The impact of temperature-related climate hazards on rail infrastructure

to climate hazards



Increasing periods of drought



Extreme temperature Increase in extreme temperature





Cold/frost Cold snap/frost



Thunderstorm/lightning

Forest fires in the vicinity of tracks



ncreasing periods of drought



Flooding Increasing periods of drought



Marine submersion



Strong wind High winds, cyclones, tornadoes



Snowstorm



High winds and sand

Solid mass movement



Solid mass movement

Type of impact



Impact with LONG-TERM



Impact with MEDIUM-TERM CONSEQUENCES on network operations: adaptive measures needed to keep trains running (e.g. TSR), and if nothing is done, traffic will inevitably come to a halt



Impact with IMMEDIATE MAJOR **CONSEQUENCES** for network operations (e.g. stopping traffic)



Overhead lines



Overhead line deflection outside tolerance



Destruction



Network freeze Increased fragility Rupture due to excessive voltage

Destruction by overvoltage





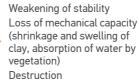




Surroundings = earthworks + vegetation











Vegetation fire









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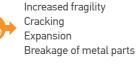




Engineering structures













Increased fragility Cracking Breakage







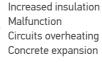


Signalling centre



















Electrical circuit malfunction



Network breakdown



Power supply • Cables





Increase in electricity consumption Structural damage (rapid expansion and contraction of conductors and insulators)































Signalling



Increase in electricity consumption Malfunction













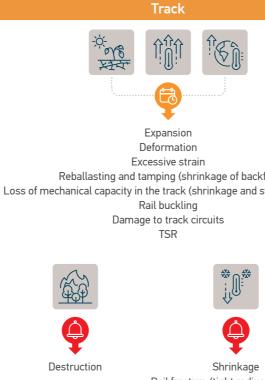


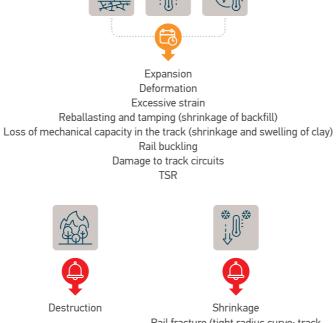






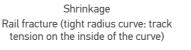






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