Ministerie van Infrastructuur
en Waterstaat

Rode draden IRSC2022

INTERNATIONAL RAILWAY
SAFETY COUNCIL

SEVILLA, OCTOBER 16-21, 2022

Rode draden IRSC

1. IRSC
2. Veiligheidscultuur
3. Nationaal bow-tie management
4. Innovaties
5. IRSC 2023 en 2024?

1. IRSC

- Sinds 1990, gestart in Japan, core group met UIC, vervoerders, infrabeheerders, toezichthouders en onderzoekers.
- Kernpunten:
  - Open forum, all to contribute
  - Learn from safety investigations
  - Forum for international experts to meet and discuss issues
  - Positive achievements – break-out, tech visits
  - Areas of concern - core group; Chatham House issue

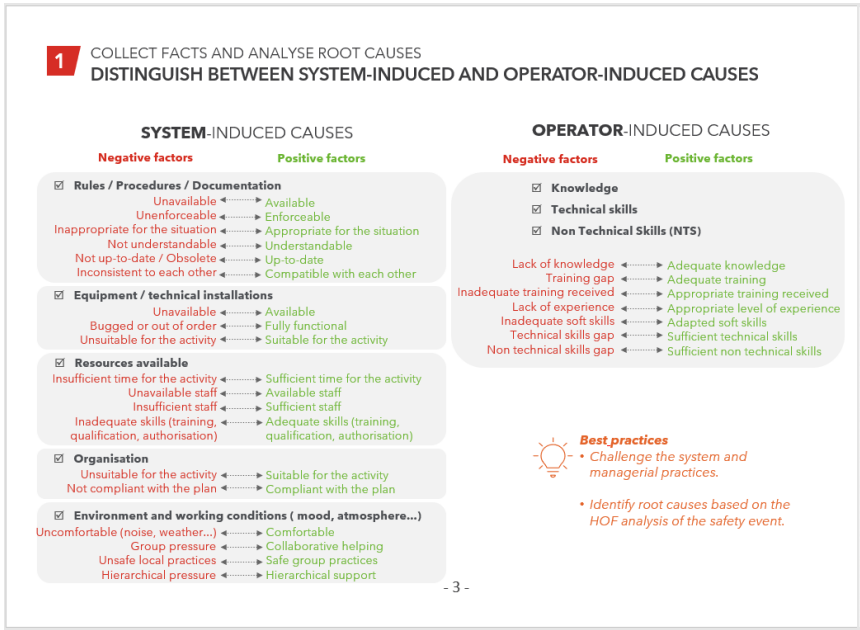
2. Veiligheidscultuur

- Safety culture has become a must-have for industry.
- Three prerequisites to install a desired safety culture in a company.
    - Diagnosing the historical safety culture pre-existing to any intended improvement
    - Understanding a typology of desirable safety cultures depending on the industrial context concerned
    - Avoiding considering safety culture in isolation and standalone.

Bron: FONdation pour une Culture de Sécurité Industrielle

Nationaal bow-tie management

1. COLLECT FACTS AND ANALYSE ROOT CAUSES
2. IDENTIFY THE BEHAVIOUR OR ACT
3. EVALUATE THE ACCEPTABILITY OR UNACCEPTABILITY OF THE BEHAVIOUR OR ACT
4. TAKE APPROPRIATE MEASURES REGARDING THE ACTORS, THE TEAM AND THE SYSTEM
5. PROVIDING FEEDBACK TO ALL PARTIES INVOLVED



1 COLLECT FACTS AND ANALYSE ROOT CAUSES
DISTINGUISH BETWEEN SYSTEM-INDUCED AND OPERATOR-INDUCED CAUSES

SYSTEM-INDUCED CAUSES

Negative factors	Positive factors
☑ **Rules / Procedures / Documentation**	
Unavailable	Available
Unenforceable	Enforceable
Inappropriate for the situation	Appropriate for the situation
Not understandable	Understandable
Not up-to-date / Obsolete	Up-to-date
Inconsistent to each other	Compatible with each other
☑ **Equipment / technical installations**	
Unavailable	Available
Bugged or out of order	Fully functional
Unsuitable for the activity	Suitable for the activity
☑ **Resources available**	
Insufficient time for the activity	Sufficient time for the activity
Unavailable staff	Available staff
Insufficient staff	Sufficient staff
Inadequate skills (training, qualification, authorisation)	Adequate skills (training, qualification, authorisation)
☑ **Organisation**	
Unsuitable for the activity	Suitable for the activity
Not compliant with the plan	Compliant with the plan
☑ **Environment and working conditions (mood, atmosphere...)**	
Uncomfortable (noise, weather...)	Comfortable
Group pressure	Collaborative helping
Unsafe local practices	Safe group practices
Hierarchical pressure	Hierarchical support

OPERATOR-INDUCED CAUSES

Negative factors	Positive factors
☑ **Knowledge**	
☑ **Technical skills**	
☑ **Non Technical Skills (NTS)**	
Lack of knowledge	Adequate knowledge
Training gap	Adequate training
Inadequate training received	Appropriate training received
Lack of experience	Appropriate level of experience
Inadequate soft skills	Adapted soft skills
Technical skills gap	Sufficient technical skills
Non technical skills gap	Sufficient non technical skills

Best practices
- *Challenge the system and managerial practices.*
- *Identify root causes based on the HOF analysis of the safety event.*

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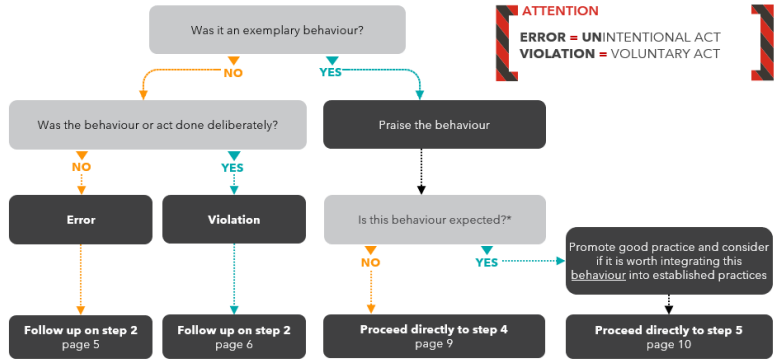
2 INDENTIFY THE BEHAVIOUR OR ACT
DISTINGUISH BETWEEN ERROR, VIOLATION AND EXEMPLARY BEHAVIOUR

WAT IS AN EXEMPLARY BEHAVIOUR?
It is a good practice, a behaviour or an act performed to guarantee a higher level of safety, even if it means breaking some rules.
Example: Airplane pilot Sully landing on the Hudson River in New York on January the 15th 2009.



** A behaviour can be considered exemplary because it has allowed a situation to be remedied, but can also be considered as undesirable given the fact that it is not the agent's but the system's responsibility to prevent or remedy this situation. Such exemplary behaviour is hence evaluated as undesirable when we want to avoid putting other agents in a similar situation.*

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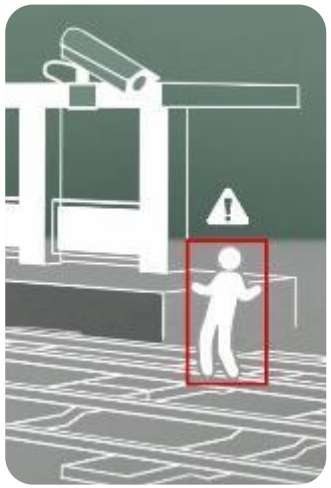
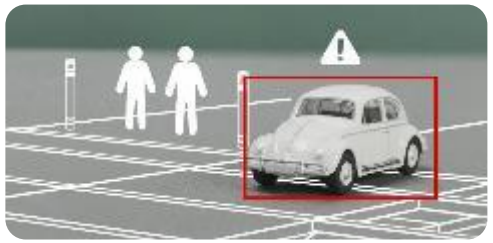
Innovaties

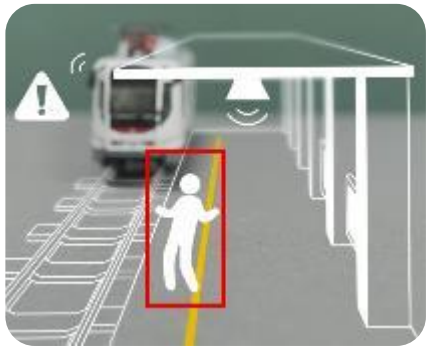
Intelligence Safety 3.0
- Anticipative prevention with intelligence

Smart Junction & Platform Analytics

- ***Video analytics to detect track intrusion***

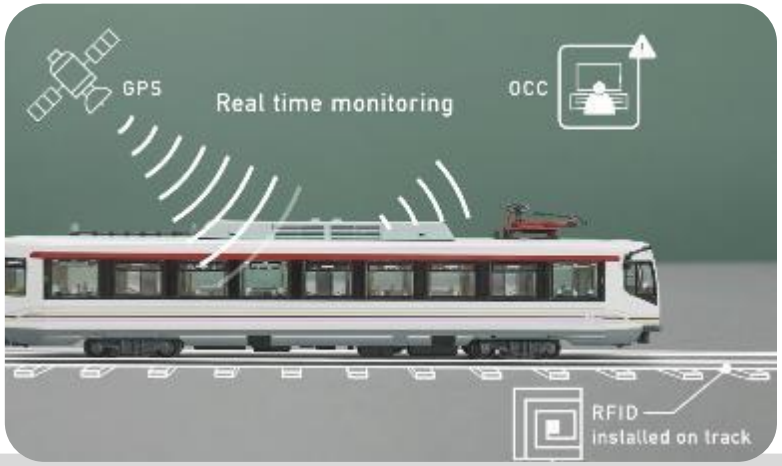






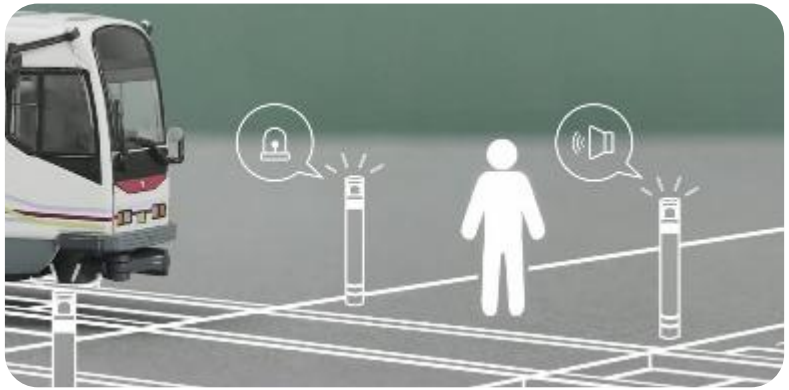
iSPS

- ***Multiple driving alerts enhancing safety***
- ***Early warning and anticipative prevention against track intrusion with analytics results***



Pedestrian Flashing Bollard

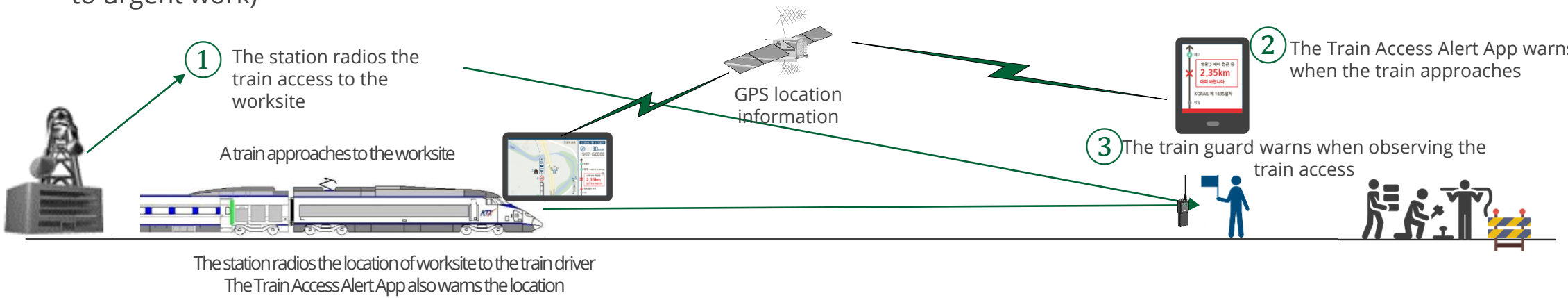
- ***Visual and audio alert, with on-ground LED strip to enhance pedestrian awareness***
- ***Early warning and anticipative prevention of pedestrian dashing out with iSPS LRV data***



2.5 Considering Enhancement of Track Workers' Safety

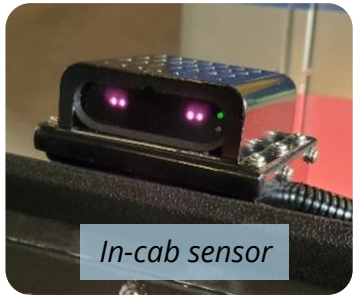
- KORAIL manages multiple safety measures, but more definite method is needed to secure track workers' safety
  - If the worker doesn't hold or activate the app, train access alerts are made by humans such as the stations' radio communication or train guards and the location cannot be found in the navigation system or MIS (some workers don't use the app due to urgent work)
  - Even if using the app, it is difficult to check the work is in progress at a pre-negotiated section or time

Parallel safety measures by humans and by the system

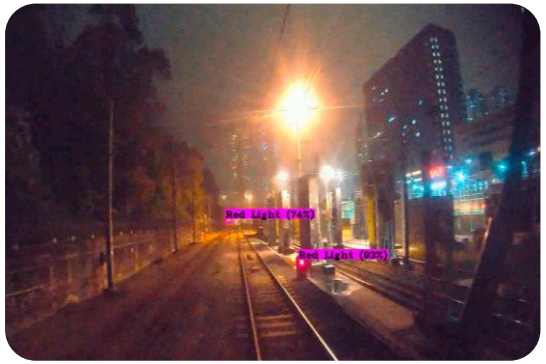


Smart Operation

Driver Fitness Monitoring System

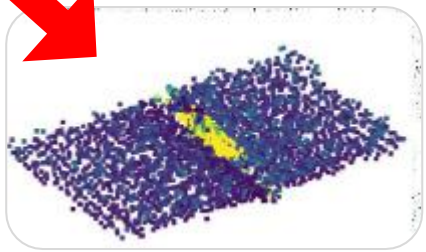


Trackside Signal and Object Detections System



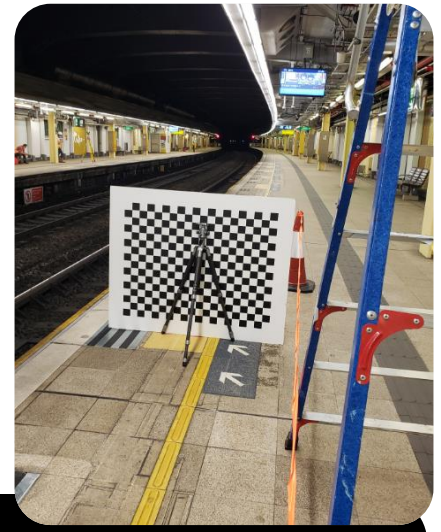
Similar design concepts are being applied to the light rail system in Hong Kong.

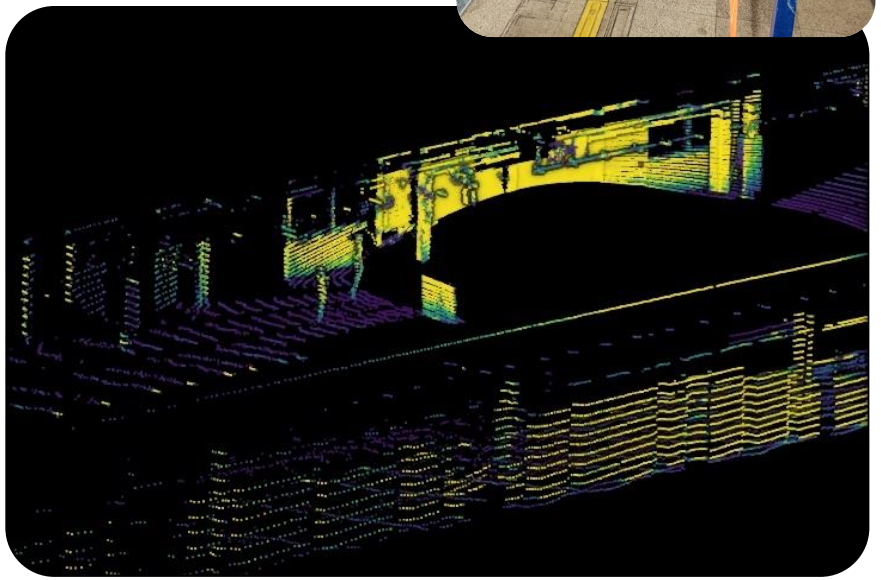
Management of Passenger Behaviour



Tramway Track Small / Foreign Object Detection System

LiDAR Crowd Control System





IRSC 2023 en 2024

- IRSC 2023 in Zuid Afrika
- IRSC 2024 in Oostenrijk
- IRSC 2026 in NL?