COMMISSION OF INQUIRY REPORT
INTO THE CRASH OF A CHINOOK HELICOPTER
IN AFGHANISTAN ON 30 MAY 2011
INVOLVING THE DEATH OF LT MARCUS CASE

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1. On 24 Mar 12 GENERAL D.J. Hurley, AC, DSC, Chief of the Defence Force appointed a Commission of Inquiry for the purpose of inquiring into a matter concerning the Defence Force, namely the crash of a CH-47D helicopter in Afghanistan on 30 May 2011 involving [ID No] LIEUTENANT (LT) Marcus Case. The following is an Executive Summary of the Report prepared by the Commission of Inquiry following its investigation into the subject crash and the death of LT Case.

2. Members of Rotary Wing Group 6 (RWG6) deployed to Afghanistan in early February 2011 for the purpose of operating two Chinook (CH-47D) aircraft as part of OPERATION SLIPPER.

3. During such deployment the Commanding Officer of RWG6 instigated a program for the carriage of passengers on RWG6 aircraft for the stated purpose
of familiarisation flights. In the course of that program members of RWG6 authorised, approved, permitted or engaged in the carriage of passengers on RWG6 aircraft in the course of a number of missions conducted by RWG6 members during such deployment up to and including 30 May 11.

4. In a number of instances the carriage of such passengers on familiarisation flights was not essential i.e. indispensable to the passenger’s mission in Afghanistan, nor to the mission of RWG6 in Afghanistan, and was therefore contrary to Joint Task Force 633 Standing Instructions (JTF633 SI (73)) requiring such carriage to be mission essential.

5. In a number of instances members of RWG6, utilising the definition of crew in DCA Directive 04/09 namely, suitably qualified personnel specifically authorised to assist in the operation of aircraft, categorised such passengers as crew on the basis that they were available to assist air crew, as required, in tasks requiring no formal qualifications, for example, assisting in loading or unloading of cargo. DCA Directive 04/09 regulating the carriage of passengers on an army aircraft in an Operational Contingency Loading (OCL) configuration, i.e. when not properly seated or restrained on approved aircraft seating, did not apply to crew.

6. As a consequence of such categorisation persons who were not suitably qualified to assist in the operation of aircraft and who should properly have been
categorised as passengers, and in that category confined to approved seating on RWG6 aircraft pursuant to the requirements of **DCA Directive 04/09**, were instead carried in OCL configurations including on the tail ramp of such aircraft contrary to the requirements of such Directive.

7. On 30 May 11 LT Case, a member of the Heron UAV detachment and not suitably qualified to assist in the operation of a CH-47D aircraft, was at his request being carried as a passenger on a mission in a serviceable RWG6 CH-47D aircraft A15-102 call sign "Brahman 12" when such carriage was not essential to his mission in Afghanistan, nor to the mission of RWG6 in Afghanistan. Although manifested as a passenger on the aircraft LT Case was categorised as crew, and as a consequence was carried in locations outside of approved seating in the aircraft, including on the ramp.

8. During the mission LT Case was attached to the aircraft by a Z51 Restraint Strap (restraint strap), which incorporated a fall arrest device. That end of the restraint strap at which the adjustment buckle and the fall arrest device were positioned was, contra to previous practice, attached to a 10,000 lb anchor point in the aircraft. The other end of the restraint strap was attached to an Air Warrior Aircrew Ensemble (AWAE) harness being worn by LT Case by an extension tether of .8 metre which linked with a karabiner and an attachment loop located at the rear of the AWAE. The combined length of this equipment in circumstances when the restraint strap was fully extended and the fall arrest
device deploying, was approximately 4.4 metres. As a consequence, in the event of the restraint strap becoming fully extended and the fall arrest device becoming fully deployed, there was the potential for LT Case to locate from the position where his strap as attached to the aircraft permitted, namely the tail ramp of the aircraft, to a position approximately two metres beyond such tail ramp.

9. In the course of the mission on 30 May 11 the aircraft encountered turbulence and experienced a large and uncommanded nose up pitch excursion of 15 to 20 degrees. In the absence of input by the Co-Pilot (CP), who was the flying pilot, the aircraft’s attitude commenced to oscillate in the pitch axis above and below the horizon, such oscillations immediately becoming divergent.

10. This phenomenon of pitch oscillation had been experienced previously by the CP and the Aircraft Captain (AC) as well as by other pilots in RWG6 and 5 Aviation Regiment (5 Avn Regt), although not of the same magnitude, and was known colloquially as “porpoising”.

11. In the absence of any formal advice, either during conversion training or by way of formal publications, as to how to deal with pitch oscillation, some RWG6 pilots, having engaged in informal discussions with other pilots about the matter, considered that an appropriate manner of dealing with it was to “freeze”
12. This procedure of “freezing” the controls of the aircraft in the pitch axis had been discussed in an RWG6 Safety and Standards meeting on 26 May 11, which the CP and the AC had attended and they left the meeting believing that such manner of dealing with “porpoising” had been collectively agreed to and endorsed by aircrew present at the meeting.

13. Accordingly, at the commencement of the oscillations after the initial pitch disturbance, the CP immediately froze the controls of the aircraft, such action being both directed and endorsed by the AC. This action failed to prevent the oscillations, which rapidly became divergent to a point reaching or exceeding the aircraft's flight limits of 30 degrees in the pitch axis in the third oscillation and ending with the fourth oscillation involving a nose down attitude in excess of 90 degrees. During the latter part of the fourth oscillation the AC took over the controls from the CP and after he made instinctive control inputs, the aircraft obtained a near straight and level hover attitude before impacting with the ground.

14. At the commencement of the oscillations LT Case was in an OCL configuration being seated together with the Aircrewman Technician on the
trailing edge of the aircraft ramp. As the oscillations commenced he, together with the Aircrewman Technician, moved back to a position in the vicinity of the hinge of the aircraft ramp but due to the forces then acting upon him could not relocate to approved seating in the aircraft.

15. In the course of the aircraft's oscillations LT Case, became weightless above the aircraft ramp in the vicinity of the hinge due to G forces and was ejected from the aircraft as it flew away from him causing his restraint strap, which had become fouled, in the Helicopter Integrated Cargo Handling System located in the vicinity of the 10,000 lb anchor point, to fully extend and the fall arrest device to fully deploy.

16. This left LT Case located approximately 2.2 metres aft of the trailing edge of the aircraft ramp. LT Case could not recover or be recovered from this position outside the aircraft and suffered a non-survivable injury when the aircraft crashed and impacted his person. The crew of the aircraft, who remained inside the body of the aircraft, survived the crash.

17. Tests carried out by the Defence Science and Technology Organisation and Aeronautical Research and Development Unit (ARDU) at Boeing Aircraft Systems facility in respect of pitch oscillations in CH-47D aircraft, subsequent to the accident, demonstrated that the method of seeking to deal with pitch
oscillation by freezing the controls and allowing the AFCS to damp the oscillations would be ineffective beyond pitch rates of five to ten degrees per second nose up or nose down and would place the aircraft and its occupants in danger.

18. The Commission received evidence from these two organisations that indicated that the correct method of dealing with an uncommanded pitch disturbance of a CH-47D was for the pilot to make immediate input into the aircraft's controls to rectify pitch attitude deviations larger than approximately plus or minus five degrees and to actively control the aircraft from that point on in order to prevent divergent pitch oscillation from occurring. This accorded with the views of the majority of experienced pilots who, when giving evidence to the Commission, described this recommended procedure as actively "flying the aircraft" and not being fully reliant on the AFCS.

19. Subsequent to the accident an Aviation Accident Investigation Team investigated and reported on the accident and made thirty-seven recommendations designed to address perceived deficiencies related to the accident. The majority of such recommendations have been implemented and the remainder are in the process of being implemented. Specifically Army Aviation has implemented a formal instruction process to train pilots of CH-47D aircraft in how to deal with pitch oscillation.
20. In broad compass the Commission found:

(i) That the method informally agreed on by RWG6 pilots during a Safety and Standards meeting on 26 May 11, for controlling pitch oscillation on CH-47D aircraft was incorrect and a causal factor in the RWG6 CH-47D aircraft A15-102 call sign Brahman 12 crashing in Afghanistan on 30 May 11. As a consequence of following such method the AC did not take control of the aircraft prior to the aircraft exceeding its flight limits.

(ii) Carriage on the RWG6 CH-47D aircraft A15-102 call sign Brahman 12 was not essential to LT Case’s mission in Afghanistan, or the mission of RWG6 in Afghanistan, and he should not have been permitted carriage on the aircraft. Having been given carriage on the aircraft he should have been treated as a “passenger” rather then “crew”, as those terms are defined in paragraph 8 of DCA Directive 04/09 and should not have been permitted to travel in an OCL configuration outside of approved seating in the aircraft.

(iii) RWG6 personnel, responsible for organising, approving, permitting or engaging in, the carriage of LT Case on RWG6 CH-47D aircraft A15-102 call sign Brahman 12 on 30 May 11 failed to properly understand, comply with, or ensure compliance with, inter alia, the requirements of JTF633 SI, DCA Directive 04/09 and SI (AVN) OPS 3-107 governing the carriage of passengers on RWG6 aircraft.
(iv) LT Case died as a result of being permitted to travel, and further, to travel in an OCL configuration on the tail ramp, in a serviceable aircraft that was allowed to depart from controlled flight and was not subsequently recovered to controlled flight in time to prevent the aircraft from impacting the ground.

21. In broad compass the Commission recommended:

(i) That the policies concerning the formal reporting of aviation incidents by way of Aviation Safety Occurrence Reports and Defence Aviation Hazard and Reporting Tracking System be re-enforced within all levels of ADF aviation with a view to providing a greater appreciation of potential safety issues within the wider ADF aviation community thereby giving that community the possibility of addressing and solving such issues in a timely manner.

(ii) The documents referred to in paragraph 20 sub paragraph (iii) hereof together with Special Flying Instructions and Standing Instructions relating to the carriage of passengers on CH-47D and other aircraft be reviewed and redrafted with a view to facilitating a proper understanding of their content and intent by those persons required to comply with the same in relation to the carriage of passengers on CH-47D and other aircraft.

(iii) The suitability of the Z51 Restraint Strap incorporating a fall arrest device, for use in CH-47D aircraft and other ADF aircraft, should be the subject of inquiry by the Airworthiness Authority.
COMMISSION OF INQUIRY REPORT
INTO THE CRASH OF A CHINOOK HELICOPTER (CH-47D)
IN AFGHANISTAN ON 30 MAY 11
INVOLVING THE DEATH OF LT MARCUS CASE

APPOINTMENT AND TERMS OF REFERENCE (TOR)

1. Andrew John Kirkham AM, RFD, QC was on 24 Mar 12 appointed, by General David John Hurley AC, DSC, Chief of the Defence Force, as President of a Commission of Inquiry (the Commission) to inquire into and report on a matter concerning the Australian Defence Force (ADF), namely the crash of a Chinook (CH-47D) helicopter in Afghanistan on 30 May 2011 (the accident), involving the death of Lieutenant Marcus Case (LT Case) in accordance with Terms of Reference (TOR) issued by the Appointing Authority. Also appointed to the Commission was Brigadier (BRIG) William Julian Andrew Mellor DSC, AM (Retired) and Group Captain (GPCAPT) Stephen John Fielder AM. On 20 Jul 12 BRIG Mellor, having retired from the Commission was replaced by Colonel (COL) Joseph Rears.
2. Appointed to assist the Commission was Privacy and Privacy.

3. In general, the Commission’s TOR require the Commission to examine and report on specified pre-accident issues, the accident itself and specified post accident and other issues. Specifically, the Commission was directed to receive into evidence and report on the Directorate of Defence Aviation and Air Force Safety (DDAASF) Aviation Accident Investigation Team’s (AAIT) Report (AAIR) into the accident which became Privacy.

BACKGROUND

4. Rotary Wing Group 6 (RWG6) comprising, among others, members of C Squadron (C Sqn), 5th Aviation Regt (5 Avn Regt) and 16 Aviation Brigade (16 Avn Bde) deployed to Afghanistan in February 2011 for the purpose of operating two CH-47D aircraft as part of Operation Slipper.

5. As the designation number indicates this was the sixth RWG to serve in this Area of Operations (AO). There had been two preceding rotations that had not been designated as RWGs.
6. [Soldier9] was the Commanding Officer (CO) of RWG6. [Soldier14] was the Executive Officer (XO), [Soldier7] was the Troop Commander (Tp Comd), [Soldier15] was the Qualified Flying Instructor (QFI) and [Soldier6] was the Operations Officer (OPSO).

7. The CO’s Operational Commander was [Soldier11] as the Commander (COMD) of Joint Task Force 633 (CJTF633) and his aviation technical control was administered through [Soldier29] as COMD 16 Avn Bde. RWGs within Joint Task Force 633 (JTF633) were designated as Task Group (TG) 633.7.

8. During such deployment the CO of RWG6 instigated a program for the carriage of passengers on RWG6 aircraft for the purpose of familiarising them with RWG6 operations (familiarisation flights). In the course of that program members of RWG6 organised, approved, permitted, or engaged in, the carriage of passengers on RWG6 aircraft in the course of a number of missions conducted by RWG6 members during such deployment up to and including 30 May 11.

9. Such familiarisation flights were required, pursuant to JTF633 Standing Instructions (SI) to be mission essential (JTF633 SI 73). JTF633 Force Protection SI does not define the term *mission essential* and it is not defined in the glossary SI Aviation (AVN) Operations (OPS) 0-102 or Australian Defence Force Publication (ADFP) 101 Defence Glossary. Consequently the Commission, in determining whether such familiarisation flights were mission essential, utilised the definition of the
word “essential” contained in the Oxford English Dictionary namely “indispensable or indispensably requisite or absolutely necessary”. For the purposes of this report the Commission has utilised the definition “indispensable”.

10. During the missions referred to in the preceding paragraph hereof a number of passengers were categorised as “crew”, pursuant to paragraph 8 c. of Deputy Chief of Army (DCA) Directive 04/09, by persons, organising, approving, permitting or engaging in such familiarisation flights, and by reason of such categorisation were treated as not being subject to Operational Contingency Loading (OCL) restrictions applicable to “passengers” pursuant to paragraph 8 d. of DCA Directive 04/09 which requires “passengers” to be carried on approved aircraft seating.

11. As a consequence of such categorisations a number of such passengers were carried on RWG6 aircraft in an OCL configuration i.e. when not properly seated or restrained on approved aircraft seating [paragraph 8 d. of DCA Directive 04/09] and were permitted to locate on the trailing edge of the aircraft ramp during flight (ramp riding) attached to the aircraft by a Z51 restraint strap incorporating a fall arrest device (the restraint strap) in turn attached to an Air Warrior Aircrew Ensemble (AWAE) being worn by such passengers.

12. LT Case was a 6th Aviation Regiment (6 Avn Regt) pilot attached to Task Unit (TU) 633.2.7 Heron Unmanned Aerial Vehicle (UAV) Detachment as a payload operator and had been in Afghanistan since 9 May 11. On 30 May 11 LT Case, having actively sought carriage on an RWG6 aircraft, was being carried as, and was manifested
as, a passenger on CH-47D A15-102 call sign Brahman 12 (the aircraft) for the purpose of familiarisation both with the operation of the aircraft, and with the terrain over which it was flying.

13. Although being manifested as a passenger, LT Case had been categorised as crew by persons organising, approving, permitting or engaging in, his familiarisation flight and as a consequence was, immediately prior to the happening of the accident, being carried in an OCL configuration on the ramp of the aircraft.

14. The crew of the aircraft were:
   - **Soldier1** Aircraft Captain, (AC);
   - **Soldier2** Co-Pilot (CP);
   - **Soldier3** Left Aircrewman (LA);
   - **Soldier4** Right Aircrewman (RA); and
   - **Soldier5** Aircrewman Technician (AT).

15. The mission on which the aircraft was engaged on 30 May 11 involved the recovery of a US Army UH60 (Black Hawk) helicopter from a position in Zabul Province at which it had conducted a precautionary landing the preceding day. A US Army Chinook CH-47F (call sign US CH-47F) accompanied the aircraft on the mission.

16. Shortly prior to the happening of the accident the aircraft was being flown by **Soldier2**, a D category pilot, whose pre-accident flying ability had been a matter of concern to more experienced aviators in RWG6.
17. While flying CH-47D aircraft during his deployment with RWG6 as well as other pilots in RWG6, had experienced uncommanded pitch excursions that had led to incidents of pitch oscillations. Other pilots within previous RWGs and C Sqn had also experienced incidents of both uncommanded pitch excursions and pitch oscillation, described colloquially as “porpoising”.

18. In the absence of formalised advice either within the CH-47D Flight Manual, by way of instruction of pilots during training, within the CH-47D Pilot Handling Notes (PHN), within the CH-47D Standards Manual (STANMAN) or any other Standards Systems advice, as to how pilots should handle incidents of pitch oscillations in CH-47D aircraft, and other pilots had engaged in informal discussions among themselves concerning the same.

19. As a consequence of such informal discussions considered that the appropriate method of dealing with uncommanded pitch oscillation was to centre and freeze (hold motionless) the controls of the aircraft in the pitch axis and allow the Advanced Flight Control System (AFCS) to fly the aircraft and damp the pitch oscillations. together with other pilots, also considered that the appropriate course was to institute, in conjunction with freezing the controls of the aircraft or in isolation, a left hand turn.

20. Following an incident on 8 May 11 in which had sought to deal with an uncommanded pitch oscillation event by freezing the controls, the AC with whom he was flying at the time, arranged for the issue of
“porpoising” and the manner of responding to it, to be raised on the agenda for discussion at the next RWG6 Safety and Standards Meeting which occurred on 26 May 11.

21. On 16 May 11 [Soldier2] failed in his attempt to obtain a pilot category upgrade to Category C. As a consequence, members of RWG6 arranged that he be taken on a remedial sortie on 24 May 11. Following the remedial sortie and a tutorial, the Troop QFI, [Soldier15] reported that he assessed [Soldier2] as competent, although needing to demonstrate a long-term trend of competent flying skills to progress within RWG6. A continuation of [Soldier2]'s Category D status was recommended by the Tp Comd on 24 May 11 and was formally awarded by the CO on 31 May 11.

22. On 26 May 11, i.e. four days prior to the accident, an RWG6 Safety and Standards meeting took place between 1458 h and 1700 h. Prior to this meeting no RWG6 personnel had sought to obtain any external advice in relation to methods for recovery from an incident of uncommanded pitch oscillation. In the course of this meeting pilots and aircrew discussed among themselves what procedures or actions should be utilised to manage and recover from an incident of “porpoising”.

23. Paragraph 23 of the minutes of the RWG6 Safety and Standards meeting of 26 May 11 [_____________________] record as follows:

"Technique for correcting porpoising. Crew reactions and corrective actions for porpoising are varied; they are derived from personal experience and
previous troop member experience and passed on crew to crew by means of word of mouth. Porpoising in the Chinook is something that is talked about but not formally instructed or documented. There exists a need to PIRR [Publication Improvement Report Request] the CH-47 PHN to come up with a consolidated technique for correcting a porpoising aircraft. The source of porpoising was discussed and the initial actions of what to do during a porpoising event were repeated, i.e. freeze the controls and avoid putting in Pilot Induced Oscillations particularly in pitch. The concept of starting a small turn with increased power was discussed, highlighting the issue of tilting the lift vector and possibly increasing the acft's ROD [Rate of Descent]. It was discussed that there are a large number of factors to consider, such as acft altitude, terrain, further turbulence etc when making this decision. As per usual any actions such as freezing the controls or starting a turn need to be briefed to the crew.

Action PIRR - [Soldier15, Soldier16]

24. Persons present at the Safety and Standards meeting of 26 May 11 left with differing views as to the general discussion that occurred in respect of “porpoising”, and its outcome. However, [Soldier2, Soldier1] left the meeting believing that outcome of such discussions had been a general agreement and endorsement by those present that the correct technique for dealing with incidents of “porpoising”, was as
contained in the minutes, namely, to freeze the controls of the aircraft in order to avoid putting in pilot induced oscillations, and to institute a small turn.

25. Shortly prior to the accident the aircraft was the tail aircraft of the two aircraft recovery mission. Soldier2 was the CP and was flying the aircraft and Soldier1 was the AC. Approximately one minute prior to the accident, which occurred at 1536 h local time, the aircraft was in cruise flight at an airspeed between 110-120 knots indicated air speed (KIAS), at approximately 1500 feet above ground level and preparing for descent into the pickup zone in Zabul Province. At this time winds in the area were at approximately 10 knots. In addition atmospheric turbulence involving vertical gusts of 7-8 metres per second (roughly 15 knots) were present in the vicinity of the aircraft and were capable of initiating pitch oscillations in the aircraft.

26. In the vicinity of a saddle, within an area of numerous steep peaks and valleys, at a height between 200 and 1500 feet above ground level the aircraft, encountering such turbulence, commenced uncommanded pitch excursion initially pitching nose up to approximately fifteen to twenty degrees which became an oscillation when followed by a pitch nose down of the same magnitude. This was followed by a second pitch nose up, of approximately twenty five degrees followed by a pitch down of a similar magnitude i.e. the oscillations had become divergent.

27. In accordance with his belief that the accepted method of controlling “porpoising” was to freeze the controls, and pursuant to the specific directions of Soldier1 who
shared this belief that he should do so, Soldier2 in the course of the first pitch nose up froze and continued to freeze the controls. During the beginning of the second oscillation he initiated a small left hand turn. These actions did not succeed in damping the pitch oscillations and there occurred a third oscillation of thirty to fifty degrees nose up and a pitch down of a similar magnitude.

28. The fourth and final nose up pitch was in the order of fifty to eighty degrees followed by a nose down pitch in excess of ninety degrees [estimated to be one hundred and ten degrees], at which time the aircraft was at a low height above terrain. During the nose down sequence of the fourth oscillation, and as the aircraft passed through approximately ninety degrees nose down, Soldier1 who to that point had directed and approved of Soldier2's actions, took control of the aircraft and initiated an input action to bring the aircraft back to straight and level flight.

29. Soldier1 through his input onto the controls of the aircraft was able to slow the rate of descent at approximately five to ten feet above ground level, when the rising aircraft pitch attitude settled at approximately zero degrees and the airspeed was then close to zero. However, the aircraft continued its descent and impacted the terrain upright. It then rolled onto its right side coming to rest on its right-hand external fuel cell. The rotor systems were destroyed by ground impact during the rollover.

30. At the time that the uncommanded pitch oscillation commenced LT Case was seated on the trailing edge of the ramp of the aircraft where he had been positioned since the aircraft took off from Wolverine on what was to become its final sortie. He
was attached to the aircraft at the 10,000 lb anchor point by a restraint strap that incorporated a fall arrest device. The other end of the restraint strap was attached to an AWAE harness being worn by LT Case by an extension tether of .8 metre which linked to a karabiner and an attachment loop located at the rear of the AWAE. At the time the uncommanded pitch oscillation commenced LT Case’s restraint strap was properly adjusted so that it was almost taut while he remained seated on the trailing edge of the ramp.

31. At that point the restraint strap, the extension tether, the karabiner and the attachment loop collectively extended to approximately two metres from the 10,000 lb anchor point to which it was attached. As a result of its calculations the Commission considers that the restraint strap had been adjusted so as to leave approximately 700-750 mm by way of unused tail from the adjustment buckle. The end of the restraint strap attached to the 10,000 lb anchor point was the end at which the fall arrest device and the adjustment buckle of the restraint strap were located.

32. At the commencement of the uncommanded pitch oscillation and LT Case moved themselves approximately 2.4 to 2.6 metres backwards off the trailing edge of the ramp, to a position approximately level with the hinge of the ramp thereby creating slack in their respective restraint straps, and grasped each other’s hands. Both were then thrown violently about the cabin of the aircraft as it continued its oscillations and as a consequence lost contact with one another.
33. In the final and most violent pitch sequence LT Case, then being weightless as a consequence of G forces acting upon him, exited the aircraft from a position in a free point in space above the ramp causing the slack in his restraint strap to be taken up and the fall arrest device to deploy to its 1.5 metre extension length as the aircraft flew away from him. [Privacy]

34. At about the same time the adjustment buckle of the strap, as a result of it having become fouled between the Helicopter Internal Cargo Handling System (HICHS) and the airframe, was caused to open so as to allow the restraint strap to fully extend, in the absence of the normal restraint created by the buckle, to a length of 2 metres. At this time the restraint strap fully extended and with the fall arrest device fully deployed was approximately 3.6 metres in length. [Privacy]

35. These combined extensions together with the length of the AWAE extension tether of 0.72 metre, the length of karabiner attaching the extension tether to the AWAE, and harness stretch of approximately 0.3 metre [a total length of 4.6 to 4.7 metres] had the effect that when LT Case exited the aircraft he became located a distance of approximately 4.4 metres from the 10,000 lb anchor point on the aircraft to which his restraint strap was attached. In essence, his restraint strap extended a further .75 metre and the energy absorber extended to 1.5 metres giving a total of approximately 2.25 metres over and above the length of strap utilised in relation to his position when seated on the ramp. The effect of these extensions left LT Case outside the aircraft in a position located approximately 2 to 2.25 metres aft of the trailing edge of the ramp. [Privacy]
36. As a consequence of LT Case exiting the aircraft to the extent referred to in the preceding paragraph hereof he was unable to recover himself or to be recovered into the aircraft and was exposed to potential serious injury during the remainder of the pitch oscillation sequence prior to the accident.

37. At the time the aircraft impacted the ground LT Case was, by reason of the combined extensions of his restraint strap outlined in paragraphs 33 to 35 hereof, left positioned in the vicinity of the trailing edge of the ramp of the aircraft. He subsequently became located underneath the ramp the aircraft and suffered an extensive fracture to his skull when it was subjected to pressure exerted through the underside of the ramp. The fracture was non-survivable and LT Case died shortly afterwards as a consequence of the happening of the accident.

38. Subsequent to the happening of the accident the crew of the aircraft responded as best they were able, in following their downed aircraft drill procedures, although physically unable to activate the Engine Compartment Fire Extinguisher System as was required in the Emergency Checklist. Specifically, all aircrew were able to exit the aircraft without sustaining any additional injuries over and above those suffered at the time of impact.

39. The crew did as much as possible in the circumstances for LT Case in moving him to a place of safety from the fire engulfing the aircraft, in attempting resuscitation techniques and in his ultimate evacuation to a coalition medical facility at [Security]. The Commission notes that [US CH-47F] was in the immediate vicinity at the time of the
accident and its crew and support staff responded quickly to provide such assistance as they could including securing the area and evacuating LT Case and the remainder of the crew of the aircraft from the crash site. US CH-47F departed the crash site at 1558 h and arrived at [Security] at 1610 h. LT Case arrived at [Security] some 34 minutes after the crash [Security]. His Certificate of Death, signed by a member of a US forward surgical team, records the official time of his death as being 1624 h on 30 May 11. [Security]

40. While at [Security] the surviving aircrew received appropriate medical treatment for cuts, bruises, abrasions and smoke inhalation and received some support before being transferred to Kandahar. At the time of departure from [Security] to Kandahar coalition forces present at [Security] formed a Guard of Honour for LT Case. LT Case’s body and the five surviving aircrew arrived at Kandahar at approximately 2100 h 30 May 11. LT Case was formally identified at Kandahar by [ADF32], his CO [Security], and was thereafter accorded appropriate respects by way of a twenty-four hour piquet at Kandahar before being escorted home to Australia. [Security]

41. At Kandahar, blood samples were taken from the surviving aircrew for the purpose of toxicological screening. Screening for illicit substances for all members was negative. Screening facilities for alcohol concentration was not available at Kandahar and by the time the samples had been transferred to an appropriate facility they had deteriorated to the extent where they were no longer examinable. The Commission notes that clinical assessments by the attending coalition Navy Emergency Physician at [Security] and the ADF Aviation Medical Officer at
Kandahar reported that they were of opinion that there was no evidence of any alcohol consumption in the 72 hours prior to the accident, or earlier, by any crew member. 

At Kandahar the aircrew were visited and appropriately supported by their CO and Tp Comd. On their return to Australia, three members of the crew of the aircraft considered that some aspects of the support they received after the accident were inadequate and fell short of what they expected might occur in the circumstances.

The Commission draws the Appointing Authority’s attention to this evidence.

42. As aforesaid, the aircraft caught fire as a result of the impact. Fire was observed in the vicinity of the forward fuselage, the rear cabin and both engines. Attempts were made to extinguish the fires in the rear cabin and at number two engine, both attempts proving unsuccessful. No attempt was made to extinguish the fire in the vicinity of the forward fuselage and the number one engine. Ultimately the aircraft was largely destroyed by fire.

43. The Commission notes that the aircraft’s Crash Position Indicator, Flight Data Recorder and Cockpit Voice Recorder, were all unable to be recovered from the aircraft. A coalition Downed Aircraft Recovery Team attended the accident site and reported that no recorders were recoverable from the aircraft wreckage. The Commission, despite attempts to do so, were unable to obtain the details of the coalition personnel referred to in this report.
44. Approximately four hours after the crash, coalition ground forces, with requisite approval from appropriate ADF personnel, destroyed the remains of the aircraft to render innocuous some remaining engine, transmission and avionics components of the aircraft and to prevent any possible exploitation of the aircraft by insurgent elements.

ISSUES EXAMINED BY THE COMMISSION OF INQUIRY

45. Given the detailed nature of the AAIR and taking account of the thirty-four recommendations contained therein, and the state of the implementation of such recommendations, the Commission confined its examination to the following aspects of and issues contained in that Report as part of its general inquiry pursuant to its TOR:

a. The identification of uncommanded pitch oscillation and divergent pitch oscillation experienced by CH-47D aircraft and the manner in which the same was dealt with by members of C Sqn, 5 Avn Regt, previous RWGs and specifically members of RWG6 including at the time of the happening of the accident.

b. The carriage of passengers, in an OCL configuration on familiarisation flights on CH-47D aircraft, by members of C Sqn, 5 Avn Regt, previous RWGs and specifically members of RWG6 including at the time of the happening of the accident.
c. The design approval, acceptance and service release of the restraint strap, its operation and the utilisation of the same by LT Case at the time of the happening of the accident.

46. On 29 Feb 12 the Operational Airworthiness Authority (OAA), issued Directive 01-2012 requiring the implementation of the AAIR thirty-four recommendations. The extent of such implementation, confirmed by Soldier28 in his evidence, is set out in a chart annexed hereto as Soldier31, which indicates that the majority of the recommendations have been implemented.

47. The Commission has made its own recommendations later in this report in respect of Recommendation number 8 of the AAIT Recommendations dealing with the restraint strap.
POTENTIALLY AFFECTED PERSONS

48. Persons initially identified as Potentially Affected Persons (PAP) were legally assisted as hereunder:

- Soldier11 assisted by Privacy

- Soldier12 assisted by Privacy and later

During the course of the hearing he was removed as a PAP,

- Soldier9 assisted by Privacy

- Soldier13 assisted by Privacy During the course of the hearing he was removed as a PAP,

- Soldier1 assisted by Privacy

- Soldier7 assisted by Privacy

- Soldier2 assisted by Privacy

- Soldier5 assisted by Privacy

- Soldier4 assisted by Privacy

- Soldier3 assisted by Privacy

- LT Case’s family, formally through his father Privacy assisted by Privacy
During the course of the hearing Soldier6 was added as a PAP and was assisted by Privacy. Subsequent to the completion of the Commission’s hearings three further notices were sent to PAP being Soldier11 and Soldier8. They were assisted in respect of such notices; Soldier11 by his initial counsel, Soldier10 and Soldier8 by Privacy respectively.

EVIDENCE IN THE COMMISSION

49. The Commission received oral evidence from a total of 53 witnesses, nine of whom were recalled. All documents received in the course of the Commission’s investigations have been scanned onto the Commission’s folder on the Defence Records Management System, namely Objective. Documents specifically relevant to this report have been annexed to the report itself.

50. While the Commission is not bound by rules of evidence, its findings are based on the civil standard of proof, namely the balance of probabilities and where appropriate the Briginshaw standard. [ADFP 06.1.4 paragraph 7.78, Briginshaw v Briginshaw (1938) 60 CLR 336 at 361-363].

51. Not unexpectedly, the accounts of a number of the witnesses called to give evidence in the Commission concerning the circumstances encompassed in the TOR
were on occasions, confused, contradictory and a combination of recollection, reconstruction and hearsay. A number of witnesses stated that they had difficulty in recalling events.

52. There were differences in evidence given to the Commission by various witnesses concerning, inter alia, meetings, briefings, conversations, actions, times, dates and a number of other matters. Although formal minutes were kept in respect of the significant Safety and Standards meeting of 26 May 11 the participants' recollections varied as to what was said and by whom, and what was agreed upon and even who was in attendance. On other occasions no records were made of particular meetings or incidents.

53. Inevitably the evidence of some witnesses was preferred to that of other witnesses in relation to such differences and generally. This was not necessarily as a consequence of a perceived lack of credibility on the part of a witness whose evidence was not preferred but involved an assessment that in the particular circumstances of their involvement in the matter or matters being investigated, some witnesses' evidence was likely to be more accurate than the evidence of other witnesses in respect of the same matter or matters.

54. This report does not engage in the exercise of detailing all differences in witnesses' evidence, and providing reasons for preferring the evidence of one witness or group of witnesses over another or others, except where appropriate to do so. The
Commission has attempted, to the extent possible, to synthesise the many accounts of
the relevant events required to be addressed pursuant to the TOR and to put such events
in chronological order.

55. Outlines of specific evidence where appearing in the report replicate, as far as
possible, the actual words, manner and form in which such evidence was given, whether
in the form of a record of conversation a statement, an email or orally during the
Inquiry, but quotation marks have not been used to distinguish direct speech from those
instances where the evidence has been paraphrased or otherwise reduced to a more
concise or understandable form. Whilst transcript references have been provided
throughout this report the Commission has taken into account the totality of the
evidence in the compilation of this report.

56. No description, review or comment contained in this report should be taken as a
conclusion by the Commission that any disciplinary or criminal offence has been
committed by any person the subject of such description, review or comment.

57. Whilst the AAIR concerning the subject accident has been utilised by the
Commission in the course of its inquiries, the Commission has not relied on or utilised
any adverse comments contained in the report concerning any PAP or other persons.

58. Prior to finalising the report the Commission read and considered each of the
submissions received from each of the PAP. Those submissions, and the Commission’s
responses to the same, form part of the Commission’s records.
MATTERS INVESTIGATED BY THE COMMISSION

A. THE IDENTIFICATION OF UNCOMMANDED PITCH OSCILLATIONS AND DIVERGENT PITCH OSCILLATIONS EXPERIENCED BY CH-47D AIRCRAFT AND THE MANNER IN WHICH THE SAME WAS DEALT WITH BY MEMBERS OF C SQN, 5 AVN REGT, PREVIOUS RWGS AND SPECIFICALLY MEMBERS OF RWG6, INCLUDING AT THE TIME OF THE HAPPENING OF THE ACCIDENT.

CH-47D Description

General

59. The CH-47D helicopter is a twin turbine, tandem rotor medium lift helicopter manufactured by the Boeing Vertol Company (Boeing). The aircraft was developed from the CH-47C and entered service in 1984. It was designed for transportation of cargo, troops and weapons during day, night, visual and instrument meteorological conditions. The two T55-GA-714A turbo-shaft engines are located either side of the aft pylon and drive the front and rear rotors via a drive train system consisting of engine transmissions, a combining transmission, reduction transmissions and drive shafts. The three-bladed rotors are counter rotating, fully articulated and controlled independently.

60. Fuel is carried in pods on each side of the fuselage. The helicopter is equipped with four non-retractable landing gear assemblies. Entry and exit from the CH-47D is
available via four points. Each cockpit flight crewmember [AC and CP] have an emergency exit. An entrance door is at the forward right side of the cargo compartment. At the rear of the cargo compartment is a hydraulically powered loading ramp. The basic layout and dimensions of the CH-47D are presented in Figure 1.

Primary Flight Controls

61. The CH-47D is controlled using conventional helicopter controls; cyclic, collective and pedals. The primary flight control system is made up of a combination of mechanical and hydraulic components. Mechanical elements are the control linkages and mixing units, and the hydraulic elements are the lower and upper boost actuators. The control system is irreversible, in that forces in the rotor system are not transferred through to the pilot flight controls. Artificial control forces are applied in order to provide a ‘normal’ feel for the pilot.
The flight control system is powered by two independent hydraulic boost systems each operating at 3000 psi pressure. Control inputs from the cockpit are transmitted through mechanical linkages to the Integrated Lower Control Actuators.
(ILCA), which in turn transmit individual axis-oriented control motions to the mechanical mixing units. The mixed control outputs are then transmitted by a series of push-pull tubes to the upper boost actuators. Both the ILCA and upper boost actuators are dual systems, in that each actuator is powered by both hydraulic systems so in the event of a failure of one system the actuator continues to function. The location of various components of the flight control system is illustrated in Figure 2.

Figure 2: Chinook Flight Control System

Flight Control Augmentation

63. The CH-47D flight control system is augmented with an AFCS that both stabilises unintended aircraft motion and allows for the aircraft to be flown with a level
of autonomy based on airspeed, bank angle, heading and/or altitude. The AFCS will be further discussed later in this report.

The Accident Aircraft A15-102

64. The aircraft was originally built as a CH-47C, but subsequently was rebuilt to a CH-47D at 2184.5 airframe hours. The Commission accepts the AAIT conclusions that the aircraft had been correctly maintained, prepared and presented for flight and there were no significant Carried Forward Unsatisfactory (CFU). Table 1 contains the relevant details for the aircraft.

<table>
<thead>
<tr>
<th>Aircraft Manufacturer</th>
<th>Boeing Helicopters (Boeing Vertol)</th>
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<tr>
<td>Model</td>
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<tr>
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<td>Year of Manufacture</td>
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</tr>
<tr>
<td>Total airframe hours at occurrence</td>
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<tr>
<td>Last service</td>
<td>RI, R2, R4</td>
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<tr>
<td>Next service due date</td>
<td>S2 (5,169.1 AFHRS), RI (5,177.3 AFHRS)</td>
</tr>
</tbody>
</table>

**Table 1: CH-47D A15-102 Summary**

65. [Soldier17](#) was the TST Comd RWG6 and as such was responsible for the maintenance of the aircraft during that deployment. [Soldier17](#) gave evidence to
the Commission that the aircraft’s AFCS was checked by way of a Maintenance Test Flight on 16 Apr 11 and an AFCS Built in Test was carried out on 12 May 11. Both tests indicated that the AFCS on the aircraft was serviceable. His further evidence was that on 19 May 11 the aircraft underwent an “R4 service” which is carried out as a matter of routine maintenance after every 150 hours of service. The R4 service included maintenance test flight for a rotor track and balance. The aircraft completed its R4 service and was certified to be serviceable on 22 May 11. The details of all work carried out in the AFCS testing and the R4 service referred to in this paragraph are recorded in the Computer Aided Maintenance Manual (CAMM2) and the printout of that program in relation to the airworthiness of the aircraft prior to its flight on 30 May 11 was tendered as . At the time of being released for service on 30 May 11 the aircraft had ten CFU with the list of those CFU being . Soldier17’s evidence was that none of the CFU affected the aircraft so as to render it unserviceable and no in-flight anomalies were reported by the crew.

Aircraft Stability

66. In terms of aircraft stability there are two components; static stability and dynamic stability.

Static Stability

67. Static stability is the initial tendency of the aircraft to go back to the trim point
when it is disturbed. If a statically stable aircraft that was to be trimmed in a level attitude and was then disturbed nose up, it would tend to return back to the level condition. Conversely, if the aircraft was statically unstable, it would tend to diverge away from the trim condition in the direction of the disturbance. As an analogy, static stability can be thought of as a spring which is pushing the aircraft back to the trim attitude. This means that for a statically stable aircraft, when disturbed from its flight path, forces will be activated which will initially tend to return the aircraft to its original position.

68. Additionally, for a statically stable aircraft, there is also a positive control stick gradient with respect to airspeed. That is, to increase the aircraft’s airspeed, the cyclic control has to be progressively moved forward [forward stick] and to decrease the aircraft’s airspeed the cyclic control has to be progressively moved backward [backward stick]. Therefore, for a statically stable aircraft there is one stick position which corresponds to each airspeed. This is also known as being statically stable about an airspeed.

69. In summary, an aircraft which tends to return to its original trimmed position when disturbed is said to be statically stable. If, on the other hand, an aircraft tends to move farther away from the trimmed position when disturbed it is statically unstable. An aircraft has neutral static stability if it tends to do neither of these and prefers to remain in its new position.
Dynamic Stability

70. Dynamic stability is the aircraft motion over time that follows an initial disturbance. While static stability creates a force that tends to return the aircraft to its original trimmed attitude, it is the dynamic stability of the aircraft that determines the way it behaves when trying to return to the trimmed attitude. Dynamic stability is therefore the way that the restorative forces act with regard to time.

71. If an aircraft’s response is such that it returns immediately to the trimmed attitude without overshooting, it is statically stable and dynamically stable but it is highly damped and non oscillatory.

72. The returning forces may be so great that the aircraft will pass beyond the original position and continue in that direction until stability again tries to restore the aircraft into its original trimmed attitude.

73. If the oscillations become smaller and eventually return the aircraft to its original position the aircraft has positive static and positive dynamic stability. In this case, it is the property that dampens the oscillations set up by a statically stable aircraft.

74. If the oscillations become larger over time, swinging through the trimmed position with ever increasing magnitude, the aircraft is statically stable but dynamically unstable. These oscillations are said to be divergent.

75. The three possible oscillatory dynamic modes are shown in Figure 3.
Overall Stability

76. An aircraft’s overall stability is a result of these two components namely, static and dynamic stability. The aircraft can be statically stable or statically unstable, just as it can be dynamically stable or dynamically unstable. This is shown diagrammatically in Figure 4 showing possible pitch responses of a hypothetical aircraft over time following a pitch disturbance.
77. The red line in Figure 4 demonstrates the response of a statically unstable aircraft at time zero, with a disturbance pushing it up and away from the trim point. Being statically unstable, pitch attitude just begins to diverge away from the direction of the trim point; so the initial response is away from the trim point. The aircraft response in this case is divergent and non-oscillatory.

78. Figure 4’s green line shows the response of a statically stable and dynamically stable aircraft. After the initial disturbance, the aircraft’s long-term response in this case is to return to the trim point after a series of converging oscillations. The key point is that a statically stable and dynamically stable aircraft will return to the trim point in the long term.
79. The blue line in Figure 4 shows a typical response for an aircraft that is statically stable but dynamically unstable. The diagram depicts a situation where there are a series of oscillations and the magnitude of those oscillations is increasing with each oscillation. This is described as a divergent pitch oscillation.

**Longitudinal Stability – Unaugmented CH-47D**

80. When operating on the primary flight controls alone [with the AFCS deactivated] the CH-47D has no inherent attitude stability in the pitch axis. Without correction from the pilot the aircraft will tend to diverge from the trimmed pitch attitude. It is statically unstable. This aerodynamic characteristic is not a deficiency in the aircraft but a direct consequence of the tandem rotor configuration. This inherent feature of the tandem rotor configuration largely results from aerodynamic interference of the forward rotor on the aft rotor.

81. In Figure 5, the X-axis along the bottom shows the trimmed airspeed. The Y-axis shows the corresponding longitudinal cyclic stick position. The red line is a plot of the longitudinal stick position as a function of airspeed for the Chinook. Between zero and 40 knots, it shows that as the airspeed increases, the cyclic stick is progressively moved forward. This means that the Chinook is statically stable up until 40 knots. However, from 40 to 160 knots, as the airspeed continues to increase, the cyclic stick is progressively moved aft. This shows that the Chinook is statically unstable from 40 knots and above for the rest of the airspeed range. This basically means that the Chinook, with the AFCS OFF, is statically unstable above 40 knots in
the longitudinal axis. It also means that there's a control reversal in forward flight above 40 knots. Both characteristics are undesirable and they both increase the pilot workload. [Defence64]'s evidence was that with the AFCS OFF, the CH-47D requires constant pilot attention to achieve the desired flight path due to the lack of inherent stability of the tandem rotor design. The result of this is an increase in pilot workload required to achieve a given mission.

Figure 5: Chinook Longitudinal Stick Position with Airspeed (Unaugmented)

As is typical for a tandem rotor configuration helicopter, the Chinook above 40 knots is statically unstable in the longitudinal axis without some kind of additional flight control augmentation. In its unaugmented form, although fully controllable, constant attention from the pilot is required in order to maintain a desired airspeed and pitch attitude. This negative static stability leads to a long term pitch response which is
Figure 6: Chinook Longitudinal Stability (Unaugmented periodic [non-oscillatory] and divergent. Evidence to the Commission was that the CH-47D is fully controllable in normal flight with the AFCS OFF, albeit with an elevated pilot workload.

An example of the Chinook’s unaugmented longitudinal stability is shown in Figure 6. The aircraft’s pitch attitude following a disturbance is shown by the blue line. This is also diagrammatically depicted by the schematic of the
aircraft below the graph. In this case, the disturbance acts to push the nose down and, if the pilot does not make any compensation, the nose will keep moving down and the aircraft will keep increasing in airspeed. Without the AFCS the pilot is constantly required to correct to counter this behaviour.

Stability Augmentation – CH-47D
84. In order to correct for the inherent static and dynamic instabilities and to reduce pilot workload the CH-47D incorporates an AFCS. The AFCS sends commands to a number of control actuators which supply control inputs to the rotor system to augment the stability of the basic aircraft. As the AFCS does not have full control authority it is not classified as an autopilot. The descriptions and analysis contained in the following paragraphs are limited to the longitudinal or pitch axis and to those required to understand the behaviour of the aircraft on 30 May 11.

Advanced Flight Control System (AFCS)
85. The CH-47D flight control system is augmented with an AFCS that both stabilises unintended aircraft motion and allows for the aircraft to be flown with a level of autonomy based on airspeed, bank angle, heading and/or altitude. The AFCS works using a combination of series and parallel hydraulic actuators that are controlled by two analogue Flight Control Computers (FCC). Redundancy is provided for by the AFCS architecture having two separate channels; each channel being controlled by a FCC that
is individually capable of exercising sufficient control authority should a failure in the other channel occur.

86. As described previously and shown in Figures 2 and 7, pilot control inputs pass through the lower mixing unit to the ILCA which effectively amplify the pilot control movements and remove forces from the rotor system. The

![Longitudinal Control System Schematic](image)

**Figure 7:** Longitudinal Control System Schematic

ILCA extend or retract and move the upper flight controls. Control movements pass from these lower boost actuators to the upper mixing units and then
to the forward and aft Upper Boost Actuators where the second stage of control hydraulic boost is applied. The amplified control inputs are then transferred to the rotor system via the swashplates.

**Extensible Link Actuators**

87. Extensible Link Actuators (ELA) are incorporated as part of the ILCA. The AFCS has input into the flight control system through the ELA. This control input is not apparent to the pilot because AFCS control inputs do not move the cockpit controls. The roll, pitch and yaw ELA operate on the three primary axes and each operates in fundamentally the same manner. In order to provide effective pitch damping the ELAs are required to be fast actuators; also called high bandwidth actuators. The ILCA ELA provide limited authority, high bandwidth series augmentation to the pitch, roll and yaw axes in order to relieve pilot workload by reducing the required control activity. In order for the pilot to overcome the ELA in the case of an actuator failure, the ELA is limited to being a fairly small actuator with only a total of 22 per cent of the full pilot authority. That means that if the actuator were to go to full extension as in the case of a hardover, the pilot would only have to apply input in the order of something like 22 per cent to override the effect and to counteract that failure.
Figure 8: ILCA ELA Supplemental Pitch Damping

88. Figure 8 shows the aircraft’s pitch response (red line) to a longitudinal cyclic pilot input (green line) and the ILCA ELA’s reaction (blue line) to immediately oppose the aircraft pitch rate thereby damping the pitch rate. By working in opposition to the pitch rate, the ELA works to slow down the rate of movement in the pitch axis. This is termed supplemental pitch damping.

Differential Air Speed Hold (DASH)

89. The DASH actuator is an extendable link that has a screw actuator on either end. It is fitted in series with the longitudinal mechanical controls. Like the ILCA, it is used by the AFCS to make flight control inputs without moving the pilot controls. It has a larger authority than the ILCA but it is rate limited in how fast it can make its inputs. The DASH actuator provides medium authority, medium bandwidth control for the
pitch axis and is used to artificially provide a positive longitudinal stick gradient to the CH-47D.

**Other AFCS Components Affecting the Longitudinal Axis**

90. There are two Longitudinal Cyclic Trim actuators (LCTA) installed in the upper controls that can be controlled manually or by the AFCS. The electro-mechanical LCTA are located in the upper controls, one on each rotor head. The LCTA maintain the helicopter at a near-level fuselage attitude as forward airspeed or altitude increase by tilting the tip-path-plane of the rotor system forward. There are also two Cockpit Control Drive Actuators (CCDA); one for the longitudinal axis and one in the collective axis.

![Figure 9: Cyclic Stick Grip](Chinook Flight Manual Figure 2-28)
91. Because the hydraulically-boosted flight controls are irreversible, a force-feel system is installed in the CH-47D to provide stable control force gradients and to allow trimming the control forces to zero. A centering spring and magnetic brake for each pilot control provide a sense of force feel to hold the control in a trim position. However, the pilot can override the force manually while manoeuvring the helicopter. When the Centering Device Release (CDR) switch (Figure 9) is pressed, electrical power is applied to release the magnetic brakes. Each centring spring assumes a new trim position where the control forces are now nulled. Releasing the switch removes electrical power and applies the magnetic brakes. The centering springs are thereby retained in their new positions.

92. The AFCS trim switch (Figure 9) is used to make small changes in the pitch (airspeed) and roll attitude while the AFCS is operating. The switch is spring loaded to the centre ‘OFF’ position. Moving the switch forward or aft from the centre OFF position commands an increase or decrease in airspeed by driving a trim motor in the longitudinal Cockpit Control Drive Actuator.

**AFCS Longitudinal Axis Stability Augmentation**

93. The unaugmented CH-47D pitch axis has no inherent attitude stability. With the AFCS OFF, the pilot must actively manage pitch attitude; with the AFCS engaged, pitch attitude stabilisation is active when airborne regardless of airspeed. Static
instabilities are corrected through the DASH actuator while dynamic stability is augmented via the ELA which are incorporated as part of the ILCA. Therefore, with the AFCS engaged, pilot longitudinal control inputs travel through the mixing units and boost actuators as described for the primary flight control system. The DASH and ELA inputs are added to the pilot inputs. The total control at the rotor system for the longitudinal axis is the sum of the pilot, DASH actuator and ELA inputs. The stability augmentation functions of the DASH actuator and ELA are described in the following paragraphs.

94. The DASH actuator is used by the AFCS to provide long term pitch stability; positive stick gradient, positive speed stability about a fixed stick position, airspeed/pitch attitude hold and control augmentation are provided from hover to maximum speed. Pitch attitude, airspeed, and longitudinal stick position signals are used by the AFCS to drive the DASH actuator which extends or retracts to maintain airspeed for a given longitudinal stick position. The DASH actuator responds predominately to pitch attitude by controlling the attitude in order to achieve the desired airspeed. The desired airspeed is determined using the longitudinal stick position input. Mechanically, the DASH actuator transmits the pilot’s longitudinal cyclic inputs to the ILCA input while simultaneously extending or retracting its two electromechanical actuators as commanded by the AFCS units. Thus the DASH effectively works in the mechanical controls as an automatically adjusting control rod.
95. The AFCS uses data from the external vertical gyros and internal yaw rate gyro to generate signals proportional to pitch rate. This derived pitch rate signal is filtered and then used to drive the pitch ILCA ELA to provide pitch rate damping to the system through control movements in opposition to the pitch rate. Pitch damping is the resistance to a rate of pitching motion, which has the effect of slowing down movements in the pitch axis. While the aircraft has some inherent levels of pitch damping, which arise primarily through the natural resistance of the rotors to vertical motion [rotor heave damping], the ELA provide supplemental pitch damping. It makes no difference whether the pitch is up or down, commanded or not, the ELA just counters a pitch rate. This additional damping is particularly important as it also improves the long term dynamic response of the aircraft. Dynamic stability and rates of divergence are very closely linked to the overall level of rate damping in the system. The altitude/airspeed hold functions of the DASH actuator correct static instabilities but also generate dynamic instabilities. In effect, the supplemental damping provided by the ELA is required to correct the dynamic instabilities generated by the DASH actuator.

AFCS Operation in the Longitudinal Axis

96. With the system operating normally, the DASH actuator corrects the static instabilities inherent in the aircraft configuration, while the ELA correct the dynamic instabilities generated by the DASH actuator and allow for high bandwidth attitude control. In essence, the aircraft pitch rates are reduced sufficiently through the damping provided by the ELA to allow the DASH actuator to act faster than the pitch attitude
changes. The result is a heavily damped and stable response to divergences in the pitch axis.

97. If the system were to operate with the ELA but without the DASH actuator, the response would be divergent and non-oscillatory, with a reduced divergence rate when compared to the basic aircraft response. Similarly, if the aircraft were to operate with just the DASH actuator the response would be highly oscillatory and highly divergent. The result of this is that a stable non-oscillatory response is only possible with both elements functioning.

98. The DASH actuator incorporates pitch attitude into its control signal while the ELA are driven by the pitch rate. Pitch information is included in both. If a pitch disturbance occurs, both sets of actuators will begin to respond in order to bring the aircraft back to equilibrium.

99. The pitch attitude can be considered to be the integral of the pitch rate, i.e. it is the sum of all the pitch rates that occurred prior to the current point in time. For example, if a pitch rate of 1 degree per second is maintained for 5 seconds, the pitch attitude will have changed by five degrees. Thus a pitch disturbance begins with a pitch rate. This causes the ELA to move in the opposite direction to the disturbance. If the disturbance continues, a pitch attitude will develop, causing the DASH actuator to begin to move, also in opposition to the disturbance.
AFCS Limitations - General

100. A number of system limitations are incorporated into the AFCS system in order to mitigate the effects of actuator failures by allowing the pilot to override the system when required. The critical case for actuator failure is termed an actuator hardover which occurs when an actuator moves uncontrollably to its full extension or retraction limit. Without system limits in this scenario an extreme control input in the direction of the actuator hardover is applied, leading potentially to an unrecoverable situation. The nature of the limitations applied to the DASH and ELA differ according to the function of the two actuators. Importantly, should a failure of any of the AFCS actuators occur, the pilot can easily override the AFCS.

ELA Limitations

101. The ELA are required to be very fast high bandwidth actuators in order to successfully counteract the pitch rate. The consequence of a hardover for an actuator of such a high response rate would be very severe, and in order to combat this, physical authority limits are incorporated. Therefore the amount of rate damping provided by the AFCS is limited by the ILCA ELA's mechanical stops. ELA saturation occurs when the ELA has reached its physical travel limit at 22 per cent equivalent input. When the ILCA ELA is contacting its mechanical stop, it is said to be saturated because it has reached its full capacity.

102. If saturated, the AFCS is no longer able to provide rate damping control inputs
in that axis and if the pitch rate is still deviating in the same direction, the ELA is not capable of arresting that pitch rate. Therefore, at some magnitude, a pitch excursion of the aircraft will exceed the capability of the AFCS system to recover. While this is most commonly experienced in the roll axis, it is seldom experienced in the pitch or yaw axes. When the ILCA ELA are saturated, it is easier to generate pitch rates but harder to arrest them. Pilots might describe this as feeling "loose".

103. As the actuator can only move within a range equivalent to 22 per cent of the total control authority available to the pilot, the pilot is always capable of overriding the actuator failure/saturation while remaining within the flight envelope.

DASH Limitations

104. The DASH actuator is required for trim adjustment across a very large speed range which requires considerable control authority and precludes the use of authority limits for failure mitigation. In the CH-47D, total actuator physical authority of the DASH is 44 per cent of total pilot control authority and so the consequences of the DASH hardover are minimised by applying a rate limit that is equivalent to 1.4 inches of pilot control per second (eq in/sec). The effect of the rate limit is that in the event of a worst possible case, a dual system hardover, the pilot is only required to apply inputs opposing the direction of actuator failure at a rate of 1.4 eq in/sec thus ensuring aircraft pitch rates generated by the DASH failure can be easily managed.

105. Increasing pitch rate will bring the rate of DASH actuator movement closer to
its limit of 1.4 eq in/sec until a point is reached where the DASH actuator is required to move faster than its capabilities. At this point the actuator becomes 'rate' saturated and is no longer able to provide inputs which are representative of the command signal. When rate limit saturation of the actuator is reached, the actuator is forced to move in the commanded direction at its maximum rate. This manifests itself as a constant linear rate of extension or retraction regardless of the commanded input as long as the commanded rate remains larger than the actuator capabilities.

106. Simply put, DASH saturation occurs when the AFCS commands the DASH actuator to move at a rate faster than the DASH actuator can actually move. This will happen when the combination of aircraft pitch rate, rate of longitudinal stick movement and rate of airspeed change reach a critical level commanding the DASH actuator to operate beyond its maximum extension rate.

AFCS Induced Oscillations

Background

107. Evidence obtained by the Commission in relation to the cause of pitch oscillations indicated that subsequent to the accident of 30 May 11 the Defence Science and Technology Organisation (DSTO) and the Aeronautical Research Development Unit (ARDU) were tasked by the AAIT to assist in ascertaining the potential cause of the pitch oscillations as reported by the aircrew. who holds a First Class
Honours Degree in Aeronautical Engineering was one of the experts from DSTO assigned to this task and was the designated witness on behalf of DSTO to present all results of their aeronautical analysis of the accident. Soldier47, the Chinook test pilot at ARDU, was also assigned to this task.

108. As mentioned previously, the aircraft was completely destroyed in the accident and the data recorders fitted to the aircraft were not retrieved. The AAIT and DSTO staff were thus limited in their initial analysis to the evidence of the aircrew as to the events of 30 May 11. Subsequent to the accident on 30 May 11 members of RWG6.5 [the next deployed RWG in Afghanistan] experienced three further incidents of pitch oscillation on 28 Jul 11, 9 Sep 11 and 13 Sep 11. The data recorded during each of these post-accident pitch oscillation events was provided to DSTO and Defence64 and his associates were able to use the data from the subsequent events to ascertain what was occurring with each of the aircraft, with particular attention being given to the effect of any pilot input, and the effect of any AFCS input, during the course of the recorded oscillations.

109. Initially DSTO used computer modelling, validated by the data from incidents of oscillations on 28 Jul 11 and 9 Sep 11, to develop theories as to events of 30 May 11. A series of tests were subsequently carried out at the Boeing Helicopter Simulation (BHSIM) facility in Philadelphia that were able to reproduce an uncommanded pitch oscillation in a similar fashion to the two incidents. It was also
found that the AFCS was behaving in a similar fashion to that seen from the DSTO simulations. These tests closely correlated the results derived from the initial computer modelling and confirmed the most likely behaviour of the AFCS under the circumstances of 30 May 2011.

110. As will be seen hereafter, the expert evidence was that, having heard the evidence of and as to their memories of what occurred on 30 May 11, and having studied the results obtained from the replication of those events in the BHSIM during November 2011, together with his analysis of the data from three post-accident pitch oscillation events in Australian aircraft, his modelling of what probably occurred to the aircraft during the minute or so before the accident, was consistent with, and confirmed by, the BHSIM testing and his computer modelling. It was his view that having regard to all of the known data, his assessment of what occurred to the aircraft on 30 May 11 could be asserted with confidence.

AFCS Behaviour Following a Large Pitch Diversion

111. As the size of an initial pitch disturbance increases so does the resulting pitch rate. Increasing the pitch rate leads to increasing magnitudes of control inputs from the ELA and a corresponding increased rate of DASH actuator movement. This occurs because the pitch rate leads the pitch attitude. As the rate of change of pitch attitude increases, the rate of commanded DASH movement increases. If the magnitude of pitch disturbance continues to increase, the authority limits of the ELA will eventually
be reached and the actuators become saturated. Similarly, increasing the pitch rate will also bring the rate of DASH actuator movement closer to its limit of 1.4 eq in/sec. Eventually, a point is reached where the DASH actuator is required to move faster than its capabilities and becomes rate saturated. The DASH will move in the direction of the AFCS commanded signal at its maximum rate which is lower than the rate demanded of it.

112. The simulation conducted at BHSIM by DSTO and ARDU suggested that the point at which the ELA reach authority limitations is relatively close to the point at which the DASH actuator reaches its rate limit. This rate is in the order of five to ten degrees per second. The significance of this is that as the ELA reach saturation, no further supplemental rate damping is able to be provided to the system. As the pitch rates continue to increase beyond the saturation point the supplemental damping remains constant. This has two primary effects. The first is that the ELA is no longer able to arrest the pitch rate, and the second effect is to allow the DASH to become increasingly dominant.

113. This situation is compounded as the DASH reaches rate saturation, introducing phase lag and overshoot which enhance the divergent tendencies of the DASH system. The DASH actuator has double the physical authority of the ELA which means that it is able to apply inputs to completely override the ELA. The result is that the aircraft enters a divergent pitch oscillation, driven by the DASH actuator. The DASH actuator makes inputs that drive the pitch rate in the oscillations, which in turn drive the DASH
actuator to make further inputs, which produce the next cycle of oscillations. The process is self-sustaining and without pilot input it is likely the divergence rates will be high. This behaviour is shown in Figure 10, which presents simulation results of pitch attitude and pitch rate, along with DASH and ELA positions during a pitch oscillation. In this case the initial pitch disturbance was initiated artificially using a pilot input, however, the AFCS response to an oscillation initiated by other means (for example, a vertical gust) would be similar once developed. In this case no pilot inputs were made following the commencement of the oscillations.

Figure 10: DASH Induced Oscillation Initiated using Pilot Input
114. The divergent and oscillatory nature of the pitch attitude can be clearly seen in Figure 10, as can the interaction between the DASH and ELA. Figure 10 indicates that as the oscillation becomes fully developed the DASH actuator begins to act in opposition to the ELA driving the pitch rate which in turn is driven by the DASH actuator with a small time delay. The magnitude of the DASH oscillations increases with each pitch attitude oscillation overriding the ELA damping and generating the next oscillation in the cycle. As the ELA reach saturation no further damping is being provided while the DASH continues to provide excitation to the system. In this particular example (Figure 10) the aircraft’s pitch attitude diverged to beyond thirty degrees [outside the flight envelope] within the first cycle.

115. A divergent oscillation will occur once the DASH actuator is unable move fast enough to arrest the pitch change and the ELA are unable to arrest the pitch rate. The evidence of was that the outcome of ELA and DASH saturation may be a divergent pitch oscillation if a transient pitch excursion large enough to cause AFCS saturation is not countered and corrected promptly by the flying pilot.

116. Testing carried out by Defence64 at the BHSIM in November 2011 indicated that atmospheric turbulence involving vertical gusts of seven to eight metres per second (roughly 15 knots), if applied under the right conditions could induce a pitch rate sufficient to lead to AFCS saturation.
AFCS Induced Oscillations - Recovery Technique

117. The overall physical authority of the DASH actuator is 44 per cent of the total control authority available to the pilot. The consequence of this is that during a DASH induced oscillation, the pilot always has enough control power to recover from the situation. The correct recovery technique, confirmed using the BHSIM during the DSTO/ARDU investigation is that control inputs should be made in opposition to the pitch and that each input should be followed by a countering input to arrest the pitch rates generated by the first input as the attitude reaches the desired condition. This process ensured that the pitch attitude changes occur faster than the DASH actuator movement, which removes the DASH from the loop and allows normal control to be resumed. These pilot actions are those that a pilot would instinctively do to recover the aircraft.

118. The DSTO/ARDU simulator testing revealed that commencing the recovery of an aircraft from a pitch excursion at ±10 degrees from the level attitude would require considerable workload for the flying pilot. However this workload was assessed as being totally acceptable. The recovery becomes progressively more difficult the longer recovery initiation is delayed.

Avoiding AFCS Induced Divergent Oscillations

119. During the course of the DDAAFS investigation and as a result of the testing carried out by DSTO/ARDU, Boeing released Service Note 145-092 to
address the issue of Chinook aircraft being operated by pilots with an “inattentive flying technique”. Essentially Boeing reinforced that pitch rates greater than ±10 degrees per second need to be actively arrested by the flying pilot so as to avoid the possibility of the AFCS becoming saturated. They further recommended that pilots should not allow uncommanded pitch attitude deviations be allowed to develop at even lower pitch rates. This advice resonated with the experienced Chinook pilots who collectively advised that they would never allow uncommanded pitch rates to develop because they did not exclusively rely on the AFCS for attitude control as they actively flew the aircraft in pitch. This was also often referred to in evidence as “flying the aircraft”. Very few instances of pitch oscillation, divergent or otherwise, were experienced in the past because pilots were flying the aircraft actively rather than flying the aircraft inactively.

120. Boeing recommended that uncommanded pitch attitude deviations should be corrected by the pilot by ±5 degrees from the trimmed attitude. Test pilot advice was that pilots would never need to recover from an uncommanded pitch oscillation if the Boeing technique of actively flying the aircraft is used. Notwithstanding Boeing’s recommendation, ARDU recommended that pitch excursions that reach ±10 degrees should be corrected immediately. Actively maintaining the aircraft attitude to within ±5 degrees is easy and instinctive.
Prior Knowledge of AFCS Saturation

121. Evidence given to the Commission by Soldier47 indicated that AFCS saturation was not taught or understood by the vast majority of the wider Chinook community, including in the United Kingdom and the United States of America. Soldier37 gave evidence that although the phenomenon of uncommanded pitch excursions may have been encountered previously by Chinook users, there has been little to no formal documentation. He said that when he reviewed the flight manuals of other Chinook users there was nothing in their manuals about how to deal with it.

122. Soldier47 gave further evidence was that he was aware that the US Army Test Centre do practice the manoeuvre because they had become aware of it during testing and that they use it to show test pilots how to get out of the manoeuvre and what it feels like in the actual aircraft. It is not taught to line pilots because the manoeuvre gets the aircraft into quite extreme attitudes and because line pilots never fly the aircraft in those regimes.

123. A series of emails, received by the Commission on 18 Sep 12 included an email from ISAF 66, a test pilot with the US Army posted to the Army Test and Evaluation Centre, to Soldier34 CO Production Test and Airworthiness Team, ADF, which indicated that ISAF 66 experienced an uncommanded pitch oscillation while attempting to do a symmetric pull up to achieve a target load factor while flight testing. As a result of that he went out...
with the US Army senior CH-47 instructor and did several intentional departures to practice recovery procedures. Evidence was that such flying was by experienced test pilots flying at the edge of the aircraft’s envelope of flight and they were manoeuvres that would not be flown without someone trying to get into that situation.

124. stated in his email that Country had done an update to the CH-47D AFCS many years ago, including specifically the DASH controllers. One of the pilots had flown such updated aircraft and claimed that the update had significantly reduced the ability to get into pilot induced oscillation. gave evidence of a conversation with a test pilot in the who confirmed the reported update and advised that it had been of benefit in relation to understanding pitch oscillation. gave evidence that the CH-47F, which is to shortly come into service with the ADF, has a significant change to the AFCS, including changes that they had put into DASH actuator control circuit and that as a result of such changes he was of opinion that it would markedly reduce the possibility of pilot induced oscillation.

125. evidence was that the small test pilot community saw no need to pass on the characteristics of the phenomenon of uncommanded pitch oscillation to the Chinook instructor community. This was because putting the aircraft into such an “extreme attitude” was never a requirement for instructor pilots or line pilots. Placing the aircraft in such a “regime” was not perceived to be a training requirement.
because such regime was only within the scope of the test pilot environment. [Ibid]

Evidence was that there was no known knowledge of similar pitch oscillations in the US Army so that no one had addressed and tried to fix it as it was an unknown problem. [Ibid] Evidence was that all control actions involved in flying an aircraft are instinctive and not something that is out of normal piloting techniques and he considered that pilots acquire instinctive control actions as they gain flying experience. [Ibid]

126. The Commission also received evidence of a previous investigation by the American Helicopter Society in 1995 concerning the handling qualities of the Chinook. [Ibid] That report indicated that in two specific instances, namely the approach to hover and the standard departure abort to hover manoeuvres large pitch rates were used or required in the transition to the hover phase and that there was saturation of the AFCS which caused a reduction in the handling quality of the aircraft. [Ibid] That reduction was from a handling quality of one to two meaning that the aircraft had passed from a satisfactory handling quality to one where some of the handling qualities might be undesirable. This is to be contrasted to a third level where handling of the aircraft is assessed as unsatisfactory.

127. The Commission noted that, although this evidence highlighted a possibility of AFCS saturation, it did so in circumstances significantly different to those that existed shortly before the accident. It was Defence's evidence that the AFCS saturation referred to was as a result of the aircraft trying to do what the pilot was demanding of it
during the transition to hover phase at low speed. The Commission considers that the matters referred to in the paper dealing with circumstances of a pilot seeking to transition to hover phase at low speed were not reasonably referrable to events that were likely to occur in cruise flight at cruise speed and that it is not appropriate to treat the matters set out in as being relevant to the facts that existed immediately prior to the pre accident onset of the divergent pitch oscillations that occurred on 30 May 11.

128. The Commission also received evidence from that he made an extensive search of available scientific literature and research but did not locate any other materials relating to any recorded incident of, or study into, the type of oscillations that occurred to the aircraft on 30 May 11, or any of the recorded oscillations in CH-47D aircraft post accident.

Pilot Induced Oscillations

129. Pilot induced oscillations are caused when a pilot’s control inputs get out of phase with either the aircraft’s natural or augmented response. If left uncorrected, an oscillation will result. The Commission understands therefore that a pilot induced oscillation will result from a pilot putting in control inputs that amplify the aircraft’s movement in a similar fashion to one pushing on a child’s swing; progressively increasing the amplitude of the swing with each input. This phenomenon
was also referred to as “over-controlling the aircraft” or “chasing the AFCS”.

130. While the Chinook is prone to pilot induced oscillations, they are not unique to that aircraft. Although the CH-47D is susceptible to pilot induced oscillations, most experienced pilots reported to the Commission that they had never personally generated a pilot induced oscillation although some had observed them when induced by other less experienced aviators. In cases where excursions occurred more experienced pilots, through their inputs, prevented the excursions from developing into oscillations. According to Soldier44, who observed some experienced pilots over-control the aircraft on occasions, pilot induced oscillation only became more evident to him with more inexperienced pilots coming through.

Recovery Technique

131. If pilot induced oscillations are suspected, the corrective action is to stop the control input that is stimulating the oscillation and then to assess and enact whatever control input is necessary to get the aircraft back into a safe flight regime. If an oscillation is indeed pilot induced, then the aircraft oscillation is expected to stop almost immediately upon stopping the control movement.
Other Minor / Non-divergent Oscillations

Three-Axis Airframe Oscillation

132. The CH-47D Chinook Helicopter came into service with the United States Armed Forces in 1984 at which time it was tested for Airworthiness and Flight Characteristics (A&FC) by the United States Aviation Engineering Flight Activity at Edwards Air Force Base California. The final test report was made in February 1984 (the 1984 Report). Testing was conducted at various altitudes up to 9,980 feet and a total of 148.8 hrs were flown between 25 Jan 83 and 13 Dec 83. Tests included handling quality tests for static and dynamic stability as well as manoeuvring stability. Such tests indicated inter alia that the AFCS was found to be enhancing characteristic of the aircraft. Of three significant shortcomings found, one was an easily excited three-axis airframe oscillation during high power conditions at light gross weight.

133. Boeing investigated the easily excited three-axis airframe oscillation and modifications were made to the AFCS to alleviate structural problems associated with the oscillations. Whilst the AFCS modifications solved the structural problems the oscillations still existed. As they were most pronounced during high power manoeuvring at light gross weight. These circumstances were thought to occur so infrequently, they were not considered to be a deficiency and, without further design changes, this shortcoming was considered acceptable.
134. The three-axis oscillation appeared to be of potential relevance to the Commission's inquiry in relation CH-47D pitch oscillations hereinbefore referred to. However, expert evidence given by [Defence64] indicated that what was described in the 1984 Report was not the same characteristic as pitch oscillation experienced within AAAvn. His evidence was that what was described in the 1984 Report were oscillations of a much shorter period and much higher frequency than experienced within AAAvn and were due to structural modes in the twisting of the rotor drive shaft before the forward and aft rotor, leading to interactions between the two rotors, which was a different phenomenon to the pitch oscillation being investigated by the Commission. [ ] The Commission accepted his expert opinion that the oscillations described in the 1984 Report were unrelated to what occurred to the aircraft on 30 May 11.

Low Amplitude AFCS ‘Nodding’

135. The CH-47D is also known to produce low amplitude oscillations that, while not damped, are not divergent. [Soldier52] described it as if the aircraft was “hunting for the attitude” and that it was particularly prevalent in A15-106 during his time in Afghanistan. [ ] The Commission received into evidence a memorandum from the US Department of the Army enclosing a Report concerning Australia Chinook Porpoising Phenomenon Documentation. The Report indicated that it considered the issue of pilot’s inputs through the actuators that could cause the flight control system to have transient behaviour that could lead to a series of pitch oscillations. The authors of the Report considered the three-axis oscillation discussed in the 1984 Report and
concluded that the oscillation there described, was most likely caused by a lightly
damped rotor-on-rotor torque mode that occurs at approximately a frequency of 1.1 Hz
and that this known phenomenon was not likely to be responsible for a divergent
oscillation. This view accords with Defence64’s evidence concerning this matter as referred to in the preceding paragraph.

136. Another type of a minor pitch oscillation could be caused by either the build-up
of tolerances within the AFCS, the failure of an AFCS input sensor or a system
calibration issue within the AFCS. The aircraft’s resistance to this form of oscillation,
within specified limits, is the subject of dedicated tests within the Maintenance Test
Flight Schedule.

137. The Commission determined that the minor non-divergent oscillations as
described in played no role during the incident on 30 May 11.

CH-47D Training with respect to Pitch Oscillations
Conversion Training

138. Australian pilots complete a conversion course, to assist them to qualify as
Category D pilots on the CH-47D, at Fort Rucker in the United States where they
receive instruction from American and other allied pilots. During that course, there
was, at the relevant time, no formal training related to the handling of pitch oscillations
in a CH-47D should they occur.
Upon completing the initial conversion course the Australian pilots proceed to Fort Lewis in the United States where they undergo CH-47D Simulator training to train them on the equipment that is fitted to the Australian CH-47D model. AAAvn instructors conduct this training at Fort Lewis and it is restricted to simulation work with no actual flying time. Soldier38 gave evidence that such training included a simulated failure of the AFCS in either the pitch, roll or yaw axis requiring the trainee to respond in accordance with the emergency section of the checklist and supplemented by the STANMAN [referred to during the course of the Inquiry but not tendered in its entirety]. Privacy gave evidence that during his training at Fort Lewis he recalled his instructor, Soldier44, presenting a slide show where the word “porpoising” may have appeared on the slide. Privacy He had an impression that it was a standard part of the training but was not taught any corrective action. Soldier44’s evidence was that no training occurred at Fort Lewis in relation to “porpoising” although the word might have been mentioned colloquially. Despite efforts by the Commission it was not possible to obtain a copy of any slide show or training notes presented by Soldier44 during his instruction of Soldier1

Operational Transition

After completing training at Fort Lewis, Australian CH-47D pilots return to Townsville where they complete their conversion qualification by flying a number of sorties under instruction in their Operational Transition to Type (OTT) course. A
number of newly qualified pilots indicated that during this phase of their training they were told anecdotally by AAAvn instructors of the "porpoising" phenomenon; that it might occur as a result of turbulence or rotor wash from another aircraft, and that they should allow the AFCS to dampen the oscillations and avoid worsening the situation by making control inputs.

141. Soldier38, an experienced instructor and pilot, gave evidence to the Commission that instructors did not instruct pilots to freeze the controls of a Chinook in response to a change in pitch. Soldier46, also an instructor, gave evidence that a pilot should always fly the aircraft irrespective of what the AFCS is doing. He said that it does not matter how well the aircraft can fly itself the person on the controls still has to make inputs to make it do what he wants it to do. His evidence was that he instructed his students accordingly. Other witnesses indicated that a technique such as freezing the controls went against the way they were instructed to fly the aircraft and in turn the way they instructed. Experienced instructor pilots gave evidence to the Commission that when the aircraft is not doing what the pilot wants it to do they should correct it by making active inputs on the appropriate controls.

Flying with the AFCS selected OFF

142. Soldier47 was an operational Chinook pilot before he conducted his test pilot training and recalled that a significant amount of flying was conducted in the CH-47D
with the AFCS selected to OFF. He stated that the only time the AFCS was mandated to be ON in accordance with the Flight Manual was during Instrument Flying in IMC and that for flight under visual conditions, the AFCS was not an essential piece of equipment. He further said that pilots flew for a significant proportion of the time with the AFCS selected OFF.

143. **Soldier47** could not pinpoint when AAAvn changed its policy with respect to flight with the AFCS selected OFF but thought it to be after he finished his operational tour on Chinooks at the end of 2006. The new policy only allowed for flight with the AFCS selected OFF when supervised by a QFI, thereby significantly reducing operational pilots’ exposure. He considered that this policy change was brought in by a senior standards officer to align it with the Black Hawk aircraft which is specifically a procedure that only QFI could supervise. He further stated that he did not agree with the philosophy behind the new policy in relation to the Chinook aircraft.

144. The Commission received evidence that flying with the AFCS selected OFF allowed the pilot to become naturally attuned to the rate and response of the aircraft following control inputs. As pilots become more proficient at flying with the AFCS OFF, they also improved their flying skills with the AFCS ON.

Analysis

145. When flying the CH-47D, Australian pilots rely on their training as set out
above, as well as the STANMAN, the CH-47D Flight Manual and the Pilot Handling Notes (PHN). None of these publications contain any instructions as to how to handle pitch oscillations should they occur. However, the Commission received evidence that in all flight situations the pilot’s primary function is to “fly the aircraft”. The STANMAN specifically states that the AC should take over and become the flying pilot if aircraft control and/or the safety of the crew become uncertain.

146. The Commission accepts the evidence that more flying time with the AFCS selected OFF is beneficial for pilots. The Commission notes that the reduced confidence of less experienced pilots in their flying ability and the change in flying technique appear to have corresponded with the reduction in pilot flying time conducted with the AFCS selected OFF. The Commission is of the view that such practice would probably allow pilots to become better attuned to the aircraft’s control and thus improve their confidence in controlling the aircraft.

147. The Commission considers that while there was no evidence of any specific formal training with respect to pitch oscillations, CH-47D pilots are given explicit guidance on how to deal with an Unusual Attitude, i.e. an aircraft attitude that the pilot has not commanded. The recovery procedure for such a situation, in any type of helicopter, is to check and correct, if necessary, Attitude, Heading, Torque and Airspeed. This procedure is shortened by pilots to AHTA and is another way of expressing the maxim of “fly the aircraft”.
148. The Commission considers that, despite the lack of formal training dedicated to dealing with pitch oscillations on the CH-47D, pilots should have the basic skills to avoid the onset of pitch oscillation by using correct flying techniques, as taught in initial flying training and to recover the aircraft should a pitch oscillation occur, again by using such flying techniques to control uncommanded pitch excursions. These basic skills will be enhanced if pilots have experienced flying the CH-47D with the AFCS selected OFF. The Commission notes that notwithstanding increasing pilot awareness and knowledge of AFCS behaviour following large pitch disturbances and its associated limitations, appropriate instruction in dealing with pitch oscillations has now been formally introduced into the CH-47D pilot training syllabus.

Chinook Pitch Oscillation Incidents

Background

149. The Commission considers that the imprecision of the term “porpoising” is likely to have led to misunderstandings between persons engaged in discussions about the subject in the sense that they may have been using the same term to describe different phenomenon. \text{Soldier8} gave evidence to the Commission that in his view the term “porpoising” ought not be used because it meant different things to different people. \text{Soldier37} and \text{Soldier47} supported this view. \text{Privacy} This report avoids the use of the term “porpoising” due to its imprecision in describing the various phenomenon presented in evidence except when specifically citing witness evidence.
<table>
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<tr>
<th>Date</th>
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<th>Remarks</th>
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<td>Soldier8 / Soldier43*</td>
<td>Cape Cleveland</td>
<td>+20° to -25° / Atmospheric turbulence Recovered by Aircraft Captain</td>
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<td>Soldier39 / Soldier52*</td>
<td>Afghanistan</td>
<td>Two incidents on the same NVG sortie, both ±20° / Atmospheric turbulence. Recovered by Aircraft Captain</td>
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<tr>
<td>29 Apr 08</td>
<td>Soldier46 / Soldier52*</td>
<td>Afghanistan</td>
<td>Two incidents on the same sortie, both ±20° / Atmospheric turbulence. Recovered by Aircraft Captain</td>
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<td>Unspecified</td>
<td>Soldier38 / Un-named Aircreman*</td>
<td>Shoalwater Bay</td>
<td>Recovered by Aircraft Captain</td>
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<tr>
<td>Unspecified</td>
<td>Soldier38 / Soldier19*</td>
<td>PNG</td>
<td>Recovered by Aircraft Captain</td>
</tr>
<tr>
<td>Unspecified</td>
<td>Soldier15 / Soldier19*</td>
<td>Afghanistan</td>
<td>±5° un-damped and uncorrected oscillation Flying pilot was “hands off” the controls</td>
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<tr>
<td>26 Mar 11</td>
<td>Soldier15 / Soldier2*</td>
<td>Afghanistan</td>
<td>+10° to -15° Recovered by Aircraft Captain</td>
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<td>Feb 11</td>
<td>Soldier15 / Soldier19*</td>
<td>Afghanistan</td>
<td>±40° / turbulence Recovered by Aircraft Captain</td>
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<tr>
<td>30 Apr 11</td>
<td>Soldier18 / Soldier19*</td>
<td>Afghanistan</td>
<td>Co-pilot initiated a rapid roll right at onset</td>
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<tr>
<td>8 May 11</td>
<td>Soldier18 / Soldier2*</td>
<td>Afghanistan</td>
<td>+15° to -20° Recovered by Aircraft Captain</td>
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Table 2: Pre Accident Chinook Oscillation Incidents Analysed by the Commission

150. The Commission noted the apparent increase in the frequency and number of Chinook oscillatory incidents, particularly in the few months preceding the accident. Coincident with this developing trend was the apparent increase in pilot concern about
pilot induced oscillation. The Commission received evidence from witnesses to a number of pitch oscillations occurring with CH-47 aircraft both prior to and after deployment to Afghanistan. The Commission analysed the evidence from 11 such incidents prior to the accident, as detailed in Table 2, paying particular attention to those occurring within Afghanistan.

151. Table 2 clearly shows that all the reported pitch oscillation incidents occurred with a less experienced pilot [at the time of the incident] flying the aircraft. Indeed all the later occurrences were at the hands of either Soldier\textsuperscript{2} or Soldier\textsuperscript{19} being the least experienced pilots in RWG6. In all but two cases, the more experienced AC affected the subsequent aircraft recovery.

152. In the light of the evidence describing the AFCS’s limited ability to control high pitch rate attitude excursions, the Commission considers that most of the incidents analysed were probably caused by AFCS saturation. In contrast, the evidence indicated that the general impression of the Chinook flying community at that time was that all of these incidents were being caused by the pilot over controlling the aircraft.

**Analysis of incidents referred to in Table 2**

153. Most experienced Chinook pilots, and those who had previously extensively flown other helicopter types, while aware of the potential for pilot induced oscillation,
had not experienced such oscillations and were not worried by them. However, more recently qualified Chinook pilots, or those without extensive helicopter backgrounds, appeared to the Commission to be overly concerned with either potentially causing, or actually experiencing a pilot induced oscillation incident.

154. Soldier41's evidence was that in his experience “porpoising” was often diagnosed as pilot mishandling or was diagnosed as a pitch excursion due to turbulence and was usually corrected when a more senior AC took over from an inexperienced CP, usually on the controls at the time the oscillation commenced.

155. The earliest recorded incidents within AAAvn of pitch oscillation in Afghanistan are 20 Apr 08 and 29 Apr 08 during the deployment of RWG1 in the first half of 2008. Soldier52, the flying pilot in both incidents, each involving two “porpoising” episodes in turbulent conditions, believed that he applied the correct recovery technique after a pitch disturbance by “centralising the controls and holding them central”. He also believed that when Soldier39 took over the controls on 20 Apr 08, that he did the same, confirming in his mind that he had used the correct technique. However, Soldier39 recalled flying the aircraft back to the level attitude by making an instinctive reaction on the cyclic before selecting the correct attitude resolving the episode quite quickly. Soldier39 asserted that his first and natural reaction to any unwanted pitch change is always to oppose it. If the oscillations increased, then he would stop chasing it and fly
the desired attitude. As the non-flying pilot and AC, he would take over control and not wait for an excursion to develop into an oscillation. The Commission notes the different interpretation of the same incident of the pilots at different experience levels.

156. Soldier46, the AC on the 29 Apr 08, similarly took over from Soldier52 after the unchecked aircraft reaction to a preceding aircraft’s wake turbulence, and recovered the aircraft. Suspecting Soldier52’s flying technique, he recommended that Soldier52 be checked by Soldier16 the Troop QFI.

157. The Commission notes that after the two incidents of April 2008 the RAEME personnel of RWG1 conducted a check of the AFCS of the aircraft involved to ensure that it was operational and that no defects were found.

158. As the number of pitch oscillation instances increased, Soldier44’s evidence was that general advice was given to junior pilots to try and allow the AFCS to deal with the “porpoising” and recover the aircraft attitude. His evidence was that he and other more experienced pilots believed that “porpoising” was likely caused by incorrect pilot inputs and that the AFCS could be relied on to damp the pitch oscillation involved. His evidence was that it was accepted that a pilot would make an initial instinctive control movement to oppose the pitch excursion, but that the idea was for the
pilot to try and damp his/her movements and end up putting the cyclic back where it was. The Commission considers that, in the mind of the junior pilot, this general advice referred to by Soldier44 had the potential to reinforce the notion that all oscillations were caused by the pilot over-controlling the aircraft.

159. Soldier2 gave evidence to the Commission of his belief that if “porpoising” commenced the AFCS would operate to input the controls and that if a pilot was to put inputs in such circumstances, the pilot’s input would effectively be doubling the correction.

160. The Commission considers that Soldier2’s unintentional but nevertheless flawed analysis which was shared by a number of pilots in the CH-47D community, fuelled a concern that pilots were inducing the oscillations by inappropriate control inputs. By extension, the inability of inexperienced pilots to deal with these oscillations probably led to erosion in the confidence of those pilots, and possibly other more experienced pilots, as to their flying ability.

161. Soldier18’s evidence to the Commission concerning the oscillation incident that occurred on 8 May 11 underlined the common belief that “porpoising” was being caused by inappropriate pilot input. He was concerned that, if mishandled, the pitch excursion could turn into a “porpoising” event. He immediately suspected that Soldier2 had over-controlled the aircraft in response to its initial pitch up.
162. Evidence from more experienced pilots indicated that they flew the Chinook by actively controlling the aircraft’s attitude. Soldier38’s evidence was that when he flew Chinook aircraft his main focus was always on aircraft attitude, as the aircraft attitude would convey what the aircraft and the AFCS was doing and the subsequent effect on aircraft performance. The primacy of attitude control is a natural inclination for experienced instructors and pilots because it is continually reinforced during AAAvn training. Privacy Soldier47 evidence was that there were few divergent pitch oscillations in the past because pilots were instinctively flying the aircraft actively rather than inactively. Privacy

163. While older and more experienced Chinook pilots actively controlled the aircraft, more junior pilots reported that they remained passive on the controls with the AFCS engaged believing that the AFCS would automatically correct all unwanted pitch attitude oscillations. As a QFI, Soldier38 noted that less experienced pilots were more passive on the cyclic; expecting the AFCS to sort out any flight disturbances without pilot input. Privacy The Commission was not able to pinpoint when this change in piloting technique occurred, but considers that it probably grew insidiously over the recent past linked with the general decrease in experience levels across the Chinook community and the aforesaid reduction in flying time conducted with the AFCS selected OFF.

164. The Commission considers that a combination of factors led to the mistaken belief within AAAvn that CH-47D pilots must be “chasing the AFCS” and therefore
causing the pitch oscillation. Evidence obtained by the Commission indicated that, with
the exception of Soldier47, CH-47D pilots were simply unaware that the AFCS had
limitations with respect to pitch rates that could, lead to actuator saturation. The lack of
understanding that the AFCS needed active pilot assistance in dealing with larger pitch
disturbances, coupled with the belief that oscillations were caused by inappropriate pilot
input, ultimately led to the aforementioned change in piloting techniques. As pilots
remained unaware of the need to actively fly the Chinook, the less experienced of them,
without the benefit of considerable flying practice with the AFSC selected OFF,
passively accepted that the AFCS could deal with any pitch disturbance.

165. The Commission considers that a misplaced faith on the part of less experienced
pilots in the AFCS’s ability to handle all pitch disturbances appeared to have grown,
over the past five years, or possibly longer and that an analysis of the evidence points to
a progressive erosion of Chinook experience, associated with a reduction in the
understanding of AFCS behaviour and limitations. Further, that a reduction in pilot
flying time conducted with the AFCS selected OFF ultimately led to a change in pilot
flying technique from actively controlling the aircraft to allowing the AFCS to control
the aircraft among the less experienced pilots.
Reporting Culture

Background

166. The evidence of was that the reporting of incidents and accidents should be in accordance with the Defence Aviation Safety Manual (DASM). Any incident that is untoward, is unexpected and in particular, has a safety implication should trigger the submission of an Aviation Safety Occurrence Report (ASOR) that would then be recorded in the Defence Aviation and Hazard Reporting and Tracking System (DAHRTS). Even if delegated to the Unit Aviation Safety Officer (ASO) or the CP to submit, it remains the AC’s responsibility to complete the ASOR.

DAHRTS is located in a computer database in Canberra and an analysis team from the DDAAFS Human Systems Performance Sub-Directorate has access to it and responsibility for managing it. DAHRTS automatically captures an ASOR as it is raised and allows the progress of activity in relation to that ASOR to be tracked and analysed. DDAAFS have 12 aviation desk officers; each having responsibilities to oversee various aircraft types. The initial investigation of an incident occurs at the unit at which the incident took place. The relevant aviation safety desk officer is responsible for considering the ASOR once the unit has completed its initial investigations. As a consequence, desk officers normally only see the completed ASOR; reviewing it for trends and the like.
168. A PIRR is a mechanism by which individuals or teams in the field can make amendment suggestions for any Defence Manuals, including Flight Manuals. A PIRR submission is the start of an administrative action; any final amendment would result from a consultative endorsement and approval process. In opinion, the PIRR in itself is not an authoritative document, the submission of which would constitute a final outcome. It could however initiate a formal amendment process that would by necessity include appropriate oversight and review.

The RWG Aviation Incident Book

169. The CO of RWG instigated an “Aviation Incident Book” for the purpose of recording by aircrew any incident out of the ordinary.

170. The Aviation Incident Book was maintained during all RWGs. However during RWG’s deployment in May 2010 ordered that the contents of the book be transferred to an electronic format for wider dissemination of the reports within AAvn. As a consequence the Aviation Incident Book was not, during 2011, in its position in the RWG crew room as it had been during previous RWGs. While the Aviation Incident Book was not in the RWG crew room entries of aviation incidents were made electronically. At some time toward the end of 2011 or the beginning of 2012 the Book was returned to the RWG crew room and the entries that had been made electronically were printed and stapled into the book.
171. The Commission notes that the Aviation Incident Book was not in the crew room during the deployment of RWG6 and accordingly pilots on their first deployment to Afghanistan may not have known of its existence. It was apparently not present when the Audit Team was in Afghanistan in April-May 2011. Nor was it present when documents were quarantined within RWG6 immediately after the accident and was not available to be inspected by the AAIT during its deployment to Afghanistan.

172. Soldier3I located the Aviation Incident Book during his deployment to Afghanistan as part of the Audit Team for RWG7 in early 2012 and, realising its potential importance to the Commission’s inquiry, arranged for its production to the Commission.

Reporting of Incidents in Relation to “Porpoising”

173. The earliest recorded incidents of pitch oscillation in the Aviation Incident Book are 20 Apr 08 and 29 Apr 08 during the deployment of RWG1. These incidents were not the subject of an ASOR although Soldier52, the flying pilot in both of them, believed that an ASOR should have been submitted in each instance. With hindsight he agreed that ASOR should have been submitted. Soldier39, OC of RWG1 and the AC of the first incident, could not specifically recall why the incident of 20 Apr 09 was not the subject of an ASOR. He believed that a decision was probably made at the time that corrective actions had been implemented and the problem had been rectified.
174. **Soldier46** was the AC for the second incident and his evidence was that he viewed the incident of **29 Apr 08** as one of wake turbulence that had been reported at the appropriate level and did not need to be the subject of an ASOR. **Soldier50** was the ASO for the second incident having taken over from **Soldier51** in the time between the two incidents. **Soldier50** indicated that, with the benefit of hindsight, while ASORing the incident would have made it more official the outcome would have been no different.

175. Although members of RWG6 experienced pitch oscillation on two occasions (**30 Apr 11** and **8 May 11**), the specific details of each incident were not directly reported in the electronic version of the Aviation Incident Book. Instead, **Soldier18** flagged his concerns about “porpoising” and its recovery technique as a Safety/Standardisation Issue because this was the first time he had heard of it. The issue of “porpoising” was discussed in the RWG6 Safety and Standards meeting on **26 May 11**. As aforesaid, persons present at the Safety and Standards meeting of **26 May 11** left with differing views as to the general discussion that occurred in respect of porpoising, and its outcome although the minutes record an action for **Soldier15** to submit a PIRR to Standards Section. The PIRR was not submitted until after the accident.
176. Neither of the incidents of 30 Apr 11 and 8 May 11 were raised with members of the Audit Team who conducted the audit of RWG6 in May 2011 although one had occurred while the team was actually present in Afghanistan.

177. Soldier9 gave evidence to the Commission that he had no knowledge of divergent pitch oscillation prior to RWG6’s deployment. He first became aware of “porpoising” in early April 2011 and sought guidance in respect of this from Soldier7 who advised him that it was a characteristic applicable to the CH-47D. His evidence was that Soldier7 explained that it was a wave motion with amplitude of up to ten degrees, normally started by some sort of disturbance, such as turbulence, which would normally be damped by the AFCS. Soldier9’s evidence was that Soldier7 did not appear to be concerned that the aircraft did this and, as a result, Soldier9 did not see “porpoising” as a concern from a safety perspective.

Analysis

178. The Commission notes that while a number of other non-related incidents recorded in the Aviation Incident Book were submitted as an ASOR by the relevant RWG ASO, no pitch oscillation incidents were the subject of any ASOR nor were any such incidents recorded on DAHRTS. Instead, evidence indicated that “porpoising” was not perceived to be an issue serious enough to merit formal reporting.
Rather it was seen as being a characteristic of a dual rotor blade aircraft capable of being controlled, in the view of more experienced pilots, by correct pilot action, or in the case of some less experienced pilots, by allowing the AFCS to damp the aircraft’s oscillations.

179. The issue of “porpoising” and the Safety and Standards System was covered in detail in the AAIT Report and the analysis and findings in this respect are endorsed by the Commission.

180. The evidence of in this regard was that the use of the Aviation Incident Book was an insufficient response to a significant safety issue and that the formal reporting processes should have been used to raise visibility of “porpoising” as a safety issue to the greater aviation community. Despite the occurrence of “porpoising” as a known issue within the various levels of AAAvn including a number in the command, standards, training and safety systems, it remained unreported within the formal ASOR system.

181. described the failure to formally report incidents of pitch oscillations as a breakdown, through normalised deviance, of the safety system that was designed to ensure that any aviation safety incident received the broadest publication possible throughout the Defence aviation community. His evidence was that the use of the Aviation Incident Book smacks against the system as its exclusive use would isolate and conceal knowledge of incidents rather than making everyone aware of such
incidents, a situation avoided by using the formal ASOR system. In not using the ASOR system, trends such as “porpoising” cannot be picked up and addressed by the appropriately qualified individuals and agencies. As the Deputy Director of DDAAFS ADF33 was unhappy to hear of the Aviation Incident Book.

182. Evidence received by the Commission was that contemplates the existence of an Incident Book within the AAAvn units under the Command of 16 Avn Bde and stipulates that, as part of the march-in procedure for AAAvn personnel, they are required, within thirty days of their arrival at their new unit, to read their new unit’s incident book as part of their Induction process.

183. The Commission also received evidence that the Standard Operating Procedure (SOP) 104 headed “SAFETY”, issued by TG633.7 [the RWG component of JTF633] and extant as at 30 May 11, required all aviation incidents to be recorded in the incident book and brought to the attention of the ASO. The ASO was to advise the CTG 633.7 on any further action needed in relation to a reported incident, where appropriate DAHRTS was to be utilised for reporting of incidents and all incidents were to be tracked as C Sqn, 5 Avn Regt incidents. The CTG 633.7 ASO was to ensure that the 5 Avn Regt ASO was to be informed of any ASOR action required by Regimental Headquarters (RHQ) 5 Avn Regt.

184. The Commission notes that while a system for the reporting of incidents by use
of the aviation incident book within AAVA units exists, and existed at 30 May 11, there is the possibility that such reporting may remain within the confines of a particular unit and not receive wider dissemination within the ADF aviation community which dissemination could provide greater appreciation of potential problems and greater resources to address, and possibly solve, such potential problems.

The Experience of the Accident Pilots in relation to the Pitch Oscillations

Soldier2

185. At the time of the accident on 30 May 11 Soldier2 had accumulated a total 821.9 flying hours of which 246.4 hours was on CH-47D aircraft. He had experienced pitch oscillations during a training flight in March 2010 when turbulence was encountered in the High Range Training Area outside Townsville. He described a circumstance whereby he and Soldier19 had a post flight debrief with Soldier44 about dealing with turbulence. While not recalling the actual incident, both he and Soldier19 remember that Soldier44 used an aircraft model to describe aircraft motion and advised them not to chase the motion.

186. Soldier2 experienced an oscillation incident under Night Vision Goggles on the tarmac at Townsville in October 2010. This oscillation was induced in the hover and was caused by Soldier2 over-controlling the aircraft. The aircraft was subsequently recovered to the hover attitude by Soldier1 the AC at the time.
Soldier2’s experience at the time was quite low. The Commission considers that this incident, although probably a bona fide example of a pilot induced oscillation caused by over-controlling, would likely have left the impression on Soldier2 that he must be particularly attentive to not over-controlling the aircraft.

187. By the time Soldier2 deployed to Afghanistan for RWG6 in early 2011 his understanding was that the correct flying technique to control an uncommanded pitch oscillation was to not induce any pilot input into the pitch axis. Rather, his understanding was that he should “freeze” and “centralise” the controls. He believed that if he did this, the AFCS could be relied upon to correct uncommanded disturbances and further, that any input he made would most likely exacerbate the problem.

188. On 26 Mar 11, when flying with Soldier15 during his mission qualification flight, Soldier2 encountered turbulence and pitch oscillations of around ten to fifteen degrees. He instinctively put in corrective action intended to correct the pitch at which point Soldier15 took over. The aircraft recovered its correct attitude within a couple of oscillations. Soldier2 believed that he had made an error in putting in an instinctive control input.

189. On 8 May 11 when flying with Soldier18, Soldier2 experienced a further pitch oscillation event. During this incident Soldier2 froze the controls and waited for the oscillations to be corrected by the AFCS. At this point
took control of the aircraft and instinctively, by making pilot inputs, recovered the aircraft. Although initially considered that the pitch oscillations were induced by Soldier 2's control inputs and were not caused by turbulence he later considered that with the benefit of hindsight and increased system knowledge control inputs he thought were coming from Soldier 2 were potentially coming from the ELA and DASH actuators and that could have been freezing the controls. At the time however he was convinced that the oscillations had resulted from Soldier 2’s over controlling of the aircraft. Soldier 2 remained convinced that he had done the right thing by freezing the controls and did not believe that he had somehow caused the pitch oscillations to occur. However this incident adversely affected his confidence.

190. Concerned with Soldier 18’s overall flying performance, Soldier 18 discussed his concern with the MLH Tp Comd, after the flight. Given the scrutiny he was receiving became more concerned about not making mistakes and became increasingly concerned about how he flew the Chinook for fear of inducing something. He believed that in a pitch oscillation incident he had no alternative except to freeze the controls [and allow the AFCS to sort out the oscillations] and if that did not work was not sure what to do.
191. [Soldier1] was a B Category pilot which category implies both extensive flying experience and significant flying ability. He had been trained to and fulfilled roles as a Kiowa pilot Unit Maintenance Test Pilot and Check Captain, Regiment Operations Captain and Regiment Operations Officer. He attained CH-47D on 14 Mar 11 while deployed on RWG6. He had a total of 1,760.3 military flying hours at this point of which were 365.2 hours were CH-47D hours [excluding simulator hours].

192. [Soldier1]'s evidence was that he first heard the term “porpoising” from [Soldier44] at Fort Lewis in February 2009. His evidence was that he was told of the phenomenon but was not taught how to deal with it and received no practical instruction on recovery techniques. His further evidence was that there was no documentation available dealing with recovery techniques in the event of an aircraft porpoising. However his evidence was that he recalled being told by [Soldier44] and later again at Townsville that in responding to “porpoising” he should not make any pitch inputs that would stop the AFCS from being able to recover the situation.

193. Evidence obtained by the Commission indicated that [Soldier1] had read the Aviation Incident Book when he arrived in Afghanistan as part of the RWG4 deployment at the beginning of 2010 but that he had no specific recollection of discussing the two entries relating to 20 Apr 08 and 29 Apr 08 with other members of RWG4.
194. [Soldier1] first experienced pitch oscillations during RWG4 in Afghanistan on two occasions as his aircraft crossed a ridgeline. On each of those occasions he froze the controls as he had been told to and in each instance the aircraft corrected itself to straight and level flight within two to three iterations. None of those oscillations exceeded five to ten degrees. He did not consider those incidents flight critical because they were only a response to turbulence and the oscillations were not divergent nor outside flight manual limits.

195. [Soldier1]'s understanding of "porpoising" was that it followed a two or three iteration cycle. The first would be minor being approximately three degrees nose up and down. The second and largest of the iterations would be approximately five to ten degrees up and down. The third smaller and final iteration would be approximately three to four degrees up and down. His understanding was that by the third iteration the AFCS would correct the pitch oscillations and regain level flight. As those iterations never exceeded the pitch limitations of the aircraft [thirty degrees nose up or down] and were not divergent he did not consider "porpoising" to be a flight critical risk. He considered it to be a normal response of the aircraft to turbulence caused by orographic or thermal updrafts or downdrafts. Until 30 May 11 no one, to his knowledge, had experienced pitch iterations in a CH-47D to become divergent or to go past the flight manual limits for the aircraft. His view was re-enforced by the fact that other pilots, including the QFIs who taught him to fly the CH-47D, were aware of the phenomenon and did not consider it to be significant or serious.
196. In respect of the RWG6 Safety and Standards meeting of 26 May 11\textsuperscript{Soldier1}'s evidence was that the final guidance for initial actions in circumstances of an aircraft "porpoising" was confirmed in the meeting as being to freeze on the controls. He noted however, that no actions following the initial action of freezing the controls [and institute a small turn] were discussed or implemented at that meeting. \textsuperscript{[\underline{\text{---}}]}

The Accident Sequence

197. As hereinbefore mentioned, \textsuperscript{Soldier2} and \textsuperscript{Soldier1} left the Safety and Standards meeting of 26 May 11 believing that there had been general agreement by those present that the correct technique for dealing with incidents of "porpoising" was as contained in the minutes, namely, to freeze the controls of the aircraft to avoid putting in pilot induced oscillations, and to institute a small turn.

198. The Commission notes that evidence from \textsuperscript{Defence67}(DSTO) in relation to the atmospheric conditions at the site, and at the time of the incident, were such that it was probable that gusts of a velocity capable of leading to a pitch rate causing saturation of the AFCS were present. \textsuperscript{Privacy} The Commission considers that it is probable that such turbulence initiated the pitch oscillation incident on 30 May 11.

199. When the aircraft commenced porpoising shortly prior to the accident, pitching to approximately fifteen to twenty degrees nose up, \textsuperscript{Privacy}
i.e. significantly in excess of the five to ten degrees of porpoising previously experienced by Soldier1, he directed Soldier2 to freeze the controls. The aircraft’s nose then pitched down to twenty degrees.

Soldier1 did not take over during the first iteration taking into account the issue of Soldier2’s confidence and the fact that he did not see the divergence as a safety issue at that point. Had he taken over he would have done exactly the same as Soldier2 was doing. He then commenced “ghosting” the flight controls with no pressure applied, i.e. holding his hand around, but just off, the cyclic and thrust controls with his feet resting lightly on the pedals.

During the second iteration when the nose up pitch had reached approximately twenty-five degrees Soldier1 made an instinctive small forward movement on the cyclic to lower the attitude. He immediately realised that his actions were not in accordance with the procedure briefed in the Safety and Standards meeting as the correct porpoising corrective actions. His inputs were opposed by Soldier2’s inputs in freezing the controls. Noting that Soldier2 was holding the cyclic firmly and not changing the pitch and appeared to be handling the situation Soldier1 considering his instinctive action to be an incorrect action, released his grip on the controls and went back to ghosting. During the second iteration Soldier1 estimated that the nose pitched down to twenty-five degrees while Soldier2 was unable to estimate the magnitude of that part of the incident.
201. In the third iteration the aircraft pitched nose up to thirty to fifty degrees, 30 degrees, cf forty to fifty degrees] i.e. at or in excess of the aircraft’s flight limits and, as aforesaid, significantly in excess of any divergence that had previously experienced, or was aware of. A nose pitch down of approximately 30 to 50 degrees followed. Continued to ghost the controls until, in the course of the fourth iteration, at a point when the aircraft pitched nose up fifty to sixty degrees and then nose down ninety degrees, continuing to one hundred to one hundred and ten degrees, beyond the vertical] he came onto the controls of the aircraft as it passed through ninety degrees nose down. As the nose of the aircraft started to lift, pitching back to less than ninety degrees nose down in its original direction of travel gently applied aft cyclic and thereafter continued increasing the thrust, focusing on controlling the aircraft attitude and avoiding the ground.

202. As the aircraft proceeded towards the ground when the nose attitude was about ten to fifteen degrees high he made a rapid full forward cyclic movement which bought the nose down to zero pitch and wings level and rapidly moved the cyclic rearwards back to the central position. When the aircraft was approximately five to ten feet above ground level allowed it to descend two to three feet off the ground and pumped the thrust control level up and down an inch or so in an attempt to recover the rotor revolutions per minute. continued to pump the thrust control level as the aircraft settled at approximately two to three feet above ground level and
increased thrust until the control lever reached its upper stop. At this point the aircraft impacted with the ground and rolled to the right.

203. ['Soldier1'] estimated that the time from first pitch up to impact was twenty to thirty seconds ['____'] however ['Soldier47'] replication of the incident in the BHSIM indicated that the time involved in this porpoising incident was in the order of 50 seconds. ['______']

Findings

204. The conclusion from the AAIT Report that the accident aircraft had been correctly maintained, prepared and presented for flight is accepted. There were no significant CFU. As far as could be ascertained, the aircraft remained serviceable, with the crew reporting no in-flight anomalies.

205. Above 40 knots the Chinook is statically unstable in the longitudinal axis without some kind of additional flight control augmentation and is fitted with an AFCS to provide that stability augmentation. The AFCS provides stability augmentation to reduce pilot workload but is not an autopilot.

206. In the longitudinal axis, the CH-47D AFCS uses a DASH actuator to provide long term pitch stability; positive stick gradient, positive speed stability about a fixed stick position, airspeed/pitch attitude hold and control augmentation are provided from
hover to maximum speed. The DASH actuator can become rate saturated when it is required to move faster than its capabilities which will happen when the combination of aircraft pitch rate, rate of longitudinal stick movement and rate of airspeed change reach a critical level.

207. In the longitudinal axis, the CH-47D AFCS uses ELA within the ILCA to provide supplemental pitch damping for both the basic aircraft and to correct the dynamic instabilities generated by the DASH actuator. The ELA can become saturated when they reach their physical travel limit and are no longer able to provide rate damping control inputs.

208. The pilot can easily override the AFCS should any of the AFCS actuators fail or become saturated.

209. The DSTO/ARDU tests closely correlated the results derived from the initial computer modelling and confirmed the probable behaviour of the AFCS under the circumstances of 30 May 11.

210. If not corrected by active intervention by a pilot, a pitch rate excursion of five to ten degrees per second is likely to cause ELA saturation, closely followed by DASH rate saturation.
211. Atmospheric turbulence involving vertical gusts of seven to eight metres per second [roughly fifteen knots] in the vicinity of the aircraft can generate a pitch rate in excess of five to ten degrees per second in a CH-47D. Such gusts were present on the day of the accident.

212. A divergent pitch oscillation will occur once the DASH actuator is unable to move fast enough to arrest the pitch change and the ELAs are unable arrest the pitch rate.

213. An uncommanded pitch excursion can be easily corrected by the pilot, particularly with early intervention, thereby eliminating the potential for a divergent pitch oscillation to develop.

214. Should an uncommanded pitch oscillation be allowed to develop, it can be quickly recovered by instinctive pilot control input; that is, firstly opposing the pitch rates and then selecting the appropriate pitch attitude.

215. Pilots should always actively fly the Chinook; checking and arresting any pitch attitude change before it reaches ±5 degrees preferably but no later than ±10 degrees. Pilots should not passively rely on the AFCS to arrest uncommanded pitch rates.

216. If a pilot induced oscillation is suspected, then the recovery action will be to immediately cease the control input causing the oscillation, and actively fly the aircraft back to the desired attitude.
217. Pilot flying proficiency and pilot confidence with respect to actively controlling the CH-47D and not stimulating pilot induced oscillations would be considerably improved by increasing the flight time spent practising flying the Chinook with the AFCS selected OFF.

218. The concept of AFCS saturation was not taught or understood in the wider Chinook community but was only known to a very small test pilot community in three other countries and Australia. The test pilot community considered that this phenomenon would never be experienced if the Chinook was flown with the correct attentive piloting technique.

219. Experienced CH-47D pilots within AAAvn did not experience pitch oscillations because they worked with the AFCS actively countering any uncommanded pitch rates that the aircraft generated following an atmospheric disturbance and thereby avoiding actuator saturation.

220. A flawed analysis by the Australian Chinook community as to the causes of the divergent pitch oscillations fuelled a concern that pilots were inducing the oscillations by inappropriate control inputs.

221. In the absence of real knowledge of the AFCS’s limitations and with concerns about causing a pilot induced oscillation, less experienced pilots were freezing on the controls and exclusively relying on the AFCS to control the aircraft following a pitch disturbance.
222. Most CH-47D pilots were unaware of the need to assist the AFCS by actively flying the Chinook and correcting high rate uncommanded pitch disturbances. The normalised deviance of many factors probably led to the mistaken belief that pilots must be “chasing the AFCS” and therefore causing the oscillations.

223. In the past, experienced pilots readily took over and corrected any uncommanded pitch disturbances when they developed at the hands of less experienced pilots before AFCS saturation caused significant aircraft oscillations.

224. More recently qualified Chinook pilots and those of less experience were more likely to experience uncommanded pitch oscillations as they flew passively on the cyclic, instead relying exclusively on the AFCS to damp the oscillations; a task that it was not always capable of. This change in piloting technique apparently grew insidiously in the Chinook community over the five years preceding the accident.

225. The reduction in the flying time that Chinook pilots have flying the aircraft with the AFCS selected OFF probably reduced confidence of junior pilots in handling the CH-47D and probably contributed to the change in flying technique used by them.

226. The only significant consideration of CH-47D pitch oscillation incidents appears to have occurred during a RWG6 Safety and Standards meeting on 26 May 11 but this led only to a PIRR and not to any formal reporting of the incident under consideration, or “porpoising” generally. No ASOR were submitted with respect to “porpoising” thereby excluding monitoring and analysis by the formal reporting system, as did the
use of the Aviation Incident Book to record incidents which tended to localise the issue.

227. Having self diagnosed the growing number of recent oscillations through the lens of their limited knowledge and experience, RWG6 personnel attempted to correct such oscillations by freezing the controls, thereby inadvertently exacerbating the real problem.

228. The inability on the part of less experienced pilots to recognise and correct a basic flaw in flying technique led to that same flawed flying technique being utilised in the aircraft shortly prior to the accident and was a causative factor in the accident.

229. Prior to the happening of the accident both Soldier2 and Soldier1 had experienced pitch oscillation incidents of no more than five or ten degrees and believed that making no pilot input onto the controls, and allowing the AFCS to damp the aircraft oscillations, was the appropriate method of dealing with the oscillations. Their respective beliefs were re-enforced by the view they considered had been reached in the Safety and Standards meeting of 26 May 11, namely that freezing the controls was an appropriate method of dealing with ‘porpoising’.

230. Freezing the controls is an inappropriate and unauthorised method of dealing with pitch oscillations caused by AFCS saturation.

231. Immediately prior to the happening of the accident, Soldier2 failed to actively control the aircraft following the initial pitch disturbance and then adopted an
inappropriate and unauthorised flying technique in freezing the flight controls.

232. At the time of the accident Soldier2 by virtue of his experiences in dealing with pitch oscillations and his low confidence, probably had been preconditioned to apply the inappropriate and unauthorised recovery technique that he did during the accident sequence. In any case Soldier2 was directed by Soldier1 as the AC, to freeze the controls.

233. Soldier1 did not take over control of the aircraft prior to, or at the time of the aircraft exceeding its flight limits, a point at which the safety of the crew had become uncertain. Soldier1 as the AC, should have taken control of the aircraft prior to the time that he did.

234. Soldier1's instinctive reaction to fly the aircraft during the second iteration was most likely the correct response at that time and in the prevailing circumstances would probably have recovered the aircraft to controlled flight.

235. At the time of the accident Soldier1 by virtue of his limited knowledge of the AFCS operation and limitations and his limited exposure to the phenomenon was probably swayed by the 26 May 11 RWG6 Safety and Standards meeting discussion on “porpoising” to a point that he no longer trusted his own intuitive recovery action; preferring instead to allow Soldier2 to use the aforesaid inappropriate and unauthorised recovery technique until it was almost too late to recover the aircraft.
236. On the final iteration, [Soldier] took over control at a point when the aircraft was at an attitude of at least ninety degrees nose down. By taking over control of the aircraft when he did [Soldier] was able to exercise some control of the aircraft’s final impact and probably lessened the magnitude of the impact and the risk of serious injury to the crew.

237. LT Case died as a result of travelling in a serviceable aircraft that was allowed to depart from controlled flight and was not subsequently recovered to controlled flight in time to prevent the aircraft from impacting the ground.

Recommendations

238. The Commission recommends that AAAvn reconsider the policy of only allowing the flying of the CH-47D with the AFCS switched OFF when a QFI is present with the view to significantly increasing pilot exposure to such flight, particularly since AFCS OFF flight is not considered to be an emergency situation.

239. The Commission recommends that the AAAvn policy with respect to using an “Aviation Incident Book” to record incidents locally be reviewed in light of the DDAAFS concerns about such use.

240. The Commission recommends that AAAvn emphasise the importance of formal reporting of aircraft safety incidents through the proper use of ASOR and DAHRTS
utilizing the accident in question, along with the previous helicopter accidents of 1996 and 2006.

241. Taking account of the aforesaid recommendations and having regard to and the amendments that have been made to pilot training for CH-47D pilots, which training includes reference to the potential for AFCS saturation and the appropriate responses thereto, and having regard to the imminent introduction of the CH-47F into the ADF fleet, the Commission makes no recommendation for any further action over and above that which has already occurred.

B. THE CARRIAGE OF PASSENGERS IN AN OCL CONFIGURATION ON FAMILIARISATION FLIGHTS ON CH-47D AIRCRAFT BY MEMBERS OF C SQN, 5 AVN REGT, PREVIOUS RWGS AND SPECIFICALLY RWG6, INCLUDING AT THE TIME OF THE HAPPENING OF THE ACCIDENT

DEPUTY CHIEF OF ARMY DIRECTIVE, SI AND SFI GOVERNING THE CARRIAGE OF PASSENGERS ON RWG6 AIRCRAFT

242. At the time of, and prior to, the happening of the accident, the following materials governed the carriage of passengers, including LT Case, on RWG6 aircraft.
These were:

- **DCA Directive 04/09**
- **SI (AVN) OPS 3-107**
- Glossary of terms referable to SI (AVN) OPS 3-107
- **SI (AVN) OPS 3-201**
- **SI (AVN) OPS 3-214**
- **Special Flying Instruction (SFI) 4/2008**
- **SFI 14/2007**
- **JTF633 SI**

Relevant parts of these materials are particularised hereunder. The Commission has emphasised significant aspects of each of the above documents by highlighting the same in bold [apart from headings which appear as bold in the original documents].

243. **DCA Directive 04/09** was signed by MAJGEN Symon, as DCA, on **24 Mar 09**.

As is indicated by Reference C of that document, this Directive had its genesis in a recommendation contained in the Black Hawk 221 Board of Inquiry report dated **7 Aug 08**.

244. This Directive was preceded by earlier **DCA Directives 18/98** and **12/08** signed by MAJGEN Abigail and MAJGEN Morrison respectively. These Directives contain the same definition of “crew” and “passenger” as **DCA Directive 04/09** but differ slightly in their definitions of OCL. Apart from the addition of the words “and Aircraft Captains” following the word Commanders in **DCA Directive 04/09**, the
Commander's Intent is identical in DCA Directives 12/08 and 04/09. There is no expression of the Commander's Intent in DCA Directive 18/98.

245. Each of the Directives refers to the risks inherent in loading persons in an OCL configuration and DCA Directives 12/08 and 04/09 contain essentially similar directions in relation to all activities involving OCL being risk managed in accordance with specified references. In DCA Directive 04/09 such references, being D and E, refer to Army Technical Instructions 01/2007 Military Risk Management dated 19 Oct 07 (ATI) and Defence Instruction Air Force (DI (AF)) OPS 1-19 Royal Australian Air Force Aviation Risk Management. The ATI provides guidance on the integration of Military Risk Management into the Military Appreciation Process in order to enhance command decision-making. [Paragraph 5 of ATI 01/2007] The Commission notes that the last mentioned document appears in fact to be DI (AF) OPS 1-18 being part of DI (General) (G) OPS 40-2. In each of the Directives the CJTF or the senior Operational Commander has been designated as the authority for the authorisation of OCL on operations.

246. DI (AF) OPS 1-18 paragraph 7 states inter alia that:

Commanders must determine the risk level that is acceptable through evaluation of the contribution to combat power and readiness arising from mission achievement against the nature of the risks involved. This is the essence of risk management.
247. **DI (AF) OPS 1-18** paragraph 8 sets out the three fundamental aviation risk management principles as follows:

   a. *Do not accept unnecessary risk.*

   b. *Accept risk only when the benefits outweigh the costs.*

   c. *Make risk decisions at the appropriate level.*

248. **DI (AF) OPS 1-18** paragraph 12 of the document states, *inter alia,*

   A fundamental feature of effective risk management is that commanders make judgements and manage risk within the limits of their delegated authority……..

   Commanders of aviation forces are to ensure that they are involved in, or have visibility of the operational risk management process and that they are provided with sufficient guidance to enable them to apply AVRM policy. Where this guidance cannot be obtained the relevant commander within the Service chain of command is to be advised.

249. It is apparent that OCL of personnel in Army aircraft has long been recognised as involving significant risk and has been the subject of DCA directives since at least 1998. In the course of its inquiries the Commission received evidence concerning the intent of **DCA Directive 04/09** and also concerning various subjective interpretations of its requirements. However, the Commission, while considering such evidence, has necessarily made its own interpretation of the terms and requirements of such Directive, which governed the carriage of passengers on RWG6 aircraft at all material times.
250. **DCA Directive 04/09** is central to the Commission’s inquiries and is reproduced in its entirety below.

"**OPERATIONAL CONTINGENCY LOADING OF ARMY PERSONNEL AND CARGO**

References:

A. **DCA Directive 12/08 – Operational Contingency Loading of Army Personnel of 26 Nov 08**

B. **Aircraft Specific AAP 7210 XXX – 35M Aircraft Role Equipment**

C. **CDF/OUT/2008/622 Review of Recommendation 7E of the Black Hawk 221 Board of Inquiry Report dated 07 Aug 08**

D. **Army Technical Instruction 01/2007 MILITARY RISK MANAGEMENT dated 19 Oct 07**

E. **DI (AF) OPS 1-19 [18] Royal Australian Air Force Risk Management**

**INTRODUCTION**

1. **OCL activities create a significantly higher risk to passengers, aircraft and crews in the event of a crash or a hard landing. Army therefore has a legal and moral obligation to minimise the risk associated with OCL in order to provide its people with safe workplaces and practices. OCL requirements may include Army personnel and related person or mission essential equipment and/or other essential equipment.**
AIM

2. This Directive describes the approved activities, authorisation responsibilities and risk management policies applicable to the use of OCL.

Commanders Intent

3. The intent of this Directive is to ensure that commanders and aircraft captains understand their responsibility for the safety of personnel under their command when allowing them to employ OCL procedures. There will always be circumstances where it is operationally necessary to employ and therefore to train for, OCL. However, before authorising use of OCL, commanders must satisfy themselves that the need justifies the risk involved, particularly in training.

Applicability

4. Reference A is cancelled by this Directive.

5. This Directive applies to the use of OCL for the carriage of Army personnel and/or mission-essential equipment in any ADF aircraft or in any civilian aircraft hired by, or operated on behalf of, the ADF.

6. Commanders of Australian forces on exercise or operations with Coalition forces are to apply the provision of this Directive to the carriage of Army personnel in any foreign military or civilian aircraft.
7. Army personnel on individual exchange postings with foreign military services are bound by the policies applicable to that service.

Definitions

8. For the purposes of this Directive, the following definitions apply:

a. Approved seating. That seating certified for that aircraft type and as described in the approved flight manual. Any reference to approved seating includes the use of the approved restraint system associated with that seating.

b. Passenger. A passenger is any person travelling in an aircraft not acting as part of the crew of that aircraft.

c. Crew. The crew are suitably qualified personnel specifically authorised to assist in the operation of aircraft.

d. OCL. OCL is the generic term for any activity involving the carriage of passengers and/or equipment in aircraft when not properly seated nor restrained on approved aircraft seating or, (in the case of equipment) is equipment restrained in accordance with ADF cargo loading guidance and contained in reference B, during any operations.
Approved OCL Activities

9. **Combat Loading.** Combat Loading is the carriage of passengers in excess of the aircraft’s maximum approved seating capacity. This may involve the removal of some or all seats in order to load passengers and equipment up to the maximum capacity of the aircraft.

10. **Special OCL Activities.** Activities where carriage of passengers or equipment outside of approved seating is required due to the nature of the activity and/or because the role equipment fitted to the aircraft requires the removal of some or all aircraft seating. Approved activities are:
   a. **Airborne Rappelling.** Exiting a helicopter using a rope and mechanical descending devices.
   b. **Fast roping.** Exiting a helicopter by descending a purpose-designed rope without the aid of mechanical descending devices.
   c. **Suspended Extraction.** Extracting personnel by means of ropes or ladder systems suspended below a helicopter. The personnel remain suspended below the aircraft until reaching the nearest safe Helicopter Landing Zone.
   d. **Recovery by Suspended Equipment.** Scaling equipment (normally caving ladders) suspended below a hovering helicopter, in order to climb into the cabin.
   e. **Water Insertion.** Dispatching troops into a body of water from within a helicopter, whilst at the hover or moving at a predetermined height and speed.
f. **Special Force Support Operations.** SF activities for which the operation of specialist role equipment (e.g. fire support weapons, surveillance equipment) precludes the user from occupying approved aircraft seating.

g. **Live Hoisting.** Live Hoisting is the procedure where personnel are raised to, or lowered from, an airborne helicopter by means of the aircraft’s mechanical hoist.

h. **Parachuting.** Parachuting is the delivery of personnel by parachute, using either freefall or static line techniques, from an aircraft in flight. Parachuting activities require approval to conduct OCL if the configuration of the aircraft does not permit the use of approved seating during take-off, landing and operations below 1000ft AGL.

**Authorisation of Operational Contingency Loading**

11. **OCL on operations.** The commander of forces assigned under OPCOMD by CJOPS [Commander Joint Operation] is the authority for the approval of OCL on operations. This will normally be the designated Joint Task Force Commander.

12. **OCL in Training.** CDF guidance, as per Reference C, states OCL in training is to be limited to that which is necessary to meet specific training objectives. Units authorized to conduct OCL training, the frequency and nature of training allowed and the approving authorities for that training
are detailed in Annex A. Combat Loading is not permitted during training unless essential to meeting OPO requirements.

13. **Parachuting.** Where a suitable ADF aircraft is not available and OCL is required by the seating configuration of civilian parachuting aircraft, the use of OCL may be authorized by the appropriate Functional HQ COMD/COFS for those activities detailed in Annex A.

14. **Defence Aid to Civil Community (DACC).** DACC tasks may require the use of OCL in an emergency. Where time permits, approval is to be sought from the tasking authority (HQ JOC, AHQ or Functional Command as appropriate).

15. **Other Activities.** Decisions to employ OCL for any other activity including events of national significance are to be referred to AHQ for approval.

16. **Emergencies.** In event of an emergency where there is a threat to life and time is not available to seek higher authorization, OCL may be authorized by:

   a. The commander of a unit which has aviation support available, or

   b. In the absence of 16 a., the air mission commander or aircraft captain.
Risk Management

17. All activities involving OCL are to be risk managed IAW the procedure as described in references D and E. This process is to include both the aviation and ground component commanders, however final acceptance of risk rests with the commander of the personnel being carried. Where OCL activities contain elements of risk that are not inherently aviation related (e.g. rappelling, roping), these risks should be incorporated and addressed as part of the ground components RMP. [Risk Management Plan]

18. In all circumstances, the following risk control measures are to be applied:

(a) Approved seating is to be used to the maximum extent possible. Seating is not to be removed in order to conduct special OCL activities except as required by aircraft role equipment. Approved cargo restraint techniques and principles are to be utilised to the maximum extent possible.

(b) Passengers are to occupy approved seating where it is available, except when specifically required by the nature of the activity to be outside of that seating.

(c) Commanders must ensure that use of OCL in training is meeting a specific training need and that alternative solutions not involving
OCL are not suitable. Achieving realism in training is not in itself sufficient justification for the use of OCL.

(d) When conducting training for Special OCL activities, exposure to OCL conditions is to be the minimum necessary to achieve a specific training objective of the activity. Personnel are not to be carried for extended distances outside of approved seating unless a requirement of the activity.

(e) Restraining devices such as OCL strops are important risk mitigation measures, however they offer minimal crash protection and are not to be used in lieu of approved seating and seat restraint systems except as specified in this Directive.

Aircraft Configuration

19. Seat Restraints. Where equipment worn by passengers interferes with the approved seat restraint system, this equipment must be removed to permit use of the restraint system. The only exception to this is for Special OCL activities where rapid egress from the aircraft is an essential requirement and the risks associated with removing and donning such equipment in flight outweighs the risk of not using the approved seat restraints. Exemptions from using approved seating restraint systems must be authorised as part of the risk management process.
20. **Black Hawk specific issues.** The Fast Roping and Rappelling Device (FRRD) employed in the Black Hawk prevents the carriage of more than four in the rear passenger seats when conducting special OCL activities requiring the FRRD to be fitted (Airborne, Rappelling, Fast Roping, Suspended Extraction or Recovery by Suspended Equipment) the following conditions apply:

[Thereafter are contained conditions sub-paragraphs a and b]

21. **Commanders must always balance the advantages of using OCL against the risks incurred by sacrificing the protection afforded by approved crashworthy seating.** Particularly when conducting training, commanders are responsible for ensuring that any OCL activity is both necessary and conducted as safely as possible.”

251. **SI (AVN) OPS 3-107** headed Operational Contingency Loading was promulgated on 1 Dec 09 for the wider circulation of **DCA Directive 04/09.** It refers *inter alia,* to that Directive as Annex A to the SI. Paragraphs 1, 2, 4, 5 and 8 state:

1. *This SI applies to the operational contingency loading (OCL) of troops including joint service exercises and overseas deployments involving Australian Army aircraft, unless otherwise approved by Army Headquarters (AHQ). The authority for this SI is Deputy Chief of Army (DCA) Directive 04/09.*
2. **Operational contingencies.** The senior Australian operational commander is the authority for the authorisation of OCL on operations.

4. **Other activities.** Decisions to employ OCL for any other activity, including events of national significance, are to be referred to AHQ for approval.

5. **Emergencies.** In an emergency, OCL may be authorised by:

   a. the commander of a unit which has Army aviation support available;
      
      or
   
   b. in the absence of a commander as defined in subparagraph 5.a., the air mission commander/aircraft captain.

**Risk**

8. Commanders at all levels are to be cognisant of the risk level inherent in loading troops in an OCL configuration. Aviation unit commanders are to bring this to the attention of commanders of supported formations.

The SI also refers in the context of related orders; instructions and publications to SI (AVN) OPS 3-201 headed “Carriage of Passengers”.

252. As will hereinafter be seen, the requirements relating to OCL the subject of SI (AVN) OPS 3-107 and DCA Directive 04/09 are modified by the provisions of
paragraph 1 of SI (AVN) OPS 3-214 although such modification does not detract from the plain intent of DCA Directive 04/09 [paragraphs 1, 2, 3, paragraph 8 d. and paragraph 18 of that Directive] in relation to Army passengers remaining in approved seating when travelling on ADF aircraft.

GLOSSARY OF TERMS REFERABLE TO SI AVN (OPS) 3-107

253. The glossary of terms referable to SI (AVN) OPS 3-107 relevantly provides the following definitions:

Aircraft Captain

*The aircraft captain is that member of the flight crew who is designated aircraft commander by the authorising officer and who has overall authority for the safe operation of the aircraft.*

Aircrewman

*An aircrewman is a qualified aircrewman loadmaster or aircrewman technician.*

Crew

*The crew are suitably qualified personnel specifically authorised to operate an aircraft.*

Operational Contingency Loading (OCL)

*OCL is a generic term for the carriage of passengers in Army aircraft where they are not properly seated nor restrained on approved aircraft.*
seating. OCL therefore includes all situations where passengers are accommodated in aircraft without fixed seating and appropriate restraints.

Troops are deemed to be in an OCL configuration if one or more of the following criteria are met.

[These criteria are set out in subparagraphs (a), (b), (c) and (d) to the definition of OCL.]

Passenger

A passenger is any person travelling in an aircraft and not acting as part of the authorised crew of that aircraft.

Qualified Aircrew

A qualified aircrew member is a member who is authorised to wear the Army Flying Badge, the Aircrewman Loadmaster Badge, the Aircrewman Technical Badge, the Flight Test Engineer Badge, a Qualified UAV Operator or approved contractor aircrew as appropriate.

254. SI (AVN) OPS 3-201 headed “Carriage of Passengers” was also promulgated on 1 Dec 09 and specified that passengers in any aircraft must be carried in accordance with this SI.

255. Relevantly, paragraphs 5, 8 and 11 of SI (AVN) OPS 3-201 state:

(5) Where special circumstances exist, the commanding officer (CO) of an operating unit may authorise a qualified flying instructor (QFI) to carry a
passenger in a crew position that would normally require a qualified crew member for the purpose of familiarising that person with aircraft operations.

(8) The names of all passengers are to be recorded in:

(a) PEX, or

(b) an operation order, or

(c) a passenger manifest.

(11) (Inter alia) Prior to takeoff, aircraft captains are to satisfy themselves that passengers in Army aircraft are aware of and, if required, briefed on, the following:.......

(h) the operation of applicable aircraft equipment, including use of seatbelts and harnesses;

(n) specific precautions for passengers occupying crew stations and any requirement for them to operate controls.

256. SI (AVN) OPS 3-214 headed “Aircraft Cabin and Personnel Security” was also promulgated on 1 Dec 09. Relevantly, paragraphs 1, 2 and 4 state:

(1) Seatbelts. Unless approved by the aircraft captain, passengers and crew are to wear seatbelts at all times during flight and any time the engine(s) are operating.
Aircrewman harnesses. Aircrewman harnesses must be worn by aircrewmen and secured to the aircraft whenever they are not seated with seatbelt fitted.

Operational contingency loading (OCL). Passengers carried in an aircraft in an OCL configuration are to conform to the requirements detailed in SI (AVN) OPS 3-107 Operational Contingency Loading.

257. SFI 4/2008 headed “CH-47D Operations during OPERATION SLIPPER” was promulgated on 3 Mar 11. Relevantly, paragraph 9 (serial 3) and paragraph 12 state:

Serial 3: On occasions when troops are carried OCL an event is to be entered in Defence Aviation Hazard Reporting Tracking System (DAHRTS).

The Air Warrior Aircrew Ensemble (AWAE) configuration presented in reference E is authorised for use by CH-47D pilots and aircrewmen.

Paragraph 12 of SFI 4/2008 reflects an identical provision contained in paragraph 14 SFI 24/2007 [123], which remained extant at all relevant times.

258. Reference E, in paragraph 12, of SFI 4/2008 in fact refers to a Design Approval Certificate dated 1 Dec 08 and 2 Dec 08 which document was not an authorisation for use of the AWAE but rather approval of the design of the equipment.
259. Following the design approval of 1 Dec 08 and 2 Dec 08 the AWAE was released into service by Army Aviation Systems Program Office (AASPO) on 18 Feb 09. The subject release document is Soldier12’s statement at I1. A copy of this release was forwarded inter alia, to HQ 16 Avn Bde, Australian Army Aviation Training Centre (AAAvnTC) and 5 Avn Regt, C Sqn OC.

260. It should be noted that the AWAE consists of six parts as detailed in paragraph sub-paragraphs to the statement of Soldier12, one of such parts, sub-paragraph being the Z51 Restraint Strap. Of significance is that paragraph sub-paragraph of the release refers to the aircrewnmen restraint strap being for aircrewnmen personnel only.

261. Soldier12’s evidence was that as a consequence of that restriction on the use of the restraint strap, any person seeking to utilise it for purposes other than for use by pilots and aircrewnmen, for example use by passengers, would need to conduct a risk assessment prior to permitting the non-authorised use of the Z51 Restraint Strap. SF1 4/2008 paragraph 12 was amended subsequent to 30 May 11 so that the use of the Z51 Restraint Strap was clearly restricted, as intended by its service release, to use by aircrewnmen personnel only.

262. SF1 14/2007 headed “Restriction on the Use of Aircrewnman Harness” was promulgated on 10 Dec 10. Relevantly, paragraph 9 states:
(9) Aircrewman harnesses do not provide suitable crash restraint. Therefore, aircrewmen shall be seated and remain in an approved seating position unless specifically required to be out of that seating position to perform a duty which cannot be achieved while seated in the same position.

263. JTF 633 SI. Relevantly, paragraphs 73 and 90 state:

(73) Movement in Afghanistan and Iraq. All moves outside of CF [Coalition Forces] bases and designated secure areas in Iraq and Afghanistan are to be mission essential in nature and meet the following requirements.

There follows a list of requirements from (a) to (o). The Commission noted requirement (i), which states:

(i) All non-mission-essential movements require a risk assessment to be conducted.

This apparent anomaly was explained by Soldier11, in his evidence, as referring to circumstances of returning a service member from the field for the purposes of compassionate leave and the risks associated with that return.

(90) Requests to waive any of the requirements of this SI must be made to J3 HQ JTF633. All requests for waivers are to include the following supporting documents:

a) a risk assessment to support the waiver request;
b) an explanation of the operational requirement for the waiver or change;

c) an explanation of the operational benefit that cannot be achieved by other practicable alternative;

d) assessment that the waiver or variation will not generate an increased risk or new risks that cannot be mitigated to an acceptable level; and

e) proof of consideration for the balance of strategic, environmental and occupational risks against the operational requirement.

264. As hereinafter appears, evidence obtained by the Commission indicated that the term “mission essential” was given differing subjective interpretations by RWG6 personnel and that as a result, a number of passengers who in the view of the Commission were not “mission essential” passengers were carried on RWG6 aircraft during 2011. No evidence emerged to indicate that any applications were made to JTF633 to waive the requirements of paragraph 73 of JTF633 S1 in respect of the carriage of such passengers.

265. It is apposite to note at this point of the report the evidence given to the Commission by [Soldier29] that there were no less than six places to go to in order to find references to OCL in Australian Army Aviation (AAAvn) documentation. He considered that harmonisation was required of such documentation in a manner such
that it could be easily referred to and clearly understood. However he considered that it would not be hard to find what was meant by OCL from S1 (AVN) OPS 3-107 and DCA Directive 04/09.

266. To the same effect was Soldier31's evidence that SFI (AVN) OPS 3-107, DCA Directive 04/09 and SFI (AVN) OPS 3-214 existed in stovepipes and that inconsistent amendments had caused them to become unsynchronised. Soldier31's further evidence was that in a pure sense reading of paragraph 8 d. of DCA Directive 04/09 anyone not restrained [on approved aircraft seating] on a CH-47D aircraft would be OCL.

267. In the Commission’s view DCA Directive 04/09 and S1 (AVN) OPS 3-107 do clearly define what is meant by OCL. However, aspects of DCA Directive 04/09 lacked precision and as a consequence were ambiguous and not properly understood by persons required to understand and comply with the Directive as hereinafter appears.

268. Whilst not relating to the carriage of passengers on aircraft in an OCL configuration the Directive from Soldier30, the then COMD 16 Avn Bde, detailing his guidance and directions to Soldier9 during Soldier9's Command of RWG6 on Operation Slipper, is relevant to indicate the duties and responsibilities of Soldier9 as the CO of RWG6 on deployment. Soldier30's Directive is: COMD 16 AVN BDE Directive 18/10 CTG633.7 – OP SLIPPER – Soldier9
269. Under the heading CO Delegation the succeeding paragraphs deal inter alia with the delegation of specified responsibilities from Soldier 9 to Soldier

Paragraphs 3, 11, 20, 21 and 22 of this Directive state:

(3) You are responsible to ensure that your sub-unit operations are IAW these SIs. You are to ensure that your sub-unit provides the highest operational capability that you are able to, whilst doing so professionally and safely.

(11) You have the authority to conduct flight authorisation up to risk level medium for all mission profiles regardless of your own aircrew qualifications or currency.

(20) AVRM procedures are to be applied IAW SI and the RWG RMP.

(21) You are to contact the HQ16 AVN Brigade Force Preservation Section prior to deployment in order to receive a briefing on safety trends associated with previous RWG operations.

(22) During your deployment you can expect to receive two OPAW audits for an independent review of operational technical airworthiness procedures. Proposed dates are as follows:

OPAW audit 1 – 28 April – 12 May ’11; and

OPAW audit 2 – 18 August – 07 September ’11.
THE COMMISSION’S ANALYSIS OF DCA DIRECTIVE 04/09

270. The following flow chart based on **DCA Directive 04/09** sets out the Commission’s interpretation of the approval process for OCL activities in the Middle East Area of Operations (MEAO). What follows is the Commission’s consideration and interpretation of the **DCA Directive 04/09** in the context of related SI and SFI.

**DCA DIRECTIVE 04/09—OPERATIONAL CONTINGENCY LOADING OF ARMY PERSONNEL AND CARGO DATED 24 MAR 09**

- **DCA Directive 04/09**
  - Authorised OCL of Army personnel and equipment (as defined in para 8 c.) in the MEAO can only occur in the following three ways

  - **Approved OCL activities**
    - Combat loading as listed in para 9
    - Special OCL activities as listed in para 10
  
  - **Any other OCL activities**
    - Any proposed OCL activity not falling into the categories in paras 9 and 10, (and possibly paras 12 and 13) is to be referred to AHQ for approval - see para 15
  
  - **OCL in emergencies**
    - In the event of an emergency on operations OCL may be authorized by:
      - Commander of a unit which has aviation support – see para 16 (a)
      - The air mission commander or aircraft captain – see para 16(b)

- **Authority for approval of above OCL activities in the MEAO**
  - Commander Joint Task Force 633 – see para 11
271. **Australian Defence Force Publication (ADFP) 102-Staff Duties Series – Defence Writing Standards (ADFP 102)** outlines the conventions that apply to Defence writing and gives guidance to ADF members in the preparation of ADF documents so as to ensure that the information contained therein is clear and avoids ambiguity and misunderstanding.

272. Paragraph 2.6 of **ADFP 102** indicates the importance of accuracy and precision in the drafting of ADF documents. That paragraph describes accuracy as vital and highlights the necessity of any ADF document being able to withstand scrutiny.

273. Whilst evidence obtained by the Commission indicated that thought and effort had gone into the drafting of **DCA Directive 04/09**, the Commission as aforesaid, considered that aspects of the Directive lacked precision and were ambiguous and in some instances were not properly understood by persons required to understand and comply with the Directive in relation to carriage of passengers on RWG6 aircraft.

274. Army considers that personnel travelling in Army aircraft in an OCL configuration are in an inherently dangerous position in the event of a crash or hard landing and that as a consequence proper risk management procedures need to be utilised, as part of Army's legal and moral obligation, to minimise risks association with OCL in order to provide its people with safe and proper workplaces and practices.  

[Refer paragraphs 1, 2 and 3 of DCA Directive 04/09]
275. Paragraph 18 of DCA Directive 04/09 mandates risk control measures in respect of the carriage of passengers on aircraft and includes the requirements that approved seating is to be used to the maximum extent possible, that passengers are to occupy approved seating where it is available except when specifically required by the nature of the activity to be outside of that seating and that restraining devices such as OCL strops are not to be used in lieu of approved seating and seat restraint systems except as specified in this Directive.

276. OCL is described in paragraph 8 d. of DCA Directive 04/09 as being “any activity involving the carriage of passengers...in aircraft when not properly seated or restrained on approved aircraft seating”. In the view of the Commission that definition clearly indicates that ramp riding, which involves not being seated or restrained on approved aircraft seating, constitutes OCL.

277. The Commission notes that paragraphs 9 and 10 of DCA Directive 04/09 cover the field of “Approved OCL Activities” being Combat Loading [paragraph 9] and Special OCL Activities [paragraph 10]. These OCL activities countenanced generally by DCA may be approved on operations by CJTF633 [paragraph 11]. The Commission notes that “Authorisation of Operation Contingency Loading” encompasses paragraphs 11, 12 and 13 of DCA Directive 04/09. The activities referred to in paragraphs 12 and 13 of the Directive may also be approved on operations by CJTF633 or certain designated subordinates. The Commission considers that the activities referred to in paragraphs 12 and 13 are such that while OCL
approval by CJTF633 may be given on operations such approval would be exceptional and specific task related.

278. The Commission considers that none of the OCL activities referred to in paragraphs 9, 10, 12 and 13 of **DCA Directive 04/09**, in respect of which CJTF633 can authorise OCL on operations, equate to a situation where CJTF633 could authorise passengers on familiarisation flights to travel in an OCL configuration in circumstances where approved seating is available on the aircraft for use by such passengers.

279. The Commission considers that the term “required” appearing in paragraph 10 of the Directive equates to the term necessary. It is readily apparent that neither paragraph 9 nor paragraph 10 encompasses a situation, outside of the restricted circumstances outlined in paragraph 10, where passengers are permitted to travel in an OCL configuration in circumstances where approved seating is available for their use.

280. Put shortly, the terms of **DCA Directive 04/09** referred to, indicate that OCL approval on operations by CJTF633 is confined to the activities covered in paragraphs 9 and 10 [and possibly paragraphs 12 and 13 if occurring on operations]. Pursuant to paragraph 15 of the Directive any decision by CJTF633 to employ OCL for any other activity, i.e. outside the activities referred to in paragraphs 9 and 10 [and possibly paragraphs 12 and 13 if occurring on operations] must be referred to AHQ for approval.
281. Paragraph 11 of **DCA Directive 04/09** specifies that the holder of the office for the time being, in this case of CJTF633, is the person with the authority to approve OCL on operations.

282. The Commission considered an interpretation of **DCA Directive 04/09** involving paragraph 11 being read so as to create an authority for CJTF633 to approve, on operations, any variation of OCL as defined in paragraph 8 d.

283. If paragraph 11 of the Directive were to be read as creating an authority for authorising CJTF633 to approve on operations any variation of OCL as defined in paragraph 8 d. there would not be the need to specify with precision in paragraphs 9 and 10 what are Approved OCL Activities and such paragraphs would be effectively surplusage to the Directive, as would paragraph 15 requiring “any other” OCL activity to be referred to AHQ.

284. Further the Commission considers that the phrase “any activity” involving the carriage of passengers outside of approved aircraft seating [paragraph 8d. **DCA Directive 04/09**] must be read in the context of paragraphs 1, 2, 3 and 17 of **DCA Directive 04/09**, which emphasise the risk associated with OCL and the requirement for risk management of OCL, in accordance with the procedures described in References D and E of **DCA Directive 04/09**. It also needs to be read in the context of the mandatory requirements in paragraph 18, namely that passengers are to occupy approved seating where it is available, except when specifically required by the nature of the activity to be outside of that seating [SI (AVN) OPS 3-214], and, further, that approved seating be
used to the maximum extent possible. These considerations militate against an interpretation of the Directive that would permit CJTF633 to approve any variation of OCL as defined in paragraph 8 d. of the Directive.

285. If, contrary to the Commission’s view, CJTF633’s power to authorise OCL was not confined to paragraphs 9 and 10 [and possibly paragraphs 12 and 13, if occurring on operations] of DCA Directive 04/09, but extended to permitting authorisation of any variation of OCL, as defined in paragraph 8 d., for example authorising passengers to engage in OCL by ramp riding when approved seating was available for the passengers’ use, then this power would be internally inconsistent with the several mandatory restrictions of OCL activities contained in paragraph 18 and the stated intent of the Directive as contained in paragraphs 1, 2 3 and 17. It would mean that CJTF633 could, in the absence of an emergency as contemplated in paragraph 16, effectively authorise himself or others to disobey mandatory provisions of a directive or order applicable to him from DCA.

286. Accordingly, the Commission considered that CJTF633’s power to authorise OCL was, in accordance with the terms and intent of DCA Directive 04/09, not intended to be open ended but restricted, and was confined to the circumstances set out in paragraphs 9 and 10 [and possibly paragraphs 12 and 13, if occurring on operations] of the Directive. On such interpretation CJTF633’s power to authorise OCL did not extend to utilising paragraph 11 of the Directive to approve passengers travelling in an OCL configuration in circumstances where approved seating was available for their use.
The Commission considered that such circumstances would be encompassed in the term “any other activity” contained in paragraph 15 of the Directive and that such a proposed OCL configuration would be required to be referred to AHQ for approval.

287. Evidence obtained by the Commission indicated that some members of RWG6 experienced difficulty in interpreting and understanding **DCA Directive 04/09**, including some personnel considering that ramp riding, not being specifically referred to in paragraphs 9 and 10, was as a consequence, not an OCL activity. Such interpretation ignores the definition of OCL contained in paragraph 8 d. of the Directive, which in its terms clearly includes ramp riding as an OCL configuration, paragraph 15 of the Directive, which indicates that the Directive is not intended to cover the field of OCL activities and paragraph 18 of the Directive which indicates that passengers are not be permitted to engage in ramp riding where approved aircraft seating is available.

288. The definition of “crew” in paragraph 8 c. of **DCA Directive 04/09** is ambiguous. The glossary to **SI (AVN) OPS 3-107** defines “crew” as suitably qualified personnel specifically authorised to operate an aircraft. Paragraph 8 c. of **DCA Directive 04/09** defines “crew” as suitably qualified personnel specifically authorised to assist in the operation of aircraft.

289. The Commission considers that the definition of “crew” contained in paragraph 8 c. of **DCA Directive 04/09** is wider than the definition contained in the glossary to **SI (AVN) OPS 3-107**, the phrase “assisting to operate”, being subject to a wider
interpretation of what constitutes operational related activities than the word “operate”. This seems, as hereinafter appears, to have led to an interpretation of DCA Directive 04/09 by some members of C Sqn and RWG6 to the effect that any potential passenger with the capacity to assist the crew of the aircraft in simple tasks such as loading or unloading cargo, could be categorised as crew and therefore not be subject to DCA Directive 04/09, which in paragraph 8 d. refers only to passengers and not to crew e.g. 290. In the definition of “crew” contained in DCA Directive 04/09 the word “operation” is not defined. Nor is it defined in the related glossary. The Commission considered that the word “aircraft” must necessarily refer to a specific aircraft to be, or being, operated by suitably qualified and specifically authorised personnel or which such personnel are to assist or are assisting to operate, and to refer only to “aircraft” that personnel are “suitably qualified” and “specifically authorised” to operate or assist in operating. For example, being qualified to operate a Kiowa aircraft cannot mean that such qualification extends to being qualified to operate a CH-47D aircraft. The same is true in respect of assisting to operate. Again this qualification must be aircraft-specific. The Commission notes in this regard, the evidence of Soldier4 and Soldier3 who, although both Black Hawk aircrew, were nonetheless required to undergo a conversion course in order to become qualified aircrew to operate a CH-47D aircraft. 
291. The evidence of ADF33 was that the term suitably qualified did not relate to tasks requiring no qualifications. He considered that aircrew could be categorised as specifically qualified personnel qualified to operate the aircraft that they are operating. His further evidence was that to become an authorised member of crew one would need to be specifically qualified for specific aircraft as a pilot, navigator, combat officer or aircrewman. He considered that suitably qualified meant being pilot or aircrew for the aircraft being operated and noted that the only qualification for assisting to move cargo would be to be an able bodied individual. The Commission noted in this regard the evidence of Soldier that he considered that there was no need for passengers to help crew because what the crew was required to do was the crew’s job.

292. ADF33 further evidence was that he did not consider LT Case to be crew on the aircraft on which he was travelling as a passenger because LT Case was not specifically authorised to operate CH-47D aircraft. The Commission notes that in any event, LT Case was not qualified to operate CH-47D aircraft. The Commission notes, in this regard, the evidence of COMD 16 Avn Bde. Soldier29 that in his view that it was not appropriate to expose non-crew to the risks associated with sorties in an AO.

293. In relation to the term “specifically authorised” the Commission notes the evidence of Soldier41 that any suitably qualified personnel would need to be specifically authorised to assist in the operation of an aircraft. His evidence was that the
person who could give such authorisation would be any of the authorising officers in the Squadron so that for example CO, RWG6 would be an authorising officer for his Command within Afghanistan.

294. In determining the meaning of the words “suitably qualified” the Commission considered the definition of the term “qualified aircrew” in the glossary of terms referrable to SI (AVN) OPS 3-107 which refers to pilots, loadmasters, aircrewman technicians and other qualified aviators, and also to the words suitably and qualified as described in the Oxford English Dictionary. These were described respectively as meaning “right or appropriate for a particular...purpose” and “officially recognized as being trained to perform a particular job; certified”.

295. The Commission considers that on these definitions the term “suitably qualified” does not extend to incorporate the actions of passengers assisting qualified crew on tasks in respect of which no qualification is required on the part of the passenger. For example, a passenger qualified as a clerk assisting to unload an aircraft under the direction of a loadmaster could not reasonably be categorised as a person “suitably qualified” to assist in the operation of an aircraft in the plain meaning of those words taking into account the definitions referred to in the preceding paragraph hereof, and thereby be categorised as crew. Rather the clerk remains a passenger performing work requiring no special skills or qualifications assisting, under instruction, a qualified person in tasks that such person is qualified to perform.
296. Having regard to the various definitions hereinbefore referred to the Commission considers that the plain meaning and intent of the definition of “crew” in paragraph 8 c. of DCA Directive 04/09, refers to properly trained pilots and aircrew, who as a consequence of such training are suitably qualified to perform the necessary tasks associated with their role in operating or assisting to operate the aircraft, and who are specifically authorised by an authorising officer to perform such tasks, in the course of the particular mission on which they are engaged. The evidence of Soldier36 and ADF33 as to the definition of “crew” was to like effect.

297. The Commission considers that evidence obtained in its inquiry did not disclose the existence of any specific authorisation for any “suitably qualified” person approved as a passenger for a familiarisation flight to act in assisting in the operation of the aircraft on which such person was to travel.

298. Further there emerged in evidence as hereinafter appears, an attitude amongst RWG6 personnel that pilots qualified on aircraft other than the CH-47D, but travelling as a passenger on that aircraft to familiarise themselves with its operations, could be categorised as crew by reason of what might be described as fraternal inclusion and therefore not be subject to DCA Directive 04/09.

299. The Commission notes that any passengers categorised as “crew” for the purposes of a familiarisation flight on RWG6 aircraft were subject to the provisions of
paragraph 1 of SI (AVN) OPS 3-214, requiring that passengers and crew, wear seat belts at all times during flight and any time the engines of the aircraft were operating unless otherwise approved by the AC.

THE INTENT OF SI AVN (OPS) 3-214

300. The Commission considers that the intent of SI (AVN) OPS 3-214 is that passengers and crew are to wear seatbelts at all times during the flight. Read in conjunction with DCA Directive 04/09 and SI (AVN) OPS 3-107, with which paragraph 4 of SI (AVN) OPS 3-214 requires compliance, the Commission considers that approval of an AC of non-compliance with the Directive is confined to permitting temporary non-compliance, e.g. to permit crew to perform tasks that could not be performed while seated or to allow passengers to use a toilet. The Commission notes that SFI 6-2012 dated 24 April 12 [ ] confirms the view taken by the Commission, namely, that SI (AVN) OPS 3-214 requires maximum utilisation of approved seating by aircrew and passengers. As aforesaid, this interpretation is buttressed by the requirements of the DCA Directive 04/09 and related SI and SFI in relation to the carriage of passengers in approved seating. In issuing SFI 6-2012 Comd 16 Avn Bde has sought to draw together in one document all SI relating to the carriage of aircrew and passengers on AAAvn aircraft.

301. The Commission obtained evidence from [Soldier31] and [Soldier36] concerning their involvement in the drafting of DCA Directive 04/09 and its predecessors as well as their interpretation of the DCA Directive 04/09. Part of [Soldier31]’s evidence has already been referred to earlier in this report.
302. [Soldier31]'s evidence indicated that in his view the intent of the DCA Directive 04/09 was not to categorise ramp riding as OCL but rather was directed to user units on board aircraft seeking to fly unrestrained when there was no operational, training or other reason for them to be doing so. He also considered that there had been a break down between the intent in SI (AVN) OPS 3-214, being Passenger Restraint Standing Instruction, and a deep understanding of the DCA Directive 04/09. However, as aforesaid, he conceded that in a pure sense reading of paragraph 8 d. of DCA Directive 04/09 anyone (a passenger) not restrained (on approved aircraft seating) would be OCL. Further, his evidence was that in relation to any proposed ramp riding on CH-47D aircraft there should be a Risk Management Plan prepared to weigh up the risks involved in such ramp riding.

303. [Soldier36]'s evidence was that during his deployment to Afghanistan in 2009 Deputy Chief of Army issued DCA Directive 04/09 relating to OCL. He was involved in writing the predecessor to the Directive while he was at AHQ in 2008 and his recollection was that there were only minor changes between the 2008 and 2009 version. [ ] His evidence was that in drafting the 2008 version of the Directive the authors were concerned to write something which gave a clear intent statement rather than identifying every conceivable circumstance [of OCL] but that he did not consider this aim was properly achieved with the 1998 Directive because of subsequent misinterpretation. The Commission notes in this regard its comments earlier in this report indicating that the Commander’s Intent in DCA Directives 12/08 and 04/09 is,
apart from including ACs as the subject of the Commanders intent in DCA Directive 04/09 identical. Soldier36's evidence was that DCA Directive 04/09 applied to all operations including Chinook operations. He considered that the DCA Directive 12/08 did not specifically cover ramp riding because persons concerned with drafting it [including himself] were not aware of the practice at the time of drafting.

MISUNDERSTANDING OF DCA DIRECTIVE 04/09

304. Evidence obtained by the Commission indicated a significant degree of misunderstanding of the content and intent of the DCA Directive 04/09 on the part of aircrew and the chain of command in RWG6 and generally within AAAvn. Such misunderstanding included believing inter alia that the Directive did not prohibit ramp riding, that it only related to Special Forces, that it only related to Black Hawk aircraft, that passengers assisting aircrew could be categorised themselves as crew and thus not be subject to the requirements of the Directive and that if there were enough seats available on the aircraft for use by each person, that they could be put into, they were not OCL, as opposed to when there were not enough seats for all people on the aircraft.
THE PRACTICE OF RAMP RIDING

305. Evidence obtained by the Commission indicated that over a number of years preceding the deployment of RWG6 to Afghanistan, significant numbers of AAAvn personnel did not see ramp riding, which occurred both in Australia and in Afghanistan, as engaging in an OCL configuration subject to restrictions, authorisations and risk assessments. Rather, it was seen as an accepted practice to be enjoyed by ADF personnel, their families, members of the Defence Remuneration Tribunal, visiting dignitaries such as the US Ambassador, and others. Soldier11's evidence to the Commission was that as at March 2011 ramp riding was culturally normalised within the Army and relatively common.

306. This longstanding and widespread practice of ramp riding within AAAvn, including by a number of senior officers, caused some Army personnel to assume, on the basis of their knowledge of such practice, that it must have been assessed by those allowing and engaging in the practice to have been permissible, or it would not have been permitted to occur.
A RE-EVALUATION OF THE PRACTICE OF RAMP RIDING IN MARCH 2011

307. However, in March 2011[Soldier56] the Squadron Sergeant Major (SSM) [and since January 2010 the Senior Aircrew Instructor (SAI) of CH-47 capability], formed a strong view that pursuant to DCA Directive 04/09 ramp riding constituted OCL and was subject to the prohibitions and restrictions contained in DCA Directive 04/09 and SI (AVN) OPS 3-214. As a consequence, he determined to make C Sqn personnel aware of his understanding of the import of DCA Directive 04/09 in relation to OCL. [Privacy]

308. [Soldier56] deployed to Afghanistan in February 2010. In 2011 he was appointed as the SSM of C Sqn and the SAI for CH-47D training. His primary role was to advise the Commander on flying policy and standards, advise the aircrewmen on changes to flying policy and standards and instruct, assess and ensure that aircrewmen maintained the standards described within SFI, SI, the STANMAN and the like. [Privacy]

309. [Soldier56] became aware of DCA Directive 04/09 in 2009. He also became aware that this Directive was to be released as an SFI. He considered that aircrewmen needed to know and understand the policies applicable to passenger
management and passenger handling because, it was a large part of the business of CH-47D aircraft constituting as it did 80 per cent of the workload in Afghanistan.

310. [Soldier56] was aware that when RWG6 deployed they did so without an aircrewman instructor. On 3 Mar 11 [wrongly referred to as 4 Mar 11] [Privacy] [Soldier56] attended a Safety and Standards meeting of C Sqn, 5 Avn Regt in Townsville and on that occasion led a discussion concerning the application of DCA Directive 04/09.

311. His views were incorporated at paragraph 9(g) of the minutes of that meeting in the following terms:

“Ramp riding” The practice of “ramp riding” by PAX or aircrew who are not performing specified crew duties was discussed. The SAI informed the meeting that if PAX or aircrew who are not performing specified crew duties were not secured in an ACFT seat they were considered to be OCL. As such, PAX or aircrew who are not performing specified crew duties are not allowed to be placed on the ramp even if they have an appropriate harness.

312. The Commission received evidence that following that meeting the practice of ramp riding in C Sqn was discontinued.
A copy of these minutes was sent under an email of 15 Mar 11 by the Chairman of that meeting, to specified personnel of RWG6 including, inter alia, Soldier7, Soldier15, Soldier5, Soldier4, Soldier3, and Soldier2. Soldier44 was concerned to send a copy of the minute to the Tp Comd, the training officer and all of the CH-47D aircrew. He did not however, send a copy to Soldier9 as the CO of RWG6. He anticipated that the minute would be distributed to all aircrew as a mechanism of making them aware of the contents of the Directive. He believed that in the next Safety and Standards meeting of RWG6 the minute would have been raised as an agenda item and read.

The evidence of Soldier41 confirmed the evidence of Soldier56 in relation to the C Sqn Safety and Standards meeting on 3 Mar 11. He was present at the meeting and confirmed that the consensus of those persons present, following discussion, was that Soldier56 was correct in his interpretation of DCA Directive 04/09. His evidence was that this interpretation of the Directive was passed to RWG6 as part of the transfer of information between C Sqn in Townsville and the deployed task force. This aspect of his evidence was confirmed by the evidence of Soldier56 that the minutes of RWG6 and C Sqn Safety and Standards meetings were exchanged so that there could be standardisation across the fleet.
315. Soldier41’s further evidence was however, that on deployment RWG6 ceased to be part of C Sqn and 5 Avn Regt becoming instead a separate unit for all intents and purposes. His evidence was that, in that context, it was more difficult to have standardisation, but that since the accident on 30 May 11 5 Avn Regt had put in place other procedures allowing closer communications between 5 Avn Regt and other deployed groups.

316. Soldier41’s evidence was that if a deployed Task Force was not complying with a certain procedure or a rule he thought it was appropriate for his senior aircrewman representative, Soldier56, to give a reminder to a detachment from C Sqn deployed as part of RWG6, of the existence of the procedures contained in DCA Directive 04/09. His evidence was that as an alternative C Sqn could formally release something through the chain of command but the Technical Control (TECHCON) chain did not really allow for something like the subject situation.

317. Soldier41 considered that it would not be appropriate for him as a Major, and Sqn OC, to issue a technical direction to the CO of a deployed unit. He expected that, within the same week that the email was sent, the standards staff on RWG6 would read, even so far as to skim read, the minutes of the Safety and Standards meeting on the basis that there was an attempt to align Safety and Standards meetings between C Sqn and RWG6, within the same week, so as to share information. He was surprised to learn that ramp riding in RWG6 continued after the end of March 2011.
318. Evidence was obtained from [Soldier15] that he received, and was aware of the warning contained in, an email of 15 Mar 11 from [Soldier44] containing a copy of such minute and considered that RWG6 was bound by the Directive contained therein. His evidence was that after receiving the email of 15 Mar 11 from [Soldier44] he did not tell [Soldier9] that ramp riding was prohibited and could not explain why RWG6 did not follow instructions to cease ramp riding. Evidence was obtained from [Soldier20], [Soldier6] and [Soldier7] indicating that [Soldier7] had received and was aware of the warning contained in [Soldier44]'s email of 15 Mar 11 to members of RWG6 that ramp riding was OCL and was forbidden. [Soldier7]'s evidence was that he did not give orders to RWG6 personnel to stop ramp riding [following receipt of the email from [Soldier44]] because he did not remember seeing such email.

319. On the basis of the evidence hereinbefore referred to the Commission considered that [Soldier7] did receive, and was aware of, the contents of such email. Despite a number of RWG6 personnel receiving and/or discussing the minutes of C Sqn Safety and Standards meeting, [Privacy] there was no specific formal consideration given to RWG6 personnel complying with the intent contained in paragraph 9 (g) of those minutes. Accordingly, ramp riding in RWG6 aircraft continued after receipt by certain RWG6 personnel of copies of the subject minute and discussion of the same. No evidence emerged which indicated that this email was brought to the attention of [Soldier9].
320. Later, on 21 Mar 11, [Soldier56] sent an email to aircrewman members of RWG6 concerning SFI 14/2007 Restriction on the use of Aircrewman Harness. The email after stating “It can’t be stated any clearer” then set out paragraph 9 of SFI 14/2007 in the following terms:

(9) Aircrewman harnesses do not provide suitable crash restraint. Therefore, aircrewmen shall be seated and restrained in an approved seating position unless specifically required to be out of that seating to perform a duty, which cannot be achieved while seated in the same position.

The email was directed to, inter alia, [Soldier4], [Soldier5], [Soldier6], [Soldier3], [Soldier58] and [Soldier27].

321. [Soldier56]’s evidence was that while he was the SAI for C Sqn at this time, he had no authority in relation to RWG6, which had its own CO. However, he felt as a WO2 he had some influence and tried to use this influence to inform RWG6 aircrew by way of his email of 21 Mar 11.

322. [Soldier7]’s evidence was that he remembered being annoyed at a particular email that [Soldier56] had sent but that he did not have a specific recollection that it was the email of 21 Mar 11. The Commission notes that the evidence did not indicate that [Soldier56] sent any email to RWG6 personnel other than the email of 21 Mar 11.
323. The evidence of Soldier6 and the evidence of Soldier20 indicated that some personnel in RWG6 including Soldier7 had expressed annoyance concerning an email sent by Soldier56 on the basis that in sending such email directly to RWG6 personnel Soldier56 had gone outside the operational chain of command and exceeded his authority. Soldier21’s evidence was that he recalled Soldier7 stating either in an O Group or a Safety and Standards meeting that he had received an email from Soldier56 talking about OCL but that after that aspect of the conversation it became more of a technical matter for aircrew and not something concerning him or his area.

324. The Commission notes in this regard the evidence of ADF33 that he did not agree that for pilots to take action an order must come from the top down rather than coming up as a senior NCOs point of view. He indicated that he never discounted any of his crew’s suggestions, reminders or aide memoires regarding a matter. Soldier7’s evidence was that he did not recall any direct approach to him [by RWG6 personnel] to discuss Soldier56’s email and that the contents of that email were not discussed with him.

325. On the basis of the evidence hereinbefore referred to the Commission considered that Soldier7 became aware of the fact and content of Soldier56’s email of 21 Mar 11. While evidence obtained by the Commission indicated that this document was received and/or considered by several RWG6 members, it was not the subject of any specific formal consideration within RWG6.
326. Accordingly, the Commission considers that neither the minutes of the C Sqn Safety and Standards Meeting of 3 Mar 11 sent by [Soldier44] on 15 Mar 11 nor [Soldier56]'s email of 21 Mar 11, each indicating that ramp riding was forbidden, received any specific formal consideration within RWG6. No evidence was received by the Commission that properly explained the absence of formal consideration of either of such warnings by members of RWG6. It appears that [Soldier9] remained unaware of both emails.

327. After the accident [Soldier29] as COMD 16 Avn Bde took steps to ensure that there was put in place a proper system for liaison between RWG6 and C Sqn in relation to the exchange of technical advice.

328. As hereinbefore set forth, RWG6 deployed to Afghanistan in February 2011 under the command of [Soldier9]. He was accompanied by [Soldier14] XO, [Soldier7] Tp Comd and [Soldier6] OPSO. The COs Operational Commander was CJTF633 [Soldier11] and his aviation technical command and control was administered through [Soldier29] at 16 Avn Bde.

INITIAL SERIES OF ORDERS ON DEPLOYMENT

As Commander of Rotary Wing Group, I have a duty of care to ensure the health and safety of all Rotary Wing Group personnel and visitors. Protective measures are well-established for combat operations but it is also essential that an effective system of Occupational Health and Safety management, tailored to operational requirements, is implemented and maintained to prevent non-combat injuries and illnesses. Any loss of operational capability as a result of incidents in the workplace or domestic environment is unacceptable.

All personnel in RWG are responsible and accountable for identifying and assessing hazards and hazardous activities and mitigating all identified risks, at their levels of training and authority. [Commission’s emphasis] Senior NCOs, Warrant Officers and Officers are also responsible and accountable for the implementation and maintenance of all the elements of the Occupational Health and Safety management systems within their workplaces. Prompt and accurate reporting of risks and incident is paramount to safety.

My expectations are that all RWG personnel will clearly understand the risks in their workplace and domestic environment, a process of continuous improvement will be in place to eliminate or mitigate significant risks, and a progressive reduction in non-combat injuries and illness will follow.

Occupational health and safety is integral to our force protection and therefore must be everyone’s priority.

330. Soldier’s intent was reinforced by TG633.7 order numbers 100 and 101 issued by him on 9 May 11. It is in the context of the COs concern
that members of RWG6 comply with OH&S requirements and identify and mitigate risks associated with hazardous activities as well as the Commission’s interpretation of the requirements of DCA Directive 04/09 and References D and E of that Directive relating to risk management and related SI and SFI, that the program for the carriage of passengers on RWG6 aircraft falls to be considered.

PURPORTED DELEGATION OF OCL AUTHORITY BY Soldier

331. In late February or early March 2011 Soldier9 met with Soldier11, CJTF633, at Kandahar Airfield and in the course of that meeting requested from Soldier11 a delegation of his authority as CJTF633 for approving OCL in RWG6 aircraft. Soldier9’s evidence was that he sought this delegation principally in order to be in a position to authorise OCL for any of his crews in the event that they had to carry more passengers than there were seats on an aircraft in situations, which would not constitute an emergency extraction i.e. in accordance with paragraph 9 of the Directive relating to Combat Loading.

332. In the course of that meeting both parties discussed the effect of DCA Directive 04/09 and SFI 04/2008 in relation to OCL. Soldier11’s evidence was that he was cognisant of DCA Directive 04/09 and had read it some two to three weeks before his meeting with Soldier9. He was alert to the requirements for
risk assessment and the need not to take unnecessary risks in military activities. He was aware that ramp riding was OCL and carried some risk but considered it to be a low risk. He was not aware, prior to the accident, that OCL authority was not required for aircraft crew members.

333. It was common ground on the evidence given by both Soldier9 and Soldier11, although Soldier11 had an imperfect recollection concerning the matter, that there was a form of purported delegation of Soldier11's OCL authority, but with restrictions. These restrictions included that Soldier9 could authorise OCL only on flights which would be Combat Service Support Mission (CSS) in nature, conducted in daylight hours, had a mission purpose and be low risk missions. For any other type of mission Soldier11’s authorisation would be required for an OCL configuration.

334. DCA Directive 04/09 is silent as to whether Soldier11's power to authorise OCL could be delegated. Soldier11's evidence was he considered that DCA Directive 04/09 did not [in its terms] deny him the capacity to delegate his OCL authority and further, that to presume that his OCL authority was non delegable would be wrong in terms of the Directive’s black letter content and the pervading military professional norm within Army that unless specified otherwise, authority is always delegable. No evidence was tendered to the Commission in support of this latter assertion.
335. soldier\(^9\) in his evidence did not accept the proposition that soldier\(^9\) could have further delegated the OCL authority purportedly delegated to him, although he had not indicated to soldier\(^9\) that he could not sub-delegate that authority. This appears *prima facie* to be inconsistent with his initial position that unless specified otherwise, authority is always delegable.

336. soldier\(^9\)’s evidence was that he saw DCA Directive 04/09 as authorising the holder of the office of CJTF\(^633\) as the authority for OCL. This interpretation of the Directive receives support from paragraph 11 of the DCA Directive 04/09, which states:

(11) *The Commander of Forces assigned under OPCOMD by CJOPS is the authority for the approval of OCL on operations. This will normally be the designated Joint Task Force Commander.*

337. The Commission notes that DCA Directive 04/09 was not the subject of any change naming soldier\(^9\) personally as the designated source of authority for OCL when he became CJTF\(^633\) on 20 Dec 10. The Commission considers that this indicates that from 24 Mar 09, being the date of DCA Directive 04/09, DCA’s delegation of authority to authorise OCL was to the office of the JTF Commander rather than to each of the occupants of that office in a personal capacity. As such the Commission considers that it was not open to soldier\(^9\) to delegate the OCL authority referrable to the office of CJTF\(^633\) (and necessarily the holder of that office for the time being) to an individual holding both a lower office and a lower rank than CJTF\(^633\).
338. The Commission notes, in the context of DCA Directive 04/09 being silent as to the issue of delegation of OCL authority, the provisions of S1 (AVN) OPS 1-201 which specifically set out the power of COs to delegate their authority to authorise flights. If in fact, authority within Army is always delegable, unless specified otherwise, this part of the S1 would appear to be superfluous.

339. As aforesaid, the Commission considers that Soldier11 was not entitled to delegate his power to authorise OCL activities, recognised as higher risk activities, to Soldier9 pursuant to DCA Directive 04/09 which does not specifically authorise such delegation and in its terms militates against any delegation away from the office of CJTF633, and the occupant of that office for the time being, to a lower office and a person of lower rank. However, the Commission does not doubt the bona fides of Soldier11 in respect of his interpretation of DCA Directive 04/09.

340. It is the Commission’s view that its interpretation of DCA Directive 04/09 as described above reflects the relevant administrative law which may be summed up in the maxim delegatus non potest delegare, i.e. the entrusting to another person by an agent, of the exercise of a power or duty entrusted to him by his principal, is in general prohibited by the said maxim without the express authority of the principal or authority derived from statute.

341. The Commission considered section 120A of the Defence Act 1903 and regulations 11(2) and 11(4) of the Australian Military Regulations 1927 in relation to
the issue of delegation. It is the Commission's view that such Act and subordinate legislation are not inconsistent with the general law relating to delegation as set out above.

342. Put shortly, the OCL authority contained in the **DCA Directive 04/09**, as interpreted by the Commission is effectively a direction or an order to the office holder for the time being of CJTF633 [at the relevant time]. and as such is to be exercised by the office holder as directed and accordingly cannot be delegated away from the office of CJTF633. On the Commission’s interpretation any attempted delegation was ineffectual and for this reason the Commission has used the term “purported delegation” earlier in this report.

343. Neither nor mentioned this purported delegation to any other person at any time. Nor did either of them make, or direct the making of, any record of such delegation, although it would have taken little time and effort to do so. ‘s evidence was that he did not think of confirming the purported delegation in writing but that a record of the purported delegation could have been made in a minute or so.

344. ’s evidence concerning the absence of any record of his purported delegation of OCL authority to related to the issue of the time involved in making such a record. His evidence was that he was not necessarily persuaded to it or to mandate it [the making of a record] because JTF633 sought to build
and realise an agile, adaptive, dynamic force able to seize relatively fleeting opportunity to great effect. Further, his evidence was that there was a need to be cautious that JTF633 were not ultimately writing a war, but fighting a war, and that he did not see the limited delegation of OCL authority to Soldier9 as being out of the realm of being managed through verbal delegation. He referred to the need to understand the multiplicity of issues and scale of staff work at every level in JTF633 but in hindsight considered that a record could have been made and as aforesaid could have been made in a minute or so.

345. Further Soldier11’s evidence was that his delegation did not lack a record; rather it was a verbal record being an order to Soldier9. The Commission does not consider that a verbal communication simpliciter is capable of constituting any form of record.

346. Soldier11’s further evidence was, that having regard to his knowledge of Soldier9’s competence, his oral delegation required no further notation, he did not consider that the delegation of a duty should be recorded because DCA Directive 04/09 gave him the sense that he was applying the standard regime for OCL in the aviation community which was not out of the ordinary, and that the purported delegation was not recorded because it was not one of immediacy of action being essential but rather an issue of a routine nature with regard to the responsibilities of a unit commander to exercise.
347. When asked to assume his potential absence from HQ JTF633 and 9's contacting HQ JTF633 in respect of OCL authorisation during such absence, Soldier11's evidence was that it would have been appropriate to let the Deputy Commander JTF633, know that he had delegated OCL authority to Soldier9.

348. Soldier9's evidence was that he did not see formalisation in writing of the purported delegation as necessary because he considered it to be clear and unambiguous and that if he had had any doubts he could have contacted CJTF633 for approval or clarification. Later his evidence was that he had been given an order by his Commander, was aware of it, comfortable with it, and aware of the reasons and circumstances in which he would use that delegation and did not see the need to write it down.

349. No arrangement was made by either Soldier11 or Soldier9 in respect to any auditing of any exercise by Soldier9 of this purported delegation of OCL authority.

350. There was no reference by Soldier9 to this purported delegation of authority for approval of OCL in the discussions that he had with Soldier10 and Soldier8 on 2 or 3 May 11 concerning whether Soldier11 as CJTF633 could authorise himself to be in an OCL configuration for the flight proposed for 5 May 11.
351. Soldier9's evidence as to why he did not mention this purported allegation to Soldier10 and Soldier8 was because he did not think it applicable for him to authorise his COMD. Further, he considered that Soldier11's authorisation to him was for those missions low risk by daylight where he was faced with a contingency where one of his AC's called him and requested it, and he did not see Soldier11's flight in that framework.

352. Soldier9's further evidence was that he thought that he should elevate the authority to authorise OCL back to Soldier11's level and to use his own OCL authority only in circumstances that had been discussed between them. His evidence was that he told Soldier11 that he was the CJTF and that he would have to authorise himself to travel in an OCL configuration.

353. Soldier9's evidence was that he did not think it appropriate to let the Audit Team know of the purported delegation because audits were part of the technical chain of command and the purported delegation was not something that would normally concern the Audit Team. Further, he did not report the purported delegation back to 16 Avn Bde because he had a clear operational chain and a clear technical chain. The Commission notes that this explanation does not appear to take account of the requirement for all OCL events to be recorded in DAHRTS, which is both operational and technical in nature. [SFI 4/2008 promulgated on 3 Mar 11]
S FAMILIARISATION FLIGHT ON AN RWG6 AIRCRAFT ON 26 MAR 11

354. Shortly after his arrival in Afghanistan, Soldier9 arranged to travel on a CH-47D aircraft from RWG6, for the purpose of familiarising himself with each job that each member of the crew of the aircraft performed. Some days prior to 26 Mar 11 he discussed this matter with Soldier7, who was to be the AC for the flight, on which Soldier9 intended to travel. At the time of this discussion Soldier9's evidence was that, at the time of this discussion, he was cognisant of ADF policy regarding the carriage of passengers in Chinooks in the MEAO and particularly DCA Directive 04/09 and SI (AVN) OPS 3-107. He was familiar with the Directive, understood the definition section in paragraph 8 which defines passengers and crew and understood the difference between passengers and crew. His evidence was that he expected all of his aviators to be familiar with the OCL Directive and that he had a copy of such Directive as did the senior staff in the Headquarters.

355. Soldier7's evidence was that he approached Soldier9 with DCA Directive 04/09 intending to discuss with him if Soldier9 was going on his flight as crew or passenger. Soldier7 was not 100% sure of Soldier9's intent as to how he was going to perform duties on the familiarisation flight. His evidence was that he referred to DCA Directive 04/09 and SI (AVN) OPS 3-107 in the course of his discussion with Soldier9 and discussed with him the terminology of crew and passenger.
356. Soldier7’s evidence was that following a discussion of the paragraphs concerning crew and passenger Soldier7 asked Soldier9 what he was going to fly as and Soldier9 responded that he would fly as crew. Initially could not recall details of the conversation in which Soldier9 gave his reasons for categorising himself as crew but said that in general terms Soldier9 indicated that he wanted to understand CH 47D operations and do what crew members did in the back of the aircraft. Later in his evidence Soldier9 could not recall whether Soldier9 gave reasons as to why he categorised himself as crew.

357. Soldier7’s evidence indicated that at the time of his discussion with Soldier9 he considered, on his reading of paragraph 8 c. of DCA Directive 04/09, that a potential passenger on a familiarisation flight on RWG6 aircraft would not need to be suitably qualified [as a pilot, loadmaster or aircrewman technician] to operate a CH-47D to be categorised as crew. He considered that a passenger could be so categorised if he was just qualified to move around cargo et cetera and experience what the aircrewmen did. He considered that Soldier9, though not suitably qualified to fly a CH-47D or to act as a loadmaster, could be categorised as crew on the basis that he would be able to assist a member of the qualified crew.

358. It did not occur to Soldier7 that there would be any reason why Soldier9 would not be able to go up as crew and assist qualified aircrewmen to
operate the aircraft in terms of loading or unloading and all the multi faceted jobs that aircrewmen do. He discussed these matters with Soldier9 and considered that Soldier9 confirmed his similar understanding of the definition of crew in paragraph 8 c. of DCA Directive 04/09.

359. Soldier7's evidence was that this discussion with Soldier9, in respect of which he could not recall significant details, constituted guidance from his CO that passengers going on familiarisation flights could be categorised as crew. However, the subject of taking future passengers on RWG6 aircraft for familiarisation flights, and the categorisation of such passengers as crew or passengers, does not appear to have been the subject of this discussion. The Commission considers that the subject discussion did not constitute guidance i.e. advice or direction, in relation to the carriage of future passengers on RWG6 aircraft, from Soldier9 to Soldier7. Rather, the Commission considers that Soldier9's interpretation of paragraph 8c. of DCA Directive 04/09 did no more than confirm Soldier7's similar interpretation of the paragraph in relation to the definition of crew.

360. Soldier9's evidence was that he manifested himself as crew on the basis that he was the CO of RWG6 and had not observed the aircrew perform their duties on a mission in pre-deployment training. In addition, he considered that he was travelling on the aircraft to assist the crew and remain with the crew.
throughout the mission. However, Soldier9’s evidence was that he did not intend that his rationale for categorising himself as crew for the mission should create a precedent for the carriage of other passengers as crew on RWG6 aircraft.

361. Evidence given by Soldier9 to the Commission indicated that his understanding of DCA Directive 04/09 and SI (AVN) OPS 3-107 in relation to the carriage of passengers in Chinooks in the MEAO was that such passengers could be restrained inter alia by a Z51 [restraint strap]. In his use of the word restrained it appears that, Soldier9 must have been referring to those parts of DCA Directive 04/09 dealing with the issue of restraint of passengers being carried in aircraft namely paragraphs 8 (a) and (d), paragraph 18 (b) and (e), and paragraph 19. It is the Commission’s view those paragraphs do not admit of such interpretation.

362. By categorising himself as crew, Soldier9 considered that, as a consequence, he was not subject to DCA Directive 04/09 regarding OCL and that he did not need to prepare or cause to be prepared any form of RMP for any OCL component of his flight. In the course of his familiarisation flight on 26 Mar 11 Soldier9 engaged in ramp riding. This was the only time that Soldier9 travelled on the ramp of a CH-47D during the deployment of RWG6 in Afghanistan.

363. While the Commission considers that Soldier9’s familiarisation flight
could be categorised as mission essential, it considers that the reasons advanced by Soldier 9, in support of his categorising himself as crew are not such as to bring him within the definition of “crew” as that term is defined in paragraph 8 c. of DCA Directive 04/09.

364. Prior to deploying to Afghanistan Soldier 9 had been fitted in Townsville with an AWAE, which he wore in conjunction with a restraint strap on his familiarisation flight. Evidence concerning the issue of AWAE to passengers carried on RWG6 aircraft is referred to hereinafter in this report.

CARRIAGE OF PASSENGERS ON RWG6 AIRCRAFT BETWEEN 26 MAR 11 AND 5 MAY 11

365. In early March 2011, Soldier 9 met with Soldier 7 and Soldier 6 to discuss the possibility of taking three to six personnel as passengers on RWG6 aircraft for the purpose of, familiarising them with the role of RWG6 and how the Chinook and its crew operated and its capabilities, broadening their knowledge of Afghanistan terrain outside the KAF, focusing their attention on RWG6 and their support to the group to ensure that the group could carry out its missions and to create synergies between the operators and support elements within Camp Baker [familiarisation flights]. Other members of RWG6 perceived these to be flights provided as a reward or incentive for services past or future.
The Commission considers that none of these purposes appear, *prima facie*, to be mission essential in the commonly accepted meaning of the word essential, namely indispensible. [Refer paragraph 9 hereof.]

**MEANING OF THE TERM MISSION ESSENTIAL**

366. Evidence obtained by the Commission indicated differing views as to the meaning of the term "mission essential". Generally, persons interpreted the term "mission" as involving the mission that an individual had been tasked to undertake, i.e. a person's day-to-day mission in Afghanistan. The term "essential" was interpreted by some persons as involving the degree to which a person's mission was thought to be enhanced or advanced or of benefit or assistance in the conduct of a person's mission by an activity being proposed, in this instance the carriage of passengers on RWG6 aircraft. Other persons interpreted the term "mission essential" as meaning essential to a passenger's job or a need to travel as a passenger on an aircraft.

367. It is apparent from these descriptions that words such as enhancement, advancement, assistance or benefit, do not equate to the word essential, which as aforesaid, the Commission has determined means indispensible i.e. the mission cannot be achieved without it. Rather, such words equate to something enabling a member to better perform his/her duties but not indispensible to the performance of the same.
368. Soldier9's evidence was that none of the persons he initially suggested could be taken for a familiarisation flight were mission essential. His initial thoughts were that by taking three to six proposed passengers for a lap around the airfield they would get an idea of what it was like to be in a Chinook and it would rejuvenate them towards working together and focussing on the operation that RWG6 was there for.

369. While Soldier9's evidence, supported by the evidence of Soldier7, was that he referred to and intended only one flight to carry three to six personnel, the evidence of Soldier6 was that he proposed this number of passengers for regular flights on RWG6 aircraft. Nothing of significance turns on this difference, which may simply be due to a misunderstanding.

370. Shortly following their meeting with Soldier9, Soldier7 and Soldier6 met with RWG6 aircrewmen to discuss Soldier9's proposals. The evidence of aircrewmen confirmed that they met with Soldier7 and Soldier6 who conveyed to them Soldier9's proposal categorised and understood as the carriage of three to six personnel on continuing flights. The aircrewmen were collectively, strongly against such a proposal.

371. Following their meeting and discussion of Soldier9's proposal with
RWG6 aircrewmen, Soldier 7 and Soldier 6 subsequently advised Soldier 9 of the aircrewmen’s resistance to the proposed carriage of passengers and further advised that in their opinion it was not appropriate to take persons posted to Camp Baker on a familiarisation flight or flights of such a nature by reason of:

(a) the fact that passengers may take up space for operational needs;

(b) JTF633 SI restricting the carriage of passengers to mission essential passengers; and

(c) the fact that such large numbers of personnel would impinge on the aircrew’s capability to monitor and supervise such passengers and had the potential to detract from training and the performance of crew duties.

This advice, proffered by Soldier 7 and Soldier 6, was accepted by Soldier 9. However, intending that a program for the carriage of passengers on RWG6 aircraft for familiarisation flights should occur, albeit, with fewer passengers than initially proposed, for the purposes hereinbefore referred to, Soldier 9 directed Soldier 7 and Soldier 6 that they could exercise their individual discretion in approving the carriage of persons wishing to fly on RWG6 aircraft.

The Commission notes the evidence of Soldier 9 that one of his purposes in taking members of Camp Baker flying was to broaden their knowledge of Afghanistan knowledge outside the KAF. The Commission considers that this indicates
an intention to permit passengers to be carried outside KAF and considers further that Soldier9 was aware that during his program for the carriage of passengers on RWG6 aircraft for familiarisation flights persons were being carried on missions outside KAF. Specifically on 29 May 11 Soldier9 approved LT Case travelling on a low risk CSS mission to familiarise himself with the terrain he would be flying UAVs over, which mission necessarily involved being outside the confines of KAF on 30 May 11.

374. Soldier9 intended that RWG6 would benefit generally from the flying of such passengers. He believed that he had made it clear to Soldier7 and Soldier6 that before they approached him in relation to any person flying, in an RWG6 aircraft, they should obtain that proposed passenger’s command approval and the reason why the proposed passenger needed to fly. He told them, however, that no persons were to be taken as passengers on RWG6 aircraft without his prior approval. The Commission was satisfied that Soldier9 was advised in each instance of the proposal to take passengers on RWG6 aircraft and approved the carriage of such passengers.

375. Soldier9 was subsequently to approve the carriage on RWG6 aircraft of nine passengers during the period 26 Mar 11 to 4 May 11, and a further six passengers during the period 5 May 11 and 30 May 11, the majority of such persons being carried for the purposes of familiarisation with RWG6 operations.
9

's evidence was that before allowing any of his RWG6 personnel to fly on a mission he considered whether the type of mission was low risk and the degree to which an individual’s carriage on an RWG6 flight would enhance his ability to contribute to the overall mission of RWG6. 

376. Soldier9's evidence was that he believed that all the flights that he approved were mission essential in nature. However such flights were not seen as mission essential by Soldier7 or Soldier6 or, at least in respect of the initial proposed carriage of passengers, Soldier9 himself. Privacy

377. The Commission considers that the term “familiarisation” does not necessarily equate with the term “mission essential” and does not accept that all of these flights were mission essential in nature in the ordinary meaning of that term as previously identified in this report namely, indispensible to the passenger’s mission in Afghanistan [or to the mission of RWG6 in Afghanistan]. After the accident Soldier11 saw it as appropriate and sensible to emphasise to Soldier9 that if persons were simply seeking to travel for familiarisation that was not sufficient reason to allow them carriage on RWG6 aircraft and any passenger flight had to be mission related.

378. Further, on 19 Aug 11 the COMD 16 Avn Bde, Soldier29, amended his directive to Soldier9 which amendment stated inter alia
that the carriage of non mission essential passengers for familiarisation purposes is to be authorised by CJTF633 and he is to accept the risk in these circumstances. The Directive required that personnel not constituting part of a mission requirement or not being part of an authorised crew, not be carried on aircraft and emphasised the need to apply Aviation Risk Management procedures.

379. Soldier’s evidence was that he assumed that the CO of persons requesting a flight would determine if the flight sought was mission essential, and further, that he would only question a fellow CO or higher HQ direction to carry members if something stood out as being unusual about the request or the person.

380. Soldier did not make any check or inquiry to determine whether passengers from outside his unit being carried on RWG6 aircraft could be categorised as mission essential according to his understanding of such category, as opposed to other persons’ understanding, such as the passenger’s CO or or Soldier

381. Soldier also intended and assumed that all persons he approved for carriage in RWG6 aircraft would be, and were being, carried as passengers, i.e. in an approved seat with a seatbelt on, and not moving about the aircraft or seated on the ramp. However, beyond ordering that persons seeking carriage in RWG6 aircraft were to be authorised as passengers, he did not direct or specify to Soldier and/or
that all persons he approved for carriage in RWG6 aircraft were to be carried as passengers in the sense described above, i.e. in approved seating, nor did he make any check or inquiry to ensure that his assumption was correct. Soldier6's evidence was that Soldier9 did not ask him any questions as to how the carriage of passengers was going in respect of his intent. His further evidence was that he was not asked for feedback in respect of the carriage of passengers by Soldier9.

382. Soldier9's evidence concerning his intent that passengers would be carried in approved seating was given some support by the evidence of Soldier6 in relation to the initial discussions concerning the carriage of passengers on RWG6 aircraft. His evidence was that he believed, from memory, that Soldier9's direction was that persons would travel as passengers on the aircraft and the intent he believed out of that was predominantly, to sit in the back seat of the aircraft somewhere. There was definitely no mention of riding on ramps.

383. Soldier9's evidence was that in retrospect it was disappointing that he was not told by his Tp Comd as to how passengers were in fact being carried and that with the benefit of hindsight he would like to have been aware of the fact that passengers were being carried on RWG6 aircraft in OCL configurations.

384. Soldier9's evidence in response to a question from Counsel Assisting
was that it was clear from evidence given to the Commission that his authorisation had been taken to a second step beyond that which he had authorised and that there was no check method in place to ensure that his orders or authorisations were being adhered to.

385. *Soldier9*'s further evidence was that there was a clear disconnect between his authorising persons to be carried as passengers on RWG6 aircraft and the fact that pilots and aircrew were deeming passengers on familiarisation flights to be part of the crew and putting them on the aircraft ramp and he did not know that was happening.

386. *Soldier9*'s further evidence was that, in hindsight he should have checked to ensure that he was correct in his assumption that all persons being carried on RWG6 aircraft were being carried as passengers in approved seating at all times in accordance with his intent but that he was comfortable with the command arrangements that he had with his subordinates.

387. In fact the majority of passengers carried in RWG6 aircraft, in furtherance of *Soldier9*'s program for the carriage of such passengers, were not carried in approved seating at all times but rather, on occasions, in OCL configurations. Both *Soldier7* and *Soldier6* had an awareness that such passengers were, or might be, being carried on occasions in OCL configurations.
388. Soldier6's evidence was that he had a general perception that people approved by Soldier9 for carriage on RWG6 aircraft were riding on the ramp. He received his own invitation to ride on the ramp on one occasion when flying in an RWG6 aircraft but did not take it up. On that occasion he was left with the impression that aircrew might invite other people to sit on the ramp in the same way that he had been invited to do so. He did not take any corrective action following his being invited to sit on the ramp although he knew that riding on the ramp probably wasn’t an appropriate thing to do in theatre. He accepted that unless aircrew were corrected they could simply have continued their normal practice of inviting people to sit on the ramp. He advised Soldier7 of the offer made for him to ramp ride but did not discuss the appropriateness of such invitation.

389. Soldier7 for his part was aware from his own knowledge that over a period of time a number of passengers were, or might be, being carried outside of approved seating and in OCL configurations on RWG6 aircraft.

390. Neither Soldier7 nor Soldier6 advised Soldier9 that some passengers being carried on RWG6 aircraft between 26 Mar 11 and 30 May 11 were in their view non-mission essential and/or not being carried in approved seating, but rather in an OCL configuration. Soldier9’s evidence was that, after his initial discussion with Soldier7 and Soldier6, he did not receive any complaint from any personnel under his command that there were any issues or
problems with the carriage of passengers.

391. **Soldier7** and **Soldier6** worked closely together in relation to **Soldier9**'s program for the carriage of passengers on familiarisation flights. **Soldier7**'s evidence was that **Soldier9** gave himself and **Soldier6** the ability to conduct their jobs as they thought fit. **Soldier6**'s evidence was that a joint decision was made between himself and **Soldier7** as to which persons would be permitted to fly as passengers on RWG6 aircraft.

392. **Soldier9**'s evidence was that at the time that he instigated the program for the carriage of passengers on RWG6 aircraft he believed it was understood that **Soldier7** or **Soldier6** could exercise their discretion when approached by someone seeking to fly, and determine whether the individual was suitable for such flight.

393. **Soldier9**'s further evidence was that **Soldier7** could accept, refuse, or comment upon, the taking of any particular individual in his role as Tp Comd before referring it to him for approval. Both **Soldier7** and **Soldier6** acknowledged this direction. **Soldier9** was comfortable with the command arrangements he had with his subordinates.
394. In his initial statement of 31 Jul 12, provided to the Commission and adopted in his evidence, evinced a familiarity with SI (AVN) OPS 3-107 in the context of 5 Avn Regt carrying non-mission essential passengers in the domestic environment. His evidence was that shortly after marching in to 5 Avn Regt in January 2010 to take up his position as OPSO for C Sqn, there was a determination, made after the issue was raised by C Sqn aircrewmen and aircrewman technicians, that ramp riding should be considered OCL. His evidence was that as a consequence he was aware from that time that ramp riding constituted OCL. No other evidence obtained by the Commission confirmed the occurrence of such a determination in early 2010.

395. However as aforesaid, the Commission obtained evidence indicating that the determination described by Soldier6 did occur within C Sqn on 3 Mar 11 when, in a Safety and Standards meeting Soldier56's views that ramp riding constituted OCL were recorded in the minutes of the meeting and ramp riding within C Sqn ceased after that date. As a consequence the Commission considered that at least by March 11 Soldier6 was aware that ramp riding constituted OCL. The Commission also noted Soldier6's evidence concerning the emails of Soldier44 and Soldier56 sent to RWG6 personnel on 15 Mar 11 and 21 Mar 11 respectively.
396. Soldier6's evidence was that in late 2009, in the course of familiarising himself with documents relevant to the conduct of operations for C Sqn, he re-read or brisked through the SI (AVN) OPS and re-familiarised himself, although not with every single SI in detail. It was his understanding at that time that the OCL Directive [which he could not remember looking into in particular detail] came into play if a passenger was not going to be seated in a seat with a seatbelt on during a flight.

397. Soldier6, when taken through DCA Directive 04/09 in the course of his initial evidence to the Commission indicated that as at 2010 he considered that paragraph 8 d., as framed, indicated that riding on the ramp as a passenger would constitute OCL whether in an operational or a domestic space.

398. Soldier6's later evidence, contained in a second statement, provided after he had been categorised as a PAP, was that, at the time of his involvement with the carriage of passengers in RWG6, he was aware that there was an SI on OCL but that he was not familiar with it. Further, his evidence was that his understanding of OCL, based predominantly on activities in other units, was that it was a situation when more people were required to be on an aircraft than there were seats available to accommodate them.

399. Taken by Counsel Assisting to his earlier evidence concerning his knowledge that C Squadron had considered ramp riding to be OCL, Soldier6's evidence was that he could not recall stating this but when shown the transcript of his evidence agreed that he had said it.
400. Soldier6's later evidence was that he believed that ramp riding was an accepted and common practice such that it did not trigger him to look at SI (AVN) OPS 3-107. He assumed that because it was occurring with the apparent knowledge and acceptance of the flight authorisation system, and because he believed that qualified aircrew were very familiar with SI (AVN) OPS 3-107, there must have been an understanding that ramp riding was not a breach of that SI. His evidence was that as a non-flying OPSO, such understanding would not necessarily have been briefed to him.

401. Later again in his evidence Soldier6's evidence was that at the time of Soldier11's flight he knew that OCL involved a passenger not being in a seat with a seat belt on during flight and understood that passengers being carried on sorties not being in a seat with a seat belt on were being carried in an OCL configuration.

402. Evidence obtained by the Commission indicated that as an OPSO, non-flying or otherwise, Soldier6 would still be required to have an understanding of the SI establishing a comprehensive formal system of flying supervision and flight authorisation for AAAvn. At no point did Soldier6 advise Soldier9 or anyone else in the RWG6 chain of command that as a non-flying OPSO he lacked the understanding or experience to be involved in operations being engaged in by RWG6 (including the carriage of passengers). Moreover, Soldier6's initial evidence to the Commission was that as OPSO it was his job to be
familiar with and comply with S1 and SF1 [relating to the carriage of passengers on RWG6 aircraft] and that he was familiar with such documents during his deployment with RWG6. His further evidence was that he knew that riding on the ramp probably was not an appropriate thing to do in theatre.

403. Soldier6’s evidence indicated that prior to 30 May 11 he approved the carriage of two non-mission essential persons on RWG6 being Soldier59 and Soldier61 and denied requests from three other persons to travel on RWG6 aircraft.

404. Soldier6 stated that there was no material inconsistency between the evidence he gave to the Commission initially and the evidence he gave to the Commission when he was recalled as a PAP. The Commission considers that there was a material inconsistency. It considers that in the course of his involvement in the program for the carriage of passengers on RWG6 aircraft, from March 2011 and certainly from the date of Soldier11’s familiarisation flight on an RWG6 aircraft on 5 May 11, Soldier6 was aware that passengers being carried on RWG6 aircraft on familiarisation flights not being in a seat with a seat belt on, and being permitted to ramp ride were being carried in an OCL configuration which was probably not an appropriate thing to do in theatre.

405. Soldier7’s evidence concerning persons being carried on RWG6 aircraft being categorised as crew has been dealt with to a limited extent earlier in this
report in the context of his discussions with Soldier's familiarisation flight on 26 Mar 11.

406. Soldier's evidence was that he understood that persons manifested as crew would not be subject to OCL [Directives as contained in DCA Directive 04/09].

407. When asked about his understanding of the term "crew" as defined in paragraph 8 c. of DCA Directive 04/09, Soldier's evidence was that he understood such term to describe a person specifically qualified and authorised to assist in operation of the aircraft and if that involved loading and unloading or doing things like that he could not see why such persons would not be qualified to do that particular thing. He agreed that his definition did not require such persons to be qualified in respect of the operating of a Chinook aircraft in accordance with the definition. He did not specifically consider "crew" as having to be qualified on Chinook per se, as opposed to just being qualified to move around cargo et cetera and experience what the aircrewmen did.

408. Soldier's evidence was that he considered that by making a passenger available for such tasks as may be allocated to him, by members of the crew of an aircraft on which the passenger was scheduled to fly, he could categorise such passenger as "crew" on the basis that the passenger would or might be assisting in the operation of the aircraft, and thus not be subject to the provisions of DCA Directive
04/09 paragraph 8 b. which specifically refers to passengers and does not mention crew.

409. Questioned by the Commission in respect of his understanding of DCA Directive 04/09 Soldier7’s evidence was that, the definition of “crew” was suitably qualified personnel specifically authorised to assist in the operation of the aircraft. [paragraph 8 c. of DCA Directive 04/09] He considered that Soldier9 would absolutely come under that category for his familiarisation flight. His rationale for this considered view was that if a person who would otherwise be categorised as a passenger was to or even might assist a member of the qualified crew, then that person could be categorised as crew. Soldier7 He gave as examples of such assistance, tactical clearance, loading and unloading or referring crew members to maintenance panel warning lights.

410. When asked by the Commission as to whether or not he considered the ramifications of that assumption, in the context of a clerk being asked to perform some duty whilst on board a Chinook during flight and as a consequence being able to be categorised as crew, Soldier7’s response was that, he did not think of the ramifications of his assumption but instead relied upon his perception that the CO supported his understanding in respect of the meaning of crew.

411. When questioned by Counsel Assisting following the giving of the evidence referred to, in the second preceding paragraph hereof, Soldier7 did not accept
that a passenger assisting a crew member by indicating a warning light on a panel could therefore be categorised as crew.

412. Soldier7's evidence was that he understood that for OCL in theatre the CJTF had the power to sign off because it was written in DCA Directive 04/09.

413. Later when questioned concerning his categorising passengers as crew as aforesaid Soldier7's evidence was that the practice of manifesting passengers as crew on familiarisation flights was confined to persons who had aviation qualifications but were not necessarily qualified to fly Chinook aircraft and that LT Case fitted that definition.

414. Later again in his evidence, in apparent contradiction of the evidence referred to in the preceding paragraph hereof, Soldier0 asserted that people, without aviation qualifications who were going flying to gain a greater understanding of the AO and Chinook operations so as to better themselves in their own jobs, were classified by him as crew. His evidence was that Soldier23, the Quartermaster SGT, was categorised as crew in the course of a familiarisation flight, to enable him to better understand how aircrew did their job.

415. In relation to the formal categorisation of passengers as crew, Soldier7's evidence was that following, and as a consequence of, his discussion with
concerning Soldier9's designating himself as crew for his familiarisation flight, he had all other passengers that he categorised as crew literally written into the authorisation brief [the OA82 Flight Authorisation Sheets as being included in the crew of the aircraft.

416. Soldier9's evidence was that an OA82 Flight Authorisation sheet could be notated to indicate that a person was being carried as a passenger on a particular flight. Evidence was that if a person was to be authorised to be part of the crew of an aircraft there would need to be specific consideration and a specific decision to that effect and a RMP and further that there should be a recording somewhere in AUSPEX or OA82 that such person was authorised to be part of the crew of the aircraft.

417. Soldier7's further evidence was that such flight authorisation documents if obtained, would verify that personnel travelling on RWG6 aircraft were recorded on such flight authorisation documents as crew or passengers. He confirmed that passengers categorised as crew could have a designation to that effect recorded in the OA82 Flight Authorisation Sheet or the PY104 Passenger Manifest, i.e. that a passenger could be designated as crew in handwriting on either sheet.

418. Late in its inquiry the Commission was provided with copies of flight authorisation records [Form OA82] in relation to RWG6. These hand written documents formed part of, which also included a printed summary of much
of the material contained in the original Form OA82s. These documents record the date of a flight, the aircraft type and number; its call sign, the pilots, the crew/passengers, the duty and route, the start time and duration and the initials of the authorising officers and AC.

419. At about the same time the Commission was provided with a printout of the Patriot Excalibur System (PEX) record for the flight of the aircraft on 30 May 11. The PEX system was designed to record similar details to those recorded in the OA82 Flight Authorisation sheet referred to above. Evidence provided to the Commission was that where the PEX system was not operating, which occurred on occasions during the RWG6 deployment, the Form OA82 would be used, and if passengers were to be carried, then that carriage would be recorded on a passenger manifest known as a PY104. "referring to “pax as per manifest”"

420. Such evidence also indicated that while RWG6 personnel could easily be recorded on PEX by reason of the fact that their details were on the RWG6 database it would have been more difficult to record similar details of persons who were not members of RWG6 by reason of their not being on such database, e.g. LT Case. In such circumstances it was usual to resort to using the handwritten PY104 Passenger Manifest to record the carriage of non-RWG6 personnel on RWG6 aircraft. [Privacy]

421. The Commission received evidence, that at the end of a mission, the PY104
Passenger Manifest, recording passengers who flew on that mission, would in the normal course of events, be destroyed as being no longer necessary. However, the PY 104 Passenger Manifest relating to LT Case’s flight on 30 May 11 was, as a consequence of the Aircraft Accident Investigation, not destroyed. That document filled in by Soldier60 with details provided by LT Case immediately prior to his flight records that LT Case was manifested as a passenger on such flight. No information was obtained by the Commission as to why the PY 104 Passenger Manifests could not be retained, or preserved in some other electronic format, so that the ADF might retain a permanent record of passengers carried on flights in the AO.

422. When the Commission obtained such Flight Authorisation documents they did not support Soldier7’s evidence. To the contrary the OA82 Flight Authorisation sheets disclosed that, out of a total of at least 80 serials recorded on such Flight Authorisation sheets up to 30 May 11, no passengers had been categorised as crew and there were only eight occasions where passengers were listed at all. These passengers were not specifically identified as passengers on such Flight Authorisation sheets. Apart from the recording of Soldier48 12 Mar 11, Soldier63 12 Mar 11, Soldier62 23 Mar 11, Soldier 6 and Soldier55 who were effectively doing flight checks as part of an Audit, on 30 Apr 11, no other passengers flown on RWG6 aircraft, including Soldier9 who categorised himself as crew, were recorded in the OA82 Flight Authorisation Sheet column headed Crew/Passengers.
423. On the basis of the evidence obtained in relation to the manner of recording persons present on flights of RWG6 aircraft the Commission considers that most passengers carried on RWG6 aircraft would have been recorded on either the OA82 Flight Authorisation sheet or the PY104 Passenger Manifest. In the absence of any record on OA82 Flight Authorisation sheets in respect of the majority of passengers on RWG6 aircraft up to and including 30 May 11 the Commission considers that such passengers were manifested as passengers on PY104 Passenger Manifests. Crew of RWG6 aircraft would be recorded on PEX, when the same was operational, or the OA82 Flight Authorisation Sheet when it was not.

424. The system as outlined in the preceding paragraphs prevented the Commission from being able to accurately ascertain which passengers were carried on which flights. The Commission was not assisted by the column on the OA82 Flight authorisation Sheets provided to record the names of passengers because in almost every instance, where passengers were apparently carried, no record was made of such carriage on the OA82 Flight Authorisation Sheets.
425. On 2 or 3 May 11, there occurred an event that had the effect of informing Soldier9’s [and others] understanding of OCL. As foreshadowed in Soldier30’s Directive to Soldier9, an audit team consisting of Soldier10, Soldier8, and Soldier55 conducted a standards audit of RWG6 between 29 Apr 11 – 10 May 11. In a discussion on or about 2 or 3 May 11, Soldier10, Soldier8, Soldier9, Soldier7, and Soldier15 met in the RWG6 conference room and discussed DCA Directive 04/09 and its relevance to the proposed carriage of Soldier11 in an OCL configuration on RWG6 aircraft i.e. how he should be carried and what approval would need to be sought for his proposed familiarisation flight on 5 May 11. [Privacy]

426. Soldier7’s evidence was that he had vague recollections of the meeting with Soldier10, Soldier8, the CO, Soldier15 and himself in the RWG6 conference room. He did not recall a discussion with Soldier10 and Soldier8 concerning Soldier11 authorising his own OCL but recalled being advised that he should prepare a Risk Management Plan (RMP) for Soldier11’s flight. Following this advice, Soldier7 prepared a RMP for Soldier11’s flight, which was the first RMP he had prepared during
the RWG6 deployment. Having gone through the process of preparing the RMP for he could not say why he did not go through the same process of preparing a RMP for those passengers flown in an OCL configuration after 5 May 11 on RWG6 aircraft.

427. In the course of that meeting and advised that carriage of personnel in OCL configuration required a formal risk assessment of OCL and the issue arose as to whether as CJTF633 could authorise himself to travel in an OCL configuration. advised that CJTF633 could authorise himself as OCL and that RWG6 personnel should complete a RMP for the proposed flight.

428. As aforesaid, the Commission considers that DCA Directive 04/09, in its terms, did not permit to authorise himself, or any other person, to fly in an OCL configuration in the circumstances envisaged for his familiarisation flight, namely, when there would be approved seating available for use. In such circumstances, the Commission considers that any approval for his carriage in an OCL configuration needed to be obtained from AHQ pursuant to Paragraph 15 of DCA Directive 04/09.

429. The Commission does not doubt the bona fides of the participants in such discussions in respect of their interpretation of DCA Directive 04/09 to the effect that as CJTF633 could authorise himself to travel in an OCL configuration on the proposed familiarisation flight on an RWG6 aircraft.
430. On the advice of Soldier10 and Soldier8, a RMP was drafted by Soldier7 and authorised by Soldier9 on 4 May 11. It was headed “OCL of ADF Members on CH-47 For Familiarisation”. The Commander’s intent was expressed as: “Provide familiarisation of ADF members in CH47D safely” and the mission objective was stated as “safely carry passangers (sic) OCL”.

431. The document completed in relation to the familiarisation flight of CJTF633 on 5 May 11 was a standard form Mission Risk Profile (MRP)/RMP document from 16 Bde (Avn). While this document could be used for either a MRP or a RMP, evidence given to the Commission by Soldier9 was that this particular form was prepared as a RMP specifically for the familiarisation flight of CJTF633 and was not regarded by him as a MRP generic document to be used for other missions. Evidence obtained by the Commission indicated that a MRP was a generic document to be utilised and considered for daily common tasks and is general in nature, while a RMP is a specific plan for a task that is to be conducted considering the specific risks and treatments applicable for the activity being planned.

432. The RMP envisaged a forced landing of the aircraft resulting in injury or death to personnel restrained by aircrewman restraint/strop. It envisaged utilisation of the same restraint system as aircrewmen or approved restraint harness and having the nearest seat available to restrain the OCL personnel in the event of emergency and take-off and landing where possible.
433. Soldier7's evidence concerning the preparation of the RMP was that he considered that because Soldier11 was going as part of the crew there was no need for a RMP to be raised and that this was why he had not raised a RMP in respect of carriage of passengers on previous RWG6 flights. He prepared the subject RMP for OCL because Soldier8 advised that this should be done. He did not look at the definition of passenger and crew in DCA Directive 04/09 when preparing the RMP. When asked by Counsel Assisting why he had not queried as to why a RMP was needed if Soldier11 was flying as part of the crew and not as a passenger Soldier7's answer was that he did not recall the specific intricacies of the discussion.

434. The Commission notes that the mission objective in the RMP, i.e. to safely carry passengers OCL is prima facie inconsistent with Soldier11 travelling as part of the crew. When this was drawn to the attention of Soldier7 he accepted that there was a difference between what it was intended that Soldier11 would be doing on the aircraft [acting as part of the crew] and what was written on the RMP and considered that to be possibly an error or omission on his part.

435. The evidence of Soldier9 was that on 4 May 11 Soldier7 provided him with an unsigned copy of the RMP for CJTF's flight and explained to him the steps necessary to be taken to minimise the risk for CJTF633 travelling in an OCL capacity. His evidence was that the RMP was specifically raised to accommodate and
provide a risk assessment for CJTF633, Soldier11’s flight. This was the first and only formal request for OCL authorisation put in by RWG6 personnel to CJTF633. Thereafter, there was no further RMP developed for any of the flights approved by the CO subsequent to 5 May 11. Soldier9 explained this on the basis that he did not have any anticipation that after Soldier11’s flight that anyone else would fly on the ramp apart from crew performing crew duties.

436. Following the discussions between Soldier9, Soldier7, Soldier8 and Soldier10 concerning the carriage of passengers considered that it was clear that riding on the ramp of a CH-47D aircraft should be considered OCL for passengers. Soldier9 was aware at that time that passengers travelling on RWG6 aircraft in an OCL configuration would require OCL authorisation from CJTF633. In this context the Commission notes Soldier9’s evidence that at the time of commencing his command of RWG6 in February 2011 he considered that a person riding on the ramp of a CH-47D aircraft, if not crew, was travelling in an OCL configuration. Soldier9 believed that Soldier7 and Soldier15, having participated in such discussions and being intelligent people would have understood the policy and interpreted the OCL Directive as he did. His evidence was that he thought that the intent that he had given earlier [to Soldier7 and Soldier6] would be reinforced by the Soldier11’s flight. He did not have any anticipation that after Soldier...
s flight anyone else would fly on the ramp apart from crew people doing crew jobs.

437. [Soldier9] made no check or inquiry to ensure that [Soldier7], as Tp Comd, understood the policy and interpreted the OCL Directive as he himself then did and did not direct him to act in accordance with his own then understanding or interpretation. As aforesaid, [Soldier9]'s evidence was that he was unaware that passengers being carried on RWG6 aircraft were being permitted to engage in ramp riding and believed that they would have been seated in approved seating.

438. Whilst the Audit Team were present at RWG6 in April and May 2011 the issue of the classification of personnel when aboard RWG6 aircraft and the carriage of personnel in an OCL configuration were matters under active discussion between a member of RWG6 and a member of the Audit Team.

439. On or before 4 May 2011 [Soldier24], an AT with RWG6, had discussed with [Soldier8] his concerns over the classification of members of the Royal Australian Electrical and Mechanical Engineers (RAEME) personnel who needed to travel in RWG6 aircraft for the purpose of fault finding or monitoring of aircraft systems as well as potential training for qualification purposes on the aircraft’s weapon systems.
440. Soldier 24’s evidence to the Commission was that he had known Soldier 8 for a long time and that he had no difficulty raising issues with him. His recollection was that he was concerned that the instructions on carrying passengers in an OCL configuration were too restrictive in that they did not allow for personnel, such as RAEME members, to properly carry out their duty without being in potential breach of the instructions. [DCA Directive 04/09] His evidence was that he raised the issue with Soldier 7 and Soldier 8 as a general matter not related to anything specific within the operations of RWG6 at the time. He believed that he was advised by Soldier 7 to write his concerns down and send them to Soldier 8.

441. On 4 May 11 Soldier 24 [as he then was] sent an email to Soldier 8 with copies to Soldier 7, Soldier 1, and Soldier 4. That email became before the Commission. Soldier 4’s evidence was that he received the email and that he recalled discussing it with Soldier 7 but could not recall the details of such discussion. Soldier 7’s evidence was that he did not dispute receiving this email but could not recall discussing it with Soldier 4. Soldier 1’s evidence was that he could not recall receiving the email.

442. The contents of such email raised the issue of RAEME personnel travelling on RWG6 aircraft and being required as part of their duty to be in an OCL configuration. The email questioned whether the RAEME member performing such duty would be authorised as crew even though they are not qualified to be so authorised. Soldier 24
questioned whether the RAEME member could be approved OCL and come directly under the supervision of the most senior crew member. The request to the addressees was for further consideration of the definition of crew and OCL requirements within RWG6.

443. **Soldier8** had no particular recollection of the details of the conversation with **Soldier24** on or before 4 May 11 but agreed that the subject email would have been sent to him on 4 May 11 and that prior to departing the AO he forwarded the email to his DRN email address in Australia on 15 May 11.

444. **Soldier8**'s evidence was that he could not recall discussing the contents of the email with either **Soldier10** as the leader of the Audit Team or **Soldier55** as the Technical Support Troop (TST) representative. He could not recall discussing the email with **Soldier9** and he did not action the matters raised in **Soldier24**'s email or discuss it with anyone on his return to Australia. His evidence to the Commission was that he did not do anything in relation to the email prior to the accident.

445. Following the preparation of the RMP **Soldier11**, purporting to exercise his authority as CJTF633, authorised himself to travel on an RWG6 aircraft on 5 May 11 in an OCL configuration. As aforesaid on the Commission's interpretation of DCA Directive 04/09 any attempted authorisation by **Soldier11** for himself to travel in an OCL configuration in the prevailing circumstances was ineffectual and
for this reason the Commission has used the term “purporting to exercise his authority”. Authority for his flight in circumstances, where approved seating was available for use, was required from AHQ pursuant to paragraph 15 of the Directive. The Commission does not doubt the bona fides of Soldier11’s belief that he was able to authorise himself or others to travel on an RWG6 aircraft in such OCL configuration pursuant to the provisions of DCA Directive 04/09.

FAMILIARISATION FLIGHTS OF Soldier11 AND Soldier59 ON 5 MAY 11

446. On 5 May 11 Soldier11 was fitted with an AWAE and flew on an RWG6 mission in the course of which he moved around the aircraft, assisted the aircrew and sat on the ramp. His staff were not authorised for an OCL configuration and travelled as passengers in seats and wearing seatbelts.

447. On the same day Soldier11 purported to exercise his OCL authority a second time so as to enable Soldier59 to fly in an OCL configuration in an aircraft accompanying the aircraft in which Soldier11 was travelling. The circumstances in which Soldier59 was purportedly authorised by Soldier11 for carriage in an OCL configuration originated in Soldier6 considering that Soldier59 would benefit from exposure to aircraft dynamics on a mission in Afghanistan.
448. Opportunistically, and without prior notice to Soldier11, Soldier6 requested OCL approval for Soldier59 from Soldier11. Soldier6's evidence was that he felt it would have been unfair for Soldier11 to authorise himself to travel in an OCL configuration and then have Soldier59 fly as a passenger. Although he advised Soldier9 of the proposed flight of Soldier59, did not advise him of his intention to seek authority from CJTF633 for Soldier59 to be carried in an OCL configuration on 5 May 11.

449. Soldier6's evidence was that he sought Soldier11's approval for Soldier59 to travel in an OCL configuration, and therefore to be out of his seat during the course of his flight, in order that the aircrew had the potential to utilise him if they needed to, or if they chose to, put him in an OCL configuration. Soldier6 considered that if the aircrew had the potential to utilise Soldier59, he may get full exposure to aircrewman operations. His evidence was that he had a reasonable suspicion that there would be certain duties that the crew may get Soldier59 to perform during the flight. He understood that having gained OCL approval from Soldier11 this meant that Soldier59 could be anywhere on the aircraft provided he was appropriately restrained. His evidence was that he believed the RMP that had been prepared for Soldier11's flight would also cover the flight of Soldier59 given that he was flying at the same time as Soldier11.
450.  **Soldier59** accepted in his evidence that **Soldier59**'s carriage on the aircraft was not mission essential. Clearly it was not. *Prima facie,* **Soldier59** was a passenger as that term is defined in DCA Directive 04/09 and, in the view of the Commission, should not have been proposed for travel in an OCL configuration on the basis that he may have been able to assist the crew in some undefined manner in the course of the mission, and as a consequence get full exposure to aircrewmam operations.

451.  **Soldier57** was the AC for **Soldier59**'s flight. His evidence was that he believed that **Soldier59** was flying as crew. He did not ask whether he had any qualifications relevant to the CH-47D. His evidence was that he did not address the issue of what capacity **Soldier59** was flying in on his aircraft. **Soldier57** authorised and understood that **Soldier59** was going as crew in the aircraft and specifically authorised him to assist in the operation of the aircraft. He did not identify any specific task that **Soldier59** was to perform, but considered that **Soldier59** was under the control of the ramp crewman who would discuss and tell him what to do at particular times if required. **Soldier77** could not specifically recall being asked for permission for **Soldier59** to leave his seat.

452.  **Soldier51**'s evidence was that, whilst believing **Soldier59** would be travelling on the flight to gain exposure to the aircrews operations, he did not turn his mind to whether **Soldier59** might be OCL during his flight. His evidence
was that all he knew was that Counsel59 was being proposed to fly for familiarisation of aircrew activity which was seen to be of value to the RWG team and he did not know or seek more information than that and was comfortable with that. He considered that his authorisation for Counsel59 to travel in an OCL configuration merited more reflection and consideration by him than was given in circumstances of some distraction. [T648]

453. As aforesaid the Commission does not consider that the provisions of DCA Directive 04/09 gave Counsel11 the authority to authorise Counsel59 being carried in an OCL configuration on RWG6 aircraft in the prevailing circumstances, namely where approved seating was available for his use.

CARRIAGE OF PASSENGERS ON FAMILIARISATION FLIGHTS ON RWG6 AIRCRAFT PRE AND POST 5 MAY 11

454. Prior to Counsel9’s meeting with the Audit Team members on 2 or 3 May 11 and discussing with them the requirements of DCA Directive 04/09 the following persons were given carriage on RWG6 aircraft for familiarisation flights being categorised as crew and travelling in an OCL configuration:

- Counsel9 [CO] who engaged in ramp riding on 26 Mar 11
- [Privacy]

- Counsel14 [XO] and Counsel61 [member of RWG6] who engaged in ramp riding on 30 Mar 11 [Privacy]
455. In addition to the personnel mentioned above the Commission notes that the OA82 Flight Authorisation sheets indicate that the following additional personnel were given carriage on RWG6 aircraft during this period: Soldier48 and Soldier63 on 12 Mar 11, Soldier62 on 23 Mar 11 and Soldier8 and Soldier55 on 30 Apr 11. Due to the late discovery of the OA82 Flight Authorisation sheets no further information was obtained by the Commission in respect of the carriage of the last mentioned personnel on RWG6 aircraft.

456. Subsequent to Soldier9's meetings on 2 or 3 May 11 with the Audit Team the following persons were given carriage on RWG6 aircraft, for familiarisation flights, being categorised as crew and travelling in an OCL configuration:
who engaged in ramp riding and purported to approve his own travel in an OCL configuration on 5 May 11. The Commission considered this flight to be mission essential in nature.

[OPS CPL] who engaged in ramp riding purportedly authorised by CJTF633 on 5 May 11

[Heron UAV detachment] on 15 May 11 who engaged in ramp riding

[Force Support Unit Clerk, Camp Baker] on 20 May 11 who engaged in ramp riding

[RWG6 LSE] who engaged in ramp riding on 25 May 11 [SGT

[RWG6] who engaged in ramp riding on 20 May 11 [SGT

LT Case [Heron UAV detachment] who engaged in ramp riding on 30 May 11

was authorised for carriage on a flight of 30 May 11 but due to other commitments was not able to fly on that day.

457. [Soldier57]'s flight on 20 May 11 arose from an approach made to her directly by [Soldier9] offering her a flight on RWG6 aircraft for the purpose of preparing an article on RWG6 activities for the Camp Baker newsletter of which she was the editor. This approach occurred subsequent to [Soldier9]'s meeting with [Soldier10] and discussing with them the issue of OCL.
Despite anticipating that Soldier57 would be taking photographs on the flight, Soldier9 did not consider the possibility that while doing so she may have been located in an OCL configuration and gave no directions to Soldier57 or any member of RWG6 in relation to Soldier57 complying with the requirements of DCA Directive 04/09.

THE PROVISION OF THE AWAE AND Z51 RESTRAINT STRAP TO NON-QUALIFIED AIRCREW

458. The TST was responsible for ensuring that any person travelling on an RWG6 aircraft did so fitted with appropriate Life Support Equipment (LSE). The chain of command within that part of the TST concerned with LSE was Soldier17, Soldier, 21 Soldier22 and Soldier25.

459. Most of such passengers as were flown on RWG6 aircraft were fitted with an AWAE to be worn on the flight. The wearing of AWAE by passengers was authorised by Soldier9 in April 2011 when, following a discussion with Soldier17, he gave approval for Soldier17 to fit passengers with an AWAE because it was more comfortable.

460. The evidence of Soldier21 was that he was not specifically told by
to issue a Z51 restraint strap to passengers. Evidence obtained by the Commission indicated that the restraint strap was a treated as a component of the AWAE and was issued in conjunction with the AWAE.

461. The effect of issuing the Z51 restraint strap in conjunction with the AWAE was that it provided the potential for the wearer to move to a greater extent within a CH-47D aircraft than a passenger simply fitted with their individually issued Modular Combat Body Armour System (MCSBS) and a Dispatcher's Harness and further, to move into OCL configurations in the event that such movement was appropriately authorised by the AC.

462. Passengers travelling in approved seating on an aircraft would not need to be fitted with an AWAE but would be restrained by the seat belt attached to each approved seat within the aircraft. Regulations required that prior to using an AWAE persons needed to be trained in its use. LT Case had been so trained.

463. The evidence of Soldier was that or someone on his behalf, would inform the Life Support Fitters section who would be flying on RWG6 aircraft the next day and should be fitted with an AWAE. Evidence was that in April 2011 he was told to start fitting AWAE to passengers and during his deployment fitted approximately fifteen to twenty passengers including Soldier.
and LT Case] with AWAЕ including the restraint strap.

464. Although the Release for Service document for the AWAЕ [•••] in its terms confined the issue of such equipment to aircrewmen only, SF1 24/2007 [•••] referring to AWAЕ being available for issue to aircrewmen, did not in its terms restrict such issue to aircrewmen only. [Privacy]

465. As aforesaid, the evidence of Soldier12, who was responsible for the Release for Service approval relating to the Z51 restraint strap was that such document confined the use of the Z51 restraint strap to aircrewmen only [•••] and that it was never intended that it be provided to persons other than aircrew. [•••] His evidence was that if a unit was to use the equipment other than for aircrew it should prepare a risk assessment and approval process before such use. [•••] He gave as examples of matters which would need to be considered in such assessment, the job expected of the person in the back of the aircraft, and whether such job involved such person’s body being outside an aircraft. [•••]

466. No risk assessment was conducted by members of RWG6 prior to authorising the non-authorised use of the AWAЕ, because, in the Commission’s view, personnel were probably unaware of the contents of the subject Release for Service document dated 18 Feb 09 despite its distribution at that time to, inter alia, 5 Avn Regt CO, OPSO, OC TSS, OC C Sqn and HQ 16 Avn Bde.
THE FLIGHT OF *Soldier54* ON 15 MAY 11

467. [Soldier54] deployed to Afghanistan in **December 2010** with Heron detachment Rotation 4 as an Aerial Vehicle Operator. In the course of his deployment [Soldier54] made it known to [Soldier6] that he was interested in being shown the RWG6 facilities and how they operated. [Soldier6] showed him the operations side of RWG6 and introduced him to [Soldier7] who showed him the flight planning engaged in by RWG6. [Soldier54] subsequently enquired about going on a Chinook flight so that he could see the other side of operations and was ultimately advised that there was a suitable CH-47D mission on which he was able to obtain carriage on **15 May 11**.

468. [Soldier54]'s evidence was that he was interested in going to an air-mobile platform in order to gain experience in relation to operations although this experience did not have anything to do with assisting his function as a Heron UAV operator. He was effectively at the end of his deployment and on his way out of Afghanistan at this time. [Soldier54] believed that it was [Soldier6] who organised the details of his flight on **15 May 11**.

469. Prior to his flight on the RWG6 aircraft [Soldier54] had a conversation with his CO [ADF32] and asked his permission to go on a RWG6 sortie. [Soldier54] categorised his discussion with [ADF32] as a friendly conversation that occurred in the OPS room of the Heron Detachment but could not recall the specific
470. Prior to the flight Soldier54 was provided with an AWAE together with a helmet. He had been previously fitted with this AWAE for an earlier flight, which had been aborted. His evidence was that he did not receive any advice concerning the fall arrest device built in to the restraint strap issued to him in conjunction with the AWAE. After being provided with the AWAE, Soldier24 ran through things with Soldier54 to check that he understood what was going on. He was subsequently given an aircrew briefing by Soldier1 in the course of which it was indicated to him that he would be moving around the aircraft as the flight progressed and at some point would be located with Soldier24 on the aircraft ramp.

471. Soldier7 was the AC for Soldier54's flight and Soldier1 was the CP. Other crew on the flight were Soldier24 and Soldier5 and one other crewman not identified. Soldier54 started the flight located at the back of the aircraft and between sorties moved forward during the course of the day spending time with the forward crewmen before finishing the flight in the jump seat. During his time at the back of the aircraft he was located on the last seat at the right hand side of the aircraft.

472. In the course of his flight Soldier54 used the intercom system to request permission to travel on the ramp. His evidence was that no crew member denied his
request to move about the aircraft and that he was on the ramp four or five times during the mission. Soldier54’s further evidence was that he had a good view of the terrain while seated in the rear seat of the aircraft. Soldier54 did not tell his CO, ADF32, that he had been ramp riding on this flight.

473. Subsequent to his flight Soldier54 spoke with LT Case about his experience advising him that it was a good experience but not indicating to him that a flight would be a benefit to him in the performance of his function as a payload operator for the Heron Detachment. Soldier54. However, he agreed with the proposition put to him that LT Case’s gaining an appreciation of the topography was more important for him as a Payload Operator than it was for Soldier54 as an Aerial Vehicle Operator.

THE FLIGHT OF LT CASE ON 30 MAY 11

474. LT Case deployed to Afghanistan on 9 May 11 as a payload operator with the UAV Heron Detachment. Whilst in Afghanistan he met with Soldier5 who was known to him as a consequence of them having both participated in a RAAF survival course in 2010.

475. LT Case and Soldier5 met by chance at Camp Baker on LT Case’s first day in Afghanistan and in the course of conversation LT Case expressed the wish to go flying with RWG6. Soldier5 thought this was a good idea and after making
inquiries left a message for LT Case on 29 May 11 to the effect that there would be an appropriate flight for him to go on the next day.

476. At approximately 1400 h on 29 May 11, LT Case’s CO, received a phone call from LT Case who asked whether he could go flying the following morning. advised LT Case that he would take over his shift so that he could go flying and accordingly released him from his Heron duties in order that he could take the proposed flight. This request constituted the totality of any discussions engaged in by in respect of LT Case’s proposed flight prior to the happening of the accident.

477. ’s evidence was that, at the time of LT Case’s phone call he thought that if LT Case had been offered a familiarisation ride with the Chinooks, then his participation in the flight would have to be duly authorised by RWG6 and be in accordance with extant ADF Aviation and Airworthiness policies. It was his understanding that LT Case would be going on the flight as a passenger, sitting in the jump seat, and would not be performing aircrew duties on that airframe. He believed that LT Case would be in either the jump seat or a seat in the back and that being in the jump seat would allow him to see what the pilots were doing and also provide him with a geographical perspective of the Afghan terrain. He was not advised that LT Case may be ramp riding or of any of the risks associated with LT Case potentially being carried on the aircraft in an OCL configuration.
478. The Commission notes that paragraph 17 of **DCA Directive 04/09** mandates that final acceptance of risk for activities involving OCL rests with the commander of the personnel being carried and further that paragraph 8 of **SI (AVN) OPS 3-107** directs that commanders of troops to be carried on an Army Aircraft in an OCL configuration should be advised of the risks attendant in such carriage prior to authorising the carriage of their personnel.

479. Further evidence was that in retrospect he considered that the primary reason for LT Case to go flying in the Chinook was directly related to his professional development as an Army pilot and a secondary reason was that flying to some of the Forward Operating Bases (FOB) would enhance his situational awareness and increase his experience in Afghanistan which would in turn enhance the Heron service and support to ground troops. However, this was not the subject of specific discussion between himself and LT Case and ultimately his evidence was that, in his opinion, LT Case’s flight was not mission essential.

480. On the basis of the circumstances outlined in LT Case’s request of to go flying on RWG6 aircraft, did not consider that such request would have been sufficient to categorise the proposed flight as mission essential. The Commission agrees that a mere request to go flying with RWG6 personnel *simpliciter* provides no basis for assuming such proposed flight to be mission essential. considered that while using a CH-47D flight to enhance an understanding of the ground was novel at the time, it was also worth trying, given the
flight safety record of the RWG to that time and that in such circumstances LT Case’s flight may have satisfied him as being mission essential. However he considered that the degree to which LT Case’s flight may have been of benefit to aid the development of the Heron Capability was never determined.

481. ADF33 was the head of the AAIT into this accident. His evidence concerning LT Case’s flight was that he considered such flight to be reasonable but not essential to the carrying out of LT Case’s job and that his carriage on the aircraft was contrary to the provisions of DCA Directive 04/09. He considered that while ramp riding may have provided LT Case with a superior view of the terrain than would have been obtained from sitting in the jump seat, the benefit of such superior view was outweighed by the risks inherent in ramp riding.

482. The Commission notes that a number of witnesses gave evidence that a reasonable view of the terrain could be obtained while sitting in either the jump seat or one of the rear seats in the aircraft. The Commission considers that if LT Case had been travelling in such approved seating he would have obtained a reasonable view of the terrain, which would have assisted him in the better performance of his duties.

483. The Commission noted that although the Heron Detachment had been operating in Afghanistan for some time prior to the arrival of LT Case, there was no process in
place for members of that Detachment to participate in a familiarisation flight in an
RWG6 aircraft for the purpose of the better performance of their duties which might
have been expected if in fact it was essential to the mission of Heron UAV operators to
engage in such a familiarisation flight.

484. As aforesaid following the subject accident, emphasised to

that familiarisation only flights should not be considered as being
mission essential. In addition the Commission notes that COMD 16 Avn
Bde, on 19 Aug 11 amended his directive which amendment in paragraphs 13, and 15 stated:

Personnel who do not constitute part of the mission requirement or are not part of
the authorised crew are not to be carried on aircraft. Sight seeing and
“operational tourism” by personnel is not permitted. The carriage of non-
essential passengers for familiarisation purposes is to be authorised by the
COMD of JTF633 and he is to accept the risk in those circumstances. You are
reminded of the risks associated with OCL and you are to be fully conversant with
the relevant orders including Reference B [being SFI 04/2008 – CH-47D
Operations during Op SLIPPER (AL12) OF 03 Mar 11].

Further, paragraph 18 of that amended Directive stated under the heading of “Safety” –

You are to apply AVRM procedures IAW [in accordance with] SI (AVN) OPS, SI
(5AVN) OPS and the RWG RMP.
485. Later on 29 May 11, LT Case was introduced by Soldier5 to Soldier1 who was to be the AC on the following day’s flight. Soldier1 was agreeable to taking LT Case on the flight, subject to his obtaining approval from his CO, and indicated that he was already taking Soldier49. However, he said that both LT Case and Soldier49 could come together on the flight and rotate through the jump seat. He confirmed with Soldier7, the authorising officer for the flight, that he would take LT Case on such flight on 30 May 11. Soldier5 left his meeting with LT Case and Soldier1 on 29 May 11 with the understanding that if LT Case’s CO approved his proposed flight then LT Case would be rotating through all crew positions including sitting on the ramp during such flight as part of the crew.

Privacy

486. During the authorisation brief conducted with Soldier7 on 29 May 11 Soldier1 discussed Soldier49 and LT Case in the Concept of Operations for firing the Mini guns and Admin and Log/Safety Equipment where fitment of AWAE was discussed. Soldier1 could not recall where he intended to place Soldier49 and LT Case within the cabin of the aircraft during the mission or whether he mentioned it during the authorisation brief. However, he recalled in similar briefings for familiarisation sorties that personnel would throughout the sortie, be rotated, through the jump seat and on the ramp. Later in his evidence he recalled that on 29 May 11 he discussed with Soldiers5 that Soldier49 and LT Case could be
rotated through various positions on the aircraft during the following days flight.

487. Soldier7's evidence was that on the evening of 29 May 11 LT Case approached him requesting a flight and indicating, in response to a question from Soldier7 that he had approval from his CO for such flight. Soldier7 told LT Case that he could fly the next day and subsequently advised Soldier9 of this fact.

488. Soldier7's evidence was that LT Case had recently arrived in theatre, was a fellow Army Aviator, and was very keen to see the AO in the operational perspective. His evidence was that he authorised LT Case's flight on 30 May 11 in order that he could gain a better understanding of the AO and a better appreciation of the tactical environment and terrain that he was operating in and he thought that that was going to better LT Case's effectiveness as a UAV operator both in his role in supporting ground troops and in detecting Improvised Explosive Devices (IEDs).

489. Soldier7's evidence was that he authorised LT Case to travel on the aircraft as crew. Initially his evidence was that he did not discuss how LT Case was to be controlled or where his position would be during the authorisation brief with Soldier1 on 29 May 11 or otherwise. Later in his evidence he asserted that LT Case was specifically authorised to travel as crew on the aircraft and that the crew duties that he was to perform were to assist in loading and unloading the
airframe, sitting on the airframe and looking for any particular issues that occurred outside that area easily missed, for example, enemy action or people on the ground as well as to observe the AO in a three dimensional sphere. His evidence was that the only reason he classified LT Case as crew was because he was assisting a crew member at the rear of the aircraft. In this latter aspect of his evidence he indicated that he did not state to any specific task that LT Case was to undertake as “crew”. Specifically, he did not discuss with whether LT Case was to be carried as crew or passenger, as that would usually be under the direction of the AC, nor there was any discussion regarding how LT Case was to be controlled on the flight or where his position would be or where he would sit during the mission. Rather, assumed and intended that LT Case would be under the control of the ramp aircrewman, who would tell him what to do if assistance was required.

490. On 30 May 11 at about 0630 h LT Case met with crew members of the aircraft and travelled with them to the flight line at Mustang Ramp. He was fitted with Personal Protective Equipment (PPE) including helmet and AWAE incorporating a restraint strap. Prior to the flight gave LT Case a safety briefing in accordance with the standard passenger-briefing card.

491. ’s only contact with LT Case on the day of the mission on 30 May 11 was on the drive out to Mustang Ramp. He observed pre-flight that LT Case was
wearing a tether attached to his AWAE and considered that being tethered to the aircraft
LT Case would not be in an OCL configuration, i.e. the same view initially held by
_Soldier9_  _Soldier1_ did not give any thought to the issue of a RMP for
LT Case’s flight. 

492.  _Soldier1_ did not recall giving any direction to the crew as to how LT Case
should be seated or restrained on the aircraft although he had an incomplete recollection
of someone requesting permission during the flight for LT Case to fire the mini-gun.

493.  _Soldier5_ ‘s evidence was that, at the Captain’s brief there was reference to
LT Case being under the control of aircrew at the back of the aircraft and _Soldier1_
trusting the crew’s judgement as to where to position LT Case without seeking his
approval. 

494.  _Soldier5_ saw LT Case as being crew and not a passenger. His evidence was
that during the AC’s briefing, concerning groupings, task items and crew duties, _Soldier1_
 had identified LT Case as being under aircrewmen control to be moved around
the aircraft as the aircrew saw fit. Further, in accordance with the AC briefing _Soldier5_
noted that LT Case obeyed his orders and directions when under his
supervision. He categorised the only duty that LT Case was performing as being
observation. He noted that LT Case took lots of photographs and videos whilst seated
on the ramp.
495. Soldier 4’s evidence was that Soldier 1 conducted the Mission/Captain’s brief. All the crew were present for this briefing as was LT Case. Soldier 1 advised that LT Case would be coming on the flight and referred to the crew helping him out where possible. Soldier 4 told Soldier 1 that the crew would look after LT Case in the back and that LT Case would probably start up the front for the first part as the aircraft headed out on the mission.

496. Soldier 4’s evidence was that at the conclusion of the Mission/Captain’s Brief he raised with Soldier 1 the prospect of LT Case sitting in the middle of the aircraft when external loading of the downed Black Hawk occurred and the fact that he may be down at the back of the aircraft at some point. Soldier 1 responded by referring to the need to be flexible throughout the sortie and to play the movement of LT Case through the aircraft by ear.

497. Soldier 4’s further evidence was that at one point in the flight he sought permission from Soldier 1 to locate LT Case at the mini-gun. His evidence was that crew would not move anyone around the aircraft without telling the pilot and if the pilot was not happy with the movement then the movement did not occur. He believed that Soldier 1 gave permission for this movement.

498. Soldiers intended moving LT Case to a seat for take off from Wolverine on the final sortie prior to the accident. However, after adjusting LT Case’s restraint strap for ramp riding and because of time constraints, he made a judgement call to leave LT
Case on the ramp during that take off instead of moving him to a seat. He did not seek Soldier1’s approval to put LT Case on the ramp at this time because his interpretation of Soldier1’s pre-flight brief was, that he was given approval to do it and further that he assumed that Soldier1 could see LT Case on the ramp through his pilot’s mirror.

499. Soldier5’s further evidence was that he did not tell Soldier1 that LT Case was located on the ramp believing that the crew had situational awareness and assuming that everybody knew of that fact. He accepted however that Soldier1 should have been advised. He considered this to be a slight error but one that would have made no difference to Soldier1, as it was not Soldier1’s style to be pedantic and require every movement in the back of the aircraft to be advised. Soldier1 was not aware during the mission that LT Case was seated on the ramp at the beginning of the last sortie prior to the accident, or at any other time.

500. Soldier1’s evidence was that he did not condone LT Case not being in a seat during take off. He accepted that Soldier5 did not need his specific approval for the movement of LT Case in the aircraft during the mission and said that if he had been asked for permission for LT Case to engage in ramp riding he would have approved it. He considered that LT Case’s only role when seated on the ramp was an extra set of eyes although such duty was not formalised by him or any other person.
501. The Commission considers that the utilisation of a passenger as an extra set of eyes does not reflect an appropriate balance between the risk to a passenger sitting in an OCL configuration on the trailing edge of the ramp and any benefit that may be received by his observations from that position.

502. Soldier accepted that while he was responsible for movement of personnel on the aircraft, and for what happened on the aircraft generally, he relied on his crew to look after LT Case's positioning on the aircraft without their reporting to him because he trusted their judgement, and trusted them to know and comply with the relevant SI.

503. Whilst, the crew of the aircraft considered LT Case to be part of the aircraft crew on the flight, he was manifested not as crew but as a passenger on the relevant PY104 Passenger Manifest. Soldier's evidence was that LT Case was manifested as a passenger because that was the only means of manifesting him. He was not sure why LT Case was not marked as crew on the Passenger Manifest and could not say whether that would be a difficult thing to do because he had never filled out a passenger manifest. In his earlier evidence he confirmed that passengers categorised as crew could have a designation to that effect recorded in the OA82 Flight Authorisation sheet or the PY104 Passenger Manifest. Neither Soldier nor Soldier provided any satisfactory explanation as to why LT Case was not listed as crew on the PY104 Passenger Manifest consistent with their regarding him as crew.

Privacy
504. The circumstances of LT Case's flight after the aircraft left Wolverine have been dealt with earlier in this report.

LT CASE'S PRE FLIGHT SAFETY BRIEFING

505. [name redacted] was the aircrewman responsible for the delivery of the passenger safety brief to LT Case prior to embarking on the mission on 30 May 11. In briefing LT Case he utilised the generic passenger brief safety card. He covered off all points of the safety briefing consistent with the card, which included safety precautions to be taken by passengers in the event of an aircraft emergency. The Commission notes in this regard that the section dealing with Emergency Procedures on the Safety Card is confined to procedures for persons travelling in approved seating. It does not deal with emergency procedures for persons travelling in OCL configurations such as on the aircraft ramp.

506. However, in addition to the brief given in accordance with the Safety Card, [name redacted] confirmed in his evidence that he had briefed LT Case to the extent of his experience and knowledge at that time in relation to the hand holds available to assist LT Case to move back off the ramp and into approved seating in the event of an aircraft emergency occurring when LT Case was located on the ramp. In addition he briefed LT Case on the utilisation of the restraint strap and showed him over
the various crew positions on the aircraft. He considered that because of his experience on other occasions prior to 30 May 11 his brief to LT Case would have been better than those he had provided to other passengers previously and was satisfied that he had provided LT Case with sufficient information and guidance about what he should do in the case of an emergency. His evidence was that he did not specifically brief LT Case of the possibility of an emergency if the aircraft commenced “porpoising”, i.e. uncommanded pitch oscillations.

507. At the time of LT Case’s flight, Soldier4 was aware from his own experience that there was the potential, for a Chinook to encounter turbulence to the extent that a person sitting on the ramp may become airborne for a short period of time. His evidence was that he was not then aware of a more severe uncommanded pitch oscillation incident experienced by Soldier27 in 2008. His evidence was that the aircrew on RWG6 did not even know what uncommanded pitch oscillations were nor did it enter his mind that that uncommanded pitch oscillations were going to cause them to crash a month later.

508. The Commission notes that an uncommanded pitch oscillation event of the magnitude experienced by the aircraft on 30 May 11 was not within the experience or contemplation of Soldier4 or Soldier1 and that Soldier4 did not contemplate any additional briefing of LT Case in this regard. The Commission considers that uncommanded pitch oscillations as previously experienced and understood by Soldier4 was one of a significant number of potential aircraft
emergencies in respect of which individual safety briefings would be impracticable. The Commission considers that it is probable that even if Soldier4 had adverted to the issue of uncommanded pitch oscillation occurring whilst LT Case was located on the ramp of the aircraft, his brief to LT Case as to how to respond to this emergency would have been the same as for other aircraft emergencies that may occur while LT Case was located on the ramp namely, to move off the ramp using available hand holds and into approved seating.

509. Whilst with the benefit of hindsight uncommanded pitch oscillations may be viewed as a significant potential danger such as would justify passengers being prevented from locating on the aircraft’s ramp, the Commission considers, on the basis of the evidence obtained, that prior to 30 May 11 the significance of the potential danger to aircrew and passengers from uncommanded pitch oscillations was not fully appreciated by RWG6 aircrew.

510. Although the Commission considered that Soldier4’s evidence lacked some particularity in relation to his pre-flight safety briefing to LT Case, concerning how LT Case should deal with any aircraft emergency occurring when he was seated on the ramp of such aircraft, the Commission considers that such briefing was in accord with Soldier4’s training, experience and knowledge and that he discharged his duties in briefing LT Case, to the best of his knowledge and ability at the time and in the circumstances of his then understanding, of the significance of uncommanded pitch oscillations and that such briefing was appropriate in all the circumstances.
FLIGHT CREW'S UNDERSTANDING OF DCA DIRECTIVE 04/09 AND RELATED SI AND SFI ON 30 MAY 11

511. Soldier's evidence was that he was aware of DCA Directive 04/09, SI (AVN) OPS 3-201 and JTF633 SI (OPS) 03-07 referred to previously in this report. This latter document incorporates the principles of Aviation Risk Management as set forth in AT1 01/2007 Military Risk Management and DI (AF) OPS 1-[18] – RAAF Aviation Risk Management, both of which are referred to in DCA Directive 04/09.

512. Soldier's evidence was that he read SI (AVN) OPS 3-201 on an average monthly, mostly to confirm entitlement of individual persons to travel on aircraft, and read the entire SI at the start of each year and when amendments were released. His evidence was that he had a good understanding of the SI. In relation to his knowledge of the policy of OCL and in particular DCA Directive 04/09 and SI (AVN) OPS 3-107 he confirmed in evidence, that he regularly reviewed these documents at the start of each year and after any amendments and when required for specific missions. He considered that he had a good knowledge of those documents while he was deployed on RWG6. His evidence was that he was well aware of the requirements in relation to OCL.

513. Soldier's understanding of OCL as that term is defined in DCA Directive 04/09 was that it referred to passengers being carried in an aircraft who were neither
seated in an approved aircraft seat nor tethered to the aircraft by an approved aircrewman harness.

514. Soldier1 understood the words “suitably qualified personnel” in the definition of “crew” in DCA Directive 04/09 to mean a person who had been assessed and approved by the aircraft captain or authorising officer as having the necessary skills, knowledge and understanding of the aircraft’s operation so as to be able to perform his or her intended role in its operations which could in some circumstances be under the supervision of another crew member. It was in this context that he considered Soldier1 in his role of assisting crew in loading and unloading aircraft under the supervision of aircrewmen as “crew” within the meaning of DCA Directive 04/09.

515. Whilst Soldier1’s evidence was that he considered LT Case to be part of the crew of the aircraft on which he was to fly, such understanding, as aforesaid, was contrary to the manner in which LT Case was categorised for the flight on the relevant documentation being the PY104 Passenger Manifest. Soldier1’s further evidence was that persons who had gone through a briefing and were on headsets and incorporated into how the aircraft crew operated and assisted by loading and unloading the cabin areas under supervision could also be categorised as crew and therefore not be subject to the provisions of DCA Directive 04/09.
516. As aforesaid Soldier regarded LT Case as crew for the purposes of the mission. His evidence was that LT Case’s only crew duty was to assist the crew in the rear of the aircraft. He agreed that LT Case was not on the ramp of the aircraft to perform a specific duty but as a form of familiarisation to gain a better appreciation of the landscape. He was an extra set of eyes but had no formal duties. He considered that assisting in the operation of the aircraft included anything that would assist the aircraft in its operation including loading and unloading of the aircraft under the supervision of one of the aircrew. When questioned about persons assisting the crew being categorised as crew agreed with the proposition that on that basis, a member from the Q store going on a familiarisation flight could be considered to be crew because he could potentially assist in the movement of cargo on the aircraft. In a crew briefing on 30 May 11 he referred to LT Case as being an addition to the aircraft’s crew.

517. Ultimately Soldier’s evidence was that he had misunderstood DCA Directive 04/09 and its relationship to ramp riding. He had, prior to the accident, believed that ramp riding was an accepted practice in the Australian Army and considered DCA Directive 04/09 to be mainly concerned with Black Hawk aircraft.

518. In relation to the flight on which LT Case travelled the Commission notes the specific provision for the carriage of a passenger in a crew position referred to in
paragraph 5 of SI (AVN) OPS 3-201 headed “Carriage of Passengers”. That paragraph states:

"Where special circumstances exist, the Commanding Officer (CO) of an operating unit may authorise a Qualified Flying Instructor (QFI) to carry a passenger in a crew position that would normally require a qualified crew member for the purpose of familiarising that person with aircraft operations."

The Commission notes that this SI did not apply in the circumstances of LT Case’s flight given that [Soldier1] was not a QFI, there were no special circumstances and he was not specifically authorised by [Soldier9] as the CO of the operating unit.

519. [Soldier5]'s evidence was that he thought LT Case had been approved to fly as crew and approved to cycle through all crew stations. In respect of DCA Directive 04/09 he believed that a person on board an aircraft wearing AWAE was not in an OCL configuration because that person was constrained in the same way he was himself. He said that he would not intentionally break an order.

520. [Soldier5] believed that he was aware of DCA Directive 04/09 prior to the accident having finished his aircrewman course on 8 Dec 10 and his Chinook transition course five flights later. He could not recall any lessons on controlling passengers but believed that he would have been instructed to use seats and seat belts.
521. Soldier believed that he would have read SI (AVN) OPS 3-107 but could not remember being instructed on it. However, he did read all SI and Directives prior to his deployment to Afghanistan with RWG6. This included SI (AVN) OPS 3-214, paragraph 1 requiring seat belts to be worn by passengers and crew at all times during flight and any time the engine(s) are operating. He believed that he complied with this SI. He read SI (AVN) OPS 3-201 prior to 30 May 11.

522. Soldier when asked about Soldier's email of 21 Mar 11, which listed him as a recipient, stated that such email had a very similar presence about it to emails he received after the accident and reading that email now he was still not really sure what Soldier was referencing to in that email.

523. The evidence of Soldier, the Tp Sgt of RWG6 and the Right Aircrewman on board the aircraft on 30 May 11 was that he was aware of DCA Directive 04/09 and SI (AVN) OPS 3-107. He was aware of OCL, categorising it as when there were not enough seats for the number of PAX on the aircraft. He also understood that in respect of restraint of passengers referrable to OCL that if there was a seat and a seat belt available they could use it. It did not occur to him on 30 May 11 that LT Case was at any stage in an OCL configuration.

524. Soldier's evidence was that in Black Hawk understanding, OCL applied to passengers and not to crew and further that OCL was a policy that applied where a
passenger was not seated in a seat with a seat belt on. When arriving in C Sqn he understood that OCL applied to passengers.

525. Soldier4’s evidence was that he did not receive a copy of the C Sqn Safety and Standards minutes of the meeting occurring 3 Mar 11. However when shown the relevant part of he did not disagree with the conclusion reached by Soldier56 and accepted by that meeting in respect of OCL as recorded in the minutes. His evidence was that RWG6 personnel did not discuss the contents of the C Sqn Safety and Standards minute and further that ramp riding and OCL was not discussed in March 2011 in RWG6. He considered that ramp riding was not OCL, occurring as it did in a crew station.

526. Soldier4 also had an understanding that if a passenger on an RWG6 aircraft was present on a familiarisation flight and was able to assist, such person could be regarded as crew. This understanding was informed by paragraph 8 c. of DCA Directive 04/09 referring to crew being suitably qualified personnel specifically authorised to assist in the operation of the aircraft.

527. Soldier4 was aware that the practice of ramp riding aboard Chinook aircraft was widespread and of long standing in Australia and on deployment. He did not think that riding on the ramp of a Chinook constituted OCL on the aircraft.
528. The Commission considers that it is not necessary in the context of its inquiries to refer to the evidence of Soldier3.

THE COMMISSIONS CONCLUSIONS IN RESPECT OF THE CARRIAGE OF PASSENGERS IN AN OCL CONFIGURATION ON FAMILIARISATION FLIGHTS ON CH-47D AIRCRAFT BY MEMBERS OF C SQN, 5 AVN REGT, PREVIOUS RWGS AND SPECIFICALLY RWG6, INCLUDING AT THE TIME OF THE HAPPENING OF THE ACCIDENT

529. Reviewing the evidence, the Commission concluded that:

a) The evidence did not indicate there to have been a deliberate breaching of DCA Directive 04/09 and the SI and SFI relating to the carriage of passengers on RWG6 aircraft.

b) DCA Directive 04/09, as drafted gave rise to difficulties in interpretation of certain of its requirements.

c) RWG6 personnel, responsible for organising, approving, permitting or engaging in, the carriage of passengers on RWG6 aircraft on missions, in the context of the factual matrix hereinbefore set forth, on occasions, failed to properly understand, comply with or ensure compliance with, the requirements of DCA Directive 04/09 including References D and E being ATI 01/2007 Military Risk Management dated 19 Oct 07 and D1 (AF) OPS 1-[18] Royal Australian Air Force Risk Management together with the related SI and SFI governing the carriage of such passengers on RWG6.
aircraft, namely SI (AVN) OPS 3-107, SI (AVN) OPS 3-201, SI (AVN) OPS 3-214, JTF633 SI and SFI 4/2008 and as a consequence a number of non-mission essential passengers were carried in an OCL configuration on RWG6 aircraft, in contravention of JTF633 SI (73), DCA Directive 04/09, including its Risk Management Principles, and related SI and SFI.

d) There was a disconnect between the intent of the Commanding Officer RWG6 in relation to the carriage of passengers on RWG6 aircraft and the implementation of the program for such carriage of passengers by members of RWG6.

e) A widespread view existed within AAAvn, based on precedent, that ramp riding was not an OCL configuration and was permissible, which may have contributed to the failures referred to in the preceding sub-paragraphs, which in turn caused a normalised deviance to occur in relation to compliance with DCA Directive 04/09 and related SI and SFI over a period of some time.

f) LT Case’s flight, although it may have been of some use to him in his role as a payload operator within the Heron Detachment, was not mission essential, i.e. indispensible to his mission in Afghanistan, and as such was in contravention of JTF633 SI (73).

g) LT Case, who was travelling as a passenger on an RWG6 aircraft, was incorrectly categorised and treated as a member of the crew, pursuant to paragraph 8 b. of DCA Directive 04/09, on the subject flight.

h) As a consequence of such categorisation LT Case was not required to be
located on approved seating on the aircraft with a seatbelt fitted as was required for a person travelling as a passenger, pursuant to paragraph 8 d. of **DCA Directive 04/09.** Instead he was permitted to travel in an OCL configuration on the ramp of the aircraft.

i) Had LT Case been, as he should have been, located on an approved seat and restrained with a seat belt, the probability is that he would have survived the accident, as did the rest of the crew who remained inside the aircraft when it crashed.

j) OCL authority given to CJTF633 by paragraph 11 of **DCA Directive 04/09** could not be delegated away from the office of CJTF633.

k) OCL authority given to CJTF633 by paragraph 11 of **DCA Directive 04/09** was confined to the activities set out in paragraphs 9 and 10 [and possibly 12 and 13 if occurring on operations] of that Directive and did not extend to the authorisation of OCL for passengers in RWG6 aircraft in circumstances where approved seats were available for use.
THE COMMISSIONS RECOMMENDATIONS IN RESPECT OF THE CARRIAGE OF PASSENGERS IN AN OCL CONFIGURATION ON FAMILIARISATION FLIGHTS ON CH-47D AIRCRAFT BY MEMBERS OF C SQN, 5 AVN REGT, PREVIOUS RWGS AND SPECIFICALLY RWG6, INCLUDING AT THE TIME OF THE HAPPENING OF THE ACCIDENT

530. The Commission makes the following recommendations:

a) All documentation currently referrable to the carriage of personnel on ADF aircraft in an OCL configuration be consolidated into one unambiguous document.

b) Authorisation to delegate, and if appropriate sub-delegate, authority within ADF be clarified and specified with precision.

c) Verbal delegations of authority within ADF be recorded, as soon as reasonably practicable, and reference made to the duration of such delegation and any variations or limitations imposed upon the original authority as delegated.

d) The term “mission essential” be defined with precision so as to obviate, to the extent practicable, differing subjective interpretations of that term.

e) The term “crew” be defined with precision with particular reference to avoiding the potential for unqualified personnel assisting qualified personnel in the operation of an aircraft to be categorised as crew.

f) Consideration be given to maintaining a record of passengers carried on ADF aircraft in substitution for the present system involving as it does the
destruction of PY104 Passenger Manifests after the conclusion of each sortie.

g) Consideration be given to amending the Army Aircraft Passenger Safety Briefing Cards, an example of which for the CH-47D is part of [_________] by extending the emergency procedures section, currently confined to procedures for persons seated in approved seating to include appropriate procedures to be adopted by persons travelling in an OCL configuration at the time of an emergency.


TOR FOR INQUIRY INTO RESTRAINT STRAP

531. The TOR of the Commission limit its inquiry into the restraint strap as to whether:

a. It was a primary or contributory causal factor in the accident [paragraph 3 a. of the TOR];

b. There was any equipment limitation, misuse, malfunction or failure [paragraph 5 e. of the TOR];
c. There was any damage to any other equipment including Personal Protective Equipment (PPE) [paragraph 6 of the TOR]; and/or
d. There was any inadequacy of any equipment including PPE which inadequacy while not being a causal factor of the accident, but which the Commission considers should be brought to the attention of the Appointing Authority [paragraph 7 of the TOR].

THE OPERATION OF THE Z51 FALL ARREST RESTRAINT STRAP

532. As set out earlier in this report LT Case was, at the time of the accident, tethered to the aircraft. The means of tethering was by way of the restraint strap. The restraint strap was attached to an extension tether, which was then attached by way of karabiner to the Personal Survival Gear Carrier attachment loop at the rear of the AWAE [Illustrated in — this demonstration shows the restraint strap at full extension so that the restraint strap is connected to the extension tether at a point about 2 metres from the anchor point].

533. The restraint strap consisted of a length of webbing strap with two double action snap hooks attached; one at either end. It had a built in webbing energy absorbing device immediately next to one of the snap hooks on the restraint strap. Moving from the snap hook past the energy absorber there is a webbing adjusting buckle. [ ] When the webbing is fully extended (without the deployment of the energy absorber)
the restraint strap measures about 2 metres from the tip of the end of one snap hook to the tip of the other. If the restraint strap’s energy absorber is deployed to its maximum length the restraint strap can extend up to 3.6 metres in total length.

THE UTILISATION OF THE Z51 RESTRAINT STRAP BY LT CASE ON 30 MAY 11

534. On 30 May 11 Soldier5 attached one end of LT Case’s restraint strap to an anchor point on the floor of the aircraft. That anchor point is rated to 10,000 lbs (approximately 4,535 kg). It is situated on the left hand side of the interior of the aircraft immediately aft of the row of seats but just forward of the ramp hinge. There is another 10,000 lb anchor point in a similar position on the right hand side of the aircraft. The exact positioning of the anchor point can be seen in the photograph which is the third photograph of and the point marked as A in

535. On 30 May 11 the restraint strap was connected to the anchor point so that the energy absorber and adjustment buckle were closest to the anchor point. Soldier5’s evidence was that he connected LT Case to this anchor point shortly before the aircraft departed Wolverine on its final journey.
536. Soldier5 gave evidence that having connected LT Case to the aircraft as aforesaid, he adjusted LT Case's restraint strap so that LT Case was able to sit on the trailing edge of the ramp with the restraint strap almost taut. This adjustment was initially carried out by way of estimation based on Soldier5's own strap length but was confirmed by way of Soldier5 seating LT Case on the ramp edge and moving LT Case's upper torso slightly forward by a couple of centimetres and noting that the restraint strap was in fact almost taut in that position. The relevance of the restraint strap in the accident has been dealt with earlier in this report.

INTRODUCTION OF Z51 RESTRAINT STRAP INTO SERVICE

537. The history of the introduction of the restraint strap into service for aircrewmen on the CH-47D was extensively addressed in documentation received by the Commission. That material included:

a) A report dated 27 Apr 12 by Defence65 of Aeronautical Life Support Logistic Management Unit (ALSLMU) considering the performance of all PPE worn by all aboard the aircraft on 30 May 11;

b) A minute dated 5 Jul 11 from ADF53 of Army Aviation Systems Project Office (AASPO) setting out his understanding of the introduction into service of the restraint strap;
c) A statement dated 12 Sep 12 of Soldier12, COMD AASPO, together with its 57 attachments detailing his understanding of the introduction into service of the restraint strap; and

d) A report dated 24 Jul 12 prepared by Soldier42 as an Investigating Officer considering the introduction of the restraint strap into service with the ADF.

538. Initially the Commission was concerned as to what causative effect, if any, the restraint strap may have had in the death of LT Case and to that end Notices were issued to Soldier12, as COMD AASPO and Soldier13, the relevant Design Acceptance Representative at the time of the introduction of the restraint strap into service, advising them that they may be persons adversely affected by the findings of the Commission.

539. During the course of the hearings the Commission formed the view that, in the context of the relevant TOR, namely paragraph 5 a., the restraint strap was not a causative factor in the accident or in the death of LT Case. Specifically, the restraint strap did not of itself have a limitation in the function for which it was designed, was not knowingly misused, did not malfunction and did not fail. That being said the Commission noted that recommendation 8 of the AAIR is:

"With respect to the Z51 Restraint Strap, DG AVN investigates all aspects of its acceptance into service, operational use, the decision to incorporate a fall arrest
device and the failure by its users to wear it in accordance with the manufacturer's instructions."

540. At the time of the hearings recommendations had been partially investigated as recommended. The investigation and its progress was referred to in the evidence of [Soldier31] who gave evidence concerning the progress of all recommendations that had been made by the AAIT. [__________]. The investigation report that had been completed by [Soldier42] was received into evidence as aforesaid. [__________]

541. Having on 16 Aug 12, day 14 of the hearings, formed the view that, in the context of the Commission’s TOR, the restraint strap was not a causative factor in the accident or the death of LT Case, [__________], as lead Counsel Assisting, advised the Commission that Counsel Assisting was of opinion that [Soldier13] was unlikely to be a person affected. [__________] The Commission accepted this advice and formally released [Soldier13] as a PAP. [__________]

542. However, at that stage the Commission did not release [Soldier12] because it determined that [Soldier12] should give evidence concerning the reason for the energy absorber part of the restraint strap being positioned near the anchor point in apparent contravention of the manufacturer’s current recommendation that the energy absorber should be positioned nearest the wearer of the restraint strap. This was of interest to the Commission by reason of the apparent fouling of the restraint buckle as a consequence
of it being positioned near the 10,000 lb anchor point in the context of paragraph 3 g. of the TOR relating to misuse of equipment.

DESIGN APPROVAL AND ACCEPTANCE OF THE Z51 RESTRAINT STRAP

543. The Commission received evidence that at the time the restraint strap was approved for service the manufacturer’s recommendation, set out in its product brochure, was silent as to which end of the restraint strap should be nearest the wearer. On 12 Oct 05 Defence of Defence wrote to of the business supplying the restraint strap, seeking guidance in respect of such matter. This request was made in the context of the absorption device in the restraint strap becoming wet during water operations as a consequence of being located nearest the aircraft anchor points. On 13 Oct 05 Civilian replied to the request indicating that the restraint strap could be worn either with the absorber device nearest the wearer or nearest the aircraft anchor point.

544. The Commission also received evidence that the manufacturer of the restraint strap issued a brochure in relation to the use of the restraint strap. That brochure was apparently normally provided with the restraint strap at its time of purchase. The manufacturer’s label sewn onto the restraint strap referred the user to the manual for
instruction on its use. The manual was amended from time to time with each amendment being ascribed a letter of the alphabet as an issue designation; hence Issue B would be a later and amended version of Issue A of the brochure; Issue C would be a later and amended version of Issue B and so on.

545. Relevantly, the early issues of the brochure were silent as to which way the restraint strap was to be worn insofar as whether the end containing the energy absorber device and the adjustment buckle should be nearer to the wearer or nearer to the anchor point. At the time of the release of Issue O of the Manufacturer’s Brochure in July 2005 it contained a recommendation that the energy absorber be positioned nearest the wearer.

546. This statement of recommendation appears to have occurred about three years after the restraint strap was released for service to and by members of the ADF. There appears to have been no awareness in the AAAvn community of this apparent change in the manufacturer’s recommendation.

547. Soldier24 gave evidence that in about 2009 while in Afghanistan as part of either RWG2 or RWG3, Soldier70, as the trade supervisor for Aviation Life Support Equipment with that RWG, questioned him as to why the energy absorber was being worn contrary to the manufacturer’s recommendation. This appears to have been the first time that this matter was raised. Soldier24’s evidence indicated that to position the absorber nearest to the wearer caused difficulties including bruising to the
wearer, and snagging on the wearer's pistol. His further evidence was that he was involved with Soldier70 and Soldier71 in an informal trial process of moving around a CH-47D for ten to twenty minutes with the absorber nearest to the wearer. Soldier24's evidence was that shortly after this informal trial, and before he flew any further missions, Soldier71 as his then Tp SGT, advised him that it was okay to continue wearing the restraint strap with the absorber nearest to the anchor point as he had been doing.

548. Soldier12 was released as a PAP before the Commission on the basis that it was not unreasonable for him not to be aware of the change of the manufacturer's recommendation three years after the restraint strap was first approved for use by members of the ADF.

549. At the time of releasing Soldier13 as a PAP the Commission indicated that, on the evidence then available, it would make no adverse findings in relation to the restraint strap nor try to resolve any apparent differences between the views of ALSLMU and AASPO but, it was probable that the Commission would make its own recommendations in relation to recommendation 8 of the AAIT. Having concluded the hearings the Commission remains of that then stated view.

550. Pursuant to paragraph 7 of the TOR the Commission considers that the following matters ought to be brought to the attention of the Appointing Authority in relation to the restraint strap. In doing so the Commission recommends that further
investigation by the Airworthiness Authority (AA) take place so as to address any potential for confusion as to which responsible authority should be involved in and take responsibility for the introduction of equipment to be worn or used by aircrew in ADF aircraft.

551. The Commission noted ALSLMU’s view that it had not been appropriately consulted or involved in the introduction of the Z51 restraint strap by AASPO despite ALSLMU being the registered Centre of Expertise for assessment of restraint straps within the ADF. The Commission, in bringing this matter to the attention of the Appointing Authority recommends that the AA consider a review of the processes in respect of the role of these two bodies in the assessment of fitness of purpose for ADF equipment and any necessary demarcation that may need to be specified. The genesis of such concerns is set forth hereunder.

552. The introduction of an energy absorber restraint strap as a securing tether for aircrewmen is the subject of differing opinions. The need to have aircrewmen move around Army helicopters is accepted by all. The PPE worn by aircrewmen has evolved from the SO27 to the SO28 and currently to the AWAE. On the basis of evidence obtained that the Commission accepts that the AWAE is an appropriate ensemble for aircrew operations. It is the decision to introduce an energy absorption, or fall arrest device, into the restraint strap connecting the AWAE to the aircraft that is the basis of the differing opinions.
553. At the time of the introduction of the SO27 harness for aircrewmen in ADF aircraft the restraint strap used to connect the harness to the aircraft was a “Pole strap”. The pole strap was adjustable but once adjusted would not further extend; i.e. there was no energy absorber or fall arrest device. It allowed aircrewmen to move about an aircraft in performance of their duties to the limit of the adjusted pole strap.

554. During considerations of the strength of anchor points on the Iroquois helicopter in late 2001 a question arose within AAAvn as to whether an aircrewman, as part of their normal duty, could be exposed to the risk of a fall. Concern was expressed that if such a fall could occur, the fall and the sudden jolt caused by the member reaching the end of the restraint strap could be of sufficient force to cause serious injury or death to the wearer of the harness. The introduction of the energy absorber, or fall arrest, component of the restraint strap was perceived as minimising the force imparted to the wearer at the end of the restraint strap and thus reducing the risk of serious injury or death in the event of a fall.

555. It was on this basis that AASPO considered Australian and New Zealand Standards as to restraint systems appropriate for use by persons working at height. The only available standards that dealt with this matter had been developed for persons working on buildings. The applicability of such a standard, which related to static structures, to a mobile air platform such as helicopters is a question that the AA may consider to be worthy of further detailed consideration.
556. Evidence received by the Commission from ALSLMU [ ] questioned the need for an energy absorber or fall arrest device being part of any restraint strap worn by aircrewmen in ADF aircraft. That report raises the issue that if a restraint strap was properly adjusted the wearer would not be able to reach a position where they could fall external to an airframe and that if such a position was reached the distance would not be such as to generate the force associated with the risk of serious injury or death.

557. The ALSLMU Report also questioned the appropriateness of using a restraint strap that was designed to extend approximately 1.5 metres upon deployment which, if it occurred, could then place its wearer a further 1.5 metres beyond the adjusted position applicable to the wearer’s safe position for the performance of his/her duty and potentially outside the airframe which the restraint strap’s primary purpose was to keep them within.

558. The Commission noted that at the time of the hearing the Z51 restraint strap incorporating the energy absorber device had been removed from service in CH-47D aircraft and that active consideration was currently underway into a suitable replacement.
THE COMMISSION’S RECOMMENDATIONS IN RESPECT OF THE Z51 RESTRAINT STRAP

559. The Commission considers that while the report dated 24 Jul 12 prepared by [Soldier42] went some way to considering the relevant issues as raised by recommendation 8 of the AAIR, the AA should be asked to consider the following questions:

a) Having regard to the removal from service of the Z51 restraint strap from use by aircrewmen aboard CH-47D aircraft, should further consideration be given to the removal of that restraint strap from use by aircrewmen aboard other ADF aircraft?

b) Having regard to the proposed replacement of the Z51 restraint strap by another form of restraint strap for use by aircrewmen aboard CH-47D aircraft should that replacement restraint strap, or some other restraint strap or device, be mandated for use by aircrewmen aboard other ADF aircraft?

c) Is it necessary to consider the process that was undertaken in relation the service release of the Z51 restraint strap having regard to the differing views expressed on this matter by AASPO and ALSLMU?

d) Is it necessary to further consider the relationship between AASPO and ALSLMU to ensure that the ADF receives the maximum benefit of the expertise comprised in both organisations?
e) Is it necessary to delineate with precision the respective roles of AASPO and ALSLMU in the assessment of fitness for purpose for ADF equipment, or, otherwise specify the respective roles of each body so as to obviate or reduce potential areas of dispute between them in respect of such assessment?

OTHER MATTERS ARISING FROM THE COMMISSION'S INQUIRY

560. The Commission refers the AA to the evidence of Soldier22 in relation to post accident certification of documentation relating to the fitting of LT Case with an AWAE prior to his flight on 30 May 11 for consideration.

CONCLUDING COMMENTS

561. The Commission extends its condolences to the family of LT Case for the loss of their son and brother, a valued member of the ADF who died in the service of his country.

562. The Commission draws attention to the efficient, effective and hard work done by the administration staff under the direction of Privacy which significantly contributed to the effective running of the Commission’s inquiries and records its appreciation of such work.
The Commission acknowledges the outstanding work of Counsel Assisting, Privacy (Lead Counsel), Privacy in the initial investigation and collation of materials, the later presentation of evidence in the Commission and generally. Their work enabled the Commission to conduct its inquiry efficiently and expeditiously and the Commission records its appreciation of such work.
Mr Andrew John Kirkham AM, RFD, QC
President of the Commission

Group Captain Stephen John Fielder AM
Commissioner

Colonel Joseph Patrick Rears
Commissioner

Dated 27 March 2013