



Risk management in the Netherlands

Pieter van Vliet

- Directorate-General of Public Works and Water Management; Rijkswaterstaat
- Senior Specialist Safety
- Pieter.van.vliet@rws.nl



Contents

- 1. Objectives of the Dutch Rijkswaterstaat**
- 2. Corporate vision on safety**
- 3. Risk or safety management**
- 4. Safety Culture**
- 5. Risk models**
- 6. Examples**
- 7. Conclusions**

Dutch Rijkswaterstaat -> safety is core business



Keeping the population's feet dry



Smooth and safe traffic on de roads and waterways



Sufficient and clean water



Reliable and usable information



Aim and role of the Rijkswaterstaat

Rijkswaterstaat is responsible for

- **Network and traffic management of the national road network**
- **Network and traffic management of the national waterway network**
- **Integral water management of the inland waters system**
- **Providing knowledge and expertise**



Corporate vision on safety

- 1. Permanent improvement of safety**
- 2. Assess explicit and transparent safety measures**
- 3. Be prepared for unavoidable hazards**
- 4. Set up safety management and a new safety culture**

Risk or safety management



Why risk management?

- To be in control
- To avoid deviations in the primary process
- Societal duty of the road authority to deliver good quality

Loss of control

Deviation from primary process

Poor business process

"Loss of control"

safety

Health

Environment

security

Finance

accidents

illness

pollution

Theft

Losses

"Loss of assets"

Rijkswaterstaat safety management system

Rijkswaterstaat safety management system concentrates on:

Safety:

- safety of road workers and safety who works for the Rijkswaterstaat**
- Safety of users of the system (internal safety)**
- Safety of the environment of system (external safety)**

Security

- Protection against wilfulness destruction of the system on politically or religious bases**

Safety management

SMS: Shell oil company as an example for the Rijkswaterstaat ambition

Shell HSE management system includes 8 elements



- Leadership and commitment
- Employee ownership and involvement
- Organization, resources and responsibilities
- Risk identification, evaluation and management
- Performance metrics, Plans, standards and procedures
- Implementation, performance measures and corrective action
- Assessment and audit



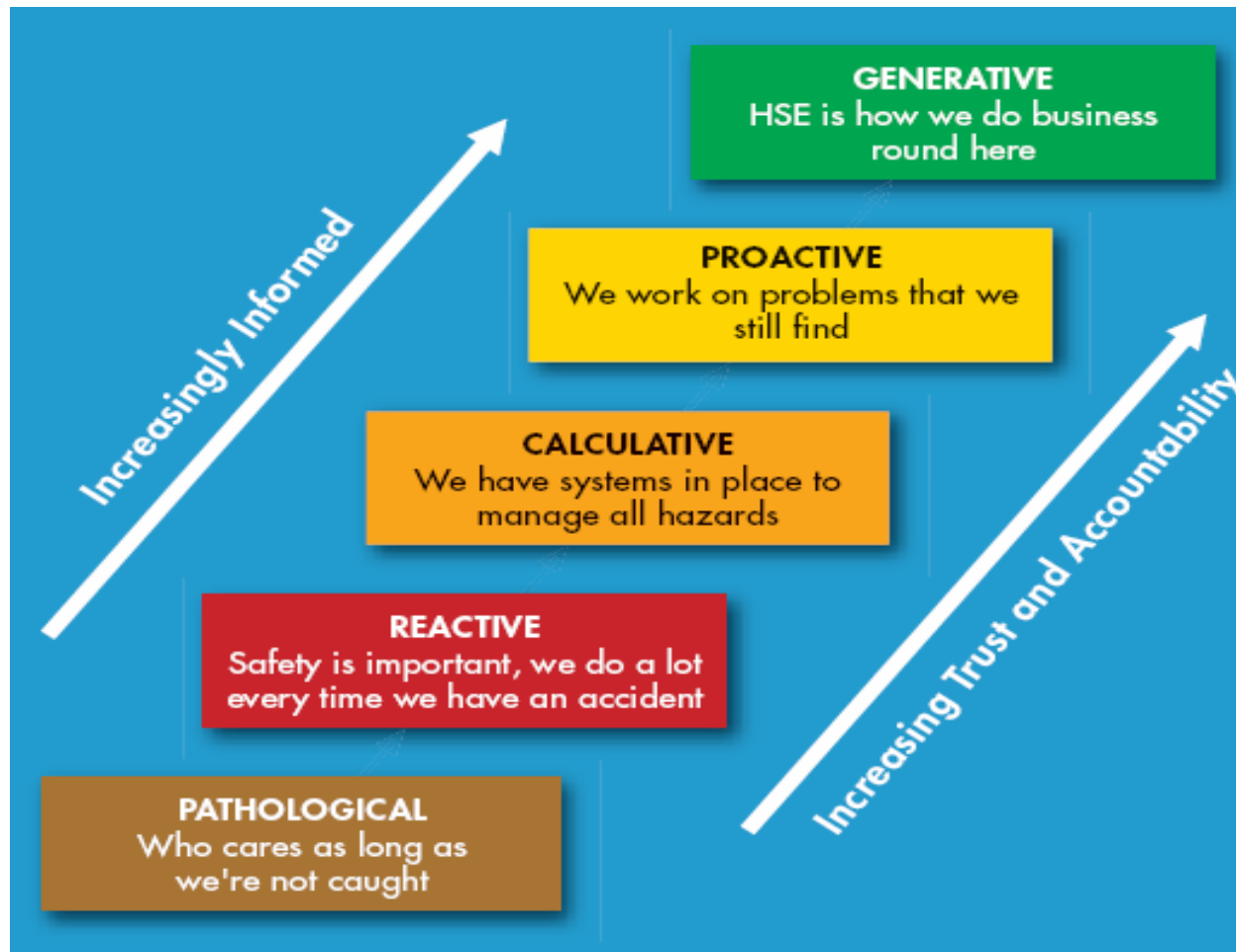
Safety culture

A safety performance involves more than mechanically applying a management system.

It requires the involvement of all in the organization, from top to bottom.

Winning hearts and minds is intending to help the organization to improve learning the way.

Safety Culture



Implementation plan Rijkswaterstaat

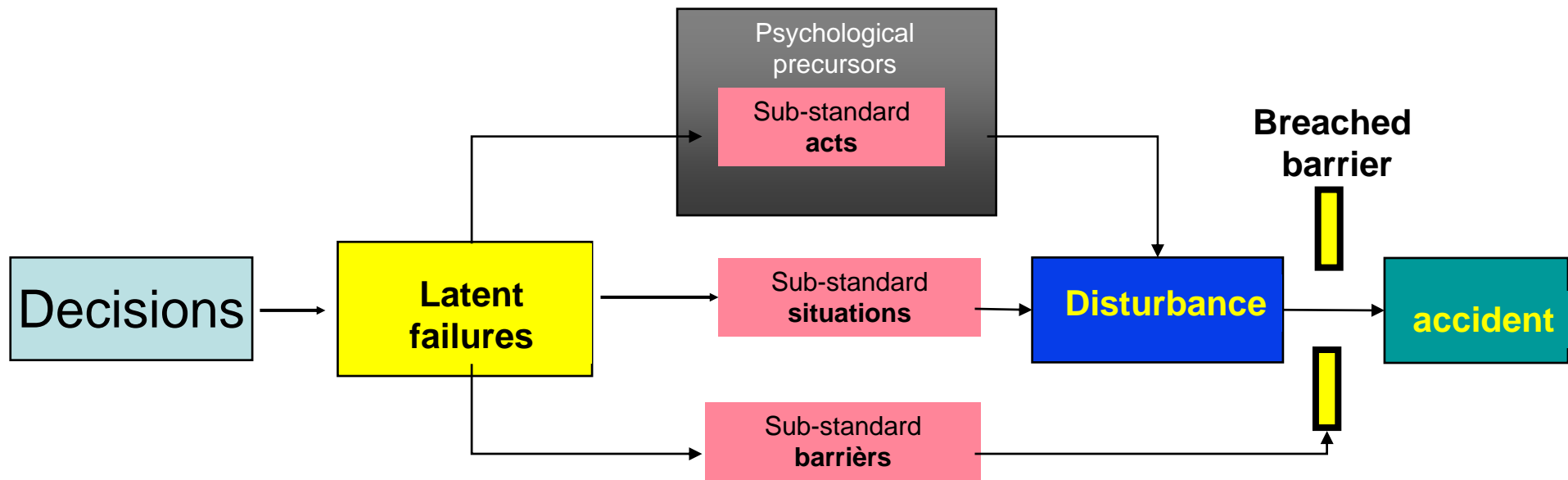
Goal: a workable safety management system for all safety areas, linked to primary processes of the Rijkswaterstaat.

Step 1: Commitment of the top of the organization, by signing a safety declaration to set up a safety management system.

Step 2: focus on safety of employees of Rijkswaterstaat, contractors and emergency services. Investigation of serious accidents (tripod).

Step 3: January 2009 the most important risks in all domains and in large projects are handled

General accident scenario (Tripod)



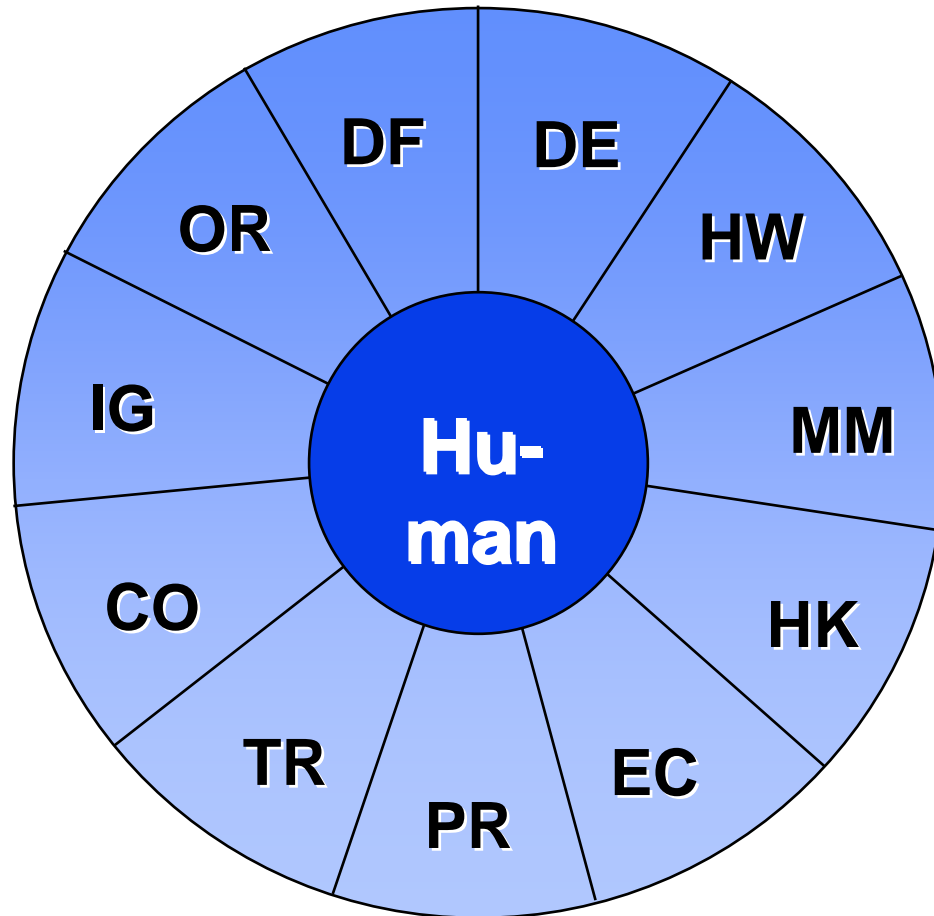
Process Disruption and Human error

Prof. Dr. J. Saari, Helsinki University

Process Disruptions can be classified in

- **75% System related errors (BRF's)**
- **25% individual related errors**
- **1% Uncontrollable (external) factors**

System related errors -> BRF's



- DE Design
- HW Hardware
- MM Maintenance Management
- HK Housekeeping
- EC Error enforcing conditions
- PR Procedures
- TR Training
- CO Communication
- IG Incompatible goals
- OR Organization
- DE Defences

Analysis tools

Tripod philosophy

Information Jop Groeneweg, University of Leiden

**Reactive: Tripod
Beta**

**Proactive: Tripod
Delta**

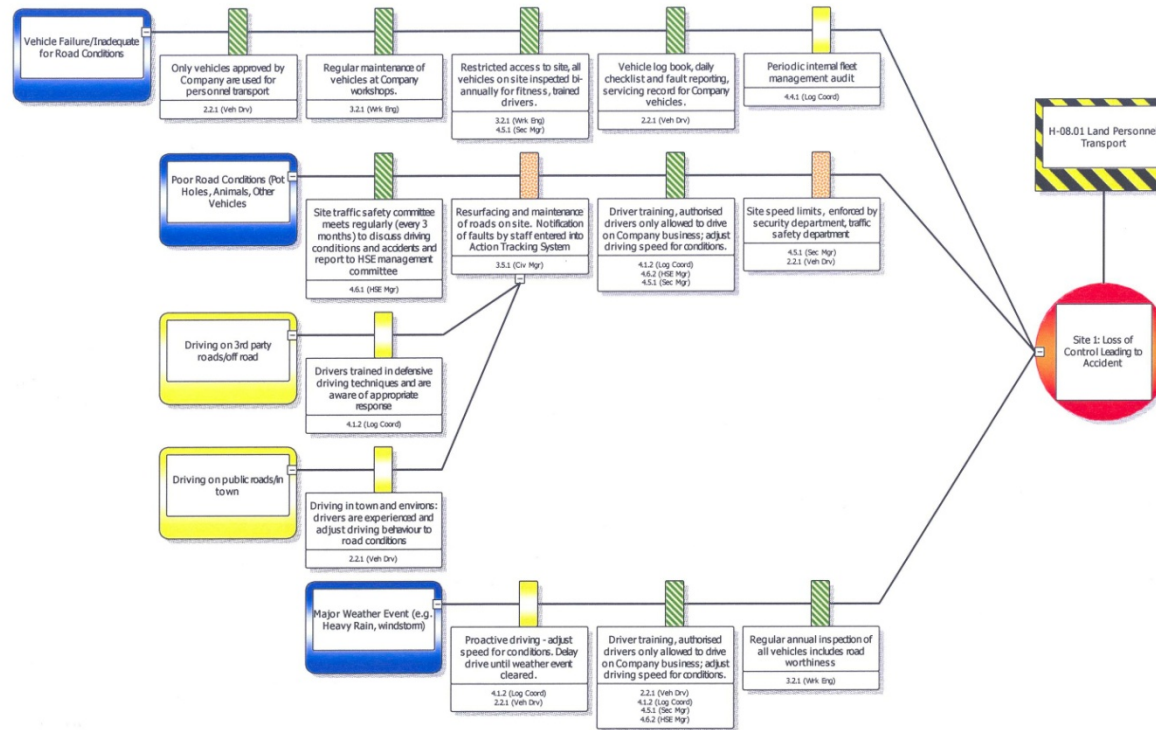
Process: BowTie

**Safety management
system**

**Violation
management**

Safety culture

Example of Bowtie



Tripod after a serious accident

Road worker was killed when she was working at the emergency lane



Interviews

- **Focussed on organizational factors**
- **Interviews with persons who are working at de Rijkswaterstaat (road inspectors, the humans who were responsible for the permission, management), the contractor, police and the inspection**

Goal: What can we learn from this accident and is necessary to change our organization



Some results

Strategically level

Recommendations for corporate Rijkswaterstaat with feedback on corporate decisions made for usually non safety issues

Tactical level

Recommendations on project organisational level: feedback on a specific process/activity

Operational level

Recommendation on detail level: road design, organisation road authority

Conclusions

The safety results of the Netherlands and Rijkswaterstaat are rather good, still we can learn a lot from safety management in other branches, like the oil and gas industry.

SMS is a systematic, explicit and comprehensive process for managing the safety domains road authorities are responsible for.

Safety performance involves more than mechanically applying a management system. To make it a success it requires the involvement of all in the organization, from the top to the bottom.

Tripod gives the road authorities detailed risk assessment techniques for analyzing potential risks and for investigation accidents afterwards.