Jaisen Gil

Senior Staff Consultant

Jaisen Gil is a Senior Staff Consultant with a mechanical engineering background and deep specialization in rail industry safety, operations, and vehicle dynamics. He brings extensive experience in derailment investigations, engineering simulations, and operations research, with a strong focus on improving freight train performance and reducing risk.

At Norfolk Southern, Jaisen led numerous derailment investigations and developed advanced simulations to model railcar and track interactions. His expertise in multibody dynamics modeling has supported accident reconstruction, train handling/makeup studies, and predictive analytics for operational risk. He represented Norfolk Southern as a technical expert during field investigations, collaborating directly with regulatory agencies such as the FRA and NTSB to support root cause analyses and safety assessments.

Jaisen also created a standard operating procedure for derailment investigations, authored reference guides on vehicle and track measurements, and helped teach technical courses on derailment mechanics and investigative methods — reinforcing his role as both a practitioner and educator in the field.

His aviation experience includes reverse-engineering aircraft components and overseeing FAA compliance testing for commercial interiors, contributing to cost-saving innovations and certification documentation. Earlier in his career, he supported manufacturing and anomaly investigations in the defense sector.

Jaisen holds a B.S. in Mechanical Engineering from Georgia Tech and maintains a Top-Secret security clearance. His technical strengths include multibody dynamics modeling and data analytics, with a proven ability to deliver actionable insights in high-stakes environments.

Education

BS, Mechanical Engineering (Summa Cum Laude). Georgia Institute of Technology. 2018

Contact Information

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Areas of Specialization

- Rail Vehicle Dynamics
- Accident Reconstruction
- Failure Analysis
- Product Design & Analysis
- Rail Risk Management
- Defense Industry Support
- Engineering Analysis & Simulation
- Data Collection & Analytics
- Failure & Safety Investigations

Positions Held

Engineering Systems Inc., Peachtree Corners, Georgia

- Senior Staff Consultant, 2025 – Present

Norfolk Southern Corporation

- Research Engineer, 2020 – Present

Sheffield Aerospace – Delta Air Lines

- Mechanical Engineer II, 2019 – 2020

Lockheed Martin

- Mechanical Engineer, 2019

Seatec Services – Delta Air Lines

- Engineer, 2015 – 2018

Continuing Education

- **Intensive Course on Electrical Contacts & Connector Design for Electronics and Microelectronics Applications** – Timron Scientific Consulting, Inc., 2016

Project Experience

Investigations

Mainline Derailments

- Conducted comprehensive investigations including full formal reports, TOES longitudinal dynamics simulations, and vehicle dynamics analyses.
- Presented findings and risk mitigation strategies to executive leadership at VP level.
- Collaborated with FRA and NTSB during high-profile cases to ensure regulatory compliance and operational improvements.

Yard Derailments

- Guided field teams in collecting critical data for derailment analysis and root-cause determination.
- Compiled evidence and provided informal recommendations to field personnel for corrective actions.
- Scope focused on rapid assessment and practical solutions to minimize yard disruptions.

Equipment Inspections

- Inspected freight cars for AAR and FRA defects, as well as conditions contributing to derailments.
- Analyzed wayside detector data to identify trends in vehicle performance and detect emerging issues.
- Evaluated new component designs (e.g., truck assemblies, draft gear systems) for abnormal wear and performance anomalies.

Operational Analysis & Engineering

Tonnage Evaluations

- Assessed maximum allowable tonnage for humping operations to mitigate derailment risk during yard processing.
- Evaluated tonnage limits for specific routes based on grade, curvature, and train handling requirements to ensure safe operations.

Track Design

- Evaluated track geometry and elevation profiles for curving performance; developed predictive metrics for lateral movement and panel shift risk.
- Evaluated rail grinding templates for their impact on vehicle dynamics and provided recommendations.

Equipment Design

- Applied simulation-driven design validation for autorack loading configurations (specifically with vehicles on the top deck) under AAR Chapter XI compliance.

Train Marshalling

- Performed longitudinal dynamics (TOES) simulations to analyze in-train coupler forces and determine optimal train makeup practices with respect to car geometry, tonnage placement, and equipment restrictions.

Technical Programs & Procedure Development

Derailment Training

- Developed and delivered technical courses on derailment mechanics and investigative methods for operations and engineering teams

Standard Procedures

- Authored a comprehensive reference manual for vehicle measurements, track measurements, and derailment investigation techniques.
- Created a company-wide SOP for derailment investigations, ensuring uniform methodology and regulatory compliance.