Transportation Trades Department, AFL-CIO

Transportation Labor Calls for Worker Protections Amidst the Development of Autonomous & Automated Rail Technologies

Labor unions have long led the fight for rail safety improvements; the combined skill and expertise of unionized rail workers prevent accidents and save lives on a daily basis. It is therefore imperative that rail workers are considered equal partners in promoting safety as new technologies, including those driven by artificial intelligence (AI), become more prevalent. Workers face a future of technology-enabled change and their voices must be a part of any debate over the deployment of automated rail technologies.

Rail workers of every craft and class are the true experts when it comes to on-the-ground knowledge of how to run trains safely and efficiently. They know from daily experience where the risk points are, and what is or is not working. And they are the ones in harm's way when something goes wrong. As such, strong union and worker engagement are essential to mitigate the harms inherent in rapid changes to transportation industries and systems like our national rail networks. The development of processes and protocols for deployment of these technologies must include the workers who will be tasked with operating or interacting with them every day.

We therefore call on Congress and the Federal Railroad Administration (FRA) to deny industry waiver requests that seek to eliminate current safety regulations in favor of deploying unproven technology; ensure rail labor is included in the testing of new technologies; promulgate regulations that account for future technological developments; and provide comprehensive employee protections for workers impacted by the development of new technologies.

Deny Safety Waiver Requests That Seek to Deploy Unproven Technology

Too often, freight railroads have viewed technological advancements through one prism: as a pathway to lower workforce levels and overhead costs by reducing or eliminating daily tasks associated with federally required inspection and testing. Class I freight railroads have already taken steps to cut corners on safety and undermine rail workers' jobs. These efforts include:

- using automated track inspection (ATI) to eliminate human track inspections, in which real workers often manually and visually detect defects that are overlooked by automated technology;
- using automated inspection portals to reduce manual rail car inspections, which are are vital in preventing derailments and accidents;
- using unqualified contractors instead of highly-skilled and trained Carmen to analyze data from automated inspection portals;
- using computer software technology to dispatch trains instead of train dispatchers, despite the fact that the software is not beholden to federal testing requirements, is known to glitch, and could have disastrous consequences for public safety;

- replacing physical wayside signals with virtual signal block technology, which eliminates safety guardrails provided by wayside signals and lacks a reliable means of detecting broken rails;
- removing train control operations from engineers by installing Zero to Zero Trip Optimizer software on locomotives, even though it is not in accordance with railroad safety standards to allow the use of such software that can manipulate the train without input from the engineers and conductors;
- deploying remote control locomotives on main line tracks, creating safety risks by eliminating two-person train crew operations in favor of a single remote control operator that has likely received less training than a certified locomotive engineer; and
- allowing autonomous trains and self-propelled battery-electric rail cars from companies like Parallel Systems to operate on traditional rail tracks, even though the technology is not developed enough to meet basic safety standards. Parallel Systems' heavy rail cars are slow to stop; the heavy duty batteries pose firefighting challenges in the event of a derailment; the equipment isn't ready for operation through grade crossings; equipment sensors are slow to react to trespassers or rail workers on the right of way; the system is vulnerable to cyberattack; and more.

The FRA should deny waiver requests by the railroads that attempt to break with compliance of current safety regulations and create a reliance on unproven technology. Newly deployed equipment and technology should strengthen the existing rail workforce's ability to perform their duties more safely. Rarely do railroads take the sensible, safety-first approach of analyzing how new technology can advance safety and supplement an employee's ability to do their job. The burden of proof should be on the railroads to demonstrate the safety of new equipment prior to its testing and adoption.

Install Federal Requirements for Testing New Technologies

A specific example of automated technology in the rail space involves train dispatchers at BNSF. BNSF train dispatchers utilize a user interface known as Train Management Dispatch System (TMDS) to control the switches and signal systems across the railroad, as well as to provide protection for trains, on-track equipment, and roadway workers working on or near the track under the train dispatcher's control. The railroad also utilizes two additional software programs known as Movement Planner and AutoRouter which, as the respective names imply, use a series of algorithms to plan and automatically line switches and signals (without prior train dispatcher authorization) to route trains across the majority of the BNSF System. In March of this year, members of the American Train Dispatchers Association (ATDA) reported that TMDS was displaying a past switch position from archived data which meant the train dispatcher had unknowingly lined switches and signals based on inaccurate information. This technological glitch, had it gone undetected, could have had disastrous consequences like a train collision.

TMDS, AutoRouter, and Movement Planer are just some examples of the computer technology that train dispatchers rely upon to control train traffic and maintain the safety of all railroad employees working on or near the routes under their control, as well as the communities those trains operate through. **However, there presently exists no requirement that these safety-critical systems are tested or certified prior to being used in a live environment where their**

accuracy is imperative to maintaining safety. Overreliance on unproven, untested technology may very likely lead to a potentially disastrous outcome. Defect detector technologies, like hot bearing detectors, are intended to prevent tragedies such as the one in East Palestine. Yet, nearly two years later, there are still no regulations to guide the use and implementation of this technology. Before prioritizing new technologies, it's vital to address and regulate the existing tools that can enhance rail safety.

Moreover, there are recent and tragic examples of what can happen when there is inadequate regulatory oversight of new technology. The 200 Hatfield Rail Crash in the United Kingdom resulted in four deaths and over 70 injuries. In this case a third-party contractor used ultrasonic testing devices to detect rail defects, but that test failed to detect critical gauge corner cracking, which led to the derailment. Similarly, an accident on WMATA in Washington, D.C. in 2009 due to a malfunction in the Automatic Train Control (ATC) system resulted in nine fatalities and 80 injuries. A faulty track circuit failed to detect that a train was stopped on the tracks, and the system did not engage the automatic brakes in time to prevent a collision. In both cases the technology in question can improve safety when implemented correctly. More recently, some railroads are attempting to advance train movement through virtual block systems, which eliminate safety redundancies provided by wayside signals and lack a reliable means of detecting broken rails. This approach is being proposed as a Positive Train Control (PTC) signal system, a technology intended only as an overlay—not a replacement—for signal systems. Safety technology should enhance, not replace, redundant safety layers to prevent accidents.

Promulgate Federal Regulations Addressing Future Technology

The way that railroads approached technological advancement in other aspects of their operations give us great cause for concern. In addition to autonomous elements of train dispatching technology, other examples of AI-driven and automated systems in rail operations include Automated Track Inspection (ATI), digital train inspection portals, and autonomous rail cars developed by Parallel Systems. We must emphasize that the development of these technologies should in no way supplant the current rail workforce and substitute their judgment and experience with unproven, poorly regulated AI-enabled technologies. We know, for example, that if left unchecked AI-enabled train inspection portal could be deployed as a replacement of qualified mechanical inspectors (QMI), instead of the technology, such as cameras and infrared sensors being used by QMIs to do their duties These highly skilled workers inspect, maintain, rebuild and repair freight cars and locomotives. An AI inspection system cannot replace this workforce or the responsibilities they carry out, and federal policy must bar any attempts to do so.

Applicants seeking to adopt new technologies into the existing rail network must utilize the knowledge-base in the existing workforce. These new technologies may revolutionize locomotion and delivery, but they still rely on a steel wheel traversing a steel rail, and will therefore benefit from the rail workforce's institutional knowledge and combined decades of experience in operations and maintenance. Regulatory bodies, including the FRA, must monitor and understand the ways in which automated technology interacts with every facet of the existing rail system, including rail workers, traditional locomotives, rail cars, and grade crossings in order to ensure the highest level of safety. This can only be accomplished through thorough testing and strict federal oversight.

It is imperative that the FRA promulgate new regulations to address the introduction of new technology, equipment, or software, whether it is new or newly put into service, to provide for the safety and general welfare of railroad workers and the public who would be affected by the introduction of those products. This approach would provide a baseline protection of safety while automated and autonomous technologies are tested to see what human functions, if any, they can safely emulate.

Provide Comprehensive Employee Protections and Training

The FRA should also require that rail workers, especially those subject to certification requirements, regularly receive training on manually carrying out the regulated tasks they perform without relying on any technological assistance. That training would ensure that these workers can carry out these important tasks when technology fails. Specific training should focus on human factors issues where "deskilling" is a potential problem due to working with systems that only require passive monitoring and not active operation. Other human factors issues such as human machine interface (HMI) are critical issues for the FRA to attend to when trying to regulate the introduction of new apparatuses, software, and technology in the locomotive cab and other aspects of railroad operations.

The next administration must ensure comprehensive employee protections that provide job guarantees; training and retraining programs; the continuation of collective bargaining rights; and terms and conditions of employment that extend throughout any shift, large or small, toward automated rail technology. The preservation of collective bargaining rights and agreements is particularly important with regard to managing technological change and its impact on working people. Any transition toward automated rail technology must also include career ladder and apprenticeship programs for rail workers, ensure the manufacture and development of new technologies is done within the United States, and that any new jobs created come with union protections. As new technology is implemented, there must be arrangements for workers who have historically been responsible for particular types of work to continue to be involved when new technology is added and when the technology with which they currently work is replaced. Furthermore, the federal government must be an active partner and recognize the risks intrinsic to technological failure and provide strict and stringent oversight of new technology.

The Railroad Revitalization and Regulatory Reform (4R) Act of 1976 requires railroads to provide "fair and equitable" protective arrangements to any railroad employee negatively affected by a federal grant to a railroad under the Act. Comprehensive protections for rail workers impacted by the implementation of new technology should emulate the 4R Act and include:

- job guarantees;
- training and retraining programs for displaced workers or workers negatively affected by the adoption of technology;
- the continuation of collective bargaining rights; and terms and conditions of employment that extend throughout any shift, large or small, toward automated rail technology;
- career ladder and apprenticeship programs for rail workers; and

- ensuring the manufacture and development of new technologies is done within the United States, and that any new jobs created come with union protections.

No one understands the realities of rail operations on the ground as well as frontline workers. Whether it be the deployment of new technologies, the crafting of new work rules, or the promulgation of new regulations, the meaningful inclusion of rail workers in these conversations and consideration of workers' input is the only way to maintain and promote safety now and in the future. In moving forward, we emphasize the importance of a comprehensive and inclusive approach to technological integration, prioritizing the safety and well-being of both the rail workforce and the public.

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