



Ministry of Social Affairs
and Employment

Programme
Improving Occupational Safety



Improving Occupational Safety

Program Improving Occupational Safety in The Netherlands

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Safe to do the job? Make sure before you start!



Program Improvement Occupational Safety

Statistics Netherlands (2004):

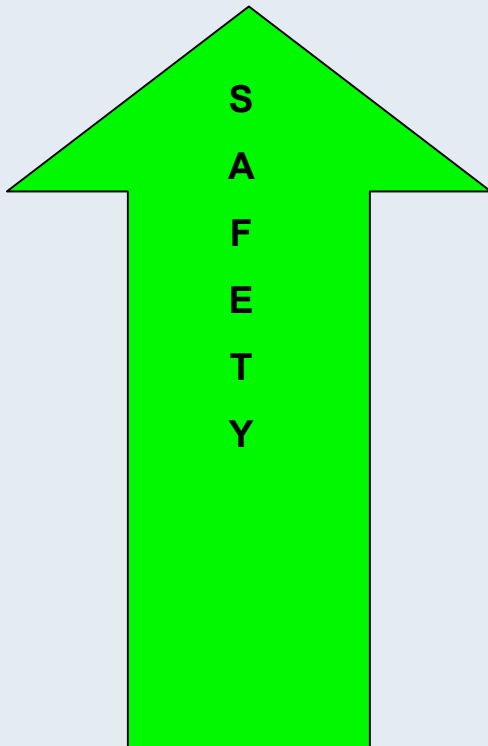
- About 7.000.000 workers in 500.000 companies
- 87.000 occupational accidents (*about 50 injured workers every working hour*)
- 83 persons died (*about 2 workers die of an accident every working week*)
- Bulk of these incidents in 51 hazardous branches with 3.000.000 workers
- Main causes:
 - Falling from height
 - Contact with machines
 - Hit by vehicles
 - Falling objects





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Development in Occupational Safety Policy



Since 2000 Culture

Since 1980 Organisation

Up until 1980 based on Technology



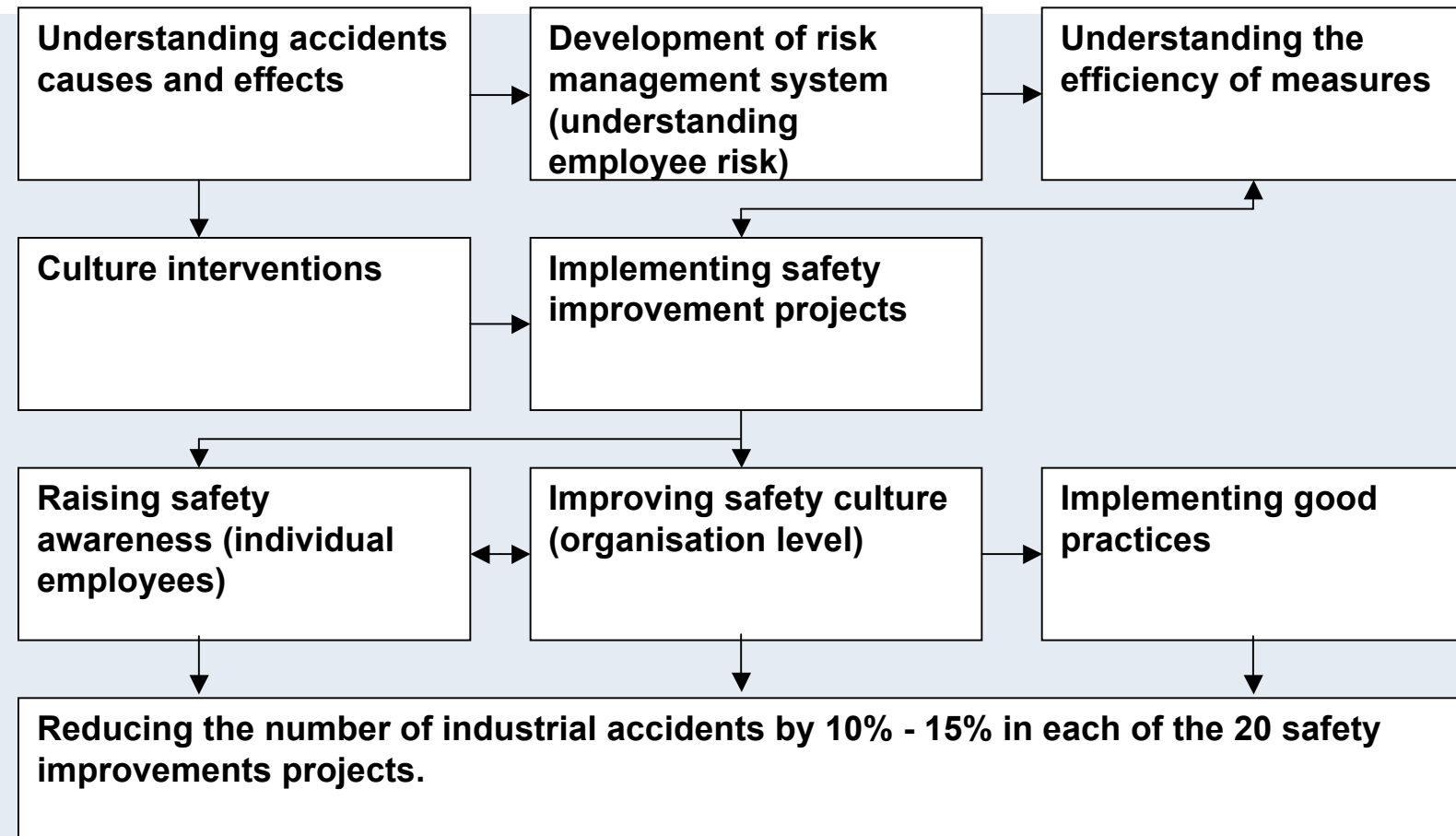
Program Improvement Occupational Safety

Policy actions 2003-2007:

- Interventions with respect to safety culture and –awareness in companies;
Aim: 10-15 % less incidents in 20 selected projects
Development of a financial model for occupational incidents
- Risk based policy on basis of a quantitative risk model for workers
- High political commitment and thus the resources



Structure of the program

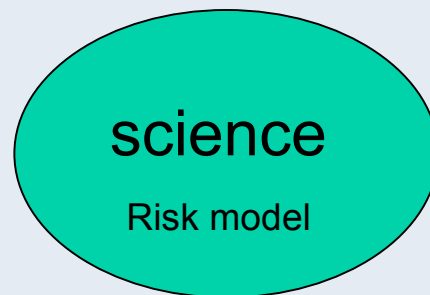
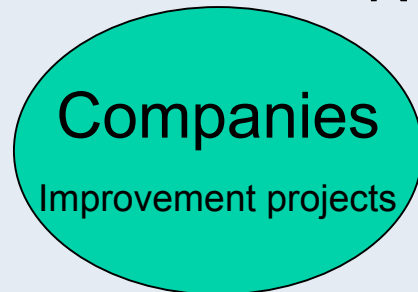




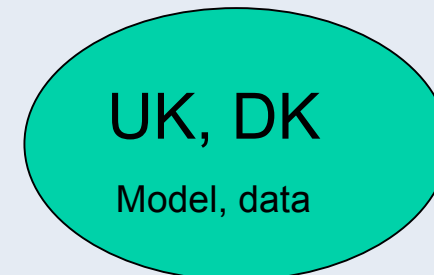
Structure of the program

Who are involved?

National



International





Occupational Risk Model

Why risk based policy and a risk model?

- Priority tool for regulator and company: deterministic approach will be more transparent
- Calculation of probability on an incident of a specific worker, the effect of measures taken and the cost effectiveness of those measures
- Start of an integral risk policy: connects with the land use planning and transport risk models
- The model is developed by an EU project group

bow-tie

Everything that leads to the incident

Everything that is the result of the incident

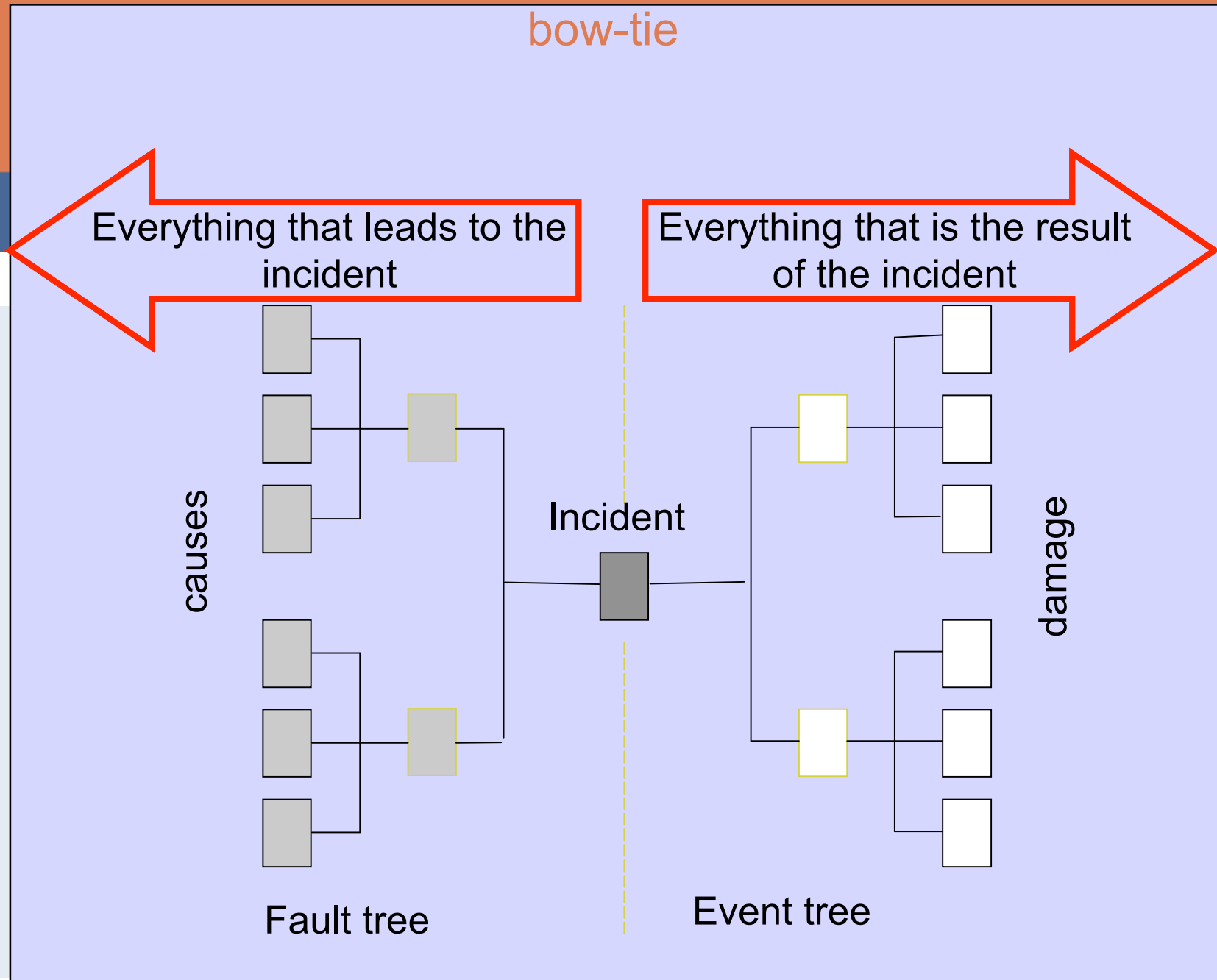
causes

Incident

damage

Fault tree

Event tree





Occupational Risk Model

Building the model

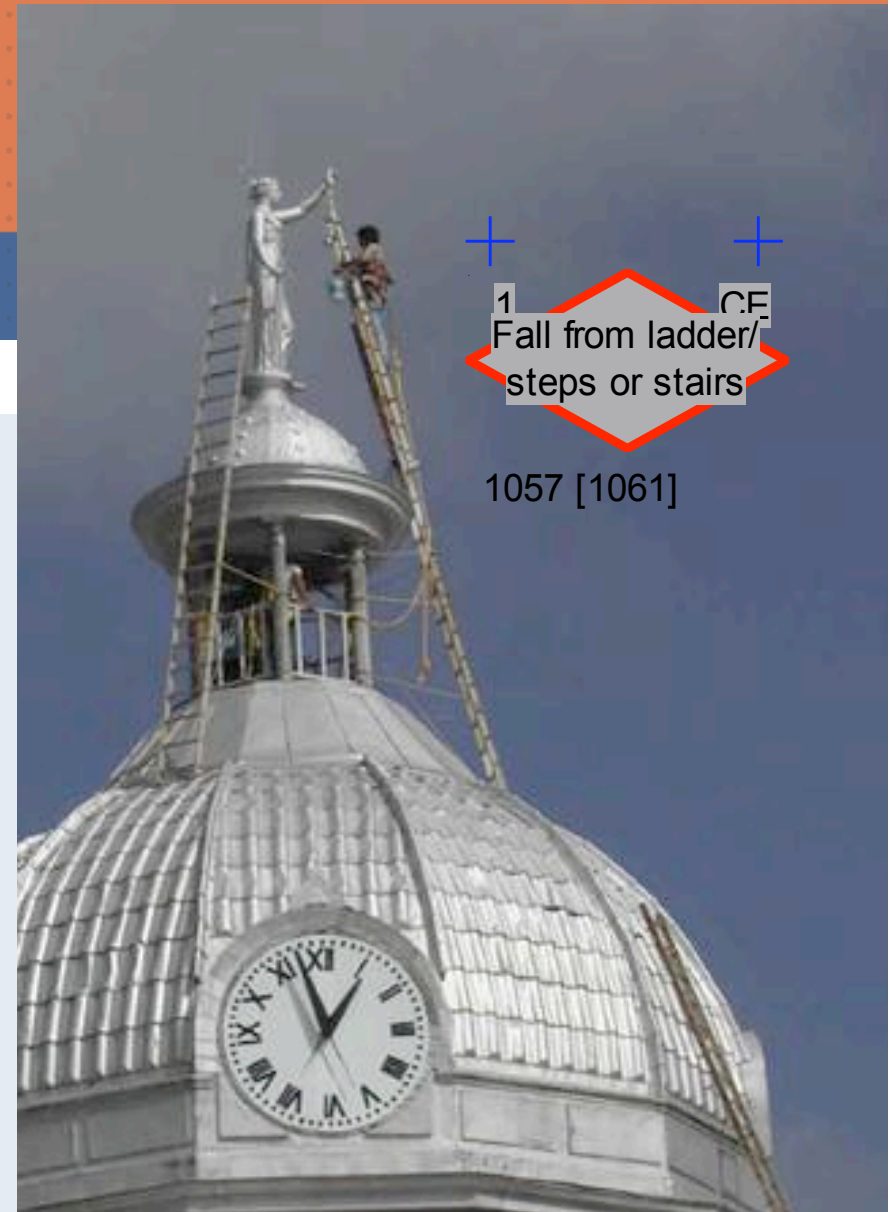
- 9000 investigated incidents are converted into scenario's and bow ties
- Barriers and management influences are modelled
- Quantification of the bow tie based on incident data and expert opinion
- Development of a cost effective risk reduction strategy
- Building of a six step QRA



Occupational Risk Model

Horrible Stories converted Into storybuild scenario's

- 12500 detailed accident reports of Dutch Labour Inspectorate
- 1998 – Feb 2004
- Around 9,000 accidents modelled in around 50 Storybuilds
- 5 person years of effort





Occupational Risk Model

Nr	Bowtie Description		
1.1	Fall from ladder (steps, stairs)	11	In or on moving vehicle
1.2	Fall from height roof/floor/platform	12.1	Person contacts charged object
1.3	Fall from scaffold	12.2	Electric arc/discharge
1.4	Fall through hole/ opening	12.3	Lightning
1.5	Fall from lift	13	Contact with extreme hot/ cold surfaces or open flame
1.6	Fall on same level	14.1	Spill/splash of hazardous substances in open container
1.7	Fall other	14.2	Person contacts hazardous substance
2	Struck by vehicle	14.3	Person contacts biological agent
3	Dropped object	15	LoC hazardous substance (active)
4.1	Flying Object ejected from machine	16	LoC hazardous substances (passive)
4.2	Flying Object ejected other	17	Fire
4.3	Flying Object blown by wind	18	Exposure to damaging noise dose
4.4	Hoisted/ hanging/ swinging Objects	19	Exposure to damaging non-ionising radiation dose
5	Contact rolling/sliding/moving object	20.1	Human Aggression
6	Contact with object person is carrying/ using/ holding	20.2	Animal+B9
7	Contact with hand held tools	21	Hazards related to entry into confined spaces
8	Contact with moving part of fixed machinery	22	Deprived of oxygen/ clean air
9.1	Blown/thrown against something	23	Lost buoyancy in water / drowning
9.2	Walk, jump into object	24	Diving related hazards
9.3	Contact with rough or sharp surface/ object	25	Extreme muscular exertion
10	Buried/suffocated	26	Office risk



● State of Affairs of the quantified risk model

- An incident model was adopted
- 9000 investigated incidents are analyzed and modelled in the so called tool “storybuilder”
- Storybuilder is a powerful tool for complex incident analysis (Amer power plant), Branch analysis (public and agricultural sector, machines) and training of safety professionals
- The scenarios were converted and quantified with the tool “bow tie builder”
- A first draft of the quantified model is ready
- A financial model for cost benefits of incident prevention has been build
- The model will be filled with storybuilder data and data from workers surveys
- In late 2006 the 2nd phase will start



Summary

- Storybuilds capture ALL known causes of Dutch reportable accidents
- The models can assist in understanding how "horrible stories" occur
- The models can be used for identifying the dominant conditions which give rise to accidents
- Policy makers, inspectors and company safety personnel can use these structures in e.g. accident investigation







● Safety Improvement Projects

Interventions in Safety Culture

- Have been successful in Europe: incident reduction in companies and branches up to 60%
- Main target is to change the basic assumption: “If you do dangerous work it is normal that you will have incidents”
- Create lasting commitment with management and workers



● Safety Improvement Projects

Culture and Safety Awareness campaign

Objectives:

- 10 -15% decrease in incidents in 20 projects
- Developing good practices as an example for other companies

Approach:

- Bottom-up: starts in companies, then good practices in branches
- Developing knowledge companies networks

The Ministry:

- Provides knowledge, financial contribution and monitors the projects
- Develops notions safety culture
- Develops network of experts in companies



Safety Improvement Projects

Is this safety culture?





Safety Improvement Projects

23 projects have started, examples:

- Chemical company
- Agriculture companies
- Corrugated cardboard companies
- Organisation of farmers
- Business estate with 400 companies
- Meat processing and sausage factory
- Building company
- Fire brigade
- Schiphol Airport





Safety Improvement Projects

First results after one year

- Chemical company: 40 % less accidents
- Building company: 30% less accidents
- Brewery: 20% less accidents
- Waste Processing: 50% less accidents

But also

- Metal company 80% of employees wear ear protection (was 20%)
- Brewery: 70% of employees wear ear protection (was 20%)





Safety Improvement Projects

Building Company

Approach:

- Target awareness and communication
- Target knowledge

Means:

- Introduction of safety committee for top- and middle management
- Safety observation rounds by management
- Safety motivation training for employees
- Analysis of accidents





Safety Improvement Projects

Fire brigade

Approach:

- Investment in awareness, communication, and leadership
- Investment in knowledge



Means:

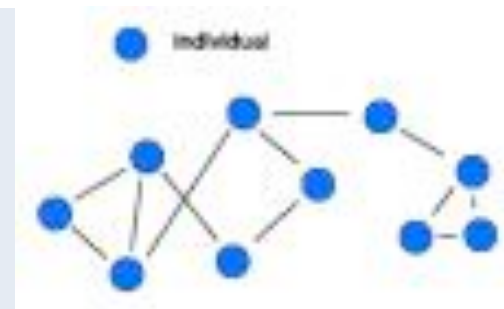
- Coaching of new commanders
- Safety workshops for fire brigade
- Developing a method and system for evaluating safety during incidents
- Integrating lessons learned in an educational program



Safety Improvement Projects

Safety network of companies

- 23 companies are in a network
- Companies help each other, the ministry facilitates
- Companies from different branches
- Meetings are thematic



In the future the number of companies in the network will further expand, via the pyramid approach.



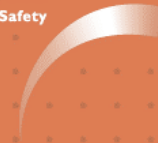
Relevance to Ionising Radiation Accidents

- Many radiation incidents have cultural aspects (see ALARA website – *Incidents: lessons learned*)
 - Awareness
 - Learning from own/previous mistakes
 - Peer reviews and safety rounds
 - Practical, non hypothetical experiences
- Risk model brings insight into
 - risk factors
 - identifying big risks



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