U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

Disclaimer: This information is considered guidance pursuant to DOT Order 2100.6A (June 7, 2021). Except when referencing laws, regulations, policies, or orders, the information in this letter does not have the force and effect of law and is not meant to bind the public in any way. This document does not revise or replace any previously issued guidance.

January 3, 2025

Mr. Chuck Baker
President
American Short Line and Regional Railroad Association (ASLRRA)
50 F Street NW, Suite 500
Washington, DC 20001

Ms. KellyAnne Gallagher
Executive Director
The Commuter Rail Coalition (CRC)
P.O. Box 235
Alexandria, VA 22313

Mr. Ian Jefferies
President and CEO
Association of American Railroads (AAR)
425 Third Street SW
Washington, DC 20024

Mr. Paul P. Skoutelas
President and CEO
American Public Transportation Association (APTA)
1300 I Street NW, Suite 1200
Washington, DC 20005

Dear Mr. Baker, Ms. Gallagher, Mr. Jefferies, and Mr. Skoutelas:

I am writing to remind the railroad industry that certain rail safety laws apply to alternative-fuel locomotives, including the Locomotive Inspection Act[1] (LIA), the Locomotive Safety Standards[2] (LSS), and the Passenger Equipment Safety Standards[3] (PESS) when they are used in passenger service. As provided in the in the LSS, the Federal rail safety laws make it

[1] 49 U.S.C. 20701-20703.
[2] 49 CFR part 229.
[3] 49 CFR part 238.

unlawful for any carrier:

> to use or permit to be used on its line any locomotive unless the entire locomotive and its appurtenances—(1) Are in proper condition and safe to operate in the service to which they are put, without unnecessary peril to life or limb; and (2) Have been inspected and tested as required by this part.[4]

Any person (including, but not limited to, a railroad; any manager, supervisor, official, or other employee or agent of a railroad; any owner, manufacturer, lessor, or lessee of railroad equipment, track, or facilities; any employee of such owner, manufacturer, lessor, lessee, or independent contractor) who violates any requirement of the federal rail safety laws concerning locomotives and locomotive appurtenances, are subject to civil penalties for each day the violation continues.[5] Moreover, any person who knowingly and willfully falsifies a record or report required by the federal rail safety laws concerning locomotives and locomotive appurtenances is subject to criminal penalties under 49 U.S.C. 21311.[6] In addition, FRA may require a railroad to remove a locomotive from service if FRA determines that the locomotive is not safe to operate in the service to which it is put, whether by reason of nonconformity with the LSS or by reason of any other condition rendering the locomotive unsafe.[7]

To help ensure compliance with the LIA prior to using an alternative-fuel locomotive, FRA has developed guidelines for the various analyses to be performed. These guidelines, which were outlined in FRA's previous letters addressing this subject,[8] are described in more detail below.

Application of Rail Safety Laws to Alternative-Fuel Locomotives

The LIA provides that:

> A railroad carrier may use or allow to be used a locomotive or tender on its railroad line only when the locomotive or tender and its parts and appurtenances—
> (1) are in proper condition and safe to operate without unnecessary danger of personal injury;
> (2) have been inspected as required under this chapter and regulations prescribed by the Secretary of Transportation under this chapter; and
> (3) can withstand every test prescribed by the Secretary under this chapter.[9]

[4] 49 CFR 229.7.
[5] 49 CFR 229.7(b).
[6] 49 CFR 229.7(c).
[7] 49 CFR 216.13.
[8] Enclosed letters dated 2013 and 2019.
[9] 49 U.S.C. 20701.

Further, the LIA requires the Secretary of Transportation, as delegated to FRA,[10] to:

> (1) become familiar, so far as practicable, with the condition of every locomotive and tender and its parts and appurtenances;
> (2) inspect every locomotive and tender and its parts and appurtenances as necessary to carry out this chapter, but not necessarily at stated times or at regular intervals; and
> (3) ensure that every railroad carrier makes inspections of locomotives and tenders and their parts and appurtenances as required by regulations prescribed by the Secretary and repairs every defect that is disclosed by an inspection before a defective locomotive, tender, part, or appurtenance is used again.[11]

Courts have consistently interpreted the term "locomotive," as used in the LIA very broadly. Generally, rail vehicles capable of moving other equipment are considered to be locomotives under the LIA.[12] This conclusion is irrespective of the vehicle's assembly or appearance, and whether or not it is engaging in a particular type of service. Thus, even when a unit used to power equipment does not look like a traditional locomotive (e.g., burro cranes, hi-rail vehicles, track mobiles), or has been modified to be an integral component of a trainset (e.g., liquified natural gas (LNG) dual-fuel locomotives, multiple-unit locomotives, the power unit of an integrated rail grinder train, etc.), such equipment, including a current alternative-fuel locomotive, is considered to be a locomotive and must therefore comply with the statutory requirements contained in LIA.

Moreover, except for "hi-rail, specialized maintenance, or other similar equipment," FRA's LSS also apply to locomotives, including current alternative-fuel locomotives.[13] The LSS contain provisions addressing locomotive inspections, tests, and safety requirements including brake systems, draft systems, suspension systems, electrical systems, internal combustion equipment, cabs and cab equipment, crashworthiness, and electronics. When any safety concerns, specific to alternative-fuel locomotives, are not addressed by the LSS, FRA will directly apply the statutory requirements of the LIA.

When alternative-fuel locomotives (excluding hi-rail, specialized maintenance, or other similar equipment) are used for passenger service, they are also required to comply with the FRA's PESS. The PESS contain provisions addressing locomotive fire safety, inspection testing and maintenance plans, training, qualification, and designation programs, pre-revenue acceptance testing programs, protection against personal injury, marking and instructions for emergency egress and rescue access, and electrical systems. When there any safety concerns specific to alternative-fuel locomotives in passenger service that are not addressed by the PESS, FRA will

---

[10] See 49 CFR 1.88.
[11] 49 U.S.C. 20702.
[12] See e.g., Baltimore & Ohio Ry. Co. v. Jackson, 353 U.S. 325 (1957); Garcia v. Burlington N. R.R. Co., 818 F.2d 713, 715 (10th Cir.1987); United States v. Fort Worth & Denver City Railway Co., 21 F. Supp. 916, 918-19 (N.D.Tex.1937).
[13] 49 C.F.R. part 229.

directly apply the statutory requirements of the LIA.

Where any new alternative-fuel vehicle is developed that is determined to be excluded from the specific coverage of the LSS and PESS, because it is hi-rail, specialized maintenance, or other similar equipment, but it is being used to move other equipment, FRA will utilize the requirements contained in the LSS and PESS to help inform its determination whether the involved equipment is safe to operate, and therefore, compliant with the LIA.[14]

Guidelines to Help Ensure Compliance with Rail Safety Laws

As outlined in FRA's 2013 letter to the rail industry addressing LNG dual-fuel locomotives and modified in the 2019 letter to the San Bernardino County Transportation Authority (SBCTA) addressing hydrogen-powered locomotives, FRA has provided guidelines to help ensure compliance with the LIA, LSS, and PESS (if applicable) prior to using alternative-fuel locomotives.[15] For this purpose, an alternative fuel is any source of energy, except diesel or electric powered via overhead line (catenary) or third rail, used to propel a locomotive. Common examples of alternative-fuels and associated technologies and components used in alternative-fuel locomotives include:

- Hydrogen, either as a gas or cryogenic liquid, used either directly as a fuel or as an additive to fuel to reduce greenhouse gas emissions and improve thermal efficiency of locomotive internal combustion engines.
- Hydrogen, either as a gas or a cryogenic liquid, for use in fuel cells to produce electrical energy for the propulsion of the vehicle. This includes any associated battery energy storage system, if used as a part of the propulsion system technology.
- Rechargeable battery energy storage system used as the primary source of energy for the propulsion of the vehicle or as significant component of a hybrid propulsion energy system.
- Natural gas, in gaseous form or as a cryogenic liquid, used as a fuel for locomotive or in a self-propelled rail vehicle.
- Other hybrid technologies using one or more energy sources for propulsion.
- Technologies that convert other chemicals to a fuel.

[14] In these situations, the safety rationale supporting the regulatory requirements contained in the LSS and PESS that concern more conventional locomotives, would be relevant because the equipment is being used in a similar manner. This approach was specifically identified when FRA issued the LSS and has been applied in this manner since that time. The March 1980 preamble to the final rule on LSS states that statutory provisions are applicable to a broader definition of locomotive (i.e. more types of equipment) than the LSS. 45 FR 21093 (March 31, 1980). The preamble discusses enforcement of the statutory provision via issuance of a Special Notice for Repair. Id., see also 49 CFR part 216.13. Historically, FRA has also enforced this provision by assessing civil penalties directly under the statutory provision when serious noncompliance is discovered. FRA intends to continue this practice.

[15] Enclosed letters dated 2013 and 2019.

- All components (valves, piping, fans, compressors, emergency shut-off equipment, etc.), appurtenances (storage vessels and tanks, large volume tenders, detection equipment, etc.) and fueling infrastructure equipment (external fuel storage tanks, hoses, nozzles, compressors, electrical charging systems, etc.) associated with each fuel technology, located either on the vehicle or on premises.

To help ensure compliance with the LIA, LSS, and PESS (if applicable) prior to using alternative-fuel locomotives, FRA recommends that railroads submit to FRA, prior to beginning testing or operation of any alternative-fuel locomotive, the following:

(1) a summary of the proposed new technology and operating concept;
(2) structural analyses documentation including crashworthiness of equipment and fuel storage elements;
(3) safety evaluation, including major systems and sub systems;[16]
(4) emergency response procedures;
(5) statements relating to stakeholder engagement, including engagement with represented labor unions and employees; and
(6) a detailed test plan.

A railroad may also submit any additional information that it believes shows compliance with the LIA, LSS, and PESS (if applicable), including updated test results.

To avoid a situation where FRA finds that a railroad is using an alternative-fuel locomotive that is not in compliance with all applicable safety laws and regulations, FRA must have sufficient opportunity to review the submitted information prior to any operation using an alternative-fuel locomotive. Early engagement with FRA's Office of Safety is highly recommended, but at a minimum, FRA requires 90 days to review submissions, noting that there may be the need for additional time post the 90-day review for FRA to review any requested additional information or responses to FRA questions. Based on the information provided in the submission, any additional information requested and any responses to questions, FRA will determine whether the new technology, including any planned risk and hazard mitigations, as provided, is compliant with the LIA, LSS, and PESS, if applicable. If deemed compliant, FRA will issue a letter of concurrence for using the alternative-fuel locomotive. Further detail about the submission is discussed below and FRA expects to discuss the submission in greater detail during meetings identified in the section below titled "Process for Working with FRA to Help Ensure Compliance."

When developing the submission, special attention should be given to specific safety hazards and

[16] Including, but not limited to, safety assessment, safety analysis, hazard long, risk analysis, and hazard mitigation. A helpful example of a screening risk model is outlined in MIL-Std 882(E).

risks relating to the testing, operation, inspection, maintenance, fueling, and storage, including of the new technology and alternative fuel source, the operating environment, and relevant industry standards, including, for example:

- Fire safety, including the impact of the alternative fuel on the safety of equipment as well as the isolation of electrical systems from potential flammable gas/liquid leaks, along with an analysis of the fire resistance of the equipment to a fire load from the alternative technology.
- Crashworthiness, including tanks, housings, and enclosures of the on-board alternative fuel storage, considering impacts from heavy road vehicles and maintenance of way equipment, in normal railroad operations and accident conditions. Specific analyses should evaluate the risks and effects of potential impacts and collisions at all highway-rail grade crossings in the operating territory of the equipment.
- Electronic systems, to include hardware and software used to monitor or control safety-critical functionality, and the associated safety analysis to evaluate the hazards and risks during normal railroad operations, failure conditions and accident conditions (derailments, collisions, sideswipes, etc.).
- General safety requirements relating to protection of crew, inspection and maintenance employees, passengers and first responders, considering protection against personal injury, exhaust, battery gases and the location of safety cut-off devices.
- Training and qualifications of all staff involved in operations, maintenance, fueling, storage and emergency response in normal operations and accident conditions.
- Communications and Emergency Preparedness planning and training.
- Compliance of the technology designs with current U.S. standards.
- The operating environment where the alternative-fuel locomotive will be used, including the physical characteristics of the infrastructure, grade, curvature, speed; number and location and highway traffic volumes and mix of vehicles at highway-rail grade crossings, adjacent/connected yards, other access points for maintenance of way equipment and personnel; weather extremes and other natural disasters (fire, flood, wind, etc.); and the surrounding communities whether rural, commercial, residential, or urban.

<u>Process for Working with FRA to Help Ensure Compliance</u>

The following are basic steps to help facilitate communication with FRA throughout any alternative fuel locomotive project.

- Submit an initial formal letter on the proposed project to FRA's Associate Administrator for Railroad Safety, via FRA Office of Safety waivers email address (FRAWaivers@dot.gov), to initiate a dialog and engage the FRA in the safety review process. The letter could also include a request for a letter of concurrence with the project from FRA. Such a letter of concurrence may be issued by FRA once the applicant fulfills all requirements, including the information identified in this document.

- Include in the formal letter, a detailed test plan and expected results and any deviations, details of the proposed project timeline (including submitting the information to FRA), milestones, composition of the project team, individual team member responsibilities, and other project relevant information.

- Meet with FRA staff prior to initiating testing and operation and at least once every 6 months during the project to provide a briefing on technical progress, updated schedule, and any additional challenges. The meeting frequency may be increased to once every 3 months when significant progress occurs. Meeting may be virtual or in person.

FRA is supportive of all efforts to use more efficient, less polluting, and domestically produced fuel, alternative fuels, and alternative power sources in rail operations. If you, or members of your organizations, have further questions about this matter, please contact Matthew Brewer, Staff Director, Engineering and Technology Division, FRA Office of Safety, at matthew.brewer@dot.gov, or Michael Masci, Senior Attorney Adviser, at Michael.masci@dot.gov.

Sincerely,

Karl Alexy
Associate Administrator for Railroad Safety
Chief Safety Officer

Enclosures:

1. FRA's 2013 Letter to Industry
2. FRA's 2019 Letter to SBCTA

U.S. Department of Transportation

Federal Railroad Administration

1200 New Jersey Avenue, SE
Washington, DC 20590

AUG 26 2013

Mr. Robert Fronczak
Association of American Railroads
425 Third Street SW
Washington, DC 20024

Mr. Thomas Streicher
American Short Line and Regional Railroad Association
50 F Street NW
Suite 7020
Washington, DC 20001

Mr. Lou Sanders
American Public Transportation Association
1666 K Street NW
Suite 1100
Washington, DC 20006

Dear Messrs. Fronczak, Streicher, and Sanders:

Recently, a number of railroads, vendors, and other interested parties have requested meetings with Federal Railroad Administration (FRA) staff to discuss potential plans and testing programs related to the use of natural gas (either compressed natural gas (CNG) or liquid natural gas (LNG)) as an alternative fuel source by the railroad industry. FRA is supportive of all efforts to use more efficient, less polluting, and domestically produced fuel in rail operations. However, in order to ensure proper consideration of each party's request, provide adequate time to meet with each party, and arrive at productive outcomes from such meetings, FRA has developed a set of meeting preparation guidelines that each party should follow. Providing the requested information prior to the meeting will help all parties achieve positive results from such efforts.

A number of stakeholders have inquired about FRA's approval of a test program for CNG and LNG use. In accordance with Federal regulations, FRA has authority over vehicles that serve as locomotive tenders. As such, any vehicle that carries natural gas or any other material being used to fuel attending locomotives is subject to FRA's statutory authority under 49 U.S.C. Chapter 207, Locomotives (formerly known as the Locomotive Inspection Act (LIA)), as well as other regulations applicable to locomotives and locomotive tenders.

The regulations permit the use of a locomotive or tender only if the equipment is "in proper condition and safe to operate without unnecessary danger of personal injury."

Accordingly, railroads and vendors must ensure that locomotives and the equipment serving as locomotive tenders are safe prior to initiating tests. Therefore, FRA's rail safety regulations must be considered in evaluating the safety of the equipment and its proposed operation, and in determining compliance with the LIA. In addition, although the Hazardous Materials Regulations are not directly applicable to a locomotive or tender and its operations, the safety rationale underlying those regulations must also be considered.

Prior to initiating the testing of new dual-fuel locomotives or tender vehicles, railroads and vendors must conduct a comprehensive safety analysis that must be provided to FRA for approval. This analysis must identify the risks of the operation and any measures designed to mitigate those risks.

Enclosure 1 to this letter lists the information that must be provided to FRA before a face-to-face meeting is conducted. Enclosure 2 to this letter lists the information and documents that must be provided to FRA if a railroad or vendor seeks approval of a proposed test plan. Please disseminate these enclosures and other preparatory materials to your members and other interested parties.

Thank you for your cooperation in this important effort. If you or your members have any questions, please contact Mr. Karl Alexy, Staff Director, Hazardous Materials Division, at (202) 493-6245 or Karl.Alexy@dot.gov.

Sincerely,

Robert C. Lauby
Acting Associate Administrator for Railroad Safety/Chief Safety Officer

Enclosures

Enclosure 1: Information to be submitted to FRA prior to a meeting on the use of compressed natural gas (CNG) or liquid natural gas (LNG) in railroad service

A railroad or industry vendor meeting with the Federal Railroad Administration (FRA) to present its plan for testing equipment modified for CNG or LNG use as fuel must provide the following items, at a minimum, at least 2 weeks prior to the meeting.

1. Statement of the objective of the meeting and the benefit to the vendor from such a meeting (what is the expected outcome of the meeting?).
2. Clear description of the system to be tested, summary of the overall test plan, goals to be achieved in the test, and the principal elements that will be evaluated.
3. List of the project team members and their respective duties. Include specific statements on whether the team includes representatives from labor unions. If not, please explain why.
4. Details of the project plan for the tests. This should include, but not be limited to, the following items:
   a. Test plan.
   b. Schedule and milestones.
   c. Location of tests.
   d. Coordination with other stakeholders (vendors, subcontractors, emergency response institutions, etc.).
   e. Alternative approaches, if any.
   f. Physical layout, operational descriptions, flow diagrams, etc.
   g. Equipment design information (marked as confidential, proprietary, not for distribution).
5. Evaluations of personnel and public safety issues during both the test phase and the operational phase.
6. Types of data that will be collected, including an explanation of why and how these may be used in the design of the commercial operations.
7. Issues that can be resolved by the railroad or vendor, and those which are external (and uncontrollable).
8. List of all regulations directly or indirectly applicable, indicating how compliance with the regulations will be achieved. Prepare a list of items for which a waiver from the requirements of the Federal regulations will be required for the purpose of testing.
9. Request for waiver from the requirements of the applicable Federal regulations for execution of the test plan, if compliance is not achievable.
10. List of potential benefits from the proposed plan to the industry and the public.

11. Set of specific questions that require a response from FRA.

Note: If the information is considered proprietary or confidential, then confidential treatment must be requested and justified, in accordance with Title 49 Code of Federal Regulations Section 209.11, *Request for confidential treatment*. Further information on confidential treatment of submittals is available upon request.

Enclosure 2: Information to be submitted for FRA approval of a plan to test the use of compressed natural gas (CNG) or liquid natural gas (LNG) in railroad service

A railroad or industry vendor requesting approval to test equipment modified for CNG or LNG use as a fuel in the rail industry must provide the following information and data to the Federal Railroad Administration (FRA).

1. All items identified in Enclosure 1 when a meeting with FRA is requested.
2. Detailed structural analysis documentation and any relevant test data to support the safe operation and crashworthiness of the equipment and fuel storage elements (note: additional analysis or validation tests may be required by FRA).
3. Procedures for equipment maintenance and testing.
4. Risk analyses addressing, at a minimum, the following items, where applicable:
    a. Fueling operations.
    b. Leak detection and response.
    c. Locomotive and tender separation (protection of crew).
    d. Survivability of tender, appurtenances, and connections in rail environment.
        - Crashworthiness (in such scenarios as derailment, collision, sideswipe, etc.)
        - Fatigue life
        - Excessive in-train forces
        - Fuel tank penetration protection
5. Details of communication plans with employees, first responders, and public organizations.
6. Other relevant data or information that will expedite processing an approval of the proposed test plan and application for a waiver.

Note: If the information is considered proprietary or confidential, then confidential treatment must be requested and justified, in accordance with Title 49 Code of Federal Regulations Section 209.11, *Request for confidential treatment*. Further information on confidential treatment of submittals is available upon request.

U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

JUL 15 2019

Dr. Raymond W. Wolfe
Executive Director
San Bernardino Transportation Authority
1170 West 3rd Street, 2nd Floor
San Bernardino, CA 92410-1715

Dear Dr. Wolfe:

This reply is in response to your April 4, 2019, letter to formally open a dialogue between the San Bernardino County Transportation Authority (SBCTA) and the Federal Railroad Administration (FRA), regarding a pilot project for the use of zero or low emission technology as a means of vehicle propulsion in regional passenger rail applications. FRA understands that SBCTA is expanding its public transit network in the San Bernardino Valley by building the Redlands Passenger Rail Project. Initially, this service—called the Arrow service—is intended to operate with Diesel Multiple Units (DMUs). However, in 2018, SBCTA was awarded a Transit and Intercity Rail Capital Program grant from the State of California to research, develop, and implement a Zero or low Emission Multiple Unit (ZEMU) pilot project. SBCTA will procure a ZEMU vehicle and convert one of the existing DMU vehicles to low or zero emissions. The goal of this grant is to implement one pilot ZEMU vehicle into Arrow service by 2023, followed by a second converted vehicle, and eventually operate a full low or zero emission passenger rail service.

The ZEMU will run on the Arrow service corridor, a 9-mile route with 5 new passenger rail stations. SBCTA is currently evaluating several zero or low emission technology options. These include:

- Electric power through catenary or third rail with on-board electricity storage using either super capacitors or batteries, and
- Power generation on-board using hydrogen fuel cell and battery combination or a hybrid system of diesel engine-battery.

The SBCTA Board will determine the ZEMU technology to implement.

An additional goal of this project is to evaluate the feasibility of extending the Arrow service to Los Angeles Union Station, based on the results of additional research, and data from the proposed pilot project. The proposed route would be along the Southern California Regional Rail Authority "Metrolink" San Bernardino Line, with the potential for wider application to other

regions in California. Therefore, SBCTA requested a dialogue with FRA to identify issues and concerns related to the use of alternative fuel technologies in passenger service.

FRA supports innovative new technologies to rail operations for both freight and passenger service. Any new technology must be demonstrated to be safe and deliver an equivalent level of safety that exists in currently operating technologies. Therefore, FRA welcomes a dialogue with SBCTA on its proposed project. Our subject matter experts are willing to meet with SBCTA representatives to initiate technical dialogue, evaluate the technology chosen, and review the various analyses and safety risks posed by the selected technology. In the past, several railroads, primarily freight, approached FRA for concurrence to use natural gas [both liquefied natural gas (LNG) and compressed natural gas (CNG)] as locomotive fuels in pilot test programs. FRA envisions a similar approach for the SBCTA pilot program.

FRA developed guidelines for the various analyses to be performed and submitted to FRA by the proposing railroad before initiating a new technology for powering a locomotive with an alternative fuel. These requirements are documented in an August 26, 2013, letter issued by FRA's Associate Administrator (AA) for Safety and Chief Safety Officer. This letter to the railroad industry is attached for your use on the proposed project. It identifies several items to be submitted to FRA for review, including, but not limited to, the details of the proposed project, the technical and technology issues, safety assessments, emergency response procedures, etc. FRA would then determine whether the project, as proposed or with revisions after discussion, is an acceptable safety risk and issue a letter of concurrence.

While the letter referenced above addresses CNG and LNG issues, the principles indicated in the letter are equally applicable to other technologies, including hybrid technologies and hydrogen-based fuel cell technologies that power either locomotives or Multiple Units (MUs). In this regard, the following items should be considered clarification addenda to the August 26, 2013, letter as applicable to other technologies:

1. Hydrogen (in either compressed form or as a liquid) use as a fuel source for a locomotive or a passenger MU is within the purview of the guidance letter.

2. All applicable safety standards in Title 49, Code of Federal Regulations (CFR) Part 229, Railroad Locomotive Safety Standards, and Part 238, Passenger Equipment Safety Standards, are applicable to both the power module (if used) and passenger car portions of an MU locomotive. Special attention is given to 49 CFR §§ 238.103, *Fire safety*; 238.107, *Inspection, testing and maintenance plan*; 238.109, *Training, qualification, and designation program*; 238.111, *Pre-revenue service acceptance testing plan*; 238.117, *Protection against personal injury*; 238.125, *Marking and instructions for emergency egress and rescue access*; and 238.225, *Electrical system.*

3. Crashworthiness of MU power system components (including but not limited to high pressure gas cylinders) and stability of MU to impacts from heavy road vehicles and forces experienced in normal railroad operations and accident conditions should be evaluated.

4. Isolation of electrical systems (batteries, fuel cells, super capacitors, etc.) from potential flammable gas leaks from storage in or close to the power units in an MU must be assessed.

5. Electronics, to include hardware and software used to monitor or control safety-critical functionality, shall be identified and evaluated in accordance with 49 CFR Part 229 Subpart E, Locomotive Electronics, in addition to 49 CFR § 238.105, *Train electronic hardware and software safety*.

6. Incorporate any relevant hazards and associated risks as identified under item 4 of Enclosure 2 from FRA's August 26, 2013 guidance letter into the railroad's safety management and/or system safety program plans.

7. Under 49 CFR Part 239, incorporate appropriate training and procedures to address risks unique to the operation of these vehicles into the railroad's Passenger Train Emergency Preparedness Plan.

If you have any questions, the FRA point of contact for this issue is Mr. Gary Fairbanks, Staff Director, Motive Power and Engineering Division. Mr. Fairbanks can be reached at gary.fairbanks@dot.gov or 202-493-6322.

Sincerely,

for Karl Alexy
Associate Administrator for Railroad Safety
Chief Safety Officer

Enclosure: Letter to the Railroad Industry from AA, August 26, 2013

U.S. Department of Transportation

Federal Railroad Administration

1200 New Jersey Avenue, SE
Washington, DC 20590

AUG 26 2013

Mr. Robert Fronczak
Association of American Railroads
425 Third Street SW
Washington, DC 20024

Mr. Thomas Streicher
American Short Line and Regional Railroad Association
50 F Street NW
Suite 7020
Washington, DC 20001

Mr. Lou Sanders
American Public Transportation Association
1666 K Street NW
Suite 1100
Washington, DC 20006

Dear Messrs. Fronczak, Streicher, and Sanders:

Recently, a number of railroads, vendors, and other interested parties have requested meetings with Federal Railroad Administration (FRA) staff to discuss potential plans and testing programs related to the use of natural gas (either compressed natural gas (CNG) or liquid natural gas (LNG)) as an alternative fuel source by the railroad industry. FRA is supportive of all efforts to use more efficient, less polluting, and domestically produced fuel in rail operations. However, in order to ensure proper consideration of each party's request, provide adequate time to meet with each party, and arrive at productive outcomes from such meetings, FRA has developed a set of meeting preparation guidelines that each party should follow. Providing the requested information prior to the meeting will help all parties achieve positive results from such efforts.

A number of stakeholders have inquired about FRA's approval of a test program for CNG and LNG use. In accordance with Federal regulations, FRA has authority over vehicles that serve as locomotive tenders. As such, any vehicle that carries natural gas or any other material being used to fuel attending locomotives is subject to FRA's statutory authority under 49 U.S.C. Chapter 207, Locomotives (formerly known as the Locomotive Inspection Act (LIA)), as well as other regulations applicable to locomotives and locomotive tenders.

The regulations permit the use of a locomotive or tender only if the equipment is "in proper condition and safe to operate without unnecessary danger of personal injury."

Accordingly, railroads and vendors must ensure that locomotives and the equipment serving as locomotive tenders are safe prior to initiating tests. Therefore, FRA's rail safety regulations must be considered in evaluating the safety of the equipment and its proposed operation, and in determining compliance with the LIA. In addition, although the Hazardous Materials Regulations are not directly applicable to a locomotive or tender and its operations, the safety rationale underlying those regulations must also be considered.

Prior to initiating the testing of new dual-fuel locomotives or tender vehicles, railroads and vendors must conduct a comprehensive safety analysis that must be provided to FRA for approval. This analysis must identify the risks of the operation and any measures designed to mitigate those risks.

Enclosure 1 to this letter lists the information that must be provided to FRA before a face-to-face meeting is conducted. Enclosure 2 to this letter lists the information and documents that must be provided to FRA if a railroad or vendor seeks approval of a proposed test plan. Please disseminate these enclosures and other preparatory materials to your members and other interested parties.

Thank you for your cooperation in this important effort. If you or your members have any questions, please contact Mr. Karl Alexy, Staff Director, Hazardous Materials Division, at (202) 493-6245 or Karl.Alexy@dot.gov.

Sincerely,

Robert C. Lauby
Acting Associate Administrator for Railroad Safety/Chief Safety Officer

Enclosures

Enclosure 1: Information to be submitted to FRA prior to a meeting on the use of compressed natural gas (CNG) or liquid natural gas (LNG) in railroad service

A railroad or industry vendor meeting with the Federal Railroad Administration (FRA) to present its plan for testing equipment modified for CNG or LNG use as fuel must provide the following items, at a minimum, at least 2 weeks prior to the meeting.

1. Statement of the objective of the meeting and the benefit to the vendor from such a meeting (what is the expected outcome of the meeting?).
2. Clear description of the system to be tested, summary of the overall test plan, goals to be achieved in the test, and the principal elements that will be evaluated.
3. List of the project team members and their respective duties. Include specific statements on whether the team includes representatives from labor unions. If not, please explain why.
4. Details of the project plan for the tests. This should include, but not be limited to, the following items:
   a. Test plan.
   b. Schedule and milestones.
   c. Location of tests.
   d. Coordination with other stakeholders (vendors, subcontractors, emergency response institutions, etc.).
   e. Alternative approaches, if any.
   f. Physical layout, operational descriptions, flow diagrams, etc.
   g. Equipment design information (marked as confidential, proprietary, not for distribution).
5. Evaluations of personnel and public safety issues during both the test phase and the operational phase.
6. Types of data that will be collected, including an explanation of why and how these may be used in the design of the commercial operations.
7. Issues that can be resolved by the railroad or vendor, and those which are external (and uncontrollable).
8. List of all regulations directly or indirectly applicable, indicating how compliance with the regulations will be achieved. Prepare a list of items for which a waiver from the requirements of the Federal regulations will be required for the purpose of testing.
9. Request for waiver from the requirements of the applicable Federal regulations for execution of the test plan, if compliance is not achievable.
10. List of potential benefits from the proposed plan to the industry and the public.

11. Set of specific questions that require a response from FRA.

Note: If the information is considered proprietary or confidential, then confidential treatment must be requested and justified, in accordance with Title 49 Code of Federal Regulations Section 209.11, *Request for confidential treatment*. Further information on confidential treatment of submittals is available upon request.

Enclosure 2: Information to be submitted for FRA approval of a plan to test the use of compressed natural gas (CNG) or liquid natural gas (LNG) in railroad service

A railroad or industry vendor requesting approval to test equipment modified for CNG or LNG use as a fuel in the rail industry must provide the following information and data to the Federal Railroad Administration (FRA).

1. All items identified in Enclosure 1 when a meeting with FRA is requested.
2. Detailed structural analysis documentation and any relevant test data to support the safe operation and crashworthiness of the equipment and fuel storage elements (note: additional analysis or validation tests may be required by FRA).
3. Procedures for equipment maintenance and testing.
4. Risk analyses addressing, at a minimum, the following items, where applicable:
    a. Fueling operations.
    b. Leak detection and response.
    c. Locomotive and tender separation (protection of crew).
    d. Survivability of tender, appurtenances, and connections in rail environment.
        - Crashworthiness (in such scenarios as derailment, collision, sideswipe, etc.)
        - Fatigue life
        - Excessive in-train forces
        - Fuel tank penetration protection
5. Details of communication plans with employees, first responders, and public organizations.
6. Other relevant data or information that will expedite processing an approval of the proposed test plan and application for a waiver.

Note: If the information is considered proprietary or confidential, then confidential treatment must be requested and justified, in accordance with Title 49 Code of Federal Regulations Section 209.11, *Request for confidential treatment*. Further information on confidential treatment of submittals is available upon request.