

C3 Knowing the ‘state of safety’: practical approaches for industry and safety authorities

Jakko van Kampen, Viola van Guldener, Johan Gort,
The Netherlands Organization for Applied Scientific Research TNO, The Netherlands

Abstract

Chemical companies are looking for ways to gain insight into the level of safety in their company so that additional measures can be taken when necessary and the effectiveness of interventions can be measured. That said, measuring safety, health and the environment is not easy. The difficulty of knowing what will happen continues to be illustrated when serious incidents occur and are analysed such as, the ‘BP Texas city’ incident (Baker et al., 2007); the blowout and explosion of the drilling rig Deep Water Horizon on the Macondo Well (OSC, 2011) and recently in the Netherlands the 2011 Chemie-pack chemical fire (Dutch Safety Board, 2012) and the Odfjell incident (Dutch Safety Board, 2013).

These type of incidents also bring forward the question of the level of insight government regulators should have in the state of safety within high risk companies. Regulators have a desire to match their inspection efforts to the risks within these companies in order to force improvements where they are most needed. They also want to better understand evolving risks to enable an appropriate response. Do regulators currently have sufficient insight into this ‘state of safety’ and which methods are possible to increase that insight?

The Netherlands has a strong tradition for using ‘soft law’ approaches wherein aspects of ‘network oriented’ and ‘self-regulation’ is starting to be used. This represents a move from detailed legislation towards goal setting legislation. And a change from government dominated regulation towards stakeholder dominated measures. We briefly report on four approaches which have been or are being piloted for increasing governmental insight into the state of safety in relation to the governance style:

1. Limiting active inspections for companies with a certified safety management system;
2. Collecting and aggregating inspector ratings of companies safety management;

3. A safety culture quickscan to investigate chemical company safety culture;
4. Possibilities for generic 'company' safety indicators.

After these reports we discuss some dilemmas for gathering insight into the state of safety, share a view towards government industry cooperation and discuss some potential research questions.

References

Baker, H. 2007. The report of the BP US refineries independent safety review panel. PDF version: www.safetyreviewpanel.com.

OSC Oil SC. 2011. Deep Water: The Gulf Oil Disaster and the Future of Offshore Drilling, Report to the President, January 2011. National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling.

Dutch Safety Board (2013) Odfjell Terminals Rotterdam Safety, during the 2000 - 2012 period

Dutch Safety Board (2012) Fire at Chemie-Pack Moerdijk

Knowing the 'state of safety'

Practical approaches for industry and safety authorities

Jakko van Kampen, Viola van Guldener, Johan Gort



Knowing the 'state of safety'

› Basics

- › SEVESO, permits and inspections

› Desire to

- › match inspection effort to risks
- › better understand evolving risks

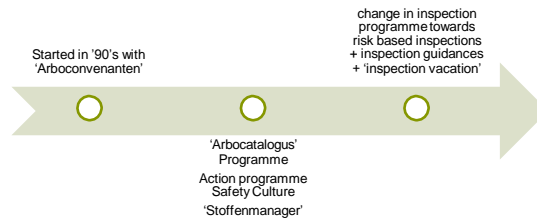
› Piloted and discussed 'soft law' approaches in the Netherlands:

1. Certification status
2. Inspector ratings
3. Safety culture
4. Generic 'company' safety indicators

→Goal: Determining (and sharing) the 'state of safety'

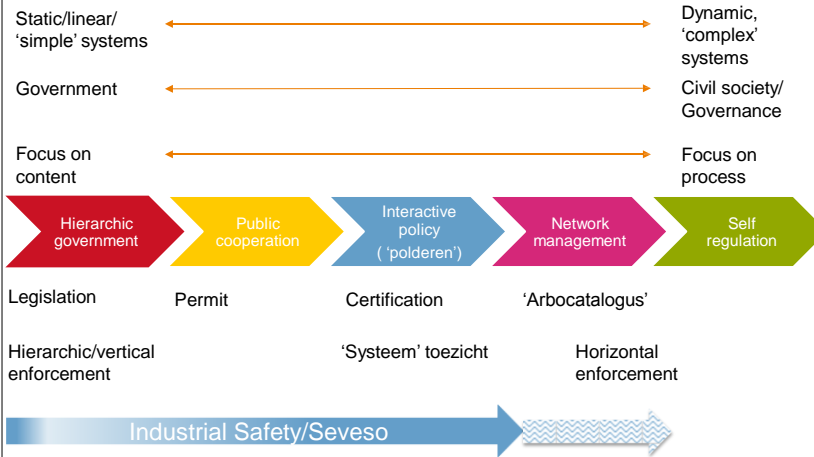
'Soft law' tradition in the Netherlands

- › Primary responsibility for OSH at companies (employers + employees)
- › From detailed legislation towards goal setting legislation



- › Hypothesis: self-regulation instruments are effective in OSH/Safety management (on paper and in real world)

Industrial Safety Transition towards.....self regulation?

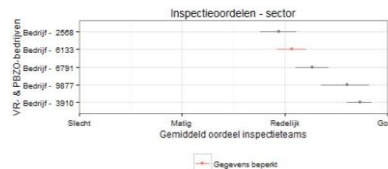


1. Utilising company certification status

- › Safety system certification seen as important
- › In the Netherlands 'OHSAS Inspection holiday' since march 2012
- › OHSAS certified companies are exempted from 'active visits' by the labour inspectorate
 - › Reactive visits still apply
 - › Major hazard companies still visited
- › Does OHSAS certification discriminate?
 - › Studied for labour-inspectorate in a comparison of 25 'company pairs'. Detailed results expected summer 2014.

2. Using inspector ratings

- › Multi-agency inspection teams visit SEVESO companies every year
- › Inspections are organised around SMS control elements
 - › Findings > Offences > Fines (also input for next visit & frequency)
- › **In addition:**
 - › For each 'SMS Control Element' three inspection team ratings are made: **1.** Documented; **2.** Appropriate; **3.** Implemented
 - › Likert rating of: "Poor", "Moderate", "Reasonable", "Good"
 - › Goes beyond offenses and reported events. Many (diverse) ratings available for each company
- › **Question:**
 - › How can we use these ratings to rank SEVESO Companies?
 - › Pilot approach.



3. Pilot study: safety culture

- › Safety Culture:
 - › The attitude, values, (implicit) assumptions, perceptions and habits of the members of an organisation relevant for dealing with (process) safety risks (Zwetsloot & Dijkman 2010)
 - › The 'unwritten rules' in the organisations or the 'way we do things'
 - › Can we assess Safety Culture and use it to benchmark?
 - › Project commissioned by the regional environmental inspectorate (DCMR)

*Professor Gerard I.J.M. Zwetsloot, PhD
& Robert A. Bezemer M.Sc. MTD*

Approach taken

- › Assessed the quality of safety culture in 14 major hazard companies in four sectors in the Rotterdam area
- › Investigation of relevant data/documents and two days of interviews with two researchers
 - › Wide selection of private interviews (Plant mgr, Works council, operators)
 - › Scoring for each interview on 14 dimensions, tied to five step 'Safety culture Ladder'
 - › Checks with other sources to counteract socially desirable responses
 - › Practice, awareness and behaviour as focus; not auditing

Direct company feedback

- › Immediate feedback end of visit
- › Inspectorate representative present
- › Sharing observations and scores, discussing findings
- › Consistency : variation across topics and between interviews
- › No 'fines' but did lead to numerous company improvement initiatives shared with inspectorate

Aggregated view

Consistency in process safety culture scores	Good or acceptable score on all 14 dimensions	Average score acceptable but with some weak dimensions	Many weaknesses, average is below standard
Refineries	2		
(Petro)chemical	4		
Bulk storage	3	1	
Warehousing and logistics		2	2

4. Using company safety indicators

› Why

- › Companies already gather a lot of information
- › Much higher 'refresh rate'
- › Desire for more insight

› Still difficult

- › Process safety ≠ Personal safety ≠ Other forms of safety
- › Standardised lagging indicators and mostly company specific leading indicators
- › Many guidance's focused mainly on 'process' little on 'evidence'

The documentation is available



What companies actually use

CCPS Survey 2013

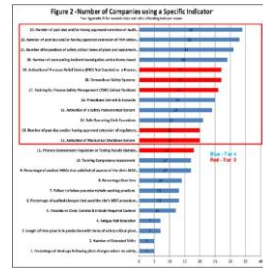
- › CCPS member companies (N=43)
- › Focused on chem. ind.
- › 23 specific leading indicators from CCPS standard

TNO survey 2012

- › Dutch safety professionals (NVVK) N=180
- › Broad, industry
- › 37 more generic indicator descriptions

RIVM interviews (Bellamy et al. 2013)

- › Twelve leading SEVESO companies
- › Explored sharing indicator data with government
- › SEVESO based potential indicators (+20)



Some overall conclusions

- › Definitely seen as important by companies, a lot of effort is put in
- › A lot of differences between companies in practice: choosing what to measure; choosing how to measure; implementing all the good advice;
- › Respondents agreed about what was important, this was however not what they used most (TNO survey)
- › Companies with a better LTI (TNO survey)
 - › Used more indicators (good companies measure...?)
 - › Used some different indicators (complex/leading/primary process)
- › Standards are available but not yet implemented everywhere

Barriers to implementation

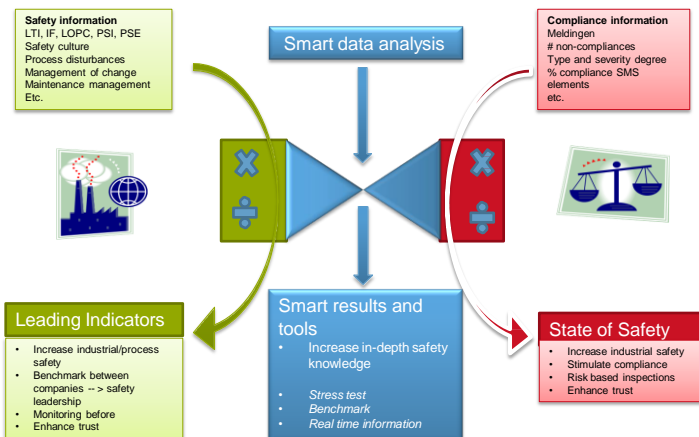
› CCPS

- › Managerial commitment; Clear definitions; Data collection (systems); Resources; Reluctance to implement

› RIVM

- › Companies did not support generic indicators for government or public sharing (RIVM study, 2013)
- › Differences between companies; implementation of standards; competitive information; knowledge needed to interpret (media/government); doubts about insight.

A view towards cooperating



Dilemma's and questions

- › Is it possible to define generic indicators applicable to all major hazard companies?
- › Should governments mandate the use and reporting of specific indicators?
- › How effective is self-regulation and 'soft law' can for major hazards?
- › What is needed for generic safety indicators for Europe's major hazard industry?
- › How could we balance industry and governmental needs?
- › Which types of self-regulation approaches are most suitable for industrial safety?