TEAMSTERS CANADA RAIL CONFERENCE

USE OF JUMP SEATS

MAINLINE

DEADHEADING

A REVIEW OF CP'S RESPONSE

BACKGROUND HISTORY & TCRC CONCERNS

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GENERAL BACKGROUND

THE "JUMP SEAT"

BACKGROUND

With CP's first order of General Electric Locomotives, CP 9500 series in 1995, the addition of a fourth seat appeared in the layout of the locomotive cabs. All of CP's GE purchases since that time have come equipped with the fourth seat commonly referred to as the "jump seat". This includes: CP GE series 9600s, 9700s, 9800s, 8600s, 8700s, 8800s, 8900s and 9300s - a total of 729 units.

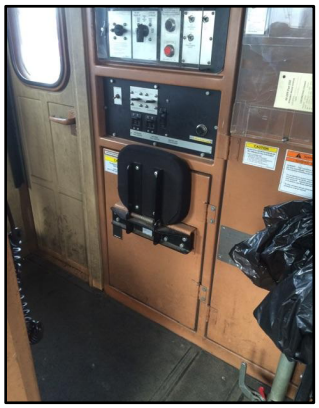
The GMD 9100 series locomotives were also equipped with the "jump seat", but all 58 units in that class have been retired.

Further, GE's in the CEFX (1001-1059) and UP GE and EMD locomotives that are equipped to lead in Canadian operations are also equipped with a "jump seat".

The traditional seating requirement in a locomotive cab is three seats. Originally there was a seat for the locomotive engineer, the headend brakeman and the fireman. This evolved as train operations changed, crew sizes were reduced and with the removal of the caboose. Train crew size has been reduced to two people on conductor only operations (locomotive engineer and conductor) and three people on non-conductor only trains (locomotive engineer, conductor and trainman). The cab layout has remained three seats.

Traditional seat placement at CP was a seat in the locomotive engineers position, and two wall mounted seats behind each other on the conductor's side of the cab. With the introduction of the new safety cabs in the CP 9500 series locomotives the seating plan was revised to three across – conductors work station, engineer's position and a center seat. The "jump seat" was also introduced, wall mounted behind the engineers position. The locomotive now has a fourth position for a person to sit.

The "jump seat" is a small, spring loaded seat, that has been traditionally used by a locomotive engineer when providing training to an engineer trainee, a place for a trainee to sit and watch the engineer and/or a place for a road foreman of engines and/or other manager to observe the engineer. This seat has no back support, no arm rests, no height adjustment and/or any adjustment features. Its intended use is for short periods of time. When not is use, the spring-loaded feature of the seat, forces it in to the up right position. (see photo at right)[1]



[1] Photo source TCRC PLBO files

[2] Refer to Appendix I – control stand/cab layout.

[3] Source: Baultar Operator Seat 3000 Series/4000 Series information pdf, http://www.baultar.com/media/1201/brochure_seats.pdf.

The three regular GE seats, are air-ride and have several adjustable features. They have been replaced and updated once in the service life of the locomotives, with new seats as approved with the input of the cab committee.

The only other seating change has been with the new revised control stand[2] that has appeared in newer CP/GE products. Given the very tight cab space, the third crew member seat is now a "retractable seat", which when not in use hangs folded on the back wall. This seat is equipped with back support, armrests and a footrest. This seat is normally in the raised position when not in use. (see photo at right)[3]

DEADHEADING

Railway operations have always had situations when there is either a surplus or a requirement for crews to be moved from one terminal to another terminal, to reduce the crew imbalance of train operations. This has been done for many years and there has always been language in the many different versions of the collective agreement to reflect this class of service.

Methods of deadheading a crew(s) have included by taxi/third party contractor by road, VIA Rail, Greyhound, caboose, trailing locomotive lead consist, locomotive(s) in the mid train or tail end position while in remote control.

With the recent ruling in the Mediation/Arbitration between CP and the TCRC, the Honourable George W. Adams, Q.C., Mediator/Arbitrator ruled on December 7th 2015, on the collective agreement matter before him.

On page three and four the Honourable Adams ruled in reference to deadheading on remote locomotives:

4. Deadheading on Remotes

a) There shall be no deadheading on mid-train remote locomotives. However, the parties shall study the concerns of the TCRC in respect of such deadheading during the currency of the collective agreement. Any disagreement on the ambit and/or timing of such study may be referred to me for summary resolution.

b) Deadheading on tail-end remote locomotives is permitted provided Emergency Evacuation Procedures equivalent to those applicable to head-end or lead consist are followed for the following four tunnels: Detroit, Spiral, MacDonald, and Connaught. Within ten days of the issuance of this award, the parties shall meet and

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work out the appropriate application of such or similar procedures to tail-end remote locomotives at these locations and all disputes may be referred to me for summary resolution.

[2] Refer to Appendix I – control stand/cab layout.

[3] Source: Baultar Operator Seat 3000 Series/4000 Series information pdf, http://www.baultar.com/media/1201/brochure_seats.pdf.

This ruling resulted in two operational changes when deadheading at CP by freight train;

1. Crews that would have ridden deadheaded in the mid-train remotes are now being required to ride in the lead unit. This results in one of the crew members being required to ride in the "jump seat".
2. Crews that used to be deadheaded by an alternate method and/or another train, when the trailing lead units are non-Canadian leaders, are now being required to ride the lead unit, again with one crew member being required to ride the "jump seat".

RESULTS TO DEADHEADING ON THE JUMP SEAT

There have been several visible results to the operational change and the requirement to deadhead on the lead unit.

Local Health and Safety Committees started to receive written *Safety Hazard Reports*, which raised the concerns about the use of this seat. There have been a least 15 filed *Safety Hazard Reports* in Eastern Canada. Items raised included concerns about the use, design and location of the "jump seat":[4]

- Foam cushion was worn out,
- The back electrical panel door would not stay in the closed position,
- The pressurized car body results in cold air blowing down back or neck (this air is consist and not a part of the cab heating/ cooling systems),
- Ride is extremely rough,
- No arm rests,
- No back support,
- Back/Neck/Head exposed to uneven non-padded back panel where several control knobs are located,
- In newer GE units with the retro old school AAR control stand, employee sitting in the jump seat is exposed to possible impact with the control stand during excessive slack action or if the unit is involved in a violent accident. Refer to Appendix I, and

[4] Photo at right – standard GE jump seat in the folded position; note the placement of locomotive control switches: Source TCRC PLBO files.

- Size of the seat pan. Photo at right shows the size of a "jump seat" in in comparison to a standard coffee pot/tea kettle and a hand. Also note lack of armrest and back support.[5]

In addition, crews raised concerns about the number of people in the operating cab:

- Possible violation of Bulletin No S-104/location of crew members when operating on other then the main track,
- Working crew can lose situational awareness as a result of non working crew in the cab. Crew distractions,
- With the number of grips on the cab (at least 8) tripping hazards are created,
- With the number of grips and people, the ability to safety evacuate a locomotive is severely reduced,
- Not enough room in the fridge for employee's food,
- "Jump seat" mounting location – can be taxed with heavier employees "when you sit on the jump seat, the door it is mounted on flex's"[6], and
- Cab layout is taxed with four people in it, particularly in the latest GE's with the new retro ARR control stand. Actual open floor space has been reduced.

Further there has been at least one reported injury and one Canada Labour Code Work refusal under Section 128.

PROACTIVE REPSONCE

The TCRC PBLO raised this concern with CP on January 12, 2016 with a written submission and received a written response on February 2, 2016 from CP.

The matter was also raised at the CP Health & Safety Policy Committee held in Toronto on Tuesday February 9th 2016. All stakeholders agreed that this practice needed to be investigated further. Currently, there is an "Ergonomic Assessments of Locomotive Jump Seats", meeting scheduled for March 2nd 2016 at Toronto Yard diesel shop, planned for 12:00 to 15:00 with key stakeholders

TCRC CONCERNS OF JANUARY 12TH, 2016

The TCRC PLBO Chairperson Laura Reamue raised the following key issues regarding the practice of deadheading crews using the "jump seat".

[5] Source Laura Reamue TCRC PBLO Chairperson's files.

[6] Safety Hazard report 3282 January 12, 2016 submitted Schreiber.

1."Jump-Seats" do not meet prescribed ergonomic standards as per the Canada Labour Part II Section 125. (1) u ,

2. Excessive Whole Body Vibration (WBV) transmitted through "jump-seats",

3. "Jump-Seats" do not meet prescribed crash-worthiness standards, and

4. Placement of grips (crew bags) could cause hazards within the cab of the locomotive.

CP'S WRITTEN RESPONCE OF FEBRUARY 2ND 2016

CP responded to each concern in a letter of February 2nd 2016, addressing each concern raised prepared by Keith Shearer GM Regulatory & Operating Practices, Operations – System Canadian Pacific.

1. "Jump-Seats" do not meet prescribed ergonomic standards as per the Canada Labour Part II Section 125. (1) u Response: Transport Canada has not defined prescribed ergonomic standards such as a CSA, ISO or related criteria that detail how different aspects of the workplace should be designed, including seating to minimize injury risk. Instead the Hazard Prevention Program, Section 14 of the On Board Trains Safety and Health Regulations require workplaces to consider ergonomic hazards (i.e. identify, assess and control) to prevent injury. To date, "jump-seats" have been regularly used as "temporary" seating (e.g. used when conducting efficiency testing, or training employees). This then becomes a matter of understanding the frequency and duration of exposure for a single employee.
Use of "jump-seats" by employees in deadhead service in the lead locomotive is still considered "temporary" seating, as employees are not required to utilize the jump seat on a regular basis. A review of crew deadheading data for the Winnipeg terminal for the three month period October through December, 2015 revealed 142 total deadhead trips with 65 transported by train. Of the 65 only 9 (14%) required the deadhead crew to occupy the lead locomotive. The average length of the trips during this period was 5.13 hours with minimum and maximum trip time of 3 hours and 9.22 hours respectively. This in and of itself presents a low frequency of exposure, but when the likelihood of exposure to a single person in the terminal is also factored in the frequency of exposure drops to a very low 0.67%.

2. "Excessive Whole Body Vibration (WBV) transmitted through "jump-seats".
Response: The TCRC presented two ergonomic related studies and have asserted that based on these two studies, whole body vibration experienced by the seated occupant on board freight locomotive cabs is an issue. CP engaged an Ergonomic Consulting firm to review the studies provided. Based on the experience of the consultant they are not aware of any whole body vibration studies completed specifically on freight locomotive "jump-seats". Studies have however been completed on Locomotive Engineer/Conductor seats used on board freight locomotives.
Whole body vibration exposure measurements have been made from several different sources since 1990 on over 100 different train runs. The testing results include the findings of testing by the Federal Railroad Administration and by Dr. Johanning, the author of the two related studies presented by the TCRC. This collection of whole body vibration testing has consistently resulted in the exposure to be below the Health Guidance Caution Zone of the health guidelines of the ISO standards for measurement and assessment of whole body vibration. For whole body vibration exposures below the Health Guidance Caution Zone, health effects have not been

clearly documented and/or objectively observed.
When testing has more recently also included evaluation for exposure over the timeframe of a career, the results indicate a low probability of an adverse health effect. The testing that supports these results involves data that has been collected on "hard mounted" locomotive cab seats, including older style seats that may be known as "toad stool" seats. "Jump-Seats" are also hard-mounted in the cab of the freight locomotive. Based on both the measurement of the seated occupant on board North American freight locomotives, and that the seats tested were hard-mounted to the interior of the cab space, it is reasonable to expect that whole body vibration exposure from occupying a "Jump-Seat" would be consistent with the results of the testing that has been completed to date.

3. "Jump-Seats" do not meet prescribed crash-worthiness standards Response: A review of the AAR Manual of Standards and Recommended Practices Cab – Locomotives and Locomotive Interchange Equipment S-580 Section 6.6.2 has been completed. See appendix 1 provided by the locomotive manufacturer – General Electric.[7]

4. Placement of grips (crew bags) could cause hazards within the cab of the locomotive Response: Crew members who are deadheading may place their grips/bags either in the alcove between the outer and inner nose compartment doors or in the alcove directly opposite the toilet compartment door.

The letter further makes reference to a decision of a Transport Canada/Safety Officer in application of a Canada Labour Code, Part 128 work refusal.

The TCRC has several concerns about the responses provided by CP.

JUMP- SEATS DO NOT MEET PRESCRIBIED ERGONMIC STANDARDS AS PER CANADA LABOUR CODE PART II SECTION 125 (1)U

The letter of February 2nd 2016 makes reference "jump seats" being used as "temporary seating" by extension it "becomes a matter of understanding the frequency and duration of exposure for a single employee." The exposure is broken down by time, not distance traveled and/or speed. Further by this method the company reports a low frequency of exposure of 0.67% when the data is examined for Winnipeg terminal.

Deadheading is not a temporary process when compared to conducting efficiency tests and/or training employee(s). There is no data to support the frequency for which a manager preforming an efficiency test or a locomotive engineer providing training to a trainee using the "jump seat" to establish a base line for the definition of temporary. The duration of this type of usage is usually short in nature. Given the normal crew size, the manager and or training engineer has the ability to use the "jump seat" for short periods as required, and use the third seat as the primary seat. Deadheading is not short term in length. Deadheading is terminal to terminal at full track miles, done at various speeds and for various lengths of time, with CP's own data indicating a maximum trip of 9 hours and 22 minutes. Although CP noted that of 65 trip deadheads by freight train, 9 were lead locomotive with a trip average length of 5 hours and 13 minutes. The deadheading employee is not sitting in the "jump seat" on a temporary basis and although the company noted that the exposure of 0.67% is a low frequency on a general basis, the person required to ride the jump seat

[7] This appendix 1 referred to by CP in their response is GE proprietary & confidential and unable to be reproduced in this report.

feels the full effect of that 0.67% for the length of the deadhead trip. For that person it is not a low frequency event.

Further the data referred to should have been a system wide audit of all deadheading to provide a more accurate database, which in turn should have been cross referenced to see how may employees were receiving a higher deadhead rate in the "jump seat" within the frequency. How many employees have been exposed to repeated "jump seat" use within the low frequency account multiple lead unit deadhead trips?

In reviewing CLC Section 125(1), I would put forth that in addition to item (U), that with the increase to four people in the locomotive cab there needs to be a review of 125 (1) (n) – **"(n) ensure that the levels of ventilation, lighting, temperature, humidity, sound and vibration are in accordance with prescribed standards**". According to reports referred to by the TCRC/CP, they only looked at the use of seats in the engineer's position. The "Whole-body vibration and ergonomic study of US railroad locomotives" noted on page 439 of the American Industrial Hygiene Association Journal July/August 2002:[8]

> "Tested locomotive cab seats currently in use (old or new) appear inadequate to reduce potentially harmful vibration and shocks transmitted to the seated operator, and older seats particularly lack basic ergonomic features regarding adjustability and postural support."

Further the authors of the report note on page 429:

> "This investigation was prompted in part by the observation in an occupation specialty clinic, that a high number of locomotive engineers were reporting low-back complaints or back-related disabilities".

Even in this study, in Table 1. Extended page 440, there is no review of a "jump seat" model, nor is it even a consideration in the study. This reinforces that if a locomotive cab is equipped with a "jump seat", its intent is for short use and has not been considered for long term use.

The U.S Department of Transportation/Federal Railroad Administration Final report 1998 "Human Factors Guidelines for Locomotive Cabs" makes recommendations 4.4.3 "Seat Design". The "jump seat" design does not come close to meeting the recommendations within this report and its use in a prolonged fashion defeats many recommendations contained in the report with respect to train crew seating, vibration and human factor considerations.

[8] Eckardt Johanning, Siegfried Fischer, Eberhard Christ, Benno Gores and Paul Landsbergis.

A review of CLC Section 125(1)(p) would also be prudent. "(p) ensure, in the prescribed manner, that employees have safe entry to, exit from and occupancy of the work place;…". Current locomotive design is based primarily around a two person crew. There is no data provided to indicate that with two additional people in the cab, that this requirement is met, particularly for the fourth person. Head on collisions at crossing accidents can result in the front door being inaccessible which results in four people being required to egress by one door.[9] Head on collisions had become a concern at Union Pacific Railroad after a crossing accident with a dump truck near Vacherie, LA, on November 30, 2000 resulted in a company officer riding in the cab being killed, Union Pacific Railroad have removed the nose door windows from all their safety cab fleet, and new units ordered do not have this option. When the door window breaks it allows collision debris to enter the cab.


Accident involving a freight train & vehicle near Bothwell on Mon. Nov. 16, 2015 (Photo courtesy of @OPP_WR via Twitter)

Also in a derailment situation, the ability for a person sitting in the "jump seat" to hold on is non-existent, since there are no armrests. An inquiry to Office of Safety Federal Railroad Administration on February 7, 2016, asked if the FRA injury data was broken down to track employee sitting location within the cab when there was a reported injury. This was met with a limited response. The FRA does not currently track that type of data. The matter has been forwarded to "Motive Power and Equipment Division" for a response.

Additionally, with the number of filed *Safety Hazard Reports*, one injury filed and application of Section 128 of the Part II of Canada Labour Code in regards to the use of the "jump seat", one would think that Part II of Canada Labour Code, Section 124 "Every employer shall ensure that the health and safety at work of every person employed by the employer is protected", would bear weight and the practice would be stopped, until the proper risk assessments and ergonomic assessments were completed.

EXCESSIVE WHOLE BODY VIBRATION (WBV) TRANSMITTED THROUGH "JUMP SEAT"

Further to the comments in the section noted above and referring to the article "Whole-body vibration and ergonomic study of US railroad locomotives as it appeared in the American Industrial Hygiene Association Journal July/August 2002", the following items are highlighted.

> Under results, page 442 "The investigated seats were made of steel/iron with a foam-on-wood cushion (some with steel spring support) or had a suspension system with a crossbar (X) dampening device (spring or hydraulic shock absorber) to attenuate vertical vibration and shocks. Regardless of the age or make, <u>all seats did not appear to adequately reduce vibrations</u> as suggested by the mean vertical (z) transmission factor of 1."

[9] photo source http://blackburnnews.com/chatham/chatham-news/2015/11/17/newbury-man-killed-in-crash/

> Page 443 notes "the basic rms vibration method and reporting is not sufficient because it may underestimate the effects of vibration (see paragraph 6.3.3. of ISO 2631-1:1997) That means that the human vibration exposure health risk should probably be assumed to be higher, although the measured basic vibration values (rms vibration data) may still be below a recommended threshold limit in a specific direction. Therefore, the measurements of basic vibration measurement alone are not sufficient to assess the possible associated health risk."
>
> The report indicates on page 445 that "modern tractor seats are now achieving better then 50% vibration reduction (mean SEAT factor 0.42)" and concludes, "Important for a health assessment are the actual daily vibration exposure duration periods and possibly cumulative exposure over 10 to 20 years. Ergonomic control and prevention strategies in locomotive cabs should include these factors, although an improved cab and seat design may be beneficial in the short-term to reduce overall whole-body vibration."

In reviewing the article, the tone is working to ensure all the data is collected in a broad scope so that all vibrations issues are reviewed to develop processes to reduce the possible risks for both short and long term health issues.

"JUMP-SEATS" DO NOT MEET PRESCRIBED CRASH-WORTHINESS STANDARDS RESPONSE

CP provided information from GE that CP's fleet is made up of 85 locomotives equipped with Baultar "jump seats" in 1995. All subsequent CP GE locomotives are equipped with Seats Inc. "jump seats".

Further, documentation provided indicated that the "jump seat" is fastened to the CA1 door and meets requirements of ARR-S580 and that the "structure is capable of withstanding required loads, without permanent deformation".

There is no issue with this response, as it deals with the "jump seats" ability to survive an accident, ie. the "jump seat" does not come loose and become a piece(s) of flying debris within the cab during an accident.

What is not addressed is what becomes of a person riding in the "jump seat" when a locomotive is involved in a crossing accident, train derailment or train collision.

Crashworthiness is designed to "mitigate effects of collisions and derailments" and improve "crew protection within the cab compartment"[10]

PLACEMENT OF GRIPS (CREW BAGS) COULD CAUSE HAZARDS WITHIN THE CAB OF THE LOCOMOTIVE

Most conductor and engineers now carry at least two working grips, a general grip with rule books and other material required while at work, plus items needed for the stay at the away from home terminal. In addition there is a food cooler bag, with most conductors and engineers carrying enough food for an average round trip at 24 to 30 hours.

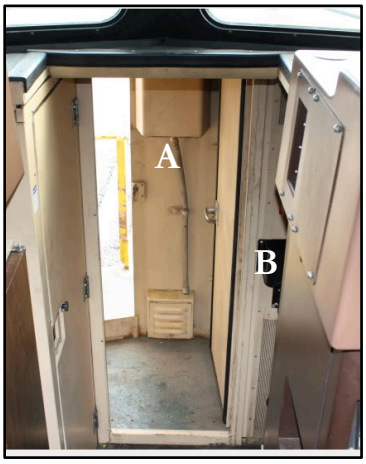
[10] Office of Research & Development 2012 R&D Review John Punwani Program Manager.

The company's response to this matter does not reflect the current grip(s) that most conductors and engineers carry with them. "Crew members who are deadheading may place their grips/bags either in the alcove between the outer and inner nose compartment doors or in the alcove directly opposite the toilet compartment door."

The locations identified by the company do not have any "luggage type" racks, and thus grips will have to be double stacked which can result in grips being crushed. Recently a conductor while travelling deadhead on VIA Rail, encountered an issue with their grip when the conductor was at the VIA Rail station checking in. The grip in question received secondary inspection by VIA Rail station staff, the bagged weighed in at 43 pounds, 3 pounds greater the VIA Rail's luggage regulations in the coach. VIA Rails policy is determined by fare, size, weight and the fact that they can be stored in a secured location – end coach rack and or overhead luggage compartment, locations designed to hold luggage and secure stored luggage in the event of an accident. Photo above shows VIA Rail end coach secure luggage location. [11]

In addition, placing their grips in the outer alcove between the outer and inner door creates three issues:

1. This location is not environmentally controlled, and exposes any grip stored there to cold or heat. Refer to photo at right letter "A".



2. This location is the normal location for the tool rack, flagging kits and the stretcher. These items are all in secured positions, which prevents them from becoming a projectile or blocking the egress route of the front door. Grips placed in this location, in an accident situation will become dislodged from their resting position and impend the egress route. The inner door opens outwards from the operating position of the cab, thus in an accident event, the inner door could become blocked, restricting the front egress route. Photo at right shows the proposed alcove storage locations for grips and the outward swing of the inner cab door. Refer to photo at right letter "A". [12]

3. Grips placed in "the alcove directly opposite the toilet compartment door" will also have to be stacked, allowing grips to be crushed. Again, in this location during an accident event, they can become dislodged and block an egress route. Refer to photo at right letter "B".

[11] photo source via google search - http://www.masstransitmag.com/article/10684320/major-overhaul-for-via-rails-corridor-fleet.
[12] photo source via google search - http://cs.trains.com/trn/f/111/t/190807.aspx?sortorder=desc

IN CAB SITUATIONAL AWARENESS

As a result of several incidents and accidents, on non-main tracks, the resulting investigation resulted in the issue of Bulletin No S-104/location of crew members. The bulletin reads:

> "trains working/travelling in yards/industry tracks for train crews working or operating in yard or industry tracks, effective immediately all employees other than the Locomotive Engineer MUST be positioned on the footboard of the Locomotive when the Locomotive is leading in the direction of travel, (this includes LiteEngines). This will improve our ability to work safely and prevent accidents such as run through switches and other unsafe events."

The intent of this bulletin is to remove any job task focus issues in the operating cab, thus improving the situation awareness of the working crew. Placing a deadhead crew in the lead unit seems to defeat the purpose of the bulletin. It should be noted that track speed for which the bulletin applies, the majority of these locations fall under CROR 105 Operation on Non – Main Track. This rules reads:

> "Special instructions will indicate when this rule is not applicable on a specific track. Unless otherwise provided by signal indication, a movement using non-main track must operate at REDUCED speed and be prepared to stop short of the end of track or the red signal prescribed by Rule 41.
>
> 1. (a) In CTC, movements may only enter a siding by signal indication or with permission from the RTC.
>
> 2. (b) Unless otherwise provided by signal indication or special instructions, movements operating on non-main tracks must not exceed fifteen (15) MPH.
>
> 3. (c) In addition to moving at REDUCED speed, a movement using a non-signalled siding or using other non-main tracks so designated in special instructions, must operate at a speed that will allow it to stop within one-half the range of vision of a track unit."

Furthermore, there are several other CROR Rules which impact crew members located in the operating cab, including CROR 33 Speed Compliance, CROR 34 Fixed Signal Recognition and Compliance attention paid to part (c)

> "If prompt action is not taken to comply with the requirements of each signal indication affecting their movement, crew members must remind one another of such requirements. If no action is then taken, or if the locomotive engineer is observed to be incapacitated, other crew members must take immediate action to ensure the safety of the movement, including stopping it in emergency if required"

and CROR 106 Crew Responsibilities.[13]

[13] Source Transport Canada web site:
https://www.tc.gc.ca/media/documents/railsafety/CROR_English_July_27_2015_F.pdf.

Deadhead crews by definition are considered non – working in relationship to the working crews. Additional people into a restricted working space, in particular the "jump seat", will have an impact on the level of situation awareness that the working crew will be able to maintain.

VIA Rail has a Cab Red Zone, as referred to in TSB Report R14T0294 "Signal Passed at Stop"[14]. Page 13 Item 1.12 explains further:

> "Cab Red Zone (CRZ) is considered to be a critical time within the cab when there are simultaneous tasks requirements (e.g., copying an authority while approaching a slow order, or operating on signals that require the train to be prepared to stop at the next signal). When travelling at a time when a CRZ is in effect, communications within the locomotive cab, including the use of the radio, is restricted to immediate responsibilities for train operation. VIA's special instructions relating to CRZ indicate that not every possible situation can be covered by the CRZ. Consequently, it becomes part of the operating crews' responsibility to utilize CRZ for any conditions warranted as "critical" to the movement.
>
> Operating with a 3rd crew member in the locomotive cab has been a long-standing industry practice and has proven to be an effective training tool, particularly with regards to familiarization, qualification of operating crews and proficiency testing. **In these situations, the responsibility of rules compliance is equally shared among all crew members in the cab**[15]".

Additionally the report makes reference on page 14 item 1.13, "Situation awareness and mental models during train operations". The information provided is from the following reference material: "M.R. Endsley and D.J. Garland, *Situation Awareness Analysis and Measurement* (Mahwah, NJ: Lawrence Erlbaum Associates, Inc.), 2000". The addition of two non working crew members will impact situation awareness.

The TSB report makes the following conclusion in the Analysis Item 2.4-Additional Crew Member in the Locomotive Cab:

> "Operating with a 3rd crew member in the locomotive cab has been a long-standing industry practice for training and familiarization in a new territory. However, even with a 3rd crew member, the responsibility of rules compliance remains equally shared among all crew members in the cab. **With a 3rd crew member, there may be a propensity for more conversation in the cab, which can lead to distraction**.[16] Also, there can be a tendency for some crew members to rely on the others to comply with the rules.
>
> In this occurrence, during the pre-trip briefing, there was no specific discussion on the potential impact of having a 3rd crew member in the locomotive cab or the need to have mitigating strategies, especially during critical periods for important operational tasks. If a 3rd crew member is present in the locomotive cab, particularly during training or new territory familiarization, the crew interaction and the communications between the crew members will be altered, increasing the risk of loss of situational awareness potentially leading to overspeed incidents and accidents."

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[14] Source TSB web site: http://www.tsb.gc.ca/eng/rapports-reports/rail/2014/r14t0294/r14t0294.asp.

[15] Boldface and underscoring highlighted by the author.

[16] Boldface and underscoring highlighted by the author.

The reports concludes with 3.0 Findings, Item 3.2 (3)

> "If a 3rd crew member is present in the locomotive cab, particularly during training or new territory familiarization, the crew interaction and the communications between the crew members will be altered, increasing the risk of loss of situational awareness potentially leading to overspeed incidents and accidents."

It should be pointed out that in this TSB report for a 3rd person in the cab, the 3rd person was in a working capacity.

This event clearly shows what can happen when situational awareness is lost or is a contributing factor in an accident or incident. CP's change in deadheading crews using the lead unit, will result in a reduced situational awareness of the working crew and increase the chances of an event.

CONCLUSION

The use of "jump seats" while deadheading in a locomotive is not a "temporary" process as proposed by the company. By definition, when being utilized in the deadheading of a crew, the "jump seat" is now being used in the same capacity as one of the three other regular seats in the cab. Thus, the expectations for using the "jump seat" has changed; it is now a primary seat.

The railway industry had been working on several fronts to address cab related issues, from cab ergonomics to crashworthiness, for which the "jump seat" has not been a key issue to be addressed, because it was never intended for long term use. Further, there is no information on what sitting on a "spring loaded seat" does to a person from the ergonomic perspective; the constant pressure of the seat trying to return to it's normal up right position.

The use of the "jump seat" is in direct opposition to CP's prior "Ergonomic Evaluation of Locomotive Cab Seating 1991, authored J.O. Kerst, Ergonomics Engineer Humantech Inc.[17]

This report noted that 85% of cab crewmembers reported job related discomfort in the neck, back, and legs, with "crowding in the cab" also a related concern (page 3). At the time of the study, "none of the seats in the study met the guidelines for ergonomic seating" (page 6).

This is interesting, as CP states on page two in their letter of response dated February 2nd 2016, when a comparison is made between older "toad stool" seats to the "jumps seats" and the vibration data. Thus "jump seats" are not "ergonomic seating". In table two of report page 19, 34% of those surveyed reported discomfort as a result of "lack of height adjustability", with 6% reporting, "seat pan too short". On pages 27 and 28 the report notes the most "uncomfortable" seats reviewed, six styles, all had several common features – they were hard mounted and the worst three had no armrests. Table 3-1 "Locomotive Cab Seating Guidelines" page 62 and 63 provides an ergonomic guideline for seats for which there are 20 criteria, which the "jump seat" does not meet any of these criteria.

[17] Report source TCRC / BLE archives

Even with the concerns raised, the practice of using the "jump seat" when being used to deadhead a crew member continues.

There is also an impact on the working crew regarding having a non-working crew present in the lead locomotive, as situational awareness will be impacted.

All the stakeholders in this matter have referred to several reports, which are all several years old. The science of seat design and reducing health risks when exposed to locomotive vibration is fluid and on going, since it was "first described in a French study as early as 1954"[18].

The use of the "jump seat" in a non-temporary fashion should be suspended. Their use should not continue until such time as it has been proven and demonstrated to be a safe practice for which there is minimal or no health risks.

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[18] Whole-body vibration and ergonomic study of US railroad locomotives" on page 445 of the American Industrial Hygiene Association Journal July/August 2002

Appendix I

Control Stand/Cab Layout

Older GE's – Desktop control stand. Photo Source Google search – Eric Aucoin Canadian Railway Observations http://canadianrailwayobservations.com/croarchives/2013/septcro/cn-sep.html

Revised AAR Contol Stand GE Locomotive/photo source Google search http://www.railpictures.net/viewphoto.php?id=311439&nseq=5