



Omgevingswet: Opportunities for a Third Safety Revolution and for a Win-Win-Win !

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Presentation outline

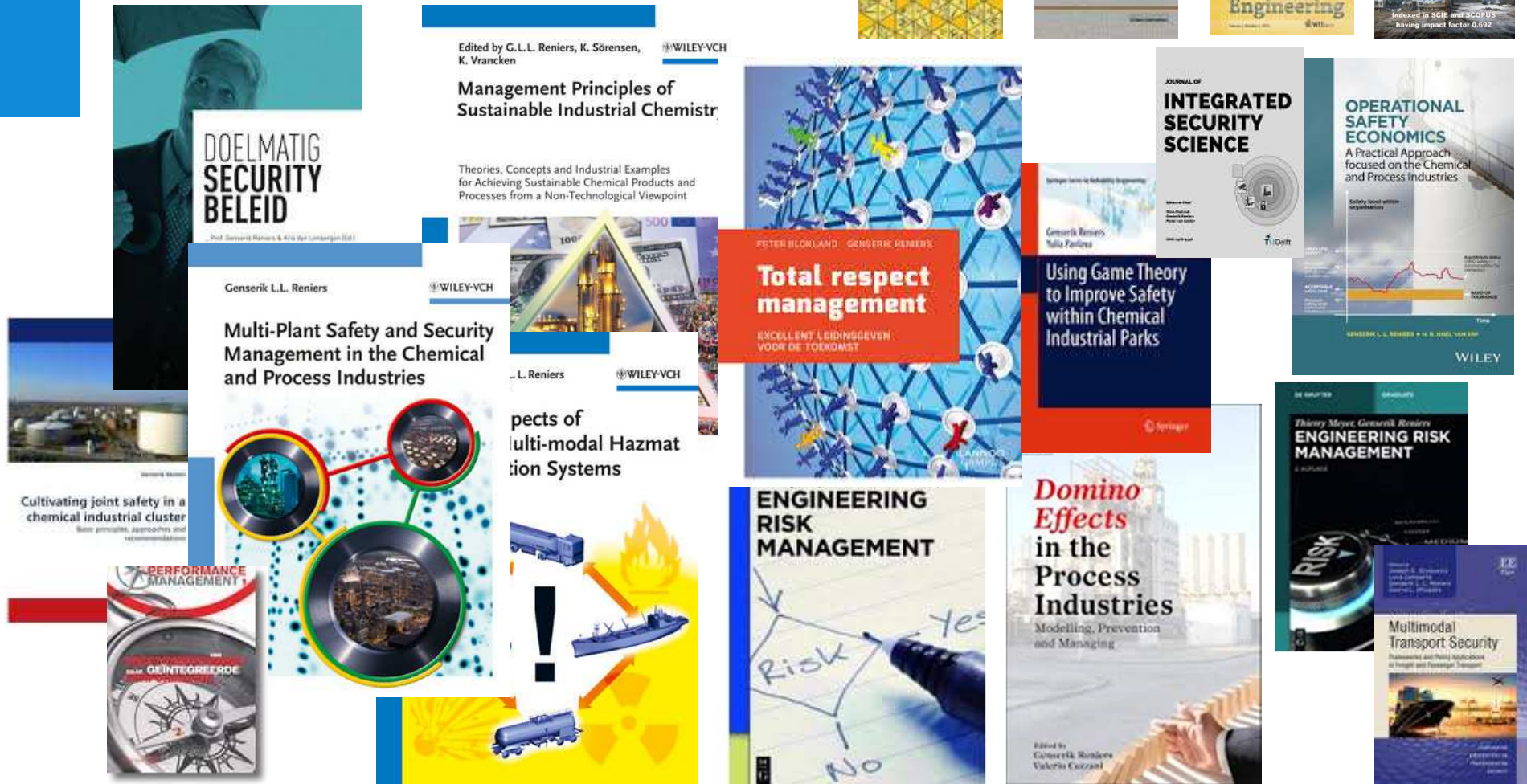
1. Who am I?
2. Brief history of safety progress
3. What are current evolutionary trends to improve safety?
4. However: a Third Safety Revolution is needed!
5. Conclusions

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- MSc. in Chemical engineering
- Ph.D. in Applied Economic Sciences
- Full professor at TUDelft & UAntwerpen (Chair on Safety of hazardous materials)

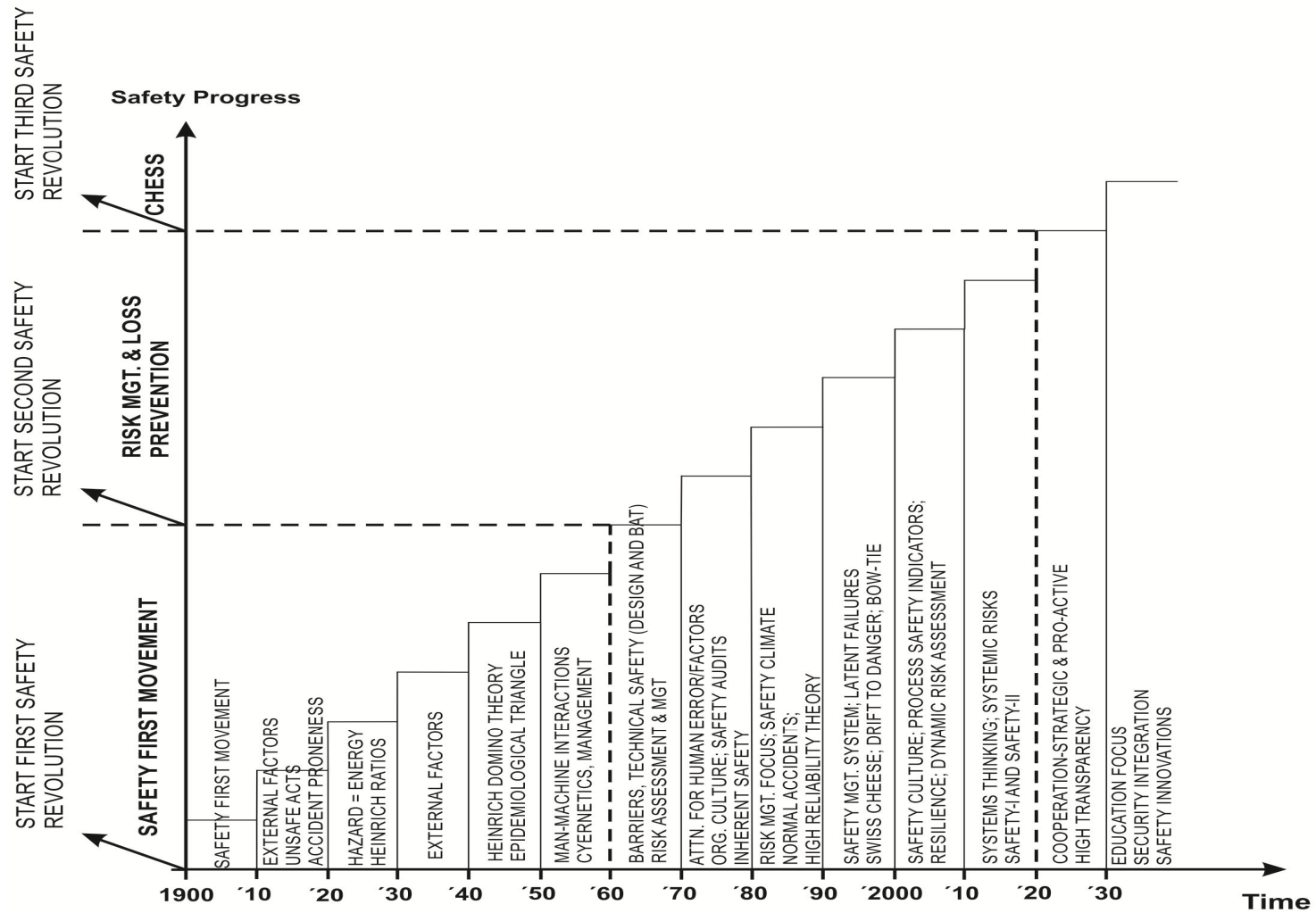
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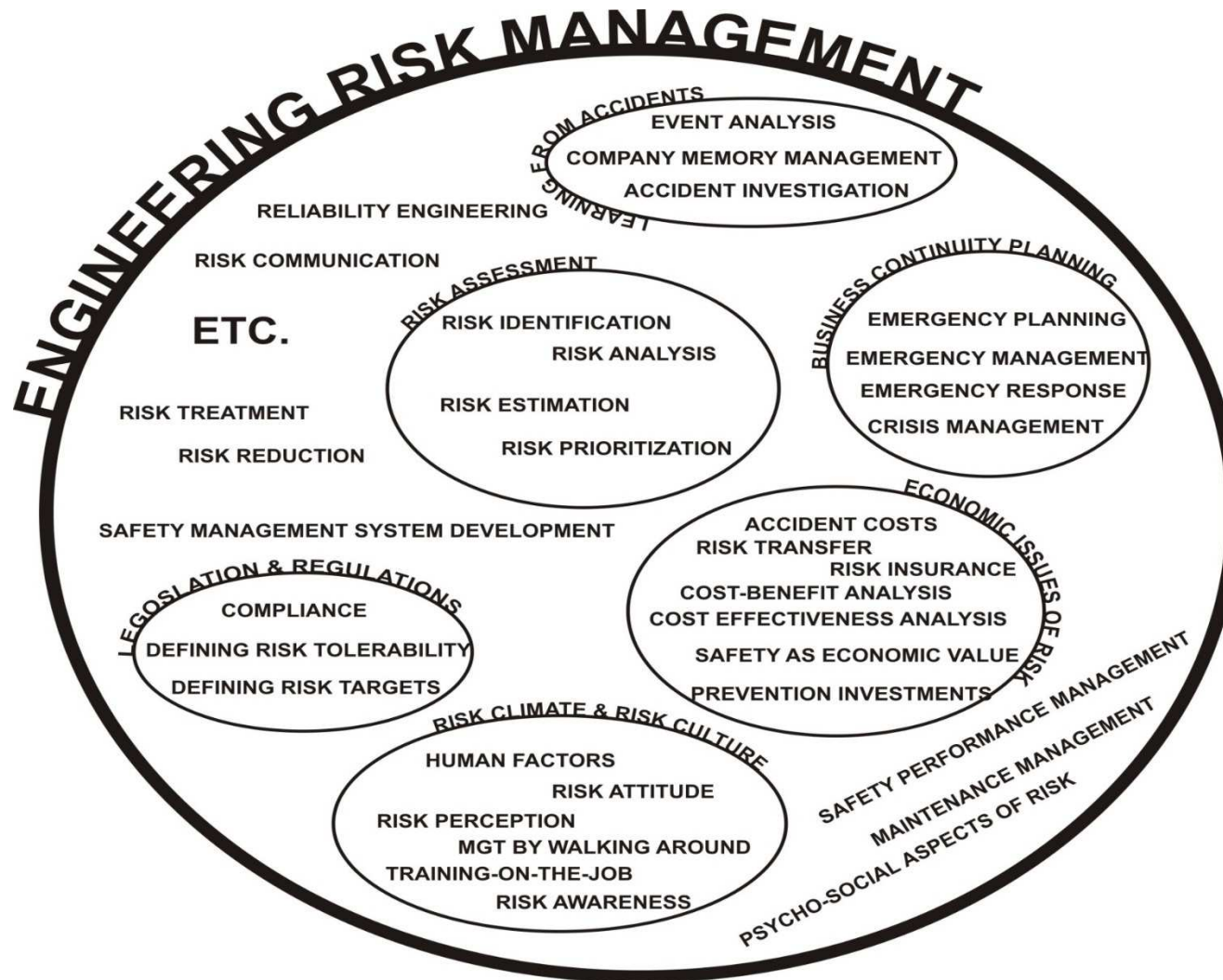
Brief history of safety progress



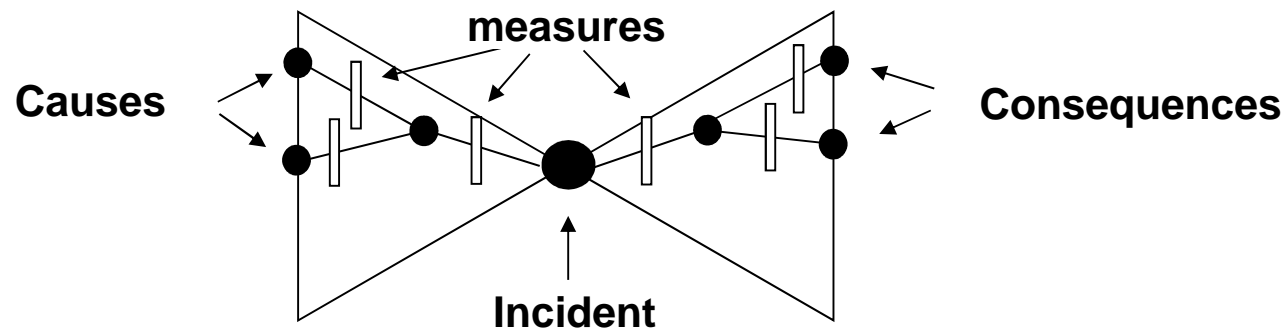
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Safety in organisations: professionalizing (variety of domains and of disciplines)



What are current evolutionary trends to improve safety – Using the bow-tie



- **PRO-ACTIVE PHASE:** collaboration (scale + O^3), dynamic risk assessments, big data, economic analyses, security TAs, harsh environments, performance mgt, trans-disciplinary solutions, systemic solutions / barriers, educate people pro-active communication (safety apps), 'culture' (single + cross-c), how safe is safe enough / ethics, mental models
- **INCIDENT PHASE:** use real-time data to make assessments, big data, communication, collaboration, simulation exercises: more 'real' and more involvement from public; serious games
- **RE-ACTIVE PHASE:** collaboration (scale + O^3), communication, psychological aspects

However: too many of the old recipes are being used and re-used in safety!

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A Third Safety Revolution is needed

“**Business as usual**” regarding dealing with safety and safety improvements since 1960’s

However:

- Adaptation to the needs of current society and societal expectations (e.g. **transparency, moral aspects and ethics**)
- Changing world: new challenges (a.o. **Security**)
- Still too many incidents and accidents – industry can really be **more excellent**
- Companies are still too much “safety-islands” instead of “**safety clusters**”

More insights needed into how to answer certain questions

- How to **integrate different types of risks** when making risk decisions?
- How to **deal with horror scenarios (e.g. terrorism) from a sustainable viewpoint?**
- How can **moral aspects** be taken into account in decision-making?
- How to develop **usable** and inclusive **dynamic risk assessment techniques**, using big data and real-time monitoring?
- How to **advance academic knowledge regarding operational- and cyber security?**
- How to truly advance **collaboration and cluster-thinking?**

More insights needed into how to answer certain questions

- How to **innovate safety** within the chemical industry **in a sustainable way**, whereby the energy transition, land-use planning, safety behavior, cluster-thinking, etc. are all considered?
- How to initiate and advance **strategic pro-active and re-active collaboration** in industrial parks/clusters?
- How to **increase people knowledge about safety, or e.g. the number of students** for safety related studies?

HOWEVER: Current thinking, mental models, technological approaches and solutions, safety implementations and **ways to improve safety DO NOT SUFFICE** to answer these questions and **to revolutionize safety** and make it much, much safer in a realistic way

A Third Safety Revolution: The '**CHESS**' Paradigm

Members from the Triple Helix (Industry, Authorities and Research institutes) truly wanting to advance the Dutch industry needs to play 'CHESS': Put focus on / advance the following:

- **C**ooperation and Clustering
- **H**igh transparency and efficient inspections
- **E**ducation, learning and training
- **S**ecurity development and integration
- **S**afety innovation and dynamic risk assessment



‘CHESS’

- **Cooperation and Clustering:**
 - Establish a multi-plant council or a cluster council
 - Establish pro-active strategic cooperation and improvement by setting up a ‘cluster safety funding’ budget
 - Use ‘flying risk assessment’ teams and ‘flying internal audit’ teams in industrial parks
 - Establish a cluster emergency planning matrix
 - Take domino effects (escalating accidents) into account in risk assessments
 - Establish a cluster safety management system upgrade approach
 - Establish a ‘cluster safety culture’
 - Etc.

‘CHESS’

- **H**igh transparency and efficient inspections
 - Establish a country-wide database for incident and accident reporting in various industrial sectors
 - Establish a ‘just culture’ in single plants and industrial parks
 - Establish a dissemination system where companies and authorities/inspection teams can learn from all incidents happening within the industry
 - Establish an understanding between cluster safety council members and inspection services to make inspections much more efficient
 - Safety inspectors should have rotating clusters/plants
 - Use drones and UAVs to continuously gather data from around the industrial park
 - Etc.

'CHESS'

- Education, learning and training
 - Knowledge management systems should be present in every company
 - There should be training sessions where plant safety managers and safety inspection services are jointly present
 - Safety learning should be supported by adequate/validated/scientificallly investigated performance management science
 - 'Dealing with uncertainties and risks' should be taught to children in primary schools
 - 'Risk management' should be taught at high schools, either as a separate course, or within existing courses
 - 'Process safety' (and inherent safety) should be taught to all chemists, chemical engineers and industrial engineers, and be considered as essential in the educational program
 - Etc.

‘CHESS’

- **Security development and integration**
 - Carry out TA’s, SVA’s or security risk assessments in plants/clusters (alongside safety risk assessments / integrated)
 - Use a cluster view to take counter-terrorism measures, besides a plant view
 - Make a priority of hazmat transportation security (transportation risk assessments and measures based on these assessments, secure lanes, secure emplacements, etc.)
 - Establish industrial park security teams
 - Develop a security incident database
 - Establish security inspections for plants/clusters (alongside safety inspections / integrated)
 - Take counter-terrorism measures seriously, preferably design-based by scientific studies
 - Etc.

‘CHESS’

- **Safety innovation and dynamic risk assessment**
 - Use big data to innovate safety within plants/clusters
 - Use dynamic risk assessment techniques (invest in them) to advance real-time knowledge and decision-making
 - Invest in research for performance management science and safety/security performance indicators (should be pro-active mainly) to see which indicators work and which don't (longitudinal studies)
 - Serious games for safety and security major accidents/terrorist attacks should be developed and used for learning and exercising
 - Science on mental models and their impact on safety should be developed and implemented in plants/clusters
 - Develop alternative risk assessment techniques whereby ethical/moral principles and economic information are considered
 - Etc.

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Conclusions:

- The **Omgevingswet** offers opportunities to achieve a **Third Safety Revolution**
- Achieving the **Third Revolution for Safety** will be very challenging and ambitious for all stakeholders, yet achievable and **in the long term very rewarding (and unique worldwide)**
- There needs to be an intensive cooperation between authorities, academia and industry on safety and security, with the necessary funding, **improving acceptability and acceptance of risks** in the Netherlands (Win-Win-Win!)
- A **strong competitive advantage for the Dutch industry** will be created, providing opportunities for large-scale investments in industrial activities
- Remember '**CHES**': **C**luster-thinking, **H**igh transparency, **E**ducation, **S**ecurity, and **S**afety innovation





**Thank you very much for your
attention!**

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