
Views and needs for risk assessment and nano-risk governance in research and industry organizations

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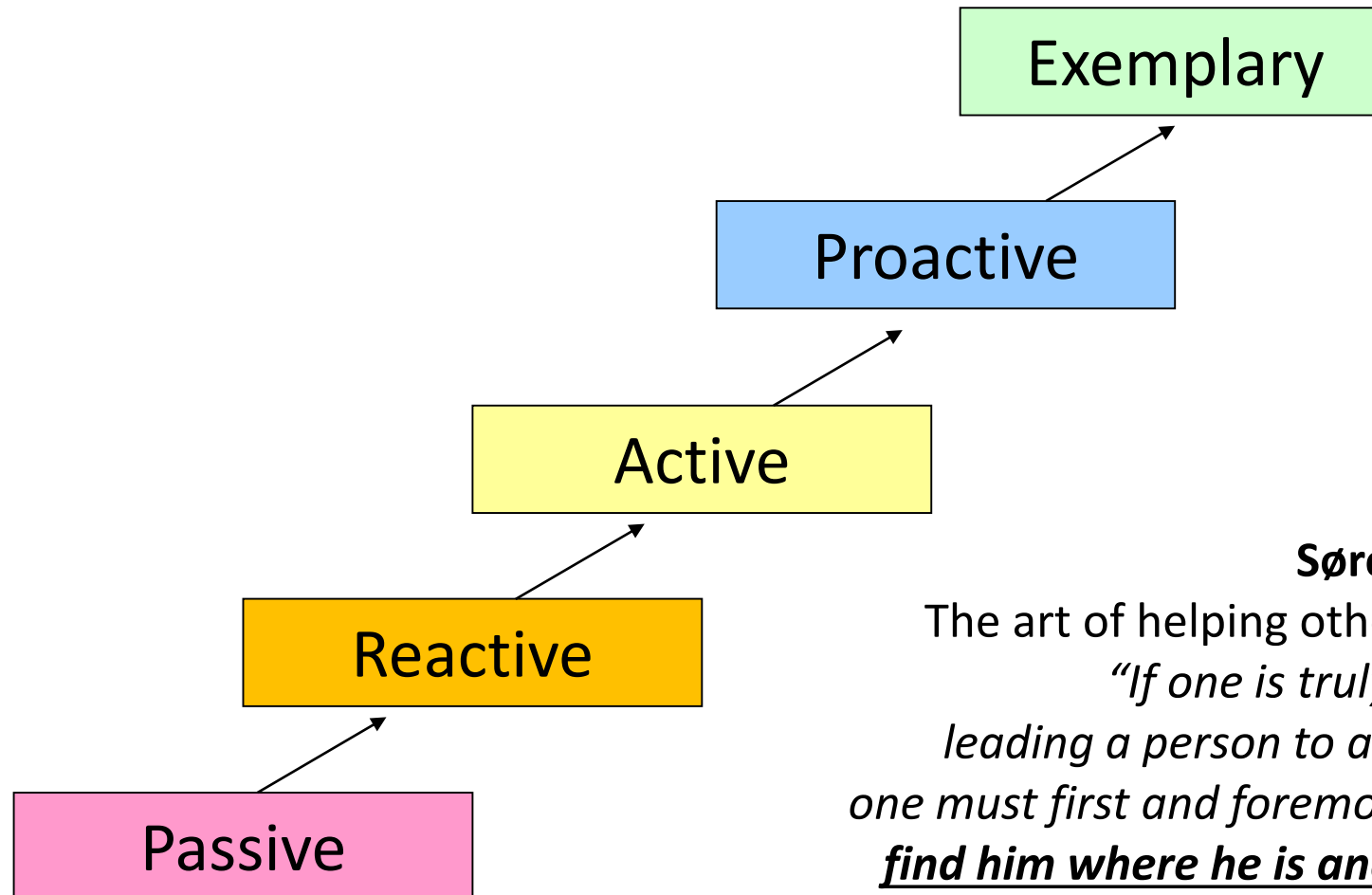
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Safety culture maturity model



Søren Kierkegaard

The art of helping others understand
*“If one is truly to succeed in leading a person to a specific place, one must first and foremost take care to **find him where he is and begin there.**”*

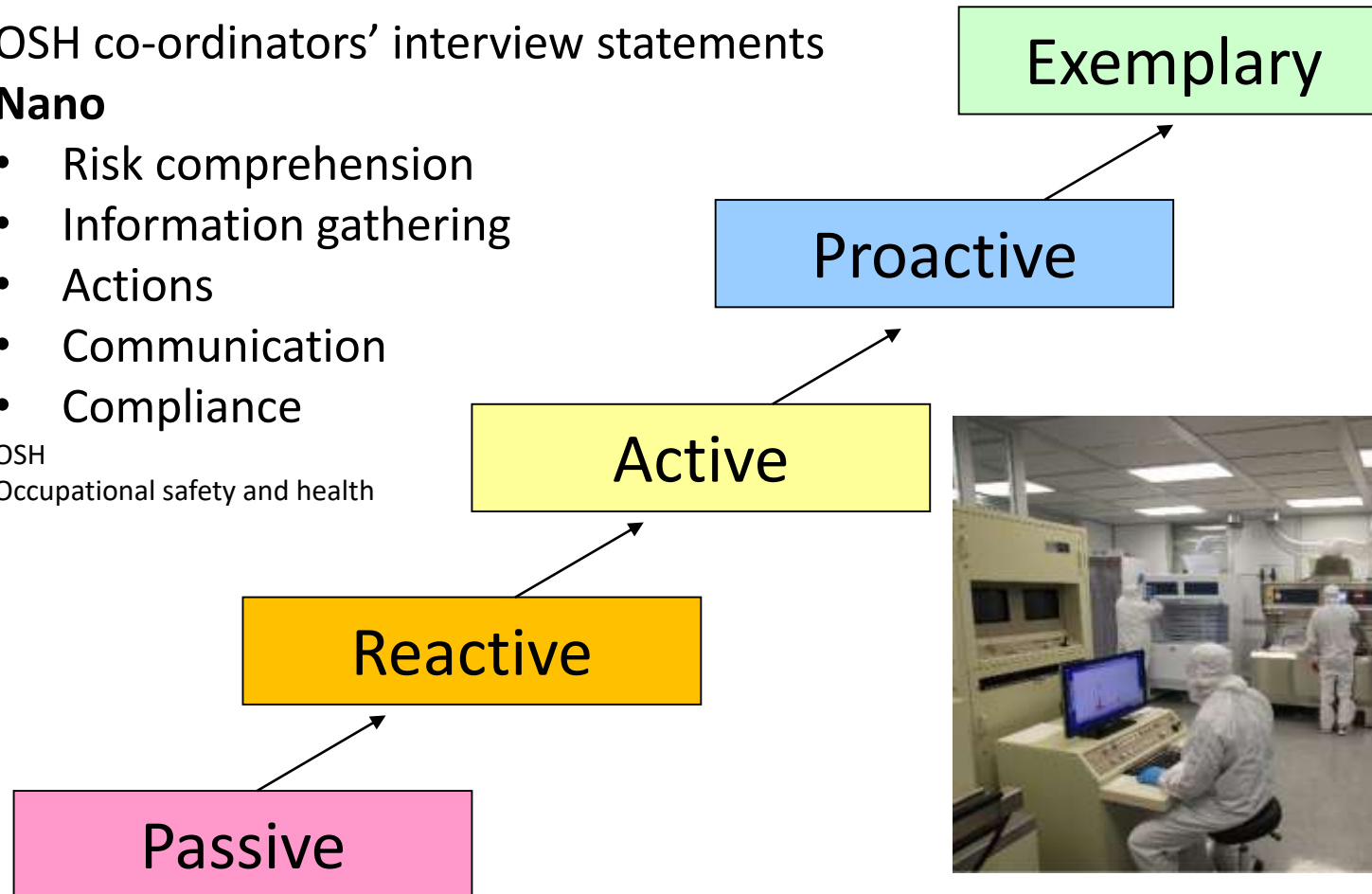
How do academia and industry attain and apply knowledge about nano? (WP4)

OSH co-ordinators' interview statements

Nano

- Risk comprehension
- Information gathering
- Actions
- Communication
- Compliance

OSH
Occupational safety and health



Needs: The nano life-cycle

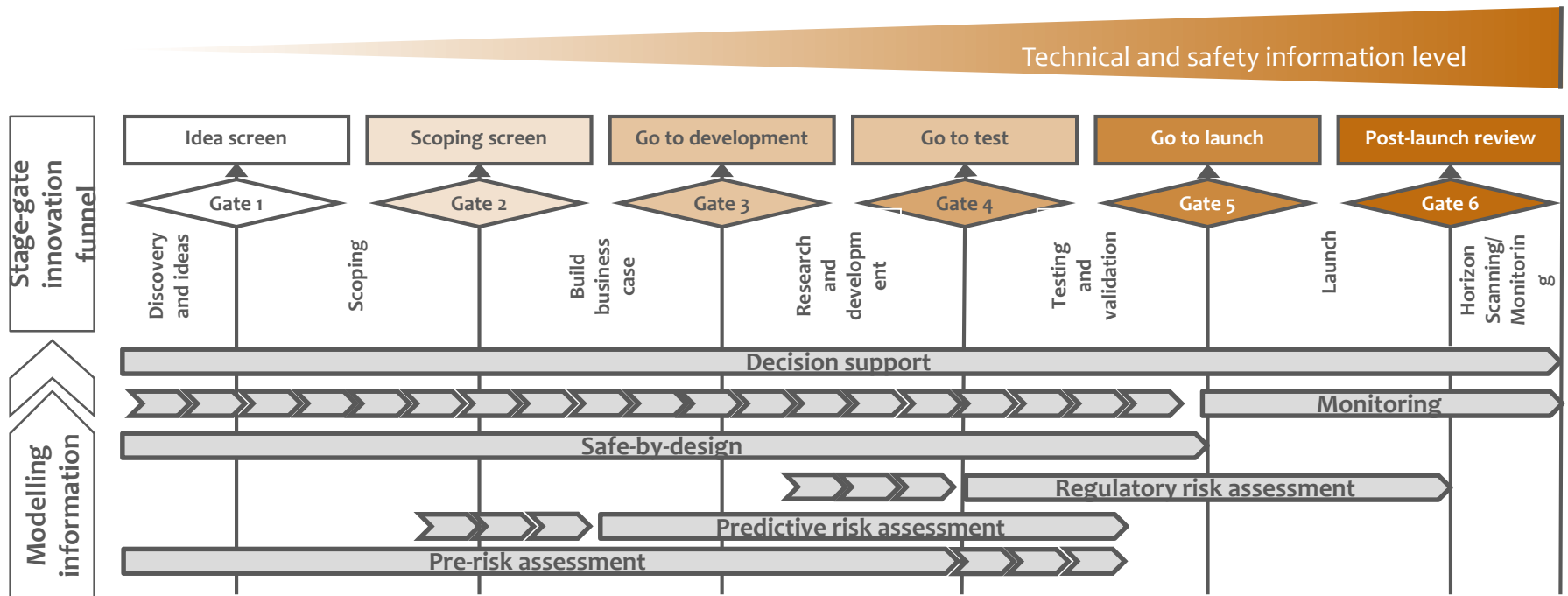
- Nano-specific OSH programs and risk assessment procedures that cover all aspects of the **life-cycle** - from research and design to disposal

Idea – Design - Production - Use - Reuse - Destruction

(OSH = Occupational safety and health)

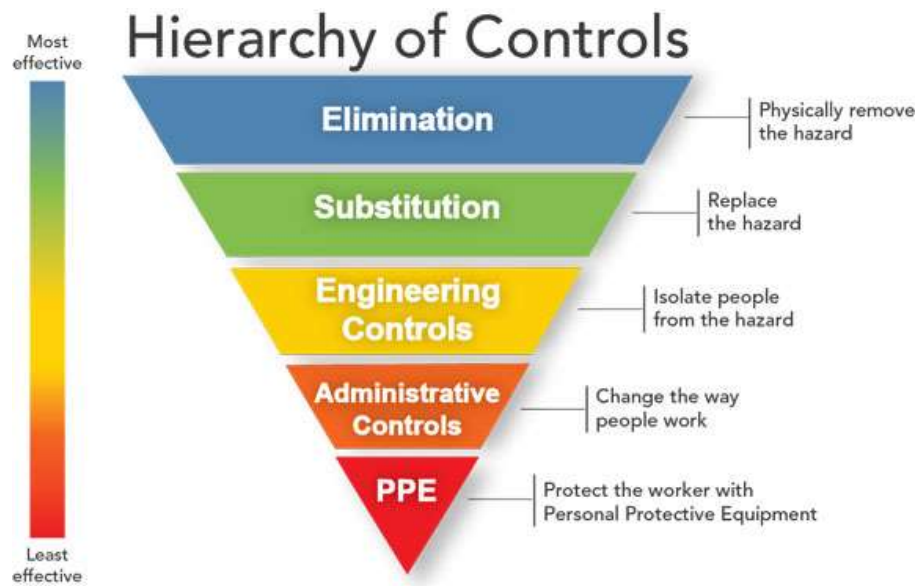
Stage-gate model

Research & innovation value chain perspective



Precautionary principle and hierarchy of controls

Appropriate **precautionary** measures should be taken even when the cause and effect relationships are not fully established scientifically



Nano-safety

- Design stage
- Powder – Slurry
- Ventilation
- Training & job rotation
- Gloves, mask

Needs: Information

- Easily accessible
- Easily understandable
- Up-to-date
- Reliable, unbiased information on impacts and implications
- Transparent
- Robust
- Exhaustive
- Applicable and low level of complexity
- Harmonization – across domains and internationally
- Risk-benefit evaluation
- Benchmarks

Specific guidelines for implementing current legislation
Not just 'what to do' but also 'how to do it'

Needs: Regulation priorities

- **New** regulation specifically for NM or **integrated** in existing regulation ?



- Specific requirements in ‘**horizontal**’ regulation (programs e.g. REACH, CLP)

or

- Specific requirements in ‘**vertical**’ regulation (cosmetics, medical devices, biocides)


Needs: Research and business

- Improving risk communication research-to-business (R2B) and business-to-business (B2B)



- Increased agreement and confidence of these actors is a prerequisite to inform and shape public opinion on issues related to risk governance of nanotechnologies

Needs: Framing, credibility, culture and collaboration

- **Geographical, political and cultural context** – critical in how NM are handled and perceived
- Regulators, engineers, social scientists, communication experts need to **collaborate** effectively in **framing** information on NM

- Both **credibility** and **culture** need to be taken into consideration

Needs: Adaptability

- No one-size-fits-all solutions!!
- Initiatives need to be **transferable, scalable and sustainable** - balancing nanotechnology **applications and implications**
- Allow for **flexible** deployment of **multilevel** and **integrated** risk governance initiatives to support sustainable nanotechnology and operational excellence

Needs: Integrated in business model

- **ISO45001** (2018) OSH standard where OSH must be more effectively integrated in the business strategy, processes, and leadership, as well as ensuring employee influence
- **ISO21505** (2017) Governance
- **ISO31000** (2009) Risk management

(OSH = Occupational safety and health)

Needs: Effective tools

Research that aims to find causal relationships between various types of **safety interventions** and outcomes, and patterns of effectiveness across contexts (*internal validity focus*), and thus tend to

De-contextualize knowledge

If results are to be used in a meaningful way in practice (company level, knowledge brokers or policy level) (*External validity focus*), thus there is a need to

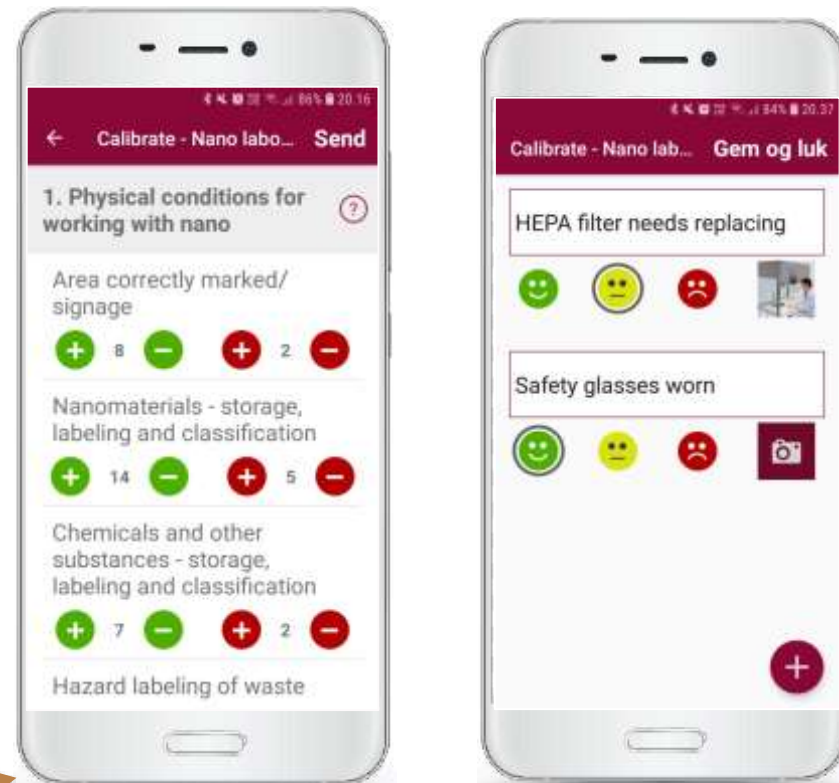
Re-contextualize knowledge

Remember - there is an inverse relationship between internal and external validity ☺

Nano Tools (examples)

- Swiss PM
- Stoffenmanager Nano
- NanoSafer
- Risk of Derm
- ConsExpoNano
- SSD/SSWD/nSSWD
- NanoQSAR
- SimpleBox4Nano
- GuideNano (e.g. life cycle)
- LICARA nanoSCAN (DS e.g. life cycle)
- SUNDS (DS e.g. life cycle)
- nanoRiskRadar
- Nano-safety Observer - App Template

Nano Safety Observer



Submitted publications

- Porcari A, Borsella E, Benighaus C, Grieger K, Isigonis P, Chakravarty S, Kines P, Jensen KA (Submitted). **From Risk Perception to Risk Governance in Nanotechnology: A Multi-Stakeholder Study.**
- Kirkegaard ML, Kines P, Jeschke KC, Jensen KA. (Submitted). **Risk perception and safety culture in the handling of nanomaterials in academia and industry – case studies.**

Take home messages: Stakeholder needs

- Developing tools: Internal vs. external validity
- Easy accessible - easy understandable
- Credibility, culture & collaboration
- Regulation – horizontal & vertical
- Adaptable and sustainable
- Life-cycle – stage gate
- Integrated in business
- Harmonization
- Framing



Thank you for your attention



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