



# **Digital transformation of the rail sector: what impact on the regulator?**

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# RAILWAY SYSTEM (AS WE KNOW IT)



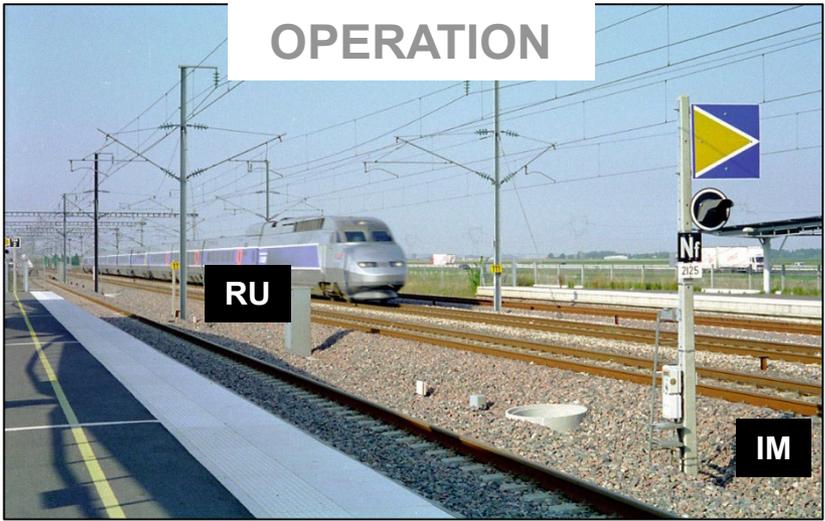
# RAILWAY SYSTEM



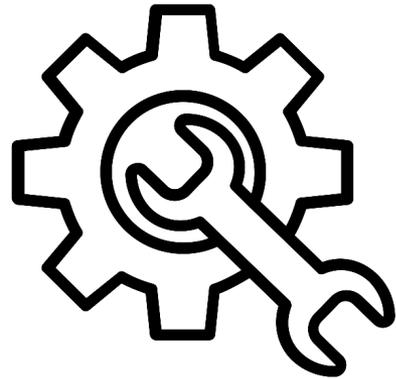
DESIGN & BUILDING



OPERATION



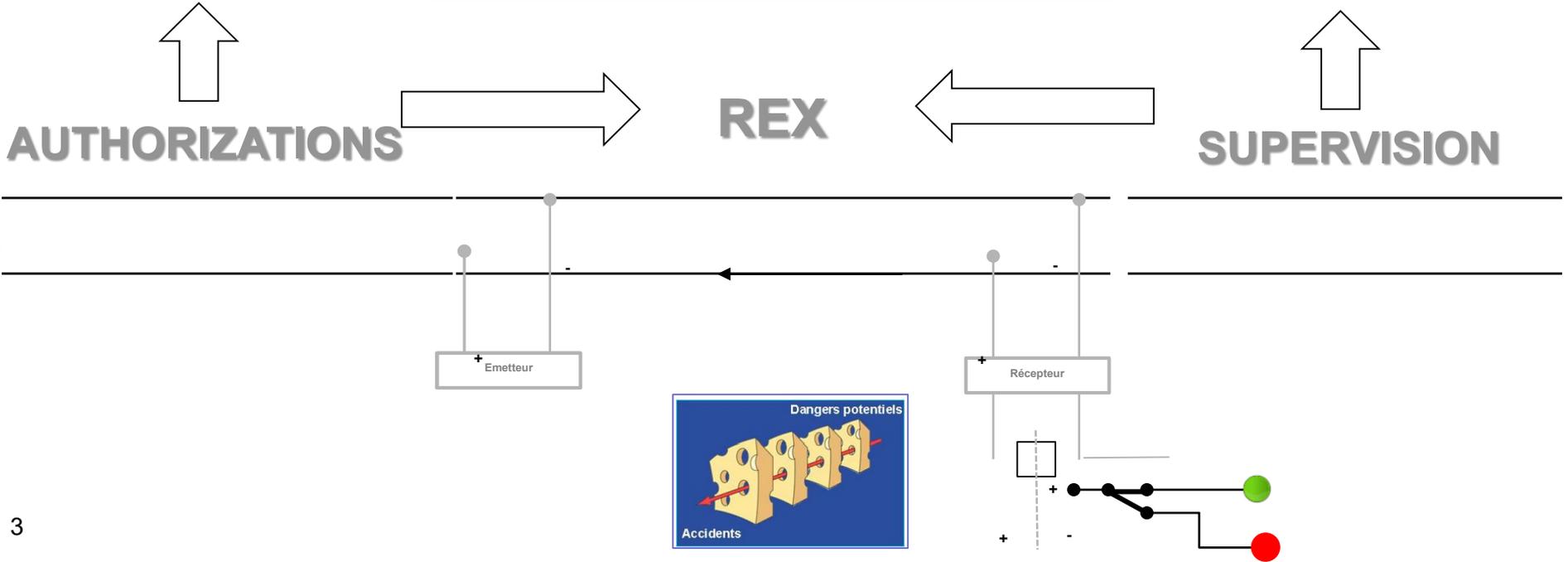
MAINTENANCE



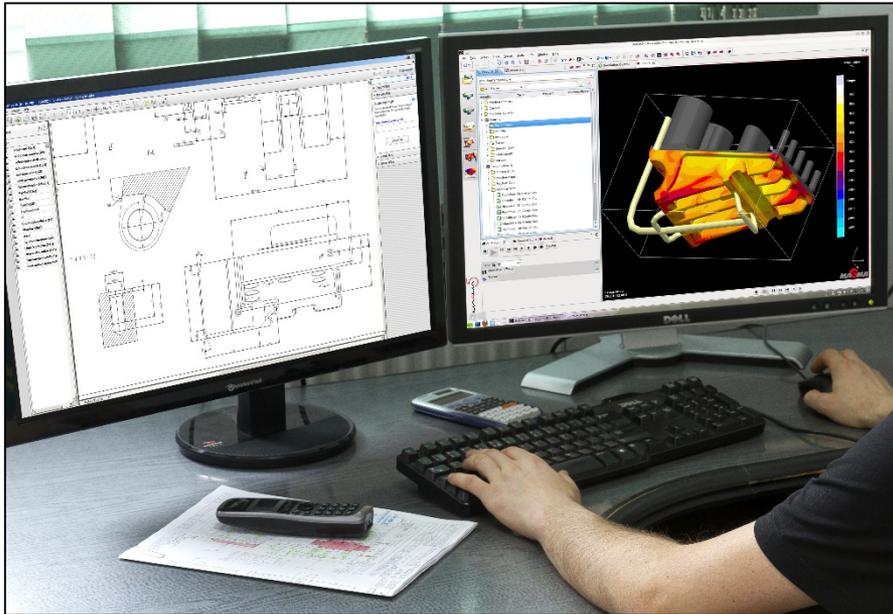
AUTHORIZATIONS

REX

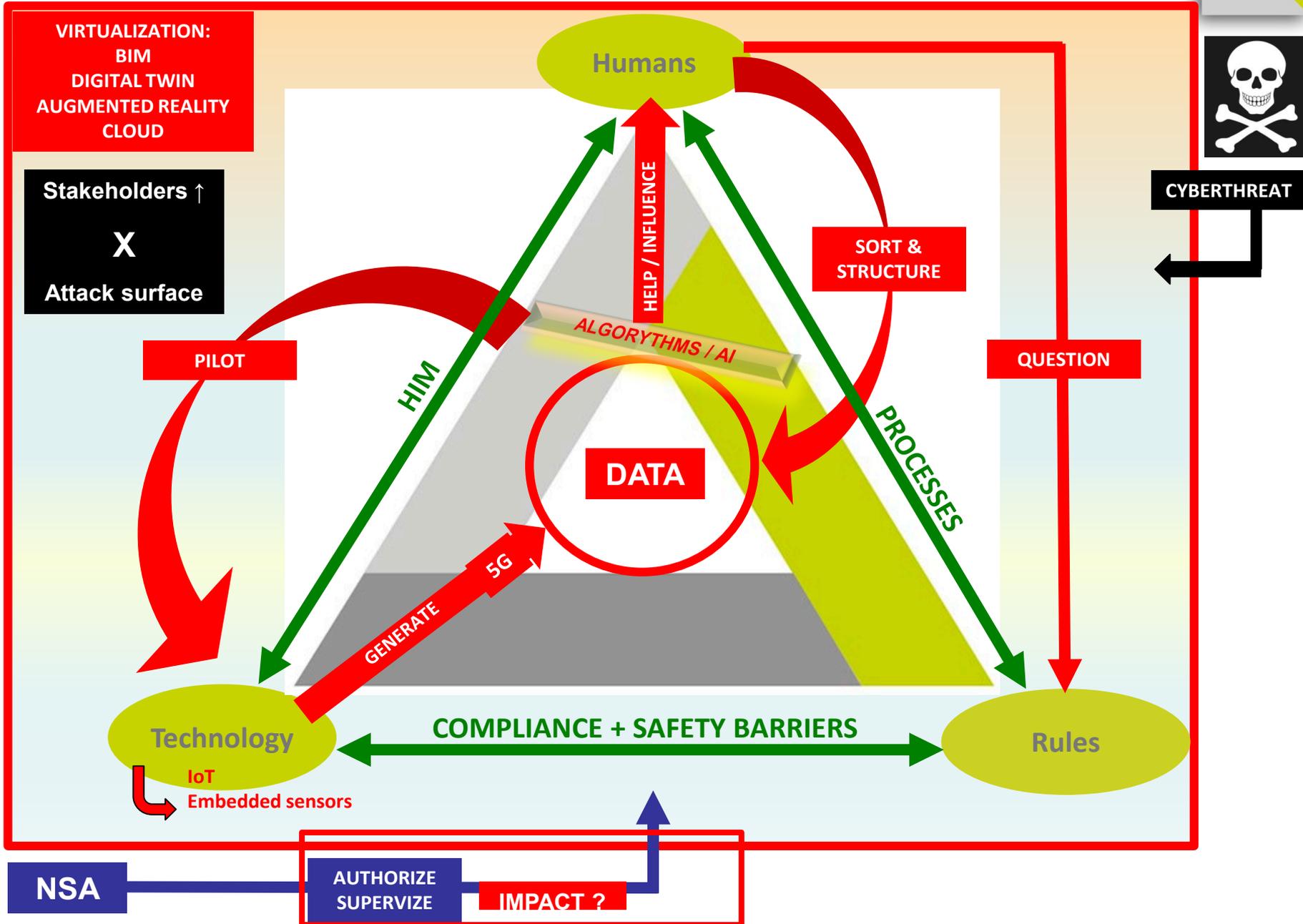
SUPERVISION



# IT'S FORBIDDEN TO DECREASE THE SAFETY LEVEL



# A NEW PARADIGM



# TOMORROW'S BOUNDARIES ?

« Given the data I have and the power of my algorithms, safety is assured if this threshold is respected »

Almost Certain	IMPROVE	STOP	STOP	STOP	STOP
Probable	SECURE	IMPROVE	STOP	STOP	STOP
Possible	MONITOR	SECURE	IMPROVE	STOP	STOP
Unlikely	MONITOR	MONITOR	SECURE	IMPROVE	STOP
Rare	MONITOR	MONITOR	MONITOR	SECURE	IMPROVE
	Insignificant	Minor	Moderate	Major	Catastrophic



Acceptability border ↘

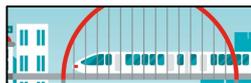
~~HUMAN EXPERTISE~~  
HISTORY  
EXPERIENCE



**MAINTENANCE**



**SAFETY EVENTS**



**AUTONOMOUS DRIVING**

# NEW PRACTICES



## 1. USE OF NEW TECHNOLOGIES TO LIMIT OPERATION COSTS

- *Autonomy* **AI** **DATA** **REGULATION** 
- *Virtual certification* **REGULATION** **DATA**
- *BIM* **DATA**

## 2. OPTIMIZE AVAILABILITY WHILE ENSURING SAFETY

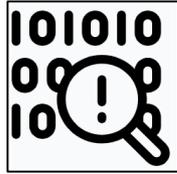
- *IoT for predictive maintenance* **DATA** **AI** 
- *Digital twin for diagnostic and railway operation* **AI**

## 3. QUICKLY DEPLOY STAFF CAPABLE OF PERFORMING SAFETY TASKS

- *Augmented reality for interventions* **REGULATION** **AI**

**What will be the role of the regulator tomorrow?**

# NSA'S MISSIONS ARE GOING TO EVOLVE



- Check algorithms?



- Challenge massive data analysis?



- No standard or regulation?



- Responsibility?



- Railway safety vs cybersecurity?

NSA's have to perform their own

digital transformation

# DIGITAL TRANSFORMATION PLAN

*To stay at the forefront of safety issues in a digitizing world*



<b>DATA GOVERNANCE</b>	<b>REX NG</b>
<b>KEY DATA TO ASSESS SAFETY ALGORITHMS</b>	<b>PLATFORMIZE</b>
<b>DIGITAL COMPETENCIES</b>	<b>TECHNOLOGY WATCH</b>
<b>ASSESS / REINFORCE / TRAIN &amp; LEARN</b>	<b>ELABORATE DOCTRINES ADAPT REGULATION</b>

# CONCLUSION



**Railway world is being digitized**

**Impact is for the better (we hope)**

**NSA's have also to evolve**

**Data are crucial**

**Timing is important**

**Superimposition of systems could be a risk**



# THANK YOU FOR YOUR ATTENTION

