

Ensuring safety during manpower changes

TNO Work and Employment



Program

- Introduction
- Research program safe manpower planning
- Arguments for and resistance against
- Stepwise change
- Results
- Summary.

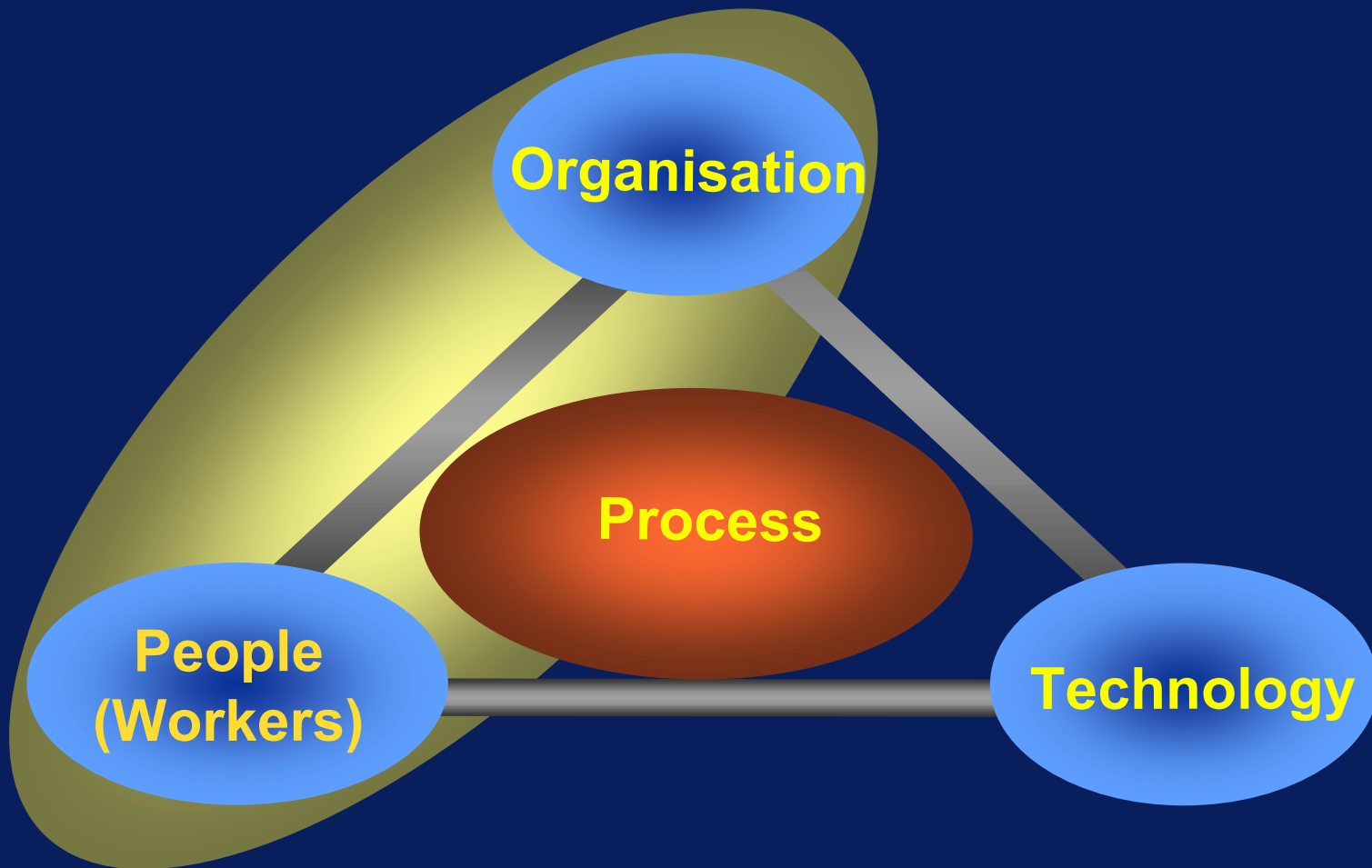
Introduction :

TNO Work & Employment



Optimal employment of people

Safety & health management is our business



Research program :

Safe manpower planning

- Cost reduction in (petro)chemical process plants and increasing automation leads to manpower reduction
- Employees give rise to **feelings** of uncertainty
- Objective of program :
develop objective criteria for an optimal manpower and support chemical companies with a 'tool for change'.

Participating companies

- Du Pont du Nemours, Dordrecht:
 - Wanted to split up a control room
- Akzo Nobel, Head office:
 - Wanted to have a validated tool for future changes
- Methanor, Delfzijl:
 - Had a manpower reduction target
- Nerefco (Netherlands refining company), Europoort:
 - Wanted to have a tool for improving performance.

Arguments for & resistance against:

Arguments for change:

- Global competition requires cost reduction
- Benchmarking within industry
- Too much hierarchical levels spread responsibility.

Resistance against:

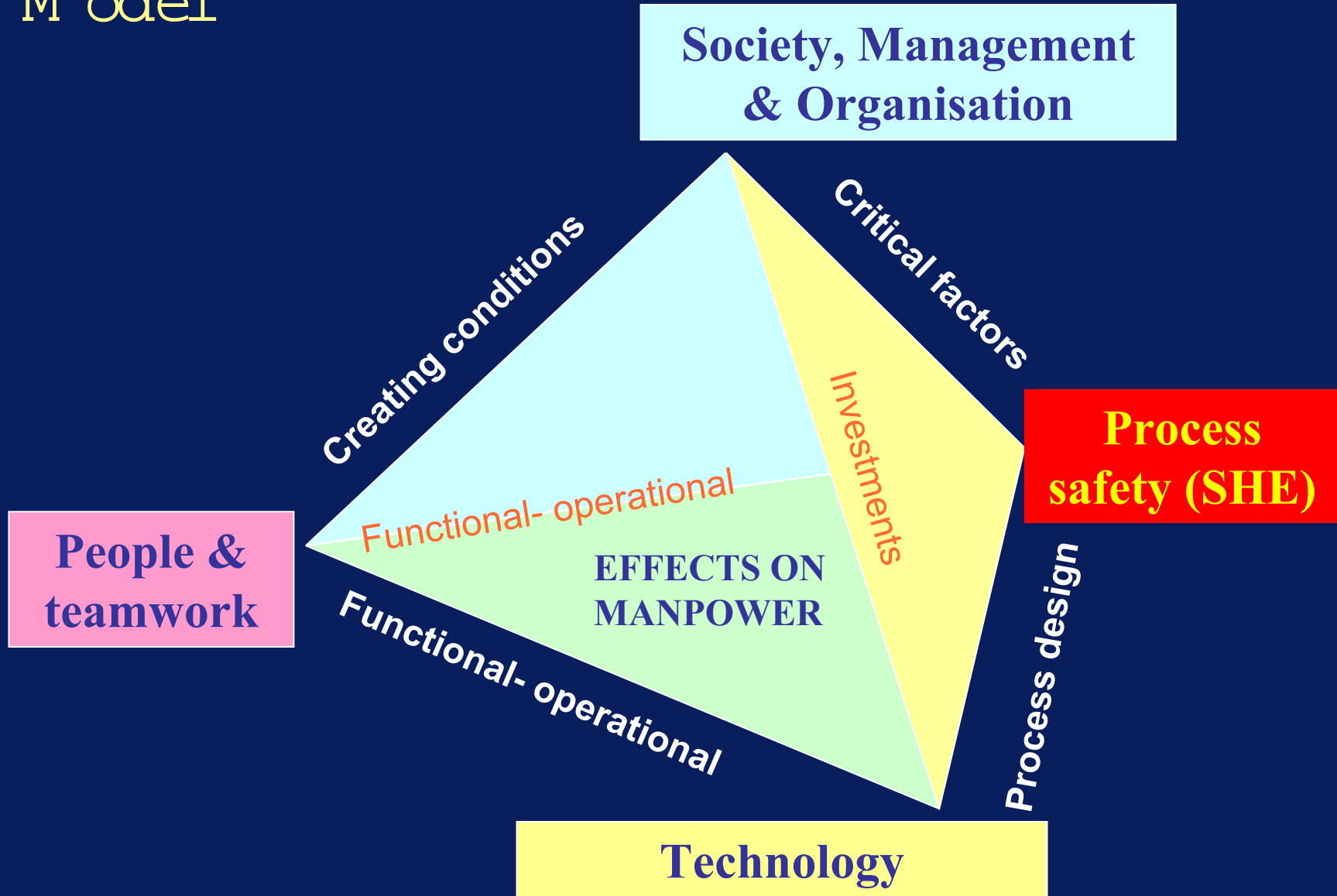
- Experienced employees are first to move out
- Positions for career development are diminished
- Competence of humans are not considered valuable
- Operators feel they are disposable.

Safe management method

Consists of:

- Optimal management model
- Method for creating an optimal management step by step
- A questionnaire and a manual for use
- Guide for acceptance of changes in management.

Model



Stepwise change

- Intake (checklist)
- 2. Meeting with stake holders
- 3. Multidisciplinary workgroup
- 4. Use of questionnaire
- 5. Implementation of solutions
- 6. Evaluation

Intake

- What is the situation of the business?
- Were former changes successful? Why?
- What is the need for change?
- Is this need realised throughout the organisation?
- What is the desired state? Why is this?

Stake holders

- To realise change by plant management involve relevant stake holders:
 - Employee committee
 - Unions
 - Engineers
 - Operators
 - Maintenance workers.
- Define what to communicate and position to take!

M ultidisciplinary w orkgroup

- G o for com m itm ent for change in the operational team s
- C reate a com m on goal
- P inpoint 'pains' and points of resistance
- Shape the desired future.



Questionnaire

- Fills in the model:
Questions about facts **and** feelings of present situation
- Result:
Knowledge of necessary changes concerning the operators **and** participation of operators with intended change
- Important success factor: process of survey!

Example questions

People & team work

Functions and task-structure

Responsibilities

Example questions:

Can all operators perform all tasks in the shift?

Does every operator actually perform all tasks regularly?

Society, organization & management

Organizational objectives

Influence of management, influence on objectives

Example question:

Who sets the targets for production?

Example questions

Technology

Complexity

Process, installations, control

Example question :

How much time is spent per shift in adjusting/tuning the process?

Process safety (SHE)

Representation

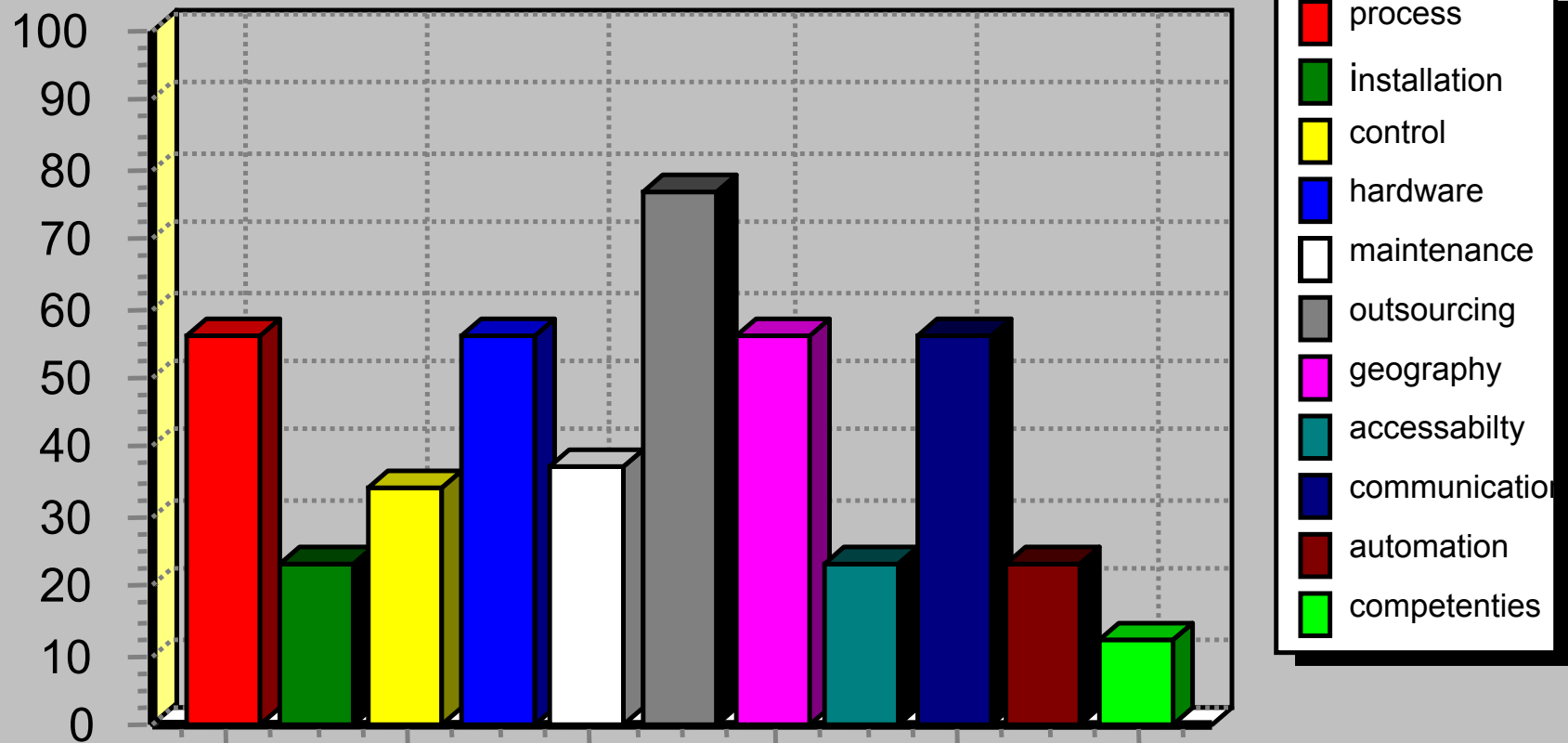
Control, emergency scenario's, alarm management

Example question :

Are mistakes from operators corrected by technology?

Example of potential for improvement

Technology-complexity



A n a l y s i s o f r e s u l t s

- R e s u l t s a r e o r d e r e d i n :
 - R e l a t i v e s t r e n g t h s (> 7 0 % s c o r e o n q u e s t i o n)
 - R e l a t i v e w e a k n e s s e s (< 3 0 s c o r e o n q u e s t i o n) .
- T o g e t h e r w i t h c o m p a n y t e a m :
 - t o p 1 0 o f w e a k n e s s e s a n d
 - a r e a s o f i m p r o v e m e n t d e t e r m i n e d .
- A c t i o n / p r o j e c t p l a n c o n s t r u c t e d .

Implementation of solutions

Managers and operators have different opinions on when to stop or slow production for safety reasons
=> Workshop to solve this problem

Operators get too many alarms in case of emergency
=> Hierarchy in alarms implemented

The same error occurs over and over again
=> Near miss system implemented with involvement of operators to search for basic risk factors

Results

- 20 original companies use the method during change
- Application of the method with three new companies:
GE Plastics, Bergen op Zoom :
 - Has integrated 3 control rooms to one

Shell Nederland Raffinaderij & Shell Nederland Chemie,
Rotterdam :

- Has integrated control rooms and optimise working processes.

DSM ACN, Geleen :

- Wants to have a second opinion on their manpower planning method and understand why there is resistance against change.

Further development

- Validation of method through statistical analysis of responses on questionnaire & describing case studies
- Specifying questionnaire for types of chemical processes
- Integration of some user friendly software applications
- Developing the method as a national norm in contact with Labour Inspectorate (?)

Statements

- Manpower changes has to be based on **qualitative** arguments.
- Involvement of **stakeholders** is essential for acceptance of change.
- There are **no other methods** for safe manpower changes which specifies the qualitative assumptions within a company.

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