

# Some side-effects of change

Valérie Sanseverino  
Denis Besnard

Centre for Research on Risks and Crises  
Mines ParisTech



# What is the problem?

Let's implement regulation A



Change

+

I know I can't foresee all possible  
consequences



Uncertainty

+

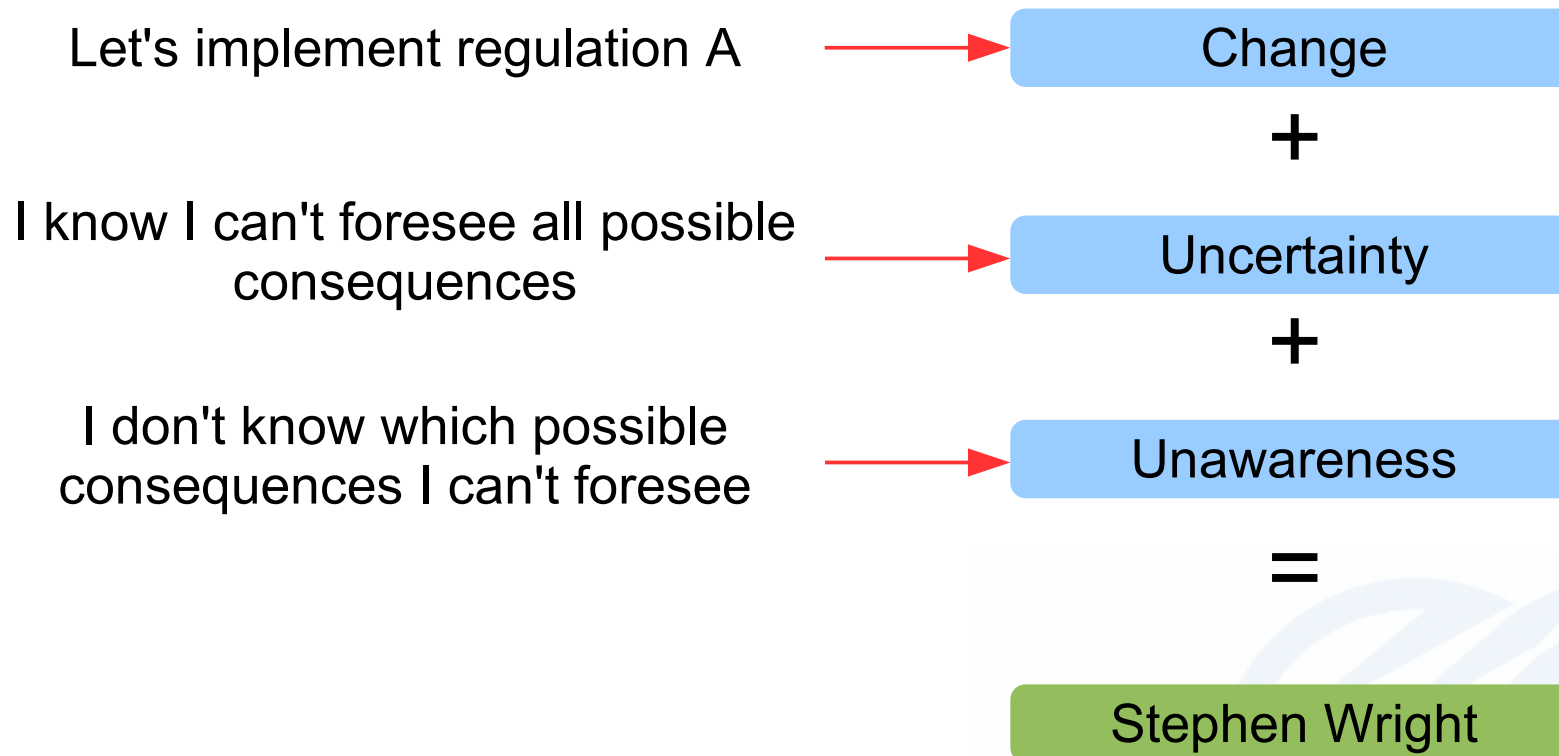
I don't know which possible  
consequences I can't foresee



Unawareness



# What is the problem?



*"Experience is something you don't get until just after you need it"*

# Safety compliance vs. Safety performance



# Safety compliance

You can't fight it. It is mandatory. \*

A

If you are non-compliant and nothing happens, you're fine

Trouble begins  
with liability

B

In case of accident at work or occupational disease

*Is there an inexcusable mistake?*

*Is there evidence of non-compliance after an audit*

\* Well, sort of

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Oh yeah ?



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...and laws hardly ever get a test period.



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- Causing what type of constraints ?
- Causing what type of possible workarounds ?
- ...



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# Myth: Compliance = Safety

Compliance to regulations does not imply safety performance

- Safety performance implies that the consequences of compliance on work be analysed
- If you do not know where the side impacts of compliance are, you won't be any safer
- Blind compliance can have detrimental effects on safety

Possible effects : risk shifting

# Regulation-related examples of risk shifting



## Origin

- Air can enable explosions
- Need to ensure safe operations on pipes

## Change

- Neutralise pipes with nitrogen

## Consequence

- Risk of anoxia for operators in the vicinity of neutralised pipes



# External contamination

## Origin

- Ensuring a high level of protection in contaminated nuclear environments

## Change

- Introduce a pressurised outfit

## Consequences

- Operators expose themselves to contamination by contact when the outfit is removed



# Working around protection covers

## Origin

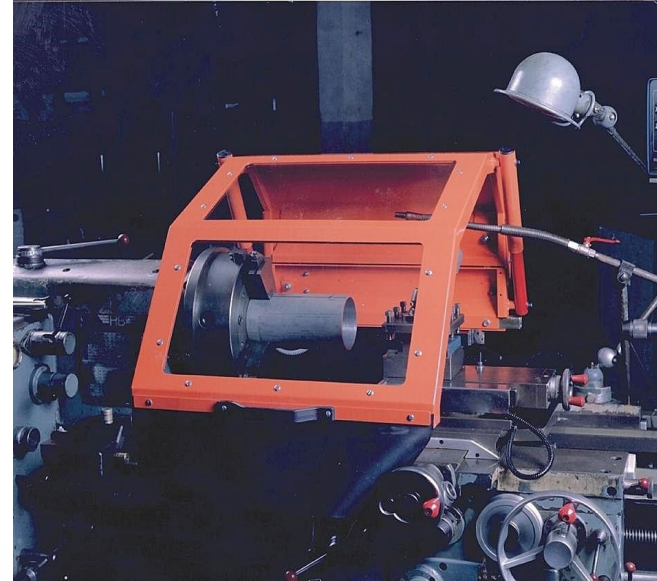
- Prevent tools or shavings from being ejected from the lathe

## Change

- Fit a cover on lathe

## Consequences

- Operator works around the cover with even less visibility than before



# People being hit on airport tarmacs

## Origin

- Diminish the environmental impact of ground operations

## Change

- Replace thermic engines of airport tractors with electric engines

## Consequences

- Increase in nb of ground operators being hit



# More examples of risk shifting





# Longer passwords are not safer

## Origin

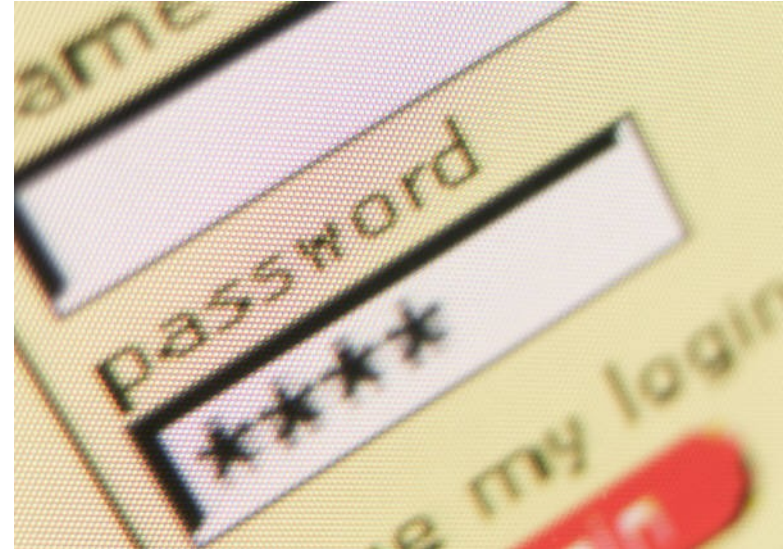
- Assumption that longer passwords are safer

## Change

- Increase the length of passwords

## Consequences

- Passwords are no longer remembered, and therefore get written down



# ABS introduces risks

## Origin

- Preventing wheels from locking during heavy braking episodes

## Change

- Fitting half a taxi fleet with ABS

## Consequences

- Taxis fitted with ABS drive faster in bends, closer to the car in front and... have more accidents



Aschenbrenner & Biel (1993), in Wilde, G. (1994). *Target risk*.

# Swapping brake and gear

## Origin

- Comply to brake and gear selector positions across Europe

## Change

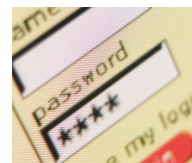
- Move foot brake to the right and gear selector to the left

## Consequences

- unknown :-)



See Cacitti & Besnard on negative transfer

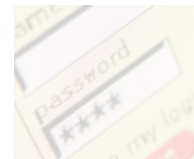


safety /  
compliance

alignment with  
the market

IT security

technology



safety /  
compliance

alignment with  
the market

IT security

technology



- Ergonomics and law do not talk much to each other whereas their interests overlap
- Accident prevention seems to only care about the technical solutions to deploy in order to comply to regulations



safety /  
compliance

alignment with  
the market

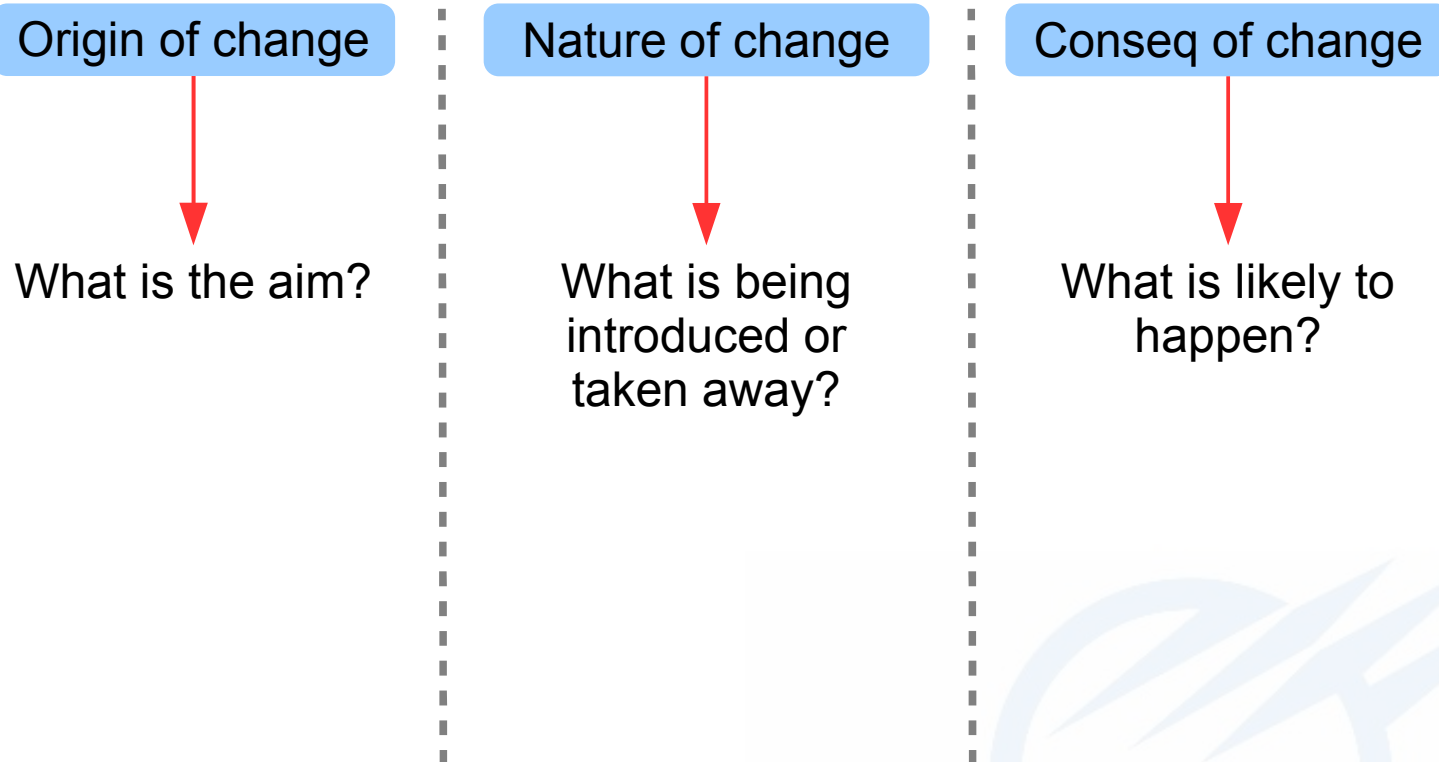
IT security

technology

So what ?



# Change and complexity





# Change and complexity

## Origin of change

Safety  
Security  
Environment  
Market alignment  
Productivity  
...

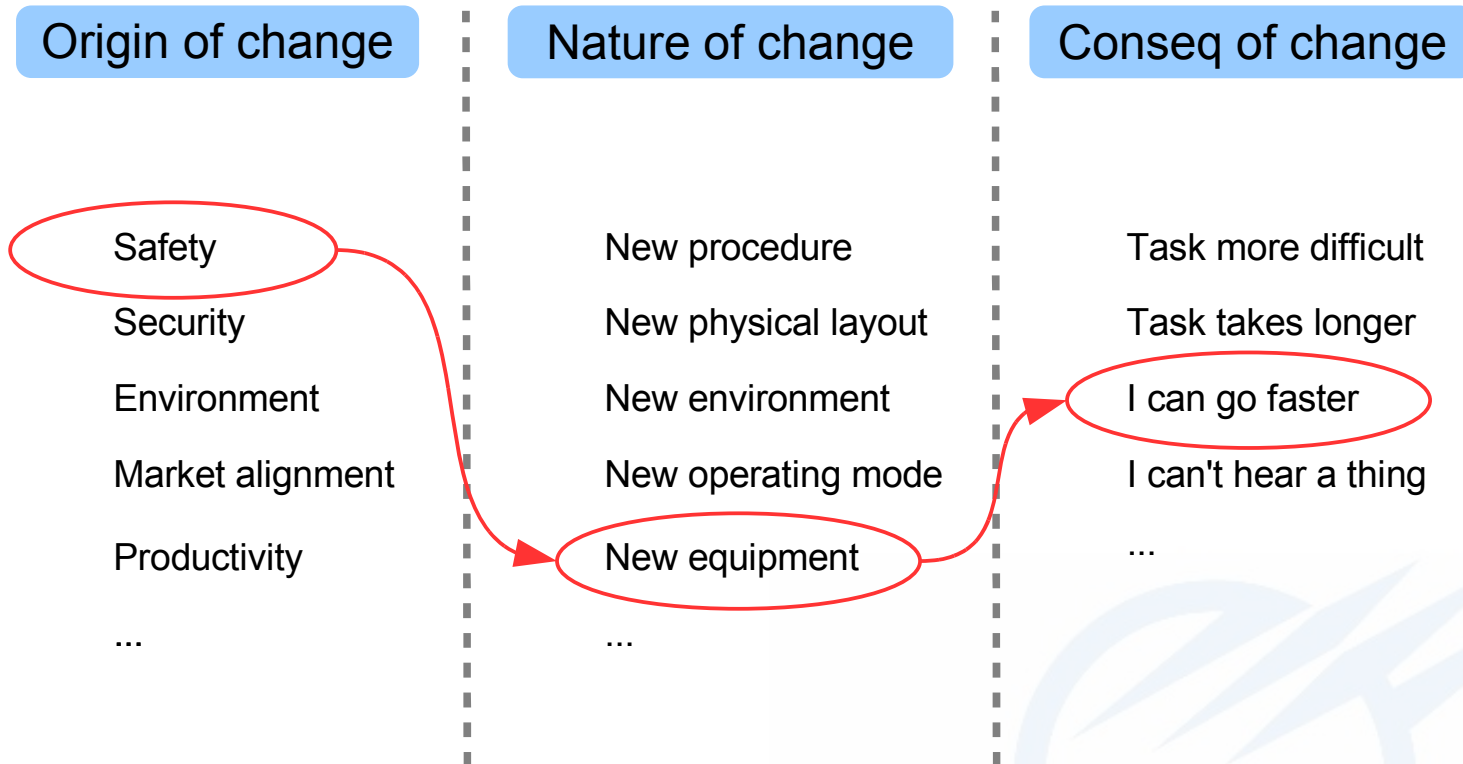
## Nature of change

New procedure  
New physical layout  
New environment  
New operating mode  
New equipment  
...

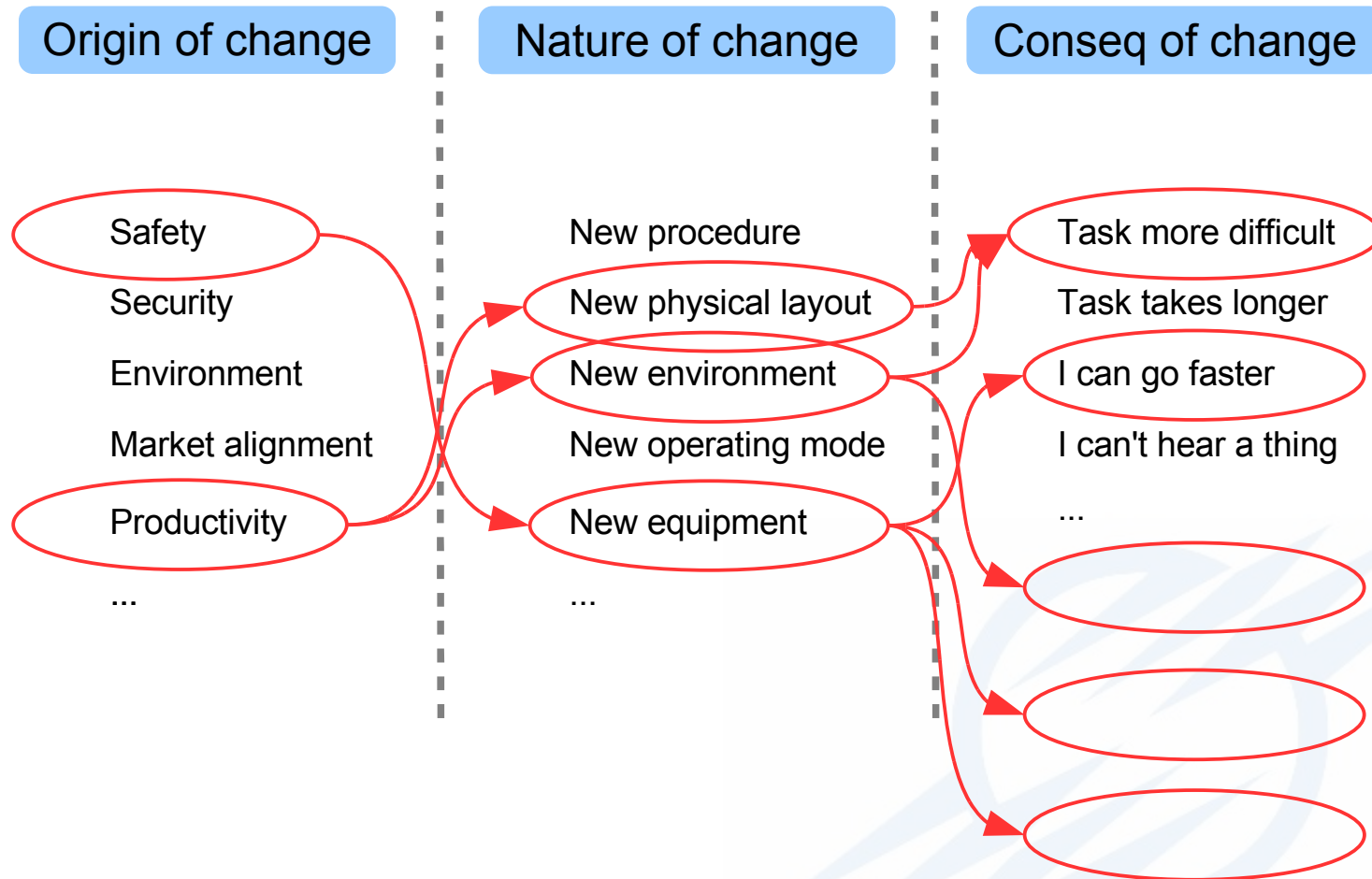
## Conseq of change

Task more difficult  
Task takes longer  
I can go faster  
I can't hear a thing  
...

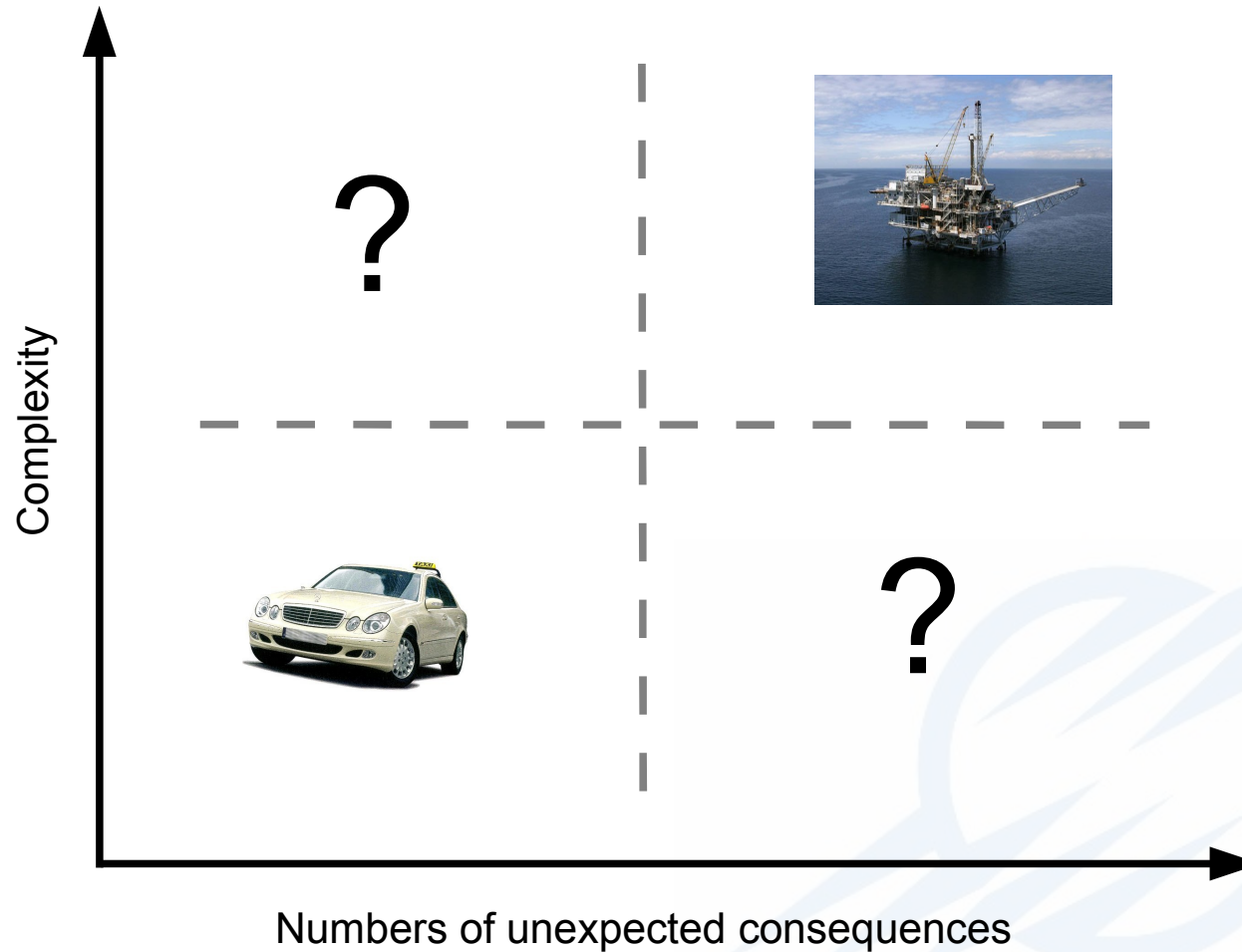
# Change and complexity



# Change and complexity



# Change and complexity



# Conclusion



# A few messages...



Safety compliance is mandatory

...but compliance does not imply higher safety



Blind compliance causes risks to shift

Analyse work **before** you change anything



Difficulty of change monitoring might be amplified by complexity

Safety compliance is only one aspect of it