



U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

VIA E-MAIL ONLY

January 15, 2025

Mr. James E. Irvin
President
Georgia Central Railway, L.P.
Heart of Georgia Railroad, Inc.
JIrvin@gwrr.com

Re: Docket Number FRA-2023-0066

Dear Mr. Irvin:

This letter is in response to the August 10, 2023, petition Georgia Central Railway, L.P. (GC) and Heart of Georgia Railroad, Inc. (HOG) (collectively, Petitioners)¹ submitted to the Federal Railroad Administration (FRA), requesting approval of a test program (Program) under 49 Code of Federal Regulations (CFR) § 211.51. FRA assigned the petition Docket Number FRA-2023-0066. FRA is treating the petition as a request for waivers of compliance and approval of a Program under 49 CFR § 211.51. This letter pertains to the set of twenty-two waiver requests and one request for statutory exemption under consideration and is issued in conjunction with, but is dependent upon, the FRA Administrator's approval of the Program under 49 CFR § 211.51.

Background

In the August 10, 2023, submission, Petitioners explain that the proposed Program involves a system of a novel, self-propelled, zero-emission, battery-electric rail vehicles and their associated computer and telemetry technology systems, manufactured by Parallel Systems, Inc. The vehicle concept consists of a single intermodal container carried by two autonomous rail vehicles (AVs). Each AV is propelled by a battery and traction motor, and has the necessary sensors, radios, and computers to be independent. Through hand-held controls or via the dispatch center, the AVs receive instructions to move either individually (e.g., 2 AVs with one container) or with a group of AVs to operate in a platoon.² Petitioners note that following testing at MxV Rail,³ the Program, if approved, would take place on a 160-mile segment of

¹ GC and HOG are subsidiaries of Genesee and Wyoming (G&W).

² The AVs do not couple, but rather receive commands to move together.

³ The testing at MxV Rail is to test the AVs' braking system and other components.

track in central Georgia,⁴ to progressively test and aim to prove the technology and collect data to support the safety case.

Petitioners state that the goal of the technology is to provide smaller freight railroads an opportunity to meaningfully compete in the short-haul transportation of containers, and the technology would provide public benefits for the environment, the economy, the national highway system, and communities disproportionately impacted by highway movement of containers. Petitioners contend that “safety is an overriding focus of the proposed Program” and Petitioners have developed, and will adhere to, a Pilot Test Safety Plan (Safety Plan), Exhibit C of the submission, to ensure safety during testing. Petitioners explain the “Safety Plan includes protocols for hazard analysis, control, and verification of controls which will be reviewed by six technical working groups who will consider the risks associated with each phase and the necessary actions to mitigate each risk.”

Petitioners provide that the Program, detailed in Exhibit B to the petition, “is based on seven phases of tightly structured and closely monitored field testing.” The Program would use the “[r]esults of testing performed during each phase . . . to evaluate the safety of the proceeding phase.” The Program would collect “[d]ata and service history” and then “evaluate changes in the design of the System, its components, and the relevant operating procedures in support of further testing before any proposed use of the System outside of the Program.” The Program includes a structured sequence of test phases to “allow collection and evaluation of the operating data in progressively more complex operating conditions.” Petitioners emphasize that the priority “of each phase of the Program is to assure safety of railroad employees, other persons and property, and the general public along the railroad lines that will be used for the Program.”

Petitioners state that the Program is “designed to evaluate the effectiveness of the System and new operational approaches to rail vehicle technology in the short-haul movement of containers.” As described in Exhibit B, the Program will gather “quantitative and qualitative data” in each phase and evaluate the reliability, compatibility, and cost of operation, along with a safety analysis. Additionally, phase-specific testing objectives are identified in the petition (e.g., to determine if conditions at the test track affect controllability of the vehicle, as well as identify any sources of variation between phases). Following each set of tests, the Pilot Phase Readiness Review (P2R2) process will occur during each phase with a report submitted to the designated FRA contact. The Program would not begin or, following Phase One, move to a subsequent phase, without written approval from FRA.

Evaluation of the Petition

FRA views the petition as consisting of (1) a request for the temporary suspension of certain FRA regulations or waivers of compliance under 49 CFR and 49 U.S.C. 20302, and (2) a request for approval of a centralized test program that would utilize that requested relief under 49 CFR § 211.51.

⁴ See Petition Exhibit C, “Testing will take place between mileposts 503 and 577.8 on the [GC] and mileposts 577.8 and 663 on the [HOG], which are two Class III freight railroads that connect directly in Vidalia, GA.”

Relief Requested

- *49 CFR Part 218, Railroad Operating Practices*
 - §§ 218.55–59, Subpart D, Prohibition Against Tampering with Safety Devices, prohibit disabling of safety devices or knowingly operating a train with disabled safety devices.

- *49 CFR Part 229, Locomotive Safety Standards*
 - Multiple provisions of Part 229 require relief given the unique design of the Vehicle and the braking system.
 - § 229.9(a)(3), Movement of Non-Complying Locomotives
 - § 229.13, Control of Locomotives
 - § 229.15(a)(10), Locomotives with Control Units
 - § 229.29, Air Brake System Calibration, Maintenance and Testing
 - § 229.47, Emergency Brake Valves
 - § 229.53, Brake Gauges
 - § 229.55(b), Piston Travel
 - § 229.71, Clearance Above Top of Rail
 - § 229.115(a), (c), Slip/Slide Alarms
 - § 229.117, Speed Indicators
 - § 229.119, Cabs, Floors, and Passageways
 - § 229.127, Cab Lights
 - § 229.131(a), Sanders
 - § 229.137, Sanitation, General Requirements
 - § 229.139, Sanitation, Servicing requirements
 - § 229.141, Body Structure, MU Locomotives
 - §§ 229.201–206, Part 229, Subpart D, Locomotive Crashworthiness Design Requirements
 - §§ 229.301–319, Review of Locomotive Electronics Safety Analysis Before Use

- *49 CFR Part 231, Railroad Safety Appliance Standards*
 - § 231.6(a), Handbrakes
 - § 231.6(d), End Handholds
 - § 231.6(e), Uncoupling Levers

- *49 U.S.C. 20302, Safety Appliance Acts*
 - Statute requires railroad equipment to have numerous appliances (couplers, sill steps, hand brakes, grab irons, hand holds) and certain car and train braking capability (a power-driving wheel brake and other appliances and power brakes).

- *49 CFR Part 232, Brake System Safety Standards for Freight and Other Non-Passenger Trains and Equipment; End-of-Train Devices*
 - § 232.103(f), (g), (j), (k), (l), (m), (n), (o), General Requirements for All Train Brake Systems
 - §§ 232.205–212, Brake Tests
 - § 232.215, Transfer Train Brake Tests

- § 232.303, General Requirements (for periodic maintenance)
- § 232.305, Single Car Air Brake Tests
- Subpart E, End-of-Train Devices
- § 232.503, Process to Introduce New Brake System Technology
- § 232.505, Pre-Revenue Service Acceptance Testing Plan
- *49 CFR Part 236, Rules, Standards, and Instructions Governing the Installation, Inspection, Maintenance, and Repair of Signal and Train Control Systems, Devices, and Appliances*
 - § 236.913, Product Safety Plan for Processor-Based Signal and Train Control Systems
- *Parts 240 and 242, Qualification and Certification of Engineers and Conductors*
 - § 240.103 and § 242.103, Approval of Design of Individual Railroad Programs by FRA

FRA conducted a public hearing on March 12, 2024, to provide the public an opportunity to provide oral comment on the petition, as well as to address Petitioners' request for an exemption of 49 U.S.C. 20302.⁵ Additionally, as explained in the Petition, G&W has performed outreach to local, State, and federal government representatives, local authorities in Georgia, and labor representatives, including hosting labor to review the design and observe testing. G&W planned further engagement with labor organizations during the MxV Rail testing and throughout the proposed Program.

Public Comments

During the public hearing on March 12, 2024, in Vidalia, Georgia, the Petitioners provided a briefing on the GC and HOG railroad operations and a summary of the technology. Additionally, presentations were made by:

- Leesa Hagan, Georgia State Representative
- Vince Verna, Brotherhood of Locomotive Engineers & Trainmen (BLET)
- Grant Buckley, Executive Director of Cordele Crisp County Industrial Development Council
- Chuck Baker, American Short Line and Regional Railroad Association
- Jared Cassidy, Alternate National Legislative Director, SMART TD
- Brad Lafevers, Founder, HOG Railroad
- Jeff Cotter, Atkins Realis, Traffic Incident Management Specialist
- Greg Regan, Transportation Trades Department, AFL-CIO

During the public comment period, 155 comments were received, 32 in support and 122 with concerns, and one with no content. FRA also received Letters of Support from four Members of

⁵ In accordance with 49 U.S.C. 20306, FRA may exempt Petitioners from the statutory requirements in 49 U.S.C. 20302 based on evidence received and findings developed at a hearing demonstrating that the statutory requirements “preclude the development or implementation of more efficient railroad transportation equipment or other transportation innovations under existing law” or an “agreement between national railroad labor representatives and the developer of the new equipment or technology.” See 49 U.S.C. 20306(a), (b)(2).

the U.S. Congress.

Although many of the public comments were directly related to safety, many comments, both supporting and opposed to the proposed program, are relevant only if this type of operation were to be approved to operate on the general railroad system, but are not relevant to this specific pilot test program. These comments will certainly be important when/if railroads seek approval for further testing or to operate.

Relevant to the pilot test program, commenters identified the following central areas of safety concern:

1. Comments questioned public safety around grade crossings.

FRA Response: FRA had similar concerns, and therefore requires flagging of all crossings for all phases as a condition for the Program.

2. Comments regarding the need for continued and expanded first responder training and qualification.

FRA Response: The Program outlines training for the first responders and each of the Fire Chiefs in the areas the pilot would be operated. These organizations submitted comments in favor of the Program based on how proactive G&W/Parallel have been in outreach and training. FRA has included an emergency responder training condition for the Program to ensure safety.

3. Comments regarding the need for Locomotive and Conductor certification for those performing these tasks.

FRA Response: FRA concurs with the need for training for all staff involved in the operation and maintenance of the technology during the Program. Petitioners stated that properly trained, qualified, and certified locomotive engineers and conductors would be employed for the test program. Relevant certification requires training on technology. As the technology is under test and not currently addressed in FRA's regulations, there is no way for the train crew to qualify on the equipment per the regulations. To mitigate this, the safety case for the Program outlines the operational requirements for the tests and the addition of a "Vehicle Supervisor" also with emergency stop capability, which serves as an alternative.

FRA Staff Review

FRA's Office of Railroad Safety has provided technical input and subject matter expertise in response to Petitioners' new operating concept and technology. Following multiple virtual introductory meetings, FRA developed a group of six technical review working groups to review specific safety aspects of this novel technology (Track, Mechanical, Signal & Train Control, Grade Crossing, Operating Practices, and Control Systems/Dispatch). FRA subject

matter experts (SMEs) from each technical working group joined meetings with working group members from Petitioners and Parallel Systems to discuss the design and potential risks associated with the proposed novel transportation technology. FRA SMEs and engineers collaborated with Volpe Engineers, the U.S. Department of Transportation, Office of the Secretary, Research Office Highly Automated Systems Safety Center of Excellence (HASS), G&W Railroad experts, Parallel Systems Engineers, and rail labor representatives providing feedback and perspective on regulatory and safety issues related to this novel equipment.

Upon receipt of the Petition, a multi-disciplinary team was tasked with the evaluation of the requested relief and to evaluate the safety of the multi-phase test program petitioned under 49 CFR § 211.51. This team reviewed the Petition with the understanding that it is strictly for testing purposes and not for introduction of this equipment into the general railroad system in revenue service at this time. As part of the FRA staff review, the Pilot Test Safety Plan was reviewed to ensure it included protocols for hazard analysis, risk assessment, and safety controls throughout the seven test phases of the Program. The Pilot Test Safety Plan includes a readiness review panel made up of GC/HOG employees, Parallel Systems design engineers, and FRA staff, who would consider the risks associated with each phase, the necessary actions to mitigate each risk, and then determine if testing can safely occur. At each phase, FRA approval is required to start testing and to transition to the next phase of testing, informed by this readiness review as well as FRA's observations of testing and review of test data.

Testing is planned in seven phases, with defined success criteria that must be achieved prior to FRA approval to move to the next test phase:

- *Phase 1 - Verification of Vehicle Communications, Traction and Braking:* Criteria to move to the next phase include successful validation of all vehicle controls and validation of all field test procedures, communication, and safety protocols.
- *Phase 2 - Testing Over a Longer Distance and More Diverse Territory:* Criteria to move to the next phase include successful validation of all vehicle controls throughout the longer distances and more diverse territory, control of the vehicle is fully validated and confirmation of shunting at a grade crossing.
- *Phase 3 - Validation of Remote Capability of Vehicle with Direct Supervision:* Criteria to move to the next phase include successful validation of all vehicle controls over the broader environment, validation of remote monitoring and video links, including back-up when communications fail, and shunting validation over the territory.
- *Phase 4 - Testing and Data Gathering with Extended Remote Operations:* Criteria to move to the next phase include final validation of all vehicle controls, validation of remote monitoring and video links, including back-up when there is a communications failure, and shunting validation over the territory.
- *Phase 5 - Vehicle Upgrades to Enhance Reliability and Performance (based on previous phases):* Criteria to move to the next phase include re-validation of all vehicle controls, re-validation of remote monitoring and video links, including back-up when communications fail, and shunting re-validation over the territory with the upgraded vehicle.
- *Phase 6 - Concurrent Operations of Vehicle with Conventional Train Service:* Criteria to move to the next phase include all vehicle controls and functionality are reliable,

intermixed operations are validated, remote monitoring and video links are reliable, and shunting is validated.

- *Phase 7 - Traverse Entire Route with Multiple Vehicles (Platooning):* At the completion of Phase 7, the vehicle controls and functionality will be reliable, intermixed operations validated, platooning operations validated, remote monitoring and video links reliable, and shunting validated.

The Pilot Phase Readiness Review (P2R2) process will allow FRA staff to monitor HOG and GC pilot testing process for waiver compliance. Additionally, FRA's participation in the Pilot Test process provides an avenue to evaluate the effectiveness of this novel self-propelled, zero-emission, battery-electric rail vehicle, observe the performance of its supporting computer and telemetry technology, and witness the operational concepts and approaches associated with the System. Noting that this is a multi-phase test program, being requested as an avenue to produce verification and validation data for a future safety case, FRA must participate in the P2R2 to ensure adherence to the waiver conditions and the Pilot Test Plan prior to transitioning between phases.

FRA's Railroad Safety Board Review and Determination

The Railroad Safety Board (Board) reviewed the petition, attended a demonstration at MxV Rail, conducted a public hearing, reviewed the FRA SME hazard analysis, Pilot Test Program, supporting technical documentation, and public comments and testimony. The Board has determined that granting the Petitioners' request for relief for the purpose of performing the testing, related to the petition for a pilot test program, is in the public interest and consistent with railroad safety. Accordingly, the Board grants the group of requested waivers and exemption from the requirements of 49 U.S.C. 20302, subject to the following conditions:

1. Petitioners must provide to FRA the projected scheduled testing for each phase outlined in the Pilot Test Program (PTP) of this petition. FRA SMEs will use this information to plan and conduct site visits to monitor testing for compliance with the conditions outlined in this letter and for observation.
2. During each pilot phase readiness review,⁶ a multi-disciplinary team consisting of the GC and HOG representatives (including operating and maintenance staff), Parallel Systems, and FRA, will review the results of each phase of testing and evaluate the readiness and safety of transitioning to the next test phase. Documentation must be provided at the completion of each phase to verify and validate that the criteria and metrics are met.

Prior to Phase 1, GC and HOG representatives (including operating and maintenance staff), Parallel Systems, and FRA will hold a safety design review to discuss in detail the specific safety features that are designed into the system to ensure safety, including brake system design, electrical storage/regenerative braking, and emergency stop procedures.

⁶ Pilot Phase Readiness Review structure is described in Petition, Exhibit C, Safety Plan, Section 3.3.

Only upon FRA's written approval will Petitioner be able to continue with the next phase of testing.

3. The testing must be restricted to the territory and mileposts documented in the Pilot Test Program, in dark territory under track warrant control.
4. Only trained and qualified railroad or designated representatives will operate the equipment. *Qualified* means a person who has successfully completed all instruction, training, and examination programs required by the employer and the applicable parts of applicable portions of 49 CFR Parts 240, 242, and 243, and that the person therefore may reasonably be expected to be proficient on all safety-related tasks the person is assigned to perform.
5. All mechanical inspections must be performed by a qualified inspector.
6. All grade crossings must be flagged for all phases where crossings are present.
7. Equipment must be inspected daily prior to use and each control console must be equipped with a digital banner indicating the equipment is safe to operate, or if there is a defective component, the banner must indicate the defect and prevent operation until the defect is repaired. Each control console must also have an accurate speed display.
8. Each vehicle must have an appropriate direction of movement indicator light on the end of the vehicle that faces the direction of travel. The trailing end of the vehicle must have a rear end marker identifying the rear of the vehicle.
9. Each vehicle must be equipped with an operable audible warning device (bells/whistle/alarm) that sounds at the required decibel level (see 49 CFR § 229.129(a)) prior to vehicle movement or over grade crossings.
10. Each vehicle must be equipped with a manual safety bus cut out switch located in a safe accessible position not on the ends of the vehicle, as well as having electronic remote safety stop capability on each control device as a first option to ensure personnel are out of harm's way when initiating an emergency stop.
11. Pilot Test Project documentation must include clear instructions on how to test, inspect, maintain, and operate the brake system and what to do in the event of a brake failure.
12. Pilot Test Project documentation must clearly define procedures to ensure the vehicle does not move (roll back or forward) when initiating a movement, including performing a standing brake test.
13. Brake calibration/inspection/maintenance process must be clearly outlined and adhered to for the duration of the test.

14. Communications loss criteria between the vehicle and operator must be documented on the FRA Form 6180.49A (blue card). Length of communications loss before automatic brake application must be documented prior to operation.
15. The Pilot Test Program must address electronic safety features during the handoff between traction and braking. Specifically identifying failsafe stop/emergency procedures in the event of a failure, outlining the electronics logic on how to enforce an emergency stop when there is a fault.
16. Since this is a new braking technology, you must provide a complete description of the process you are following, including how you manage energy stored in the batteries to prevent overcharge from regenerative braking.
17. Provide emergency response training for all emergency responders who might be called to respond in the event of an emergency.
18. Although these vehicles do not couple there must be a provision for a rescue coupler or alternate process to provide a safe way to move the vehicle in the event of a system failure or emergency.
19. Petitioners must produce and provide FRA with a monthly test report in a useable electronic format (for example, an Excel file). The report will contain information pertaining to the test area to include vehicle identification, date of each test, geographic (milepost) limits of the test, issues identified, anomalies and proposed solutions.
20. Prior to advancing beyond Phase 2 and in accordance with Condition 2, petitioners must provide FRA with specific documentation explaining how safety-critical products were developed, how the equipment is inspected, a concept of operations, maintenance schedule and a thorough testing plan indicating what constitutes a pass or fail. Petitioners must also describe how personnel working with safety-critical products will be trained to perform functions of the Program safely. Petitioners must provide FRA with an updated Railroad Safety Program Plan and Product Safety Plan and obtain FRA approval before any Phase 3 testing begins.
21. All personnel involved in the process outlined in this grant of relief must be informed of the scope of relief granted and be aware of all conditions prior to participation in the process. GC and HOG must make readily available at every test segment location a copy of this letter and any amendments prior to participation in the test.
22. As this technology and operating approach does not involve a locomotive cab where facilities would normally be located, Petitioners must make available lavatory facilities for operating and test crews.
23. End handholds and uncoupling levers are not applicable to this equipment because it does not couple. Based on evidence developed during the March 2024 hearing, FRA

exempts Petitioners from the requirements of 49 U.S.C. 20302 for purposes of testing this new technology. The purpose of the statute is to protect employees who are between traditional rail equipment lacking air hoses and coupling equipment, but because this novel equipment being tested does not couple or have air hoses, the risk has been engineered out.

This relief will be re-evaluated at the completion of each phase of the test program.

FRA reserves the right to modify or rescind this letter upon receipt of information pertaining to the safety of rail operations or in the event of non-compliance with any condition related to this waiver or any approval of the petition for a Pilot Test Program under 49 CFR § 211.51. Further, FRA reserves the right to take enforcement action under 49 U.S.C. § 20111 for noncompliance with any condition of this letter or applicable Federal regulations. In addition, based on the consideration and analysis of data gathered during the Program, upon Petitioners' written request, FRA may consider modifying this letter as appropriate. FRA looks forward to a continual dialogue with Petitioners on the findings of the Program, as it is implemented.

In any future correspondence regarding this letter, please refer to Docket Number FRA-2023-0066. If you have any questions, please contact Mr. Matthew Brewer, Staff Director Engineering and Technology Division, Office of Railroad Safety, at (509) 994-1978 or Matthew.Brewer@dot.gov.

Sincerely,

Karl Alexy
Associate Administrator for Railroad Safety
Chief Safety Officer