

Report 10-004: Hawker Beechcraft Corporation 1900D, ZK-EAQ
cargo door opening in flight, Auckland International Airport, 9 April 2010

The Transport Accident Investigation Commission is an independent Crown entity established to determine the circumstances and causes of accidents and incidents with a view to avoiding similar occurrences in the future. Accordingly it is inappropriate that reports should be used to assign fault or blame or determine liability, since neither the investigation nor the reporting process has been undertaken for that purpose.

The Commission may make recommendations to improve transport safety. The cost of implementing any recommendation must always be balanced against its benefits. Such analysis is a matter for the regulator and the industry.

These reports may be reprinted in whole or in part without charge, providing acknowledgement is made to the Transport Accident Investigation Commission.



Final Report

Aviation Inquiry: 10-004
Hawker Beechcraft Corporation 1900D, ZK-EAQ
cargo door opening in flight, Auckland International Airport
9 April 2010

Approved for publication: May 2011

Transport Accident Investigation Commission

About the Transport Accident Investigation Commission

The Transport Accident Investigation Commission (Commission) is an independent Crown entity responsible for inquiring into maritime, aviation and rail accidents and incidents for New Zealand, and co-ordinating and co-operating with other accident investigation organisations overseas. The principal purpose of its inquiries is to determine the circumstances and causes of occurrences with a view to avoiding similar occurrences in the future. Its purpose is not to ascribe blame to any person or agency or to pursue (or to assist an agency to pursue) criminal, civil or regulatory action against a person or agency. The Commission carries out its purpose by informing members of the transport sector, both domestically and internationally, of the lessons that can be learnt from transport accidents and incidents.

Commissioners

Chief Commissioner	John Marshall, QC
Deputy Chief Commissioner	Helen Cull, QC
Commissioner	Captain Bryan Wyness

Key Commission personnel

Chief Executive	Lois Hutchinson
Chief Investigator of Accidents	Captain Tim Burfoot
Investigator-in-Charge	Ian McClelland
General Counsel	Rama Rewi
Assessor	Richard Rayward

Email	inquiries@taic.org.nz
Web	www.taic.org.nz
Telephone	+ 64 4 473 3112 (24 hrs) or 0800 188 926
Fax	+ 64 4 499 1510
Address	Level 16, AXA Centre, 80 The Terrace, PO Box 10 323, Wellington 6143, New Zealand

Important notes

Nature of the final report

This final report has not been prepared for the purpose of supporting any criminal, civil or regulatory action against any person or agency. The Transport Accident Investigation Commission Act 1990 makes this final report inadmissible as evidence in any proceedings with the exception of a Coroner's inquest.

Ownership of report

This report remains the intellectual property of the Transport Accident Investigation Commission.

This report may be reprinted in whole or in part without charge, provided that acknowledgement is made to the Transport Accident Investigation Commission.

Citations and referencing

Information derived from interviews during the Commission's inquiry into the occurrence is not cited in this final report. Documents that would normally be accessible to industry participants only and not discoverable under the Official Information Act 1980 have been referenced as footnotes only. Other documents referred to during the Commission's inquiry that are publicly available are cited.

Photographs, diagrams, pictures

Unless otherwise specified, photographs, diagrams and pictures included in this final report are provided by, and owned by, the Commission.



Hawker Beechcraft 1900D, ZK-EAQ



Location of occurrence

Source: mapsof.net

Contents

- Abbreviations vii
- Data summary viii
- 1. Executive summary 1
 - Summary..... 1
 - Key Lessons..... 1
- 2. Conduct of the inquiry 2
- 3. Factual information 3
 - 3.1. Narrative..... 3
 - 3.2. Personnel information 4
 - 3.3. Aircraft information 4
 - 3.4. Closed-circuit television recording..... 6
- 4. Analysis 8
- 5. Findings 10
- 6. Safety actions..... 11
 - General 11
 - Safety actions addressing safety issues identified during the inquiry..... 11
- 7. Key Lessons..... 12
- Appendix 1: Submissions received..... 13

Figures

Figure 1 Annunciator light panel 4
Figure 2 Cargo door ZK-EAQ – after the incident 4
Figure 3 Cargo door ZK-EAQ 5
Figure 4 Cargo door locked..... 6
Figure 5 Cargo door unlocked 6

Abbreviations

Commission	Transport Accident Investigation Commission
DDPG	dispatch deviation procedures guide
MEL	minimum equipment list
TEM	threat and error management
UTC	universal co-ordinated time

Data summary

Aircraft particulars

Aircraft registration:	ZK-EAQ
Type and serial number:	Hawker Beechcraft Corporation 1900D ¹ , UE 363
Number and type of engines:	2 Pratt & Whitney Canada PT6A-67D turboprops
Year of manufacture:	2002
Operator:	Eagle Airways Limited
Type of flight:	scheduled air transport
Persons on board:	12
Captain's licence:	air transport pilot licence (aeroplane)
age:	29
total flying experience:	3815 hours (2370 hours on type)
First officer's licence:	commercial pilot licence (aeroplane)
age:	25
total flying experience:	2555 hours (1210 hours on type)
Date and time	9 April 2010, 0813 ²
Location	Auckland International Airport latitude: 37° 00.5' south longitude: 174° 47.5' east
Injuries	nil
Damage	minor

¹ Hawker acquired Beechcraft from Raytheon Aircraft Company in March 2007.

² Times in this report are New Zealand Standard Time (UTC +12 hours) and are expressed in the 24-hour mode.

1. Executive summary

Summary

- 1.1. On Friday 9 April 2010, ZK-EAQ, a Beechcraft 1900D aeroplane, departed from Auckland International Airport. As the aeroplane became airborne the rear cargo door opened. The crew returned and landed the aeroplane safely. There were no injuries and minor damage only to the aeroplane.
- 1.2. The aeroplane was being operated with a permitted inoperative warning system that provided an indication to the crew when the cargo door was unlocked. An engineer had cleared the aeroplane to operate provided a crew member visually checked that the door was closed and locked before each departure. As the aeroplane was prepared for departure, the loader closed the cargo door but did not fully rotate the handle to lock the door. The first officer was distracted during the final pre-flight inspection of the aeroplane and did not positively check the condition of the door.
- 1.3. The captain and first officer did not adequately confirm that the cargo door had been visually checked and confirmed locked before departure. As the aeroplane was taxied, the door handle vibrated loose, allowing the door to open during the take-off.
- 1.4. As a result of the safety actions taken by the operator, the Commission did not need to make any recommendations.

Key Lessons

- 1.5. The lessons to be learned from this incident were relevant to all pilots and included:
 - cargo doors and other openings on an aircraft must be securely latched and positively checked before flight,
 - the need to strictly follow and complete checklists, and
 - should there be an interruption of a checklist, the checklist should be recommenced either from the beginning or the last confirmed item completed.

2. Conduct of the inquiry

- 2.1. The Transport Accident Investigation Commission (the Commission) was first notified of the incident by the operator at 0910 on Friday 9 April 2010, approximately one hour after the occurrence. The operator was directed to remove the aeroplane from the tarmac to a secure location to await the arrival of Commission investigators, who subsequently arrived at Auckland International Airport at about 1400 that same day.
- 2.2. The aeroplane was inspected and released back to the operator at about 1730 the same day. Interviews were held with the crew of ZK-EAQ, local ground handling staff and the operator. Witness statements were obtained from air traffic service staff on duty and aeroplane documentation was reviewed. This report summarises that information.
- 2.3. On 24 March 2011 the Commission approved the report for circulation to interested persons for comment. The Commission received 2 submissions, which have been considered when approving this final report.
- 2.4. The final report was approved for publication on 26 May 2011.

3. Factual information

3.1. Narrative

- 3.1.1. On Friday 9 April 2010, Eagle 854 was a scheduled flight from Auckland International Airport to Whangarei using ZK-EAQ, a Hawker Beechcraft Corporation 1900D (Beech 1900D) aeroplane. The aeroplane was operated by Eagle Airways Limited (the operator), one of the Air New Zealand group of companies. On board the aeroplane were 10 passengers and a crew of 2 pilots.
- 3.1.2. The aeroplane had earlier that morning been flown from Kerikeri to Auckland by another crew, landing at Auckland at about 0735. The crew of Eagle 854 reported for duty at 0720 and met the arriving crew as part of their flight preparation. The crew of Eagle 854 reviewed the aircraft documentation and noted an entry in the aircraft technical log that stated that the cargo door annunciator light³ remained illuminated after the door was closed (see Figure 1). There was no associated master warning indication, so an engineer had cleared the aircraft for flight in accordance with the operator's Dispatch Deviation Procedures Guide (DDPG) with the condition that a crew member confirmed by visual inspection that the door was latched prior to each departure.⁴
- 3.1.3. ZK-EAQ was parked at gate 34 of the domestic terminal, positioned heading away from the terminal area and passenger access point. After the aeroplane had been refuelled, the first officer positioned himself near the left wing of the aircraft to direct boarding passengers around the wing and towards the entry door on the forward left side of the aeroplane. The captain meanwhile was on board the aeroplane completing his before-start checks. A loader was also present to assist with loading baggage and dispatching the aeroplane.
- 3.1.4. After the last bag had been placed in the cargo hold, the loader said that he lowered the rear cargo door, rotated the handle to the horizontal position and moved to the front of the aircraft and removed a "fast bag"⁵ trolley in preparation for engine start. The first officer, after escorting the last passenger to the entry door, donned his hi-visibility vest and started his final walk-around inspection of the aeroplane before boarding and joining the captain.
- 3.1.5. The gate area was monitored by closed-circuit television, which recorded the scene described above. See section 3.4 for a fuller description of the recording and of the actions of the first officer and loader. The captain later commented that after the first officer had boarded the aeroplane, they discussed the cargo door warning light remaining illuminated as expected from the DDPG entry. The first officer confirmed he had checked the cargo door, so the crew continued their preparations for departure.
- 3.1.6. At 0807, about on schedule, the engines were started and ZK-EAQ taxied for take-off. At about 0815, ZK-EAQ commenced its take-off roll on runway 05. As the aeroplane lifted off, the passengers and crew heard a loud noise from the rear. At the same time, several control tower staff observed that the cargo door was almost fully open.
- 3.1.7. The crew suspected the cargo door had opened, and this was confirmed shortly after by the tower controller, so they initiated a return to the aerodrome. The aeroplane was landed at about 0820 and returned to the gate to offload the passengers. There were no injuries and minor damage only to an antenna and a cargo door gas strut. No baggage was lost overboard (see Figure 2).

³ A device that gives off a sound or light to indicate which of several electrical circuits is active.

⁴ The DDPG was also known as a minimum equipment list (MEL).

⁵ The "fast bag" trolley was a small trolley available to collect passengers' excess baggage for stowage in the cargo hold. A set of scales was available to record baggage weight.



Figure 1
Annunciator light panel



Figure 2
Cargo door ZK-EAQ – after the incident

3.2. Personnel information

- 3.2.1. The captain held an air transport pilot licence (aeroplane), a category B instructor rating and a current Class 1 medical certificate. He had accrued a total of 3815 flying hours, including 2370 hours on the Beech 1900D. He had joined the operator in 2006 and obtained his captaincy qualification in December 2007.
- 3.2.2. The captain's most recent line and instrument checks had been completed on 27 November 2009. He had flown 14 hours in the preceding 7-day period and 38 hours in the preceding 30-day period. The captain had had a 21-hour break from duty preceding the incident flight. He reported having had a good night's sleep and being in good health.
- 3.2.3. The first officer held a commercial pilot licence (aeroplane), category B and D instructor ratings and a current Class 1 medical certificate. He had accrued a total of 2555 flying hours, including 1210 hours on the Beech 1900D. He had joined the operator in February 2008.
- 3.2.4. The first officer's most recent line and instrument checks had been completed on 3 March 2010. He had flown 15 hours in the preceding 7-day period and 32 hours in the preceding 30-day period. The first officer had had a 15.5-hour break from duty preceding the incident flight. He reported having had a full night's sleep and being in good health.
- 3.2.5. The operator and training records of both pilots were reviewed and nothing of note was found.
- 3.2.6. The loader responsible for the loading of ZK-EAQ had joined the operator in 2002 and qualified as a loader on the Beech 1900D soon afterwards. He had previously been a loader with another airline. A review of his training and personnel records identified nothing of note.

3.3. Aircraft information

- 3.3.1. ZK-EAQ was a Hawker Beechcraft Corporation 1900D, low-wing, pressurised aeroplane capable of carrying 19 passengers and a crew of 2. The aeroplane had been manufactured in the United States in 2002 and was powered by 2 Pratt & Whitney Canada PT6A-67D turboprop engines. The operator had taken possession of the aeroplane shortly after it was manufactured.
- 3.3.2. The aeroplane had one normal entry door located behind the flight deck on the left side. A larger cargo door was located at the rear of the aeroplane, also on the left side. The cargo door was hinged at the top and opened outwards and upwards. The door was opened from the outside by a button and handle located at the bottom of the door. A rotation of the handle moved 6 camlocks, 3 on each side of the door, and 4 latch pins at the bottom of the door.
- 3.3.3. To open the door, the button was first depressed and held in while the handle was rotated through about 75° in a clockwise direction until nearly vertical, which released the locks. Two

gas struts on each side of the door helped the door to swing open and restricted its upward travel.

- 3.3.4. To close the door, a lanyard or strap normally stowed along the inside bottom of the door was pulled down to enable the exterior handle to be grabbed. With the door still partially open, the lanyard would be stowed. The door would then be closed and the handle rotated in an anticlockwise direction until horizontal, which would engage the camlocks and pins. The button would then pop out to indicate the locks had engaged. A viewing port located on the cargo door, about 50 centimetres forward of the handle, provided a back-up indication; the door was locked if a vertical line was visible through the viewing port, (see Figure 3).

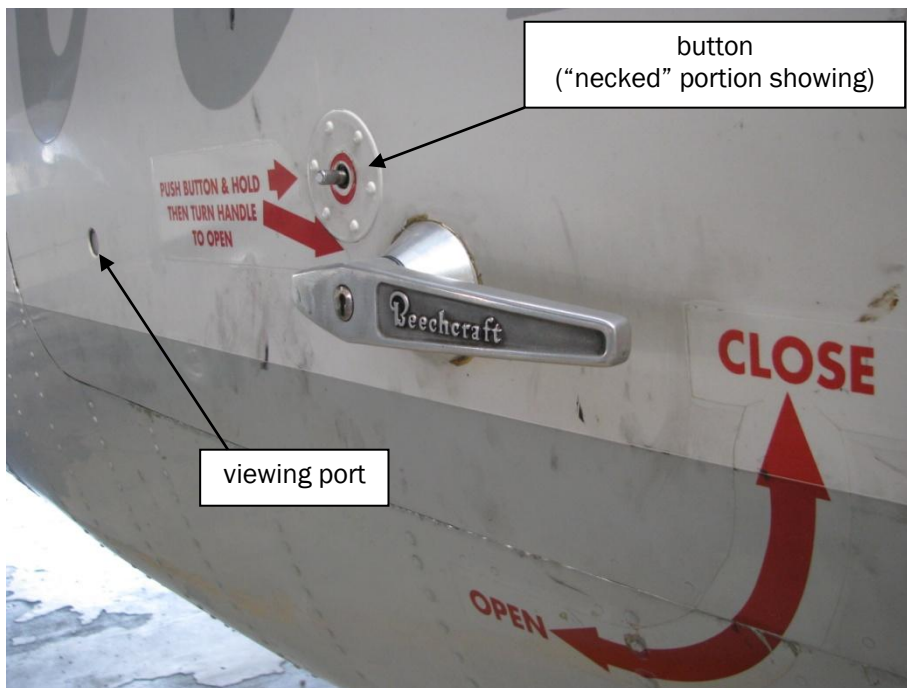


Figure 3
Cargo door ZK-EAQ

- 3.3.5. An examination of the cargo door after the incident confirmed that there was some “play” in the door handle. The handle could be rotated until nearly horizontal, which only partly engaged the locks but not enough to lock them fully and pop the button indicator. The original bright colour of the button had faded to a bare metal colour since manufacture (see Figures 4 and 5).
- 3.3.6. The correct engagement of the locks normally extinguished a warning light on the annunciator panel on the flight deck. The previously mentioned door warning indication fault was traced to one of the 6 lock micro-switches being loose and not making contact. An adjustment of the door rigging corrected the fault.



Figure 4
Cargo door locked



Figure 5
Cargo door unlocked

Operator procedures

3.3.7. The operator's procedures directed that the first officer was responsible for the final "walk-around" inspection after passengers had boarded and before engines were started. It was normal practice for the first officer to conduct the walk-around in a clockwise direction, starting at the forward entry door, moving around the front of the aeroplane to the right wing, to the tailplane and back around the left wing to enter the aeroplane. The operator's flight operations manual directed that as part of the inspection the first officer was to:

Check the cargo hold, ensure that the baggage is labelled for the correct destination and the volume is consistent with the weight of baggage recorded on the load sheet. If the aircraft is still being loaded, closing of the cargo door can be delegated to the trained loading personnel. The thumbs up signal from the loader must be obtained and the cargo door annunciator light must be out prior to engine start.⁶

3.3.8. The operator's DDPG listed defects that could be deferred for a stipulated period of time or number of flights before rectification, thereby allowing the aircraft to continue operating. On the day before the incident, the cargo door annunciator light was found to remain illuminated after the cargo door had been confirmed closed and locked. The door system was checked by an engineer and an entry made in the aircraft's technical log as described earlier.

3.3.9. The operator confirmed that a "visual inspection", as prescribed by the rectification deferral in the aeroplane technical log, should consist of the first officer checking that the handle had been rotated fully anticlockwise and was locked, the button had popped out and the vertical line could be seen in the viewing port. The above task was to be performed by a crew member and could not be delegated to a loader.

3.3.10. The operator's procedures stated that when external power was used for engine starting, the nose wheel chocks were to remain in place until after the start and the loader was then to be instructed by the crew to remove them.

3.4. Closed-circuit television recording

3.4.1. An airport company closed-circuit television camera was mounted on a light stand near gate 34 and recorded much of the activity around ZK-EAQ before it departed the gate. The recording from the camera was viewed by the Commission. Although the camera normally recorded the gate 34 area, it would also automatically and regularly scan the general area before returning to point towards gate 34.

3.4.2. The recording commenced with the first officer near the left wing tip of the aeroplane and directing passengers from the terminal exit, around the aeroplane and to the entry door. The

⁶ Eagle Airways Limited Flight Operations Manual, "FOM 2 Page 4 of 2", effective 1 June 2009.

cargo door was observed to be open and the lanyard hanging from the door. The loader was seen approaching the cargo door from the rear of the aeroplane and lowering the door using the lanyard. He stowed the lanyard and closed the door. The loader, however, could not recall if he intended locking the door fully or intended just to catch the door to stop it swinging open again. The combination of camera position and the aeroplane's high tailplane obscured the cargo door handle.

- 3.4.3. The loader remained by the cargo door for about 90 seconds, during which time the first officer escorted the last of the passengers from the left wing tip to the entry door. After the last passenger had entered the aeroplane the first officer donned his hi-visibility vest and commenced the final walk-around. As the first officer moved around the right side of the aeroplane the loader moved to the front of the aeroplane, pulling the chocks from the nose-wheel and placing them on the fast bag trolley.
- 3.4.4. Out of full view of the camera, the first officer removed the safety cone positioned near the rear of the aeroplane and placed it by the terminal exit door, some 15 metres behind the aeroplane. The loader was then observed pulling the trolley towards the left wing tip of the aeroplane, where he was stopped by the first officer, moving in what appeared to be an almost direct line from the terminal to the left wing tip. After a short conversation, the loader replaced the chocks under the nose wheel and removed the trolley, while the first officer entered the aeroplane and closed the entry door.
- 3.4.5. About one minute later the engines were started and the external power supply disconnected and removed. As ZK-EAQ was about to taxi, the camera began to scan the general tarmac area and away from the aeroplane. When the camera scanned back towards gate 34, ZK-EAQ had taxied clear of the gate and the cargo door and position of the handle could not be seen.

4. Analysis

- 4.1. The release of an outward opening door on any aircraft is a serious event, more so on a pressurised aircraft where the force of the opening could result in secondary damage that could affect the control of the aeroplane. The procedures for ensuring door security are therefore critical.
- 4.2. The incident was a result of the door not being closed properly by the loader and then the first officer not checking that it was locked as he was required to do. It also involved a number of unchecked assumptions being made by the loader, first officer and captain about the actions or intended actions of others. The DDPG requirement for a crew member to check the security of the cargo door rather than rely on the loader was a defence⁷ against the door inadvertently not being closed properly, which replaced the usual defence provided by the door-closed annunciator in the cockpit. The crew not following that requirement removed that defence.
- 4.3. The original fault of the cargo door annunciator light remaining illuminated after the door was closed and locked was not critical provided a crew member visually confirmed the door was locked. However, during the final walk-around inspection the first officer was interrupted in his task, by having to remove the cone at the rear of the aeroplane and then seeing the chocks had been removed. The practice of allowing a loader to close and lock the cargo door probably led the first officer to believe the loader had done so on this occasion, but this was no defence for him not to follow a specific instruction; to check it himself. The faded paint on the visual lock indicator meant positive confirmation of the door being closed required a close-up check of the indicator, but the checker needed to be close anyway in order to check the sight glass.
- 4.4. The need to remove the cone from near the rear of the aeroplane should not have been a concern as this was commonly required. The removal of the nose wheel chocks was not normal and was a greater distraction for the first officer. When interrupted during a checklist or routine, the person running the checklist should return to the point in the checklist where he or she was interrupted from task, or if that is unclear, start the routine again.
- 4.5. The closed-circuit television recording suggested that the loader was waiting by the cargo door for the last passenger to arrive. The majority of passengers did not utilise the fast bag trolley service, so probably in anticipation that there would be no final baggage being placed on the fast bag trolley he pulled the cargo door down and rotated the handle, probably to about the horizontal position. The loader could not recall if this action was intended to lock the door or simply catch the door to stop it swinging open. After the last passenger had passed the trolley and boarded the aeroplane, the loader moved forward to remove the nose-wheel chocks and trolley in preparation for the start.
- 4.6. The loader had, however, forgotten that external power was to be used for the start, so the chocks needed to remain in place until after the start. As the first officer returned towards the aeroplane after removing the safety cone at the rear, he saw the loader had removed the chocks, so went directly to the loader to instruct him to replace the chocks. The first officer possibly looked in the direction of the cargo door as he passed the left side of the aeroplane, and seeing the handle was in about the horizontal and locked position he assumed the loader had closed and locked it. It was not uncommon for a loader to close and lock the cargo door, allowing the first officer to return almost directly to the flight deck. The cargo door annunciator light in the cockpit was the final defence for the pilot to know the door was closed and locked. With the fault in the micro-switch that defence was removed but replaced by the additional requirement that a pilot physically check the door. An additional defence would be to require anyone permitted to close an aircraft external door to complete the process and lock the door, even if another person is responsible for cross-checking that it has been done.
- 4.7. After the first officer had completed his pre-flight inspection and re-entered the aeroplane in preparation for engine start, the crew reportedly discussed the illuminated “cargo door open” annunciator light. Both pilots were satisfied the door had been checked as required and was closed and locked. However, the final walk-around inspection and checking of the cargo door was a repetitive exercise undertaken numerous times each day, with the actions possibly

⁷ The term “defence” is used to describe a measure taken to remove, mitigate or protect against a hazard, as used by Professor James Reason’s in his model on accident causation, commonly called “The Swiss Cheese Model”.

becoming automated. The discussion between the 2 pilots was not robust enough to challenge the mindset that the first officer had probably formed: that the loader had closed and locked the door.

- 4.8. The operator's pilots were instructed in "threat and error management" (TEM) as part of their normal training cycles. TEM provided a systemic approach to aviation safety, giving a framework for understanding and directing human performance. The use of these TEM skills by the crew could have prevented the incident. If both pilots had recognised when reviewing the maintenance log before flight that the defective cargo door warning system was a "threat" to safety of flight, they almost certainly would have paid close attention to the DDPG requirement for a crew member to confirm visually that the door was locked before flight. Further, prior to engine start the crew could have confirmed what specific actions the first officer had taken to ensure the threat was managed, for example that the handle had been confirmed locked and the indicators checked.
- 4.9. An examination of the handle confirmed that it was possible to align the handle about horizontal, but owing to the play in the handle the locks would not engage until the handle had been pushed firmly slightly past the horizontal and the button had popped. The fading of the button colour degraded its effectiveness as an indicator and as a warning to pilots that the door was possibly insecure.
- 4.10. With the locks not being fully engaged, the vibration generated during the taxi to the take-off position was sufficient to cause the locks to back off. The locks finally released and the door opened at about the point of rotation during take-off. The take-off speed is lower than the speed the aeroplane normally achieves in the cruise. Had the door opened while the aeroplane was in the cruise phase of flight or descending the risk of it detaching and damaging control surfaces around the rear of the aeroplane was higher.
- 4.11. Because of the safety actions taken by the operator, the Commission has made no recommendations (see section 6 of this report).

5. Findings

The following findings are not listed in any order of priority:

- 5.1. The locking arrangement for the cargo door was designed so that it would not unlatch in flight if properly closed. The fact that it opened in flight on this occasion means that it had not been properly closed.
- 5.2. The cargo door handle rigging had some play that was able to be rectified later, but this did not prevent the door being properly secured.
- 5.3. The faulty cargo door sensor effectively removed a source of warning to the crew that the cargo door might not be properly secured, a risk that should have been mitigated by the special requirement for the first officer to physically check the security of the cargo door before flight, which was not done.
- 5.4. An operator's instruction that if the cargo door was closed it had to be locked and checked by the person closing it would have reduced the risk of the door being inadvertently left unlocked at the end of routine operations,
- 5.5. The interruption of the first officer's walk-around check and his assumption that the loader had secured the cargo door, and the captain's acceptance that the first officer had performed the special door check, were not consistent with the principles of TEM.

6. Safety actions

General

- 6.1. The Commission classifies safety actions by 2 types:
- (a) safety actions taken by the regulator or an operator to address safety issues identified by the Commission during an inquiry that would otherwise result in the Commission issuing a recommendation; and
 - (b) safety actions taken by the regulator or an operator to address other safety issues that would not normally result in the Commission issuing a recommendation.
- 6.2. The following safety actions are not listed in any order of priority.

Safety actions addressing safety issues identified during the inquiry

On 15 May 2010 the operator advised the Commission that the following internal safety recommendations were being actioned:

- (a) *That painting of the necked portion of the door button collar is undertaken for easier visual confirmation that it has been engaged and the door is locked.*
- (b) *Additions to the AirNZ PPM [Policy and Procedures Manual] training data of the cargobutton operation and functionality.*
- (c) *That DDPG (MEL) procedures are amended to include both crew members confirm the cargo door is locked in cases where the annunciator light is inoperative and rectification has been deferred and:*
- (d) *SOPs [standard operating procedures] specifically SOP 1.10.4.6 are amended to include reference to ensuring the door is locked following a check of the cargo hold.*
- (e) *That the DDPG (MEL) Item 52.2 Cargo door annunciator is moved from Category 'C' (10 day deferral period) to a Category 'B' (3 day referral period) item to reduce exposure to continued operations with the aircraft in this configuration.*
- (f) *That Auckland ramp monitor the activities of loaders with the intention of eliminating any practice whereby the B1900 cargo door is left in the closed position and unlocked.*
- (g) *That this occurrence becomes part of the Organisations CRM [crew resource management] training course, to ensure crew learn from the set of circumstances which resulted in the First Officers walk around not being completed and the subsequent occurrence.*

7. Key Lessons

- Cargo doors and other openings on an aircraft must be securely latched and positively checked before flight;
- the need to strictly follow and complete checklists; and
- should there be an interruption of a checklist, the checklist should be recommenced either from the beginning or the last confirmed item completed.

Appendix 1: Submissions received

1. The Commission received submissions on the draft final report from:
 - (a) The captain and loader.
2. The submissions received have been considered and, where appropriate, reflected in this report.



**Recent Aviation Occurrence Reports published by
the Transport Accident Investigation Commission
(most recent at top of list)**

- 10-003 Cessna C208 Caravan ZK-TZR engine fuel leak and forced landing, Nelson, 10 February 2010
- 10-006 Runway Incursion, Dunedin International Airport, 25 May 2010
- 10-001 Aerospatiale-Alenia ATR 72-212A, ZK-MCP and ZK-MCJ, severe turbulence encounters, about 50 nautical miles north of Christchurch, 30 December 2009
- 09-002 ZK-DGZ, Airborne XT-912, 9 February 2009, and commercial microlight aircraft operations
- 10-009 Interim Factual: Cessna C152 ZK-JGB and Cessna C152 ZK-TOD, mid-air collision, near Feilding, Manawatu, 26 July 2010
- 09-007 Piper PA32-260, ZK-CNS, impact with ground following a loss of control after take-off, near Claris, Great Barrier Island, 29 September 2009
- 09-005 Cessna 182N ZK-FGZ and Bombardier DHC-8 Q311 ZK-NEF, loss of separation and near collision, Mercer, 40 km south of Auckland, 9 August 2009
- 08-007 Robinson Helicopter Company, R22 Alpha ZK-HXR, loss of control, Lake Wanaka, 1 November 2008
- 09-006 Cessna 207, ZK-DEW aircraft starting incident resulting in runway incursion, Queenstown Aerodrome. 5 September 2009
- 09-004 Britten Norman BN2A-Mk III Trislander, ZK-LOU loss of engine propeller assembly, near Claris, Great Barrier Island, 5 July 2009
- 08-005 Kawasaki-Hughes 369D, ZK-HWE, un-commanded yaw and loss of control, Maori Saddle, near Haast, Westland, 11 August 2008
- 08-001 Cessna 152 ZK-ETY and Robinson R22 ZK-HGV, mid-air collision, Paraparaumu, 17 February 2008
- 07-006 Hawker Beechcraft Corporation 1900D, ZK-EAK, landing gear malfunction and subsequent wheels-up landing, Woodbourne Aerodrome, Blenheim, 18 June 2007

Price \$24.00

ISSN 1179-9080 (Print)
ISSN 1179-9099 (Online)