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3rd July 2026

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Dear [REDACTED]

I refer to your email of 14 May 2026 requesting, under the Official Information Act 1982 (OIA), copies of Courts of Inquiry reports and Assembling Authority comments.

As noted in the email to you of 12 June 2026, the two Courts of Inquiry Reports concerning deaths at Linton, and the respective Assembling Authority Comments have not been authorised for release to you under section 200T of the Armed Forces Discipline Act 1971 (AFDA).

Copies of the Courts of Inquiry Reports and respective Assembling Authority Comments for the three matters listed below are authorised for release to you under section 200T of the AFDA.

- *Toxic Gas Incidents between 23-28 November 2022 in HMNZS Te Mana;*
- *Two RNZAF UNIMOG's rolling over in August 2024;*
- *Injury during live firing practice, Ardmore MTA.*

Where indicated: information related to capability and/or partner information is withheld to avoid prejudice to the security and defence of New Zealand or the international relations of the Government of New Zealand in accordance with section 6(a) of the Official Information Act 1982 (OIA); personal information is withheld to protect privacy in accordance with section 9(2)(a) of the OIA and labels are added to support comprehension; information provided in confidence is withheld in accordance with section 9(2)(ba)(i) of the OIA; and, staff information is withheld to avoid its malicious or inappropriate use, such as phishing, scams or unsolicited advertising in accordance with section 9(2)(k) of the OIA.

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Yours sincerely

GA Motley
Brigadier
Chief of Staff HQNZDF

Enclosures:

1. Toxic Gas Incidents between 23-28 November 2022 in HMNZS Te Mana
2. Two RNZAF UNIMOG's rolling over in August 2024
3. Injury during live firing practice, Ardmore MTA

**REPORT OF THE COURT OF INQUIRY
REGARDING
TOXIC GAS INCIDENTS BETWEEN 23-28 NOVEMBER 2022 IN HMNZS TE MANA**

GENERAL

1. The Court as originally constituted convened on 17 Oct 23. However, due to the exigencies of the Service, did not receive evidence. The Court was re-constituted by the Assembling Authority and reconvened as ordered on 1 Aug 24 at 1330, in accordance with [MCC Minute 206/2024, DO-0145/0-1-03, dated 29 July 2024](#).²
2. The Court started collecting evidence on 2 Aug 24 and received the final evidence on 25 Nov 24, receiving evidence from 28 witnesses who produced 135 exhibits.
3. [This paragraph is contained in the classified addendum]
4. The Court highlights that, due to the passage of time between the incidents occurring over the period 23-25 Nov 22 and the commencement of gathering evidence for this Court of Inquiry in Aug 24, witness recollection of events in some cases was lacking in detail and/or inconsistent with the Command Investigation (CI) interview transcripts. Where there are inconsistencies between witnesses' recollections of events during the interviews conducted for this Court of Inquiry and those conducted for the CI, the Court has generally preferred the evidence recorded in the Nov 22 CI interview transcripts³ as being more likely to be accurate due to the contemporaneous nature of those interviews.
5. The Court established that there were three⁴ separate incidents of Carbon Monoxide (CO) detection in compartment 3M, which occurred in Wellington over the period 23 to 25 Nov 22.⁵ In summary, the Court has concluded that:
 - a. CO was most likely generated in the aft sewage treatment plant (STP) and emitted through the deck drains into 3M;
 - b. in each of the incidents, the recorded level and duration of CO emissions were unlikely to be harmful to personnel in 3M at the time; and
 - c. any detriment suffered by witness 10 and/or 11 is unlikely to have been caused directly by exposure to CO but may have been a neurofunctional consequence of a genuinely held belief in CO exposure and exacerbated by perceived failures in treatment and subsequent support from the RNZN.
6. As set out at Recommendations and Comments section below, the Court makes five recommendations:
 - a. to minimise the risk of any further CO emission from the STP in 3M;

² s. 9(2)(a) [REDACTED], counsel assisting, was not present due to being absent on leave overseas. The Court was assisted by s. 9(2)(a) [REDACTED], who was granted permission to attend all sittings of the Court and was permitted by the President to ask questions of witnesses.

³ Exhibit C.

⁴ Exhibit B, pg 2, para 6.

⁵ The terms of reference refer to the period 23 to 28 Nov 22; however the last incident occurred on 25 Nov 22.

- b. to ensure responses to toxic gas incidents are in accordance with standard operating procedures (SOPs), in order to minimise any risk to personnel from a lack of appropriate treatment for exposure to toxic gas;
- c. for the management of outsourced clinical diagnosis and care, and the support of personnel whose diagnosis and care has been outsourced; and
- d. to provide an opportunity for the reassessment and, if appropriate, the treatment of any neurofunctional deficit suffered by witness 10 and/or 11.

DESCRIPTION OF INCIDENTS AND RESPONSE ACTIONS

Incident One – 23 Nov 22

7. In the days prior to the incidents, HMNZS TE MANA (TEM) had been undertaking a period of activity, s. 6(a) [REDACTED], in Australian waters before sailing for New Zealand.⁶ The ship entered Wellington Harbour on 22 Nov 24, anchoring overnight before going alongside the following day.⁷
8. Immediately prior to the first incident on 23 Nov 22 (Incident One), the ship had remained at anchor overnight within the confines of Wellington Harbour. The ship's log states that, on 23 Nov 22;⁸
 - a. at 0840 (NZDT +13), the ship closed up for Special Sea Dutymen (SSD);
 - b. at 0910, the ship weighed anchor to conduct pilotage to Aotea Quay;⁹
 - c. at 0946, the ship came alongside Aotea Quay; and
 - d. at 1015, the ship reverted to eight hours' notice for sea (NFS).
9. There was no evidence of exact time or the ship's position when Incident One occurred. However, the Court heard evidence that CO detection was reported to the Machinery Control Room (MCR) during the ship's final approach to Aotea Quay.¹⁰
10. The Court established that witnesses 10 and 11 were closed-up in compartment 3M undertaking their SSD role¹¹ (at the aft-steering position). During their duty, witnesses 10 and 11 reported:
 - a. two separate instances of a rotten egg smell – a potential indicator of the presence of hydrogen sulphide (H₂S); and
 - b. entered/exited compartment 3M three times between 0840 and 0946.
11. **Personnel Involved in Incident One.** The Court established the involvement of the following personnel and their respective roles during Incident One:
 - a. s. 9(2)(a) [REDACTED] : witness 10;
 - b. s. 9(2)(a) [REDACTED] : witness 11;

⁶ Witness 11, pg 3, para 11.

⁷ Witness 3, pg 3, para 13.

⁸ Exhibit Z, pg 1.

⁹ Exhibit B, pg 2, para 6 (a).

¹⁰ Exhibit C, pg 2.

¹¹ Witness 10, pg 4, para 1.

- c. s. 9(2)(a) : witness 2;
 - d. s. 9(2)(a) : witness 6; and
 - e. s. 9(2)(a) : witness 1.¹²
12. **Incident One Response Actions (first detection).** Witnesses 10 and 11 smelt an odour of rotten eggs,¹³ which is a potential indicator for the presence of H₂S.¹⁴ The odour dissipated for approximately 30 minutes before returning. Upon detecting the odour for the second time, both witnesses 10 and 11 exited 3M to the aft damage control (DC) position and telephoned the Machinery Control Room (MCR) to inform them of the smell¹⁵.
 13. Witness 2 was located in the MCR and, upon receiving the call, witness 2 instructed witnesses 10 and 11 to:
 - a. get a Quattro (Gas Alert Quattro Multi Gas Detector);¹⁶
 - b. return to 3M, don a headset; and
 - c. relocate to the bottom of the stairs from 3M to 2M and stay there to maintain communications with the bridge (thus also ensuring witnesses 10 and 11 were in close proximity to a means of egress from compartment 3M).
 14. Upon obtaining a Quattro, witnesses 10 and 11 re-entered 3M for the first time, established communications with the Officer of the Watch (OOW) and relocated as close as possible to the bottom of the ladder to 2M. The extent of any toxic gas sweep of compartment 3M by witnesses 10 and 11 is unknown,¹⁷ but witness 10 indicated that no toxic gas was detected by the Quattro upon their return to compartment 3M.¹⁸
 15. Sometime between 10 to 30 minutes¹⁹ after re-entering 3M, the rotten egg odour returned and the Quattro detected CO²⁰ at 14 parts per million (ppm). Figure 1 details the first detection of CO (downloaded from Quattro S/N QA 113 022216).²¹ In addition, exhibit E provides photographic evidence of the peak reading on 23 Nov 22. There was no audible alarm as the minimum Alarm 1 (low level) for the Quattro is set at 20 ppm.²²

¹² Witness 1 has since discharged from the RNZN.

¹³ Exhibit BA, pg 1.

¹⁴ Exhibit BP, para 3.

¹⁵ Exhibit BB, pg 1.

¹⁶ Exhibit BR.

¹⁷ Exhibit BP, pg 1, para (2) describes toxic gas as: H₂S, methane, refrigerants and CO.

¹⁸ Exhibit C, pg 2.

¹⁹ Witness 10 indicated 30 mins later the rotten egg odour returned (Exhibit BA, pg 1), while Witness 11 indicated 10 minutes (Exhibit BB, pg 1).

²⁰ Exhibit CM, Table 1. WorkSafe standards: Time Weighted Average (TWA) is 20 ppm over eight hours. Short Term Exposure Limit (STEL) is 100 ppm over 15 minutes.

²¹ Exhibit DI, pg 1.

²² Exhibit BU, pg 1, Table 2.

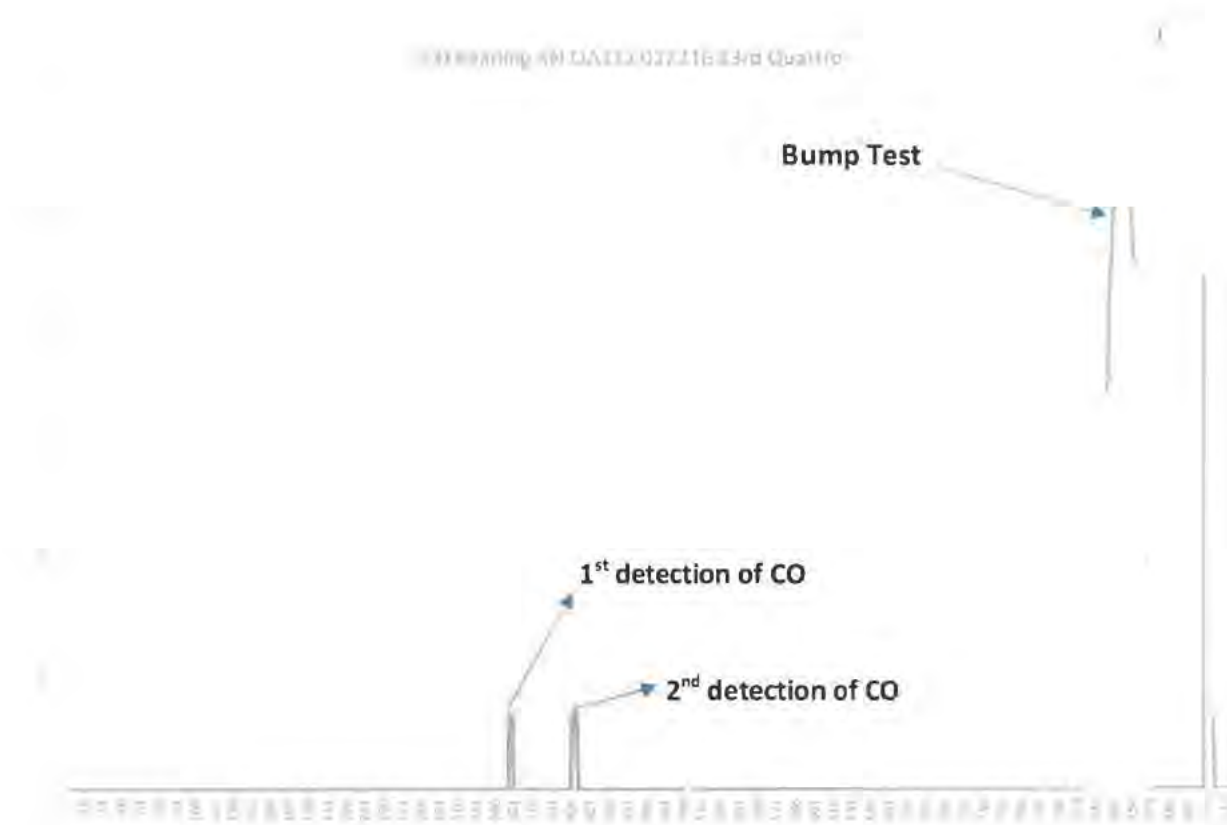


Figure 1 – CO Reading SN QA113 022216

16. Witnesses 10 and 11 exited the compartment to the aft DC station and informed the MCR. Witness 10's evidence was that they were instructed by witness 2 to:
 - a. be closed-up in aft steering (compartment 3M);
 - b. open the Quarter Deck (Qx) door and the 3M hatch; and
 - c. stand as close to the 3M hatch as possible while remaining on headset.²³
17. Witness 2 informed the OOW of the situation and requested that aft steering be fallen out as soon as the ship was safe (berthed).²⁴
18. **Incident One Response Actions (second detection).** Witnesses 10 and 11 re-entered compartment 3M, but due to the length of the headset cable, they could only locate themselves halfway to the ladder that leads from 3M to 2M, ie within compartment 3M.
19. Witness 10 stated the Quattro was reading a constant 14 ppm,²⁵ while witness 11 recalled viewing 16 ppm.²⁶ The evidence indicates a maximum exposure time of 10 minutes was experienced by both witnesses, because approximately 10 minutes after re-entering 3M, the pipe was made to fall out SSD.²⁷ In addition, the ship's log indicated TEM reverted to eight hours' NFS at 1015.²⁸

²³ Exhibit BA, pg 1.

²⁴ Exhibit C, pg 20.

²⁵ Figure 1 – 2nd detection of CO from Quattro S/N QA 113 022216.

²⁶ Exhibit BB, pg 1.

²⁷ Exhibit B, pg 2, para 8(e).

²⁸ Exhibit Z, pg 1.

20. The ship's SHEM coordinator advised witness 25 to conduct a bump test, which was carried out (results detailed at Figure 1).
21. **Incident One Medical Response.** On completion of SSD, witnesses 10 and 11 relocated to the sickbay for clinical assessment by witness 1. Witness 1 stated that "I did not conduct any observations then, because they were still walking around, I made a clinical judgement that they were ok, also the ppm was low".²⁹ Witness 1 instructed witnesses 10 and 11 to submit an RNZN 1 (Safety, Health and Environmental Report of an Event, Concern or Something Good).
22. Witness 25³⁰ sat down with witness 10 to complete the RNZN 1 and on completion was submitted to the Ship's SHEM co-ordinator.³¹

Incident Two – 24 Nov 22

23. **Events leading up to Incident Two.** TEM sailed from Aotea Quay to sea, at 1003 on 24 Nov 22,³² to conduct a "shop window" (a demonstration of the ship's capabilities) with approximately 30 guests (civilian and military) embarked.³³ Throughout the day, the ship was operating within Wellington Harbour and the approaches to Wellington Harbour.
24. On completion of the shop window activities, the ship closed up for SSD and cable party at 1350, and conducted pilotage to Queen's Wharf, where the first line went across at 1506.³⁴ SSD were fallen out at 1525.³⁵
25. The Court established that there was one incident of CO detection in compartment 3M, occurring during the evolution to berth at Queen's Wharf (Incident Two). At the time, weather conditions were inclement, with the wind gusting at approximately 40 kts,³⁶ complicating the berthing evolution.³⁷
26. **Personnel Involved.** The Court established the involvement of the following personnel and their respective roles during Incident Two:
 - a. s. 9(2)(a) witness 10;
 - b. s. 9(2)(a) witness 11;
 - c. s. 9(2)(a) : witness 4;
 - d. s. 9(2)(a) : witness 2;
 - e. s. 9(2)(a) : witness 25;

²⁹ Exhibit A, pg 1.

³⁰ s. 9(2)(a)

³¹ Exhibit F.

³² Exhibit Z, pg 2.

³³ Witness 3, pg 4, para(1)(4)

³⁴ Exhibit Z, pg 2.

³⁵ Exhibit Z, pg 2.

³⁶ Exhibit C, pg 17.

³⁷ The ship's log at 1200 recorded the wind at 28 kts, from 330°: Exhibit Z, pg 2.

- f. s. 9(2)(a) [REDACTED] witness 21;
 - g. s. 9(2)(a) [REDACTED] witness 1;
 - h. s. 9(2)(a) [REDACTED] witness 6; and
 - i. s. 9(2)(a) [REDACTED].
27. Witnesses 10 and 11 were closed up within 3M and settled into their normal SSD resting positions within the compartment (see Figure 2). As a result of Incident One, witness 10 took the initiative and brought a Quattro as a precautionary measure, which was positioned next to witness 11 (Figure 2).
 28. The Court has established that Incident Two occurred while TEM was conducting pilotage to Queen's Wharf and was in close proximity to the berth. The Court could not establish the exact time of Incident Two, however witnesses 10 and 11 stated during the TEM CI that they regained consciousness at approximately 1445 with the Quattro alarming at 48 ppm CO.³⁸ Neither of the witnesses recalls losing consciousness, nor did either witness report any of the symptoms in the TEM CI that would be expected to precede³⁹ unconsciousness as a result of CO exposure.⁴⁰
 29. **Incident Two Response Actions.** Witnesses 10 and 11 stated that, upon regaining consciousness, they evacuated the compartment to the after DC station and telephoned the MCR to inform the MCR watchkeepers of the Quattro alarm for CO. The telephone call was received by the 's. 9(2)(a) [REDACTED] of the watch', who passed the information to witness 4, indicating that there was toxic gas in 3M.⁴¹
 30. Witness 2 directed witnesses 10 and 11 to come to the MCR and report the situation.⁴² Witness 2 established the facts regarding the incident, with a specific focus on determining the health of witnesses 10 and 11 by identifying symptoms of CO ingestion: "I didn't see any signs of drowsiness, red eyes and they were coherent".⁴³
 31. Witness 2 gave evidence that he asked witnesses 10 and 11 whether they were able to continue with SSD, if they were to close up in the Petty Officers' mess with breathing apparatus (BA);⁴⁴ both witnesses replied in the affirmative.⁴⁵ The recollection of witnesses 10 and 11 differed, with their evidence being that they were directed to return to their duties, rather than being asked if they were able to do so.⁴⁶

³⁸ Exhibit B, pg 3 para 9 (c).

³⁹ Exhibit DW, pg 2, describes symptoms that may occur at a concentration (800ppm) that leads to unconsciousness – headache, dizziness, and convulsions within 45 minutes and unconscious within 2 hours.

⁴⁰ Exhibit C, pg 3.

⁴¹ Exhibit AE, pg 1.

⁴² Exhibit J, pg 1.

⁴³ Exhibit C, pg 20.

⁴⁴ Exhibit BA, pg 2.

⁴⁵ Exhibit J, pg 1.

⁴⁶ Exhibit BB, pg 2.



Figure 2 – Location of Witnesses 10 and 11 in Compartment 3M

32. Witness 4 said he was directed by witness 2 to find two other personnel who could be on standby, in case there were a requirement to re-enter 3M for a (safeguard) steering gear breakdown.⁴⁷ Witnesses 10 and 11 relocated to the aft DC station until replacement personnel were identified by witness 4.⁴⁸
33. Suitably qualified personnel were found to relieve witnesses 10 and 11.⁴⁹ A team of engineering department personnel with Damage Control Breathing Apparatus (DCBA) entered 3M to check for the presence of any toxic gas. Utilising a Multi Rae device,⁵⁰ those personnel detected CO with a peak reading of 68 ppm.⁵¹
34. After giving initial direction to various personnel as described above, witness 2⁵² rang the Commanding Officer's telephone on the bridge, which was answered by witness 6.⁵³ Witnesses 2 and 6 briefly discussed the particulars of Incident Two. Witness 6 asked witness 2 if he intended on piping toxic gas, to which witness 2 replied that he did not intend to do so.⁵⁴
35. Due to the ship's proximity to the berth and prevailing weather conditions, which witness 6 described as being 40 knots of wind across the berth, witness 6 ended the conversation with witness 2 and decided not to inform the Commanding Officer until the ship was safely alongside the berth.⁵⁵

⁴⁷ Exhibit C, pg 15.

⁴⁸ Exhibit AE, pg 1.

⁴⁹ Exhibit G, pg 2.

⁵⁰ Exhibit BR.

⁵¹ Exhibit C, pg 21.

⁵² Exhibit C, pg 20.

⁵³ The Commanding Officer 'had the ship' at the time of the call and was in charge of the berthing evolution.

⁵⁴ Exhibit C, pg 21.

⁵⁵ Exhibit C, pg 17.

36. Witness 2 gave evidence consistent with his statement to the CI⁵⁶ that he contemplated piping toxic gas but decided against that course of action because of:⁵⁷
 - a. the ship's close proximity to the berth had the potential to create confusion with the pilot onboard, tugs connected, and the potential for alarms sounding and the ship's crewing state being altered while the Commanding Officer had the ship on the final approach to the berth; and
 - b. due to the civilians onboard and the potential to create panic among them.
37. The Court has established that the Commanding Officer was not aware of Incident Two until after the ship had berthed, and therefore was not given the opportunity to decide how the ship would respond to Incident Two.
38. **Medical Response Actions.** Witness 1 carried out an initial medical assessment of witnesses 10 and 11 following Incident Two in the Petty Officers' dining hall,⁵⁸ where both witnesses 10 and 11 were situated immediately after Incident Two had occurred.
39. At approximately 1510, both witnesses 10 and 11 were taken to the sickbay for observations, where a peripheral capillary oxygen saturation (SpO₂) monitor was utilised. Witnesses 10 and 11 had respective readings of 98% and 96% SpO₂, which is within the normal range.⁵⁹
40. Witnesses 11⁶⁰ and 10⁶¹ presented with no apparent symptoms of exposure to CO at the time of examination. Witness 1 contemplated providing oxygen (O₂) as a means for treatment but decided not to administer O₂ as the SpO₂ readings were above 94% for both.⁶²
41. Witness 1 gave evidence that no consultation records were taken on completion of the medical examination.⁶³ Witness 1 instructed both witnesses to submit an RNZN 1 form.⁶⁴
42. Witness 10 stated that, approximately 10 minutes after the medical examination by witness 1, witness 10 started to have a severe headache. He found witness 11, in order to compare symptoms.⁶⁵ Witness 11 said that he also had a headache, at which point they contacted s. 9(2)(a) . The Court could not determine if any pain relief was issued or an additional medical examination was carried out by the s. 9(2)(a) .

⁵⁶ Exhibit C, pg 20, interview held 29 Nov 22 at 1930.

⁵⁷ Exhibit C,

⁵⁸ Exhibit C, pg 25.

⁵⁹ Exhibit Y, pg 2.

⁶⁰ Exhibit X, pg 4.

⁶¹ Exhibit X, pg 7.

⁶² Exhibit X, pg 25.

⁶³ Exhibit C, pg 25.

⁶⁴ Exhibit G.

⁶⁵ Exhibit X, pg 4.

43. At approximately 2000 witness 10 returned to the ship from leave,⁶⁶ as he felt “pretty horrendous”. Witness 10 spoke with witness 11,⁶⁷ who indicated that the Duty Medic was returning to the ship in order to administer pain relief medication to witness 11. At approximately 2100, the Duty Medic returned to the ship and issued packets of paracetamol to witnesses 10 and 11.⁶⁸ No medical examination was carried out by the Duty Medic and no consultation notes were taken.
44. Witness 15 was the Duty Medic at the time and provided evidence to the TEM CI indicating that they were informed by s. 9(2)(a) of Incident Two, as witness 15 was going to take over as the Duty Medic for the weekend.⁶⁹

Incident Three – 25 Nov 22

45. **Events leading up to Incident Three.** TEM was berthed overnight at Queen’s Wharf, where leave was granted to ship’s company not required for duty until 0800 25 Nov 2022.⁷⁰ The Court established that one incident of CO detection in compartment 3M occurred during the early hours of 25 Nov 22 (Incident Three), when the compartment was unoccupied.
46. The Quartermaster, s. 9(2)(a), entered compartment 3M on hearing an audible alarm while conducting rounds. The alarm also woke the Assistance Officer of the Day (AOOD), who had been asleep in the Gun Room in compartment 2L.
47. **Personnel Involved in Incident Three.** The Court established the involvement of the following witnesses and their respective roles during Incident Three
 - a. Quartermaster: s. 9(2)(a);
 - b. s. 9(2)(a): witness 24;
 - c. s. 9(2)(a); and
 - d. s. 9(2)(a): witness 21.
48. The Court intended to interview the Quartermaster, who had left the Navy subsequent to the incidents and emigrated overseas, but was unable to make contact with him.
49. **Incident Three Response Actions.** Evidence gathered from the TEM CI⁷¹ indicated that, at approximately 0300, Quartermaster was conducting rounds as a part of his duties as the Quartermaster. While walking towards the Quarterdeck, Quartermaster heard an alarm emanating from 3M.
50. Seeing the hatch was open, Quartermaster proceeded into 3M to investigate the alarm and sighted a Quattro on top of the fire hydrant, which was displaying 30 ppm.⁷² Quartermaster exited 3M on sighting the Quattro reading.

⁶⁶ Exhibit X, pg 4.

⁶⁷ Who was duty as the Quarter Master (QM).

⁶⁸ Exhibit X, pg 4.

⁶⁹ Exhibit C, pg 19.

⁷⁰ Exhibit Z, pg 2.

⁷¹ Exhibit C, pg 13.

⁷² Exhibit C, pg 13

51. Following Incident Two, witness 2 had prescribed procedures (a) to monitor for CO in 3M and (b) to ensure safe access to 3M, as detailed at paragraph 68 below. However, the Court was unable to ascertain whether processes had also been established to inform duty watch personnel that there was a Quattro sited within 3M to monitor CO levels, and to detail subsequent follow-on actions for toxic gas response, if the Quattro were to alarm.
52. Witness 24 was asleep in the Gunroom (2LZ4) and was woken by an audible alarm. Upon looking out the Gunroom door, witness 24 noted that the 3M hatch was open and the alarm was emanating from that hatch.
53. Witness 24 contacted witness 21 and was directed to locate the DTR to ascertain what the alarm was.⁷³ Witness 24 exited the Gunroom at the same time as **Quartermaster** exited 3M. The DTR arrived at the 3M hatch at the same time.
54. All three personnel entered compartment 3M and the DTR proceeded to the Quattro, reading aloud 30 ppm. The DTR reset the Quattro and it immediately alarmed again, at which point all three exited the compartment. Witness 24 directed that the 3M hatch be closed and a DC boundary light be turned on and placed on top of the hatch.⁷⁴
55. Witness 24 shook witness 21 in his cabin, explained what had occurred, and the actions taken. Witness 21 was content that the hatch had been closed, the compartment was isolated and any issue could be dealt with in the morning.⁷⁵ Witness 21 directed witness 24 to update the DTR with the actions to be taken.⁷⁶
56. **Incident Three Medical Response Actions.** The Court has found there were no reported injuries resulting from Incident Three.

Were the Actions Taken iaw Applicable SOPs?

57. This section of the report addresses the immediate action in response to detection of CO and the subsequent medical treatment of witnesses 10 and 11 separately.
58. **Applicable Toxic Gas Procedures.** The Court established from evidence provided by witness 12 that the applicable Standard Operating Procedures (SOP) and policy for dealing with toxic gas Incidents One to Three and after-action reporting at the time were:⁷⁷
 - a. NZ Supp 033 to BRd 2170(1)⁷⁸ – Toxic Gas;
 - b. NZ Supp 032 to BRd 2170(1) – Gas Alert Quattro Multi Gas Detector; and
 - c. TEM Toxic Gas SOP.

⁷³ Exhibit C, pg 9.

⁷⁴ Exhibit C, pg 9.

⁷⁵ Exhibit C, pg 9.

⁷⁶ Exhibit C, pg 9.

⁷⁷ Exhibit BD, pg1.

⁷⁸ Exhibit BP, pg 1.

59. **Findings.** The SOPs focus on H₂S as the primary toxic gas risk. Furthermore, no SOP provided for the immediate action to be taken by personnel who detect toxic gas in a compartment without a fixed detection system. Nevertheless, witnesses 10 and 11 in respect of Incidents One and Two and witness 24 in respect of Incident Three acted appropriately in immediately notifying the MCR and the OOD respectively.
60. Witness 2 did not apply the toxic gas SOPs in responding to Incidents One and Two. Witness 2's rationale is detailed above at paragraph 36, but the Court observes at this juncture that, by not piping the toxic gas incidents, other members of ship's staff (SS) were insufficiently aware of the incidents and the potential consequences of exposure to CO. This impacted subsequent actions, including:
 - a. the medical response to Incidents One and Two; and
 - b. a lack of awareness of the precautions taken in response to Incidents One and Two, which led to witness 24, **Quartermaster** and s. 9(2)(a) entering compartment 3M during Incident Three.
61. Nevertheless, witness 2 maintained positive control over Incidents One and Two and the investigations following each of Incidents One to Three.
62. Witness 21 did not apply the toxic gas SOP in responding to Incident Three but took appropriate action considering the time of the incident, that ship's company had been granted leave, and the ability to address the incident adequately in the morning. The Court also notes that witness 21's response to Incident Three may have been influenced by the nature of the response to Incidents One and Two.

Investigatory Measures to Establish Cause of Incidents

63. Following Incident One, SS utilised a Quattro in an attempt to identify the source of the rotten egg smell and the CO gas. Witness 25⁷⁹ indicated that, during the course of the investigation, 14 ppm CO was detected, however the source could not be determined.
64. It is the Court's opinion that, SS responded with a pragmatic albeit cursory investigation in an attempt to identify the source of CO gas, because:
 - a. the detection of CO was unexpected in compartment 3M;⁸⁰
 - b. the detection of CO during Incident One had been at a low level with no known risk to human life; and
 - c. toxic gas response training⁸¹ focused only on compartments with known sources of toxic gas risks, principally those with STPs.
65. Following Incident Two, witness 2 directed the formation of a ME investigation team (led by witness 25), to search for the source of the CO gas in 3M.⁸² The team wore DCBAs while conducting the search. The focus was the kidney hatches in the garbage

⁷⁹ Exhibit C, pg 28.

⁸⁰ Witness 25 at Exhibit C, p 28 indicates "that 14ppm CO was unexpected" and "there is no known sources of CO in the compartment".

⁸¹ Exhibit BE is a minute detailing the agenda for a Table Top Tactics (TTT) on toxic gas with a casualty in 4F. Exhibit BF details a Powerpoint presentation for DC TTT walkthrough with a focus on toxic gas at sea in 4FA2 – STP room.

⁸² Exhibit C, pg 20. See heading "what happened next?"

store, where the forward hatch was removed and the Quattro was lowered into 4M. Nil toxic gas was detected in 4M, nor in 3M during a subsequent search.

66. On completion of the initial search, the ME investigation team went off air, at which point witnesses 2 and 4 entered 3M (not on air) and conducted a secondary, detailed assessment also utilising a Quattro.⁸³ Again, no toxic gas was detected.
67. The Court is satisfied that based on the presented evidence, witness 2 took direct control of the investigation of Incident Two by:⁸⁴
 - a. ensuring a briefing took place;
 - b. ensuring personal protective equipment was utilised by the ME investigation team,⁸⁵ which included the wearing of DCBA, a search line being attached between team members while entering 4M, and instructing the team to remain within visual range of a supervisor; and
 - c. briefing the ME investigation team to take the Damage Control Officer (DCO) master key, to check all compartments, high, low and in the corners, inside the garbage compactor itself, and to take tools to remove kidney hatches adjacent to the beer and wine store and to access the 4M void space.
68. As a result of not identifying the source of the CO gas, witness 2 directed that ME duty personnel must carry a Quattro when proceeding into 3M.⁸⁶ However, it appears that this requirement was not widely promulgated amongst other members of the ship's company.
69. Witness 2 stated that, after Incident Three, the investigations into the source of the CO utilised the confined spaces entry procedure iaw NZBR 2020.⁸⁷ The intent of the ongoing search was to access the remaining kidney hatches in the garbage store. Personnel entered with BA and extension masks. However, subsequent testing resulted in no detection of toxic gas.
70. On completion of the investigation following Incident Three, witness 2 directed the OOD to establish a rope barrier with a sign to be placed at the bottom of the ladder in 3M, indicating that access to the emergency steering compartment is permitted only with a Quattro.⁸⁸ The sea safety event (SSE) signal corroborates the response, stating "SS are required to only access 3M with gas alert Quattro in possession" and "SS to evacuate the [compartment] immediately upon detection of CO".⁸⁹
71. In addition, witness 2 directed through the ME department night orders that personnel were to access 3M only with a Quattro, and if there were an incident or the Quattro alarmed, they were to follow the correct process, and involve the duty watch.

⁸³ Exhibit C, pg 21.

⁸⁴ Exhibit C, pg 20.

⁸⁵ The team consisted of two personnel wearing DCBA and ME SR (Witness 25)

⁸⁶ The Court established measures were put in place post Incident Three – see heading "Incident Three Investigation".

⁸⁷ Exhibit C, pg 22, see heading "Had the OOD/AOOD reported the incident to you prior to this?"

⁸⁸ Exhibit X, pg 22.

⁸⁹ Exhibit R, pg 2, para 6.

72. It is the Court's opinion that there was sufficient rigour and determination by SS to continue searching for the source of the CO. Witness 2 recognised the need to establish a temporary boundary with a warning sign, and for personnel to carry a Quattro device when entering 3M.
73. **Subject Matter Expert Testing.** The Director Naval Safety (DNS)⁹⁰ directed an investigation⁹¹ take place iaw DFI 0.71, Part 3, art 3.3.6, with the investigation team consisting of witness 20 from Navy Occupational Safety and Health (NAVOSH) and Subject Matter Experts (SMEs) from Air Matters Limited. The investigation team met TEM alongside Tauranga on 01 Dec 22.
74. SS worked with the NAVOSH investigation team. On completion of the testing, no toxic gas had been detected. The SMEs provided a comprehensive report dated 16 Dec 22,⁹² which confirmed that there were no detectable levels of CO or H₂S gases.⁹³
75. While the testing was thorough, the Court observes that it was not possible to replicate fully the conditions at the time of Incidents One to Three, including the machinery configuration. Witness 4 noted that TEM's forward STP was processing but the aft STP was not.⁹⁴ It is unknown whether this was a change of configuration following any of the incidents and, if so, when that change occurred.
76. **Summary of Testing Carried Out.** It is the Court's opinion that SS carried practical and common-sense investigations: namely, by personnel wearing BA sets, with air on, and initially using a Quattro and then the Multi Rae to search for CO. The robustness of the investigation was further enhanced through the engagement of independent SMEs.

Steps Taken to Prevent Further Exposure to Toxic Gas

77. After incident three, the ship established procedures to treat compartment 3M as a controlled environment, which included:⁹⁵
 - a. keeping the hatch to 3M closed, roped off, with a red warning light on top, limiting access to personnel who required it as part of their duties;
 - b. personnel entering were to do so in pairs, with one remaining outside the compartment, and the one entering carrying a Quattro and Emergency Escape Breathing Device (EEBD); and
 - c. the Officer of the Watch (OOW) was to be informed of personnel entering and exiting the compartment.
 - d. modifying the steering gear failure SOP to have personnel (after completing initial checks) waiting outside compartment 3M at the aft DC station until they were required to enter 3M, with an extra person then monitoring from outside the compartment.

⁹⁰ Exhibit S, pg 1.

⁹¹ A screen level testing of air quality in 3M was carried out. The testing took place while TEM was alongside Tauranga on 01 Dec 22. During the test, the ship was configured as close as possible to replicate normal onboard conditions, albeit with the possible limitations described at paragraph 75 above.

⁹² Exhibit AB.

⁹³ Exhibit AB, pg 7, para 5.

⁹⁴ RNZN Witness 4, pg 17, lines 26 to 28.

⁹⁵ Exhibit S, pg 3.

78. It is the Court's opinion that the implementation of these procedures provided the ship with sufficient control of access to compartment 3M, thereby minimising the risk of CO exposure.
79. After the incidents, the Commanding Officer also issued a directive which detailed measures to ensure the ongoing safety of ship's company when entering 3M.⁹⁶ The measures included:
 - a. utilising the man below system (Velcro name tag to be placed at the entry to the compartment);
 - b. personnel to carry EEBDs; and
 - c. a Multi Rae device was left powered and continuously operating within the compartment.

Efficacy of Applicable SOPs

80. The Court did not hear any evidence to question the efficacy of SOPs.
81. The Court does note, however, that toxic gas SOPs are generally designed for compartments containing known potential sources of toxic gas, where potential exposure to toxic gas is anticipated to be a risk, and which tend to have fixed toxic gas detection systems.
82. The same compartments are used to drill and evaluate the ship's responses to toxic gas incidents. In particular, the SOPs omit steps for the initial raising of an alarm in circumstances where toxic gas is detected in other compartments or by non-fixed systems.

MEDICAL

Casualties

83. There were no reported injuries or adverse effect resulting from Incidents One and Three. Although an alarm from a Quattro initiated Incident Three, there is no evidence that CO was present when personnel entered compartment 3M or, if so, that they were affected by it.
84. The Court has established that witnesses 10 and 11 are the only personnel to have been exposed to CO and to have sought, and received, clinical treatment following Incident Two. As detailed below, the Court has concluded that witnesses 10 and 11 did not receive any somatic injury from Incident Two but have suffered neurofunctional sequelae from a belief in potential harmful exposure and perceived inadequacies in the response to Incidents One and Two.

Nature and Extent of Injuries

85. Witnesses 10 and 11 have had ongoing symptoms consistent with – but not exclusive to – CO exposure. These symptoms have included headaches, sleep disruption, poor concentration, anxiety, and poor general wellbeing.⁹⁷

⁹⁶ Exhibit AR, pg 1.

⁹⁷ Exhibit AJ, **Quartermaster** and Exhibit AK – **s. 9(2)(a)** medical reports.

86. The evidence received indicates it is *highly unlikely* that witnesses 10 and 11 were rendered unconscious by exposure to CO or any other detectable toxic gas. The Court is led to this conclusion based on the following evidence received:

- a. **Likely Exposure Time.** For Incident Two, the Quattro detected CO for a period of only 72 seconds,⁹⁸ during which time the CO level increased from 0 ppm to 48 ppm at its maximum and then plateauing (see Figure 3).⁹⁹



Figure 3 – CO Reading 24 Nov 22

- b. The correlation between exposure levels, times and potential consequences are set out at Table 1 below. Witness 8 also gave expert evidence that the effects of CO exposure are dependent on the combination of the severity and time of the exposure.¹⁰⁰
- c. The evidence of witnesses 10 and 11 was that they were unconscious prior to the Quattro alarming, meaning they would have to have been rendered unconscious at CO levels less than 20ppm.¹⁰¹
- d. **Device In Date for Calibration.** During Incident Two, gas detection equipment (a Quattro) was present, on and monitoring for the entire duration that witnesses 10 and 11 were in the compartment.¹⁰²
- e. The gas detection equipment in use was in date for calibration,¹⁰³ and was placed between witnesses 10 and 11. No other toxic gas was detected during any of the incidents in compartment 3M.

⁹⁸ Exhibit DJ, 3M Carbon Dioxide readings – 24 Nov 22.

⁹⁹ Exhibit CX, pg 3. Air Matters report – Quattro monitor readings

¹⁰⁰ RNZN Witness 8, pg 9, lines 1 to 5.

¹⁰¹ Exhibit BU, pg 1. The alarm 1 (low level) is 20ppm. The alarm 2 (high level) is 100ppm.

¹⁰² Exhibit BC displays the position of the Quattro QA113-022209 in relation to Witness 10 and 11

¹⁰³ Exhibit CJ, pg 2, Quattro QA113-022209 device calibration certificate.

- f. **Work Safe New Zealand CO Guidelines.** The WorkSafe Carbon Monoxide Quick reference guide states that exposure to CO at the level of 100 ppm would only be likely to produce a headache after an exposure of two to three hours,¹⁰⁴ while unconsciousness would be likely to arise at 800 ppm within two hours of continuous exposure. However, unconsciousness would be preceded by headache, dizziness, nausea and convulsions within 45 minutes of exposure, a point also made by witness 8.¹⁰⁵

Concentration of CO in the Air	Symptoms that may occur at this concentration	Incident Two
35 ppm	Headaches and dizziness within 6-8 hours of continual exposure.	Quattro QA113-022209 device recorded an increase from 0 to 48 ppm over a period of 72 secs.
100 ppm	Headache within 2-3 hrs.	
200 ppm	Headache within 2-3 hrs, loss of judgement.	
400 ppm	Headache within 1-2 hrs	
800 ppm	Headache, dizziness, nausea and convulsions within 45 minutes ; unconscious within 2 hours .	Witnesses 10 and 11 claim they were rendered unconscious for a period of 20 minutes. Quattro QA113-022209 device recorded max 48 ppm in 3M at the time of claimed unconsciousness.
1600 ppm	Headache, accelerated heart rate, dizziness and nausea within 20 minutes; death in less than 2 hours.	
3200 ppm	Headache and dizziness and nausea within 5-10 minutes; death within 30 minutes.	
6400 ppm	Headache and dizziness in 1-2 minutes; convulsions, breathing stops, and death in less than 20 minutes.	
12800 ppm	Unconsciousness after 2-3 breaths; death in less than 3 minutes.	

Table One – Work Safe NZ Carbon Monoxide Quick Reference

¹⁰⁴ Exhibit DW. Work Safe NZ CO Quick Reference.

¹⁰⁵ RNZN Witness 8, pg 14, lines 8 to 17.

- g. **Subsequent Symptoms Inconsistent with Unconsciousness.** The Court heard evidence from witness 8,¹⁰⁶ which indicated that the symptoms experienced by witnesses 10 and 11 immediately after regaining consciousness were inconsistent with CO exposure,¹⁰⁷ noting that:
- (1) witnesses 10 and 11 did not display any other neurological symptoms before or after unconsciousness;¹⁰⁸
 - (2) if witnesses 10 and 11 had been exposed to a level of CO sufficient to cause unconsciousness, it is highly unlikely that they would have regained consciousness in the same environment with only an audible alarm;¹⁰⁹ and
 - (3) significant CO exposure causing unconsciousness would result in significant impairment to motor skills,¹¹⁰ which were not present (witnesses 10 and 11 were able to relocate unaided from 3M to the Petty Officers' mess and then to the ship's sickbay¹¹¹ for a medical assessment by witness 1).
- h. As part of the immediate medical assessment, witness 1 observed that witnesses 10 and 11 appeared alert. Witness 1 considered witnesses 10 and 11 to have been shocked about the incident,¹¹² but that they otherwise seemed fine. Witness 1 ascribed the alertness of witnesses 10 and 11 to an adrenaline rush, but witness 8 relevantly gave evidence that it is hard to override the physiologic process through adrenaline, concluding that the physical effects of CO poisoning cannot be overcome by adrenaline.¹¹³
- i. Witness 28 estimated the period of unconsciousness to have been 20 minutes, based on an assumption of a recorded lowered heart rate from witness 11's smartwatch.¹¹⁴ In considering the lowered heart rate, witness 8 provided evidence to the effect that:
- (1) a lowered heart rate is consistent with being asleep, whereby the body prepares for sleep by decreasing the stress hormones, decreasing the sympathetic nervous system and decreasing the parasympathetic nervous system. The parasympathetic nervous system specifically drops one's heart rate, blood pressure, and body temperature;¹¹⁵

¹⁰⁶ Witness 8 is a physician trained in the United States of America, who is board certified in emergency medicine and medical toxicology with expertise in patient care, medical research and graduate medical education. Witness 8 s. 9(2)(a)

¹⁰⁷ Witness 8 reviewed medical records for witnesses 10 and 11 (exhibits AK and AJ) prior to being interviewed at s. 9(2)(a), Dunedin, on 16 Aug 24.

¹⁰⁸ RNZN COI Witness 8, pg 14, lines 8 to 17.

¹⁰⁹ RNZN COI Witness 8, pg 15, lines 1 to 14.

¹¹⁰ RNZN COI Witness 8, pg 18, lines 1 to 7.

¹¹¹ Exhibit C, pg 25.

¹¹² Exhibit C, pg 25.

¹¹³ RNZN COI Witness 8, pg 35, lines 15 to 21.

¹¹⁴ Witnesses 10 and 11 were referred to Witness 28 to carry out a neuropsychological assessment (witness 10: 18 Jan 23 and witness 11: 8 and 10 Feb 23).

¹¹⁵ RNZN COI Witness 8, pg 41, lines 1 to 5.

- (2) if both witnesses were rendered unconscious due to CO exposure, then they would likely have been in a comatose state, presenting as tachycardic, which results in a faster heart rate;¹¹⁶
- (3) having a lower heart rate during unconsciousness, as a result of sufficient CO exposure to cause a comatose state, is incongruent except in circumstances where the individual is perimortem, ie he or she is dying.¹¹⁷

87. **Non-Pathognomonic Symptoms.** The symptoms experienced by witnesses 10 and 11 subsequent to the incidents are not pathognomonic with CO exposure; meaning, witnesses 10 and 11 displayed a collection of symptoms that are not related exclusively to CO exposure but may be generic to a range of possible afflictions.¹¹⁸
88. The Court did not receive any evidence which linked the symptoms experienced by witnesses 10 and 11 to CO exposure or the effects of CO exposure at any significant level of concentration for a sustained period of time. While exposure to 800ppm of CO will lead to unconsciousness within two hours of exposure, the physical symptoms at this concentration would include headache, dizziness, nausea and convulsions within 45 minutes. Both witnesses were exposed to a recorded CO level of only 48ppm. Neither witness reported any of the precursor symptoms to be expected of CO exposure at a level sufficient to render a person unconscious.

What are the Long Term/Ongoing Effects?

89. Notwithstanding the Court's conclusions above, witnesses 10 and 11 presented as honest in their belief that they were rendered unconscious by toxic gas.
90. The injuries described by witnesses 10 and 11 fell into two distinct categories: injuries immediately after Incident Two and ongoing injuries. These are addressed separately below.
91. **Injuries immediately after Incident Two.** Approximately 10 minutes after both witnesses 10 and 11 were examined by witness 1 following Incident Two, they reported similar symptoms of severe headaches and feeling "spacey".¹¹⁹ These symptoms persisted into the evening of 24 Nov 22 for both witnesses.
92. **Ongoing Injuries.** The Senior Medical Officer, Defence Health Centre, Devonport requested a neuro-psychological assessment (NPA) for each of witnesses 10 and 11, to determine whether there had been a neurocognitive impact from Incidents One and/or Two. A second assessment was carried out, approximately 12 months later, to determine if there had been any improvement in neurocognitive outcomes:
- a. **First Assessment.** Witness 27 carried out the NPA on witness 10 on 18 Jan 23; witness 28 carried out the NPA on witness 11, on 08 and 10 Feb 23.¹²⁰

¹¹⁶ RNZN COI Witness 8, pg 41, lines 11 to 14.

¹¹⁷ RNZN COI Witness 8, pg 41, lines 18 to 19.

¹¹⁸ RNZN COI Witness 8, pg 18, lines 22 to 30.

¹¹⁹ Exhibit C, pg 4.

¹²⁰ Exhibit AJ, pg 8-13 and exhibit AK, pg 14-20 respectively.

- b. **Second Assessment.** Witness 28 carried out the NPA on witness 10 on 07 Mar 24; witness 27 carried out the NPA on witness 11 on 13 Feb 24.¹²¹
93. Because the establishment of a baseline for both NPAs was necessarily subjective, the Court requested a peer review be carried out by SMEs, witness 18 and witness 26,¹²² to assist the Court in analysing the assessments' findings and to reconcile the NPAs with the evidence of the levels of exposure to CO.
94. The peer reviews and expert witness interviews revealed limitations in the way the NPAs were undertaken, and the types of testing utilised, which call into question the conclusions of the NPAs and the treatment subsequently recommended.¹²³
- a. The conclusions in the NPAs relied upon a premorbid level of functioning (the baseline), which was subjective in that it relied upon descriptions of premorbid ability described by witnesses 10 and 11 themselves.
 - b. As a result, premorbid cognitive ability may have been over-estimated. A higher baseline, contrasted with subsequent testing results, may then have created an appearance of impairment or greater impairment than may have been the case. A more precise assessment of baseline cognitive ability would have provided a more accurate view of any actual impairment.
 - c. The NPAs contained little detail around the educational history of witnesses 10 and 11, and it does not appear that testing specifically designed to estimate the baseline level of function (e.g. National Adult Reading test, Test of Premorbid Function) were administered.
 - d. The NPAs assumed as a starting point that both witnesses 10 and 11 were rendered unconscious as a result of CO exposure. It is the Court's view that this assumption influenced the assessments by witnesses 27 and 28 that there was a sufficient level of CO to render both witnesses unconscious and therefore the ongoing symptoms described by witnesses 10 and 11 were directly caused by exposure to CO.¹²⁴
 - e. There was no evidence of memory impairment, which is an area that tends to be susceptible to the effects of cerebral hypoxia.
 - f. The NPA did not include any psychometric evaluation of affective function or personality. This would have assisted the analysis by identifying mood-related factors and/or traits/dispositions (health anxiety/somatoform tendencies) that may have influenced the presentation, symptom reporting and cognitive test findings resulting from the NPA. Witness 26 provided a view that, in cases where non-specific symptoms are present, carrying out a personality assessment to tease out different aspects of personality traits:

¹²¹ Exhibit AJ, pg 31-35 and exhibit AK, pg 49-55 respectively.

¹²² Exhibit CN, Dr s. 9(2)(a) CV and exhibit ED, Dr s. 9(2)(a) CV.

¹²³ Exhibit EE and RNZN COI Witnesses 18 and 26.

¹²⁴ IAW Worksafe CO quick reference at Table One, 800ppm is the level of exposure that will render a person unconscious over a period of two hours.

- (1) would have determined if there is a tendency towards hypochondriasis – if someone is likely to present with physical manifestations of stress, is very health focused, and/or is symptom aware and symptom focused, this may itself create a pattern of symptom vigilance, more symptoms, and more anxiety about those symptoms;¹²⁵ and
 - (2) identify any anxiety traits, whereby physical symptoms may be caused by anxiety rather than physical injury or illness, if there is:¹²⁶
 - (a) a predisposition, or a vulnerability, towards higher than normal levels of anxiety in stressful circumstances; or
 - (b) a predisposition to catastrophise circumstances.
 - g. Symptom validity was not explored sufficiently (through assessment) to understand the extent to which the reported symptoms and experiences are a true reflection of the results of an experience, or if symptoms are being over-reported or exaggerated for any reason.¹²⁷
95. **Conclusion.** The Court accepts that witnesses 10 and 11 have suffered some temporary impairment and has not seen any evidence to suggest malingering. However, the Court is of the view that, given the level of established CO exposure in conjunction with the peer review findings, the impairments reported at Exhibits AJ and AK are not the direct result of CO exposure.
96. Rather, it is more likely that both witnesses 10 and 11 believed they were exposed to a traumatic event (index event) and this has resulted in the development of a neurofunctional disorder or Post Traumatic Stress Disorder, caused by:¹²⁸
- a. a belief (albeit mistaken) that witnesses 10 and 11 were exposed to harmful levels of CO during Incident One and/or Incident Two;
 - b. having no control over being exposed to the same risk to health and life as a result of being required to close up in compartment 3M on 24 Nov 22 despite Incident One on 23 Nov 22;
 - c. the view of witnesses 10 and 11 that the initial medical response on 24 Nov 22 was inadequate, due in part to the failure to treat them immediately with high-flow O₂;
 - d. the view of witnesses 10 and 11 that they ought to have been immediately referred for higher medical treatment, including O₂ treatment under hyperbaric conditions;¹²⁹ and
 - e. the views of witnesses 10 and 11 that:
 - (1) the RNZN has failed in its duty of care to ensure appropriate ongoing medical care; and/or

¹²⁵ RNZN COI Witness 26, pg 24 lines 15 to 25.

¹²⁶ RNZN COI Witness 26, pg 25 lines 14 to 24.

¹²⁷ RNZN COI Witness 26, pg 24 lines 26 to 32

¹²⁸ RNZN COI Witness 26, pg 26 lines 23 to 31, pg 27 lines 1 to 32,

¹²⁹ The information upon which these views are based was received by witnesses 10 and 11 subsequent to Incident Two, beginning with their referral to Wellington Hospital on 25 Nov 22.

- (2) The RNZN has failed to treat the incidents with appropriate seriousness and urgency.¹³⁰

What medical care was provided to the casualties following the incident, including care provided external to the NZDF?

97. Witnesses 10 and 11 received the following medical care following Incident Two:
- a. Witness 1 carried out a medical examination, including observations in the ship's sickbay;

s. 9(2)(a)

Establish the extent to which the provision of medical treatment was in accordance with applicable orders and best medical practice, and identify any deficiencies?

98. The Defence Medical Treatment Protocols (DMTP) clinical practice guidelines are to be used by NZDF clinical practitioners, which included witness 1 at the time of the incidents.¹³³
99. The provision of immediate medical care by witness 1 did not strictly follow the approved DMTP, dated July 2022. In particular:
- a. following Incident Two, witness 1 did not consider seeking medical practitioner attention iaw with DMTP Red Flags; ¹³⁴ and
 - b. witness 1 did not administer high flow O₂,¹³⁵ as prescribed by the DMTP treatment protocol.¹³⁶
100. The Court's opinion is that best medical practice would have required:
- a. witnesses 10 and 11 to have been referred for higher medical treatment immediately after the examination by witness 1 given the apparent exposure to CO and the report of unconsciousness – this did not occur until more than 24

¹³⁰ RNZN COI Witness 10, pg 9 lines 2 to 5.

¹³¹ Exhibit AJ, pg 11.

¹³² Witnesses 10 and 11 medical reports at Exhibits AK and AJ respectively, details the external agencies utilised.

¹³³ RNZN Witness 14.

¹³⁴ Exhibit BY.

¹³⁵ Exhibit CA.

¹³⁶ Exhibit BZ.

hours after Incident Two, and only as the result of witnesses 10 and 11 reporting ongoing symptoms; and

- b. the administration of high flow O₂ following Incident Two, although witness 8 observed there is little medical evidence establishing that the administration of high-flow O₂, whether under hyperbaric or isobaric conditions, improves the outcomes of people who have been exposed to CO.¹³⁷
101. Witness 1 did not follow the DMTPs, but he observed that witnesses 10 and 11 were both alert and asymptomatic. Witness 1 also recalled being aware that the level of CO detected was only 48ppm.¹³⁸ However, the fact that witnesses 10 and 11 reported having been rendered unconscious ought to have been considered by witness 1 as a significant factor in determining the appropriate medical treatment.
102. The Court also observes that, by not broadcasting a toxic gas incident or responding in the normal way as prescribed by SOPs, the ship did not move to a heightened state of responsiveness. This impacted actions at the individual level, including for witness 1,¹³⁹ by failing to trigger the normal, trained responses to a toxic gas incident.

EQUIPMENT

What equipment and training were provided to ship's company in order to mitigate the risk of toxic gas exposure?

103. The Court heard evidence that ship's staff received continuation toxic gas training prior to the three incidents occurring, including a tabletop exercise, a materiel check, and a sea safety and readiness exercise (SARC) in Sep 22. The ship was assessed as "Safe" during the SARC, with only minor deficiencies identified.¹⁴⁰
104. There is no evidence to suggest that the ship's level of training to respond to a toxic gas incident was deficient in any way.
105. The Court noted that there is no toxic gas training specifically for compartment 3M, as this compartment was not known to contain any potential source of toxic gas or to be a location where exposure to toxic gas is anticipated to be a significant risk. The Court recommends that toxic gas training be expanded to include responding to incidents in compartments other than those containing known sources of potential toxic gas exposure.
106. The equipment available for responding to toxic gas incidents included DCBAs, EEBDs, Quattros and a Multi Rae. The evidence suggests that the Quattro was functioning correctly, as:
- a. it detected CO during Incidents One and Two;

¹³⁷ RNZN Witness 8, pg 10, lines 27 to 28 and pg 26, lines 22 to 26.

¹³⁸ Exhibit C, pg 25.

¹³⁹ Exhibit C, pg 26: witness 1's TEM CI statement notes: s. 9(2)(ba)(i)

¹⁴⁰ RNZN CO Witness 12, Exhibits BD, BF, BG, BH, BI, BJ, BK, BL, BM, BN, BO, BP, BQ, BS, and BT.

- b. it was in date for calibration, having been calibrated on 22 Aug 22 and not being required for recalibration until 18 Feb 23;¹⁴¹ and
 - c. the data downloaded from the Quattro appeared to show normal operation and activation of alarms.
107. The Court has not been presented with any evidence to suggest that equipment or property has been damaged as a result of any of the three incidents.

REPORTING

What onsite and reporting actions were taken following the injury to the causalities?

108. The actions taken following Incidents One and Two, and the reporting within TEM following each incident, are described above.

To what extent were notification procedures carried out in accordance with relevant orders, policies and procedures? Specifically, has WorkSafe been notified? Record how and when notification occurred?

109. **Applicable Reporting Procedures.** The applicable reporting procedures are:
- a. **Naval Forces General Orders (NFGOs).** Part 3, Chapter 4, Section 1, Article 3.4.06(f), (g) and (m).
 - b. **NZ SUPP 029 to BRd 2170(1)** – Reporting and Incident Severity of Fires, Floods and Toxic Gas Incidents;¹⁴²
 - c. **Maritime Component Commander's Operational Orders.** NZBR 97, Chapter 23 – Safety Management and Reporting; and
 - d. **Safety Investigations.** DFI 0.71 – NZDF Safety Management System Framework.¹⁴³
110. **Actions taken iaw Relevant Procedures.** SS took the following reporting actions:
- a. RNZN 1s were raised for Incidents One and Two.¹⁴⁴ These were submitted iaw NFGOs Part 3, Chapter 4, Section 1, Article 3.4.06(f) and (g).
 - b. Although no QUICKREP was raised iaw NZ SUPP 029, a Sea Safety Event (SSE) signal was raised for Incident Two on 24 Nov 22 and released on 25 Nov 22.¹⁴⁵ This was submitted iaw NFGOs Part 3, Chapter 4, Section 1, Article 3.4.06(m), and included a sufficient description of the incident.
 - c. A NOTICAS signal was raised after witnesses 10 and 11 were referred for external medical assessment. This was submitted iaw NZBR 97, Chapter 23, Article 23.05(g).

¹⁴¹ Exhibit CJ, pg 2, Quattro QA113-022209 device calibration certificate.

¹⁴² Exhibit BO.

¹⁴³ Exhibit DO.

¹⁴⁴ Exhibits F and G.

¹⁴⁵ Exhibit R.

- d. A Critical Incident Notification (CIN) was released by the CO to HQJFNZ Maritime Operations on 25 Nov 22.¹⁴⁶ This was submitted iaw NFGO Part 6, Chapter 3, Article 6.3.08(b).
- e. WorkSafe was notified of Incident Two via the WorkSafe online notifiable event submission at 1409 on 25 Nov 22.¹⁴⁷ WorkSafe subsequently confirmed on 15 Dec 22 that its decision was to not intervene and the file was to be closed.¹⁴⁸

PREVIOUS INCIDENTS

Describe any similar incidents involving toxic gas which have occurred on either TEK or TEM in the 3M compartment before or after incidents on 23-25 Nov 22?

- 111. The Court has not received evidence that indicates that there have been toxic gas incidents in compartment 3M onboard TEK or TEM before or after the three incidents.

What actions were taken to identify the cause of the incidents and were they successful?

- 112. Following the incidents, TEM carried out a thorough investigation (including the use of external SMEs, Air Matters Limited) into identifying the source of the CO detected within 3M. The source of the CO was not identified.
- 113. **Toxic Gas Incidents in 3K Heads and Bathrooms (August 2002).** The Court heard evidence from witness 5 that toxic gas was detected in 2002, in TEK's compartment 3K heads and bathrooms.¹⁴⁹ This was reported with initial CO levels measured at 65 ppm, which spiked to 1000+ ppm when drain water traps were lifted.¹⁵⁰
- 114. [This paragraph is contained in the classified addendum]
- 115. The Court has not received any evidence that that, when TEK detected CO in compartment 3K in 2002, toxic gas was also detected in the 3MZ2 garbage store of either TEM or TEK.
- 116. **Identifying Source of Toxic Gas in 3K.** A thorough investigation (Aug 02 to Jul 03) by TEK, Captain Fleet Support (CFS) organisation and the Sewage Treatment Plant (STP) manufacturer identified the source of CO as emanating from the aft STP.¹⁵¹ The likely source was determined to be the electrocatalytic cell (Book Cell), which creates excess CO that builds up in V2 and then V1 and discharged the CO via associated pipework into the 3K heads and bathroom.¹⁵²

¹⁴⁶ Exhibit O.

¹⁴⁷ Exhibit CY.

¹⁴⁸ Exhibit DA.

¹⁴⁹ Exhibit AP, pg 4.

¹⁵⁰ Exhibit AP, pg 5, OPDEF KH 49/03 3K Bathroom – Safety Issue – Toxic Hazard, para 4A.

¹⁵¹ Exhibit AP.

¹⁵² Exhibit AP, pg 11 para 3.

117. **Relevance to TEM CO release into 3M (Nov 22).** The 2002 toxic gas incident in TEK is of relevance to the 2022 toxic gas incidents in TEM due to the fact that 3K and 3M are linked by a common grey-water piping system.¹⁵³ That system captures dirty (but not biologically dangerous) water from deck drains, which flows into a grey water tank for processing (if configured to do so) by the aft STP unit.¹⁵⁴

Describe what measures were recommended to prevent recurrence and to what extent they have been implemented?

118. An engineering solution via Configuration Change Proposal (CCP) 2095¹⁵⁵ was developed from the investigation into the toxic gas incident in TEK, with a barometric leg being installed in TEK to mitigate the risk of CO gas emanating from STP into the compartment 3K heads and bathrooms.
119. The same engineering solution was not replicated in TEM.¹⁵⁶ The evidence indicates that this was due to the absence of any report of toxic gas in TEM's heads or bathrooms.¹⁵⁷
120. However, modifications to TEM were made during TEM's first selected restricted availability (SRA) period in FY 23/24 (TEMS123),¹⁵⁸ where a large U-bend was installed in the main gravity line to the aft STP (to match TEK s. 6(a) [REDACTED]). The drain line receives grey water from the 3M garbage store deck drains and the 3K heads and bathroom deck drains.
121. Following the toxic gas incidents, witness 5 contacted witness 2 and requested that TEM check the:¹⁵⁹
- a. 3M garbage store deck drain top-hats are topped up with water;
 - b. grey line and associated air injectors into the STP; and
 - c. garbage store sink S-bend is topped up with water.
122. Witness 5 indicated that to the best of his knowledge, there is currently no maintenance routine within the Fleet Maintenance Management System (FMMS) to regularly top up deck drain top-hats with water.¹⁶⁰

¹⁵³ Exhibit AV.

¹⁵⁴ Exhibits AX.

¹⁵⁵ Exhibit AF.

¹⁵⁶ Exhibit AO, pg 6, para 3.

¹⁵⁷ Exhibit AO, pg 6, para 3.

¹⁵⁸ Exhibit AR, pg 1.

¹⁵⁹ RNZN COI Witness 5, pg 5, lines 18 to 21 and pg 6, lines 8 to 15.

¹⁶⁰ RNZN COI Witness 5, pg 8, lines 6 to 9. The Court was not presented with evidence to suggest the 3M garbage store deck drain top-hats and the sink S-bend were topped up with water.

RECOMMENDATIONS AND COMMENTS

Make recommendations that will help prevent similar injuries occurring to others in the future.

123. An engineering change has already been made which will minimise the risk of CO emanating from the aft STP to 3M (or to other grey water drains connected to the aft STP),
124. **Recommendation One – Maintenance of Deck Drain Top Hats.** To further minimise the risk of CO emanating from the aft STP to 3M, the Court recommends that:
 - a. the Defence Logistics Command (Maritime) reviews FMMS to identify whether there is a maintenance routine which informs ship's staff regularly to check deck drain top-hats and the 3M garbage store sink S-bend are topped up with water, as required; and
 - b. if not, to institute such a maintenance routine.
125. This will create an additional barrier to the release of toxic gas from the grey water system into 3M.
126. **Recommendation Two - Adhering to SOPs.** The RNZN routinely carries out procedural based training (such as dealing with toxic gas) to assist personnel to become familiar with equipment, its use, and importantly, to heighten their response to deal with an incident.
127. The Court concludes that the toxic gas SOP should have been followed for all three incidents, as this would have:
 - a. heightened the ship's response to the incident;
 - b. triggered practised responses from the ship's company, including the medical response;
 - c. ensured all members of the ship's company were aware that CO had been detected in 3M and therefore the potential for risk in that compartment;
 - d. avoided or minimised the risk of exposure to other members of the ship's company;
 - e. allowed for a gradual response de-escalation, as greater situational awareness was understood by the damage control organisation; and
 - f. enabled the Commanding Officer to understand the emerging nature of incidents so that informed decisions could be made.
128. The Court recommends that the Maritime Component Commander (MCC) forwards a copy of the Court's findings and recommendation on this issue to Commanding Officers of sea-going units, with a directive that immediate actions following a toxic gas incident are to adhere to SOPs. Commanding Officers may subsequently direct a response to an incident which departs from SOPs if the circumstances warrant it, e.g. to prioritise another evolution.

129. **Recommendation Three - Dealing with Future Neuropsychological Assessments.**

Witness 28 highlighted to the Court that further information for the NPAs had been requested but not provided by the NZDF.¹⁶¹ The Court considers that the information requested would have provided a more holistic view of the individuals under assessment, enabling the establishment of a more accurate baseline.

130. The Court recommends that:

- a. where the assessment and/or treatment of any member of the NZDF is referred to an external agency, the local DHO liaises with the patient and external agency to ensure information requested by the medical practitioner is provided in a timely manner, subject to any consent required from the patient; and
- b. the MCC forwards a copy of the Court's findings and recommendation on this issue to Director Defence Health (DDH) and Chief Medical Officer; and
- c. DDH appropriately promulgates directions to ensure that, where engaged, external agencies have sufficient information to provide the NZDF with the most accurate medical diagnosis.

131. Information to be provided to medical practitioners may include cognitive and/or behavioural testing and/or assessment undertaken at any time, whether prior to, or after, recruitment. For any information which would ordinarily be withheld from the member, appropriate confidentiality protocols may need to be agreed between the NZDF and the medical practitioner.

132. **Recommendation Four – Management of Members Who Post or Transfer.** Witness 11 considered the communication from the RNZN, and the management and coordination of his treatment, to have been poor once he posted on parental leave.¹⁶² Witness 11 did not receive emails regarding his NPA, which were sent to his DIXS email account; witness 11 also subsequently had to make his own logistical arrangements for rehabilitation treatment.

133. It is recommended that:

- a. DHO review its processes for the management and coordination of treatment of members, especially those who post on leave, transfer Services (including to the Reserve), or are released from the Service subsequent to an incident requiring any future or ongoing assessment and/or treatment; and
- b. the MCC forwards a copy of the Court's findings and recommendation on this issue to DDH.

134. **Recommendation Five - Further NPAs.** Witness 26 considered that, if the symptoms experienced by witnesses 10 and 11 were ongoing, they should undergo a comprehensive neuropsychological review by an experienced clinician who is able to incorporate personality (e.g. MMPI-2) and mood assessment into the analysis, as well as a detailed symptom validity evaluation.¹⁶³ A more in-depth examination of attention functions, working memory, speed of processing and executive functions would be

¹⁶¹ RNZN COI Witness 28, pg 25, lines 11 to 19.

¹⁶² RNZN Witness 11, pg 21, line 24 to pg 22, line 1 and pg 24, lines 18 to 22.

¹⁶³ Exhibit EE, pg 6.

informative, as the outcome of testing would provide a more accurate baseline assessment.

135. It is recommended that:

- a. witnesses 10 and 11 are given the option to undergo a revised NPA, at the RNZN's expense, if their symptoms are ongoing. Decisions on any further treatment can then be made based on the findings of that NPA; and
- b. the MCC forwards a copy of the Court's findings and recommendation on this issue to DDH.

Comment on any further matters which the court considers relevant to the purpose of the inquiry?

136. Nil.

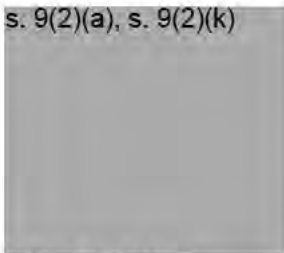
Security classification

137. The Court considers iaw s 200R(5) that all aspects of this Recording of Proceeding, bar two, can be designated with the IN-CONFIDENCE privacy marking. The remaining aspects are separately recorded in an appropriately classified addendum to this Report iaw s 200R(4). The Court has adopted this approach rather than having the entire Report classified.

138. The Court recommends the Maritime Component Commander re-classify MCC Minute 206/2024 as STAFF-IN-CONFIDENCE.

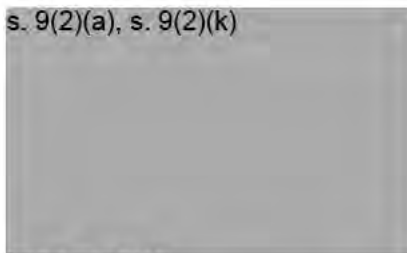
Dated at Devonport Naval Base this 4th day of July 2025

s. 9(2)(a), s. 9(2)(k)



CAPT, RNZNR
President, Court of Inquiry

s. 9(2)(a), s. 9(2)(k)



CDR, RNZN
Member, Court of Inquiry

**ADDENDUM
TO THE
REPORT OF THE COURT OF INQUIRY
REGARDING
TOXIC GAS INCIDENTS BETWEEN 23-28 NOVEMBER 2022 IN HMNZS TE MANA**

This addendum contains an Addendum to the Report of the Court of Inquiry which is considered to necessitate a security classification iaw s 200R(4).

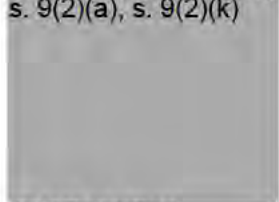
General

s. 6(a)



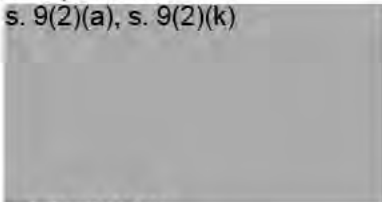
Dated at Devonport Naval Base this 4th day of July 2025

s. 9(2)(a), s. 9(2)(k)



CAPT, RNZNR
President, Court of Inquiry

s. 9(2)(a), s. 9(2)(k)



CDR, RNZN
Member, Court of Inquiry

COMMENTS BY ASSEMBLING AUTHORITY

I have reviewed the COI report and accept the findings as reported.

I approve the recommendations of the inquiry and direct that these are to be taken for action as described.

In addition, the Sea Safety Training Squadron and Maritime Training Group are to take the recommendation at para 105 for action to ensure Toxic Gas training is provided for application for all compartments on board ships to ensure Standard Operating Procedures (SOP) are consistently applied as described by me on P3 of the report.

SOP are issued for the guidance of all concerned. They have been developed over time, to assist in the safe and efficient conduct of the wide range of ship operations (including training), and detail the procedures that are normally to be followed by Ship's Companies. Unless there is a good reason to deviate from these instructions they should be followed, to ensure consistency, efficiency and safety.

Therefore, Ships should adhere to SOPs, regardless of ship's evolutions underway, to enable Command to understand the risks and make an informed decision on how to prioritise the incident management against the evolution being undertaken (see paras 60 and 128). Action - XO MCC

Toxic Gas training shall be provided for application of SOPs and IA for all compartments of ships given the confined nature of ship design (see paras 81 and 105). Action - CO MTG.

Advice on CCP 2095 installation in TEM, as per TEK's modification, is to be sent to MCC. Action - NCF SAM.

MCC Minute 206/2024 dated 29 July 2024 is to be reclassified as Staff-In-Confidence – Action XO MCC.

s. 9(2)(k)



/ S ARNDELL
CDRE, RNZN
MCC

Dated at HQJFNZ on 25 Jul 2025

REPORT OF THE COURT OF INQUIRY

Investigating the circumstances surrounding two RNZAF UNIMOG 1700L, s. 9(2)(k) (Whenuapai) and s. 9(2)(k) (Woodbourne) rolling over in August 2024.

EXECUTIVE SUMMARY

RNZAF UNIMOG s. 9(2)(k) (Whenuapai).

1. UNIMOG s. 9(2)(k) driven by Witness 7 s. 9(2)(a) with one passenger in the cab, was travelling to Kaipara Weapon Range to support a Parachute Training Support Unit (PTSU) task. On South Head Road approximately 20 minutes North of Parakai the driver lost control of the vehicle on a wet and winding section of road. The vehicle left the road crashing through a concrete power pole and rolled several times before coming to rest on its wheels in bush. No other vehicles were involved in the incident. The driver and co-driver were uninjured. There were no personnel travelling in the rear of the vehicle. The UNIMOG suffered major damage and has been written off. The cost of damage to the Vector power network was \$19,323 and the cost to recover the UNIMOG back to RNZAF Base Auckland was \$6,026.

2. UNIMOG s. 9(2)(k) was well maintained and had a current COF. A technical inspection of the vehicle following the rollover found no mechanical or design issues that caused or may have contributed to the rollover. There was no evidence that fatigue, alcohol or any substance had impaired the driver's ability.

3. The posted speed limit for South Head Road is 80kph with the stretch of road where the rollover occurred subject to an New Zealand Transport Agency (NZTA) 45kph advisory reduced speed. Immediately prior to the rollover the UNIMOG speed was 64kph. The driver was trained and licensed but had limited experience driving UNIMOGs on public roads.

4. The Court finds the primary cause of the rollover of UNIMOG s. 9(2)(k) was the vehicle was driven too fast for the conditions, and the driver lost control. A contributing factor was the driver's lack of experience, and the driver's failure to correctly assess the situational risks leading to poor decision making regarding safe speed.

RNZAF UNIMOG s. 9(2)(k) (Woodbourne)

5. UNIMOG s. 9(2)(k) driven by Witness 4 NZ Army standby reserve soldier from s. 9(2)(a) the sole occupant of the vehicle, was travelling to Maruia to support a 2nd/4th RNZIR Exercise, EX YPRES. On State Highway 65 approximately 19 km south of Murchison township the vehicle on a winding section of road, lost traction causing it to cross the centre line before coming to a stop 180 degrees in the opposite direction, and slowly rolling over onto a farmers fence. No other vehicles were involved in the incident. The driver was uninjured. The UNIMOG suffered minimal damage and was returned to service within a few weeks after the incident. The cost to recover the vehicle back to RNZAF Base Woodbourne was \$4,973. The cost to repair the farmer fence is yet to be determined.

6. UNIMOG s. 9(2)(k) was well maintained and had a current COF. A workshop inspection of the vehicle was conducted immediately after the rollover. There were initial suggestions a component of the UNIMOG rear suspension may have contributed to the UNIMOG not behaving correctly when

cornering. This was assessed as unlikely by the subject matter expert. The Court found there was no evidence to indicate mechanical or design issues contributed to the rollover.

7. The section of road where the vehicle lost traction was winding and wet and the road geometry is generally uneven. State Highway 65 has a posted speed limit of 100kph however the corner where the UNIMOG lost traction is subject to an NZTA advisory 75kph reduced speed. Immediately prior to the rollover the UNIMOGs speed in the corner was 81kph.

8. The driver was licensed and qualified to drive UNIMOGs and there was no evidence to indicate the driver misjudged his approach to the corner. The driver is experienced, having spent many years as a Combat Driver in the Regular Force before he transferred to the Reserves. There was no evidence that fatigue, alcohol or any substance had impaired the driver's ability.

9. The Court is unable to pinpoint a primary factor to cause the rollover of UNIMOG s. 9(2)(k). The Court finds multiple factors: speed (although below the posted speed limit was above the advisory speed for the corner), road geometry and wet and slippery conditions on the day combined to destabilise UNIMOG s. 9(2)(k) leading to loss of traction and rollover.

GENERAL

10. The inquiry was carried out over the period 08 Oct 24 to 21 Feb 25. Evidence from 23 witnesses was considered and 94 documentary exhibits were collected. The interviews were mostly conducted in person with several follow up interviews conducted via MS Teams for efficiency reasons.

11. This Court will answer the Terms of Reference set by the Assembling Authority, Deputy Chief of Airforce. To do so in the clearest manner the report will commence with the sequence of events that led up to the incidents, firstly UNIMOG s. 9(2)(k) followed by UNIMOG s. 9(2)(k). The report will cover off several considerations that have been presented by key witnesses. This report will then address additional observations made by witnesses that the Court deems relevant to the inquiry and conclude with the Courts conclusion and findings and recommendations.

12. Findings and recommendations are detailed as the report builds to capture the appropriate context for the statements made.

ROLLOVER OF RNZAF UNIMOG s. 9(2)(k) (WHENUAPAI)

Circumstances of the Rollover

13. The crash and subsequent rollover of UNIMOG s. 9(2)(k) took place at approximately 1300 hours on Friday 16 August 2024 on a wet and winding section of South Head Road near Wilsons Road, Kaipara, Auckland³. The UNIMOG was driven by Witness 7 s. 9(2)(a), with Witness 8 s. 9(2)(a) travelling as the co-driver in the cab.⁴ No cargo or passengers were being transported in the rear of the UNIMOG.

14. The UNIMOG was heading to the Kaipara Air Weapons range to support a Parachute Training Support Unit (PTSU) activity later that day. Witness 15 (OC CIS) gave evidence that the tasking of the s. 9(2)(a) UNIMOG s. 9(2)(k) and squadron personnel was appropriately authorised by the s. 6(a).⁵

15. South Head Road in the vicinity of the crash site is a two lane, sealed road in good condition (Photograph 1) with a posted legal speed limit of 80kph. The section of road where the rollover occurred is subject to a NZTA hazard warning and recommended reduced speed advisory, with motorists advised to reduce speed to 45kph for the next two kilometres. There was no other traffic and no roadworks in the area at the time of the crash. The road surface was wet having rained earlier that morning.⁶



Photograph 1. Extract from Exhibit 15 G and Exhibit 16 C.

16. Witness 7 gave evidence that approximately 20 minutes after leaving Parakai he was driving UNIMOG s. 9(2)(k) on a downhill section of winding road, through an S bend when just past the apex of the bend he felt the rear of the UNIMOG slide out.⁷ He estimates his speed to be 62 to 65 kilometres per hour⁸ (the Court was presented ERoad data recorded from the UNIMOG that confirmed the vehicle speed was 64kph immediately before the rollover).⁹ The UNIMOG fishtailed and fearing the vehicle would roll down the bank on the left, Witness 7 stated he steered toward a power pole hoping it would arrest the vehicles forward momentum. The UNIMOG however severed the concrete power pole and rolled down the bank two to three times coming to rest on its wheels in bush approximately 30 meters below the road (Photograph 2). Witness 7 and Witness 8 climbed

³ Exhibit 11 J (NZ Police Crash Report)

⁴ Exhibit 11L and 11M (Witness 7 and Witness 8 transcript).

⁵ Exhibit 15 A.

⁶ Witness 4, Q3 and Witness 9 Q5.

⁷ Witness 7, Q11-14.

⁸ Witness 7, Q5.

⁹ Witness 21, Q1 and Exhibit 11 F (ERoad entry 16/08/2024 12:49).

out of the vehicle cab unaided and made their way up the bank to the road.¹⁰ Neither individual sustain any injuries.¹¹



Photograph 2. Extract from Exhibit 11 K.

17. The rollover was witnessed by Witness 10 and another CPL travelling behind the UNIMOG in an NZDF van. Witness 10 immediately telephoned Witness 9 in the lead vehicle to inform him of the incident, while the other CPL called the emergency services. Witness 10 stated he started to descend to the crashed vehicle but stopped when he saw Witnesses 7 and 8 exit the cab and start to make their way back up the bank to the road. No further attempt was made to approach the UNIMOG because of the risk posed by live power lines hanging in the trees above the vehicle. Witness 10 stated that shortly after this he telephoned OC PTSU to advise Base Auckland command of the crash. Next on the scene were FENZ and Vector contractors who informed Witness 10 that power was turned off and recovery of the UNIMOG could begin. NZ Police arrived next followed by RNZAF Medics who had been recalled from Kaipara Weapons Range.¹²

18. Witness 10 stated that at approximately 1500 hours after assessing both individuals the Medics drove Witness 7 and Witness 8 back to RNZAF Base Auckland to be checked over by a doctor. Witnesses 10 and Witness 9 remained at the scene and assisted with traffic management while the UNIMOG was being towed out of the bush.¹³

19. Witness 9 was the most senior person involved in the road movement to Kaipara. Witness 9 gave evidence that he met up with Witness 7 and Witness 8 in the PTSU compound at RNZAF Base Auckland at approximately 1100 hours. Witness 9 stated he asked Witness 7 if he knew the route to Kaipara and Witness 7 said he did, having been out their "heaps".¹⁴ Witness 9 stated that all three vehicles departed RNZAF Base Auckland together at approximately 1140 hours for the Kaipara Weapons Range via Parakai.¹⁵

¹⁰ Exhibit 11 L - 11M.

¹¹ Witness 13, Q2 -7.

¹² Witness 10, Q1.

¹³ Exhibit 11 N.

¹⁴ Witness 9, Q1.

¹⁵ Witness 9, Q1

20. Witness 9 stated his last sighting of UNIMOG s. 9(2)(k) behind his vehicle was approximately 10 minutes North of Parakai as he crested the hill close to Wilsons Road. When he reached the straight at the base of that section of road Witness 9 slowed and waited for the UNIMOG to appear. When the UNIMOG failed to show Witness 9 backtracked and came across the other RNZAF van parked on the roadside and Witness 10 standing in the road pointing down to the rollover site.¹⁶

21. Witness 9 stated the tow truck arrived at approximately 1630 hours and by 1930 hours all personnel and UNIMOG NG4921 were recovered to RNZAF Base Auckland.¹⁷ UNIMOG s. 9(2)(k) sustained major damage because of the rollover and has been written off with NZDF insurance paying out an agreed value. The vehicle will be disposed of by the NZDF once stripped of useable parts.

Vehicle Compliance and Maintenance

Servicing and Maintenance

22. Witness 18 s. 9(2)(a) provided evidence to the Court that he carried out the routine servicing (12-month servicing schedule) on UNIMOG s. 9(2)(k) and this work was completed on 10th April 2024.¹⁸

23. UNIMOG s. 9(2)(k) was inspected by VTNZ on 15th May 2024 and issued a COF. The VTNZ technician did comment that remediation work was required in the future for rust developing in the A pillar, and axle two brake effort, was borderline. None of these observations affected the vehicle passing its COF. UNIMOG s. 9(2)(k) had a current COF at the time of the rollover.¹⁹

24. Witness 7 (vehicle driver) stated the vehicle 'wobbled' on the road and required constant steering input to keep in a straight line. Witness 7 also stated most of the UNIMOGs he had driven behaved like this though s. 9(2)(k) appeared worst even though it had the least amount of mechanical faults.²⁰ This information was passed to the Expert Witness for assessment during the vehicle's post rollover technical inspection.

25. Witness 19 s. 9(2)(a) gave evidence that UNIMOG s. 9(2)(k) had all historic Work Orders closed during the 12 monthly servicing that was completed in May 2024. Witness 19 stated that there were historic Work Orders open against UNIMOG s. 9(2)(k) for the vehicles ROPS and steering and suspension system dating from 2023. Witness 19 stated she tasked Witness 18 to go back through these Work Orders and rectify. Witness 18 subsequently undertook repairs to the ROPS plywood (re-riveted) and elements of s. 9(2)(k) steering and suspension system. New rear tyres were also fitted to s. 9(2)(k) at this time. On completion of the physical work Witness 18 test drove UNIMOG s. 9(2)(k) around Base Auckland to functional check the vehicles steering, suspension and braking. No issues were identified.²¹

26. Witness 17 gave evidence that he carried out the final test drive of s. 9(2)(k) ahead of its May 24 COF. Witness 17 stated he could not remember the exact route he took but he generally follows the same route for all test drives being the public roads around Base Auckland and finishing off with higher speed motorway driving and back to Base Auckland. Witness 17 presented Exhibit 17 A that

¹⁶ Witness 9, Q1.

¹⁷ Witness 9, Q1.

¹⁸ Exhibit 18 B.

¹⁹ Exhibit 18 F.

²⁰ Witness 7 Q41 to Q46.

²¹ Witness 18, Q10.

shows he signed off s. 9(2)(k) as 'S' on 13th May 2024. Asked to define 'S', Witness 17 stated it means the vehicle operated and handled as expected with no unusual pulling or performance issues. All work was checked and confirmed in SAP Order s. 9(2)(k).²²

Roll Over Protection System (ROPS) – Front cab

27. To protect the occupants in the cab of UNIMOGs in the event of a roll over, a protection system was developed in conjunction with the existing vehicle handrails and footsteps culminating in an Engineering Change Instruction Issued in 2003 through the NZ P98 (Land Equipment Maintenance Engineering Instructions). This directed the installation of a Roll Over Protection System (ROPS) to the entire NZDF fleet of UNIMOGs.

28. In 2010, a further Engineering Change Instruction was issued through the NZ P98 directing an upgrade to the UNIMOG ROPS. This upgrade involved additional strengthen of the A-Pillars using extension plates. This is the current standard of the ROPS system fitted to all NZDF UNIMOGs.²³

29. The ROPS of UNIMOG s. 9(2)(k) functioned as designed fully protecting the occupants of the cab as the vehicle rolled multiple times. The ROPS itself suffered minor damage to the structure running across the top of the windscreen but otherwise the ROPS maintained its full integrity (Photograph 5).



Photograph 5. Extract from Exhibit 16 D.

Finding 1: The Court finds the servicing and maintenance of UNIMOG s. 9(2)(k) by GSEMF AK personnel was completed to a high standard. There is no evidence of any servicing or maintenance actions/inactions that may have contributed to or caused the rollover.

Expert Witness - Mechanical Assessment

30. Witness 20 s. 9(2)(a) conducted a technical inspection of UNIMOG s. 9(2)(k) as an Expert Witness.²⁴ The technical

²² Exhibit 17 A.

²³ Witness 18 gave evidence that ROPS is fitted to UNIMOG s. 9(2)(k) and that elements of the system were repaired as part of the vehicles 12-month service completed in May 24.

²⁴ Witness 20 s. 9(2)(a)

inspection was conducted in accordance with guidance provided in DFI 46.5 and consisted of a visual inspection of key vehicle components, along with checking components for functionality. Because of the severity of the damage, some components could not be inspected for functionality.

31. Inspection identified the tyre pressure for all four tyres were 10 PSI below OEM specifications. Witness 20 stated tyre pressure 10 PSI below OEM specifications, in this case for all four tyres, would not affect the ride behaviour of the vehicle.²⁵ Witness 20 stated that if however only one tyre on one axle (either axle) were deflated below OEM specifications, then potentially the vehicle would drift off centre. This was not the case and therefore there was no risk. Witness 20's report determined there were no mechanical or design defects with UNIMOG s. 9(2)(k).²⁶

32. The Court is unable currently to answer TOR 23 "what is the relevant ISO for roll over protection." The court has requested Directorate Land Engineering (DLE) to investigate this TOR.

Finding 2: The Court finds no evidence of any mechanical defects or design issues with UNIMOG s. 9(2)(k) that may have contributed to or caused the rollover.

Recommendation 1: The Court recommends the Directorate of Land Engineering review the NZ ISO standard for heavy vehicle Roll Over Protection Systems to ensure ROPS fitted to the NZDF UNIMOG fleet remains compliant with current NZ standards, and release updated Engineering Change Instructions if required.

Contributing Factors

The Driver

33. Duties and Activities 24hrs Prior: Witness 7 stated he spent the day before the rollover preparing for the PTSU driving task and it was a normal workday. The night before the crash Witness 7 stated he spent the evening gaming with university friends before going to bed at approximately 2130 hours. Witness 7 stated he believed he had not consumed any alcohol that evening as he usually did not drink on weekdays.²⁷

34. Substance Testing: The attending NZ Police officer performed a passive breath test on Witness 7 that was negative for alcohol.²⁸ CO s. 9(2)(a) ordered Witness 7 to undergo Urine Drug Testing upon returning to RNZAF Base Auckland. This was administered by MPs late afternoon 16th August 2024, with the outcome being no drugs detected.²⁹

35. Licensing and Defence Driver Permit (DDP): Witness 7 is licensed and qualified to drive UNIMOGs, holding a Class 1 and Class 2 driving licence and Defence Driving Permit (DDP) for MSV (Lt), HX60, LOV and UNIMOG military vehicles.³⁰ Witness 7 gained his UNIMOG DDP s. 9(2)(a) approximately two months prior to the crash.³¹

²⁵ Witness 20, Q7 – Q9.

²⁶ Witness 20, Q5, Q6 and Exhibit 20 A.

²⁷ Witness 7, Q59.

²⁸ Exhibit 11 J.

²⁹ Exhibit 11 A.

³⁰ Exhibit 7 B.

³¹ Exhibit 11 D (page 12)

36. **Experience:** Witness 7 stated he had driven UNIMOGs once a week or so since gaining his UNIMOG DDP. His most recent drive was several weeks before the crash being a one-hour return task from RNZAF Base Auckland to Omaha Beach. Witness 7 could not recall the actual number of UNIMOG driving tasks he had performed since gaining his UNIMOG DDP. The Court later heard evidence from Witness 15 s. 9(2)(a) that Witness 7 had driven a UNIMOG on two other occasions for any length of distance or time on public roads since gaining his DDP: a total of 6.5 hours driving time being accrued before the rollover on 16th August 2024. The most recent drive was the journey between Whenuapai and Omaha Beach on the 2nd of July 2024.³²

37. Although he was driving below the legal speed limit, it is the Courts view that Witness 7 failed to differentiate between what was a comfortable speed for a car against a safe speed for a UNIMOG in the same conditions. Witness 7 did not recall seeing any warning or advisory signs in the area even though he drove past the signs approximately 800m before the point of rollover (Photograph 4). Witness 7 failure to respond to visual warning cues and his inaction to reduce his speed further is likely due to his limited experience driving heavy military vehicles.³³

Finding 3: The Court finds no evidence of fatigue, alcohol or illegal substances being a factor in the rollover.

Finding 4: The Court finds it likely that Witness 7 had not fully developed the experience required to drive heavy military vehicles, specifically, his ability to see and understand what's happening on the road around him, to process visual cues and make decisions and judgements quickly.

The Vehicle

38. **First Parade:** Witness 7 stated prior to departing RNZAF Base Auckland on the morning of Friday 16th August 2024, he performed the vehicle First Parade of UNIMOG s. 9(2)(k), carrying out before and after start-up checks without issue.³⁴

39. **Service/Maintenance:** The vehicles brakes, suspension and steering had been recently serviced, checked and signed-off. New rear tyres had also been recently fitted. Witness 19 s. 9(2)(a) stated that when UNIMOG s. 9(2)(k) left the workshops after its 12 monthly service in May 24 that the vehicle had a completely clean sheet.³⁵

40. **ERoad Data:** UNIMOG s. 9(2)(k) is fitted with an ERoad GPS based system that provides information on vehicle telematics such as speed and the rate of acceleration and deceleration (braking). Witness 15 had the raw ERoad data assessed by the Transport Operations Officer - Logistics Command Land and presented the results to the Court, which showed cornering throughout the journey was consistent and at low speeds, and there were no speed violations, heavy braking, or heavy cornering. The speed of UNIMOG s. 9(2)(k) immediately prior to the crash as recorded by ERoad was 64 kph.³⁶

Note 1: On 29 October 2024 New Zealand Government Procurement (NZGP) issued a Request For Proposal (RFP) seeking suppliers to an All of Government (AoG) contract to provide government agencies a range of fleet management services including vehicle

³² Exhibit 15 E.

³³ Witness 7, Q5-Q8.

³⁴ Exhibit 7 A.

³⁵ Witness 19, Q3.

³⁶ Exhibit 15 D.

telematics (GPS services). The RFP closed on 28 November 2024. The Office of DLC(Land) has advised the Court that NZDF's future use of ERoad and/or its replacement is subject to the outcome of the All of Government contract and in the interim Chief Defence Force has agreed to maintain the current level of NZDF vehicle telematics until the AOG contract is announced in June - July 2025.

41. Speed. Witness 7 stated his speed just before the rollover was approximately 62-68 kph with his ERoad displaying 65 kph. Witness 7 did not recall seeing any warning or advisory speed limit/signs.³⁷ The NZTA advisory speed for that section of road is 45 kph.³⁸

Finding 5: GPS telematic systems eliminate doubt as to how a vehicle was being operated; its speed, acceleration or deceleration; evidence that previously was reliant on the driver's memory or the memory of witnesses. The Court finds ERoad data to be a valuable tool to determine or eliminate the degree driving behaviour contributes to an incident and hastens the identification of causal factors and areas where additional control measures are needed to help prevent future incidents.

Recommendation 2: The Court recommends Defence Logistics Command (Land) maintain the current level of GPS telematics systems in NZDF 'B' vehicles, with the objective to achieve 100% installation across the NZDF operating fleet of UNIMOG 1700L vehicles being vehicles that pose a high risk of harm to the carriage of passengers on New Zealand roads.

The Environment

42. General. The section of South Head Road in the vicinity of the rollover is in good condition. At the time of the rollover the road was wet but free of roadworks and loose material that might have contributed to the rollover. There were no other vehicles involved in the incident.

43. NZTA Warning Signs: Witness 15 gave evidence that on Tuesday 10th December 2024 he drove the section of South Head Road near the rollover and hazard warning and supplementary recommended speed signs are clearly visible on the left-hand shoulder of the road approximately 800m before the rollover site.³⁹

44. The NZTA signs warn motorists of a winding section of road 2km in length where due to road alignment factors this section of road has an operating speed of 45kph, considerably below that of the remainder of the road at 80kph,⁴⁰ (Photograph 4). The NZTA website qualifies the application of supplementary speeds, stating that the recommended speed for hazard areas is based on a light vehicle and that speeds may be too fast for a heavy vehicle.⁴¹

Note 2: reference to NZTA information is not considered as evidence in this report, it is included for information and context only.

³⁷ Witness 7, Q5 to Q8.

³⁸ Exhibit 15 F.

³⁹ Witness 15, additional interview Wed 11 Dec, Q2.

⁴⁰ NZ Transport Agency Waka Kotahi - Typical curve signs – <https://www.nzta.govt.nz/roads-and-rail/traffic-control-devices-manual/part-5-traffic-control-devices>.

⁴¹ NZ Transport Agency Waka Kotahi - Road code - <https://www.nzta.govt.nz/roadcode/heavy-vehicle-road-code/>



Photograph 4. Extract from Exhibit 15 F.

Finding 6: Acknowledging that the road was wet, the Court finds no evidence of any unknown or unavoidable factors with the road or environment that may have contributed to the rollover. The Court finds the inherent hazard of this section of road to be prominently and permanent identified by NZTA warning signs that advise motorists to reduce speed.

Expert Witness – Operational Assessment

45. Witness 21 s. 9(2)(a) gave evidence as an Expert Witness on the possible causes of the crash.⁴² Witness 21 reviewed witness statements, ERoad data from UNIMOG s. 9(2)(k), the MD1302 submitted to Vehicle Incident Crash Reporting System (VICRS) and used google maps to review the section of road leading up to the rollover site.

46. Witness 21 stated that google maps showed the 45 kph advisory sign for 2 kilometres onwards, in the direction of travel located approximately one kilometre from where Witness 7 lost control of UNIMOG s. 9(2)(k). Witness 21 stated that with the road being wet a driver should drop a further 5km under the advisory speed.⁴³

47. Witness 21 stated he attributed the rollover of UNIMOG s. 9(2)(k) to three factors.⁴⁴

- a. Speed -the vehicle was exceeding the advisory speed limit for the bends; being driven at 64kph vs the recommended 45kph.
- b. Environment – winding and wet road with permanent NZTA warning signs installed to advise drivers of the hazard ahead and to slow to 45kph for the next 2 km.
- c. Driver – though licensed and qualified the driver was inexperienced.

⁴² Witness 21 is a Driving Instructor (22 years); Driver Testing Officer (19 years) and Certifier (qualifies other Testing Officers); a graduate of the UK MOD Master Drivers Course (2015) and a trained Vehicle Crash Investigator who has led multiple vehicle crash investigations.

⁴³ Witness 21, Q5.

⁴⁴ Witness 21, Q1.

48. Witness 21 expert opinion is the driver lost control of the UNIMOG due to the vehicle travelling too fast for the conditions.⁴⁵

Cause of the Rollover - Findings

Primary Factor – Excessive Speed for the Conditions

49. Witness 7 stated he felt one of the UNIMOGs rear wheel slip as he departed the Parakai carpark at a slow speed of 30kph. This was approximately 20 minutes before the rollover.⁴⁶ It is the Courts view that this should have served as a warning to the slippery nature of the road and reinforced the need to abide by advisory and warning signs along the route. The UNIMOG was travelling at 64kph through a downward section of wet and winding road where the NZTA advisory speed was 45kph.⁴⁷ Had the UNIMOG been driven at the advisory speed it is probable the rollover would have been avoided.

50. It is the view of the Court that the primary cause of the rollover as stated by the Expert Witness was excessive speed, with UNIMOG s. 9(2)(k) travelling at 64kph in a hazard area covered by an advisory speed of 45kph. The wet road conditions and low experience of the driver were secondary but significant contributing factors to the rollover.

Finding 7: The Court finds the primary cause of the crash and subsequent rollover of UNIMOG s. 9(2)(k) was speed with the vehicle travelling too fast for the conditions, causing the driver to lose control.

Contributing Factor – Experience

51. Witness 7 had limited experience driving UNIMOGs on the open road for any significant distance or period since gaining his UNIMOG DDP two months previous s. 9(2)(a)⁴⁸ Witness 7 would have benefited from remaining under workplace driving supervision and to have completed further workplace assessment to confirm his competency to drive NZDF UNIMOGs before being authorised to undertake unsupervised UNIMOG driving tasks.

Finding 8: The Court finds that although trained and licensed, Witness 7 was inexperienced in driving a UNIMOG on the open road and was ill prepared to assess the cumulative risk of UNIMOG (heavy military vehicle), hazard (winding road) and environment (wet and slippery road surface) and therefore he was not prepared to respond appropriately.

Recommendation 3: The Court recommends OC s. 9(2)(a) order Witness 7 to undergo additional workplace driving training under supervision/instruction and completes a driving assessment in accordance with DFI 40.3 to confirm his competence to drive NZDF vehicles.⁴⁹

Reporting

52. Reporting was completed appropriately and in a timely manner. The driver raised MD1302 for Vehicle Incident Crash Reporting System (VICRS) and the unit raised the incident in NZDF Safety

⁴⁵ Witness 21, Q1

⁴⁶ Witness 7, Q1.

⁴⁷ Witness 15, Q2 and Exhibit 15 F.

⁴⁸ Witness 7, Q66 – Q76.

⁴⁹ DFI 40.3, Chapter 11, Section 2, paragraph 11.4 (h), any NZDF driver that has been identified at fault in an avoidable vehicle incident is to have their driving assessed.

Event Management Tool (SEMT), with command Incident Reporting actioned by CO s. 9(2)(a). In accordance with Safety Work Act 2015, DASH reported the incident to WorkSafe as a Notifiable Event, even if later WorkSafe confirmed the incident did not meet the threshold and was deemed NOT Notifiable.

Vehicle Incident Crash Reporting System (VICRS) - s. 9(2)(k)

53. NZDF Vehicle Incident Form (MD1302) was completed by Witness 7 and submitted to VICRS on Tuesday 20th August 2024.⁵⁰

Safety Event Management Tool (SEMT) - s. 9(2)(k)

54. The Court heard evidence from Witness 12 s. 9(2)(a) that s. 9(2) raised a safety event in SEMT on Tuesday 20th August 2024.⁵¹

Incident Notification

55. Witness 16 (CO s. 9(2)(a)) gave evidence that at 1441hrs 16 August 2024 he released the first of two emails - Critical Incident Notification – UNIMOG Incident to Base Commander RNZAF Base Auckland, and senior Commanders including ACC, CAF, DCAF and CDF of the incident.⁵² The Directorate of Aeronautical Safety and Health (DASH) Auckland (AK) was also informed at that time.

56. Witness 16 sent a second and final email update at 2101 hours 16th August 2024 advising that personnel involved in the incident had been assessed by medical personnel and released from duty following routine substance testing by Military Police, and that UNIMOG s. 9(2)(k) had been recovered to RNZAF Base Auckland and quarantined at GSEMF. No further updates were planned or expected.⁵³

WorkSafe - s. 9(2)(k)

57. Once the details of the incident were known, DASH (AK) reported the rollover of UNIMOG s. 9(2)(k) to WorkSafe on Thursday 22nd August 2024 as a Notifiable Event per WorkSafe 'triggers'.⁵⁴ WorkSafe responded to DASH later that day confirming the event did not meet the threshold, therefore is NOT Notifiable. WorkSafe placed a note under the PCBU (NZDF) record in their system to acknowledge NZDFs reporting and of the WorkSafe decision.⁵⁵

Police Traffic Crash Report - s. 9(2)(k)

58. Police attended the incident and filed a Traffic Crash Report capturing the driver, vehicle and environment details but concluding the cause of the crash is unclear. The officer issued Witness 7 an Infringement Notice for failing to drive entirely within the lane (D702) that carries a \$150 fine. No further action is being taken regarding the incident by Police. The police report is part of the JMPU evidence pack presented to the Court.⁵⁶

⁵⁰ Exhibit 15 C.

⁵¹ Exhibit 12 C.

⁵² Exhibit 16 A.

⁵³ Exhibit 16 B.

⁵⁴ Exhibit 12 D.

⁵⁵ Exhibit 12 C.

⁵⁶ Exhibit 11 J.

Finding 9: The court finds all reporting action was completed in accordance with normal NZDF reporting procedures including the requirements under the Health and Safety Work Act 2015 to notify WorkSafe.

Injury, Trauma and Property Damage

Injury/Trauma

59. Witness 13 s. 9(2)(a) gave evidence that she was recalled from Kaipara Weapons range to the crash site arriving approximately 20 minutes after the rollover where she examined the Witness 7 and Witness 8. Witness 13 stated both Witness 7 and Witness 8 were subjected to a full set of medical observations including history taking and orientation, questioning regarding pain, loss of consciousness, and a physical assessment. Both individuals were assessed as uninjured. Witness 13 stated she accompanied Witness 7 and Witness 8 to RNZAF Base Auckland and informed Witness 14 s. 9(2)(a) of the incident.⁵⁷

60. Witness 14 s. 9(2)(a) gave evidence that she examined Witness 7 and Witness 8 at RNZAF Base Auckland approximately 1600 hours on Friday 16 August 2024, and her physical examination found nothing abnormal. Witness 14 saw Witness 7 and Witness 8 a second time some weeks later and neither individual reported any ongoing issues.⁵⁸ When asked by the Court if there was any injury or trauma that may cause permanent side effects or require ongoing treatment for individual, Witness 14's stated there is not but qualified her statement, saying she is not an expert on ongoing neurological or psychiatric complications.⁵⁹

Vehicle First Aid Kit

61. Witness 7 confirmed UNIMOG s. 9(2)(k) was fitted with a first aid kit. The Vehicle First Parade Sheet completed the morning of Friday 16 August 2024 also confirmed a serviceable first aid kit was 'checked' as being fitted⁶⁰. The first aid kit was not used because there were no physical injuries to treat.⁶¹

Property Damage

62. The incident destroyed a concrete power pole that was part of the Vector Limited power network. Vector wrote to the NZDF on 2nd September 2024 advising they attended an incident on 31 August 2024 to repair damaged to their network equipment for which they believe the NZDF was responsible.⁶² There are no reports of damage to any other property.

63. Witness 15 gave evidence that the insurance claim process through New Zealand Insurance (NZI) has been completed and the loss adjustor has paid the full amount of \$19,323.23 claimed by Vector to repair damage to their network. A further cost of \$6,026.00 invoiced by Ace Towing for the heavy tow vehicle has been paid from s. 9(2)(a) operating budget. This action was approved by CO s. 9(2)(a) because payment was due before command had had any interactions with NZI.⁶³

⁵⁷ Witness 13, Q3 – 9.

⁵⁸ Witness 14, Q1 – 4.

⁵⁹ Witness 14, Q5.

⁶⁰ Exhibit 7A.

⁶¹ Witness 7, Q30 - 32

⁶² Exhibit 16 F.

⁶³ Witness 15, additional interview Wed 11 Dec, Q8-Q11.

Insurance

64. UNIMOG s. 9(2)(k) suffered significant damage because of the incident the vehicle will be written off and disposed of in due course (Photograph 3). A claim for the vehicle was lodged with NZI on 21st August 2024 as part of VICRS reporting; claim number s. 9(2)(k).⁶⁴



Photograph 3. Extract from Exhibit 16 D.

Finding 10: The Court finds no evidence of any short-term or permanent injury or side-effect to either the driver or passenger caused by the rollover that may require ongoing treatment.

Finding 11: The Court finds the remediation and payment of damages has been completed through NZDF Insurance (Vector and UNIMOG) and s. 9(2)(a) Cost Centre (ACE Towing) and no further action is anticipated.

⁶⁴ Exhibit 2 C. ⁶⁴ The Court has subsequently been advised by the DEMO Equipment Manager (Air) that UNIMOG NG4921 is to be written off and NZI pay NZDF approximately \$23.5K. NZDF will retain the vehicle wreck and DEMO will sign the insurance discharge and send the wreck to Trentham for managed disposal (military asset) with removal of high value parts before destruction - email s. 9(2)(a), DEMO), s. 9(2)(k) Roll 16 Aug 2024 Parakai Akld, dated Friday 24/01/2025 11:44am.

ROLLOVER OF RNZAF UNIMOG s. 9(2)(k) (WOODBOURNE)**Circumstance of the Rollover**

65. The rollover of UNIMOG 1 took place at approximately 1000 hours on Sunday 25th August 2024 travelling South on a wet section of State Highway 65 approximately 19 kilometres South of Murchison township. The UNIMOG was driven by Witness 4 a standby reservist driver with s. 9(2)(a).⁶⁵ Witness 4 was the sole occupant of the UNIMOG and was uninjured. No other vehicles, military or civilian were involved and there were no witnesses to the rollover.

66. The UNIMOG was being driven from RNZAF Base Woodbourne to Maruia to preposition the vehicle for use by 2/4 RNZIR for EXERCISE YPRES. Witness 3 (s. 9(2)(a) 2/4 RNZIR) gave evidence that the tasking of the RNZAF UNIMOG and the driver (Witness 4) was authorised by Witness 2 (s. 9(2)(a)) and OC s. 9(2)(a) respectively.⁶⁶

67. State Highway 65 in the vicinity of the rollover site is a two-lane sealed road in fair to good condition with a speed limit of 100 kph.⁶⁷ On the day of the rollover, the road was wet having rained earlier that morning. There was minimal traffic and no roadworks in the area or loose material on the road at the time of the incident. The Southern approach to the bend is subject to a NZTA hazard warning and recommended reduced speed advisory of 75kph (Photograph 6) and immediately prior the rollover UNIMOG 1 was travelling at 81kph.



Photograph 6. Extract from Exhibit 6 I.

68. Witness 4 gave evidence that he and another LCPL were conducting a road move of two UNIMOGs from Woodbourne to Maruia. Neither vehicle had co-drivers. An informal briefing to cover rest periods and location, and the general route was completed before departing Woodbourne at approximately 0700hrs on Sun 25 Aug 24. During the rest and refuelling stop at Murchison they were joined by Witness 3 (s. 9(2)(a) 2/4 RNZIR) travelling to Maruia from Nelson. Departing from Murchison, Witness 3 took the lead followed by UNIMOG 2 with Witness 4 (UNIMOG 1) at the rear.

⁶⁵ Exhibit 6A.

⁶⁶ Witness 3, Q64.

⁶⁷ Exhibit 6C.

69. Approximately 20 minutes after departing Murchison Witness 4 stated he arrived at the corner where the rollover happened. Witness 4 stated he was approximately 80% through the corner looking down the exit straight when he felt the rear of the UNIMOG slide out. Witness 4 tried to correct the vehicle, but it skidded to the right and then left, then entered a small ditch, spinning the vehicle 180 degrees and causing the UNIMOG to slowly tip over onto its right side. The UNIMOG came to rest across a wire-strand farm fence (Photograph 7). The rollover caused minor damage to the right-side drivers mirror and door panel and deflated the right rear tyre. Witness 4 stated he was uninjured and after exiting the vehicle he called Witness 3 in the lead vehicle and informed him of the incident.⁶⁸



Photograph 7. Extract from Exhibit 6 H.

70. Witness 4 stated he could not recall his speed into the corner⁶⁹ however, in his MD1302 statement completed shortly after the rollover he recorded his speed as between 75 to 80kph.⁷⁰ ERoad data from UNIMOG 1 presented to the Court by Witness 21 (s. 9(2)(a)) confirmed the vehicle speed through the corner was 81kph.⁷¹

71. Witness 3 gave evidence that the two RNZAF UNIMOGs were to rendezvous with him at Maruia, but it happened that he met up with the vehicles at Murchison while being refuelled. At that point, all three vehicles travelled together towards Maruia with Witness 3 in the lead. Witness 3 stated approximately 15 minutes after leaving Murchison he noticed only one UNIMOG behind him. Witness 3 pulled over allowing the first UNIMOG to pass with the intent to let the second UNIMOG catch up. Witness 3 stated that after a while when the second UNIMOG did not appear he realised something was wrong, and shortly after that he received the phone call from Witness 4 advising him of the rollover.

72. Witness 3 stated he backtracked to the rollover site and attended Witness 4 who appeared to have no visible injuries and Witness 4 advised that he was fine. Witness 3 and Witness 4 checked the UNIMOG was switched off and that there were no obvious oil or fuel leaks from the vehicle. Witness 3 stated he then called the Police⁷² and soon after informed his chain of command of the

⁶⁸ Witness 4, Q39.

⁶⁹ Witness 4, Q6 to Q7.

⁷⁰ Exhibit 2B (s. 9(2)(a)) email sent to s. 9(2)(a) that along with the hand filled in MD1302 was presented to the Court by Witness 2 s. 9(2)(a)).

⁷¹ Witness 21, Q15.

⁷² Exhibit 2C, VICRs Incident Report s. 9(2)(k); Section 3. Incident/Crash Details; Police Incident Number: s. 9(2)(k).

incident. Witness 3 then contacted Witness 2 at RNZAF Base Woodbourne to arrange a heavy vehicle recovery.⁷³ Witness 2 engaged HESLOP Motors Nelson who recovered the UNIMOG to Base Woodbourne later that afternoon.⁷⁴

73. UNIMOG 1 sustained minor damage because of the slow nature of the rollover and following repair to the driver's side mirror, drive-line Torque Tube (corrosion), balancing of rear wheels and a full mechanical inspection and after passing a test drive, 1 was returned to service approximately three weeks later.

Vehicle Compliance and Maintenance

Servicing and Maintenance

74. Witness 1 (s. 9(2)(a)) provided relevant servicing documentation showing routine six- and twelve-monthly servicing on UNIMOG 1 had been completed on 3 April 2024 and 6 October 2023 respectively.⁷⁵ Both scheduled servicing protocols were completed by RNZAF Base Woodbourne maintenance staff and Witness 1 confirmed there was no deferred or outstanding servicing or maintenance due on UNIMOG 1.⁷⁶

75. UNIMOG 1 was inspected by VTNZ on 24th April 2024 and failed its COF inspection for excessive steering and wheel hub play. Remedial action was completed by RNZAF Base Woodbourne GSE staff and a COF re-check was completed on 9th May 2024 resulting in VTNZ issuing a new COF. UNIMOG 1 had a current COF at the time of the incident.⁷⁷

Post Rollover Inspection

76. Transmission Torque Tube. Witness 1 stated during the post rollover inspection he identified the rear torque tube was incorrectly set up with excessive pre-load causing the torque tube to bind with the transfer case flange. Witness 1 stated this would likely prevent the torque tube freely changing its drive angle as weight was added/removed from the truck deck. Witness 1 stated the binding could cause the torque tube to move suddenly and with force when the vehicle drove over big bumps and this may affect the handling characteristic of the UNIMOG.⁷⁸

Note 3: The issue of the torque tube binding and possible effect on vehicle handling is addressed in the Expert Witness – Mechanical Assessment section of the report.

77. Deflated Right Rear Tyre. Post the rollover Witness 3 stated the rear right tyre was deflated and at the time he did not know if the tyre had been slowly deflating and contributed to the rollover, or the tyre had deflated because of the rollover. Witness 1 inspected the right rear wheel and found no evidence of damage to the rim or evidence of a puncture that may have contributed to a slow loss of tyre pressure. Witness 1 re-inflated the tyre and refitted the wheel to UNIMOG 1. Checking the tyre some days later Witness 1 stated the tyre pressure had not gone down.⁷⁹

⁷³ Witness 3, Q1 to Q3.

⁷⁴ Witness 2, Q12 and Exhibit 2F (s. 9(2)(a)) subsequently advised the Court the \$4,973.75 HESLOP recovery cost was paid by NZDF insurance - claim number s. 9(2)(k)).

⁷⁵ Exhibits 1 F and 1 C

⁷⁶ Witness 1, Q14.

⁷⁷ Exhibit 1 H.

⁷⁸ Exhibit 1 A, 1 B, 1 C and 1 D

⁷⁹ Witness 1, Q90, Q91.

Finding 12: The Courts finds that the loss of tyre pressure in the right rear tyre is likely the result of the tyre bead being disturbed as the tyre slid sideways across the road surface and it is unlikely to have caused or contributed to the rollover.

Rollover Protection System (ROPS) – Front Cab

78. Witness 1 gave evidence that the Roll Over Protection System (ROPS) was installed on UNIMOG 1 in June 2004 and the system was upgraded in February 2010 per NZ P98.⁸⁰ The ROPS functioned correctly, maintaining the integrity of the vehicle cab and prevented injury to the occupant. The ROPS of UNIMOG 1 was undamaged.

Expert Witness – Mechanical Assessment

79. Having suffered only superficial damage, UNIMOG 1 was returned to service before the Court was convened and was not inspected by Expert Witness - Mechanical, Witness 20 (s. 9(2)(a)). Witness 20 reviewed the witness statements and exhibits and specifically consider the evidence presented to the Court concerning the rear torque tube of UNIMOG 1, and the concern that it may have caused or contributed to the rollover.

80. Transmission Torque Tube: Witness 20 stated he reviewed the evidence presented to the Court by Witness 1 concerning operation of UNIMOG 1 torque tube. Witness 20 stated the UNIMOG torque tube allows deflection up to 30 degrees between the two rear-wheel-hubs for improved cross-country performance. Witness 20 stated a laden or unladen UNIMOG has no direct bearing on the operation of torque tube as it is not connected to the vehicle tray/deck and therefore there is no deflection of the torque tube when weight is put on or removed from the vehicle deck. Witness 20 stated the torque tube is a rigid linkage between the transfer box and rear differential – a solid tube with a drive shaft running through the middle with a universal at one end which allows variation side to side during cross-country operation. When a UNIMOG is driven on a road (straight or cornering) there is no additional influence on the vehicle by the torque tube, and the condition of the torque tube described by the evidence presented by Witness 1 would not change the on-road handling of the UNIMOG.

81. Witness 20 opinion as an Expert Witness is that any binding of the torque tube would not have affected the on-road handling characteristics of UNIMOG 1.⁸¹

82. DFI 46.5 Quarantine Requirements: Witness 20 stated the requirement to quarantine UNIMOG 1 following the rollover to maintain technical evidence to support a technical investigation was not complied with.⁸² Witness 20 acknowledged the work done to return the vehicle to service was to a high standard but inadvertently it may have removed some of the evidence that may have helped with determining answers to questions about vehicle handling. The Courts opinion is the requirement of DFI 46.5 is not well known in the RNZAF with the DFI predominantly used by NZ Army units.

83. NZ P98 Land Equipment Maintenance Engineering Instruction - Vehicle Roll Over Engine Reclamation Procedure Miscellaneous Instruction: Witness 20 also stated there was no evidence that the Vehicle Engine Reclamation Process was completed in accordance with NZ P98⁸³ following

⁸⁰ Witness 1, Q20 and Exhibit 1M.

⁸¹ Witness 20 Q26.

⁸² DFI 46.5 Land Engineering and Maintenance Support System, Chapter 8 – Technical Inspection, paragraph 8.9 Quarantine Requirements.

⁸³ NZ P98, B Vehicles, General to GS B Vehicles, Vehicle Rollover Reclamation Procedure, B 259-16

the vehicle roll-over. This process is to be carried out by a Maintenance Organisation (MO) and should be completed as soon as possible to minimise the effects of oil contamination to induction systems on the vehicle. Witness 1 stated that they did not use the NZ P98 as it was considered an NZ Army document.

84. It is the Courts opinion that the actions and maintenance carried out by Woodbourne GSE were appropriate and the intent of the Engine Reclamation procedure were fully met but note the completion of NZ P98 documentation was not carried out.

Finding 13: Based on the evidence presented by the Expert Witness, the Court finds no evidence that the binding of the torque tube was likely to have caused or contributed to the rollover.

Finding 14: Woodbourne GSE whilst intent was there, it did not follow processes per DFI 46.5 and NZ P98 following a vehicle rollover.

Recommendation 4: The Court recommends RNZAF commanders/managers responsible for managing and/or maintaining NZDF vehicles e.g. 230 SQN and Maintenance Support Squadrons, review Base/Wing/Unit Standing Orders and SOPs, the purpose of the review to ensure orders, instructions and procedures state that following a vehicle rollover:

- a. vehicle rollover procedures are to be actioned in accordance with NZ P98, and
- b. the vehicle is to be quarantined in accordance with DFI 46.5 Chapter 8.

Contributing Factors

The Driver

85. Duties and Activities 24hrs Prior: Witness 4 was well rested for the driving task stating he had finished his civilian work on Friday 23rd August 2024. On Saturday night, Witness 4 looked after his children while his wife went out and he went to bed approximately 2130 hrs. Witness 4 stated he did not consume any alcohol Saturday night. Witness 4's evidence to the Court is consistent with his statement made shortly after the rollover when interviewed via FaceTime by Witness 6 (s. 9(2)(a) [REDACTED]).⁸⁴

86. Substance Testing: The attending NZ Police did not perform passive breath or evidential alcohol testing of Witness 4. Witness 4 was not subjected to NZDF Urine Drug Testing.

87. Licensing and Defence Driver Permit (DDP): Witness 4 is licensed and qualified to drive UNIMOGs, holding full Class 1, 2, 3, 4 and 5 driving licences and Defence Driving Permit (DDP) for MSV (Lt), LOV, UNIMOG, MB2228, MX58, Matbro and Skytrak.⁸⁵ Witness 4 renewed his UNIMOG DDP on 14th June 2024 approximately two months prior to the rollover.⁸⁶

⁸⁴ Exhibit 6 B, Interview conducted by Witness 6 and s. 9(2)(a) 2/4 RNZIR over FaceTime with Witness 4 3 Reserve Coy, s. 9(2)(a) – 25 AUG 24.

⁸⁵ Exhibit 4 A and 4 B.

⁸⁶ Exhibit 11 D (page 12)

88. Experience: Witness 4 is an experienced NZDF driver having been a Regular Force Army Combat Driver before he transferred to the Standby Reserves. Witness 4 completed UNIMOG familiarisation course in 2013 and drove UNIMOGs for several years before he transitioned to the MX58 fleet. Witness 4 has completed Junior and Intermediate Transport Courses and deployed to Sinai as part of the MFO Transport Section.

89. Witness 4 stated he had not recently driven a UNIMOG and estimated it was 18 months since his last UNIMOG task.⁸⁷ The Court does not place much weight on this being a contributing factor given Witness 4's total experience driving NZDF range of heavy vehicles. In his civilian employment (s. 9(2)(a) [redacted]), Witness 4 stated he drives a range of commercial vehicles, including heavy trucks of Class 4 and Class 5 on a weekly basis, on sealed and gravel roads. Witness 4 successfully navigated approximately 174km of State Highway 65, with several corners more challenging than the corner where the rollover occurred. ERoad data illustrates Witness 4's driving performance throughout the journey was consistent.⁸⁸

Finding 15: The Court finds no evidence of fatigue, alcohol or illegal substances affecting the performance of Witness 4 (vehicle driver) or being a factor in the rollover.

The Vehicle

90. First Parade: Witness 4 stated that he and the other driver carried out the vehicle First Parade and no issues were identified. Witness 4 signed off the First Parade Sheet.⁸⁹

91. Service/Maintenance: Servicing per NZ P93 – Land Equipment Inspection and Servicing Manual was up to date and the vehicle had completed its 24-month service in October 2023 and its most recent six-month service in April 2024. UNIMOG [redacted] 1 failed its COF on 24th April 2024 due to excessive wheel hub play and a request by VTNZ to check manufacturer's specifications for steering tie rod play. Both front suspension ball joints were re-shimmed in May 2024 (SAP Order s. 9(2)(k)) and UNIMOG [redacted] 1 passed its COF re-test on 9th May 2024.⁹⁰

92. ERoad Data: Witness 6 (s. 9(2)(a) [redacted]) presented UNIMOG [redacted] 1 ERoad data to the Court (assessment carried out by Witness 2) that showed no overspeed notifications were triggered and that Witness 4 showed a disciplined approach to his driving performance.⁹¹ ERoad recorded UNIMOG [redacted] 1 speed through the corner where the rollover occurred at 81kph, slightly above the 75 kph advisory speed for the corner.⁹²

93. Speed

- a. UNIMOG [redacted] 2: UNIMOG [redacted] 2 was travelling the same route approximately one minute ahead of UNIMOG [redacted] 1. ERoad data from [redacted] 2, presented to the Court by Witness 23 (DLC(L) Transport Operations Officer), shows [redacted] 2 travelling below the 75 kph advisory speed and the UNIMOG successfully negotiated the corner.⁹³

⁸⁷ Witness 4, Q14.

⁸⁸ Exhibit 6 G, page 5 of 7.

⁸⁹ Witness 4, Q1 and Exhibit 2A.

⁹⁰ Exhibit 1 D, 1F, 1G and 1H.

⁹¹ Exhibit 6 G.

⁹² Exhibit 15 D.

⁹³ Exhibit 23 B.

- b. UNIMOG 1 : Witness 4 stated his speed into the corner, based on the vehicles fluctuating speedometer needle was between 80-85kph⁹⁴ and he continued to decelerate as he steered through the corner. Witness 4 stated the speedometer of UNIMOG 1 was bouncing plus and minus 5km making an accurate assessment of speed using the vehicle speedometer difficult.⁹⁵

94. Figures 1 and 2 compare the telemetric data transmitted by ERoad for UNIMOG 1 and 2 at the same two points of the corner at (a) entry and (b) apex. Figures 1 and 2 illustrate that 1 was travelling faster than the 75kph advisory speed at both points.

95. That UNIMOG 2 travelling through the apex at 77 kph and successfully negotiated the corner, while UNIMOG 1 travelling through the apex at 81 kph did not complete the corner, suggests vehicle speed was a contributing factor to the roll over, noting the faster a vehicle travels, the greater the overturning (side) forces applied to the vehicle become; the speed-squared-effect.⁹⁶

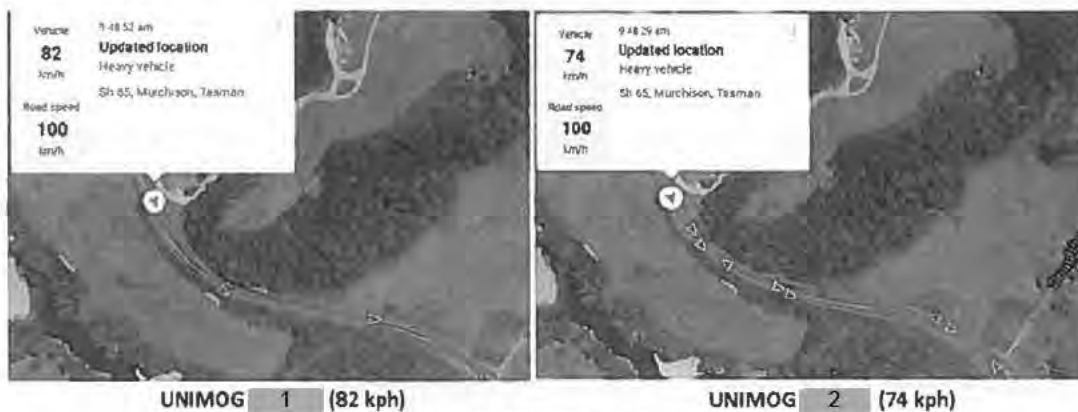


Figure 1. Comparison of Entry Speeds

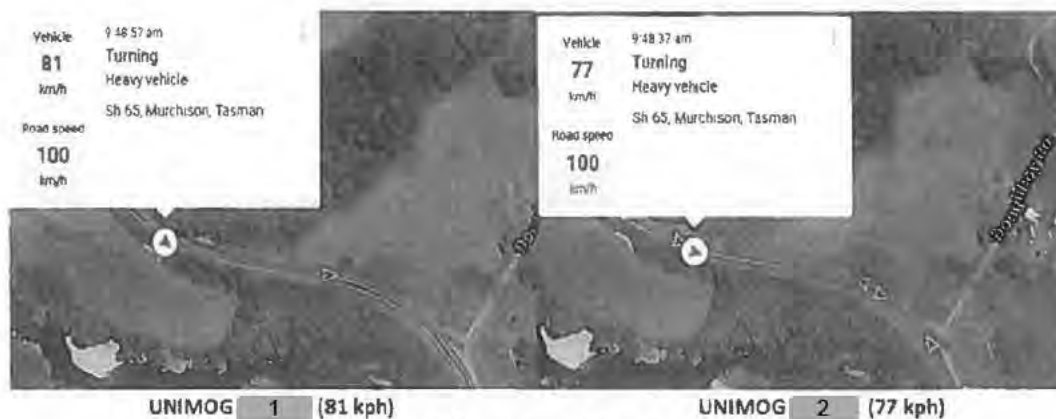


Figure 2. Comparison of Apex Speeds

Note 4: the NZTA state overturning forces increase by the square of speed (speed-squared effect) and a small increase in speed has a much greater increase in cornering (side) forces and a dramatic impact on vehicle controllability (Source - nzta.govt.nz/resources/heavy-vehicle-stability-guide/).

⁹⁴ Exhibit 6 B.

⁹⁵ Witness 4, Q6 to Q11.

⁹⁶ NZ Transport Agency Waka Kotahi – Heavy vehicle stability guide, version 1.0 published June 2008.

Note 5: reference to NZTA information is not considered as evidence in this report, it is included for information and context only.

96. Previous Handling Problems of UNIMOG 1. Poor handling characteristics of UNIMOG 1 had been previously reported by Witness 2 (Customer Support Manager WB) following a task from Woodbourne to Maruia 28th July 2024 – approximately three weeks before the rollover. Witness 2 gave evidence that at 0830 hrs on Mon 29th July 24 he verbally informed GSE technicians at RNZAF Base Woodbourne that UNIMOG 1 handle poorly (hard to control, the vehicle “swayed” and it felt like the back end of the vehicle was “coming round”).⁹⁷

97. Witness 1 stated he recalled the issue being mentioned to him, but he did not regard the matter as serious and the issue was forgotten because of the section’s high Monday morning workload⁹⁸. The topic was not raised again to Witness 1 and with no written report the issue of poor handling of UNIMOG 1 was forgotten, and no follow up action was taken.

98. DFI 40.3 requires RNZAF vehicles whose maintenance is controlled by DEMO to be maintained in accordance with Land Equipment Inspection & Servicing Manual – NZ P93. This instruction is applicable to all RNZAF operated UNIMOGs i.e. 1⁹⁹ and requires drivers to complete a vehicle Last Parade Sheet at the end of a task to note any faults occurring during the task¹⁰⁰. A last parade sheet was not raised for UNIMOG 1 following the Woodbourne to Maruia task in July 2024. While the completion of a Last Parade Sheet is no guarantee that maintenance may have identified/rectified an issue and thus prevented the rollover, the Court finds the opportunity to investigate was lost because without a written record the GSE section lost visibility of the issue. Had the Last Parade Sheet been completed to record the poor handling of UNIMOG 1 it is likely the issue would have been more thoroughly investigated.

99. The Court noted that DFI 40.3 Annex 13A - NZ Army Maintenance Process expands and reinforces the requirement to complete Last Parade Sheets¹⁰¹. However, Annex 13B - RNZAF Maintenance Process is silent on the use of Last Parade Sheets. It is the opinion of the Court that greater awareness of the responsibilities of drivers and the use of Last Parade Sheets by units operating RNZAF vehicles is required to ensure essential servicing and reporting of faults is formally captured to allow vehicles to be maintained in a safe and reliable condition.

100. In contrast to the experience of Witness 2, Witness 4 stated that of the approximately 174 km he had driven before the rollover, that UNIMOG 1 drove like any other UNIMOG, and nothing specific stood out as being “crook” or “broken”.¹⁰² However, because of the handling issues previously raised by Witness 2 UNIMOG 1 was subjected to an extensive inspection when it was recovered to RNZAF Base Woodbourne.

101. The findings and maintenance carried out on UNIMOG 1 because of the post rollover inspection are discussed at the Expert Witness - Mechanical Assessment section of this report.

⁹⁷ Witness 2, Q1, Q2 and Exhibit 2 E.

⁹⁸ Witness 1 Q1 (A3, A4)

⁹⁹ DFI 40.3 Land Transport, Chapter 13 – Maintenance, Inspection and Recovery – Annex 13B, RNZAF Maintenance and Inspection Processes, paragraph 1 (c).

¹⁰⁰ DFI 40.3 Land Transport, Chapter 5 – Drivers Responsibilities, paragraph 5.7 (1) to (5) and Chapter 13, Annex 13A paragraph d – Drivers First Parade, Halt Parade and Last Parade servicing.

¹⁰¹ DFI 40.3 Land Transport, Chapter 13 – Maintenance, Inspection and Recovery, Annex 13A, paragraph 1 (d).

¹⁰² Witness 4, Q31-Q33

Finding 16: The Court finds the use of verbal reporting of vehicle faults in place of formal written reports (last parade), whilst well intentioned, creates conditions for errors and omissions.

Finding 17: The Court finds the poor handling of UNIMOG 1 reported by Witness 2 was not experienced by Witness 4 and the Court is unable to establish if the vehicle handling characteristics were abnormal and therefore may have contributed to the rollover.

Recommendation 5: The Court recommends RNZAF commanders/managers review Base/Wing/Unit Standing Orders, the purpose of the review is to ensure orders, instructions and procedures state personnel are to comply with the requirements of DFI 40.3 Chapter 5, para 5.7 and DFI 40.3 Chapter 13 Annex – (in part “.. drivers to conduct First and Last Parade service inspections”.

Recommendation 6. The Court recommends adding a recurring order in RNZAF Base Routine Orders, that all personnel are to complete First & Last Parade service inspections in accordance with DFI 40.3 Chapter 5, paragraph 5.7, with reference to the COI findings.

Recommendation 7: The Court recommends Defence Logistics Commander (Land) as custodian of DFI 40.3, amend the RNZAF Maintenance Process at DFI 40.3 Annex 13 B paragraph 1, to include the requirement for drivers to complete First and Last Parade sheets in accordance with NZ P93; mirroring the wording in Annex 13A - NZ Army Maintenance Process.

The Environment

102. **General:** Witness 6 (s. 9(2)(a)) gave evidence that the road surface in the area of the rollover is worn and ranges from poor to good condition. The road surface of the approach to the corner where the rollover occurred is good but changes to a worn/smooth surface through the corner apex and exit.

103. **NZTA Warning Signs:** The corner has a total of four warning/caution signs, reference Photograph 8. There are three signs facing the South bound approach to the bend, the first a combined NZTA hazard warning sign (S bend) and supplementary speed sign advising a reduced speed of 75 kph.¹⁰³ Two signs are located closer the bend warning motorist of ICE/GRIT and SLOW WHEN WET.¹⁰⁴ The fourth and last sign is a 75 kph chevron sign positioned at the entry into the corner. All signs are prominently displayed.

¹⁰³ Recommended speed for hazard area is based on a light vehicle and may be too fast for a heavy vehicle – NZ Transport Agency Waka Kotahi – Road code - <https://www.nzta.govt.nz/roadcode/heavy-vehicle-road-code/>

¹⁰⁴ <https://www.nzta.govt.nz/roadcode/code-for-cycling/road-signs-and-markings/#warning>



Photograph 8. Extract from Exhibit 6 I.

104. Rollover Site Visit by Witness 6 [s. 9(2)(a)]. Witness 6 concluded two probable scenarios led to the rollover, firstly a loss of traction due to a combination of driver error and speed; and second a loss of traction due to a vehicle fault. Considering the speed of the UNIMOG, slightly above the advisory speed, Witness 6 followed several large vehicles through the corner (speed matched) and noted large vehicles transited the corner at approximately 90kph without difficulty (co-driver reading off the ERoad display). Witness 6 stated Witness 4s driving behaviour was assessed (based off the ERoad data) as showing a disciplined approach and that his driving trend remained the same throughout the whole trip. Witness 6 concluded the loss of traction due to driver error and/or speed was unlikely. On the balance of probabilities, Witness 6 considered the loss of traction due to a vehicle issue was more likely.¹⁰⁵

105. Rollover Site Visit by COI Members: The COI members visited the site of the rollover on 14th February 2025 and 20th March 2025. Conditions were similar but the Court noted the road had been resurfaced since the rollover. COI members walked in a Southern direction from the corner entry point through to the exit-straight approximately 200m farther down the road. At a point past the apex but before the exit point, the road level and camber of the South bound lane noticeably change within a very short distance.



Photograph 9. Taken by COI President. Fri 14th Feb 25.

¹⁰⁵ Exhibit 6A.

106. The red arrow in Photograph 9 indicates the point where the camber of the South bound lane changes from inwards sloping to flat, and the road angle changes from a downhill slope to rising uphill before flattening out. The change in camber and level is sudden and vehicles were observed to 'bounce' as they travelled over the transition in road geometry.

107. The Court considered if it was probable the combination of the wet and slippery road, higher overturning (side) forces due the speed-square effect and rear wheel 'bounce' as UNIMOG 1 passed through the transition in road geometry was sufficient to momentarily reduce the downward force on the road by the vehicles rear wheels and this affected the cornering stability of the UNIMOG.

108. The proposition that UNIMOG 1 lost traction immediately after transiting the change in road geometry (after the apex but before the exit) is corroborated by two pieces of evidence: firstly, photographic evidence presented by Witness 6 showing the location of the UNIMOG wheel marks where the vehicle first left the road onto the left-hand shoulder (Exhibit 6 D), and secondly by Witness 4's statement that he was 75-80% through the corner (past the apex) and looking down the exit straight (but not yet at the exit point) when he felt the vehicle lose traction, which is around the point where the road geometry changes.

109. Observation by COI members of the road geometry and the distance between the transition point and point where the UNIMOG first left the road (Exhibit 6 D) supports the proposition that loss of traction did occur around the change in road geometry. This is consistent with the NZTA heavy vehicle stability guide that states vehicle rollovers normally occur between the apex and the exit of a corner.¹⁰⁶

110. There are two probable scenarios the Court considers probable. The first, the loss of traction was due to a vehicle problem as suggested by Witness 6. The second scenario is a loss of traction due to a combination of elements as discussed at paragraphs 105-109.

111. The Courts opinion is that the scenario where a vehicle problem caused or contributed to the rollover is not supported by the evidence and is therefore unlikely. The Court heard evidence that UNIMOG 1 possibly had an existing mechanical problem, but the Court heard counter evidence from an expert witness that eliminated this as a likely cause.

Note 6: The matter of a possible pre-existing vehicle problem is addressed in detail in the Expert Witness – Mechanical Assessment section of this report.

112. The last scenario to consider is that several factors; wet road, increase overturning forces due to speed, and the sudden change in road geometry combined to cause UNIMOG 1 to lose traction. It is the opinion of the Court that several factors acting in unison did undermine the cornering ability of UNIMOG 1 and this is the likely cause of the rollover.

Finding 18: The Court finds multiple factors; speed, environment and road geometry combined to cause UNIMOG 1 to lose traction, leading to the rollover.

Expert Witness – Operational Assessment

113. Witness 21 (s. 9(2)(a)) gave evidence to the Court on possible causes of the rollover. Witness 21 reviewed witness statements, photographic Exhibits, ERoad data from UNIMOG

¹⁰⁶ NZ Transport Agency Waka Kotahi – Heavy vehicle stability guide, version 1.0 published June 2008.

1, the MD1302 submitted to Vehicle Incident Crash Reporting System (VICRS) and used google maps to review the section of road leading up to the site of the rollover.¹⁰⁷

114. Witness 21 stated that google maps showed the NZTA 75kph speed advisory for the corner but in this case, his view was speed was a lesser factor in this rollover compared to the rollover of UNIMOG s. 9(2)(k). That the road was wet is still a factor.¹⁰⁸ Witness 21 stated the driver may have miss queued the apex of the corner. This is based on Witness 21's review of Exhibit 6 D photograph 'Exit of the corner facing South from the Apex' that showed the UNIMOGs left hand (front) wheels had tracked inside the South bound lanes left-hand white guideline suggesting the driver had inadvertently cut the corner. Witness 21 stated it appeared the UNIMOG had gone over the guideline and potentially hit the 'loose' and because of the chunky tyres on NZDF UNIMOGs the vehicle had 'dug in' and this led to the vehicle losing stability. Asked to summarise his assessment to the Court, Witness 21 stated he considered three factors contributed to the rollover of 1

- a. Poor technique in apexing the corner, where the driver uses the lane but slightly cuts the corner to straighten the corner rather than staying in the middle of the lane. In this case the driver may have driven off the road into the 'loose'.
- b. The vehicle speed was higher than the advisory speed, and
- c. The slippery nature of the road (NZTA warning signs were posted to warn motorists of slippery nature of the road when wet).

115. It is the opinion of the Court that the UNIMOG wheel marks represented in Exhibit 6 D may be the result of the UNIMOG running off the road after it had initially lost traction (fishtailed) and not from the driver miss queuing the apex as suggested by Witness 21. The Courts opinion is supported by evidence presented by Witness 4 and Witness 6, both stating the vehicle lost traction and ran off the road after the apex of the corner not prior or on the apex of the corner.

Finding 19: The Court finds that there is insufficient evidence that Witness 4 miss queued the apex of the corner and that this action contributed to the rollover.

Finding 20: The Court finds there is sufficient evidence to support the Expert Witness assessment that speed and road conditions contributed to the rollover.

Cause of the Rollover

116. Primary Factor – The Court finds that there is no single cause for the rollover and that it is likely several contributing factors combined to cause the rollover.

- a. **Contributing Factor 1.** The UNIMOG was travelling at 81kph within a 75kph advisory reduce speed area. Although the speed differential is small, the overturning side forces increase by the square of the speed and the increased side forces in combination of other factors likely reduced the UNIMOGs safety margin for cornering.

¹⁰⁷ Witness 21 is a Driving Instructor (22 years); Driver Testing Officer (19 years) and Certifier (qualifies other Testing Officers); a graduate of the UK MOD Master Drivers Course (2015) and a trained Vehicle Crash Investigator who has led multiple vehicle crash investigations.

¹⁰⁸ Witness 21, Q13, Q14.

- b. **Contributing Factor 2.** At a point past the apex, the sudden change in the road geometry (road camber and level) likely affected vehicle traction and the vehicle's cornering ability.
- c. **Contributing Factor 3.** The road conditions were wet and slippery further reducing the vehicles traction and cornering ability.

Finding 21: Witness 4 had driven approximately 175 km that morning on similar road conditions without incident and ERoad showed a positive driving performance and culture. The vehicle was not subject to any mechanical issues.

Finding 22: The Court finds it likely a contribution of factors combined to destabilise the UNIMOG as it was navigating the corner leading to a loss of traction and the eventual rollover.

Reporting

117. The initial incident and follow up command reporting was carried out in accordance with normal reporting procedures. Witness 3 (s. 9(2)(a)) reported the incident by telephone to 2/4 RNZIR HQ and followed this up a short time later with a text SITREP to Witness 6 (s. 9(2)(a)) that included pictorial evidence. Witness 6 emailed an Incident Report to HQ 1 (NZ) Bde that afternoon after interviewing both UNIMOG drivers and Witness 3 via FaceTime. The following day, Witness 4 raised MD1302 NZDF Vehicle Incident Form for VICRS reporting.

118. The Court found that subsequent SEMT reporting and the requirement to inform WorkSafe of the rollover was not actioned by respective commands. The H&S Advisor at RNZAF Base Woodbourne raised a SEMT as a placeholder some weeks later, and WorkSafe was informed of the rollover retrospectively by Witness 22 (s. 9(2)(a)) on 20th February 2025.

Vehicle Incident Crash Reporting System (VICRS) - s. 9(2)(k)

119. NZDF Vehicle Incident Form (MD1302) was completed by Witness 4 and submitted to Witness 3 for upload to VICRS on 26th August 2024. The report was amended by Witness 2 (Woodbourne) later that day to capture the correct vehicle speed of 81kph as recorded by ERoad.¹⁰⁹

Safety Event Management Tool (SEMT)- s. 9(2)(k)

120. The Court was advised by Witness 6 that the responsibility to complete additional reporting such as SEMT was the responsibility of s. 9(2)(a) and/or HQ 1 (NZ) Bde.¹¹⁰ When SEMT action was not forthcoming the Base Safety Advisor at RNZAF Base Woodbourne raised a SEMT report on 4th September 2024 as a placeholder only, because by that time it was known a COI was to be assembled. The SEMT has subsequently been closed by Witness 22 because it has performed its purpose and WorkSafe have advised the event is Not Notifiable.

Incident Notification

121. Witness 6 gave evidence that he advised Brigade HQ via email during the afternoon of 25th August 2024, that an incident involving a UNIMOG had occurred. HQ 1 (NZ) Bde tasked Witness 6 to

¹⁰⁹ Exhibit 6E (page 8 of 14 and 12 of 14).

¹¹⁰ Witness 6, Q50 and Q51.

investigate and report the circumstances of the rollover.¹¹¹ Over the next two days Witness 6 interviewed the UNIMOG drivers and the driver of the 4x4 (Witness 3) and visit the site of the rollover to gather information regarding the road and environment¹¹². Witness 6 forwarded his completed report to CO s. 9(2)(a) on 10th September 2024.¹¹³

WorkSafe - s. 9(2)(k)

122. The Court finds no evidence of s. 9(2)(k) or 1(NZ)Bde informing WorkSafe of the rollover. Witness 22 (s. 9(2)(a)) gave evidence that from an RNZAF perspective and based on the very similar circumstances of the s. 9(2)(a) UNIMOG (s. 9(2)(k)) that rolled some weeks earlier where WorkSafe determined the incident was NOT Notifiable because it did not meet the threshold of a notifiable event, the decision was made by RNZAF H&S advisors to not inform WorkSafe of the rollover of 1 .¹¹⁴ Witness 22 has subsequently informed WorkSafe of the rollover of 1 and WorkSafe have confirmed the event is NOT Notifiable and have placed a note of the second rollover on the NZDF PCBU file.¹¹⁵ This report will address WorkSafe notifiable events in more detail at 'WorkSafe – What events need to be notified' paragraphs 151 to 153.

Police Traffic Report - s. 9(2)(k)

123. A NZ Police officer from Murchison attended the rollover site, spoke with the driver and set out safety cones and signs before heading back to the station. The officer later returned to provide traffic control during the recovery of the UNIMOG by the heavy tow vehicle. No further action by NZ Police is anticipated.

Finding 23: The Court finds initial reporting action by Witness 4 (driver), Witness 3 (s. 9(2)(a)) and Witness 6 (s. 9(2)(a)) was thorough and timely, and completed in accordance with normal NZDF reporting procedures.

Finding 24: The Court finds the reporting in SEMT and the requirement to inform WorkSafe were not actioned per normal NZDF or WorkSafe reporting requirements.

Recommendation 8. The Court recommends HQ 1 (NZ) Bde review Base/Camp orders for reporting vehicle incidents in SEMT and the informing of WorkSafe of vehicle rollover events, the review is to ensure sufficient information is included in orders, instructions and procedures to assist commanders/managers to complete SEMT reporting and meet requirements to report vehicle rollover incidents to WorkSafe in accordance with criteria in the Notify WorkSafe 'tool' published on the WorkSafe website.

Injury, Trauma and Property Damage

Injury/Trauma

124. Witness 3 stated that when he arrived at the scene of the rollover, Witness 4 was sitting on top of the passenger's door with the vehicle resting on its right side. Witness 3 helped Witness 4 down from the vehicle and conducted a visual check of Witness 4 looking for any obvious injuries

¹¹¹ Witness 6, Q10-Q12 and Exhibit 6C.

¹¹² Witness 6, A17 to A22.

¹¹³ Witness 6, Q4 to Q5.

¹¹⁴ Witness 22, Q7 and Exhibit 22 B.

¹¹⁵ Exhibit 22 C.

and he asked Witness 4 if he was ok. Witness 4 replied he had already checked himself over and that he was fine. The slow nature of the rollover meant Witness 4 was able to brace himself and he did not suffer any significant body or head impacts with the vehicle. No further medical assistance has been sought by Witness 4.¹¹⁶

Vehicle First Aid Kit

125. Witness 4 stated the vehicle had a first aid kit, but the kit was not used because he suffered no physical injuries. The Vehicle First Parade Sheet completed on the morning of 25th August 2024 reflects a serviceable first aid kit was checked as fitted.¹¹⁷

Property Damage (Third Party)

126. Witness 3 stated the rollover damaged a portion of a farm stock fence located at 845 Shenandon Highway owned by a civilian. The owner was working in the paddock when the accident occurred and came over and exchanged mobile phone numbers with Witness 3. The owner made temporary repairs to the fence using waratahs and wires and indicated to Witness 3 that at some stage he would like to know what was happening regarding a permanent fix, indicating NZDF to cover costs. Witness 3 has passed the owner's contact details on to his command to follow up.

Insurance

127. At the time of the interviews, costs to repair the farmer's fence is yet to be determined. CO s. 9(2)(a) expects to cover the cost of repair through NZI.

¹¹⁶ Witness 3, Q2.

¹¹⁷ Exhibit 2 A, B Vehicle First Parade Sheet XX2208 dated 25 Aug 24.

CARRIAGE OF PERSONNEL in the rear of UNIMOGs

128. In the case of UNIMOG s. 9(2)(k) (Auckland), the Court heard evidence from Witness 15 (s. 9(2)(a)) that personnel have not been transported in the rear of UNIMOG for some time.¹¹⁸ At the time of the incident, only the front set of rear seats were installed on UNIMOG s. 9(2)(k). Witness 15 however stated that the only reason they had tasked the UNIMOG was to carry stores and equipment. Not personnel. Witness 15 stated that the advice on carriage of personnel in the rear of UNIMOGs is inconsistent with practise and although passengers are not carried policy does allow for this practise in accordance with the 3 hour/250km rule in DFI 40.3.¹¹⁹

129. In the case UNIMOG 1 (Woodbourne), the Court heard evidence from Witness 3 that seats were fitted to UNIMOG 1 so that troops could be carried from Maruia into the designated exercise area only.

Policy

130. DFI 40.3 Land Transport. Policy states for journeys of less than 3 hours or 250 km, commanders may use UNIMOGs to transport personnel on open public roads, with alternate transport such as buses and vans mandated for on road journeys that are likely to be greater than 3 hours or 250 km. Control measures around the use of UNIMOG vehicles for the movement of passenger is promulgated at Annex 6A of the DFI, reference Figure 3¹²⁰.

131. Annex 6A Error – UNIMOG U1700L Off Road – troops in back. Three control measure are stated to manage the risk to passengers carried off-road. Firstly, the activity is be carried out in accordance with DFI 40.3 Chapter 3, Section 4, however this is incorrect with Section 4 referring to 0800NZFORCES How's My Driving and not the off-road movement of personnel as passengers. The second control is a compliant NZROPS Pods must be used, however there are no UNIMOG Pods in general use and the only compliant system is a specific pod developed for 16 Fd Regt (artillery) designed to carry both troops and ammunitions and equipment. The final risk control measure and the only one that is in any way effective, is a subjective measure where the driver is to dismount passengers when an adverse condition is assessed to pose a high risk.

Finding 25: The Court finds the risk control measures of DFI 40.3 Annex 6A for Off Road – Troops in back, are non-existent in practice and the safety of passengers is solely reliant on the competency of the driver to identify adverse conditions and correctly assess the degree of risk.

Recommendation 9: The Court recommends Defence Logistics Commander (Land) as custodian of DFI 40.3, amend Annex 6A to provide the correct reference for risk control measures to support the Mercedes Benz UNIMOG 1700L sub-heading 'Off-Road – Troops in back' (ref paragraph 144).

¹¹⁸ Witness 15, Q42

¹¹⁹ DFI 40.3, Land Transport, Chapter 6, Paragraph 6.3

¹²⁰ DFI 40.3 Land Transport, Chapter 6 – Vehicle Operating Instructions – Annex 6A Risk Control Measures Matrix For Operating Dual Purpose Vehicles (DPVS) For The Carriage Of Personnel - Mercedes Benz U1700L (Version 1.03 16 December 2024).

Vehicle Type	Variants and seating configuration	On Road - No Troops	On Road - Troops in back	Off Road - No Troops	Off Road - Troops in back
	MERCEDES BENZ U1700L Two rear passenger wooden slate bench seats. Seats approx 16 personnel. Compliant NZROPS Pods fitted seating up to 16 passengers. Compliant NZROPS Pods fitted to Artillery U1700L.	Yes IAW DFI 40.3 Chapter 6, Section 2 Chapter 7, Section 1 Chapter 8, Sections 1 and 2	Yes PSM and wooden bench seats can be used, but priority is to use compliant NZROPS pods. Must not carry personnel for any longer than 3 hours or 250 km. For comfort and safety, buses and vans must be used if the journey is likely to exceed 3 hours or 250kms. IAW DFI 40.3 Chapter 6, Section 2 Chapter 7, Section 1 Chapter 8, Sections 1 and 2	Yes IAW DFI 40.3 Chapter 3, Section 4 Chapter 6 Section 2	Yes IAW DFI 40.3 Chapter 3, Section 4 but must use safety compliant NZROPS Pods¹²¹. If no NZ ROPS are used passengers are to be dismounted where adverse conditions of the road or ground present a high risk of ground giving way, losing traction, causing sliding, loss of control, roll over or tipping. Non-compliant rear passenger seating is not to be used¹²¹

Figure 3. Extract Annex 6A Risk Control Measures Matrix for Operating Dual Purpose Vehicles (DPVS) For The Carriage Of Passengers – UNIMOG 1700L

132. Witness 21 (s. 9(2)(a)) stated the NZ Army continue to use the UNIMOG to transport personnel in both on-road and off-road environments within the risk control measures set out in DFI 40.3 (Figure 3) and supported by risk-based assessment and Risk Management Plans (RMP) produced for each activity/exercise, that specifically addresses the risk around carriage of passenger by UNIMOG (and vehicles in general). The approval level for the RMP is at minimum of LTCOL¹²¹. Witness 21 stated the risk control measures of Annex 6A and the activity RMP are deemed fully effective, and no other controls are used. Witness 21 stated the final decision on the acceptability of risk to passengers is ultimately the responsibility of the vehicle driver. If the driver considers the terrain to pose a high risk they are to disembark the passengers, and the vehicle and passengers are to cross the terrain/obstacle separately.

133. Although DFI 40.3 allows the carriage of passengers on-road up to 3hrs or 250 km, in the RNZAF context this practice has ceased because the risk to personnel is deemed unacceptable. Military Air Base (MAB) commanders have enacted local rules limiting the carriage of passengers by UNIMOG to within operating/exercise areas only. Alternative transport such as buses are used for the movement of personnel on-road to and from operation/exercise areas.

Finding 26: The Court finds it is not common practice for the RNZAF to carry passengers by UNIMOG other than within exercise and training areas, with MAB commanders enacting local rules to restrict the on-road movement of passengers by UNIMOG.

134. The Court acknowledges the UNIMOG is the only vehicle available to move personnel in some conditions, i.e. in off-road training and exercise areas. For on-road movement there are alternate transport options available but apart from restrictions put in place at a base level, there is no specific RNZAF policy or instruction to describe the additional limitations over and above DFI 40.3 that the RNZAF would require its commanders/managers to observe when considering the on-road movement of personnel by UNIMOG. It is the Courts opinion that an RNZAF order is required to provide a visible and repeatable reference of the RNZAF specific risk controls to be applied when planning the carriage of passenger on-road by UNIMOG.

¹²¹ Witness 21, Second Interview Q2.

Finding 27: The Court finds there is no RNZAF specific instruction to supplement DFI 40.3 and elevate local MAB rules to Standing Order status to provide a visible and repeatable reference for commanders/managers.

Recommendation 10: The Court recommends commanders of Military Air Bases amend Base Standing Orders to add order(s) to describe additional RNZAF risk controls, minimum authorisation levels and the types of journeys and conditions when personnel shall / shall not be transported by UNIMOG. The order(s) should reference DFI 40.3 instruction and differentiate between the freedoms/limitations applicable to off-road training and exercise areas, and on-road tasks.

Driver Authorisation (Passengers)

135. The lesson learned from the rollover of UNIMOG s. 9(2)(k) (Whenuapai) is that the competency of the vehicle driver is a crucial risk mitigator, or risk multiplier if the driver is not competent to complete the assigned task. Competency of the driver is also a risk control measure at DFI 40.3 Annex 6A, where drivers are required to identify adverse conditions and assess the degree of risk and to dismount passengers where the risk presented is high.

136. While the carriage of passengers by UNIMOG both off-road and on-road presents risk (rollover), it is the opinion of the Court that the greatest potential to cause serious harm to personnel is presented by the on-road movement of personnel. The Court found the on-road environment is also where the UNIMOG is most susceptible to external influences that challenge drivers, higher speeds, variable road surface conditions and geometry, weather and other traffic.

137. It is the opinion of the Court that drivers of UNIMOGs where passengers are to be transported on-road should meet a higher standard of competency and be specifically authorised to undertake on-road passenger tasks as part of their environmental and employment training in accordance with DFI 40.3.¹²² This could be as simple as requiring drivers to have a minimum number of years' experience of driving UNIMOGs e.g. two years and drivers are able to demonstrate UNIMOG driving currency and competency having completed an Advance Driver Assessment (UNIMOG) within a maximum time frame e.g. not greater than 24 months and requalifying every two years.

Finding 28: The Court finds the creation of a separate driving authorisation to carry passengers on-road (at highway speeds up to 90kph) would reduce the risk of an inexperienced driver being selected for an on-road passenger task.

Recommendation 11. The Court recommends Training and Doctrine Command (NZ) TRADOC (Master Driver-Trg) review the current Defence Driver Permit (DDP) model, the purpose of the review to determine if a separate category of UNIMOG driver authorisation 'On-Road Carriage of Passengers' is practical and would strengthen management/control of drivers-to-task and amend DFI 40.3 environmental and employment training requirements as appropriate.

¹²² DFI 40.3 Chapter 4, Section 4, paragraph 4.23.

OTHER MATTERS RELEVANT TO THE INQUIRY

WorkSafe – What events need to be notified

138. WorkSafe as the health and safety regulator must be notified when certain work-related events happen (notifiable events). In March 2024 WorkSafe released an information guide to provide information about what a person conducting a business or undertaking (PCBU) must do if a notifiable event happens.¹²³ The two categories of a notifiable events are:

- a. Notifiable injury or illness – an injury or illness (work related) that requires a person to be admitted to hospital for immediate treatment, and
- b. Notifiable incident – an unplanned or uncontrolled work-related incident that exposes the health and safety of workers to serious harm.

139. WorkSafe defines a notifiable incident to be ‘damage to or collapse, overturning, failing or malfunctioning of any plant that is required to be authorised for use under regulations’. The term plant includes vehicles and therefore a vehicle rollover (overturning) is notifiable to WorkSafe regardless of personnel being injured or not. In addition to the guide, WorkSafe provide a ‘Notify WorkSafe’ tool on their website to guide PCBUs through the notification process and determine whether the event is a notifiable injury, illness or incident.

140. Based on the response to the reporting of the rollover of **s. 9(2)(k)** some weeks earlier that WorkSafe determined was NOT Notifiable, the reporting of rollover of **1**, was not made as it was assumption it too would be treated in the same way. Should occurrences of UNIMOG rollovers continue a threshold may be reached where WorkSafe is obliged to investigate due to the number of repeat events. While WorkSafe may determine an individual incident is NOT notifiable, the reporting of all rollovers by the NZDF will ensure the NZDF fully meets its obligations. Reporting carries zero risk but under reporting carries a reputational risk if later WorkSafe determined to investigate NZDF vehicle rollovers, possibly due to a fatality, and NZDF was found to be under-reporting the number of rollovers.

Finding 29: The Court finds the reporting of **1** rollover to WorkSafe was first missed by the operational responsible commands (**s. 9(2)(a)/HQ 1 (NZ) Bde**) for which the Court has been unable to determine a reason, and later not reported by RNZAF Health & Safety managers due to the assumption it would be viewed as NOT notifiable by WorkSafe.

Recommendation 12. The Court recommends single service Health & Safety commands ensure every vehicle rollover event is reported to WorkSafe, using normal reporting procedures regardless of past responses from WorkSafe for similar events, in accordance with the criteria in the ‘Notify WorkSafe Tool’ published on the WorkSafe website.

DFI 40.3 Land Transport – driver competency

141. DFI 40.3 places specific responsibilities on commanders and managers to ensure personnel undertaking driving tasks are qualified, including current competency is achieved through on-job-training and assessment.¹²⁴ DFI 40.3 recognises that drivers gaining a Defence Driving Permit (DDP)

¹²³ Exhibit 12 D – WORKSAFE March 2024 ‘What events need to be notified’ worksafe.govt.nz

¹²⁴ DFI 40.3 Chap 15, Sect 1, paragraph 15 (e) (4).

are deemed trained drivers having achieved "initial experience" and thereafter individuals require specific environmental and employment training to be delivered as required and to support this supervisory staff are to constantly assess, and where necessary have drivers reassessed; to ensure driving skills are maintained.¹²⁵

142. In the case of UNIMOG s. 9(2)(k) (Whenuapai), Witness 7 had few opportunities to practice his UNIMOG driving skills, and witness statements were silent on whether workplace training tasks were carried out under supervision and/or that his workplace driving was assessed.

143. The challenges to deliver workplace driver continuation training is compounded by the RNZAF not having an organic driver training capability. This limits the RNZAF ability to produce driving instructors (train the trainers) and deliver driving training to personnel in a timely manner. The RNZAF also has no HQ level manager/staff officer to provide SME and policy advice or provide audit functions/reports to senior leadership that RNZAF operations, systems and processes are compliant with NZDF policy and orders.

144. Prior to 2011 the RNZAF had a full time Vehicle Fleet Manager (VFM) employed within Air Staff. With the disestablished of the RNZAF Motor Transport Trade in 2011 the position was transferred to DSSG and a DSSG VFM (Air) was appointed working out of RNZAF Base Woodbourne. As part of the DSSG re-design introduced in February 2024 the DSSG VFM (Air) role was disestablished. Since that time the administration and management of the RNZAF vehicle fleet has been disjointed.

Finding 30: The Court finds that the requirement for workplaces to provide driver continuation training under supervision and where necessary with drivers being reassessed, is not widely promulgated or enacted in the RNZAF.

Recommendation 13: The Court recommends RNZAF commanders/managers review and where necessary amend Wing/Unit Standing Orders and/or SOPs to include the requirement of DFI 40.3 Chap 4, Sect 4 paragraph .23 (a) (i) specifically to emphasise individuals require specific environmental and employment training to be delivered as required and to support this supervisory staff are to constantly assess and where necessary have drivers reassessed.

Recommendation 14: The Court recommends ACAF T&S undertake a review of driving training and driving management within the RNZAF, the purpose of the review to determine the value of creating an organic RNZAF driving training capability and a Vehicle/Transport Manager position in Air Staff; to present a business case to increase resources, if supported by the review outcome, to the Air Workforce Management Board (AWMB) for consideration.

UNIMOG rear bench seats

145. When UNIMOG 1 was recovered to RNZAF Base Woodbourne after the rollover, one of the rear bench seats was found loose in the rear of the truck. It was initially thought the seat attachment points had failed because of the rollover. If personnel had been in the seat there was a high possibility for serious injury. Woodbourne GSE staff raised the issue with the Court as a safety concern around the possible failure of the seat locking system due poor design and/or incorrect seat fitment and also raised concerns regarding the serviceability state of UNIMOG rear cargo plywood decks, which is integral to the seat locking system but which in the case of UNIMOG 1 is badly

¹²⁵ DFI 40.3 Chap 4, Sect 4 paragraph 4.23 (a) (i)

deteriorated. The COI President notified the COI Assembling Authority and Directorate of Land Engineering (DLE) of a potential safety risk by email on 31 October 2024.¹²⁶

146. Subsequently, Witness 3 gave evidence that the rear bench seat of UNIMOG 1 was removed after the rollover to provide space to carry a flat tyre back to Base Woodbourne rather than perform the difficult task of refitting the flat to the spare wheel tray located under the UNIMOG vehicle body.

147. While the Court determined the rear seat was purposely removed and was not subject to a safety fail, several factors contribute to what the Court considers an emerging risk to the safety of personnel travelling in the rear of UNIMOGs, specifically flimsy tensioner safety link and deteriorating seat anchor points and plywood cargo deck.

Seat Safety Link

148. The rear wooden bench seats are side facing with supports fitted directly into slots in the main vehicle cargo deck. The security of seats to the cargo deck is achieved by a chain and turn buckle tensioner set-up, with an over centre safety-link to ensure tension is maintained and seats do not collapse in on themselves. The safety-link is a simple over-centre mechanism that can be disengage by accidental interference from bags or people. With the safety link opened, it is possible for the chain and turn buckle to loosen over time and allow the seat supports to disengage from the cargo deck. The safety link is highlighted in Photograph 10.

Finding 31: The Court finds in a crash scenario under high G forces, passengers could be at risk of being thrown around the cargo area even though they remain secured to the seat by seatbelts.



Photograph 10. Extract from Exhibit 1 K.

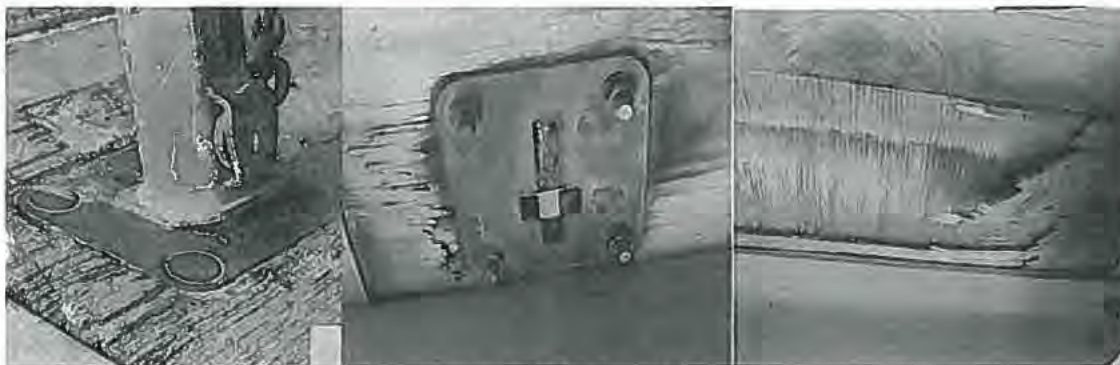
Recommendation 15: The Court recommends the Directorate Land Engineering investigate options to replace the current over-centre safety link with a positive-locking mechanism.

Seat Anchor Points & Plywood Cargo Deck

149. The rear bench seats in the UNIMOG are anchored to the main cargo deck through a T-shaped foot that slots into a metal anchor plate bolted to the vehicle deck. While some bolts are installed into the vehicle steel sub-frame, most plates are simply bolted together sandwiching the plywood cargo deck. In the event of an accident or rollover, the ability of the anchor plates to support the weight of seat and passengers is dependent on the strength of the plywood deck. In the

¹²⁶ Email – UNIMOG COI process re the reporting of a safety concern - COI President (s. 9(2)(a)) to COI Assembling Authority (A/DCAF GPCAPT M Going) dated 31 October 2024.

case of UNIMOG 1 the plywood deck around several metal anchor plates is badly deteriorated and breaking up. The Court heard evidence from Witness 1 that there is no inspection plan or schedule maintenance for UNIMOG cargo decks or seat anchor points. It is up to individual maintenance staff to determine the serviceability of cargo decks and act as necessary. Reference Photograph 11.



Photograph 11. Extract from Exhibit 1 K.

Finding 32: The Court finds the absence of inspection and maintenance schedule for ageing UNIMOG plywood cargo deck increases the potential for harm to passengers should the seat to cargo-deck interface fail during a rollover or crash.

Recommendation 16: The Court recommends that Directorate Land Engineering develop a maintenance programme for UNIMOG cargo decks to include minimum inspection schedules, damage tolerances and repair/replacement criteria.

Recommendation 17: The Court recommends that the Directorate Land Engineering initiate a nationwide survey of all UNIMOG 1700L seat anchor points and plywood cargo decks to identify immediate actions to eliminate any safety issues.

REPORT CONCLUSION

150. The Court found speed was the primary cause of the Whenuapai UNIMOG rollover and a combination of several factors, including speed was the likely cause of the Woodbourne rollover. The circumstances of the two rollover events are very similar with both UNIMOGs failing to negotiate a corner on a rural highway in wet conditions. The vehicles were driven below the posted speed limit but in both cases above the NZTA advisory speed recommended for the section of road and conditions on the day. NZTA hazard warnings signs were prominently displayed at the entry to the corners for each rollover event, warning motorists of the hazards ahead (slippery when wet) and to reduce speed.

151. The Court found that the drivers were appropriately licensed and held current DDPs to drive UNIMOGs. In the case of the Whenuapai rollover the LAC driver had little on-road driving experience in a UNIMOG and this likely contributed to poor judgment around safe road speed. The Court highlighted the lack of RNZAF specific instructions to address the carriage of passengers by UNIMOG, noting MAB commanders have restricted the practice but DFI 40.3 does allow the on-road carriage of passenger by UNIMOG up to 3hrs or 250km.

152. The Court found no evidence of any vehicle design or maintenance action, or inaction that may have caused or contributed to the rollovers. The Court noted the poor condition of the rear passenger seat attachment points and cargo deck of the Woodbourne UNIMOG and highlighted the lack of scheduled maintenance in these areas and recommended a survey of the NZDF UNIMOG fleet to address potential safety concerns.

REPORT RECOMMENDATION

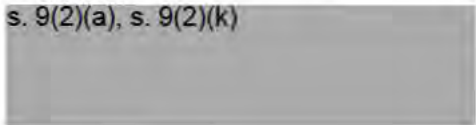
153. The Court made 32 findings and 17 recommendations throughout this report and to preserve the context of each the recommendations have not been repeated here.

154. It is the recommendation of the Court the 17 recommendations made through this report are taken for action by the relevant areas of the NZDF.

Dated at Defence House 30 April 2025.

President:

s. 9(2)(a), s. 9(2)(k)



Member:

s. 9(2)(a), s. 9(2)(k)



**Annex C to Court of Inquiry Report
Into the Circumstances of Two RNZAF
UNIMOG 1700L Rolling Over in Aug 24**

SUMMARY OF FINDINGS AND RECOMMENDATIONS

COURT FINDINGS

Finding 1: The Court finds the servicing and maintenance of UNIMOG s. 9(2)(k) by s. 9(2)(a) personnel was completed to a high standard. There is no evidence of any servicing or maintenance actions/inactions that may have contributed to or caused the rollover.

Finding 2: The Court finds no evidence of any mechanical defects or design issues with UNIMOG s. 9(2)(k) that may have contributed to or caused the rollover.

Finding 3: The Court finds no evidence of fatigue, alcohol or illegal substances being a factor in the rollover

Finding 4: The Court finds it likely that Witness 7 had not fully developed the cognitive skills required to drive heavy military vehicles, specifically, his ability to see and understand what's happening on the road around him, to process visual cues and make decisions and judgements quickly.

Finding 5: GPS telematic systems eliminate doubt as to how a vehicle was being operated; its speed, acceleration or deceleration; evidence that previously was reliant on the driver's memory or the memory of witnesses. The Court finds ERoad data to be a valuable tool to determine or eliminate the degree driving behaviour contributes to an incident and hastens the identification of causal factors and areas where additional control measures are needed to help prevent future incidents.

Finding 6: Acknowledging that the road was wet, the Court finds no evidence of any unknown or unavoidable factors with the road or environment that may have contributed to the rollover. The Court finds the inherent hazard of this section of road to be prominently and permanent identified by NZTA warning signs that advise motorists to reduce speed.

Finding 7: The Court finds the primary cause of the crash and subsequent rollover of UNIMOG s. 9(2)(k) was speed with the vehicle travelling too fast for the conditions, causing the driver to lose control.

Finding 8: The Court finds that although trained and licensed, Witness 7 was inexperienced in driving a UNIMOG on the open road and was ill prepared to assess the cumulative risk of UNIMOG (heavy military vehicle), hazard (winding road) and environment (wet and slippery road surface) and therefore he was not prepared to respond appropriately.

Finding 9: The court finds all reporting action was completed in accordance with normal NZDF reporting procedures including the requirements under the Health and Safety Work Act 2015 to notify WorkSafe.

Finding 10: The Court finds no evidence of any short-term or permanent injury or side-effect to either the driver or passenger caused by the rollover that may require ongoing treatment.

Finding 11: The Court finds the remediation and payment of damages has been completed through NZDF Insurance (Vector and UNIMOG) and s. 9(2)(a) Cost Centre (ACE Towing) and no further action is anticipated.

Finding 12: The Courts finds that the loss of tyre pressure in the right rear tyre is likely the result of the tyre bead being disturbed as the tyre slid sideways across the road surface, and it is unlikely to have caused or contributed to the rollover.

Finding 13: Based on the evidence presented by the Expert Witness, the Court finds no evidence that the binding of the torque tube is likely to have caused or contributed to the rollover.

Finding 14: Woodbourne GSE whilst intent was there, it did not follow processes per DFI 46.5 and NZ P98.

Finding 15: The Court finds no evidence of fatigue, alcohol or illegal substances affecting the performance of Witness 4 (vehicle driver) or being a factor in the rollover.

Finding 16: The Court finds the use of verbal reporting of vehicle faults in place of formal written reports (last parade), whilst well intentioned, creates conditions for errors.

Finding 17: The poor handling of UNIMOG [REDACTED] 1 reported by Witness 2 was not experienced by Witness 4. The Court is therefore unable to establish if the handling characteristics of the vehicle contributed to the rollover.

Finding 18: The Court finds multiple factors; speed, environment and road geometry combined to cause UNIMOG [REDACTED] 1 to lose traction, leading to the rollover.

Finding 19: The Court finds that there is insufficient evidence that Witness 4 miss queued the apex of the corner and that this action contributed to the rollover.

Finding 20: The Court finds there is sufficient evidence to supports the Expert Witness assessment that speed and road conditions contributed to the rollover

Finding 21: At the time of the incident, Witness 4 had driven approximately 175 km that morning on similar road conditions without incident and, ERoad showed a positive driving performance and culture. The vehicle was not subject to any mechanical issues.

Finding 22: It is in the Courts view that all three contributing factors combined to destabilise the UNIMOG as it was navigating the corner, leading to a loss of traction and eventual rollover

Finding 23: The Court finds initial reporting action by the driver, s. 9(2)(a) [REDACTED] and 2/4 RNZIR command was thorough and timely, and completed in accordance with normal NZDF reporting procedures

Finding 24: The Court finds the reporting in SEMT and the requirement to inform WorkSafe were not actioned per normal NZDF nor WorkSafe reporting requirements.

Finding 25: The Court finds the risk control measures of DFI 40.3 Annex 6A for Off Road - Troops in back, are non-existent in practice, and the safety of passengers is solely reliant on the competency of the driver to identify adverse conditions and correctly assess the degree of risk.

Finding 26: The Court finds it is not common practice for the RNZAF to carry passengers by UNIMOG other than within exercise and training areas, with MAB commanders enacting local rules to restrict the on-road movement of passengers by UNIMOG.

Finding 27: The Court finds there is no RNZAF specific instruction to supplement DFI 40.3 and elevate local MAB rules to Standing Order status to provide a visible and repeatable reference for commanders/managers.

Finding 28: The Court finds the creation of a separate driving authorisation for the carriage of passengers on-road (at highway speeds up to 90kph) would reduce the risk of an inexperienced driver being selected for an on-road passenger task.

Finding 29: The Court finds the reporting of **1** rollover to WorkSafe was first missed by the operational responsible units (s. 9(2)(a) HQ 1 (NZ) Bde) for which the Court has been unable to determine a reason and later not reported by RNZAF Health & Safety managers due to the assumption it would be viewed as NOT notifiable by WorkSafe.

Finding 30: The Court finds that the requirement for workplaces to provide continuation type driver training under supervision and where necessary with drivers being reassessed, is not widely promulgated or enacted in the RNZAF.

Finding 31: The Court finds in a crash scenario under high G forces, passengers could be at risk of being thrown around the cargo area even though they remain secured to the seat by seatbelts.

Finding 32: The Court finds the absence of inspection and maintenance schedule for ageing UNIMOG plywood cargo deck increases the potential for harm to passengers should the seat to cargo-deck interface fail during a rollover or high-speed crash

COURT RECOMMENDATIONS

Recommendation 1: The Court recommends the Directorate of Land Engineering review the NZ ISO standard for heavy vehicle Roll Over Protection Systems to ensure ROPS fitted to the NZDF UNIMOG fleet remains compliant with current NZ standards, and release updated Engineering Change Instructions if required.

Recommendation 2: The Court recommends Defence Logistics Command (Land) maintain the current level of GPS telematics systems in NZDF 'B' vehicles, with the objective to achieve 100% installation across the NZDF operating fleet of UNIMOG 1700L vehicles being vehicles that pose a high risk of harm to the carriage of passengers on New Zealand roads.

Recommendation 3: The Court recommends s. 9(2)(a) (AK) order Witness 7 to undergo additional workplace driving training under supervision/instruction and completes a driving assessment in accordance with DFI 40.3 to confirm his competence to drive NZDF vehicles¹²⁷.

Recommendation 4. The Court recommends RNZAF commanders/managers responsible for managing and/or maintaining NZDF vehicles e.g. s. 9(2)(a) and Maintenance Support Squadrons,

¹²⁷ DFI 40.3, Chapter 11, Section 2, paragraph 11.4 (h), any NZDF driver that has been identified at fault in an avoidable vehicle incident is to have their driving assessed.

review Base/Wing/Unit Standing Orders and SOPs, the purpose of the review is to ensure orders, instructions and procedures state following a vehicle rollover:

- a. vehicle rollover procedures are to be actioned in accordance with NZ P98, and
- b. the vehicle is to be quarantined in accordance with DFI 46.5 Chapter 8.

Recommendation 5: The Court recommends RNZAF commanders/managers review Base/Wing/Unit Standing Orders, the purpose of the review is to ensure orders, instructions and procedures state personnel are to comply with the requirements of DFI 40.3 Chapter 5, para 5.7 – (in part “.. drivers to conduct First and Last Parade service inspections”.

Recommendation 6: The Court recommends adding a recurring order in RNZAF Base Routine Orders, that all personnel are to complete First & Last Parade service inspections in accordance with DFI 40.3 Chapter 5, paragraph 5.7, with reference to the COI findings.

Recommendation 7: The Court recommends Defence Logistics Commander (Land) as custodian of DFI 40.3, amend the RNZAF Maintenance Process at DFI 40.3 Annex 13 B paragraph 1, to include the requirement for drivers to complete First and Last Parade sheets in accordance with NZ P93, mirroring Annex 13A - NZ Army Maintenance Process.

Recommendation 8: The Court recommends HQ 1 (NZ) Bde review Base/Camp orders for reporting vehicle incidents in SEMT and the informing of WorkSafe of vehicle rollover events, the review is to ensure sufficient information is included in orders, instructions and procedures to assist commanders/managers to complete SEMT reporting and meet requirements to report vehicle rollover incidents to WorkSafe in accordance with criteria in the Notify WorkSafe tool published on the WorkSafe website.

Recommendation 9: The Court recommends Defence Logistics Commander (Land) as custodian of DFI 40.3, amend Annex 6A to provide the correct reference for risk control measures to support the Mercedes Benz UNIMOG 1700L sub-heading ‘Off-Road – Troops in back’ (ref paragraph 131).

Recommendation 10: The Court recommends commanders of Military Air Bases amend Base Standing Orders to add order(s) to describe additional RNZAF risk controls, minimum authorisation levels and the types of journeys and conditions when personnel shall / shall not be transported by UNIMOG. The order(s) should reference DFI 40.3 instruction and differentiate between the freedoms/limitations applicable to off-road training and exercise areas, and on-road tasks.

Recommendation 11: The Court recommends Training and Doctrine Command (NZ) TRADOC (Master Driver-Trg) review the current Defence Driver Permit (DDP) model, the purpose of the review to determine if a separate category of UNIMOG driver authorisation ‘On-Road Carriage of Passengers’ is practical and would strengthen management/control of drivers-to-task and amend DFI 40.3 environmental and employment training requirements as appropriate.

Recommendation 12: The Court recommends single service Health & Safety commands ensure every vehicle rollover event is reported to WorkSafe, using normal reporting procedures regardless of past responses from WorkSafe for similar events, in accordance with the criteria in the ‘Notify WorkSafe Tool’ published on the WorkSafe website.

Recommendation 13: The Court recommends RNZAF commanders/managers review and where necessary amend Wing/Unit Standing Orders and/or SOPs to include the requirement of DFI 40.3

Chap 4, Sect 4 paragraph .23 (a) (i) specifically to emphasise individuals require specific environmental and employment training to be delivered as required and to support this supervisory staff are to constantly assess and where necessary have drivers reassessed.

Recommendation 14: The Court recommends ACAF T&S undertake a review of driving training and driving management within the RNZAF, the purpose of the review to determine the value of creating an organic RNZAF driving training capability and a Vehicle/Transport Manager position in Air Staff; to present a business case to increase resources, if supported by the review outcome, to the Air Workforce Management Board (AWMB) for consideration.

Recommendation 15: The Court recommends the Directorate Land Engineering investigate options to replace the current over-centre safety link with a positive-locking mechanism.

Recommendation 16: The Court recommends that Directorate Land Engineering develop a maintenance programme for UNIMOG cargo decks to include minimum inspection schedules, damage tolerances and repair/replacement criteria.

Recommendation 17: The Court recommends that the Directorate Land Engineering initiate a nationwide survey of all UNIMOG 1700L rear seat anchor points and plywood cargo decks to identify immediate actions to eliminate any safety issues.

ROYAL NEW ZEALAND AIR FORCE
Office of Deputy Chief of Air Force
DCAF MINUTE No. 01/2025

20 Oct 25

SO LOG

DASH

For Information

IG(F)

COI Administrator, DSM

RECOMMENDATIONS: UNIMOG COURT OF INQUIRY

Reference:

- A. COI Into the Circumstances of Two RNZAF Unimog 1700L, s. 9(2)(k) (Whenuapai) and 1 (Woodbourne), Rolling Over in August 2024, dated 30 Apr 25

Introduction

1. Firstly, I commend the Court for conducting a high-quality investigation into the circumstances surrounding the rolling over of two RNZAF UNIMOG vehicles. Safety is paramount to everything we do, and particularly important in activities that are considered BAU, where complacency may set in. The court has established that there are no common factors that led to the roll-over of two vehicles, apart from a degree of driver error. The normal post-incident command response is appropriate to address those matters. However, the court did identify a number of administrative issues that should be addressed. As these issues relate directly to transport, I require SO LOG to take the lead in implementing these recommendations.

2. As is the nature of the NZDF, the recommendations cut across Service commands and portfolios. Therefore, I will address the recommendations by those which fall under Air Force authority to direct, and those which fall outside of Air Force Authority. For the latter, I request the appropriate authority address the matter in an appropriate and timely fashion. In all cases, I require feedback and the required evidence to be sent directly to the IG(F), so that the recommendation can be closed.

3. My decision and comments on those recommendations that fall under Air Force authority are as follows:

- a. REC 3. *The Court recommends s. 9(2)(a) (AK) order Witness 7 to undergo additional workplace driving training under supervision/instruction and completes a driving assessment in accordance with DFI 40.3 to confirm his competence to drive NZDF vehicles.*

- (1) **Not Accepted:** The identified individual has previously passed the required level of proficiency and testing. I understand the intent, however, given the time passed since the incident and given that the individual has continued to drive the UNIMOG, without incident, as required by his Unit (confirmed with CO on 20 Aug 25), I consider this recommendation no longer necessary.

- b. *REC 4. The Court recommends RNZAF commanders/managers responsible for managing and/or maintaining NZDF vehicles e.g. s. 9(2)(a) and Maintenance Support Squadrons, review Base/Wing/Unit Standing Orders and SOPs, the purpose of the review is to ensure orders, instructions and procedures state that following a vehicle rollover: (a) vehicle rollover procedures are to be actioned in accordance with NZ P98, and (b) the vehicle is to be quarantined in accordance with DFI 46.5 Chapter 8.*

(1) **Comment:** Noting the recent changes to Defence Force Orders, it is timely to review RNZAF orders. I note that Base Standing Orders (BSO's) are reviewed on an annual basis. It is standing policy that all orders and SOP's of sub-units are consistent with and comply with higher level direction, therefore, I am amending the recommendation to focus on the higher level Base Standing Orders which includes RNZAF Base's Auckland, Ohakea and Woodbourne.

(2) **Accepted:** Given the similarity across recommendations 4, 5, and 6, in that all are administrative in nature, I direct SO LOG to draft appropriate amendments for Base Standing Orders. I will consider the recommendations complete on promulgation of the order within each Base/Formation Standing Orders. This task is to be completed NLT 28 FEB 26.

- c. *REC 5. The Court recommends RNZAF commanders/managers review Base/Wing/Unit Standing Orders, the purpose of the review is to ensure orders, instructions and procedures state personnel are to comply with the requirements of DFI 40.3 Chapter 5, para 5.7 – (in part “.. drivers to conduct First and Last Parade service inspections”.*

(1) **Accepted:** See Recommendation 4

- d. *REC 6. The Court recommends adding a recurring order in RNZAF Base Routine Orders, that all personnel are to complete First & Last Parade service inspections in accordance with DFI 40.3 Chapter 5, paragraph 5.7, with reference to the COI findings.*

(1) **Accepted:** See Recommendation 4

- e. *REC 10. The Court recommends commanders of Military Air Bases amend Base Standing Orders to add order(s) to describe additional RNZAF risk controls, minimum authorisation levels and the types of journeys and conditions when personnel shall / shall not be transported by UNIMOG. The order(s) should reference DFI 40.3 instruction and differentiate between the freedoms/limitations applicable to off-road training and exercise areas, and on-road tasks.*

(1) **Not Accepted:** NZDF LWA Minute 20/2025 released 02 May 25, precludes the carriage of rear passengers on public roads, and clarifies the circumstances in which personnel can be carried, therefore, the key safety concern raised by this recommendation has been addressed.

- f. *REC 13. The Court recommends RNZAF commanders/managers review and where necessary amend Wing/Unit Standing Orders and/or SOPs to include the requirement of DFI 40.3 Chap 4, Sect 4 paragraph .23 (a) (a) specifically to emphasise individuals require specific environmental and employment training to be delivered as required*

and to support this supervisory staff are to constantly assess and where necessary have drivers reassessed.

- (1) **Not Accepted:** this issue is covered within NZDF Driver Training and PDT for larger exercises and operations. Both incidents reviewed by the COI occurred on formed roads with posted speed limits therefore I believe the linkage to be tenuous and not relevant.

- g. *REC 14. The Court recommends ACAF T&S undertake a review of driving training and driving management within the RNZAF, the purpose of the review to determine the value of creating an organic RNZAF driving training capability and a Vehicle/Transport Manager position in Air Staff; to present a business case to increase resources, if supported by the review outcome, to the Air Workforce Management Board (AWMB) for consideration.*

- (1) **Accepted:** This recommendation is accepted; however, the action has already been undertaken with discussion at the Air Force Management Group (replacement for AFMG) held on 24 Jul 25, with resources assigned. This recommendation is considered **CLOSED**.

4. My decision and comments on those recommendations that fall outside of Air Force authority are as follows:

- a. *REC 1. The Court recommends the Directorate of Land Engineering review the NZ ISO standard for heavy vehicle Roll Over Protection Systems to ensure ROPS fitted to the NZDF UNIMOG fleet remains compliant with current NZ standards, and release updated Engineering Change Instructions if required.*

- (1) **Accepted:** Whilst no injuries occurred in either incident, it appears to be logical to confirm that our vehicles remain compliant with current NZ ISO standards, or ensure the organisation fully understands the risks associated with non-compliance. I direct SO LOG to formally advise DLE of this recommendation for their action as required. I require this task to be completed by **28 FEB 26**.

- b. *REC 2. The Court recommends Defence Logistics Command (Land) maintain the current level of GPS telematics systems in NZDF 'B' vehicles, with the objective to achieve 100% installation across the NZDF operating fleet of UNIMOG 1700L vehicles being vehicles that pose a high risk of harm to the carriage of passengers on New Zealand roads.*

- (1) **Not Accepted:** NZDF LWA Minute 20/2025 released 02 May 25, precludes the carriage of rear passengers on public roads, therefore, the key safety concern raised by this recommendation has been addressed by LWA. Further, DFI 40.3 Amendment 1 to Chapter 3, Section 5 Telematics policy, sets the NZDF standards and implementation policy. I consider this to be sufficient mitigation for this issue.

- c. *REC 7. The Court recommends Defence Logistics Commander (Land) as custodian of DFI 40.3, amend the RNZAF Maintenance Process at DFI 40.3 Annex 13 B paragraph 1, to include the requirement for drivers to complete First and Last Parade sheets in accordance with NZ P93; mirroring Annex 13A – NZ Army Maintenance Process.*
- (1) **Accepted:** The provision of a high-level order within this DFI will support the direction to be provided by BSOs. I direct SO LOG to formally advise DLC (attention LC(L)), of this recommendation for their review and action. I require this task to be completed by **28 FEB 26**.
- d. *REC 8. The Court recommends HQ 1 (NZ) Bide/JSG/ATG review Base/Camp orders for reporting vehicle incidents in SEMT and the informing of WorkSafe of vehicle rollover events, the review is to ensure sufficient information is included in orders, instructions and procedures to assist commanders/managers to complete SEMT reporting and meet requirements to report vehicle rollover incidents to WorkSafe in accordance with criteria in the Notify WorkSafe tool published on the WorkSafe website.*
- (1) **Accepted:** I note the Units listed in the recommendation are predominantly Formation level, not Base/Camp, however, as with Air Force, I believe a review of current orders to ensure they have been updated to reflect the changes from DFO to DFI, is logical. I direct SO LOG to formally advise Army Health & Safety, of this recommendation for their review and action. I will consider the matter complete up confirmation from Army Health & Safety that a review has occurred. I require this task to be completed by **28 FEB 26**.
- e. *REC 9. The Court recommends Defence Logistics Commander (Land) as custodian of DFI 40.3, amend Annex 6A to provide the correct reference for risk control measures to support the Mercedes Benz UNIMOG 1700L sub-heading 'Off-Road – Troops in back' (ref paragraph 131).*
- (1) **Accepted:** This matter is purely administrative and raised for awareness. The reference provided within Annex 6A is incorrect and requires amendment as DFI 40.3 Chapter 3 Section 4 refers to 0800NZFORCES 'How's My Driving?'. I direct SO LOG to formally advise DLC (attention LC(L)), of this recommendation for their review and action. I require this task to be completed by **28 FEB 26**.
- f. *REC 11. The Court recommends Army Training Group (ATG) (Master Driver-Trg) review the current Defence Driver Permit (DDP) model, the purpose of the review to determine if a separate category of UNIMOG driver authorisation 'On-Road Carriage of Passengers' is practical and would strengthen management/control of drivers-to-task and amend DFI 40.3 environmental and employment training requirements as appropriate.*
- (1) **Not Accepted:** Noting NZDF LWA Minute 20/2025 and the established criteria for the issue of Defence Driving Permits (DDP), being a 40-day

training course for a heavy vehicle DDP, it is considered that an additional qualification is not necessary.

- g. *REC 12. The Court recommends the reporting of every vehicle rollover event to WorkSafe, using normal reporting procedures regardless of past responses from WorkSafe for similar events, in accordance with the criteria in the 'Notify WorkSafe Tool' published on the WorkSafe website.*

(1) **Accepted:** I direct DASH to engage with Army Health & Safety for their review and action. I require this task to be completed by **30 NOV 25**.

- h. *REC 15. The Court recommends the Directorate Land Engineering investigate options to replace the current over-centre safety link with a positive-locking mechanism.*

(1) **Partly Accepted:** This recommendation requires a full technical review and given the recent direction by the LWA, a formal assessment of requirement. I direct SO LOG to formally advise DLC of this recommendation for their review and action if required. I will consider the recommendation complete on acknowledgement from DLC. I require this task to be completed **NLT 30 NOV 25**.

- i. *REC 16. The Court recommends that Directorate Land Engineering develop a maintenance programme for UNIMOG cargo decks to include minimum inspection schedules, damage tolerances and repair/replacement criteria.*

(1) **Accepted:** I believe this recommendation to be pertinent, but I am surprised such a programme does not already exist. I direct SO LOG to formally advise DLC of this recommendation for their review and action if required. I require this task to be completed **NLT 28 FEB 26**.

- j. *REC 17. The Court recommends that the Directorate Land Engineering initiate a nationwide survey of all UNIMOG 1700L seat anchor points and plywood cargo decks to identify immediate actions to eliminate any safety issues.*

(1) **Not Accepted:** NZDF LWA Minute 20/2025 released 02 May 25, precludes the carriage of rear passengers on public roads, therefore, the key safety concern raised by this recommendation has been addressed

s. 9(2)(k)

D.J. Hunt

AIRCDRE

DCAF

REPORT OF THE COURT OF INQUIRY

General

1. This Court of Inquiry (COI) was conducted over the period 21 Oct 24 to 08 Nov 24. Evidence was collected from 11 witnesses and supported by 17 Exhibits.
2. Following the incident, an initial Command Investigation was conducted ¹ and Technical inspections were also conducted into the weapons and ammunition used.² The information contained therein was considered in order to ensure consistency of evidence and conclusions in this COI. Where witnesses confirmed the information in the initial investigation this is referenced as reliable evidence in answering the Terms of Reference (TOR). Also of considerable weight is the Video Recording of the incident from the Battle Training Facility (BTF)³ which was also referenced with witnesses to establish reliable fact. This exhibit is held by TG6 for reference if necessary due to its security classification.
3. The following facts were established in answer to the TOR. In all cases the facts established are supported by a minimum of two reliable sources be that a Witness Statement or an Exhibit.

TOR 1. Describe the incident.

Where and when did incident occur?

4. The incident which resulted in the injury to Witness 3 occurred at the Battle Training Facility (BTF) Ardmore Range Method of Entry House (MOE) at approx. 1139 on 11 Sep 2024.⁴

What was the nature and purpose of the training that was taking place at the time of the incident?

5. The training being conducted was close quarter battle, CQB, live firing room clearance drills in the MOE as part of squadron readiness training.⁵

Who were the personnel involved in the incident and what roles were they performing?

6. The key personnel on the ground during the incident are as follows:
 - a. Witness 1 - Patrol Medic Team 1
 - b. Witness 2 - Team 1 Member

¹ Exhibit A.

² Exhibits E and F.

³ Exhibit I.

⁴ Witness 1, Witness 3, Witness 4; Exhibit A, Exhibit I.

⁵ Witness 1, Witness 3, Witness 4; Exhibit E, Exhibit F.

- c. Witness 3 - Team Leader and Injured soldier (the Injured Soldier)
- d. Witness 4 - Range Conducting and Safety Officer (the RCO)
- e. Witness 5 - Patrol Medic Team 2
- f. Witness 6 – Team 2 member
- g. Witness 7 - Team 1 Member
- h. Witness 8 - Leader Team 2
- i. Witness 9 - S7 Training Officer 1 NZSAS
- j. Witness 10 - Medical Officer 1 NZSAS
- k. Witness 11 - OC s. 6(a) 1 NZSAS

Describe in Chronological order the relevant events immediately leading up to the incident during the incident and immediately post the incident.

7. The following narrative describes the key events as they occurred:
8. On the 11 Sep 24, Witness 8 arrived at the MOE early to conduct the initial set up for the exercise to be conducted that morning ('the EX'). The RCO arrived around 1020hrs and conducted the routine checks and preparation for the EX.
9. 8 personnel arrived at approximately 1030hrs, sorted their kit and received the safety brief from the RCO. The personnel then split into 2 teams.
10. Team 1 consisted of:
 - a. Witness 1,
 - b. Witness 2,
 - c. Witness 7, and
 - d. Witness 3, the Injured Solider.
11. Team 2 consisted of:
 - a. Soldier A,⁶
 - b. Witness 6,

⁶ Person A was not interviewed during the COL.

c. Witness 5, and

d. Witness 8.

12. Witnesses 1 and 5 were the qualified patrol medics for the Ex.

13. The teams then conducted live firing run throughs of room clearance drills and each team went through two run throughs each of the MOE house with no issues. Each room was set up with 2-3 targets. On the third run through of Team 1 was when the incident occurred. The incident can just be seen in the video at Exhibit i.

14. The first and second rooms had been cleared and the team stacked up on the door to make entry into the third room. Witness 1 was the second man standing behind Witness 7 on the right of the room. Witness 2 was the doorman, so to the left of the door and the Injured Soldier was behind him. Witness 2 used the shotgun to breach the locked door firing once and then he had a weapon stoppage. He then rolled back and the Injured Soldier stepped forward and kicked the door open. Witness 1 then threw a dummy flashbang into the room as Witness 7 engaged a target to the left inside the room. Witness 7 then stepped to the left in line with the doorway and engaged another target to his front.

15. As Witness 1 and Witness 7 made entry into the third room the Injured Soldier slumped down onto the floor while. Witness 2 knelt to check him with the team initially thinking it was a medical training scenario planned to test their drills.

16. Witness 1 and Witness 7 continued into the third room to clear it. Witness 2 seeing blood realised it was a real injury and called STOP. Witness 1 and Witness 7 returned to the second room and Witness 7 called out for Witness 5, who was the Patrol Medic from Team 2 waiting in the admin area, to grab the medical kit. The RCO ran out at that point to organise an ambulance through the BTF staff.

17. Witnesses 1 and 2 started taking off the Injured Soldier's kit and found a wound to his right trapezius muscle above his protective body armour. Witness 5 came in with the med bag and started applying first aid. Initially, chest seals were placed on the entry and exit wounds, however, they were not sticking due to the blood. These were pulled off and celox packing gauze was applied to try and pack the wounds and stop the bleeding.

18. The witnesses continued to apply first aid to the Injured Soldier and got him onto a stretcher. Witness 5 got IV access in the Injured Soldier's left arm and Witness 1 connected a 500-ml bag of 0.9 percent sodium chloride and let it flow.

19. The ambulance arrived approx. 20 minutes later, at 1159hr as did a car with 2 civilian doctors. A handover was conducted with the ambulance staff and Witness 5 accompanied the Injured Soldier him to Middlemore Hospital.⁷

Outline the relevant Orders, SOPS, Doctrine and any other instructional information that is directly relevant to the training/incident.

20. The following key documents relate to the training and incident.⁸

- a. Purpose Built Range Practise Instruction - Enduring (Exhibit B). This standard form details the nature and procedures for conducting an exercise of the type carried out on 11 Sep 24. It is signed by the OC s. 6(a) Witness 11 on 19/01/2024.
- b. Risk Assessment Matrix for s. 6(a) AMTA (BTF) MOE House Enduring PBRI (Exhibit C). Signed by s. 9(2)(a) on 20.2.2024.
- c. s. 6(a) Training Programmes 02 – 13 Sep (Exhibit D). These documents cover the training conducted in the lead up to the 11 Sep incident.
- d. s. 6(a). This doc covers the drills to be followed in using an assault grenade.
- e. DFO (A) Vol 2, Chap 8, Section 1, Accident and Event Reporting (Exhibit H). Details the procedure for reporting incidents of the type that occurred on 11 Sep 24.
- f. DFO (A) Vol 7, Chap 2 Section 4 Ammunition Accident and Incident Procedures (Exhibit H). This details the procedures required in the case of possible ammunition accidents or faults.
- g. RCO Checklist for EX Safety. Summary Brief delivered by RCO SGT Witness 4 on the day of the training.

TOR 2, Incident Response.

⁷ Witnesses 1 P1, 2 P1, 3 P1, 4 P1, 5 P1 7, P1; Exhibits A, J and I (video)

⁸ In order these are Exhibits; B, C, D, L, H, M,

What immediate actions were taken when the incident occurred?

21. As described above, the immediate actions were taken following the incident:
22. Witness 2 seeing blood realised it was a real injury and called "STOP". The training was stopped and weapons were laid down on the floor.
23. Medical treatment was immediately applied by Witness 1, 5 and 4 called for an ambulance through the BTF. Witness 4 and Witness 1 returned to the second room and Witness 4 called out for Witness 5, who was waiting in the admin area, to grab the medical kit. Witness 4 also ran out at that point to organise an ambulance through the BTF staff.
24. Witness 1 and Witness 2 started taking the injured soldier's kit off and found a wound to his right trapezius muscle. Witness 5 came in with the med bag and started applying first aid. Initially chest seals were placed on the entry and exit wounds however they weren't sticking due to the blood. These were pulled off and celox packing gauze was applied to try and pack the wounds and stop the bleeding.
25. Team members continued to apply first aid to Witness 3 and got him onto a stretcher. Witness 5 got IV access in his left arm and then Witness 1 connected a 500 ml bag of 0.9 percent sodium chloride and opened it up let it flow.
26. Following the arrival of the ambulance and two Doctors, Witness 3 was taken to Middlemore Hospital in the ambulance accompanied by TPR Witness 5.⁹
27. The training was stopped and the HQ advised of the incident. The unit S7 deployed to the incident site. He secured the scene including recordings, weapons and ammunition and began to collect statements from the personnel present.
28. Subsequently the unit HQ reported the incident to CA who placed a moratorium on live firing.
29. At 1445hr 11/09/2024 a NOTICAS was raised for Witness 3.¹⁰
30. An initial investigation along with ammunition and weapons investigations were initiated and completed.¹¹

⁹ Witnesses 1 P1, 2 P1, 3 P1, 4 P1, 5 P1 7, P1; Exhibit A, J and I (video)

¹⁰ Exhibit G.

¹¹ Witness 9 P1-2; Exhibits A, E, F, and G

To what extent were these actions IAW applicable SOPs.

- 31. The live firing training was being carried out IAW DFO Vol 7 and AMTA Range Standing Orders.
- 32. On the realisation that an injury had occurred the order to STOP was given and the team carried out the actions directed in the Safety Brief.
- 33. Medical assistance was provided and an ambulance sought IAW the Safety Brief.
- 34. The RCO and HQ TG6 initiated Incident Reporting and Ammunition Incident actions IAW DFO (A) Vol 2 and DFO (A) Vol 7.¹²

TOR 3. Medical.**Identify the individuals who were injured (casualties).**

- 35. There was 1 injured person who is Witness 3.¹³

Describe the nature and extent of the injuries sustained.

- 36. Witness 3 sustained a penetrating wound from a ricocheted round through his right shoulder. s. 9(2)(a)

.14

What medical care was provided to the casualty following the incident including ongoing medical requirements?

- 37. At the time of the injury Witness 3 received immediate first aid from a patrol medic. He was assessed as being stable and was medically transferred to Middlemore Hospital for ongoing care.

- 38. s. 9(2)(a)

- 39. s. 9(2)(a)

¹² Witnesses 4 P1-3, 9 P1-2; Exhibits A, E, F, H, and M.

¹³ Witnesses 1, 3 and 4

¹⁴ Witness 10

40. s. 9(2)(a)

41. s. 9(2)(a)

To what extent was the provision of medical treatment IAW applicable orders and best medical practice?

42. On site treatment was immediate and effective in stabilising the injury. Actions to call for the ambulance were immediate and carried out IAW the Safety Brief. Witness 10 (a medical doctor) considers the treatment throughout to be of a 'high standard' including at Middlemore Hospital.¹⁶

TOR 4. Equipment.

What equipment was been used during the training?

43. The training was being carried out in the MOE house using 2-3 standard targets and fit out for each room.

44. The weapons been used were the 5.56mm MARS (L), Remington 870 shotgun and inert Flashbang grenade.

What specific safety equipment was provided to personnel IOT mitigate the risk of injury during the training?

45. Targets in the MOE are set out with bullet catchers in positions to minimise any chance of deflections. Each team members wore long sleeves, standard body armour that covers the torso, helmet, ESS ballistic glasses, buff over faces and gloves.¹⁷

To what extent did the equipment function correctly?

46. The COI found no evidence of any equipment failure. The COI assesses, based on the subsequent inspection and ammunition reports, that a bullet fired by Witness 4 as he engaged

¹⁵ Witnesses 3 P1-2 and 10 P1-2.

¹⁶ Witnesses 4 P1-3 and 10 P1-2

¹⁷ Witnesses 3 P2, 8 P1

target in A15 room from room A13 struck the grenade thrown by Witness 1 behind him ricocheted and hit the injured soldier in the trapezius.

47. The subsequent Command Investigation of the incident (Exhibit A), a Technical Inspection of the weapons used by a qualified Armourer (Exhibit E) and an Ammunition Investigation by DLO ATO (Exhibit F) all support this assessment by the COI.¹⁸

To what extent was any equipment or property damaged as a result of the incident?

48. The only damage was to the Grenade Hand Assault (inert) which was stuck by a 5.56 bullet.¹⁹

TOR 6. Safety.

Describe the planning conducted prior to the training including any risk management plans.

49. The enduring PBRI was signed 19 Jan 24 and covers all the relevant details and references for conduct of this activity.²⁰

50. The Risk Assessment Matrix was completed and signed on 20 Feb 24.

51. s. 6(a) was going through a period of live firing training from 2-13 Sep IAW the Training Programme and included higher level live firing exercises prior to the MOE training.

52. A safety brief was delivered on the day of the training to all personnel by the RCO. Checks had been conducted of the MOE prior to the training.²¹

Describe the safety environment before and during the training.

53. The training prior to the injury had been carried out without incident and IAW SOP. Four run-throughs had been conducted (each team has completed two run-throughs each) and the fifth, where the incident occurred, was progressing as expected.

54. Safety briefs had been delivered and the teams conducted debriefs before and after each run. Targets were set up IAW SOP and personnel, including medical staff and the RCO, were positioned as required.²²

¹⁸ Exhibits A, E, J and F

¹⁹ Exhibits A, E and F

²⁰ Exhibit B.

²¹ Witness 1 P1; Exhibits B, C, D and M.

²² Witnesses 1 P1, 3 P 1-2 and 4P 1-4

55. **What safety training is provided to staff performing safety roles for the training that was been conducted. Were personnel conducting safety roles suitably qualified and experienced?**

56. All relevant staff were suitably qualified:

- a. The RCO Witness 4 was qualified as a PBRI Range Conducting Officer (RCO) and Counter Terrorism RCO.
- b. Each team had a qualified patrol medic and all s. 6(a) personnel present were qualified Combat Life Savers (CLS).²³

To what extent was the planning and safety measures IAW SOP and the RMP?

57. The COI found that the planning and safety measures met all required SOP and standards and were fit for purpose.²⁴

TOR 8. Reporting.

What on site and reporting actions were taken following the injury to the causality? To what extent were these actions IAW relevant orders.

58. HQ s. 6(a) were immediately advised and the S7 went to the site and secured the scene. SOCC and AGS were advised and within 4 hours CA had put a moratorium on live firing (since lifted). A technical inspection was carried out and CATO advised. The ATO and an ammo tech arrived about 1540 hrs. A NOTICAS was issued at 1445.²⁵

59. The reporting actions were carried out IAW the requirements of DFO (A) Vol and 2 and DFO (A) Vol 7.²⁶

To what extent were notification procedures carried out IAW relevant orders policies and procedures? Has WorkSafe been notified?

60. Reporting actions were carried out as required and WorkSafe were informed on 12 Sep 24.²⁷

²³ Witness 4, P4, Witness 9 P 1-2; Exhibit B and H

²⁴ Witnesses 4 P1-5, 8 P1-3; Exhibits A, B, and F

²⁵ Witness 9 P 3, Exhibits G and Q

²⁶ Exhibits A, E, F, H and Q

²⁷ Witness 9 P 3, Exhibit Q

TOR 9. Previous Incidents.

Describe any previous similar incidents involving ricochet incidents during CQB or similar training.

61. No witnesses were able to recall any similar incidents and the COI did not obtain any evidence of similar incidents having occurred in the past.²⁸

If relevant, describe what measures were recommended to prevent recurrence and to what extent they have been implemented.

62. Witnesses describe what they saw as an extraordinarily unlikely event that occurred in the course of well-planned and conducted training by experienced soldiers. Accordingly, whilst the incident has been reviewed extensively no changes or measures have been recommended.²⁹

TOR 9. Comments and conclusions by COI

63. The COI concluded the following:

- a. The injury to Witness 3 was caused by a ricochet of a bullet that stuck the inert flashbang grenade as it was thrown into the room. The grenade had been thrown IAW correct practice and the firer of the bullet was engaging a target also IAW correct training and practice. While the injury to the soldier had the potential to be serious it occurred in extraordinarily unlikely circumstances (a freak accident).
- b. All actions taken by personnel throughout were timely effective and conducted IAW with the relevant Orders, SOPs, training and applicable RMP.
- c. The COI found no evidence of a failure in the preparation, safety measures, conduct, medical plan and adherence to orders by s. 6(a) staff that contributed to, or could have prevented, the incident.
- d. Given the unlikely recurrence of the incident, the COI does not recommend any changes to policy or procedure for training of this type (or associated reporting actions).

²⁸ Witness 9

²⁹ Witnesses 4 P4, 9 P2; Exhibits A, E and F

Recommendations

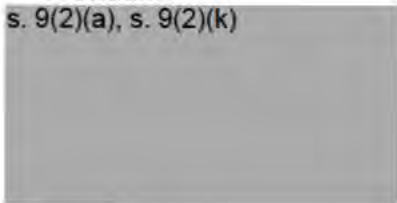
64. It is recommended that the Assembling Authority:

- a. **Note** the circumstances in which the injury occurred were extraordinary and the likelihood that such an event occurring again (bullet hitting an inert flashbang grenade) is very low.
- b. **Note** the immediate actions of the personnel involved was timely, effective and IAW applicable Orders, SOPs, safety instructions and the RMP.
- c. **Note** that the Injured Solider has sustained a serious injury but the medical advice is that he is assessed as likely to return to full duties in due course.

Dated at Auckland on 28 November 2024

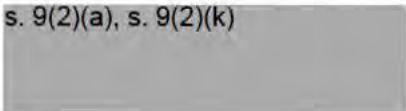
President:

s. 9(2)(a), s. 9(2)(k)



Member:

s. 9(2)(a), s. 9(2)(k)



HEADQUARTERS NEW ZEALAND DEFENCE FORCE
Special Operations Command
SOC MINUTE 21/2024

7 Dec 24

1080/SOC/5202-2-389

CA (through DCA)

For Information:

G7

IG(A)

1NZSAS Regt

ASSEMBLY AUTHORITY COMMENTS: COI 5202-2-389

References:

A. Court of Inquiry 5202/2/389, dated 28 Nov 2024

Purpose

1. This minute acknowledges the completion of the Court of Inquiry (COI) into the circumstances surrounding the injury to a 1NZSAS Regt soldier during a CQB live firing practice on 11 Sep 2024. This minute will formally recommend the closure of this COI. It will note the recommendations contained within Ref A and will provide direction to the Special Operations component based on this report.

Comment

2. It is clear that the incident as described within Ref A was an extremely low probability event. While this COI has validated that 1NZSAS Regt is conforming to the DFOs which govern training, is training safely and is complying with policies and procedures, it is clear that accidents will still occur.

3. The COI has not found evidence that a failure in preparation, safety measures, conduct or adherence to orders eventuated in this event therefore 1 NZSAS Regt is to be assured that this HQ maintains trust in its officers and NCOS to continue to deliver hard, effective training.

4. Although it is positive that this COI has validated the 1NZSAS Regt approach to training, a soldier was still seriously injured. Our challenge now is to continue to train hard in order to meet our directed outputs, while continuing to take all practicable measures to ensure the safety of our team members.

Findings

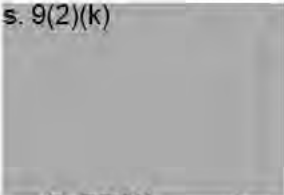
5. As Assembling Authority I note all three recommendations detailed in Ref A, at para 64. I agree, and am comfortable that as these findings are not recommendations there are no delegated tasks for remediation.

6. I would like to acknowledge the President, Member and Counsel Assisting. This report is comprehensive and has been delivered in a most timely fashion.
7. Due to the clarity of Ref A, the fact that there are no recommendations requiring remediation and the finding that 1NZSAS Regt has followed procedures, I recommend that this COI be closed.

Recommendations

8. It is recommended that CA:
 - a. **Note** that COI 5202/2/389 has been completed.
 - b. **Note** that the court did not find fault with 1NZSAS Regt safety in training procedures.
 - c. **Note** that the soldier is expected to return to full duties in due course.
 - d. **Note** that as there are no recommendations for remediation I recommend that this COI be formally closed.

s. 9(2)(k)



C. GRAY
COL
SOCC