

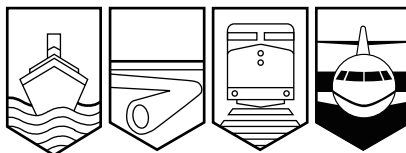
Transportation Safety Board  
of Canada



Bureau de la sécurité des transports  
du Canada

## **AVIATION OCCURRENCE REPORT**

**A99A0046**



### **INJURIES TO PERSON WHILE DEPLANING**

**AIR CANADA**

**BOEING 767-200, C-FBEM**

**ST. JOHN'S, NEWFOUNDLAND**

**31 MARCH 1999**

**Canada**

The Transportation Safety Board of Canada (TSB) investigated this occurrence for the purpose of advancing transportation safety. It is not the function of the Board to assign fault or determine civil or criminal liability.

## Aviation Occurrence Report

### Injuries to Person While Deplaning

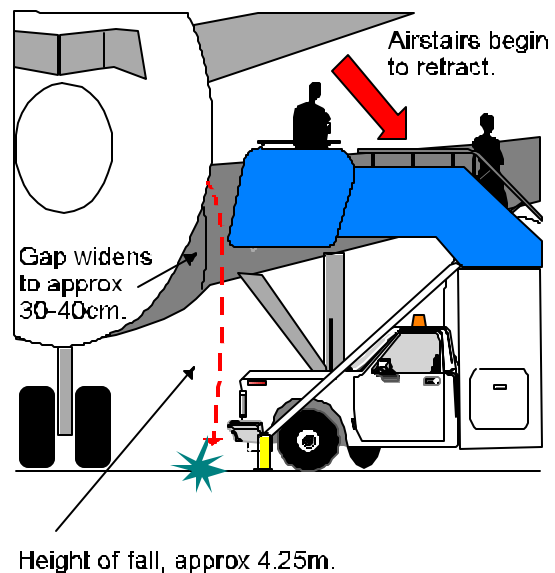
Air Canada

Boeing 767-200, C-FBEM  
St. John's, Newfoundland  
31 March 1999

Report Number A99A0046

#### Summary

Air Canada Flight 861 arrived in St. John's, Newfoundland, from London, England. As there is no direct access to the customs area from the company passenger bridge at the St. John's Airport, the aircraft was marshalled to a gate on the open ramp. A passenger stand was positioned at door L1 of the aircraft and two employees ascended the stairs to open the aircraft door and position the side gates. After approximately 10 to 12 passengers had exited the aircraft, a flight attendant carrying an infant in a car seat deplaned. When the flight attendant stepped on the passenger stand, he noticed that it was descending slowly away from the aircraft. He turned to tell the in-charge flight attendant, but at the same time as he turned, the infant's five-year old brother, who was following with his mother, stepped out and fell between the aircraft and stairs to the apron below. The child suffered a broken arm and lacerations to the head in the fall and was taken to the hospital for treatment and observation.

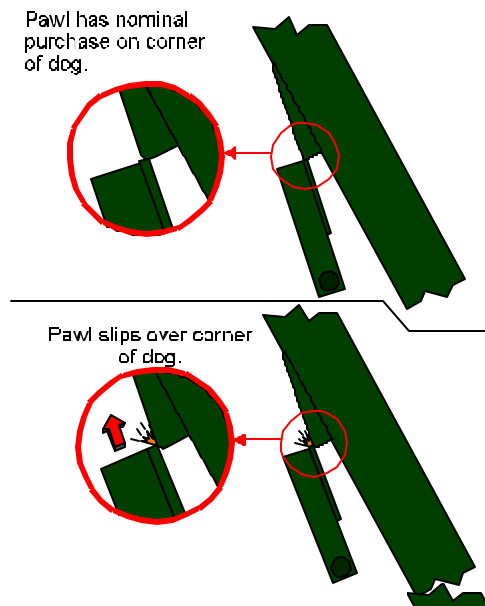
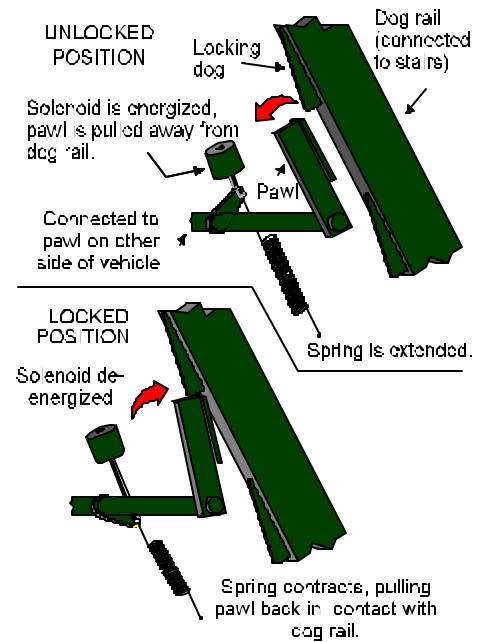


*Ce rapport est également disponible en français.*

## Other Factual Information

The passenger stand (Trailbec BMH series unit No.15) used for the deplaning of Air Canada Flight 861 is designed for use on various aircraft of different door sill heights. The stair height is adjusted by means of a moveable upper stair portion which is raised and lowered by an hydraulic cylinder. The upper stair portion is held in the raised position by a mechanical pawl and dog locking system. This pawl is normally held in the engaged (locked) position by a spring and it is disengaged by an electric solenoid which functions in opposition to the spring. The solenoid is energized by a “deadman”

(spring- loaded to the off position) button in the cab of the vehicle. The stair is raised a half step above the desired height and then lowered against the stop.



Several tests were carried out on the locking mechanism after the accident. In about half of these tests, the pawls failed to engage or only partially engaged. In tests where the pawl partially engaged the dog, the upper stair remained in place for a short period, then, as the pawl slipped off the dog, the stair descended. In tests where the pawl failed to engage the dog, the stairs began to descend immediately.

Operators of the passenger stand reported that, when the upper stairs are lowered against the stop, a jolt is felt in the truck. The jolt was one indication of locking mechanism engagement. The operators also visually verified the locking mechanism engagement with a cursory look while leaving the vehicle. There was no procedure in place which required a close visual inspection to confirm locking mechanism

engagement. Operators also reported that they had had no formal training on the operation of the passenger stand. This was supported by one operator who stated that he depressed the “deadman” button while raising the stairs; it is only necessary to depress this button while lowering the stairs.

Visual verification that the locking mechanism was fully engaged was hampered by the pawl, the dog, and the background being painted a uniform dark green and by the fact that, on this

vehicle, a small brace (which had been added to support the unit's side panel) impeded the operator's view of the pawl.

The passenger stand unit involved in this occurrence was built in 1974 and was completely refurbished in Montreal in May and June 1998 before being shipped to St. John's in July 1998. The refurbishment records included the notation "Free-up stair lock assy." The only record of repairs to the passenger stand (BMH 15) after its arrival in St. John's was the repair of an hydraulic pump leak on 16 July 1998.

Air Canada has daily inspection sheets for its ground support equipment; however, BMH 15 was not listed on these sheets. Air Canada also has a policy to perform periodic service checks on units such as passenger stands every 250 hours of accumulated operation or once per annum, whichever comes first. The service check requirement was initiated by the Ground Service Equipment (GSE) Branch and includes a "Functional Test - Stairway" section in which millwright (ground support equipment maintenance) personnel are to check the operation of the stair pawl locking mechanism. BMH 15 had been in use approximately 11 months and had accumulated 380 hours of operation since it was refurbished. There was no record of a service check having been carried out on BMH 15 since it was refurbished.

In the past, the GSE Branch had a system whereby each station submitted the hour metre reading on all its equipment to the main office in Montreal. The main office would then generate a list of those units requiring service checks to each station. This system had been unavailable for some time and had been reinstated just before the occurrence. The GSE Branch also had an Operational/Safety Check process that was to be completed periodically. This check also included a specific inspection of the locking mechanism. There was no record of this check having been carried out on BMH 15 since it had arrived in St. John's.

The Canadian Aviation Regulations (CAR) do not apply to ground support equipment nor are these types of equipment currently subject to audit by Transport Canada; operators set their own policies and procedures for service checks, inspections, and record keeping.

Regulation 705.40, entitled "Passenger and Cabin Safety Procedures," and CAR standard 725.40, "Commercial Air Service Standards," require that air operators specify in their Operations Manual procedures to ensure the safe movement of passengers to and from the aircraft. The operator's Transport Canada-approved manual met these requirements. There is no regulatory requirement for an operator to specify crew positioning during boarding or deplaning. The in-charge flight attendant was reportedly near the door being used for deplaning.

## *Analysis*

The locking mechanism used to hold the upper stairs in position is a fairly simple mechanical device. The pawl that prevents the stairs from descending is held in place against the dog rail by a spring and released by energizing a solenoid. In this occurrence, the pawl had only partially engaged the dog rail and, after several passengers had travelled over the stairs, it slipped off, allowing the upper stairs to descend away from the aircraft. Whether this was due to a weakness in the spring, a mechanical resistance in the mechanism, or a combination of

both, the proper functioning of the locking mechanism was impeded. The company had procedures in place whereby periodic service checks and periodic operational/safety checks were to be carried out on all ground support equipment to ensure proper mechanical functioning. However, these procedures were not being followed and the passenger stand was 130 hours overdue for a service check.

There was no policy in place requiring the passenger stand operator to do a close visual inspection of the locking mechanism to ensure full engagement. Other passenger stand operators reported that they would take only a cursory look at the locking mechanism when leaving the vehicle. Any visual inspection would have been impeded because the pawl, the dog rail, and the background were all painted the same dark green colour and, on this particular vehicle, a support brace impeded the operator's view.

## *Findings*

1. The locking mechanism was not functioning properly, and as a consequence, disengaged allowing the upper stairs to descend away from the aircraft.
2. The procedures that were to ensure the proper mechanical operation of the passenger stand were not being followed.
3. The passenger stand was 130 hours overdue for a service check.
4. There was no company requirement for the passenger stand operator to do a close visual inspection of the locking mechanism.
5. Passenger stand operators were taking only a cursory look at the locking mechanism when leaving the vehicle.
6. Visual inspection of the locking mechanism was impeded because the components were all painted the same dark green colour and, on the occurrence vehicle, a support brace impeded the operator's view.
7. Operators of the passenger stand reported that they had not received formal training on the operation of the equipment.

## *Causes and Contributing Factors*

The locking mechanism was not functioning properly, and as a consequence, disengaged allowing the upper stairs to descend away from the aircraft. Contributing to the occurrence were the failure to follow the GSE maintenance schedule and the absence of a requirement to visually inspect the locking mechanism of the passenger stand before use.

## *Safety Action Taken*

Air Canada has initiated the following safety actions:

- A comprehensive inspection was completed on all Air Canada passenger stands within 48 hours of the accident. All pawl mechanisms have been painted in contrasting colours to facilitate determination of the pawl position, and support braces have been relocated so as not to impede the operators' view of the pawl. All airstairs units have been put on a weekly follow-up to ensure all checks are completed on time.
- The company has disseminated details of the occurrence to the Air Transportation Association of Canada, the International Air Transportation Association, and the Air Transportation Association of America.

A TSB Occurrence Bulletin containing details of the occurrence and relevant information about the unsafe condition has been sent to Transport Canada for dissemination to the aviation community.

Transport Canada is distributing a Commercial and Business Aviation Advisory Circular (CBAAC) to advise other operators using similar equipment of the potential for injury and the steps that may be taken to avoid similar occurrences.

*This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson Benoît Bouchard, and members Maurice Harquail, Charles Simpson and W.A. Tadros, authorized the release of this report on 22 October 1999.*