



Report 97-009

Airspace incident

Air Traffic Control and RNZAF Lockheed C130 Hercules NZ7002

Auckland Terminal Control Area overhead Whenuapai Aerodrome

15 May 1997

Abstract

At 1132 hours on Thursday 15 May 1997 ten free-falling parachutists exited from Hercules NZ7002 at 10 000 feet above Whenuapai Aerodrome. The parachutists passed some miles in front and to the left of a Bandeirante aircraft transiting the area at 7000 feet. No collision occurred between the parachutists and the Bandeirante. A clearance to release the parachutists had been issued to the Hercules crew but the clearance was inappropriate due to a misunderstanding between the Air Traffic Controllers. Safety issues identified included imprecise and unclear communication and inadequate procedural instructions to Controllers to ensure misunderstanding did not occur when issuing clearances. The Airways Corporation initiated appropriate corrective actions following the incident.

Transport Accident Investigation Commission

Airspace Incident Report 97-009

Aircraft type, serial number and registration:	Lockheed Hercules C130H, GELAC4053, NZ7002
Number and type of engines:	Four Allison T56-A-15
Date and time:	15 May 1997, 1132 hours ¹
Location:	Whenuapai, Auckland Latitude: 36° 47' S Longitude: 174° 37' E
Type of flight:	Military
Persons on board:	Crew: 7 Passengers: 20
Injuries:	None
Nature of damage:	Nil
Pilot-in-Command's licence:	Military qualification
Pilot-in-Command's age:	30
Pilot-in-Command's total flying experience:	1680 hours 1170 hours on type
Investigator-in-Charge:	K A Mathews

¹ All times in this report are NZST (UTC + 12 hours)

1. Factual Information

- 1.1 On Thursday morning 15 May 1997 RNZAF Hercules NZ7002, callsign “Herc 02”, was scheduled for three parachute drop training sorties overhead Whenuapai Aerodrome. Each sortie comprised three releases of military parachutists conducting either “free-fall” or “stand-off” exercises to the Aerodrome.
- 1.2 On the third sortie of the morning, at about 1100 hours, Hercules 02 was manoeuvring north-east of Whenuapai in the Auckland Terminal Control Area (TMA) at 10 000 feet. On board was a crew of two pilots, a navigator, a flight engineer and three loadmasters. Twenty parachutists were on board and the first drop was to consist of ten parachutists free-falling to about 4000 feet before opening their parachutes.
- 1.3 The Hercules was holding before commencing a run in to the release point, in anticipation of a suitable break in the clouds and appropriate clearances from the Drop Zone Safety Officer, Auckland Control and Whenuapai Tower. The Hercules needed to track 230° magnetic inbound to the Whenuapai ultra high frequency tactical air navigation aid (TACAN), then to the release point, at 10 000 feet.
- 1.4 At about 1123 hours a suitable weather opportunity for the drop presented itself. The Drop Zone Safety Officer had approved the drop so the co-pilot asked Auckland Control if there were any restrictions for one pass over Whenuapai at 10 000 feet. The Terminal Radar Controller (callsign Auckland Control) responsible for traffic separation in the TMA responded, “Herc 02 affirmative, we do, there is a P3 in the circuit, just standby”.
- 1.5 Some two minutes and forty seconds later the co-pilot advised Auckland Control that the Hercules was turning inbound to Whenuapai. The Terminal Radar Controller instructed the Hercules to continue to standby for a drop clearance as there might be a few minutes delay before a clearance could be given. The co-pilot acknowledged the instructions and asked if they could change frequency to Whenuapai Tower to talk directly with them. The Terminal Radar Controller approved the change.
- 1.6 The co-pilot advised the Whenuapai Aerodrome Controller on duty in Whenuapai Tower that Hercules 02 was running in and that it would be five minutes until they dropped. He requested drop clearance for one drop only of free-fall parachutists, advising that they had a limited window of opportunity to release the parachutists. Several seconds later the Aerodrome Controller responded, “Herc 02 is cleared to drop”. The co-pilot then asked Tower to inform Auckland Control they would be tracking out to the west for about 20 miles, after the drop, to have a look at the weather out there.
- 1.7 In the meantime Eagle 830² had departed from runway 23 at Auckland International Aerodrome for Whangarei. The Terminal Radar Controller had initially sent the aircraft on a westerly heading to avoid data block congestion on his radar screen due to other traffic, including the Orion (P3) at Whenuapai.

² Embraer Bandeirante, twin-engined aircraft

- 1.8 About one and a half minutes later the Terminal Planner, who was seated alongside the Terminal Radar Controller, contacted Whenuapai Tower by telephone. He asked, "What's the Herc doing at the moment?" The Aerodrome Controller replied, "He's running in for a quick free-fall drop over Whenuapai then he would like to go out to the west and have a look at the weather." The Terminal Planner asked, "OK, what about Orion 01 on the ILS (instrument landing system), we haven't given him approval to drop, he said he wanted to talk to you so I guess he's doing that but can you, like are you happy to ---- him versus Orion 01?" The Aerodrome Controller replied, "I'll keep the Orion out of the way", and the Planner said, "OK". The Aerodrome Controller continued with, "Yea, I'll do that" and the Planner replied, "That's fine".
- 1.9 During the conversation between the Terminal Planner and the Whenuapai Aerodrome Controller, Hercules 02 changed back to Auckland Control and the co-pilot asked, "We've got drop clearance from Whenuapai, have you got any restrictions for our drop?" The Terminal Radar Controller responded, "Herc 02 affirmative, we don't understand that at all, there's a P3 below you just out of 3000 feet on the ILS 21." The co-pilot replied, "Herc 02 roger, we've copied that, we'll continue holding". The Terminal Radar Controller responded, "Affirmative".
- 1.10 About one minute later Eagle 830 was instructed by the Terminal Radar Controller to "turn right resume own nav to [Whangarei] intercept track to Springfield." The aircraft was passing about 4000 feet at the time and climbing to 7000 feet. The track to Springfield took Eagle 830 within 2 nm east of the Whenuapai TACAN.
- 1.11 During this period the Terminal Radar Controller was also vectoring several aircraft for the ILS approach for runway 23 at Auckland. These included Eagle 144 which was already established on the ILS, followed by a light twin and a BAe 146.
- 1.12 One minute after the Terminal Radar Controller had directed Eagle 830 to turn right to Springfield, Eagle 144 carried out a missed approach. Auckland Tower advised the Terminal Planner of the missed approach and a short time later Eagle 144 informed the Terminal Radar Controller it was on the missed approach. No reason was given by Eagle 144 for the missed approach. The Terminal Radar Controller instructed the aircraft to climb straight ahead to 3000 feet. He subsequently vectored the aircraft for a further ILS and established that it had missed the approach due to poor weather conditions.
- 1.13 At about the same time the Hercules co-pilot again contacted Whenuapai Tower and told the Aerodrome Controller they had not received a drop clearance from Auckland Control because of the Orion at 3000 feet below them on an ILS approach. The Aerodrome Controller replied, "I'll keep the P3 out of the way of your drop".
- 1.14 The co-pilot asked the Aerodrome Controller, "Can you talk to Control and tell them that so they can give us a clearance, please?" The Aerodrome Controller replied, "I've squared that away with them". The co-pilot then asked, "Confirm you've got a positive clearance from Auckland Control for us?" The Aerodrome Controller responded, "That's affirm".
- 1.15 The co-pilot then informed the Aerodrome Controller, "Herc 02 is running in, in light of clearances from yourself and Auckland Control". The Aerodrome Controller responded, "Confirmed, you are cleared to drop by both Whenuapai Tower and Auckland Control."
- 1.16 The Hercules commenced its run in to the release point. The Aerodrome Controller established that the Orion, on final approach, was visual so he instructed it to break off its approach and to carry out one wide right hand orbit to facilitate the drop by the Hercules.

- 1.17 Some three minutes after Hercules 02 was cleared for the drop by Whenuapai Tower the co-pilot advised the Aerodrome Controller they had released ten parachutists. This was acknowledged by the Aerodrome Controller.
- 1.18 At the same time the Terminal Planner contacted the Whenuapai Aerodrome Controller and advised him, "There is no drop clearance issued at the moment, we've got traffic all over the place so he is going to be holding for three or four minutes". The Aerodrome Controller replied, "My understanding is that we had drop clearance from you at my discretion, I'm keeping the Orion ----- clear of him." The Planner asked, "Has he dropped has he?" The Controller replied, "He has dropped." The Planner said, "Well he was told specifically after I spoke to you last time, he was told specifically on the frequency that there was no drop clearance." The Controller replied, "I understood I had a drop clearance." The Planner responded, "Well he was talking to us and we told him categorically there was no drop clearance, we've got a Bandit (Bandeirante, Eagle 830) going straight over the top of you at 7000 feet."
- 1.19 At this time the Terminal Radar Controller contacted the Hercules and asked if they had dropped. The co-pilot replied, "Herc 02 affirm." The Terminal Radar Controller responded, "I think you are going to hear a bit more about that, standby." The co-pilot said, "We actually got positive clearance from Tower and they said you cleared us and they cleared us as well." The Terminal Radar Controller responded, "That's not our understanding".
- 1.20 The parachutists were released approximately 4.8 nm ahead of Eagle 830, in its 10 o'clock position, which was level at 7000 feet. No collision between the parachutists and the aircraft occurred.

Personnel and procedural information

- 1.21 The records for each of the Controllers show they were suitably rested and qualified for their respective positions. They were not subject to abnormal stress and were fit for their duties. They were familiar with parachute dropping exercises. Similarly, the crew of Hercules 02 was suitably rested and qualified, and fit for duty. They had carried out a number of these exercises in the past.
- 1.22 The Whenuapai Control Zone extended from the surface to an altitude of 2500 feet, and the Whenuapai Aerodrome Controller was responsible for traffic in the control zone. The Auckland TMA over Whenuapai extended upwards from the control zone ceiling to 9500 feet, and the Auckland Terminal Radar Controller was responsible for traffic separation in that area.
- 1.23 The Terminal Planner was seated alongside the Terminal Radar Controller. He communicated directly with the Terminal Radar Controller, assisting him and providing the link between the Terminal Radar Controller and Auckland and Whenuapai Towers, via telephone. The Planner endeavoured to provide an accurate picture of the traffic situation at Whenuapai for the Terminal Radar Controller, and co-ordinate drop approval for the Hercules.
- 1.24 Normally an aircraft carrying out parachute drops over Whenuapai will first obtain clearance from Auckland Control to release the parachutists through the TMA. Once this clearance has been issued the aircraft will be instructed to contact Whenuapai Tower. After an aircraft contacts Tower the Aerodrome Controller will assume an appropriate clearance has been issued by Auckland Control for release through the TMA, unless advised otherwise by the aircraft crew or the Planner. The Aerodrome Controller will then issue a drop clearance into the control zone, his area of responsibility, once the traffic in the zone permits the drop. An aircraft captain has the responsibility to ensure appropriate clearances have been received for release through the TMA and into the control zone.

- 1.25 The operation was being conducted in accordance with established procedures detailed in a letter of agreement between Whenuapai Tower and Auckland Control. However, the letter did not contain procedural details ensuring an error-free operation for a parachute drop approval to aircraft in the Auckland TMA. There was no requirement for the Planner to contact the Aerodrome Controller and advise that drop approval through the TMA had been authorised by the Terminal Radar Controller.
- 1.26 The Terminal Radar Controller had the responsibility for protecting the standard missed approach airspace at Whenuapai for aircraft carrying out an ILS approach. The standard missed approach from runway 21 takes an aircraft in a right hand turn to 3000 feet. The Terminal Radar Controller could not clear the Hercules to release parachutists through the TMA until he could establish that the airspace to 3000 feet was not required for a missed approach.
- 1.27 Since there was an Orion carrying out an ILS approach to runway 21 at Whenuapai the Terminal Radar Controller had to protect the missed approach area. As a result there would be a delay of several minutes before he could issue a clearance to the Hercules, so the Terminal Radar Controller used the opportunity to direct Eagle 830 to turn right and to resume its own navigation to Whangarei via Springfield.
- 1.28 Poor weather conditions prior to the event had delayed the earlier release of the parachutists by the Hercules, and the conditions at Auckland Aerodrome had caused Eagle 144 to carry out a missed approach off an ILS approach to runway 23. This heightened the likelihood of the Orion approaching Whenuapai having to carry out a missed approach.
- 1.29 During the initial conversation between the Planner and the Whenuapai Aerodrome Controller the Planner did intend to issue a clearance to Whenuapai Tower for the drop after having established that the Aerodrome Controller could provide separation between the Orion and the parachutists. When the Planner began to tell the Terminal Radar Controller about his intentions he heard the Terminal Radar Controller tell the Hercules crew that there was no drop clearance and to continue holding, and the Hercules response “We’ll continue holding.” This led the Planner to believe that no drop would occur, and therefore he saw no necessity to contact Whenuapai Tower immediately to advise the Controller there was no clearance. At the time, and prior to the event, the level of traffic in the Auckland Terminal Control Area, in conjunction with the prevailing weather, resulted in a high workload for the Planner and Radar Controller.
- 1.30 At about the same time the Planner heard the instructions to the Hercules, Eagle 144 had commenced a missed approach off the ILS at Auckland. Potentially a serious conflict could have occurred between the following light twin and the faster BAe 146, if the light twin also missed the approach. The faster aircraft would have been quite close to the preceding aircraft, and this urgency added to the workload of the Terminal Planner. This further delayed the Terminal Planner contacting the Aerodrome Controller to confirm cancellation of the drop clearance.
- 1.31 The Whenuapai Aerodrome Controller believed he had been issued a clearance by the Planner for the Hercules to release the parachutists through the TMA following his initial conversation with him.
- 1.32 A radar was available to the Aerodrome Controller to aid him in his primary function of maintaining visual observation of operations in the vicinity of an aerodrome. He saw no necessity to reference it in this instance. The Manual of Air Traffic Services cautioned Aerodrome Controllers to ensure the radar did not distract them from their primary function.

2. Analysis

- 2.1 This incident resulted essentially from a lack of clear and precise communication among the various parties and a lack of safeguards in the established procedures to ensure confusion did not occur. It also demonstrated how quickly any new factor, in this case Eagle 830, introduced into a situation without the knowledge of all the parties can cause confusion.
- 2.2 Initially the main reason preventing the Terminal Radar Controller issuing a drop clearance to the Hercules was the necessity to protect the missed approach airspace at 3000 feet for the Orion. This airspace was directly beneath the intended release point of the Hercules.
- 2.3 The Hercules crew and the Aerodrome Controller were made aware of the potential conflict with the Orion. Once that situation was under control however they saw no reason why the drop could not proceed. The Planner's original concern was also the Orion and he attempted to resolve the situation to facilitate the parachute drop by the Hercules. When the Aerodrome Controller assured the Planner he would keep the Orion clear he was satisfied the drop could go ahead.
- 2.4 The Terminal Radar Controller however was in direct communication with the Hercules and also responsible for a number of other aircraft movements in the Auckland TMA. As he had not issued a drop clearance to the Hercules and believed it would be several more minutes before he could, due to the approach by the Orion, he took the opportunity to direct Eagle 830 to turn right and to intercept the track to Springfield. Prior to this Eagle 830 had not been conflicting traffic for the parachuting drop.
- 2.5 The Planner became aware of Eagle 830 turning right to Springfield, and therefore passing close to Whenuapai, only after he had ensured the requirements of the Orion would not prevent the drop. He did not inform the Aerodrome Controller immediately because he was aware of the conversation between the Terminal Radar Controller and the Hercules and was satisfied the Hercules would continue holding. At the same time he had a high workload, and had also to direct his attention to a potential conflict developing between aircraft on the ILS approach at Auckland. In the meantime, the Hercules co-pilot re-established contact with Whenuapai Tower without first informing the Terminal Radar Controller. This action created an opportunity for confusion to occur. The Aerodrome Controller, not aware of Eagle 830, issued a clearance for the release of the parachutists based on his previous conversation with the Planner.
- 2.6 This incident was unlikely to have occurred if the Whenuapai Aerodrome Controller had been required to receive confirmation from the Planner, via telephone, that drop approval through the TMA had been authorised by the Terminal Radar Controller, before issuing a drop clearance in the control zone.

3. Findings

Findings and any recommendations are listed in order of development and not in order of priority.

- 3.1 The controllers and aircrew were properly qualified and fit for duty.
- 3.2 The controllers and aircrew were familiar with parachute dropping exercises.
- 3.3 The Hercules crew was authorised to release the parachutists.

- 3.4 A lack of clear and precise communication amongst the controllers led to a misunderstanding of the traffic situation.
- 3.5 The workload of the controllers was a contributing factor.
- 3.6 The misunderstanding of the traffic situation resulted in an inappropriate drop clearance being issued to the Hercules by Whenuapai Tower.
- 3.7 The air traffic services documented procedures for parachuting operations did not contain adequate safeguards to prevent any misunderstanding occurring amongst the controllers.

4. Safety Actions

- 4.1 Following this incident the Airways Corporation initiated corrective actions, and put in place safeguards, by amending the instructions contained in the unit orders and letter of agreement between Whenuapai Tower and Auckland Air Traffic Services, for parachuting operations.
- 4.2 These corrective actions require that:
- i) the Aerodrome Controller shall be telephoned by either the Terminal Planner or the Terminal Radar Controller and advised when each drop approval has been authorised for aircraft operating in the TMA,
 - ii) the Terminal Planner, if on duty, shall confirm with the Terminal Radar Controller that no conflicts exist for an intended drop,
 - iii) the telephone call is to be completed before an aircraft is given permission to change radio frequency to Tower, and
 - iv) the Aerodrome Controller is not to issue a drop clearance until a telephone call authorising the drop has been received from either the Radar Controller or the Planner.

15 October 1997

Hon. W P Jeffries
Chief Commissioner

Glossary of aviation abbreviations

AD	Airworthiness Directive
ADF	automatic direction-finding equipment
agl	above ground level
AI	attitude indicator
AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
amsl	above mean sea level
AOD	aft of datum
ASI	airspeed indicator
ATA	actual time of arrival
ATC	Air Traffic Control
ATD	actual time of departure
ATPL (A or H)	Airline Transport Pilot Licence (Aeroplane or Helicopter)
AUW	all-up weight
°C	degrees Celsius
CAA	Civil Aviation Authority
CASO	Civil Aviation Safety Order
CDI	course deviation indicator
CFI	Chief Flying Instructor
C of A	Certificate of Airworthiness
C of G (or CG)	centre of gravity
CPL (A or H)	Commercial Pilot Licence (Aeroplane or Helicopter)
DME	distance measuring equipment
E	east
ELT	emergency location transmitter
ERC	Enroute Chart
ETA	estimated time of arrival
ETD	estimated time of departure
°F	degrees Fahrenheit
FAA	Federal Aviation Administration (United States)
FL	flight level
ft	foot/feet
g	acceleration due to gravity
GPS	Global Positioning System
h	hour
HF	high frequency
hPa	hectopascals
hrs	hours
HSI	horizontal situation indicator
HT	high tension
IAS	indicated airspeed
IFR	Instrument Flight Rules
IGE	in ground effect
ILS	instrument landing system

IMC	instrument meteorological conditions
in	inch(es)
ins Hg	inches of mercury
kg	kilogram(s)
kHz	kilohertz
KIAS	knots indicated airspeed
km	kilometre(s)
kt	knot(s)
LAME	Licensed Aircraft Maintenance Engineer
lb	pound(s)
LF	low frequency
LLZ	localiser
Ltd	Limited
m	metre(s)
M	Mach number (e.g. M1.2)
°M	degrees Magnetic
MAANZ	Microlight Aircraft Association of New Zealand
MAP	manifold absolute pressure (measured in inches of mercury)
MAUW	maximum all-up weight
METAR	aviation routine weather report (in aeronautical meteorological code)
MF	medium frequency
MHz	megahertz
mm	millimetre(s)
mph	miles per hour
N	north
NDB	non-directional radio beacon
nm	nautical mile
NOTAM	Notice to Airmen
NTSB	National Transportation Safety Board (United States)
NZAACA	New Zealand Amateur Aircraft Constructors Association
NZDT	New Zealand Daylight Time (UTC + 13 hours)
NZGA	New Zealand Gliding Association
NZHGPA	New Zealand Hang Gliding and Paragliding Association
NZMS	New Zealand Mapping Service map series number
NZST	New Zealand Standard Time (UTC + 12 hours)
OGE	out of ground effect
okta	eighths of sky cloud cover (e.g. 4 oktas = 4/8 of cloud cover)
PAR	precision approach radar
PIC	pilot in command
PPL (A or H)	Private Pilot Licence (Aeroplane or Helicopter)
psi	pounds per square inch
QFE	an altimeter subscale setting to obtain height above aerodrome
QNH	an altimeter subscale setting to obtain elevation above mean sea level
RNZAC	Royal New Zealand Aero Club
RNZAF	Royal New Zealand Air Force
r.p.m.	revolutions per minute
RTF	radio telephone or radio telephony

s	second(s)
S	south
SAR	Search and Rescue
SSR	secondary surveillance radar
°T	degrees true
TACAN	Tactical Air Navigation aid
TAF	aerodrome forecast
TAS	true airspeed
UHF	ultra high frequency
UTC	Coordinated Universal Time
VASIS	visual approach slope indicator system
VFG	Visual Flight Guide
VFR	visual flight rules
VHF	very high frequency
VMC	visual meteorological conditions
VOR	VHF omnidirectional radio range
VORTAC	VOR and TACAN combined
VTC	Visual Terminal Chart
W	west