



Washington Legislative Office

# Transportation Division

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June 30, 2017

Ms. Kim Toone,  
Information Collection Clearance Officer  
Office of Information Technology,  
Federal Railroad Administration  
1200 New Jersey Avenue SE.  
Washington, DC 20590

**RE: Proposed Agency Information Collection Activities: Autonomous Locomotive Technology  
Docket No. FRA-2017-0002-N-12**

Dear Ms. Toone,

These comments are on behalf of the Transportation Division of the International Association of Sheet Metal, Air, Rail and Transportation Workers (SMART). The SMART Transportation Division, formerly the United Transportation Union, is America's largest rail union and our members work in all operating crafts including engineers, conductors, trainmen, switchmen and yardmasters.

On their behalf, we submit the following comments on the Federal Railroad Administration's (FRA) Information Collection Requests (ICR) regarding locomotive automation.

With these requests, FRA seeks to conduct two studies regarding automated locomotive technology. The first study proposes to identify and evaluate the potential for human error associated with automated systems in the locomotive cab, and seeks to identify training, operational procedures, or automation design standards that will improve safety. The second study proposes to design and evaluate a prototype of a locomotive automated throttle control, more appropriately called "cruise control." FRA states that the results of these studies will be used to assist the Federal government in recommending display design standards to manufacturers. In both cases, FRA ultimately seeks to generate data with the use of train simulators.

We support FRA taking steps to ensure that technology deployed on the nation's railroads in the future is held to the highest safety standards. And we support the agency's efforts to identify technical and safety challenges that come with the adoption of new technologies. That being said, we do have some concerns with how these two studies are proposed to be conducted.

## **Locomotive Simulators**

As mentioned above, both studies rely on putting locomotive engineers through simulated exercises to generate data. We recommend that these studies be designed to simulate the operation of a locomotive in a way, to the extent possible, that reflects the real life working conditions of locomotive operators. A failure to do so will result in the collection of information that will inaccurately reflect the success and failures of autonomous technology.

First and foremost, FRA must consider the effects of fatigue: the number one safety issue in the freight rail industry. Locomotive engineers and conductors, particularly those in the freight rail industry, frequently work long and unpredictable shifts separated by minimal amounts of sleep. The vast majority of freight rail conductors and engineers work unpredictable schedules and are on call 24 hours a day, 7 days per week, and must report for duty with as little as 1 hour and 15 minutes' notice. It is common practice for freight operating employees to be called to work unexpectedly and be required to work a 12 hour shift overnight. Placing an engineer in a simulator only after they have received a good night's sleep with a predictable schedule will not generate data that replicates an engineer's experience and performance of real life railroading. Including unpredictable work schedules and the fatigue that comes with it will help produce more accurate results.

As FRA seeks to collect data on human error caused by automation technology, it must consider the effects of distraction and disengagement inside a locomotive cab. Railroad operators often have difficulty focusing if they are frequently being second guessed by a computer on how they perform the operational functions of the locomotive. For example, interactive computer-generated devices such as Positive Train Control (PTC), *Trip Optimizer* and *Leader* force locomotive engineers to constantly look away from the track ahead and instead interact with the in-cab computer screens. We believe that such devices are causing far greater distractions than the use of a personal cell phone and must be taken into consideration for the study. Furthermore, an engineer's ability to focus during a short simulator experience is not comparable to the same conditions that the engineer may face during his seventh hour into a twelve-hour shift at four o'clock in the morning, after having had no rest in the preceding 20 hours. It is not clear from the ICR proposals how FRA plans to account for the substantial issue of fatigue, but it must do so if it expects to reliably collect data on distractions and disengagement.

Finally, FRA does not speak to the conditions that the simulations will include. We recommend that FRA ensure that the simulations cover both day and night operations while taking into account the real work shift engineers and conductors are subjected to. Night operations and longer shifts will assist FRA in generating information that is more representative of the impacts of the proposed technology.

While the consideration of all the items discussed above may improve the data that is collected, a simulated experience cannot, and will never, fully replicate the realities of the actual operation of a locomotive operation. FRA should view all data through this lens during the collection, interpretation, and application of the information.

## **Sample**

In the “Supporting Statement” documents for both requests, FRA states that a description of the sampling method is not applicable because the research is not a survey. We recommend that of the engineers selected for participation, FRA include both freight and passenger rail engineers as well as engineers from different railroads and geographic locations such as the Midwest and Southern regions who commonly work 12 hour overnight shifts. By doing so, FRA can increase the quality of its data.

## **Design and Evaluation of a Robust Manual Locomotive Operating Mode**

In the second collection, FRA proposes a study that will ultimately gather data on the operation of the prototyped automated throttle control system. FRA proposes to test both a group of freight rail engineers (experienced group) and a group of university students (apprentice group). Through this prototype and study, FRA is seeking to demonstrate automation of one small element of a locomotive’s operation. In the event that the groups perform somewhat similarly on the isolated and limited operational task, we urge FRA to take a holistic view of locomotive operations. Alternatively, an individual who might perform well on a locomotive simulator does not mean he or she will make a good railroad engineer. There is a common saying in our industry, “you have to learn how to run the simulator and you have to learn how to run a train, they ain’t the same.”

We have real concerns about university students participating in study because they are not representative of our industry. A college or even high school student can practice for months on a computer based F-16 simulator and likely get quite good at it. That doesn’t mean the U.S. Air Force would let one of these students get in one and go up against a group of Russian MiG fighters. We recommend that when you call these students in to participate in this study that you request for them to report, let’s say on Tuesday morning at 9:00 a.m. and then instead call them at 8:00 p.m. the Monday night before and require them to show up at 9:30 p.m. for their 12-hour shift on the simulator, without allowing for any breaks. Accepting this unexpected call for 9:30 p.m. cannot be optional for the students, because our members are faced with this situation every day in the real world of freight railroading and they either take the call and come to work or they are terminated.

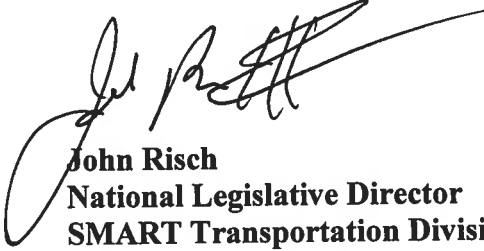
As automated locomotive technology advances and is considered by the FRA, we believe that new developments and research must be subject to substantial FRA oversight. For these reasons, we urge FRA to ensure that any new developments do not reduce safety on the nation’s railroads, as many of the distracting locomotive technologies are currently doing. Therefore, it is critical that FRA takes steps to collect good quality data, while also being aware of its limitations at this preliminary stage.

One last suggestion is that FRA do a scientific poll of operating employees that are currently using Trip Optimizer, Leader and PTC and get their honest feedback about the distractions that are already taking place in our industry solicit input on how those distractions might be

mitigated. We stand ready to assist with help on such a survey. We can randomly generate lists of operating employees and develop the survey itself, since we regularly survey our membership.

We appreciate the opportunity to comment on FRA's proposed Information Collection Request, and encourage the agency to consider our concerns as it moves forward with this collection.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "John Risch", with a long, sweeping horizontal line extending to the right.

**John Risch**  
**National Legislative Director**  
**SMART Transportation Division**