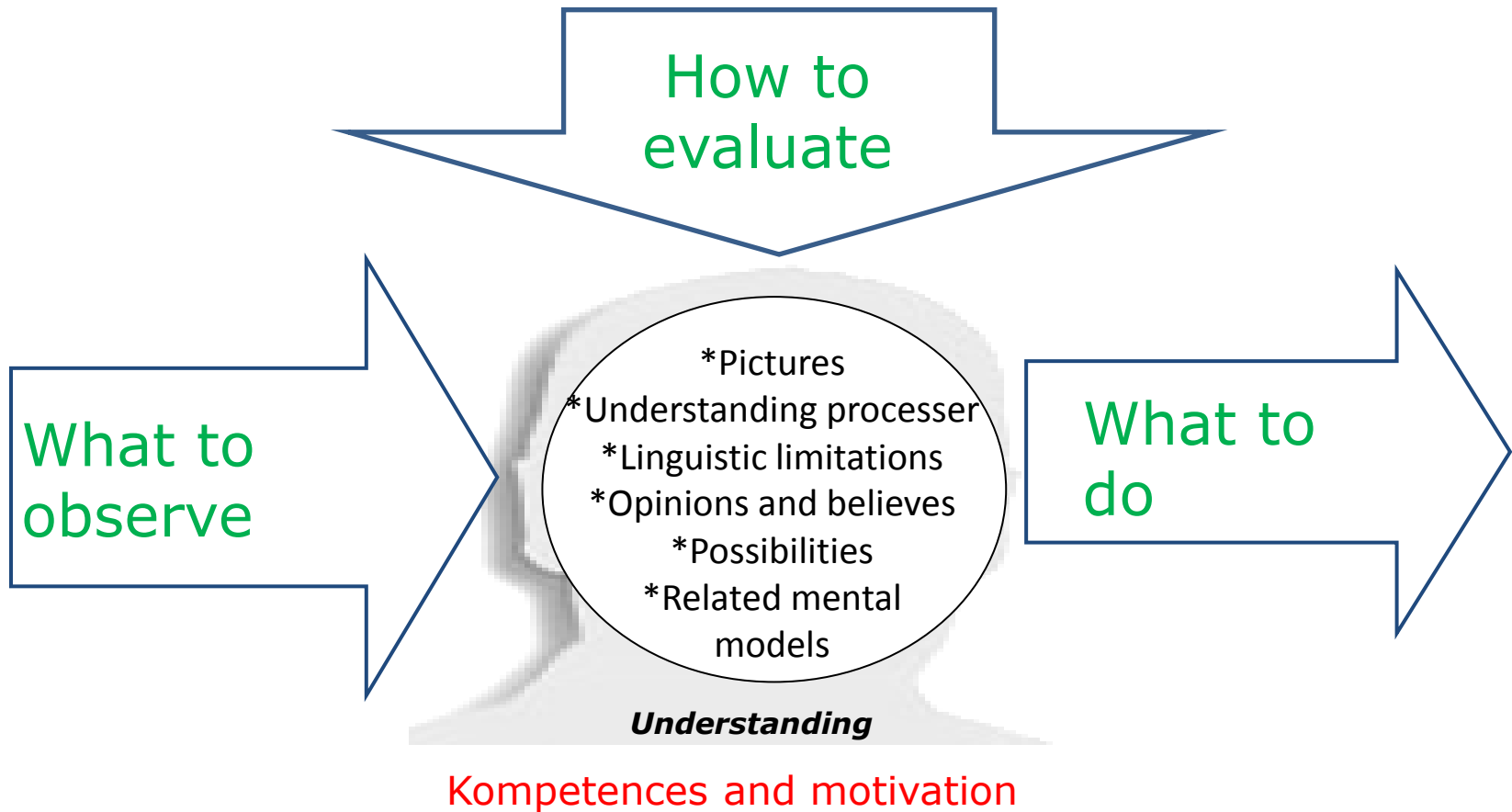
The Dutch informations



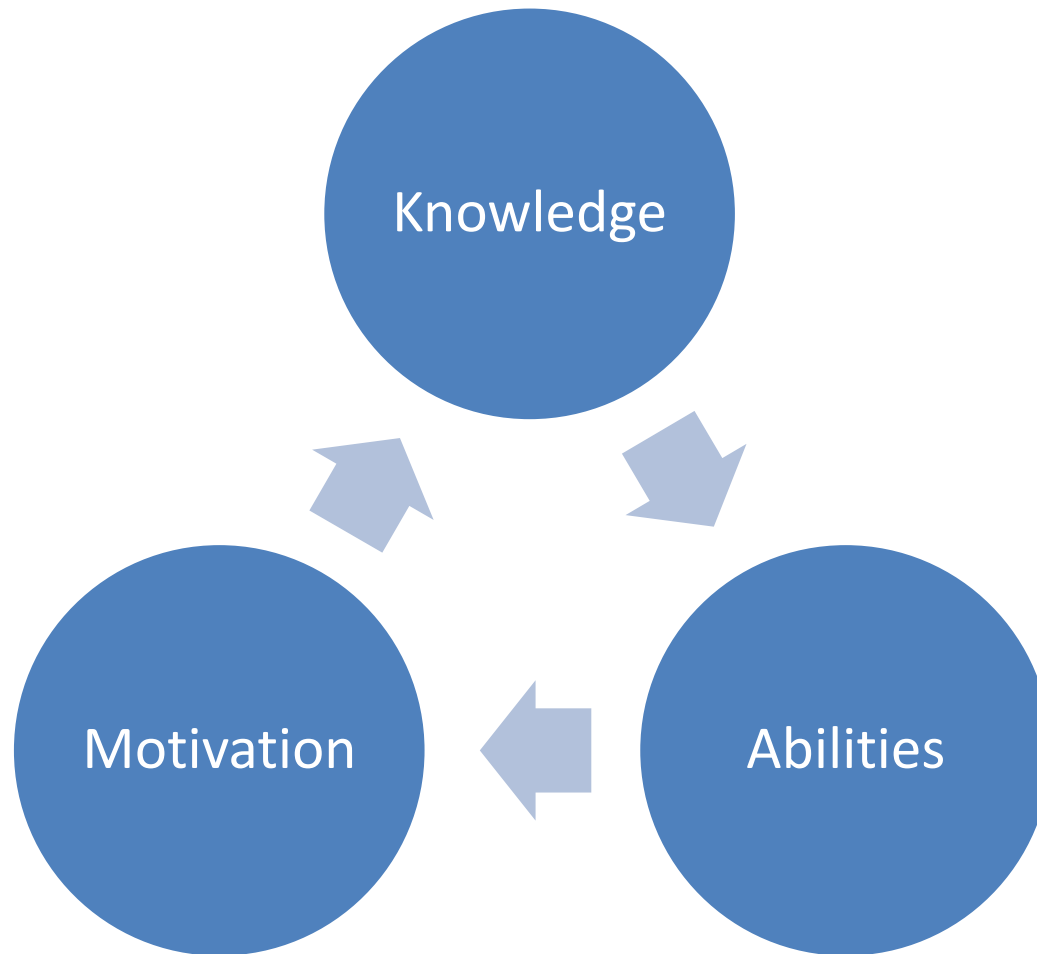
The cause analysis versus the risk analysis



Situational awareness



Three important elements



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



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 stiller, platforme, niveauforskelle, tage mv.			
Barriertyper	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 om rækværk er monteret korrekt og i god vedligeholdelse tilstand	Vurder tilgængelighed, vedligeholdelse, styrke, opsætning af rækværk. Vurder motivation til at sikre vedligeholdelse af rækværkets 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 rækværk mangler eller ikke er i orden.
Udstyrets placering og fundering	Observer udstyrets placering og 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 muligheden 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
Brugerstabilitet	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 adfærd 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 stiller, platforme, niveauforskelle, tage mv.			
Barriertyper	Observer/ vurder	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 om rækværk er monteret korrekt og i god vedligeholdelse tilstand	Vurder tilgængelighed, vedligeholdelse, styrke, opsætning af rækværk.	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 og 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 muligheden 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
Brugerstabilitet	Observer din helbredstilstand før du går i højden Vurder om du kan klare opgaven 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 højest materialer og udstyr op, så du har en hånd fri til at kunne holde fast Udfør opgaven med et sikkert og professionelt adfærd

INFO cards in three levels

General level hazards	For all kinds of	1
Cross-cutting level hazards	For subgroups of	17
Specific level hazards	For specific	64

Sub groups of Hazards

Subgroup of critical events
Falls from heights
Falls from the same level
Being struck by falling objects
Being struck by fragments
Being struck by moving objects, becoming caught up/jammed, crushed.
Becoming buried
Violence
Being struck by moving objects, becoming caught up/jammed, cutting
Collisions
Electric shock
Burns
Poisoning, etching
Strain injuries
Electric shock
Fire
Suffocation, poisoning or drowning
Explosion

What has been demonstrated

Different hazards needs different safety barriers and different management delivery processes

Some safety barrier is generic but other are very specific

Accident are not all of a kind because they relate to different hazards, different needs for safety barriers and different management deliveries.

The challenges for creating of safety

1. problem

- The top manager, the daily supervisor and the employee has many duties
- As long nothing has happen the everybody presume everything is OK
- Jens Rasmussen's drift to danger is very difficult to observe in the daily routine

The challenges for creating of safety

2. problem

- The safety system and knowledge found for prevention initiative has been found in larger companies.
- Most enterprises is SME's and most accidents happens in SME's

The challenges for creating of safety

3. problem

- Very few actually understand how hard it is to create safety and keep the safety level on the top

How to create safety

1. proposal

- To see safety as an integrated part of creating a more efficient working process and making good economical results.
- To ensure that effectiveness includes safety and quality by making the easy way to perform a job to be the safest.

How to create safety

2. proposal

- To change the view of the meaning of being a professional for top managers, daily supervisors and all kind of employments.
- To be a professional in the job must include to make the job in a safe and quality right way.

How to create safety

3. Proposal

- To distinguish prevention methods for different hazards, prioritize and make prevention step by step.
- Accept there is no easy route, it is hard work.

The human factor

- People can work day in and day out in a hazardous environment.
- Through their thoughtfulness, ingenuity, attention and physical abilities they can compensate for poorly designed equipment, facilities and routines, and thus prevent the risks being triggered.
- Then one day in a few seconds someone loses his or hers attention and the accident happens.

- For that moment the human factor is recognized

We have not many accidents because of the human factor – it is because of the human factor we have so few.

Carin Sundström-Frisk 1982

Safety engineering

- **Integration safety in technologies**
- **Integration safety in projects and processes**
- **Make safety the easy way and the easy way to be the safe**

- **Prepare instructions, maintenance procedures, clear and visible icons for what to remember**
- **The remaining risks or hazards, must be clear where and when and how to manage**

The simple accidents are simple to analyze and understand when the accident has happened

But to observe the hazards and be aware of and take the risk serious are most difficult

To be a professional at all power level must include to carry out the job safely- that means to make sure all necessary safety barrier are in place

Thank you for listening



Kirsten Jørgensen,
WorkingonSafety 2014