Joint UNECE-UNCTAD Workshop:

Climate Change Impacts on International Transport Networks

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Adapting Rail Infrastructure to Climate Change (ARISCC)

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Adapting Rail Infrastructure to Climate Change

by Jerzy Wisniewski, Director Fundamental Values Dpt., UIC for UNECE, Geneva, 8th of September 2010

UIC – a global association with almost 200 members around the world

UIC Mission

Promoting the development of rail transport at world level, in order to meet challenges of mobility and sustainable development

UIC – working for and with the members:
UIC is the global organisation for cooperation between and promotion of railways. UIC has a strong tradition of working on sustainability issues, both in supporting members in improving their sustainability performance as well as communicating on the sector level towards external key stakeholders.

UIC & Climate Change

A systematic approach: Mitigation & Adaptation
Strategy - Improvement - Communication

Why ARISCC?
Railways have an in extremely long life time and are constructed to withstand natural hazards, such as i.e. the 50 years flood. However, as number and intensity of incidents will arise, also the pressure on the capacity of the rail system will rise together with the costs of the sector in the future.

If the right measures are taken at the right time, the risk will be bearable!

International cooperation and coordination are needed for example when impacts that might be new for one region, already are well handled in other regions.

Better knowledge will help the rail sector to take the right decisions - and take the right concrete measures at the right time!

ARISCC:
Adapting Rail Infrastructure to Climate Change

Background
Adapting to the growing risks that the increasingly higher frequency of extreme weather events (with increasing higher intensity) is a newer challenge for society and for the rail sector.

ARISCC is about preparing rail infrastructure for when ‘today’s extreme weather becomes tomorrow’s normal weather’ (John Dora, Network Rail)

The results are needed by:
- Governments for long term planning and financing infrastructure projects.
- Infrastructure managers for planning and managing the risks.
- Companies within the risk assurance and construction business.
Possible consequences and events caused by extreme weather:

- High and low water periods
- Dry and hot summer
- Extreme storm events
- Freezing spells with increasing wet snow
- Intense rainfall
- Sudden temperature changes
- Intense sunlight
- Precipitation
- Intense rain periods
- Extended rainfall
- Intense sunlight
- Wind
- Drought
- Precipitation
- Vegetation

Impact on Railways/Assets:

- Temperature:
  - High temperatures: overheating infrastructure and rolling stock equipment
  - Heat waves: overheating

- Sudden temperature changes:
  - Tension track: buckling

- Intense sunlight:
  - Overheating: track buckling, slope fires, signaling problems

- Precipitation:
  - Intense rainfall:
    - Erosion, landslides, flooding
    - Damage to embankments, slope
    - Overwash
    - Earthwork, drainage systems, tunnels, bridges
  - Extended rain periods:
    - Drainage, surface water, floodwater
    - Other infrastructure assets, operation
  - Intense rainfall:
    - Flooding
    - Coastal, surface water, fluvial, landslides
    - Drainage systems, tunnels, bridges
  - Wind:
    - Coastal storms & sea level rise
    - Coastal flooding
    - Embankments, windbreak, operation
  - Lightning & thunderstorms:
    - Overvoltage
    - Signal issues

- Vegetation:
  - Faster plant growth, new plant vegetation management

Adapting Rail Infrastructure to Climate Change

Examples on extreme weather events' impact on rail infrastructure:

Factors: Temperature, Rainfall, Precipitation, Wind, Disasters, Natural Hazards, Wet Weather, Extreme Events

How ARISCC?

- ARISCC is combining existing expertise and management under today's weather conditions and to use these to build a new level of nature hazard management and expertise, including solutions and strategies to prepare for the changing weather and climate conditions of the future, as well as cooperation with meteorological institutes.

- Identify risks/ vulnerabilities,
- Manage quantitative risk assessments,
- Classify and prioritize risks
- Learn from good practice

ARISCC: Deliverables

- D 1 Guidelines: Risk Analysis & Adaptation Measures
- D 2 Solutions and Examples
- D 3 Exchange of good practice
- D 4 D5 Standards for new and existing Infrastructure
- D 5 Case Studies: UK West Coast, Rhine Valley, Global Case Study

ARISCC focuses on integrating management of weather and climate related natural hazards such as flooding, severe storms, landslides, rock falls, avalanches, etc.

in a way that strengthens the railway infrastructure performance and avoids or minimizes damage to railway infrastructure assets.

Risks from impacts by climate and natural hazards are already handled by the railways - example from Austria

Thank you for your kind attention

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