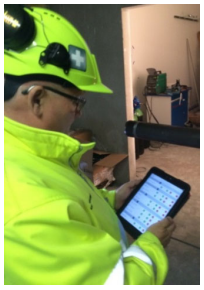
caLIBRAte nano risk governance

NanoSafety Cluster

National Research Centre for the Working Environment Denmark

Safety Observer app template for use in measuring safe and healthy working conditions and behaviour with nanomaterials



Safe-by-design & NFFA Workshop
Lund, Sweden
10-01-2020

Pete Kines, Senior researcher
Psychologist and Civil engineer
Division of Safety Research
pki@nfa.dk

National Research Centre for the Working Environment Denmark

Affiliation

- **Funding:**
  - **CaLIBRAte** project WP 4, EU Horizon 2020 research and innovation programme under grant agreement No 686239
  - Nano Taskforce, Working Environment Council, Denmark
  - Danish Centre for Nano Safety

- **Authors:** Pete Kines, Marie Louise Kirkegaard, Ulla Birgitte Vogel & Keld Alstrup Jensen; National Research Centre for the Working Environment, Denmark

National Research Centre for the Working Environment Denmark

Calibrate - project
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

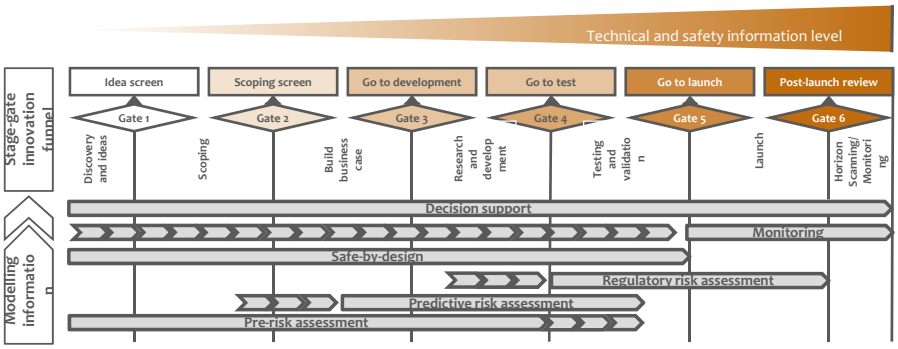
Idea – Design - Production - Use - Reuse - Destruction

(OSH = Occupational safety and health)

3

National Research Centre for the Working Environment Denmark

Stage-gate model
Research & innovation value chain perspective



National Research Centre for the Working Environment Denmark

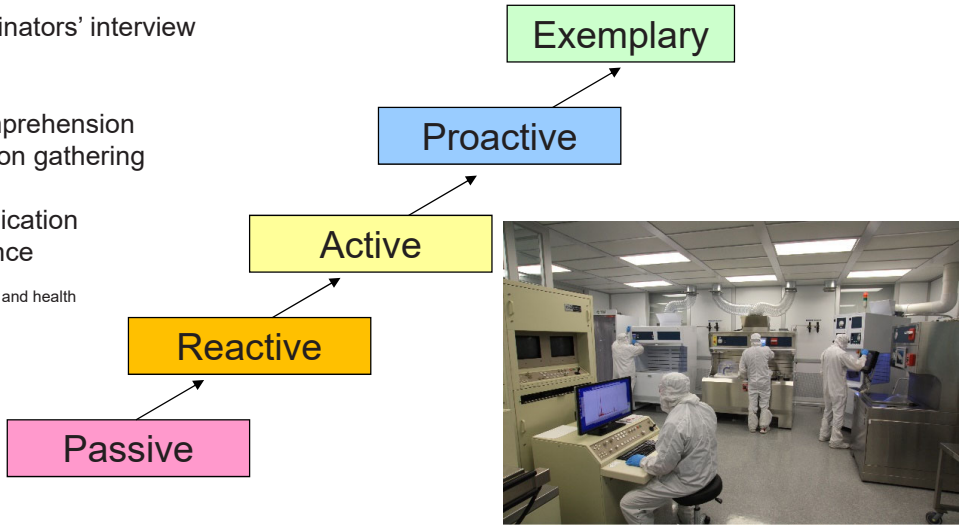
How do academia and industry attain and apply knowledge about nano? (WP4)

OSH co-ordinators' interview statements

Nano

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

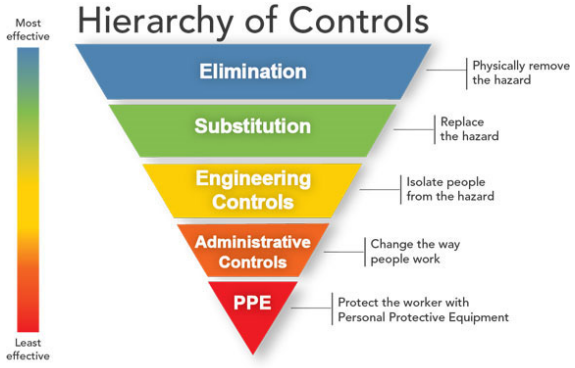
OSH
Occupational safety and health



National Research Centre for the Working Environment Denmark

Precautionary principle and hierarchy of controls

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



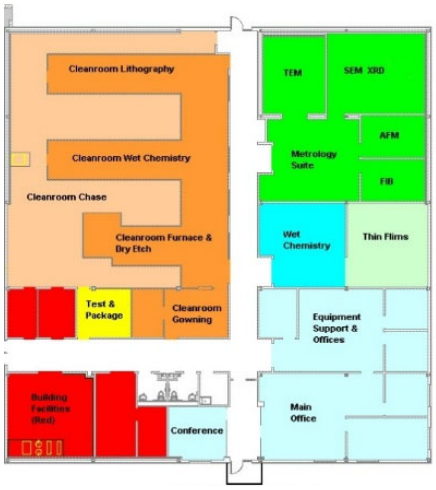
Nano-safety

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

6

National Research Centre for the Working Environment Denmark

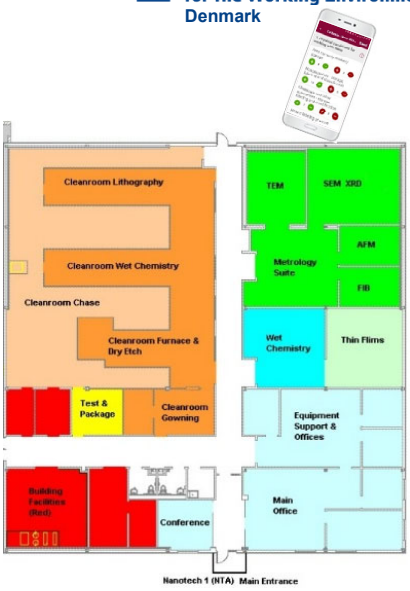
Paint factory – plant layout



National Research Centre for the Working Environment Denmark

Objectives

- ✓ A tool for use in **safety rounds** in **workplaces** and laboratories that work with or are exposed to nanomaterials and nano-related products
- ✓ Intuitive and **easily useable** by students, workers, faculty, lab directors and occupational safety and health (OSH) professionals in assessing nano OSH risks
- ✓ Focus on both **safety** ☺ and **risks** ☹

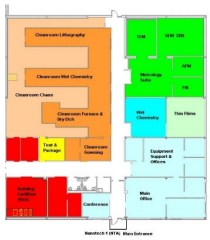


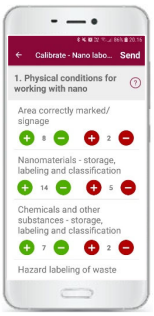
Nanotech lab

National Research Centre for the Working Environment Denmark

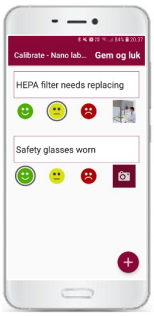
Examples of things to observe and measure: Nano-observer

1) Signage, marking and labelling (one of more observation for each room, storage area, piece of equipment or tool, etc.)





1: Observe
2: Count
Safe
Unsafe
3: Notes
4: Photos



National Research Centre for the Working Environment Denmark

Examples of things to observe and measure: Nano-observer

2) Nano handling, storage & transport

(one observation for each process in a given area)

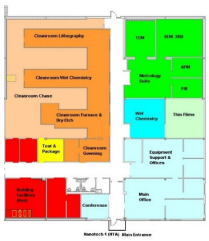
1: Observe
2: Count
Safe
Unsafe
3: Notes
4: Photos

National Research Centre for the Working Environment Denmark

Examples of things to observe and measure: Nano-observer

3) Ventilation and filters (e.g. one observation for each HEPA-filer as to whether it is properly maintained and cleaned)

1: Observe
2: Count
Safe
Unsafe
3: Notes
4: Photos



National Research Centre for the Working Environment Denmark

Examples of things to observe and measure: Nano-observer

4) Personal protective equipment (e.g. gloves, lab coats, long pants, safety glasses, ear plugs, face shields, closed-toed shoes, respiratory masks)

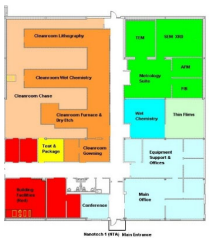
1: Observe
2: Count
Safe
Unsafe
3: Notes
4: Photos

National Research Centre for the Working Environment Denmark

Examples of things to observe and measure: Nano-observer

1: Observe
2: Count
Safe
Unsafe
3: Notes
4: Photos

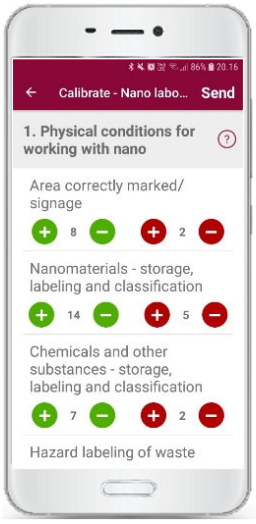
6) Order and tidiness (work and transport areas)
7) Hygiene (e.g. no food or drinks in the lab; changing clothes)
8) Waste storage, recycling and disposal (e.g. signs, labels)
9) First aid equipment (e.g. one observation per necessary station)



National Research Centre for the Working Environment Denmark

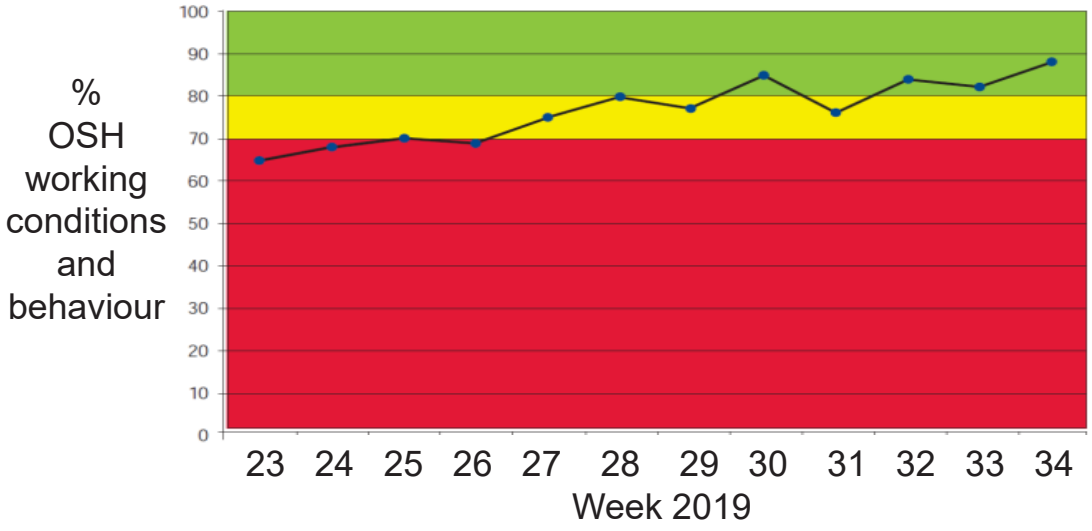
Safety index

Topics	Observation Safe	Total	Observation Unsafe	Total
1. Signage	///// ///	8	//	2
2. Nano-materials/products	///// ///// ////	14	/////	5
3. Chemicals	///// //	7	//	2
4. Waste and disposal	///// ///	8	///// ///// ///	13
5. Personal protective equipment	///// ///// ///// ///// ////	24	///// ///// ////	14
6. First aid equipment	///// /////	10	//	2
	Total	71	Total	38
			71 / (71 + 38) x 100 =	65 %



National Research Centre for the Working Environment Denmark

Nano-observer Safety index



National Research Centre for the Working Environment Denmark

Nano-observer: Results

Results and report immediately available:

1. On device
2. In email – PDF report sent to both user and account administrator
3. In web-account
4. In Excel format

National Research Centre for the Working Environment Denmark

App links

Information

- nfa.dk/safetyobserver

Administrator modul

- safetyobserver.nfa.dk

Download free (150+ countries)

NU PÅ Google Play

Hent i App Store

Safety Observer

caLIBRAte nano risk governance

NanoSafety Cluster

National Research Centre for the Working Environment Denmark

Thank you for your attention

☺

Pete Kines, pki@nfa.dk

PhD-Civil Engineering, MSc-Psychology
Division of Safety Research
National Research Centre for the Working Environment
Copenhagen, Denmark