

ARISCC - Adaptation of Railway Infrastructure to Climate Change

Workshop, October 19 & 20 2010, Paris

Roland Nolte, IZT Berlin

Agenda

Tuesday, October 19 (afternoon)

➤ **Welcome & Introduction**

Jerzy Wisniewski, UIC Director Fundamental Values

➤ **Global Adaptation Network** (United Nations)

➤ **The European perspective** – the position of the rail sector:

Adapting rail infrastructure to Climate Change

Anne-Laure Le Merre, CER

➤ **Overview over the ARISCC project**

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The First R: Readiness

How can the Railways prepare for extreme weather events and respectively the consequences of climate change?

A. How to inform about current weather and potential hazards?

Example InfraWeather, Christian Rachoy, ÖBB

B. How to learn from past events? Example: Event recording & GIS based System at SBB, Andreas Meyer, SBB

C. How to monitor and document the status of infrastructure assets? Example: Monitoring & Maintenance of protective structures and civil engineering structures at SBB, Andreas Meyer, SBB

ARISCC Overview - Objectives

ARISCC

- Focuses on integrated management of weather & climate related natural hazards
- Aims at keeping/improving railway infrastructure performance
- Helps to avoid/minimize damage to railway infrastructure
- **Starts with managing today's weather conditions**
- Develops solutions & strategies to prepare for future weather/climate conditions

ARISCC Overview - Scope

ARISCC covers the following weather & climate related factors, natural hazards and respective risks for railway infrastructures

| Factor | Trend | Effect | Impact on Railways/Assets |
|--|--|------------------------------------|---|
| All listed factors/events will occur more often and their impacts will be more severe according to the existing climate models | | | |
| 1. Temperature | change of distribution patterns, higher average and maximum temperature | | |
| 1.1 High temperatures and heat waves | | overheating | infrastructure equipment rolling stock equipment |
| 1.2 Sudden temp changes | | tension | track buckling |
| 1.3 Intense sunlight | | overheating | track buckling, slope fires, signaling problems |
| 2. Precipitation | change of distribution patterns, more extreme events | | |
| 2.1 Intense rainfall | | soil erosion, landslides, flooding | damage to embankments, earthwork |
| 2.2 Extended rain periods | | slower drainage, soil erosion | other infrastructure assets, operation |
| 2.3 Flooding: coastal, surface water, fluvial | | landslides | drainage systems, tunnels, bridges |
| 2.4 Drought | | desiccation | earthworks desiccation |
| 3. Wind | change of distribution patterns, more extreme events | | |
| 3.1 Storm/gale (inland) | | higher wind forces | damage to installations, catenary |
| | | uprooting of trees | restrictions/disruption of train operation |
| 3.2 Coastal storms & sea level raise | | Coastal flooding | embankments, earthwork, operation |
| 4. Lightning strikes and thunderstorms | | Overvoltage | catenary and signaling |
| 5. Vegetation | faster plant growth, new plants | | vegetation management |

ARISCC Partners

Deutsche Bahn

Finish Rail Administration

Network Rail

ÖBB

SBB

SNCF

ARISCC Deliverables & Products 1

Solutions for Natural Hazard Management & Early Warning

- Monitoring, impact assessment,
- Vulnerability mapping,
- Early warning, Risk assessment

ARISCC Webpage - Knowledge Base & Exchange Platform

- Good practice, Pilot projects
- Competence mapping,
- Country profiles, contacts...

ARISCC Deliverables & Products 2

Guidance Document: Natural Hazard Management, Risk Analysis & Adaptation Measures

- Guidance for integrated natural hazard management
- Easy to use document, Detailed examples

Case Studies: UK West Coast, Rhine Valley

- Priority Setting, Vulnerability Mapping
- Risk & costs assessment
- Cost scenarios 2030 with/without adaptation

ARISCC Intermediate Results

What has been done so far:

- Solutions for **Integrated Natural Hazard Management** (detailed)
- Collection of **good practice projects** and measures (30 examples)
- **Competence mapping** for adaptation of railway infrastructure to climate change
- **Guidance document** (Integrated natural hazard management)
- **Coordination** with relevant adaptation to climate change projects (TraCCA, Chamäleon, *PARAmount*)

ARISCC Intermediate Results – Guideline

Integrated Natural Hazard Management & Adaptation to Climate Change – Guidance Document (1)

- Weather Information & Weather Warning
- Monitoring & Documentation of Status of Assets
- Event Recording, Documentation & Assessment
- Regional Climate Projections & expected Climate Loads
- Natural Hazard Mapping

ARISCC Intermediate Results - Guideline

Integrated Natural Hazard Management & Adaptation to Climate Change – Guidance Document (2)

- Vulnerability Mapping
- Risk Assessment & Risk Management
- Implementation of Adaptation Aspects in all Steps
- Alternative Adaptation Scenarios (costs & impacts)

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Integrated Natural Hazard Management



Thank you for your attention!