In Camera: Why Locomotive Cabs Need Video and Voice Recorders

Michael Bourque

Canadians, like citizens the world over, have grown grimly familiar with the incalculable value of cockpit voice recordings to determining the causes of airline disasters. Canadian railways are united in wanting to install similar technologies in locomotive cabs. The government of Canada says the technology needs more study. The Railway Association of Canada says, "What's to study?"

For more than two years, Canada's railways have been advocating for the right to use a proven technology to prevent accidents. Not only will this technology improve our understanding of accidents after they occur—it will save lives by helping to prevent them in the first place. Locomotive video and voice recording (LVVR) systems can be installed in locomotive cabs, so that railways can identify and eliminate factors that contribute to accidents. But under the current *Canadian Transportation Accident Investigation and Safety Board Act*, railways are not permitted to use this technology for safety management purposes, even though they are required by law to have safety management systems.

LVVR systems are proven and available now, and Canadian railways are ready to install and maintain them at their own expense. So—why are we not implementing this safety enhancing technology? In the US, many railroads, including Canadian National and Canadian Pacific, are moving ahead, working with their employees and unions to address privacy concerns. Indeed, the latest railroad to announce that it will employ the technology is Amtrak, following the recent fatal Philadelphia derailment.

And in Canada? We're "studying it," under the joint direction of the Transportation Safety Board of Canada (TSB) and Transport Canada. Which leaves Canada's rail industry asking: "What's left to study?"

According to the TSB, "A number of railway accident investigations in North America have led to findings, recommendations and other safety communications that have identified human factors as an underlying safety issue." Often, the human behaviours and interactions at issue in accidents are those that occur in the operating cab of the train's locomotive. Examples include distraction, speeding or other unauthorized operation, or failure to follow signals. These are some of the same factors observed in many highway vehicle accidents.

It is easy to understand how recorded information would be of great value to investigators after an accident has occurred. Consider the importance of the cockpit voice-recorder information to an aviation accident investigation (or indeed, to reflect on the recent Amtrak derailment in Philadelphia, in a situation where the locomotive engineer himself can't recall the events leading up to his fatal over-speed operation of a train).

Both the TSB, and its US counterpart, the National Transportation Safety Board (NTSB), have issued recommendations calling for railways to use LVVR technology, for both investigative and preventative purposes.

There is no doubt that this technology will assist investigators when human factors have played a role in an accident. And there have been many: Chatsworth, Calif. (2008—25 fatalities); Burlington, Ont. (2012—3 fatalities); the Bronx, N.Y. (2013—4 fatalities); Philadelphia, Pa. (2015—8 fatalities); to name a few. More importantly, the very presence and use of this technology, as part of government-mandated railway safety management systems, would help prevent accidents from occurring.

Some critics have questioned how this could be. First, LVVR would allow for immediate review of incidents such as emergency brake applications, speeding and passed stop signals, all of which can now be observed in real time by other locomotive and wayside systems. LVVR would also act as an additional layer of audit and testing, as required under each company's mandatory safety management system. By their very presence, these systems would also discourage unauthorized activities that distract the crew members' attention from their duties, such as the use of cell phones or other personal electronic devices. They could also be linked to new technologies to help identify early signs of fatigue. And, finally, they could be used to highlight

The high-tech interior of a CN locomotive. The addition of voice and video recordings, writes Michael Bourque "would help railways identify and eliminate" causes of accidents. CN photo

training, ergonomic, equipment, or procedural gaps when systemic issues are observed.

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Understandably, railway operating employees and the groups that represent them have legitimate privacy concerns about the use of such recorded information. Canada's railways are committed to ensuring that recordings are only used by the TSB for accident investigation, and by authorized railway personnel for legitimate safety management purposes. As with any untried tool, the final procedures for the use of LVVR information in Canada have yet to be written. But the industry believes that certain fundamental principles should apply.

First, access to the information must be tightly controlled and only used within strict guidelines. Local management would not have direct access to this information.

Second, when required by the TSB, a regulatory agency such as Transport Canada that is conducting an investigation, or a law enforcement agency, the recorded information would be subject to strict chain of custody requirements.

Third, the hard disks currently available for use with these systems are automatically over-written in about a week. In the absence of an incident or audit, the recorded information would be disposed of within a short timeframe.

Fourth, the review of recorded information would necessarily be limited. It would be focused on risk, or on an incident or trend basis. One example would be to focus on areas where both freight and passenger trains operate at high speed. Another would be to review any time an emergency brake application is made, or where a signal is missed. Some random audits could be used to improve safety. The idea would be to use this technology in concert with other systems to add yet another layer of safety to railway operations.

Practically speaking, the use of onboard cameras is no more invasive than having a railway supervisor ride the train, listen to radio communication or review videotapes of yard operations. And LVVR is a proven technology. A recent study conducted at San José State University's Mineta Transportation Institute followed some 20,000 transit buses equipped with audio-video equipment. The study found that the technology resulted in a 40 per cent reduction in collisions per million miles travelled, and a 30 per cent reduction in passenger injuries. They also reported findings of up to a 50 per cent reduction in unsafe driving events.

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Canada's freight and passenger railways would like to install LVVR systems in their locomotives. But on-board recordings are currently privileged and can only be used for post-occurrence investigations by the TSB. Legislative change is required in order for railways to be able to use this technology to prevent accidents and increase safety.

"What's left to study?" Perhaps how many accidents we've prevented, after we install these devices.

Let's get on with installing this life-saving, injury preventing, and environment-protecting technology, in keeping with the recommendations of the TSB and the NTSB. People of good will can work out any privacy concerns, just as we have done for locomotive event recorders, yard cameras, and forward-facing locomotive video. In the meantime, safety comes first, particularly when the safety of many is in the hands of a few. P

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