

TrackSafe

Track Geometry Safety Assessment System



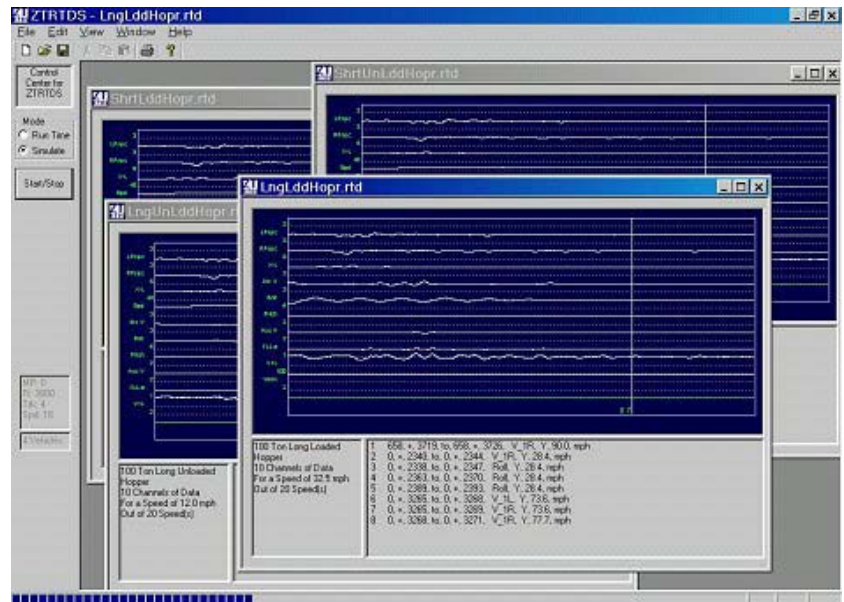
What is TrackSafe?

TrackSafe is a powerful system for assessing track safety based on predictions of vehicle performance in response to measured track geometry. Current methods for track geometry assessment only consider the various parameters such as gage, surface, alignment, and cross-level individually. In addition, safety thresholds are set based on nominal vehicle parameters.

TrackSafe uses the real-time dynamic simulation of multiple vehicle types and traveling speeds to predict and locate potentially unsafe areas in track. This approach more comprehensively considers the result of repeated, but, perhaps, non-defective anomalies in the track geometry. Furthermore, it considers the effect of combinations of track geometry parameters.

How Does TrackSafe Work?

TrackSafe is designed to operate on-board a track geometry car traveling at full track speed. The system allows the selection of the number and type of vehicles that will be simulated, as well as the traveling speeds to be simulated for each vehicle. Response predictions for each vehicle include the vertical displacement and acceleration of the carbody, as well as carbody roll and wheel unloading. These values are then compared with dynamic response safety limits. Output reports identify areas of track that are predicted to result in unsafe vehicle response and include the type of response (e.g. wheel unloading, harmonic rock off, etc.) and the vehicle speed(s) at which the unsafe response occurs.



Benefits

- Helps users locate track defects and other geometry-related anomalies
- Predicts when a specific rail car would experience an unsafe dynamic response
 - Derailment
 - Excessive acceleration
 - Harmonics
- Performs analysis in real time for multiple cars simultaneously
- Can be used to re-run a track geometry recording to investigate incidents

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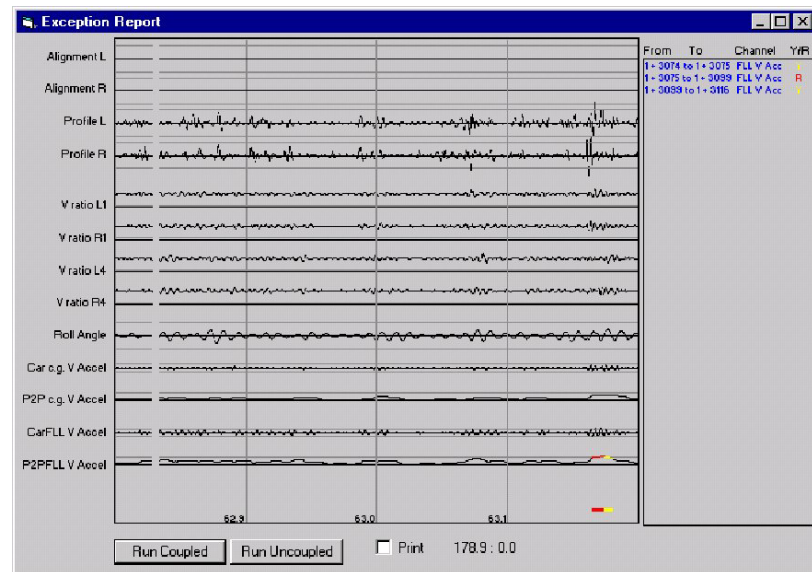
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Vehicles can be modeled for various carbody types:

- Freight Cars
 - Loaded or Unloaded
 - Short or Long Body
 - Box Car
 - Hopper
 - Tank Car
- Passenger Cars
- Transit Cars

TrackSafe provides a comprehensive assessment of track safety that can help locate areas where poor, but non-defective track geometry may lead to unsafe vehicle performance. By simultaneously analyzing the response of multiple vehicle types and a range of traveling speeds in real-time, *TrackSafe* provides a more complete inspection of the existing track geometry and can be used to reduce track geometry-related derailments.



The dynamic responses calculated can include:

- Displacements and accelerations of car
- Roll and pitch angles of car
- Peak-to-peak accelerations of car
- Static wheel forces
- Dynamic wheel forces

Features

- Easy-to-Use Windows™ application
- Displays input/output data graphically
- User selects multiple types of rail cars for dynamic response analysis
- User selects a range of speeds for dynamic response analysis
- User sets warning and exceedance thresholds for various dynamic responses
- Reports for all unsafe dynamic responses

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