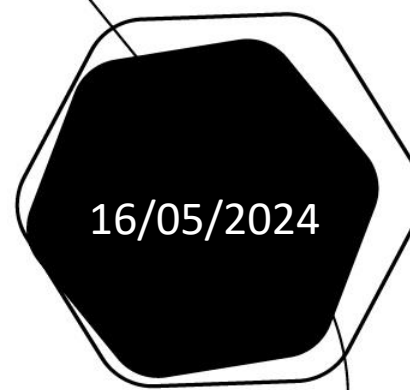
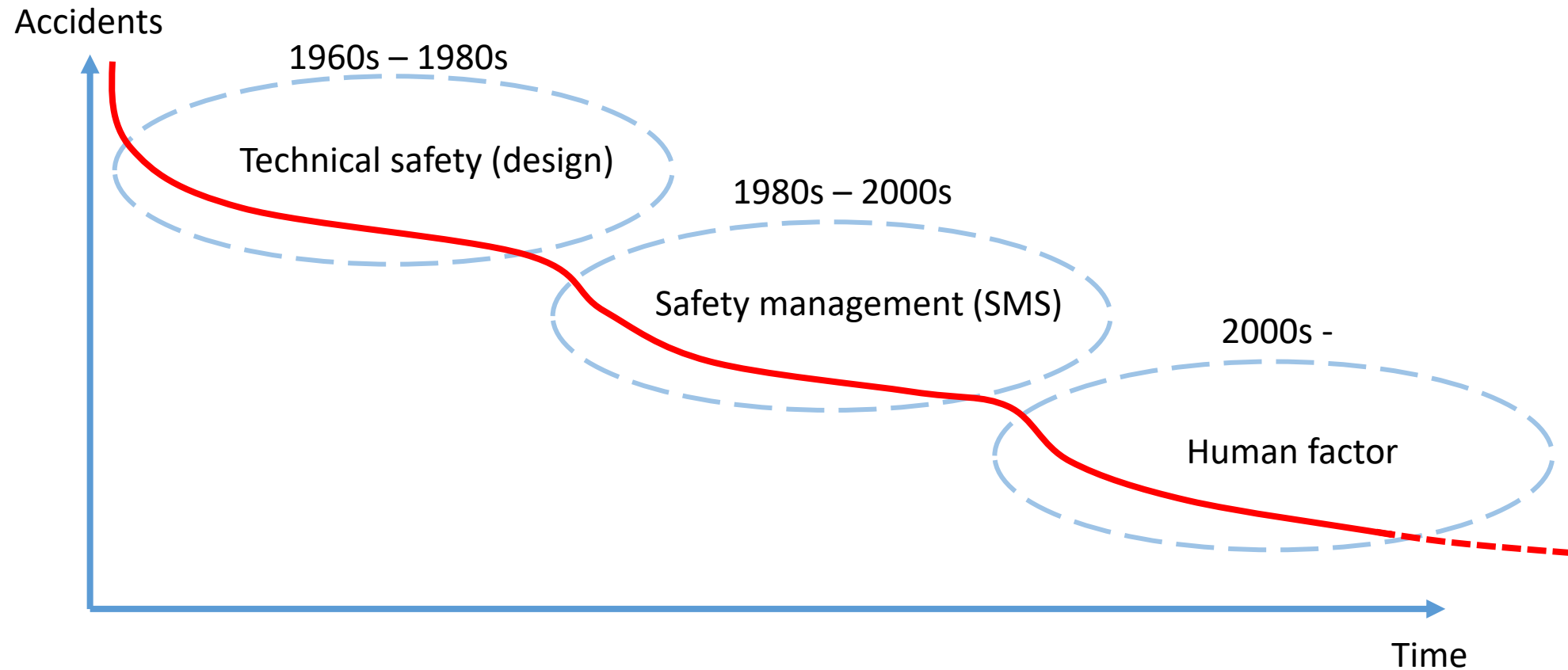


Human Factor FR experience



Evolution of concerns on industrial safety



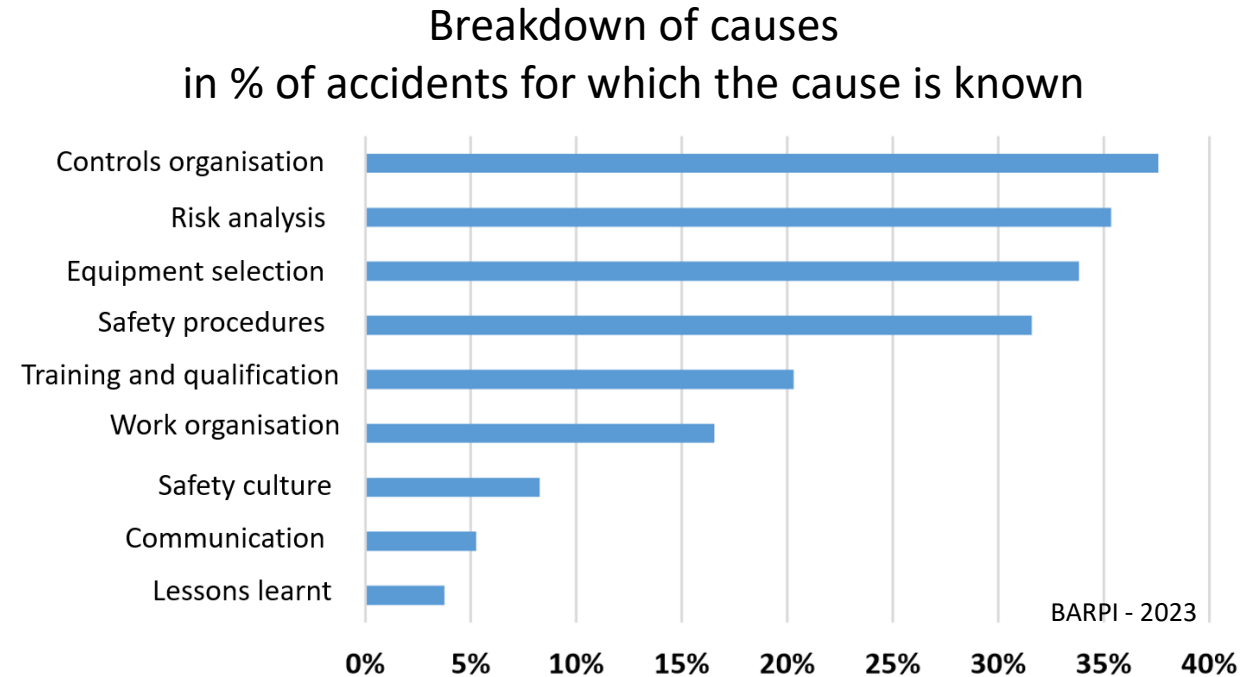
Some numbers for France

In France, between 1992 and 2012:

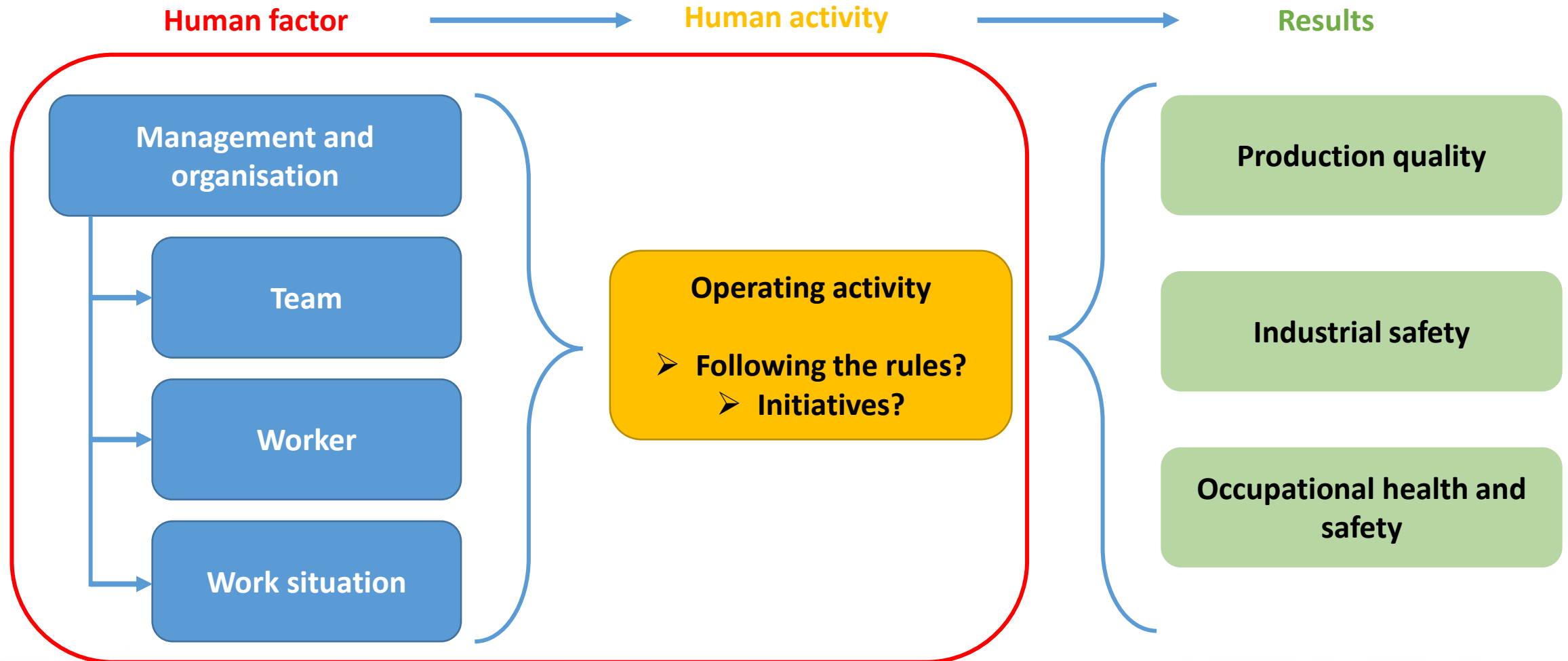
- ~10 500 accidents
- 55 % due to human factor
 - Flaws in the organisation (36 %)
 - Insufficient knowledge of the process (18 %)

In 2012, the human factor was identified as the main cause for 374 industrial accidents out of 604.

In 2022, the share of accidents due to human factor is still high (> 30%)



Scope of human factor analysis

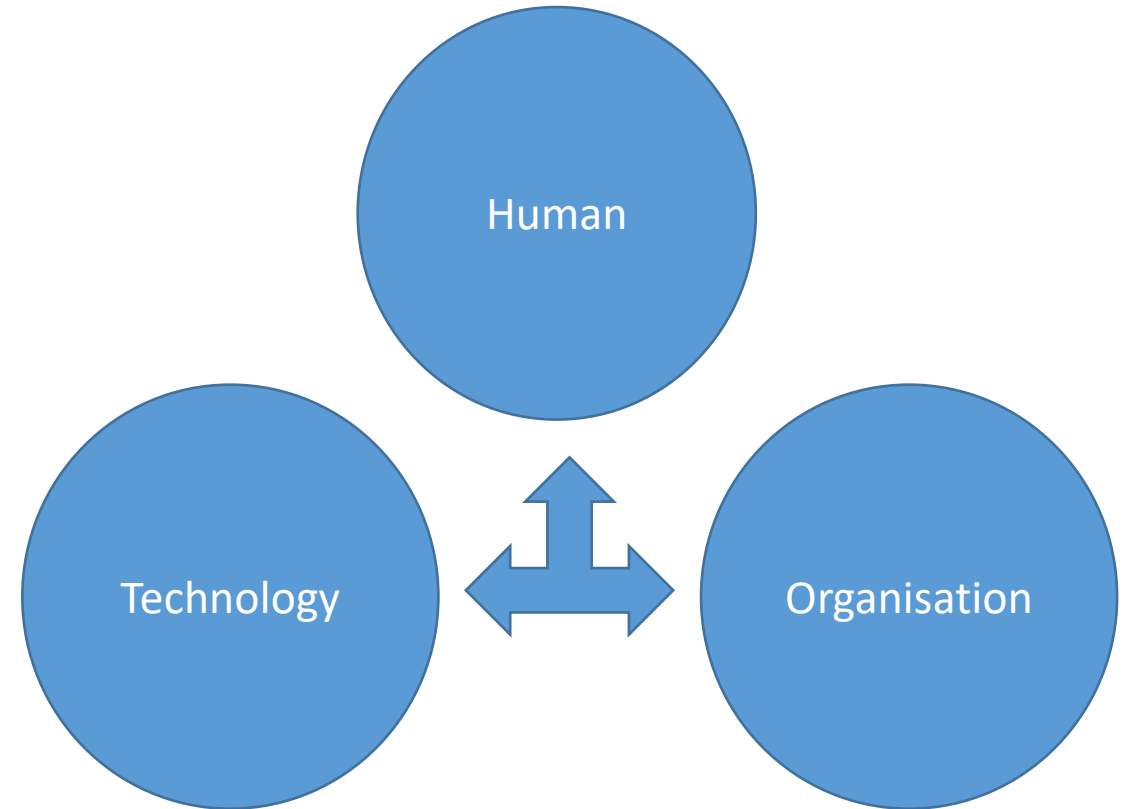


The French methodology: Ω 20

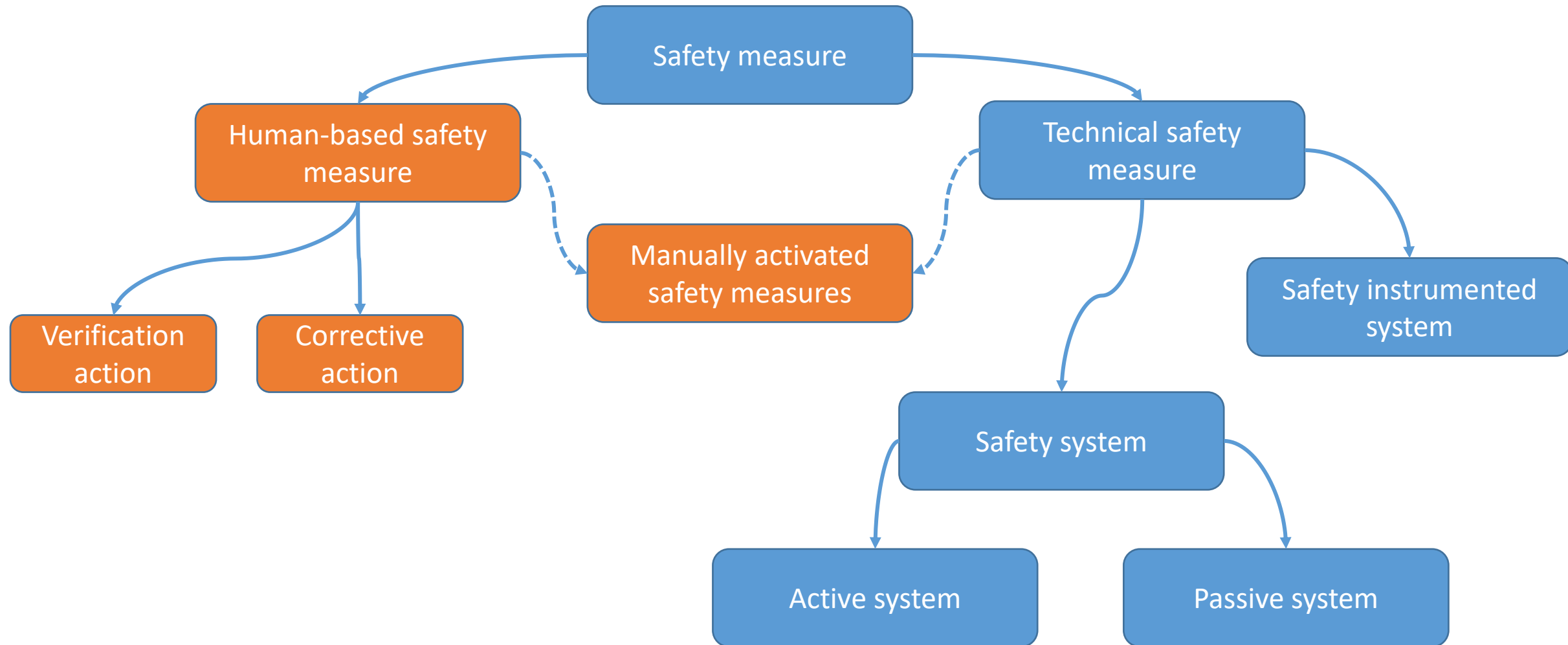
Simplified model for human interactions with the environment:

1. Observation and detection
2. Analyse and conclusions
3. Action

Human factor needs to be considered together with other factors: e.g. the **technology** and the **organisation**.



Step 1: audit of human-based safety measures



Step 2: analyse of human-based safety measures

- What makes a valid human-based safety measure?
 - **Independence:** the safety measure should be independent from the cause of considered accident
 - **Efficiency:** the safety measure should work efficiently within a given context and a given timeframe
 - **Response time:** the response time should be sufficient to act on the chain of events leading to the accident

Step 3: level of confidence

- Ω 20 guidelines define a **methodology** to determine the adequate level of confidence
- The level of confidence is established taking into account various configurations, linked to how humans interact with the environment:
 - Gathering information
 - Analysing the information
 - Deciding on the action to take
 - Performing the actions

Probability of failure on demand (PFD)	Level of confidence	Risk-reduction factor
$10^{-3} < \text{PFD} < 10^{-2}$	2	100
$10^{-2} < \text{PFD} < 10^{-1}$	1	10
$\text{PFD} > 10^{-1}$	0	1

Regional guidance and inspection criteria

- Some local inspection services have **standard inspection criteria** for **key roles** in a typical industrial installation (e.g. production, maintenance, subcontractors, health and safety, warehouse, etc.)
- Based on the Ω 20 methodology, they established series of **questions** for each critical position, with a **score** for each question
- Questions are organised per **categories**: human factor, management of change, organisation, risk analysis, training, subcontracting...
- The total score in each category helps inspectors **assess the level of implementation** of the SMS (insufficient / acceptable / good)

Results from last national inspection campaigns

- 600 inspections on safety management system:
 - 180 non-compliances found
 - 85 formal notice letters sent to operators
 - 5 penalties with monetary fines
- Specifically on **subcontracting**: 293 inspections
 - 150 non-compliances found
 - 11 formal notice letters