

Final Factual Report- Dangerous Goods carried on civilian aircraft

consigned by Royal New Zealand Air Force

Issued at Wellington October 18, 2013.

Introduction

1. On 24 October 2012 the Civil Aviation Authority (CAA) released an interim factual report, identifying the initial investigation findings into a dangerous goods (DG) incident which occurred on 22 August 2009, where Passenger Service Units (PSUs) containing DG were consigned by the Royal New Zealand Air Force (RNZAF) and carried on a civilian passenger aircraft.
2. Based on the information provided by RNZAF, DHL Global Forwarding (DHL Global) and Air New Zealand (ANZ), the investigation identified the following initial areas to be examined:
 - a. Communication during and post the incident; particularly reporting of the incident outside of the RNZAF and New Zealand Defence Force (NZDF).
 - b. Civil Aviation Rules (CAR) relating to DG carriage and reporting requirements in place at the time of the incident.
 - c. The RNZAF internal investigation that was conducted and the recommendations made; specifically those that were applicable outside of the NZDF.
 - d. Outstanding issues and further lines of inquiry for the CAA.
3. As a result of the interim investigation, the CAA concluded that no enforcement action could be taken however, the safety investigation would continue to look at the following factors:
 - a. The communication processes between the RNZAF and civilian agencies and organisations.
 - b. The effectiveness of the measures put in place by the RNZAF to prevent re-occurrence of a similar event. Specifically those measures relating to the civil/ military interface over DG carriage or DG information transfer to civil aviation participants.

- c. Obligations on the RNZAF when it is engaging civil aviation participants e.g. for the shipment of DG.
- d. If civilian aviation participants fully met the obligations placed on them under the CAA requirements relating to DG.
- e. The adequacy of the aviation safety regulatory framework governing NZDF consignment of DG by civil air transport.
- f. The robustness of the overall aviation safety regulatory framework in dealing with the carriage of DG.

CAA investigation

- 4. The CAA investigation into the consignment of prohibited dangerous goods by the RNZAF on a passenger ANZ aircraft in 2009 sought to consider the elements associated with the incident itself; specifically those related to the civilian aspects of the incident and issues of a systemic nature, that while not all directly related to the singular incident have highlighted possible weaknesses in the current DG system that need to be considered.
- 5. As was concluded in the RNZAF internal report the active failure associated with this incident was the misidentification and subsequent incorrect packaging and labelling of the Chemical Oxygen Generators within the PSUs. The PSUs were subsequently transported via the New Zealand civil aviation system with the error not being identified until the PSUs arrived at the RNZAF aircraft servicing facility in Canada.
- 6. The RNZAF internal investigation also highlighted a number of RNZAF organisational and systemic failures, the result of which has led it to make some long-term changes to their internal processes to ensure a reduced risk of a similar incident occurring in the future. The RNZAF however did not report their investigation or its findings externally to any civilian agencies at any stage.
- 7. In relation to the specific incident the CAA investigation found several issues that were pertinent to the civilian aspects of the event:
 - a. While the RNZAF had contacted the TAIC, based on the information the TAIC was given, the TAIC concluded that no incident had occurred at the interface between military and civil aviation. The CAA was not aware of the event taking place. Moreover, there was no recognised formal mechanism for the RNZAF to exchange information with the CAA regarding DG issues. Given the CAA technical function

in relation to the CARs, the establishment of the CAA / NZDF MoU (currently underway), will improve the provision of technical advice, guidance and incident reporting between the CAA and NZDF.

- b. While the RNZAF has internal DG rules in place based on IATA requirements, there is no formal requirement for the RNZAF (NZDF) to comply with CAR 92, when consigning DG on civilian aircraft.
8. In addition, to the specific events of the incident, the investigation noted a number of issues that highlighted potential weaknesses within the wider DG system that need to be considered:
- a. The investigation found there is ambiguity within CAR 92 specifically in relation to the roles and functions of those involved in the process and the demarcation between these roles. A lack of consistency with IATA and ICAO instructions and regulations, specifically in relation to terminology for the functions undertaken within the DG process was also evident. This is compounded by the CAA DG information booklet not aligning with the CAR particularly regarding terminology.
 - b. Under the DG process there is an inherent reliance on the offerer to correctly identify package and label DG at the start. Mistakes by an offerer can perpetuate throughout the system unnoticed. Subsequent handling is only to confirm, through an external examination that the DG consignment is correctly packaged, shipping documents have been generated and the item is not damaged or leaking etc. This anomaly generates a potential single point of failure within the system negating the other process steps in place.
 - c. In addition, the investigation noted a lack of clear guidance or specific training in how to discharge the requirements of an offerer. Given the importance of the offerer's function in the DG system, it is felt that this area should be reviewed.
 - d. Where training is identified under CAR 92 for specific DG functions i.e. operators, requirements exist for recurrence training to take place on a biennial basis. This requirement does not take into account an individual's actual hands-on usage of the process. Given the investigations understanding of the minimal hands on experience of RNZAF personnel involved in this incident and potential for this to be replicated in other organisations who operate in the civil DG system, it is felt consideration

could be given to reviewing DG training requirements to ascertain if hands-on currency would be a useful addition to the current calendar based approach.

9. Given the potential consequences of DG processing failures to the safety of aircraft it is important that a robust system is in place to mitigate risks. Therefore, it is felt that due consideration be given to the recommendations made within this report, to help ensure and enhance the integrity of the New Zealand civil aviation DG system.

Recommendation

10. The following recommendations are made:

- a. CARs relating to DG should be applied to NZDF when consigning DG on civilian aircraft and consideration should be made regarding a change to CAR 92 to include its applicability to NZDF.
- b. Consideration is given to a review of CAR 92 to ensure the roles and functions of those involved in the civil DG process are clearly articulated.
- c. Subject to acceptance of recommendation 2, a review of the CAA DG information booklet is undertaken or consideration is given to replacing it with an Advisory Circular, which better aligns with CAR 92.
- d. Consideration is given to mitigating the offerer as a single point of failure within the system.
- e. A review of DG recurrence training is undertaken to ascertain the value in introducing a hands-on training currency in addition to the current calendar based approach.

REDACTED VERSION 24-10-2012

INTERIM FACTUAL REPORT INTO RNZAF DANGEROUS GOODS (DG) INCIDENT INVOLVING AIR NZ FLIGHT NZ0084 AUG 2009

INTRODUCTION

1. Following recent press reports relating to the Royal New Zealand Air Force (RNZAF) identification of a serious incident involving the shipment of wrongly prepared and identified dangerous goods on a commercial Air New Zealand flight (NZ0084) in Aug 2009, the CAA Safety Investigation Unit (SIU) has commenced an investigation into the events surrounding this incident.
2. The investigation is particularly focused on the civilian aspects of this incident and the military / civilian interface; noting that the RNZAF undertook its own internal investigation and operates internally to its own Aviation Authority rules.

AIM

3. The aim of this report is to provide a preliminary review of the incident involving the transportation of RNZAF supplied Dangerous Goods (DG) on a commercial Air New Zealand Flight (NZ0084) in August 2009. The report will look to determine the events associated with the incident including:
 - a. Communication during and post the incident; particularly reporting of the incident outside of the New Zealand Defence Force (NZDF).
 - b. Civil aviation rules relating to DG carriage and reporting requirements in place at the time of the incident.
 - c. The RNZAF internal investigation that was conducted and the recommendations made; specifically those that were applicable outside of the NZDF.
 - d. Outstanding issues and further lines of inquiry for the CAA.

BACKGROUND

4. In Aug 2009 the RNZAF shipped a DG consignment containing Boeing B757 Passenger Service Units (PSU) via a commercial Air New Zealand flight (NZ0084), from Auckland to Vancouver, Canada. On the shipments arrival at its final destination (Cascade Aerospace), it was discovered that the PSU had been in-correctly packaged and labelled for their [*correct*] DG classification. In addition, once the PSU were removed from the packaging it was also found that the Chemical Oxygen Generator (COG) unit within the PSU had not been made safe for transportation in accordance with RNZAF or Boeing technical instructions.
5. On discovery of this incident the RNZAF contacted the Transport Accident Investigation Commission (TAIC) and initiated its own internal investigation.
6. The specific unit within the PSU that defines it as DG is the Chemical Oxygen Generator (COG). Each generator has a release pin which holds the firing pin in position. A lanyard connects the masks to the release pin. Behind the firing pin is a primer to start the chemical reaction in the generator. When initiated the outside

temperature of the COG can reach temperatures of 260°C, sufficient to ignite materials in contact with it. In addition, the oxygen released can also support and intensify any fire.

7. When working on or transporting a COG it is a RNZAF and Boeing technical requirement that an additional safety pin is installed into the generator firing mechanism which effectively locks out the firing pin preventing it from striking the primer. This additional safety pin was not fitted in the COG the RNZAF prepared for shipping.
8. International concerns over incidents involving the carriage of COG had resulted in a number of Regulatory and Advisory measures being put in place since May 1996 as a result of the ValuJet 592 accident.

COMMUNICATION OF THE INCIDENT

9. Initial investigations into reporting of the incident have revealed that a number of agencies external to the NZDF appear not to have been fully aware of the incident at the time or post the event. The civilian agencies who would be expected to be aware of this incident, either as a participant or in an subsequent investigatory capacity are:
 - a. Transport Accident Investigation Commission (TAIC)
 - b. Air New Zealand (as the carrier)
 - c. ██████████ (as the freight handling company)
 - d. CAA.
10. TAIC. While TAIC was informed of the event by the RNZAF, it appears there was a misunderstanding over the actual events that had taken place. TAIC was informed (by the RNZAF) that the PSU had not actually been loaded or carried on the aircraft, but merely assigned to it. Subsequently TAIC did not record this as an incident under their MOU with the RNZAF.
11. Air New Zealand. Air New Zealand, while aware of the carriage of the DG containing the PSU (albeit under a wrong classification, paragraph 18 to 20), was not aware that an incident had occurred involving the PSU and that the incident was being investigated by the RNZAF.
12. ██████████. As with Air New Zealand, ██████████ was aware of the carriage of the DG containing the PSU (albeit under a wrong [initial] classification, paragraph 18 to 20) in acting as the freight forwarder for the RNZAF. Although, again ██████████ was not aware that an incident had occurred involving the PSU and that the incident was being investigated by the RNZAF.
13. CAA. A search of the CAA data systems and files has revealed no evidence that this incident had been reported, or communicated, to the CAA.
14. Under civil aviation rules the organisations and agencies listed at paragraph 9, should have been aware of the events surrounding this incident, as either a participant in the system for authorisation and carriage of DG, or subsequently as part of the CAA reporting and investigation requirements.

CAA RULES RELATING TO DG

15. The Civil Aviation Rules (CAR) and other documents relating to this incident include:

- a. CAR Part 92 – Carriage of Dangerous Goods by Air. Part 92 prescribes the minimum safety requirements applicable to each person who conducts any function associated with the carriage of dangerous good by civilian aircraft. Part 92 includes the packaging, marking, and labelling requirements of dangerous goods and the operators training and operating responsibilities.
- b. CAR Part 12 - Accidents, Incidents and Statistics. The objective of Part 12 is to ensure that the Authority receives information about accidents and incidents. The information will be analysed to identify any necessary corrective actions with an overall objective of improving aviation safety. This includes reporting and investigating DG incidents.
- c. Technical Instructions for the Safe Transport of Dangerous Goods by Air. International government regulations published by the International Civil Aviation Organisation (ICAO), the United Nations Organisation responsible for international aviation matters. The ICAO document has legal status in New Zealand and many other countries. These are effected within New Zealand civil aviation via CAR Part 92.
- d. International Air Transport Association (IATA) Dangerous Goods Regulations. Based on the ICAO Technical Instructions, the IATA Dangerous Goods Regulations include essential information about airline industry standards and conventions.

16. In the application of these requirements, three functional areas are routinely recognised:

- a. Offerer. The party that offers dangerous goods for transportation and who is responsible for: determining whether a material is regulated, assigning classification and proper shipping name and preparing the package before offering for transportation.
- b. Carrier. The party that accepts dangerous goods for transportation. Carriers must assure that each package is in good order and verify that the marks and labels, plus accompanying documentation is correct.
- c. Packaging Manufacturer. The party that supplies packaging that it represents as conforming to any UN/ICAO packaging specification. Under Part 92, there is no definition of a packaging manufacturer. However, CAA guidance implies that this is the party that submits the packaging for testing and applies for the specification markings to be placed on a packaging, even if that packaging is assembled from components fabricated by other parties.

17. The CAA recognises that a single company can undertake more than one of these roles at any one time. For example *“a freight forwarder acts as a carrier when it accepts a shipment from a chemical manufacturer; it becomes an offerer when it offers the same shipment to an airline”*.

18. While the PSU were marked as DG, they were incorrectly categorised against the rules and requirements in place. The PSU were originally categorised by the RNZAF as

“*Life-saving appliances self-inflating*” as opposed to the correct categorisation of “*Oxygen generator, chemical (including when contained in associated equipment, e.g. passenger service units (PSUs).....)*”.

19. Post receipt of the PSU by [REDACTED] it appears the UN categorisation was incorrectly transcribed from the RNZAF paperwork, although the class and packaging instructions listed alongside this categorisation still related to the RNZAF original categorisation of “*Life-saving appliances self-inflating*”.
20. Neither the RNZAF incorrect categorisation, or subsequent discrepancy between categorisation, class and packaging instructions were picked up by the freight forwarder ([REDACTED]) or the carrier (Air New Zealand).
21. The incorrect categorization and labelling appears to have been a significant factor in the PSU being loaded and carried on a passenger aircraft as opposed to a cargo aircraft. IATA technical instructions stipulated that PSU containing Oxygen Generator Units are only to be carried on cargo aircraft.

RNZAF INVESTIGATION INCLUDING (EXTERNAL) RECOMMENDATIONS

22. The RNZAF undertook an in-depth internal investigation into the events surrounding the shipment of the PSU on a commercial Air New Zealand Flight (NZ0084) reporting in November 2009. The report covered a wide spectrum of internal RNZAF/NZDF areas relating to the event. The report reached the conclusion that the RNZAF had been at fault in: not making the COG [PSU] safe for transport; their incorrect DG packaging and labelling; and their subsequent offer for shipment under the wrong DG categorisation.
23. The report makes 22 internal recommendations to allow the RNZAF/NZDF to address the issues found during the investigation. It is understood that the RNZAF have actioned 19 of these recommendations and is in the process of addressing the remaining ones. In addition, there have been no other RNZAF recorded incidents involving DG carriage on civilian aircraft since this event.
24. While the report highlights, on a number of occasions, the gravity of the failings against IATA, ICAO and civil aviation requirements, and the need to ensure that these failings are brought to the attention of the appropriate civilian agencies, it appears this was never done. Moreover, there is no specific recommendation for this action within the report.

OUTSTANDING ISSUES AND FURTHER LINES OF ENQUIRY

25. At this stage of the investigation the primary concern is whether the intent of the rules was fully implemented and applied by all parties. A table summarising the events as determined to date, is shown at Annex A.
26. Following the preliminary review there are a number of areas that require further investigation including:
 - a. The communication processes between the RNZAF and civilian agencies including TAIC and the CAA.
 - b. The effectiveness of the measures put in place by the RNZAF to prevent re-occurrence of a similar event. Specifically those measures relating to the civil

military interface over DG carriage or DG information transfer to civil aviation participants.

- c. Obligations on the RNZAF when it is engaging civil aviation participants i.e. in the shipment of DAC.
- d. If civilian aviation participants fully met the obligations placed on them under the CAA requirements relating to DG.
- e. The adequacy of the aviation safety regulatory framework governing NZDF consignment of DG by civil air transport.
- f. The robustness of the overall aviation safety regulatory framework in dealing with the carriage of DG.

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ANNEX A to
13/SIP/0002
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SUMMARY OF EVENTS

Ser	Functional Area	Event / Potential Issues
1	Offerer	<ul style="list-style-type: none">- PSU incorrectly prepared for air transportation (no safety pin fitted).- PSU incorrectly DG categorised.- DG incorrectly packaged.- Incident not fully communicated/reported.
2	Carrier (Freight Forwarder)	<ul style="list-style-type: none">- DG transcribed/classified incorrectly.- Discrepancies in categorisation not identified.- Discrepancies in categorisation, packaging and allowable quantities not identified.
3	Carrier	<ul style="list-style-type: none">- Discrepancies in categorisation, packaging and allowable quantities not identified.