

Substitution of dangerous Chemicals



Experiences and practical considerations from the Netherlands

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Introduction

- * Corné Bulkman
- * 45 years
- * Living in a small village named St. Willebrord
- * Occupational hygienist \pm 20 years
- * 1995 founded Muopo
- * Several years involved in OHS education

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Content

- * Motives for substitution
- * Examples
 - * Successes and blunders
- * Aspects of substitution
 - * Risk model
 - * Human psychology
- * How to do
- * Recapitulate



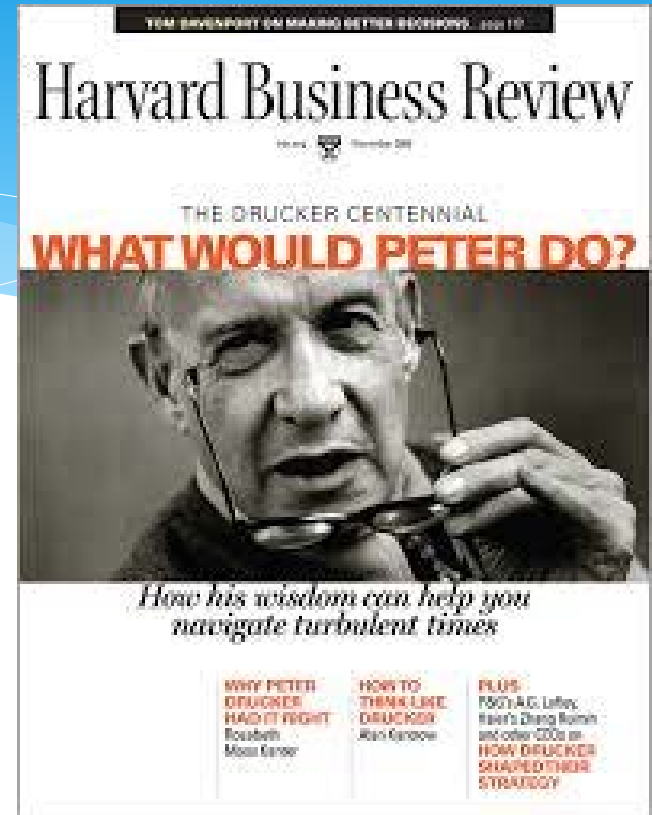
Motivations for the replacement of hazardous substances

- * Legal argument
- * Economical argument
- * Social argument



“The first duty of business is to survive, and the guiding principle of business economics is not the maximization of profit.....it is the avoidance of loss”

Peter Drucker



Stop Strategy

1. Substitution
2. Technical measures
3. Organization measures
4. Personal protection



Example



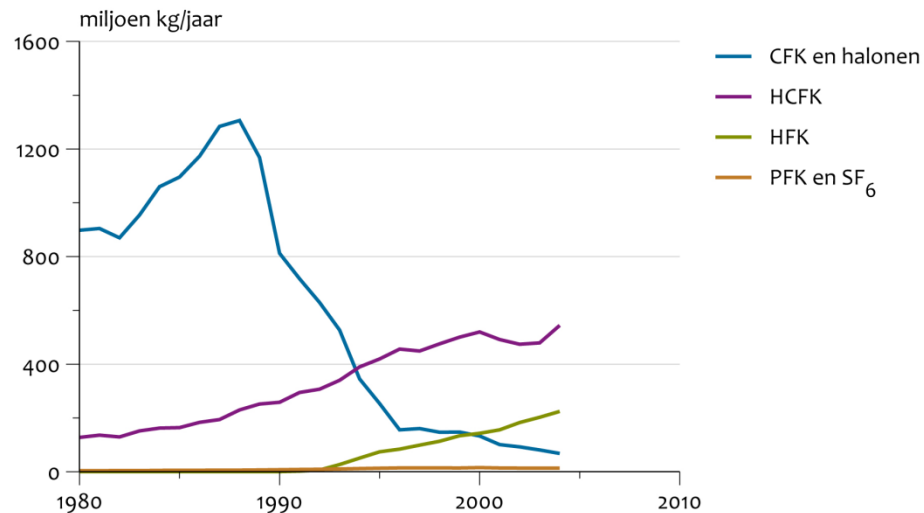
- * Asbestos (NL)
 - * 1993 prohibition for the use
 - * 500 new diagnosis every year
 - * No decrease of numbers
 - * > 2024 mandatory removal of all asbestos roofs



Example

- * CFCs
 - * For protection of the ozone layer

Mondiaal gebruik ozonlaagaantastende stoffen en vervangers



Bron: EDGAR 3.2 FT2000, AFEAS, 2006; UNEP Ozone Secretariat, 2006; UNFCCC, 2006; Smythe, 2004.

PBL/feb07/0175
www.compendiumvoordeleefomgeving.nl

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Example

- * Disinfectants
 - * Ethanol
 - * Cleaning
 - * IPA
 - * H₂O₂
 - * Chloride
 - * Non chloride containing



The right choice ?

- * Factory for adhesive tape

- * Toluene - Ammonia

- * Oel

- * 384 mg/m³ (15 min)

- * 36 mg/m³ (15 min)

- * 150 mg/m³ (8h)

- * 14 mg/m³ (8h)*

- * Vapour pressure

- * Toluene in a relative closed process with ventilation at the source in the process Ammonia installation relative open system

The right choice ?

- * Wash-installation Isopropyl alcohol
 - * Argument in 2000
 - * Solvents substitution
 - * Alternative
 - * **Ethanol**
 - * Current argument ???

The right choice ?

- * Printing company
 - * Toluene ink replacing by water ink
 - * Technical feasible
 - * Quality printing ++
 - * Exposure of employees +++++
 - * Speed of printing -----
 - * Economical feasible -----

What if reprotoxic chemicals are mandatory to replace according to technical feasibility

The right choice ?

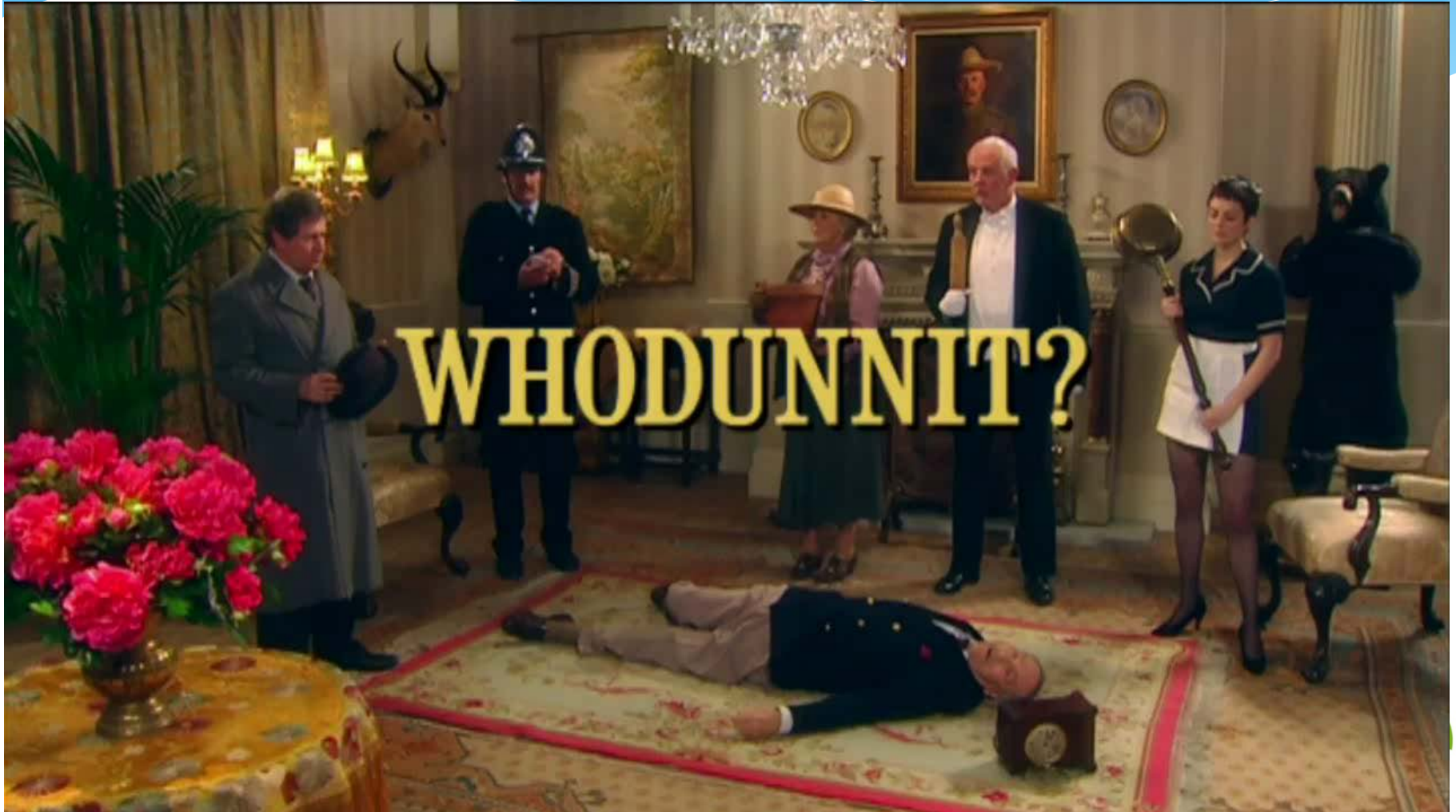
- * Conservation of steel
 - * Water-based high solid coatings instead of solvent-based
 - * Quality assured
 - * Less strain on employees and the environment etc..
 - * Why still not used ??
 - * Technical specifications of the client

Aspects with substitution

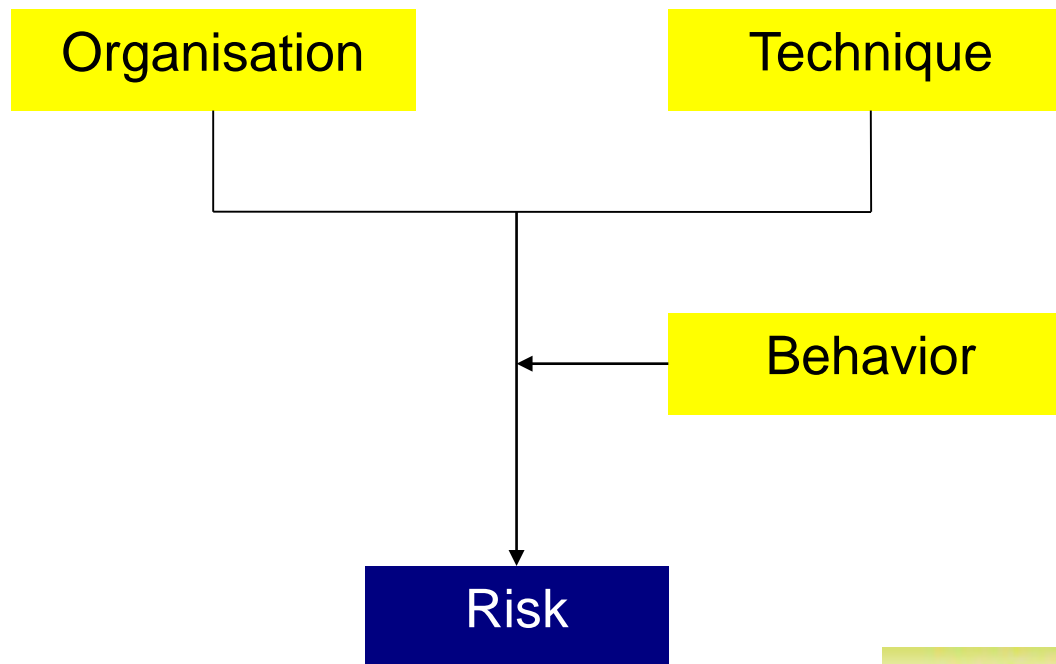
- * Substitution of a chemical for risk reduction
 - * How to judge?
 - * Do you have a complete overview?



Who has the all-seeing eye?

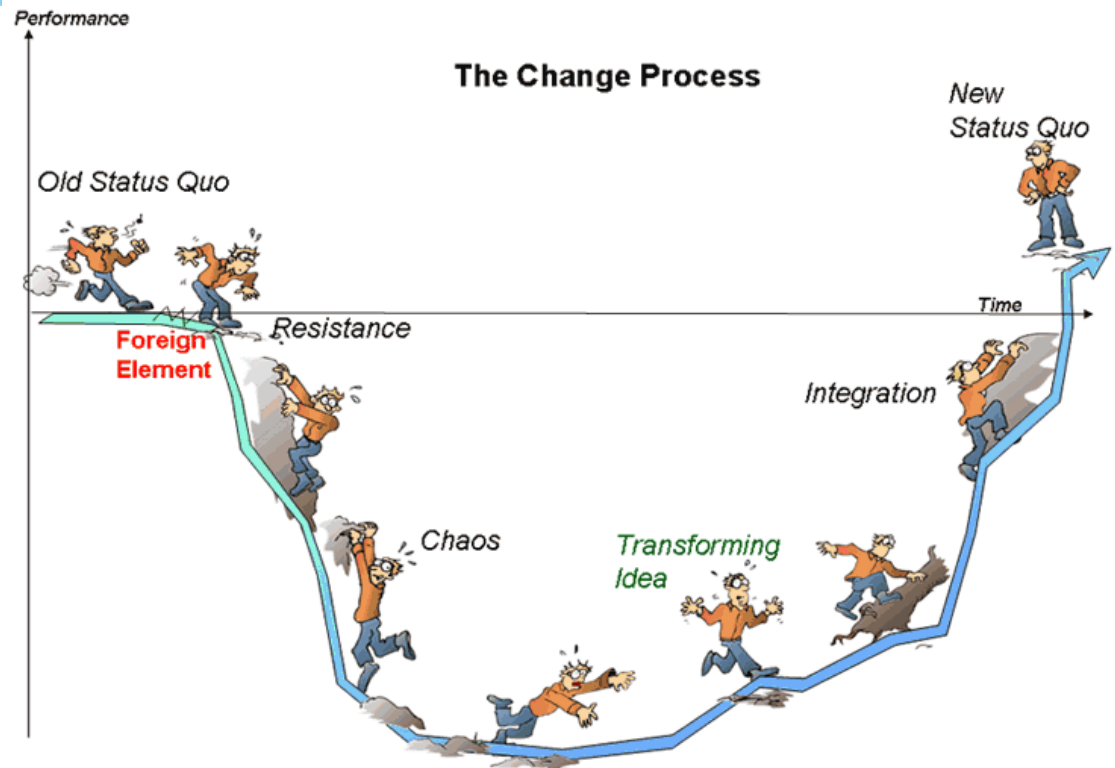


Risk reduction model



Phases of change

1. Denial
2. Goodbye
3. Letting go
4. Experimenting
5. Integration



Process of change

- * Who takes the initiative?



How to do?

1. Awareness
 - * Intention and commitment
2. Technical possibility
 - * knowledge, who are your partners
3. Convincing
 - * Management, Employees, clients etc.
4. Implementing
 - * Acceptance
5. Common practice
6. Legislation



Recapitulate

- * Motivation
 - * High Health issues / risks
 - * Good for business
 - * Legislation ??
- * Be aware of focus
 - * Not just the CMR chemicals
 - * Broad view
- * Human factor
 - * Change is always associated with resistance

Health and Safety is supported by directives and legislation but thrives on motivation.

